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Comparative Perspectives on Trade Cost Geography: Latin American Insights

Sebastian Villano *

Resumen

La globalización y el comercio internacional han sido durante mucho tiempo temas centrales en la investigación económica y en las agendas políticas globales. Sin embargo, el reciente aumento de políticas proteccionistas ha exigido una reevaluación del papel del comercio en la economía mundial. Este estudio tiene como objetivo examinar el proceso de integración económica internacional entre diversos países en las últimas décadas, con un énfasis particular en las economías de América Latina. Un análisis detallado de los costos de comercio entre países es esencial para entender las dinámicas y los patrones de esta integración.

Para alcanzar este objetivo, se han desarrollado indicadores innovadores, aprovechando bases de datos exhaustivas y utilizando Modelos de Gravedad Estructural con los datos más recientes disponibles. Los resultados subrayan la naturaleza diversa de las reducciones en los costos de comercio entre regiones y países. La geografía y la asimetría desempeñan un papel crucial en la comprensión de estos costos. Generalmente, las economías desarrolladas enfrentan menores costos de comercio, mientras que las economías emergentes en Asia han obtenido notables beneficios de la globalización. En contraste, América Latina ha enfrentado obstáculos para mejorar el acceso a los mercados globales mediante políticas arancelarias de comercio.

Además, al comparar las ganancias obtenidas por los exportadores frente a las de los consumidores, se revela que la globalización ha otorgado ventajas más consistentes a los exportadores, mientras que los consumidores han experimentado una mayor variabilidad en los beneficios. De manera notable, los consumidores asiáticos han emergido como los principales beneficiarios, en contraste con los consumidores latinoamericanos, quienes han experimentado avances comparativamente modestos.

Dentro de América Latina, la heterogeneidad se destaca como la característica principal, con economías que muestran resultados variados en la reducción de los costos de comercio. Mientras algunas han mostrado progreso, otras se rezagan sin avances significativos, permaneciendo más aisladas.

Palabras clave: Costos de comercio, Integración, Indicadores de modelo de gravedad estructural, América Latina.

Código JEL: F02, F13, F14, F15

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Abstract

Globalization and international trade have been longstanding focal points in economic research and global political agendas. However, the recent surge in protectionist policies has necessitated a reevaluation of the role of trade in the global economy. This research aims to scrutinize the process of international economic integration among various countries in recent decades, with a particular emphasis on Latin American economies. A comprehensive analysis of trade costs across countries is imperative for comprehending the dynamics and patterns of this integration.

To accomplish this objective, novel indicators have been devised leveraging comprehensive databases and utilizing Structural Gravity Models with the latest available data. The results underscore the diverse nature of reductions in trade costs across regions and countries. Geography and asymmetry play a pivotal role in comprehending trade costs. Typically, developed economies experience lower trade costs, while emerging economies in Asia have notably gained from globalization. Conversely, Latin America has encountered obstacles in enhancing global market access through trade tariff policies.

Additionally, upon comparing the gains attained by exporters against those of consumers, it becomes apparent that globalization has conferred more consistent advantages upon exporters, whereas consumers have encountered greater variability in the benefits. Notably, Asian consumers have emerged as primary beneficiaries, in contrast to Latin American consumers who have experienced comparatively modest advancements.

Within Latin American countries, heterogeneity stands out as its primary characteristic, with economies displaying varying outcomes in reducing trade costs. While some have shown progress, others lag behind without significant advancements, remaining more isolated.

Keywords: Trade costs, Integration, Structural gravity indicators, Latin America.

JEL Classification : F02, F13, F14, F15

1. INTRODUCTION

Globalization and international trade have been critical issues in economics and politics for several decades, with many studies highlighting the positive effects of trade and economic integration on productivity and economic growth. Other studies have studied about the effects of increased liberalization on unemployment and inequality.

Despite the proliferation of free trade agreements and the growing interdependence of the world's economies, protectionist policies have recently gained momentum, and multilateral organizations, such as the World Trade Organization, have faced significant challenges in achieving their primary objectives. These developments necessitate reassessment of the role of trade in the modern global economy.

Over the past few decades, countries have pursued various development and international integration strategies leading to varying outcomes. As a result, the effects of globalization, which are frequently associated with a reduction in trade costs, have been diverse and uneven across nations.

In recent years, the international trade scenario has been marked by various disintegration processes, including Brexit, as well as the implementation of protectionist trade policies exemplified by the US-China trade war. Moreover, notable developments have occurred with the establishment of new trade agreements such as the TPP and TTIP. Additionally, the conflict between Russia and Ukraine has significantly elevated the importance of these issues, making them central areas of concern.

In the Latin American and Caribbean (LAC) region, economic integration has been a pivotal element in countries' development strategies. Over the past three decades, preferential trade agreements (PTAs) have served as the primary instrument. Despite the extensive network of intra-regional trade agreements, where more than 80% of trade benefits from tariff preferences, their efficacy in promoting trade is somewhat limited, resulting in relatively low rates of intra-regional trade. However, trade relationships and agreements have undergone significant evolution over time. As noted by Baldwin (2011), "Today's regionalism is qualitatively different from the 90s."

The discipline of international trade revolves around three fundamental inquiries: What factors propel trade and shape its composition, what advantages ensue from it, and how are these advantages allocated? Addressing these queries necessitates delineating the geography and asymmetry among nations, as well as examining various international integration strategies. This research endeavors to elucidate these issues by delineating the geographical distribution of trade costs and tracing their temporal evolution. Analyzing trade costs disparities across nations provides valuable perspectives on global market competitiveness.

The academic literature has extensively explored the subject of measuring trade costs. Several studies have used the gravity model to analyze the costs of international commerce at the country level using various techniques. These investigations have yielded valuable insights into the factors that affect trade costs, such as tariffs, trade facilitation, and transportation expenses, and their impacts on global market competitiveness. One of the first seminal works on this subject is Anderson & van Wincoop's (2004) research on "Trade Costs."

More recently, Arvis et al.'s (2016) work, "Trade Costs in the Developing World:1995-2012," has also contributed significantly to the field. The authors discovered that trade costs substantially decreased over this period due to improved infrastructure and trade facilitation measures. Freeman et al.'s (2021) latest research project, "Unlocking Novel Approaches to Estimate Country-Specific Trade Costs and Trade Elasticity," highlights that the topic continues to attract attention with new techniques and applications developed.

The topic is of utmost importance for Latin America, a region that lags in international trade and global value chains and where regional integration processes lack depth and horizon. One of the most recent studies is "Pathways to Integration: Trade facilitation, infrastructure, and global value chains" (Sanguinetti et al., 2022). This study provides a measure of the relative costs of trade and explores various approaches that countries can take to achieve economic integration. This study highlights the critical importance of trade facilitation, infrastructure, and global value chains in reducing trade costs and promoting economic growth.

This study aligns with the structural gravity models of trade (SGM), specifically building upon the foundational work of Anderson & van Wincoop (2003) and subsequent advancements by Novy (2013), Anderson & Yotov (2010), Agnosteva et al. (2014), and Yotov et al. (2016). These scholars, drawing upon SGM, derive indicators for measuring trade costs. Our research delves into the evolution of trade costs, employing recent innovations in estimation methods (Larch et al., 2019; Yotov, 2022) and advanced techniques for estimating Poisson (pseudo) regression models, incorporating numerous high-dimensional fixed effects (Correia et al., 2020).

Our approach is significantly influenced by recent analyses conducted by Moncarz et al. (2023) and Sanguinetti et al. (2022). These studies underscore that, beyond high tariffs and non-tariff barriers, a primary reason for the low level of trade in Latin America and the Caribbean is the more substantial impact of geographical distance in this region compared to others.

Building upon the SGM and contributing to the existing literature, our study employs both well-known and newly developed trade cost indexes. These indexes aid in characterizing and understanding the dynamics of trade costs across regions and over time. In particular, we utilize a novel indicator called Eta (η), which compares international trade costs to domestic costs. This indicator enables the breakdown of total trade costs into two components: the tariff component, reflecting trade policy through applied tariffs, and the non-tariff component, encompassing all other trade costs.

Furthermore, the Eta indicator not only aids in geographical characterization and trade cost dynamics but also enables us to achieve consistent regional aggregation. It allows us to identify patterns and integration strategies in both intra-regional and extra-regional trade.

The primary objective of this study is to enhance our understanding of the trade cost structure and its dynamics, with a specific focus on Latin America and Caribbean countries. To achieve this, we expanded a comprehensive database developed by Moncarz et al. (2021), that covers the period from 1995 to 2017, selected as the most recent period with complete information.

The analysis primarily focuses on the manufacturing sector. It encompasses a large sample of countries (113), representing over 94% of international trade in this sector. This extensive coverage allows for a comparative assessment of regional performance.

As an empirical strategy, we first apply the Eta index at the regional level, distinguishing between the trade policy (tariff) component and all other (non-tariff) components. We also analyze intra-regional and extra-regional linkages for both importing and exporting roles. Next, we delved deeper into the Latin American region by disaggregating it into subregions, allowing us to explore the heterogeneity within the region.

Finally, we conducted an analysis at the country level. At this level, we initially apply the same indicators and decompositions as at the regional level. Next, we utilize well-established indicators from the literature, specifically the Constructed Trade Bias (CTB), to examine the connections between countries in their roles as exporters and importers. Furthermore, we analyze the trade openness and temporal evolution of individual countries, employing the Constructed Home Bias (CHB). Lastly, we compare the performance of consumers and exporters through the utilization of multilateral resistances (MRs).

Primary findings indicate a reduction in overall trade costs across all regions. While international integration is predominantly driven by intra-regional relations, the most substantial advancements in cost reduction have occurred with extra-regional partners in recent decades.

By disaggregating total trade costs into the tariff and non-tariff components, the results reveal that non-tariff trade costs have experienced a more significant reduction compared to tariff costs. The influence of trade policy, particularly through tariff reduction, has reached a point of diminishing returns, underscoring the necessity for alternative strategies to propel additional cost reductions and, consequently, foster deeper integration.

In the context of tariff policy, it is noteworthy that the LAC region stands out as the only region that has not significantly reduced its tariff barriers to the rest of the world.

This observation suggests a failure of countries to enhance their market opening through preferential tariff access.

Both the Central America and Caribbean (CAC) and South America (SAM) sub-regions of Latin America and the Caribbean face difficulties in reducing tariff trade costs with extra-regional markets. Additionally, SAM stands out as the only region worldwide experiencing a decline in its intra-regional integration, as measured by non-tariff trade costs. This highlights the need for targeted efforts to address these challenges and improve market access within the region, enabling stronger engagement with global markets.

In terms of dynamics, developing countries in Asia have made notable strides in reducing their overall trade costs. This progress is typically accomplished through a combination of tariff trade policies and complementary strategies, such as non-tariff measures.

When evaluating the impact of trade cost integration on the benefits for both consumers and producers within an economy, firms generally experience more significant and uniform gains than consumers. This finding is consistent with the "specialization effect" proposed by Anderson & Yotov (2010). Among consumers, those from Asian countries benefited the most, whereas some Latin American consumers experienced relatively smaller gains.

The remainder of this paper is organized as follows. Section II presents a characterization of global trade based on a model-free analysis using the database created for this project. Section III presents the theoretical framework that includes the base model and main trade cost measurement indicators to be applied. Section IV presents the empirical strategy with two parts: creation of the database and empirical application of the model and indicators. Section V presents the results of the applied trade cost indicators, from the most aggregated level to the countries and agents within them. Finally, Section VI concludes the paper.

2. MODEL-FREE ANALYSIS

This section presents a collection of stylized facts that highlight the differences in openness performance among regions and countries as exporters and importers as well as their regional trade orientation. Several indicators and measures have been employed to characterize trade openness in countries and regions. Conventionally, openness indexes are expressed as the proportion of the Gross Domestic Product (GDP). However, in this study, we measure countries' sizes by gross production and expenditure (apparent consumption), enabling them to define two indicators: production openness (exports/production) and consumption openness (imports/expenditure). This choice was justified for two reasons. First, the numerator and denominator of both indicators are measured in the same unit of measurement, namely, the gross value. Second, these indicators are consistent and coherent with the SGM.

We constructed a database using information on production, expenditure, and trade in manufacturing (sector D of the International Standard Industrial Classification, revision 3). Countries were grouped according to geographical region. This study uses a new database covering 113 countries from 1995 until 2017. The sample of countries represents more than 94% of world trade in this sector.

Domestic trade refers to transactions in which the origin and destination countries are the same, whereas international trade encompasses the remaining transactions. The latter is further subdivided into intra-regional trade, when the two countries involved belong to the same geographical region, and the remaining transactions are classified as extra-regional trade.

A- Global - Regional

Manufacturing expanded as a result of international trade. The world's manufacturing output increased at a cumulative annual rate of 4.9% from to 1995 to 2017, with a dynamic characterized by trade openness. International trade grew by 5.7%, whereas domestic trade grew by 4.7%. The trade openness index increased by 3.7 percentage points (pp).

In global terms, there was a contraction in regional integration and, hence, an increase in the extra-regionalization of trade. The degree of intra-regional integration in manufacturing fell by 6.4pp globally (see Table II.1). Although the process has not been homogeneous across regions, Asia, Africa, and Latin America have regionalized trade. In contrast, the opposite trend was observed in Europe, Oceania, and North America.

The concentration of manufacturing production varies significantly across regions. In 2017, Asia (ASA) accounted for the majority of production, representing 61.6% of total output, while Europe (EUR) and North America (NAM) accounted for 18.2% and 13.7%, respectively. The openness to international trade also shows heterogeneity across regions, as shown in Figure II.1a. Europe has the lowest proportion of domestic trade, accounting for only 50% of its total trade, while ASA and NAM have the highest ratios, with 83% and 78% of their total trade being domestic, respectively. It is worth noting that Europe has the lowest level of domestic trade due to having the highest proportion of intra-regional trade, accounting for 67%. (Refer to Figure II.1b).

The total manufacturing exports in 2017 amounted to USD 11,869 billion and were evenly distributed between intra- and extra-regional trade. The three " *hub* " regions concentrate most of the world trade (89% of imports): EUR (38%), ASA (33%), and NAM (18%) (Table II.1).

Extra-regional trade (50% of world trade) occurs among the ASA, EUR, and NAM regions. The main exporting region to the rest of the world is ASA, with 43% of the total extra-regional exports as EUR (25%) and NAM (18%). Meanwhile, they accounted for 83% of imports (ASA, 33%; EUR and NAM, 25%).

Latin America and Caribbean is considered a minor global player compared with the three major regions. Despite accounting for 6% of total exports and 7% of total imports, the region's production is only 4.7%. However, it experienced a 4.4% increase in production owing to more significant foreign trade (6.5%) than domestic trade (3.7%). Most of the region's trade (82%) occurs outside the region, with Mexico's primary trade being with the United States, representing one-third of the region's total exports.

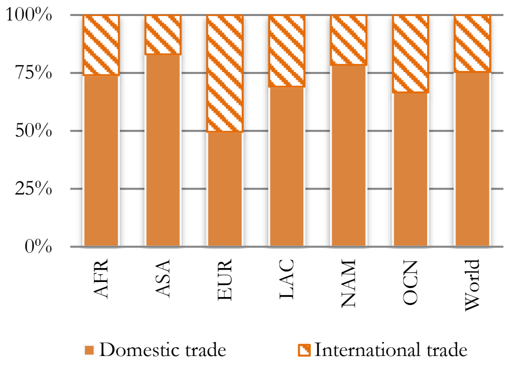
Latin America's production and consumption openness rates are higher than the world averages of 30.9% and 34.4%, respectively, as well as their growth over the analyzed period, which increased by 11.7pp for production and 12.1pp for consumption. Notwithstanding, greater trade openness occurs primarily within the region, with manufactured exports increasingly staying within the region (5.6pp), while imports only slightly increase (0.7pp) (see Table II.1). These findings align with the cost indicators presented in Section V, which highlight Latin American countries' poor performance in reducing trade costs.

For a better identification of subregional characteristics within our region of interest, Latin America and the Caribbean (LAC), we have 22 countries that we can characterize based on their geographical and trade-related features into three subregions, following the classification of the United Nations.[1]

One Latin American subregion is South America (SAM), which accounted for 3.2% of global manufacturing production and 3.4% of global manufacturing consumption in 2017. Trade openness is low at 18%, while the world average is 25%, and its dynamics are among the lowest in the world. It is one of the regions with the most closed, poorly integrated, and least dynamic economies.

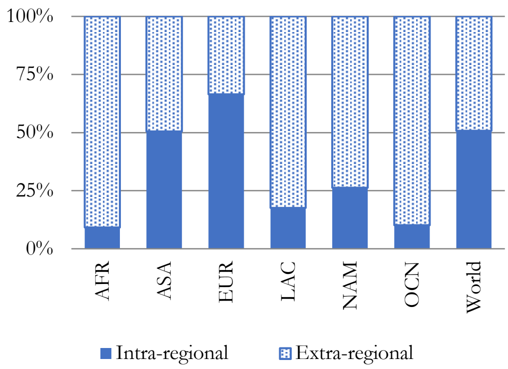
[1] World's countries were grouped into nine regions. This allowed Latin America to be divided into three regions with more specific and appropriate geographical and trade particularities. The world as a whole is divided into nine regions: Africa (AFR), Central America and the Caribbean (CAC), North America (NAM), South America (SAM), Central Asia + Eurasia + South Asia (CSEA), Europe (EUR), the Middle East (MES), the Pacific (PAC) , and Southeast Asia + East Asia (SEEA

Figure II.1a Composition of production by region. 2017
(Values in percentages)



Regions: Africa (AFR), Asia (ASA), Europe (EUR), Latin America and the Caribbean (LAC), North America (NAM), and Oceania (OCN).

Figure II.1b Breakdown of exports by region. 2017
(Values in percentages)



Source: Prepared by the author

The region's production grew (4.2%) below the global growth level (4.9%). Both domestic trade (4.0%) and international trade (5.3%) were less dynamic than the global average (4.7% and 5.7%, respectively). According to Table A.1. in the Appendix A, there has been a decrease of 4.6pp in regional trade integration. The trade expansion has shifted towards the rest of the world.

Another LAC subregion is Central America and the Caribbean (CAC), it represents a marginal share of world production (0.3%). Nevertheless, it showed a greater dynamism in its production throughout the period, with a growth in production (5.0%) above the world average but above all in exports compared to the rest of the world (6.4% vs. 5.7%).

As a result, CAC experienced a notable increase in its openness relative to output, rising by eight percentage points from 22% in 1995 to 30% in 2017. This positions CAC as the third most open region in terms of output, following EUR (50%) and PAC (33%). The regional export orientation indicator witnessed a significant increase of 8.8pp, while the regional integration indicator advanced by 7.1pp, both representing the most substantial progress globally.

Finally, the last Latin American country, México, is part of NAM, which includes two more countries, Canada and the United States, but accounts for 14.9% of world production and 16.3% of expenditure. NAM has lower growth rates than the world average in terms of production, consumption, exports, and domestic trade. It only shows greater dynamism relative to the world average for imports (6.0%).

Table II.1 Main indicators by region, 1995 to 2017

	Product. (Yi=Xii+Xi)			Expend. (Ei=Xii+Mi)			Export (Xi)			Import (Mi)			Domestic Trade (Xii)		
Reg. Code	Values[a]	Part. [b]	Growth[c]	Values	Part.	Growth	Values	Part.	Growth	Values	Part.	Growth	Values	Part.	Growth
AFR	533	1.1	4.5	676	1.4	4.9	138	1.2	7.2	281	2.4	7	395	1	3.8
ASA	29,747	61.6	7.3	28,642	59.3	7.1	5,045	42.5	7.9	3,941	33.2	7.1	24,701	68	7.1
EUR	8,815	18.2	2.3	8,820	18.3	2.3	4,440	37.4	4.3	4,446	37.5	4.5	4,375	12	0.9
LAC	2,273	4.7	4.4	2,393	5	4.5	703	5.9	6.7	823	6.9	6.5	1,570	4	3.7
NAM	6,622	13.7	2.5	7,360	15.2	3	1,429	12	4.3	2,166	18.3	5.7	5,194	14	2.2
OCN	338	0.7	2.5	437	0.9	3.6	113	1	4.5	212	1.8	6.7	225	1	1.8
World	48,328	100	4.9	48,328	100	4.9	11,869	100	5.7	11,869	100	5.7	36,459	100	4.7

	Prod. Opening (Xi /Yi)			Consumption opening (Mi /Ei)			Regional export orientation (xRR/Xi)			Regional import orientation (mRR/Mi)			Regional integration (2xRR/ (Xi +Mi))		
Reg Code	Values[d] 1995	Values 2017	Variation[e] (17-95)	Values 1995	Values 2017	Variation (17-95)	Values 1995	Values 2017	Variation (17-95)	Values 1995	Values 2017	Variation (17-95)	Values 1995	Values 2017	Variation (17-95)
AFR	14.6	25.9	11.4	26.8	41.6	14.8	5.9	9.1	3.2	2.8	4.5	1.7	3.8	6.0	2.3
ASA	14.7	17.0	2.2	13.8	13.8	0.0	38.5	38.6	0.0	41.8	49.4	7.6	40.1	43.3	3.2
EUR	32.9	50.4	17.5	31.9	50.4	18.5	73.3	66.5	-6.8	76.6	66.4	-10.2	74.9	66.5	-8.5
LAC	19.3	30.9	11.7	22.3	34.4	12.1	50.3	55.9	5.6	34.6	35.4	0.7	45.7	51.5	5.9
NAM	14.9	21.6	6.7	16.5	29.4	13.0	39.0	40.9	1.9	36.9	31.7	-5.2	36.7	32.5	-4.2
OCN	22.1	33.5	11.4	25.1	48.5	23.4	13.9	10.2	-3.7	11.8	5.4	-6.3	12.7	7.1	-5.6
World	20.9	24.6	3.7	20.9	24.6	3.7	56.1	49.7	-6.4	56.1	49.7	-6.4	56.1	49.7	-6.4

(a) Values are in billions of current dollars. (b) Part. Is participation in percentage. (c) Average cumulative growth rate for 1995-2017 for the variables measured in current dollar values.
(d) Values in percentages. (e) Change in value of the indicator between 1995 and 2017 in percentage points.
Regions: Africa (AFR), Asia (ASA), Europe (EUR), Latin America and the Caribbean (LAC), North America (NAM), and Oceania (OCN).
Xi: exports; Mi: imports; Yi: production; Ei: expenditure; Xii: domestic trade; xRR: intra-regional exports; mRR: intra-regional imports.
Source: Prepared by the author

B- Countries

For Latin American and Caribbean (LAC) countries, similar indicators characterize trade relations at the regional level. In 2017, the total regional output was $2,273 billion. Brazil emerged as the leading producer of manufactured goods, contributing 37.7% to the region's total output, followed by Mexico with 24.8% and Argentina with 11.8%

Notably, countries in Central America and the Caribbean (CAC) such as Costa Rica, Honduras, El Salvador, and Nicaragua, as well as Uruguay and Chile in South America (SAM), and Mexico in North America (NAM), all exhibit an openness exceeding 40%. The region's average production openness is 31%.

In addition to their above-average openness, these countries display a regional export orientation surpassing the regional average of 18%, with the exception of Mexico, where the regional market accounts for only 6% of its total exports. Other countries, such as Colombia, Panama, Guatemala, and Paraguay, maintain a high share of their exports within the regional market despite being relatively closed economies.

The analysis of these countries as importers reveals a similar pattern, albeit with some variations. Generally, all countries demonstrate greater openness, with an average import openness of 34%. The same countries stand out for their openness, particularly those in the CAC (El Salvador, Nicaragua, Panama), while the larger economies in SAM, especially Brazil and Argentina, exhibit below-average openness.

Refer to Figure II.2, which illustrates the relationship between trade openness (x-axis) and regional trade orientation (y-axis), with the size of the bubbles representing trade value. This analysis is presented for both export (part a) and import (part b) flows. The dotted lines indicate the regional averages for each indicator within the LAC region.

The dynamic behavior of countries over the analyzed period shows an increase in both production and consumption openness for most Latin American countries. Mexico, CAC countries such as Costa Rica, Honduras, Nicaragua, and El Salvador, and some South American countries like Uruguay and Chile, exhibit greater dynamism than the regional average, with production openness increasing by 11.7pp and consumption openness by 12.1pp. (See Table II.2)

A general trend is that SAM economies have reduced their regional trade integration, while CAC economies have shown the opposite, significantly increasing their regional exports and imports. A primary reason for this trend is the greater integration of Central American and Caribbean economies with North America through strengthened commercial links with Mexico.

Mexico, although a Latin American country, is commercially part of NAM. Within this subregion, it has an openness of 67%, showing a notable increase of 32.5pp. over the period analyzed. The degree of regional integration with NAM amounted to 71% in 2017, representing a reduction of 8.9pp (see Table A.2 in Appendix A). The main reason for this lower degree of integration is the decline in regional imports relative to extra-regional imports, primarily from China, while exports remained relatively constant.

The remaining large Latin American economies, such as Argentina, Brazil, and Colombia, have the lowest rates of openness in terms of production and consumption in the region (below 6%). In each case, low openness was accompanied by a reduction in regional integration: Argentina by -1.6pp, Brazil by -0.5pp, and Colombia by -3.4pp. These economies, accounting for 55% of LAC's manufacturing output (75% of SAM), can be categorized as closed, non-dynamic, and not regionally focused.

Table II.2 Variation [(*)] of main indicators by country
(Values in percentage points)

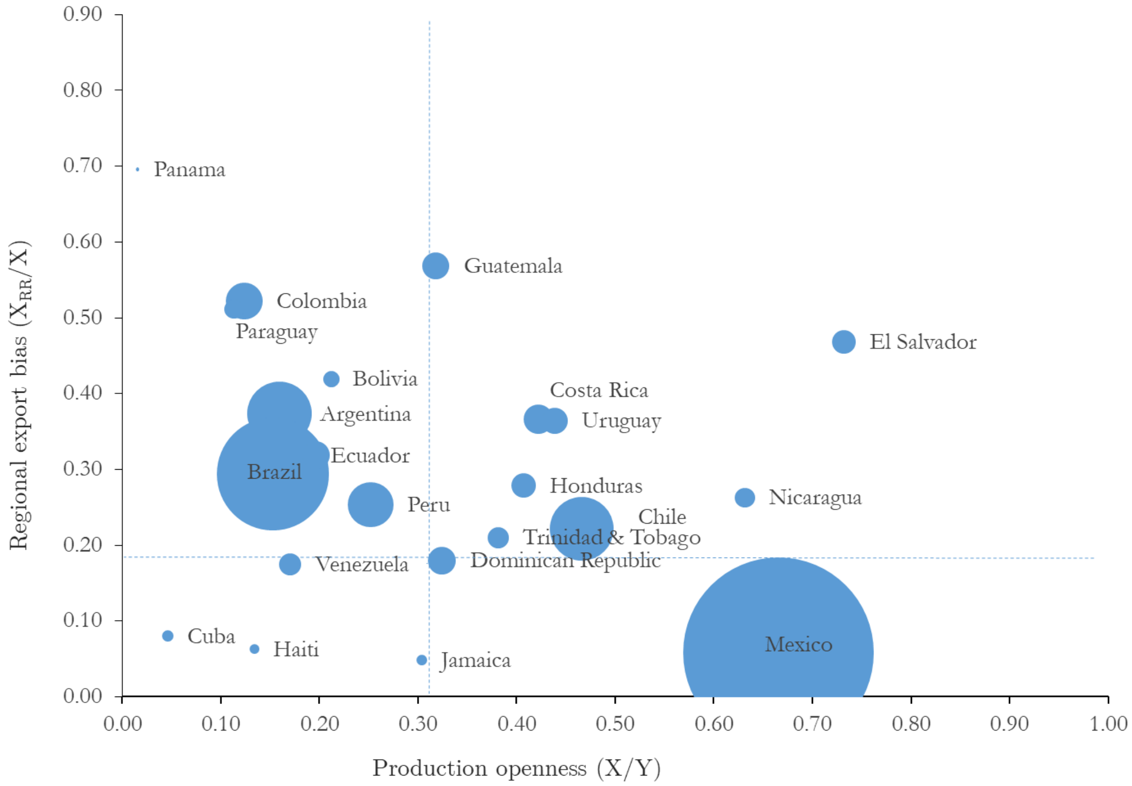
Countries	Prod. Opening (Xi /Yi)	Consumption opening (Mi /Ei)	Regional export orientation (xRR/Xi)	Regional import orientation (mRR/Mi)	Regional integration ((xRR+mRR)/(Xi +Mi))
ARG	2.9	6.1	-10.3	6.3	-1.6
BOL	1.0	3.0	5.1	-5.5	-2.6
BRA	3.5	2.5	3.9	-5.4	-0.5
CHL	14.6	17.2	0.2	-6.3	-3.4
COL	1.3	3.8	-1.7	-3.5	-3.4
CRI	16.9	13.0	2.3	-2.3	0.1
CUB	-5.5	-0.3	-1.5	-10.5	-5.0
DOM	4.3	15.5	17.3	5.1	10.5
ECU	8.3	11.5	-1.2	-5.1	-3.9
GTM	8.8	6.3	-6.9	0.0	-0.9
HND	13.3	9.9	13.8	12.5	12.6
HTI	6.1	4.3	5.2	27.0	20.8
JAM	-25.5	1.4	1.7	3.2	5.8
MEX	32.5	35.3	-1.1	0.3	-0.6
NIC	38.4	31.4	4.2	10.7	7.0
PAN	-8.2	-8.9	19.9	16.0	15.1
PER	10.7	11.1	5.9	-7.5	-2.6
PRY	0.9	-20.2	-13.2	-12.3	-11.0
SLV	48.8	33.4	-4.8	6.1	4.4
TTO	15.6	8.8	-10.5	3.3	-3.9
URY	15.7	17.0	-21.3	-19.4	-20.3
VEN	-13.6	-7.7	-25.5	0.4	-11.2
LAC	11.7	12.1	-4.6	-3.4	-3.9

(*) Change in value of the indicator between 1995 and 2017.
Source: Prepared by the author

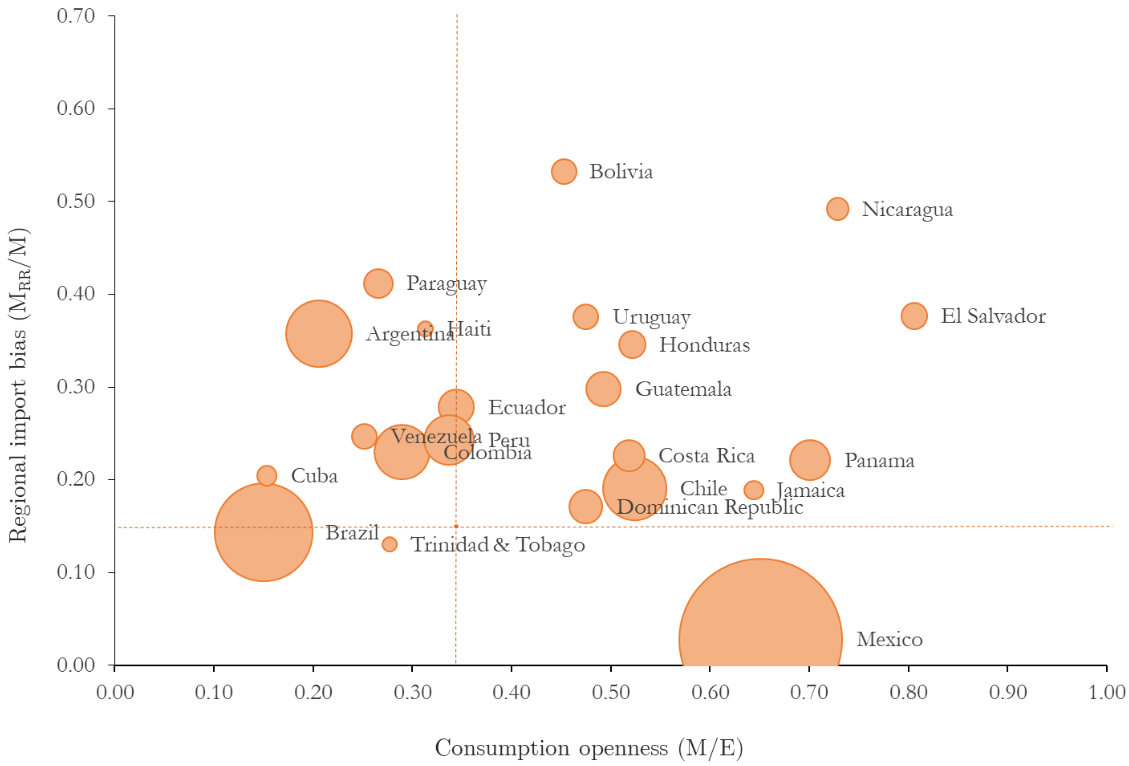
Appendix I, Figure A.1, represents the relationship between trade openness and regional integration for LAC countries, both as exporters and importers. These graphs, analogous to Figure II.2, are subdivided into the three mentioned subregions. This allows for intra-subregional comparisons and demonstrates how the narrative can change depending on the regional definition used.

Figure II.2 Trade Openness and regional orientation, 2017

a) Exports and production



b) Imports and consumption



Source: Prepared by the author
See details in Appendix A. Table A.2.

3. CONCEPTUAL FRAMEWORK

A- Theoretical background

Newton's Law of Gravitation has been applied in economics since the late 19th century; however, it was initially developed without a clear theoretical basis. Anderson (1979) first gave the gravity equation a theoretical foundation under the assumptions of product differentiation by place of origin and Constant Elasticity of Substitution (CES) expenditures. Despite early theoretical developments and the model's empirical solid performance, it was not until the late 1990s and the early 2000s that the gravity model of trade gained significant economic attention.

Structural gravity theories have been particularly influential, with Eaton and Kortum (2002) deriving gravity on the supply side as a Ricardian structure with intermediate goods, while Anderson & van Wincoop (2003) popularized the Armington-CES model of Anderson (1979) and emphasized the importance of the general equilibrium effects of trade costs. Arkolakis, Costinot, and Rodriguez-Clare (2012) (ACR) recently demonstrated that a large class of models generates isomorphic gravity equations that preserve the trade gains. These gains are invariant to a series of alternative micro-foundations, including single-economy models with monopolistic competition, Heckscher-Ohlin frameworks, Ricardian frameworks, entry of heterogeneous firms, selection into markets, sectoral Armington models, sectoral Ricardian models, sectoral input-output linkage gravity models, and dynamic frameworks with asset accumulation.

Allen et al. (2014) established the universal power of gravity by deriving sufficient conditions for the existence and uniqueness of the trade equilibrium for a wide range of general equilibrium trade models. This study is framed within the demand models of Anderson & van Wincoop (2003), Larch & Yotov (2017), and Yotov (2022).

B- Model – Theory

One of the main advantages of the structural gravity model is that it delivers a tractable framework for trade policy analysis in a multi-county environment. Accordingly, the model used in this study considers a world that consists of countries in which each economy produces a good (i.e., goods differentiated by place of origin (Armington, 1969)) that is traded with the rest of the world. The supply of each good is fixed at Q_i, and the factory-gate price for each variety is p_i. Thus, the value of domestic production in a representative economy is defined as $Y_i = p_i Q_i$, where Y_i is the nominal income in the country i. E_i denotes the country i's aggregate expenditure. Aggregate expenditure can also be expressed in terms of nominal income by E_i=$\phi_i Y_i$, where $\phi_i > 1$ shows that country i runs a trade deficit, and $1 > \phi_i > 0$ reflects a trade surplus. As in Dekle et al. (2007, 2008), we treat trade deficits and surpluses as exogenous.[2]

The structural gravity model represents a global joint constant elasticity of substitution (CES), sub-utility, or production function. Following Larch & Yotov (2017), the structural gravity model (SGM) assumes identical preferences or technologies across countries for domestic varieties of goods or services differentiated by place of origin. The market-cleaning conditions for each trade flow by origin and the budget constraint of each

[2] Complete derivation in Larch & Yotov (2017) p13.

destination produce a structural form. The SGM is specified as a system of three equations for the bilateral flows and multilateral resistance pair:

$$X_{ij} = \frac{E_j Y_i}{Y}\left(\frac{t_{ij}}{P_j \Pi_i}\right)^{1-\sigma} \quad \text{(III.1)}$$

$$(\Pi_i)^{1-\sigma} = \sum_j \left(\frac{t_{ij}}{P_j}\right)^{1-\sigma} \frac{E_j}{Y} \quad \text{(III. 2)}$$

$$\left(P_j\right)^{1-\sigma} = \sum_i \left(\frac{t_{ij}}{\Pi_i}\right)^{1-\sigma} \frac{Y_i}{Y} \quad \text{(III. 3)}$$

X_{ij} denotes the value of trade flows at destination prices from the region of origin i to the destination region j. The double-subscript order denotes the origin and the destination. E_j is the expenditure at the destination j from all origins. Y_i denotes the sales from i to all destinations, whereas Y is the total world output. $t_{ij} \geq 1$ denotes the bilateral trade cost factor from i to j, and σ is the elasticity of substitution between goods. P_j is the Inward Multilateral Resistance (IMR) and the CES demand price index. Π_i is the Outward Multilateral Resistance (OMR), which by equation (III.2) is the aggregation of external trade costs relative to the destination price indexes. Multilateral resistances are a general equilibrium concept since $\{\Pi_i, P_j\}$ solves equations (III.2) and (III.3) given $\{t_{ij}, \mathrm{Y}_i, E_j\}$.

Equation (III.1), which represents the theoretical gravity equation that governs bilateral trade flows, can be conveniently decomposed into two terms: (i) size term, $Y_i E_j / Y$, and trade cost term, $(t_{ij}/(\Pi_i \mathrm{P}_j))^{1-\sigma}$:

The intuitive interpretation of the size term, $Y_i E_j / Y$, is the hypothetical level of frictionless trade between partners i and j if there were no trade costs. Mechanically, this can be demonstrated by eliminating bilateral trade frictions (i.e., setting $t_{ij} = 1$) and re-deriving the gravity system. Intuitively, a frictionless world implies that consumers will face the same price for a given variety regardless of their physical location, and that their expenditure share on goods from a particular country will be equal to the share of production of the source country in the global economy (i.e., $X_{ij}/E_j = Y_i / Y$).

In essence, the size term inherently provides valuable insights into the correlation between a country's size and its bilateral trade flows. This means that larger producers tend to export more to all destinations, while sizable or affluent markets are inclined to import more from all sources. Moreover, trade flows between countries are notably larger when the trading partners exhibit a greater size.

The natural interpretation of the trade cost term $(t_{ij}/(\Pi_i \mathrm{P}_j))^{1-\sigma}$ captures the total effects of the trade costs that drive the wedge between realized and frictionless trade. The trade cost term comprises the following three components.

i. Bilateral trade costs between partners i and j, t_{ij}, are typically approximated in the literature by various geographic and trade policy variables, such as bilateral distance, tariffs, and the presence of regional trade agreements (RTAs) between partners i and j.

ii. The structural term P_j, coined by Anderson & van Wincoop (2003) as inward multilateral resistances, represents an importer j's ease of market access.

iii. The structural term Π_i, defined as the outward multilateral resistance by Anderson & van Wincoop (2003), measures an exporter i's ease of market access.

Multilateral resistance serves as a mechanism that translates the initial effects of trade policy at the bilateral level into country-specific impacts on consumer and producer prices. It captures both the direct effects of trade costs on trade flows and the general equilibrium effects, which consider changes in prices, income, and expenditures resulting from trade cost changes.

C- Trade costs indexes

By beginning with the equilibrium equations, we derive multiple indicators that effectively help us characterize the global trade costs' geography and their changes over time. All indicators arise directly from the structural model; some require normalization to be interpreted (e.g., MRs), while others do not, enabling temporal and spatial comparison, aggregation, and decomposition.

i. General equilibrium effects trade cost indexes subject to normalization

The indexes presented in this section correspond to some of the equations of the structural gravity system, namely the multilateral resistances that can be recovered from equations (III.2 and III.3) and the market-clearing condition[3]. A common feature and potential caveat of multilateral resistances and factory-gate prices is that these indexes can only be obtained with normalization, expressed in the relative form concerning a reference group. As a result, these indexes can be compared consistently across countries for a given sector and year; however, the required normalization makes comparisons over time and across sectors difficult.[4]

Inward multilateral resistance indexes (IMR). The inward multilateral resistances P_j are theory-consistent general equilibrium aggregate indexes that measure the incidence of trade costs for each country's consumers as if these consumers buy from a unified world market. Thus, inward multilateral resistance, formulated in equation (III.3), can be used to evaluate the effects of domestic and foreign trade policies on consumers in each country.

Following Larch et al.´s (2017) notation, an alternative definition of P_j, which is consistent with the structural gravity model, is a CES price aggregator:

$$P_j = \left[\sum_i \left(\alpha_i p_i t_{ij}\right)\right]^{1/1-\sigma} \tag{III.4}$$

Based on this definition, P_j can be interpreted as a supplier access index (Redding & Venables, 2004). The inward multilateral resistance of CES aggregators may be

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[3] Combining the system of equations III.1 – III.3 with the market cleaning conditions ($p_i = \left(\frac{Y_i}{Y}\right)^{\frac{1}{1-\sigma}} \frac{1}{\alpha_i \Pi_i}$) and the aggregate expenditure expressed in terms of nominal income ($E_i = \varphi_i Y_i = \varphi_i p_i Q_i$) enables us to establish structural gravity system decomposing the effects of trade policy on trade into three different channels (Head & Mayer, 2014) (Larch et al., 2017).

[4] A possible remedy is to choose as a reference group a country for which reliable data are available across all dimensions for the index of interest. Subsequently, these data series can adjust all indexes to compare across dimensions.

interpreted as ideal price indexes. Variations across countries may reflect variations in consumer price indexes (CPIs). However, inward multilateral resistances may have more variation than the corresponding CPIs and, as a result, only loosely track variations in the CPIs. There are several possible explanations for the differences between inward multilateral resistance and CPIs (Anderson & Yotov, 2010).[5]

Outward multilateral resistance index (OMR). Similarly, as explained earlier, outward multilateral resistances Π_i are theory-consistent general equilibrium aggregates of the incidence of trade costs for each country's producers, as if they ship to a unified world market.

The outward multilateral resistance indexes, defined in equation (III.2), can be combined with inward multilateral resistance indexes to decompose the incidence of trade costs for consumers and producers in each country (Anderson & Yotov, 2010b). In the literature, alternative interpretations have been given to outward multilateral resistance, such as market access indexes (Redding & Venables, 2004) and total factor productivity frictions in distribution (Anderson & Yotov, 2010a).[6]

ii. General equilibrium effects trade cost indexes independent of normalization.

An important use of the multilateral resistance and factory-gate price indexes discussed above is to combine them to construct more complex and informative complementary general equilibrium indexes that provide additional insights into the effects of trade policy. We present three indicators already developed by other authors (CTB, CHB, and CIB), a new one complementary to these, and a product of the transformation of the same (Eta- η). However, unlike the standard structural terms (Π_i, P_j, and p_i), the general equilibrium indexes presented and discussed below are, by construction, all independent of the normalization required to compute the multilateral resistances and factory-gate prices.

Constructed trade bias (CTB). Based on the structural gravity model, the constructed trade bias index proposed by Agnosteva et al. (2014) is defined as the ratio of the econometrically predicted trade flow $\hat{X}_{ijt}$ to the hypothetical frictionless trade flow between the origin i and destination j:

$$CTB_{ijt} = \frac{\hat{X}_{ijt}}{Y_{it}E_{jt}/Y_t} = \left(\frac{\hat{t}_{ij}}{\hat{P}_j\hat{\Pi}_i}\right)^{1-\sigma} \qquad \text{(III.5)}$$

The right-hand side of equation (III.5) corresponds to the predicted/constructed value of the composite trade cost term from structural gravity equation (III.1).

The CTB index serves as a comprehensive measure that captures both direct effects (through bilateral trade costs t_{ij}) and indirect effects (via multilateral resistance terms

[5] First, the inward incidence of trade costs probably falls on intermediate goods users in a way that does not show up in measured prices. Second, the production-weighted inward multilateral resistances are not conceptually comparable to the consumer price indexes of final goods baskets. Third, the inward multilateral resistances may capture home bias in preferences, which results in attributions to trade costs that cannot show up in prices. Finally, the inward multilateral resistances may be subject to measurement error, and the CES model on which they are based may be mis specified.
[6] For more information about multilateral resistances properties, refer to the Larch et al. 2017, Chapter 2. Page 71.

Π_i and P_j) of trade policy or other trade cost changes on bilateral trade. This makes it a versatile general equilibrium trade cost index.

This index is not dependent on normalization or elasticity of substitution, enabling comparisons across sectors and over time. It represents a pure-volume displacement ratio, measuring predicted volume relative to a frictionless benchmark that can be observed.

The variations in CTB over time stem from two primary sources. Firstly, they reflect how changes in production and expenditure patterns impact the general equilibrium multilateral resistance terms, consequently influencing CTBs. Anderson & Yotov (2011) emphasized the significance of this channel, highlighting changing specialization and consumption patterns as crucial factors in determining trade costs and globalization. Secondly, changes in CTB also reflect alterations in bilateral trade costs over time.

In addition, the CTB index can be extended and systematically aggregated to generate a set of general equilibrium indexes that encompass the impact of trade policy on trade costs at different regional aggregation levels. An example of such an indicator is as follows.

Constructed home bias (CHB). Anderson & Yotov (2010) introduce CHB as the predicted hypothetical frictionless domestic trade ratio within a given country. CHB is independent of normalization.

$$CHB_{it} = CTB_{iit} = \frac{\hat{X}_{iit}}{Y_{it}E_{it}/Y_t} = \left(\frac{\hat{t}_{ii}}{\hat{P}_i\hat{\Pi}_i}\right)^{1-\sigma} \tag{III.6}$$

Intuitively, CHB measures the extent to which the economy is from a frictionless trade equilibrium. CHB is a complementary index to the widely popular welfare statistics of ACR (2012).[7] Note also that CHB is independent of the elasticity of substitution because it is constructed using $(1-\sigma)$ power transforms t_{ij}, Π_i, and P_j. The reported CHB values are calculated for each country as $\left(\frac{t_{ii}}{\Pi_i\, P_i}\right)^{1-\sigma}$. Two countries i and j with the same domestic trade cost $t_{ii} = t_{jj}$ may have quite different CHBs because $\Pi_i P_i \neq \Pi_j P_j$.[8]

Interlinking the indicators:

This study employs two well-established trade cost indicators previously introduced, derived from the structural trade model: CTB and CHB. Their combination also forms an indicator that belongs to the same family of indicators, known as the Constructed Interregional Bias (CIB). The CIB is defined as the ratio between the cost of trade between an economy and its trading partners (CTB) divided by the cost of trade within the economy itself (CHB). This relationship among CTB, CHB, and CIB serves to provide a comprehensive assessment of trade costs and their impact on economic activities. From the perspective of exporting country i, we have: $CIB_{ijt} = \frac{CTB_{ijt}}{CHB_{it}}$.

[7] Anderson et al. (2014) proposes the constructed foreign bias (CFB) index, defined as the predicted volume of international export trade relative to the hypothetical frictionless volume of trade, and the constructed domestic bias (CDB) index, which corresponds to the ratio of fitted to frictionless intra-national trade, excluding trade within subregions in a country. The CFB index may be handy in assessing the effects of trade policy on international trade. In contrast, the CDB index can be used to evaluate the intra-national effects of trade policy.
[8] Our empirical application requires normalization tii=tjj=1

Subsequently, we introduce our novel indicator, Eta (η), whose derivation and characteristics will be presented below. This indicator is a transformation of CIB, which is a quotient of CTB and CHB originating from the equations of the structural model (III.1 – III.3), and consequently, from the multilateral resistances[9]. When considering an exporting country i, the relationship can be expressed as follows:

$$\eta_{it} = (CIB_{it})^{1/(1-\sigma)} = \left(\frac{CTB_{it}}{CHB_{it}}\right)^{1/(1-\sigma)} \qquad \text{(III.7)}^{10}$$

iii. New Structural Trade Costs Index – Eta

This study aims to characterize the global patterns of trade cost behavior, with a particular focus on the breakdown and appropriate regional aggregation of trade cost measures. This approach enables us to investigate the asymmetrical trade costs that can significantly affect international trade.

One contribution of this study is the decomposition of total costs into two components. The first component, referred to as the tariff component, identifies the tariff policy-related costs. The second component, denoted as the non-tariff component, encompasses all other costs, including trade policy-related costs not captured by the first component. This breakdown is both theoretically sound and accurate, and follows the structural gravity model.

Additionally, this approach is an appropriate method for aggregating trade policy measures, such as tariffs or applied tariffs, because it avoids the issue of endogeneity when weighed by imports or exports and eliminates bias that may result from a simple average.

Eta′s (η) indicator proposed in this study is part of the CTB family and is consistent with the structural model with some modifications, as mentioned earlier. The indicator includes a time dimension and consistent aggregation at the regional level (intra- and extra-regional, following Agnosteva et al. (2014), and decomposition into tariff and non-tariff components (Novy, 2013).[11]

In order to generate this indicator, we build upon the methodology introduced by Anderson & Neary (2003) and further developed by Arvis et al. (2016). This methodology involves utilizing trade intensities to determine an "average cost" that aligns with observed trade patterns. For ease of reading, the derivation of this indicator, following the aforementioned authors, is included in the appendix. Please refer to Derivation III.1. in Appendix B.

Substituting the definition of CTB (eq. III.5) and CHB (eq. III.6) into equation III.7, we obtain a disaggregated formulation of our indicator Eta (η):

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[9] An aggregation of CIB for an exporter i is: $CIB_{it} = \sum_{j \neq i} \frac{X_{ijt}}{E_{-it}^{W} \frac{X_{iit}}{E_{it}}}$. See Derivation B.3. in Appendix B.

[10] See Derivation B.2. and B.3. in Appendix B. Also, Agnosteva et al. (2014) provide an alternative interpretation of Eta, as sellers' incidence measures,

[11] To obtain average total ($\overline{\tau}_{it}$), tariff ($\overline{t}_{it}$), and other trade costs ($\underline{\tau}_{it}$)by country i, we have: $(1+\overline{\tau}_{it})^{(1-\sigma)} = (1+\overline{t}_{it})^{(-\sigma)}(1+\underline{\tau}_{it})^{(1-\sigma)}$. See derivation B.7 in Appendix B for a symmetric case.

$$\eta_{it} = \left(\sum_{j \neq i} \frac{X_{ijt}}{E_{-i}^{W} \frac{X_{iit}}{E_{it}}} \right)^{\frac{1}{1-\sigma}} \tag{III.8}$$

where: η_{it} - indicates the costs of international trade relative to domestic trade. It measures the average proportion by which trade costs, directly and indirectly, reduce an economy's exports concerning the effect on its domestic trade.

By utilizing applied tariffs at the bilateral level, denoted as (t_{ijt}), it is possible to derive an analogous metric that solely accounts for non-tariff trade costs:

$$\underline{\eta}_{it} = \left(\frac{\sum_{j \neq i} X_{ijt}}{\frac{X_{iit}}{E_{it}} \sum_{j \neq i} (1+t_{ijt})^{-\sigma} E_{jt}} \right)^{\frac{1}{1-\sigma}} \tag{III.9}$$

Therefore, the average Eta_tariff paid by i's exports is obtained by dividing (III.8) by (III.9):

$$\overline{\eta}_{it} = \left(\frac{\eta_{it}}{\underline{\eta}_{it}} \right)^{1-\sigma/-\sigma} = \left(\sum_{j \neq i} (1 + t_{ijt})^{-\sigma} \frac{E_{jt}}{E_{-it}^{W}} \right)^{-\frac{1}{\sigma}} \tag{III.10}$$

Regarding the link among indicators, average total ($\tilde{\tau}_{it}$), tariff ($\overline{t}_{it}$), and other trade costs ($\underline{\tau}_{it}$)by country i, we have:

$$\eta_{it}{}^{1-\sigma} = (\overline{\eta}_{it})^{-\sigma} (\underline{\eta}_{it})^{1-\sigma} \tag{III.11}$$

A similar approach could be applied to countries from imports perspective.

Regional aggregation and decomposition.

As previously discussed, aggregation into regional or extra-regional origins and destinations can also be achieved with indicators derived from the properties of the CTB indicators.

Agnosteva et al. (2014) demonstrate that achieving consistent aggregation of the CTB (and related indicators) for a particular country with a set of trading partners is possible. We are interested in distinguishing between the intra- (R) and extra-regional (E) destiny of exports (origins of imports) to compare their behaviors.

In order to accomplish this, we begin with a bilateral indicator (e.g. CTB_{ij}) for the minimum unit at the country level. This indicator can then be expanded to cover a subregion (R or E) or total. In Agnosteva et al.´s (2014) notation, the Constructed Trade Bias for the country i's exports to $C(i)$ is given by the ratio of the theoretical aggregate volume with frictionless benchmark aggregate export volume $Y_i \frac{E_{C(i)}}{Y}$ where $E_{C(i)} \equiv \sum_{j \epsilon C(i)} E_j$.[12] Finally, the regional indicators are obtained after a second aggregation such that where $E_C \equiv \sum_i E_{C(i)}$.[13]

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[12] $CTB_{C(i)} = \sum_{j \epsilon C(i)} \frac{E_j}{E_{C(i)}} CTB_{ijt}$.

[13] Following the example of CTB, $CTB_C = \sum_{i \epsilon C} \frac{E_{C(i)}}{E_C} CTB_{C(i)} = \sum_{i \epsilon C} \sum_{j \epsilon C(i)} \frac{E_j}{E_C} CTB_{ijt}$. For more details, see Agnosteva et al. (2014).

This allowed us to perform a consistent aggregation of the CTB indicators and derivations. Among them, Eta index, aggregated at the regional level for exporter i, is:

$$\eta_{it,R} = \left(CIB_{it,R}\right)^{1/(1-\sigma)} = \left(\frac{CTB_{it,R}}{CHB_{it}}\right)^{1/(1-\sigma)} \quad \text{(III.12)}$$[14]

measures the average proportion by which trade costs directly and indirectly reduce i's exports to partners belonging to R, relative to the effect on their domestic trade.

Despite being acceptable and consistent, the aggregation suggested by Agnosteva et al. (2014) has a flaw in that the overall aggregate does not add up to the total regional and extra-regional aggregations, as one may initially anticipate. This is because the weights can be altered in addition to indicators.[15]

This raises the additional issue that the overall, regional, and extra-regional components of the indicator of trade costs (CTB, CIB, and Etas), when broken down, may not exhibit the same sign of change over time. To enhance readability, we have included in Appendix B Derivation B.5. a set of weighting suggestions aimed at addressing this issue[16] also Table B.1. (Appendix B) summarizes the aforementioned indicators from both exporter and importer perspectives, their potential aggregation, and their connection with other indicators.

[14] See Derivation B.4. in Appendix B.

[15] Although theoretically possible, this only happens in a minimal number of cases. In particular, this is seen for some European countries and consequently for the region as a whole because they are experiencing significant changes in their regional weight relative to their global weight. This means that Europe lost much ground globally regarding the proportion of its spending to that of the rest. Depending on the purpose of the analysis, Section V illustrates this case and the recommended course of action.

[16] The breakdown by region is consistent as long as the global Eta is the weighted sum of the regional indicator plus the extra-regional one for a country or region j. $\eta_{jt} = \propto \eta_{jt}^{R} + (1-\propto)\, \eta_{jt}^{E}$; $\eta_{jt} = \frac{\sum_{i\in R} Y_{it}}{YW_{-j}} \eta_{jt}^{R} + \frac{\sum_{i\in E} Y_{it}}{YW_{-j}} \eta_{jt}^{E}$. Derivation B.5. in Appendix B address this issue to achieve coherence.

4. METHODOLOGY

A- Databases

This section describes the procedure carried out to construct the databases used in the empirical analysis, with special attention to the bilateral transactions database that includes domestic trade flows, which are indispensable for the empirical analysis to be carried out.

The design of this database is based on Moncarz et al. (2021), although we were able to include more nations and expand the trade and production data up until 2019. Finally, we choose to use this information through 2017 because we combine it with the Teti (2020) applied tariff database.

Although some databases provide information on domestic trade, their degree of geographic coverage means that data is not available for a number of nations in Latin America. Additionally, while operating at a particular level of aggregation, questions are raised regarding their level of sectoral coverage.

The International Standard Industrial Classification (ISIC, Revision 3)'s Agriculture, Livestock, Hunting and Fishing (sector AB) and Manufacturing industries (sector D) are the two primary sectors for which the database was initially built. Finally, the paper uses the database of the Manufacturing sector. Regarding geographic coverage, it includes those countries for which information could be obtained at the desired level, or alternatively, it could be reconstructed through the procedures explained below.

The constructed database encompasses 113 countries, incorporating the majority of Latin American nations, and spans the years 1995 to 2017. The full list is provided in Table A.IV.1, and the nations included account for more than 94% of global commerce in the D sector.

In addition to the mentioned trade data, other data sources used include UNSTAS' National Accounts - Analysis of Main Aggregates (AMA) database for production and value-added data for sectors AB [17]; the World Bank World Development Indicators (WDI) database for value-added data[18]; Input-Output Tables (IOTs) from OECD provide data on production, value-added, gross exports, and net exports[19]; and the CEPII BACI database for six-digit bilateral trade data of the Harmonized System in its 1992 version (HS-1992)[20]. One advantage of the BACI base is that it reports statistics in which a harmonization process has been carried out between what has been declared by the importing country and what has been declared by the exporting country. The data is expressed to FOB values, and the original information source is COMTRADE.

To compile the bilateral transaction database, it was essential to establish four separate databases—current dollar production, total exports in current dollars, domestic transactions in current dollars, and bilateral flows of trade in current dollars. These databases were subsequently merged after implementing required adjustments. The

[17] https://unstats.un.org/unsd/snaama/Index.
[18] https://databank.worldbank.org/source/world-development-indicators.
[19] http://www.oecd.org/sti/ind/input-outputtables.htm.
[20] http://www.cepii.fr/CEPII/en/bdd_modele/presentation.asp?id=37.

final step involved integrating the bilateral trading flow data with the domestic transaction data.

We gathered information on the most prevalent factors in the gravitational trade model in addition to data on bilateral trade flows and domestic transactions. The "Gravity" database created by CEPII and the "Dynamic gravity dataset" (DGD) database created for the United States International Trade Commission are the two primary sources (USITC)[21].

B- Estimation method and empirical form

We obtain an estimate of bilateral trade costs in each period (τ_{ijt}) without requiring any assumption of symmetry. In addition, countries' particular geography is included in multilateral resistances as sellers (Π_{it}) and buyers (P_{jt}). These resistances are aggregations of trade costs to all markets, appropriately weighted by each market's ability to sell or buy (see Equations III.1 – III.3).

This study proposes an estimation of the following functional form of bilateral trade flows:

$$X_{ijt} = \exp\{\psi_{it} + n_{jt} + \mu_{ij} + \alpha\,[TP_{ijt}] + \delta TC_{ijt} + \textstyle\sum_t \omega_t d_t\} + \varepsilon_{ijt} \qquad \text{(IV.1)}$$

where ψ_{it}, n_{jt}, and μ_{ij} are origin-time, destination-time, and asymmetric origin-destination fixed effects (i.e., $\mu_{ij} \neq \mu_{ji}$), respectively.[22] We follow Baier et al. (2019), and the effect of globalization is controlled by including a set of dummies (d_t) that equals 1 for international trade observations (when $i \neq j$) as opposed to domestic trade (when $i = j$), at each time t. The coefficients ω_t capture the process of globalization over time, as all countries trade more with each other and less with their domestic markets.[23]

Trade complementarity (TC_{ijt}) measures the degree of matching between the specific products sold by i and bought by j. The literature justifies the inclusion of this variable in aggregate gravity models (Deardorff, 1998). It has been pointed out that the low level of intra-regional trade in LAC is the result of very similar productive structures and trade specialization patterns. The inclusion of a complementarity variable, TC_{ijt}, seeks to control this kind of effect.[24] Origin-destination fixed effects control permanent trade costs $\tau_{ij} = \exp(\mu_{ij})$.

We consolidate all potential bilateral trade policy variables under the variable Trade Policy (TP_{ijt}). This encompasses both the discriminatory associations within preferential trade agreements and the non-discriminatory relations through the multilateral treatment of the Most Favored Nation (MFN) Tariff. Relations with agreements incorporate both the tariff and preferential agreement, whereas relations without agreements solely consider the treatment of the MFN tariff. Within preferential trade relations, we disaggregate them into different types of agreements based on their depth and level of commitment. The detailed model and various specifications are provided in

[21] Database construction is described in greater depth in Appendix C.
[22] Including asymmetric fixed effects helps control the endogeneity of trade policy (Baier & Bergstrand, 2007) and potential scale effects in trade costs due to differences in trade volumes (Heid et al., 2021).
[23] In equation IV.1, all explanatory variables, except for fixed effects where applicable, take the value zero for domestic trade (i=j), so they capture the impact on international trade *vis-à-vis* domestic transactions.
[24] Refer to Flores (2020).

Appendix D. For now, we focus on the estimation results necessary to calculate the set of indexes developed earlier, presenting a parsimonious version of the model.

The empirical application of SGM faces two information problems. First, a high proportion of trade flows equals zero, censored observations in which there is no trade between two countries (or their value is so small that the agencies compiling the statistics approximate it to zero). Second, information on domestic trade should be included, as sales of one's own production in the domestic market are excluded from most international trade databases. As domestic trade is usually more important than any bilateral trade flow, this can be seen as a country-specific truncation in the right tail of the distribution of traded values.

To tackle these issues, we adopt the latest technique for estimating (pseudo-)Poisson regression models with multiple high-dimensional fixed effects as proposed by Correia, Guimarães, and Zylkin (2020), relying on the Poisson Fixed Effect estimator introduced by Santos Silva & Tenreyro (2006).

The estimation is obtained using Stata's commands ppmlhdfe and ppml_fe_bias. After the estimation, countries' multilateral resistances are recovered applying Fally (2015), which involves a prior transformation and normalization step[25].

Ultimately, to derive the results of trade cost indicators, we utilize the outcomes from the empirical model and apply a trade elasticity from the established literature. We adopt a value of 5.5 for the trade elasticity of substitution parameter (σ), aligning with research findings from Head and Mayer (2014), Costinot and Rodríguez-Clare (2014), Anderson, Larch, and Yotov (2020), and Fontangé et al. (2023).[26]

[25] We are grateful to Thomas Zylkin for his help on how to recover the three sets of fixed effects after applying the correction of Weidner and Zylkin (2021). Multilateral resistances are obtained following Fally (2015) using Germany in its role of the importer as the country of reference ($IMR_{DEUt} = 1$).

[26] The elasticity estimates from the literature usually vary between 2 and 12. See Eaton and Kortum (2002) Anderson & van Wincoop (2003), Broda et al. (2006). Larch & Yotov (2017) employs a sigma value of 7. In Anderson et al. (2020), values ranging between 5.1 and 8.0, obtained through alternative specifications and robustness experiments, are utilized to estimate the trade elasticity of substitution. These estimates align with existing literature, where values typically range between 2 and 12, as observed in works such as Eaton and Kortum (2002), Anderson & van Wincoop (2003), Broda, Greeneld, and Weinstein (2006), and Simonovska and Waugh (2011). Fontagne et al. (2023) apply a sigma value of 5 in their counterfactual exercises. Costinot and Rodríguez-Clare (2014) and Head and Mayer (2014) provide comprehensive summaries and discussions of available estimates for the trade elasticity parameter.

5. RESULTS

This section explores the results of the indicators discussed in Section III. As mentioned earlier, the chosen trade cost indicators allow for regional aggregation and temporal comparability. Our approach begins with presenting regional-level results, followed by a more in-depth analysis at the national level.

We utilize the Etas indicator to gain insights into market access for both exporting and importing countries and regions. We differentiate between total trade costs, encompassing both tariff and non-tariff elements, and conduct a geographical analysis with respect to overall, intra-regional, and extra-regional trade partners. Regional-level results are presented in Part A of this section, while national-level results are covered in Section B.

For clarity and interpretation, we present results for countries and regions in their roles as exporters. A country has relatively more leeway to provide access to its domestic market than to gain access in foreign markets. Gaining access to foreign markets is part of its trade policy strategy, which is partly analyzed in this study. Consider an example where a country aims to fully liberalize suddenly. It can do so by opening up its market, for instance, setting a cero NMF tariff. However, this does not alter the access it has to external markets.

Similarly, at the end of each section, we summarize the main findings from an importer's perspective, which are further developed in the annex. Additionally, as a preview, empirically, the results are much more heterogeneous when analyzed from the exporters' perspective than from the importers.

A- Regional measures

As shown in Model Free (Section II), in the late 1990s and early 2000s, the world experienced rapid growth in trade and production. During the analysis period, the global economy faced two major crises: the dot-com bubble in 2002 and the financial crisis in 2008, which resulted in a decline in trade, production, and consumer confidence. In 2015, the slowdown in the Chinese economy and falling commodity prices caused a decrease in global trade. Notwithstanding these challenges, global trade and production experienced growth until the COVID-19 pandemic.

Trade costs are one of the most structural characteristics of trade, or at least capture some of the most invariable over time (e.g., geographical aspects, distance) and other variables to a different extent (e.g., trade policy, consumer preferences, tastes). Thus, the empirical results show that despite strong fluctuations in trade flows, relative trade costs do not suffer as pronounced movements with a trend towards reduction.

On average, all regions of the world have globally integrated, reducing their trade costs both intraregional and extra regionally. Global trade costs witnessed an average reduction of -10.3% from 1995 to 2017. While trade integration has primarily taken place within regions, the most notable improvements in overall cost reduction were witnessed in extra-regional trade, registering a substantial decrease of -13.9%. In contrast, intra-regional trade costs saw a more modest reduction, amounting to only -5.9%.

Upon analyzing the breakdown of total trade costs into tariff and non-tariff components, a significant reduction of -9.1% is attributed to non-tariff measures, emphasizing their substantial impact on overall trade costs. In comparison, the impact of tariff policy is relatively smaller, with a reduction of -1.4% (see overall values in Table V.1).

This result indicates a diminishing significance of tariff component in total trade costs. As mentioned earlier, the tariff policy indicator used in this study aligns with the structural trade model, ensuring an unbiased weighted measure of the variations in applied tariffs on trade costs. It is imperative to underscore the stark contrast between the reduction exclusively in applied tariffs during the observed period, which experienced a percentage decline of 45%, and the corresponding change in tariff trade costs ($\Delta\overline{\eta}_{it}$ =-1.4%).

The selected indicator takes into account not only the changes in applied tariffs but also the economic significance of trading partners. The size and growth dynamics of an economy are crucial factors in determining the level of market access achieved or granted. This intuitive understanding is captured in Equation III.10.[27]

Table V.1 Trade costs ranking and variation (percentage change 2017 - 1995), regions as exporters

Region	Rank	Total			Non-tariff			Tariff		
		Overall	Regional	Extra	Overall	Regional	Extra	Overall	Regional	Extra
AFR	6	-12.6	-20.7	-11.8	-12.0	-9.3	-11.3	-0.6	-10.4	-0.5
ASA	3	-17.6	-11.4	-22.7	-16.9	-10.3	-21.3	-0.7	-0.9	-1.5
EUR	2	-1.9	-11.2	-3.2	-2.0	-9.2	-2.9	0.1	-1.8	-0.3
LAC	**5**	**-7.4**	**-7.1**	**-7.9**	**-8.0**	**-2.0**	**-8.8**	**0.5**	**-4.3**	**0.8**
NAM	1	-2.3	-14.0	-0.8	-0.7	-12.8	1.5	-1.4	-1.1	-1.9
OCN	4	-7.2	-10.3	-7.6	-5.0	-8.6	-5.4	-1.9	-1.5	-1.9
World		**-10.3**	**-5.9**	**-13.9**	**-9.1**	**-4.1**	**-12.3**	**-1.4**	**-1.9**	**-1.9**

*- World average measures. Regions as exporters. a- Variation in percentage from 2017 values to 1995. Rank: ranking over overall total trade cost. 1-lowest trade costs 6-hihest trade costs.
Source: Prepared by the author

The Latin American region has the second-highest trade costs after Africa, as indicated by its ranking in Table V.1. One contributing factor to the persistence of high trade costs has been the limited progress in reducing tariff costs, particularly through preferential access to markets, especially those outside the region.

In a broader sense, a country's integration strategy can be reflected through its trade policy, specifically captured by the applied tariffs, as well as the partners with which it establishes trade ties. While this region actively pursues regional integration through trade agreements, resulting in an improvement of -4.3%, countries in the LAC region have not succeeded in improving (reduce) their tariff overall trade costs ($\overline{\eta}^{ov}_{LAC}$= 0.5) or their access to extra-regional markets ($\overline{\eta}^{er}_{LAC}$ = 0.8%), as evident in the last three columns of Table V.1.

[27] Europe is an example; although it reduces its average tariff costs, it diminishes its relative engagement with the rest of the world, particularly with its more dynamic partners. As a result, it ends up relatively closing itself and, consequently, increasing its relative costs.

As explained in Section II, we can enhance our analysis by subdividing the previously identified six regions into nine smaller subregions. This approach allows for a more detailed examination of the heterogeneity within the Latin American and the Caribbean (LAC) region, specifically into three subregions: NAM, CAC, and SAM. By disaggregating the LAC region in this manner, we can gain a deeper understanding of the diverse characteristics and dynamics present within the region.

As mentioned earlier, both the CAC and SAM sub-regions in LAC have not succeeded in reducing their tariff trade costs, leading to restricted access to markets in other regions. In contrast, the NAM subregion has employed a tariff policy that has contributed to an improvement in its global access, both within and outside its region.

Another significant finding is that the South American subregion (SAM) stands out as the only region in the world that fails to improve the regional integration of its exports in terms of non-tariff trade costs, which increased at 0.9%. (Refer to Appendix A, Table A.4.)

This outcome can be attributed to various factors, including high transport trade costs within the region, lack of deep trade agreements, inefficient border, and trade facilitation processes, and inadequate infrastructure. This compelling evidence supports the earlier suggestion that enhancing infrastructure for connectivity within Latin America could lead to a structural reduction in trade costs and an increase in regional trade.

These findings align with the research conducted by Mesquita-Moreira et al. (2014) and Sanguinetti et al. (2022), both of which underscore the substantial impact of distance on the structural costs of trade within Latin America when compared to other regions.

From our regional analysis, it becomes evident that countries exhibit more consistency in their behavior as importers compared to their roles as exporters. In other words, there is greater diversity in strategies and outcomes when it comes to accessing markets as exporters compared to providing access.

When assessing regions from the importers' standpoint, we observe a widespread decrease in overall trade costs. This reduction in trade costs is more homogeneous across all regions, resulting in increased market access globally, both within and outside the region. This observation is supported by the data presented in Table A.5. in Appendix A. [28]

B- Country measures

As indicated at the beginning of this section, the subsequent sub-section examines trade costs at the country level. We employ relative trade cost indicators (Etas) to scrutinize the geographical and dynamic aspects of overall trade costs, including a breakdown into tariff and other components. This comprehensive analysis is presented in Section i).

Furthermore, we explore the interconnections between countries, evaluating the overall performance of each country as a single entity. The CTB index captures the evolving relationship between two trade partners over time, enabling an examination of

[28] Similar to the findings from the exporter's perspective, the analysis from the importer's point of view reveals that the SAM subregion does not demonstrate improvements in intra-regional integration when examining non-tariff components.

asymmetric relationships between countries. The outcomes derived from the application of this indicator are presented in Section ii).

Conclusively, in Section III, we delve into the country-specific CHB index, assessing domestic costs related to market access over time. The CHB index incorporates both multilateral resistances (MRs) in its formulation. This section concludes by analysing these MRs, evaluating the market access achieved by the country's exporters (OMR), and the market access provided by the country as an importer, received by consumers (IMR).

i. Trade costs over countries

Despite the challenges faced by many economies, globalization has increased global integration, with an average of -10.3% decrease in trade costs over the analyzed period. One of the key results reveals that countries with lower overall trade costs tend to exhibit higher levels of production and trade, both domestically and internationally. This observation can be attributed to two primary factors mentioned earlier: asymmetry and geography.

Firstly, as anticipated, the size of the economy plays a significant role in influencing the level of international trade. This is because a larger economy enables companies to achieve economies of scale, leading to increased efficiency and a more competitive market among businesses.

Generally, countries with larger economies tend to exhibit greater economic output and expenditure, resulting in higher levels of trade, both domestically and internationally. Furthermore, nations with lower trade costs often are larger economies and actively engage in international trade. The top five countries with lower relative trade costs are China, the United States, Germany, France, and Japan.

While less significant than the first, the second factor relates to small economies that are highly integrated into the world market. These countries are geographically close to large economies and have greater economic integration, which leads to lower trade costs. Examples include Switzerland, Belgium, Canada, and the Netherlands.

On the other hand, smaller economies and those located in more remote or less-connected regions tend to face higher trade costs. The bottom five countries in the ranking were Tonga, Guinea-Bissau, Samoa, Gambia, and Malawi. (Refer to Appendix A. Table A.7. for details).

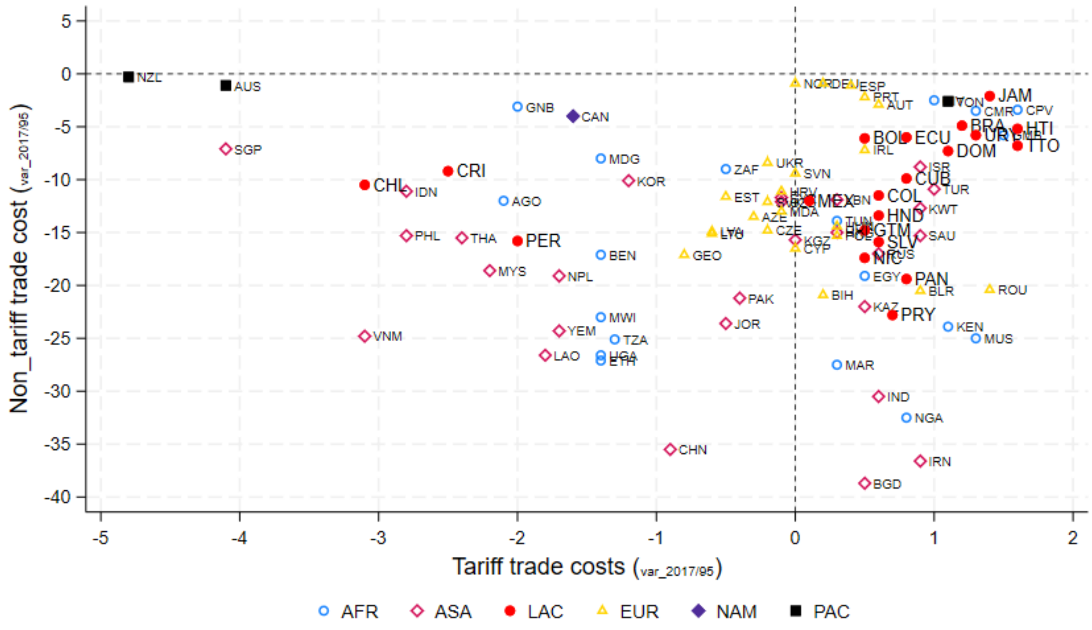
In Latin America, the aforementioned global pattern persists consistently. Countries with lower export trade costs, indicating improved access for exporters, encompass larger economies such as Mexico, Brazil, and Argentina, along with smaller nations that boast robust global connectivity, such as Chile, Costa Rica, and Peru.

On the other hand, countries with higher trade costs are Haiti, Cuba, Panama, Bolivia, and Paraguay. The latter two are landlocked, while the others are small economies, islands, and mainly less-developed countries.

Regarding temporal dynamics, it was observed that most of LAC economies reduced their trade costs to a greater or lesser extent, while only two countries increased their trade costs: Argentina and Venezuela (see Table A.8. in Appendix A).

Out of a total of 113 economies, 82% decreased their overall trade costs, while the remaining 18% increased them. This is illustrated in the following two graphs. Figure V.1 depicts the disaggregated variation of overall trade costs in its two components, Tariff (x-axis) and Non-tariff (y-axis), considering the scenario where countries reduce their overall trade costs. Meanwhile, Figure V.2 represents the scenario in which overall trade costs increase.

Figure V.1 Tariff and Non-tariff trade cost variation* over countries. Case of overall trade costs (η) decrease.



*Variation in axis is the percentage change of values in 2017 relative to values in 1995.
Source: Prepared by the author

Overall, emerging economies have been the primary beneficiaries of globalization. The main reason for the reduction in overall trade costs is the decrease in non-tariff costs. This highlights the importance of working on trade policies and deeper integration strategies beyond tariff policy alone.

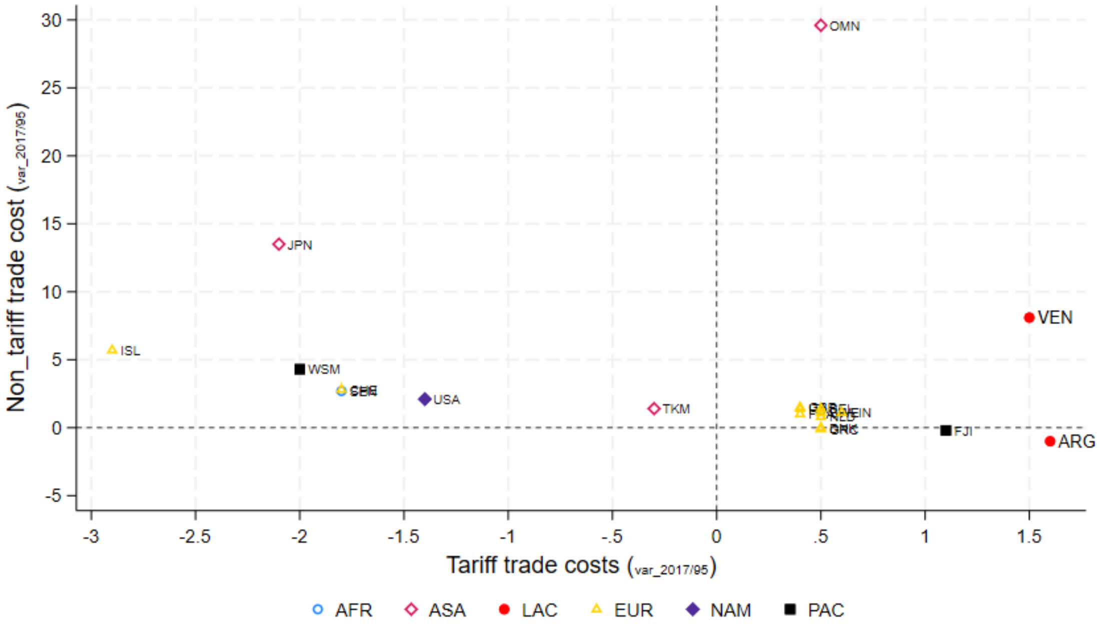
Two countries (Australia and New Zealand) decreased global costs mainly due to tariff policy, with less improvement on the other component. Asian economies have been particularly dynamic in reducing trade costs, often through tariff changes and other initiatives such as non-tariff measures.

Close to half (45%) of the countries enhancing their market access adopt a consistent tariff reduction policy, while the remaining half does not. This underscores the significance of considering a more comprehensive array of factors and strategies beyond regional trade integration alone to achieve a significant reduction in overall trade costs.

As seen in the left panel of Figure V.1, Costa Rica, Chile, and Peru stand out among the LAC countries that improved their trade costs through tariff policy. In contrast, the remaining LAC economies that reduced global costs did so through means other than tariff policy.

The remaining nations (18%) had a relative increase in trade costs, with the majority of developed economies affected (the USA, Japan, and EU countries), as well as several developing countries in the Pacific and Africa, as previously mentioned, Argentina and Venezuela from LAC region exhibit the poorest performance in reducing tariff trade costs. In both cases, but particularly in the Argentinean context, this increase in trade costs is solely attributed to a rise in tariff policy measures.

Figure V.2 Trade costs variation* breakdown over country. Case of overall trade costs (η) increase



*Variation in axis is the percentage change of values in 2017 relative to values in 1995.
Source: Prepared by the author

Just as was done with the regional analysis, the eta values can be assessed globally, disaggregated by components (as done earlier), and based on their geographical distribution, depending on whether trade partners are from the same region or extra regional.

All reductions in overall trade costs are accompanied by lower intraregional costs. Nevertheless, exclusively lowering regional trade costs does not automatically lead to a decrease in overall trade costs. To achieve a reduction in overall trade costs, regional trade integration is imperative.

To conclude the analysis of trade costs at the country level, we will apply the previously outlined strategy. It is worth remembering that Equation III.7 establishes the connection between the Eta indicator and the CTB and CHB indicators. Eta serves as a convenient transformation of CTB and CHB from an individual country's perspective. In summary, a more open economy is characterized by a lower CHB and a higher CTB, resulting in a lower Eta value.

Next, we will delve into the interconnectivity strategy among countries using the CTB indicator. Finally, we will assess each country's dynamics of openness using the CHB indicator. Additionally, we can further scrutinize their openness as importers or exporters by incorporating the concept of multilateral resistances.

ii. Inter-country trade costs

The constructed trade bias (CTB) measures the overall impact of trade policy and is affected by two main factors over time (Eq. III.5). First, changes in production and consumption patterns can modify multilateral resistance terms and second, changes in bilateral trade costs. The relationship between a country's level of development and its CTB has been well established.

More developed and centrally located countries tend to have lower CTBs than less developed and remote countries. This pattern is mainly because more significant regions tend to trade more with themselves, resulting in a lower multilateral resistance.

While variations in bilateral trade costs play a role in the CTB, the link between size and multilateral resistance is particularly strong (Anderson & van Wincoop, 2003; Anderson & Yotov, 2010; Agnosteva et al., 2014).

International borders are a barrier to potential trade and redirect trade toward domestic markets. However, on average, smaller countries tend to have higher levels of trade costs across all sources. This is due to the strong tendency of more significant economic regions to have lower inward multilateral resistance, as explained by Anderson & Yotov (2010).

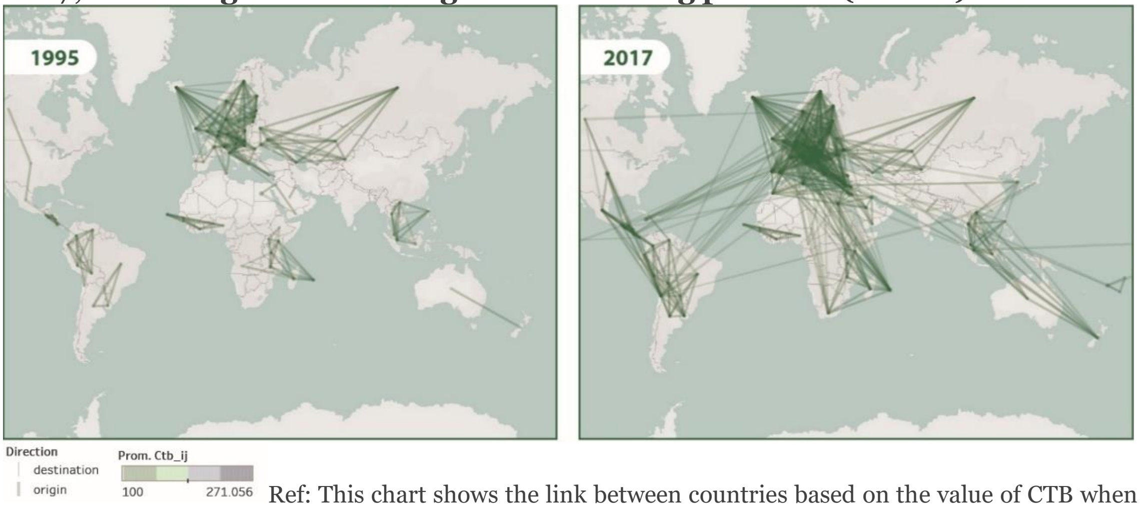
As a result, any exporter faces higher-priced competition, on average, when selling to smaller regions. Our analysis found that 84% of the CTB ratios are less than one, indicating that most countries face lower trade costs within their borders than in their international trade relationships.

When analyzing bilateral relationships with a CTB measure greater than one in our study period, we found that Cyprus, Switzerland, Italy, Belgium, Ukraine, and Hungary had the highest number of such relationships.

The analysis revealed that economies are more integrated, and a reflection of this is that the number of relationships with CTB greater than one increased by 37% in 2017 compared to 1995. However, as shown in Figure V.3 this indicator doubled (118%) in 2017 when trade relationships are covered under a preferential trade agreement.

The Figure V.3. displays the CTB indicator, which represents bilateral trade costs, for two time periods: 1995 and 2017. This indicator captures the trade costs between a specific exporting country and an importing country. The selected links shown in the graph represent the strongest trade relationships, characterized by lower trade costs.

Figure V.3 Overall bilateral trade cost. CTB Network Map (CTB ≥ 1) 1995 vs. 2017, when Regional Trade Agreement among partners (RTA=1)



Ref: This chart shows the link between countries based on the value of CTB when CTB > 1. According to the model, the higher the value of the CTB, the greater the expected trade between trading partners. The intensity of the trade relationship is depicted through color, with darker shades indicating lower costs. Additionally, the direction of the trade is represented by arrows, where the larger arrowhead represents the destination of the trade (importing country) and the smaller arrowhead represents the origin (exporting country).
The aggregated values over exporters are presented in Table A.7. in the Appendix A.
Source: Prepared by the author

As expected, more developed and central countries have lower international trade cost biases than less developed and distant countries. The European region has the most extensive integration network under free market conditions. These countries also have the highest number of relationships with lower costs in bilateral relationships supported by deep trade agreements (RTA=1).

A clear message emerging from the graphical comparison between the two time periods is that while there was strong regional integration through trade agreements in 1995, the temporal dynamics show that this integration deepened by 2017. Additionally, new extra regional ties were also established during this time.

iii. Within each country

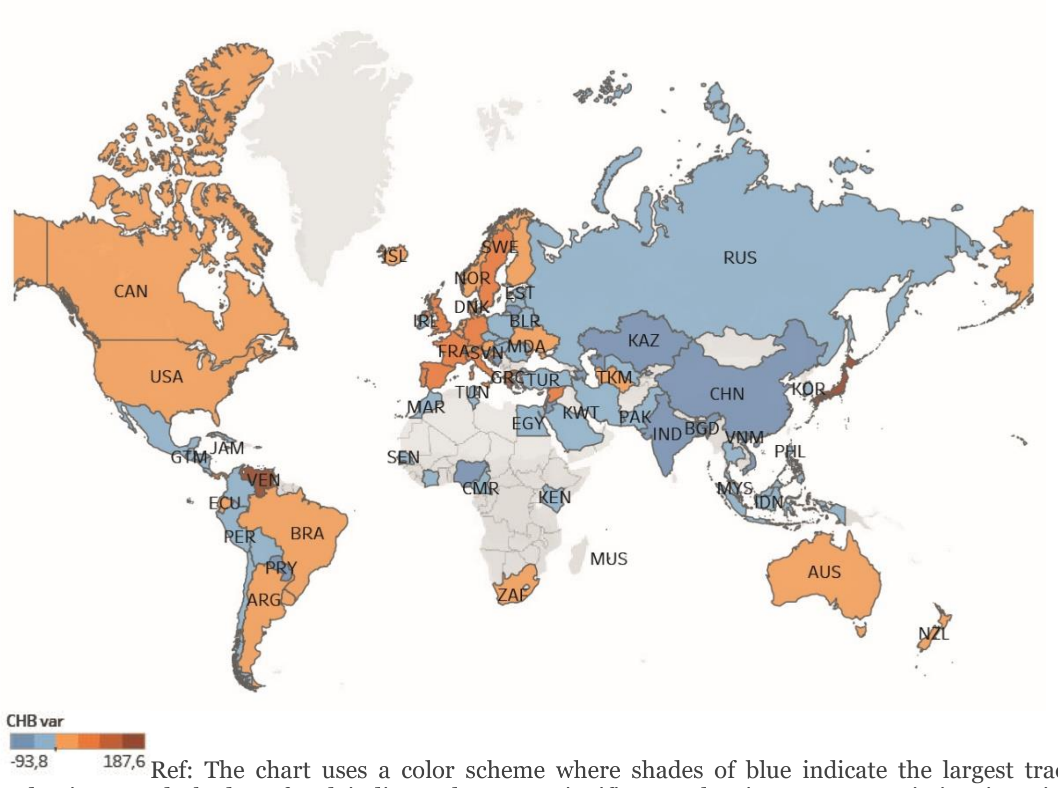
The Constructed Home Bias (CHB) index, introduced by Anderson & Yotov (2010), serves as an indicator of the predicted hypothetical ratio of frictionless domestic trade within a particular country. In essence, the CHB index quantifies the deviation of an economy from a frictionless trade equilibrium. A lower CHB value indicates a greater level of openness in the economy, reflecting its proximity to a frictionless trade scenario.

The index consolidates both the roles of exporter and importer within a country at a specific point in time. It encompasses the market access a country enjoys as an exporter (OMR) and the market access it provides to the rest of the world, thus reflecting its openness as an importer (captured through IMR). Recall Eq. III.6. By considering both these aspects, the index offers a comprehensive perspective on the country's trade dynamics and its position within the global trade network.

The results are presented in Figure V.4, illustrating the variation and evolution of CHB across the countries in our sample. This figure visually depicts the changes in CHB from 1995 to 2017, providing insights into how the trade dynamics of each country have evolved over time.

As anticipated, more integrated countries (lower trade costs), as measured by CHB, are highly relevant in terms of manufacturing production and trade. These countries typically belong to the most globally integrated regions, such as China, the United States, Japan, Germany, Korea, and India. Conversely, smaller and more geographically distant regions, such as Africa and the Pacific, face higher trade costs, as exemplified by countries like Congo, Samoa, Guinea, and Cape Verde.

Figure V.4 CHB variation* across countries 2017/1995



Ref: The chart uses a color scheme where shades of blue indicate the largest trade cost reductions, and shades of red indicate the most significant value increases. *Variation in axis is the percentage change of values in 2017 relative to values in 1995.
Source: Prepared by the author.

The temporal dynamics reveal that the majority (eight out of the top ten) of countries with the most significant reductions in CHB are located in Asia. This suggests that the region has been the driving force behind reducing trade costs, with positive spillover effects at the regional level.

Conversely, some prominent Latin American economies, including Brazil, Argentina, Venezuela, Ecuador, and Uruguay, are among the economies that made limited progress in capitalizing on the globalization process, as evidenced by an increase in their CHB values. Significant economies in Asia, Europe, and North America also experienced such increases, but their initial relatively open status at the beginning of the period (1995) should be taken into account when interpreting these changes.

Instead, the fall in home bias is due to the general equilibrium effect of changes in production and expenditure share on multilateral resistance. However, a decrease in trade costs may lead to increased specialization in production over time, ultimately resulting in a decrease in CHB. (Anderson & Yotov, 2010).

As CHB accounts for both the role of a country as an exporter (OMR) and importer (IMR), in order to investigate the distinct aspects within the same economy, we utilize the indexes derived from the structural model of trade, known as multilateral resistances. These indexes enable us to examine the various actors and dynamics within the country's trade landscape.

A- The inward multilateral resistance index (IMR) measures the incidence of trade costs for consumer access to goods from different countries. As mentioned in equation III.3, these indexes can be used to assess the effects of domestic and foreign trade policies in each country. They can also be interpreted as a measure of supplier access, as proposed by Redding & Venables in 2004. Changes in the IMR can reflect changes in the Consumer Price Index (Eq. III.4).

In general equilibrium, relative multilateral resistances are what matter for resource allocation. To compute the IMR, we use the estimated values in structural equations (III.1-III.3) and a normalization process. For this, we set Germany's (DEU) inward multilateral resistances to equal one each year, and all other countries' MRs are relative to Germany's consumers.

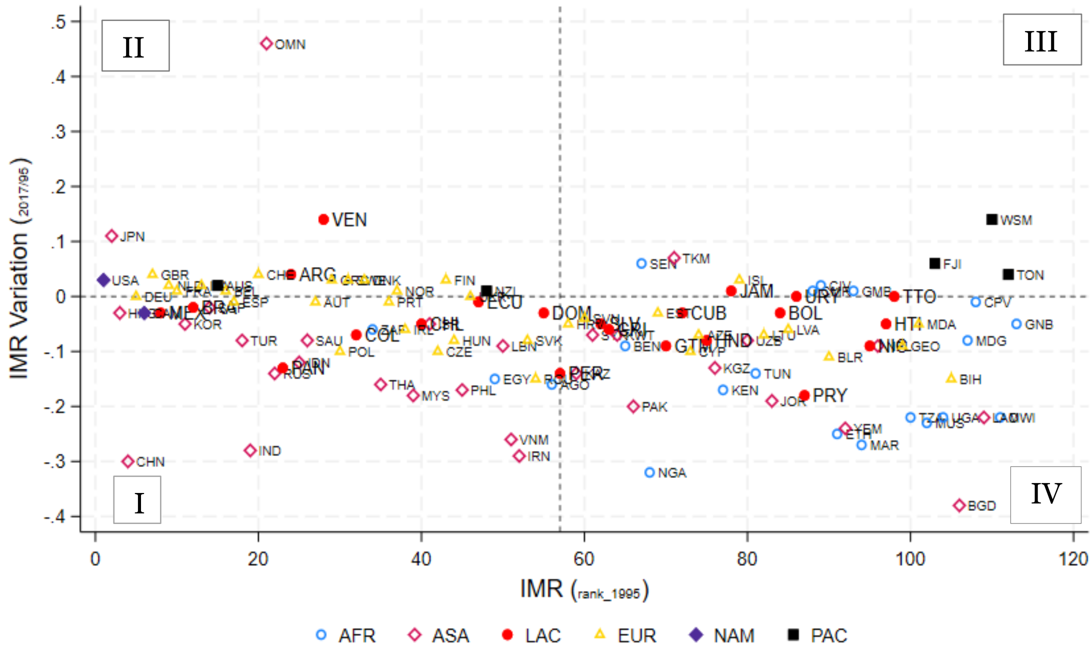
Figure V.5 illustrates the ranking of countries based on their IMR for the base year (1995) on the x-axis and demonstrates the variation over time until the year 2017 on the y-axis. The colors and shapes in the figure represent the different regions to which the countries belong. This visualization provides insights into the changes in given market access for different countries and regions over the analyzed period.

In line with other trade cost indicators, both at regional and national levels, Asian countries have achieved significant reductions in trade costs. This breakdown affirms that these improvements have translated into benefits for consumers. Evidence of this can be observed in the lower values of resistance (lower ranking on the horizontal axis) and greater reductions in resistance (decrease on the vertical axis) seen in the lower-left panel of the graph. Notable countries in this regard include China, India, Malaysia, Vietnam, among others. Additionally, some Latin American countries have seen positive advancements in reducing trade costs for their consumers, such as Mexico, Brazil, Colombia, Panama, Chile, and Peru (refer to panel I in Figure V.5).

Conversely, there is a trend of increasing trade costs and elevated cost values in Oceania, specifically in countries like Tonga, Samoa, Fiji, and Jamaica as part of the Latin America and Caribbean region (Panel III).

In Panel IV, there are countries where consumers have improved their position relative to others but still face access to markets that is more costly than the global average. This is applicable to several Latin American economies, including Uruguay, Trinidad and Tobago, Cuba, Bolivia, Paraguay, and Nicaragua. Although these countries have made some relative progress in reducing trade resistances, this improvement remains below the world average.

Figure V.5 IMR over the country. Rank position and variation* 2017/1995



*Variation in axis is the percentage change of values in 2017 relative to values in 1995.
Source: Prepared by the author

Finally, from a buyer's perspective, the relative situation of Argentinian and Venezuelan buyers has worsened. There has been an increase in their resistance, resulting in reduced access to goods from the rest of the world or an increase in associated costs in 2017 compared to 1995 (Panel II). (See details for LAC countries in Table A.V.6.)

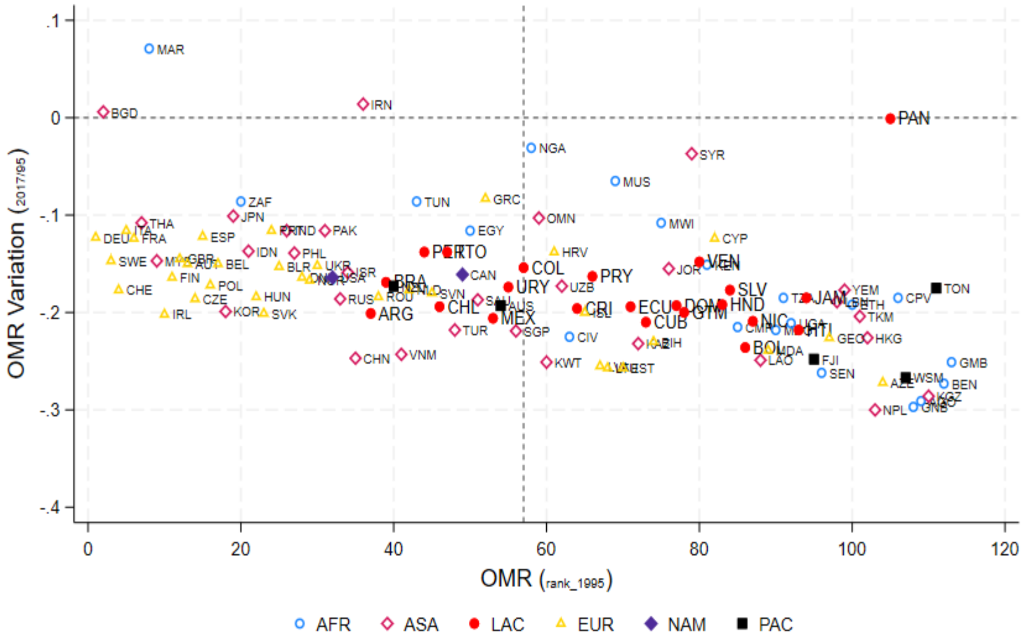
B- The Outward Multilateral Resistance Indexes (OMR) measure the incidence of trade costs on producers' access to foreign markets for selling their goods (Eq. III.2). The OMR can be interpreted as a market access index for firms, as proposed by Redding & Venables (2004). It can also be seen as a measure of total factor productivity in the distribution, as suggested by Anderson & Yotov (2010b).

Compared to the gains seen on the buyers' side of countries, the gains on the producers' side were much more widespread and consistent. On average and across the entire distribution, reducing trade costs was more significant for producers. This may be due to the "specialization effect" proposed by Anderson in 2010. The dispersion of OMRs is also lower than that of the buyers, and the reduction in OMRs over time is more pronounced.

From the perspective of firms, those from European and Asian countries are currently better positioned due to their lower relative costs

In contrast, many less developed economies in Africa, Asia (excluding Southeast Asia), and Latin America present higher resistances.

Figure V.6 OMR over country. Rank position and variation* 2017/1995



*Variation in axis is the percentage change of values in 2017 relative to values in 1995.
Source: own elaboration

Among Latin American countries, as observed in Figure V6, companies are midway through the table, with Argentinean exporters leading at position 37, followed by Brazil, Peru, and Chile. Following the global trend, all have improved in terms of their barriers to accessing favorable prices in foreign markets.

Finally, in terms of temporal dynamics, the variability of the indicator ranges from a reduction of -30% for Nepal to an increase of 7% for Morocco. This underscores the widespread impact of globalization on firms' productivity and survival. (Refer to ranking positions and variations in Figure V.6 and Table A.9. in Appendix A.) [29].

[29] Also refer to Figures A.1a. and A.1b. in Appendix A.

6. CONCLUSIONS

This paper provides a comprehensive geographical analysis of trade cost dynamics in various countries over the past few decades, particularly in Latin American nations. By utilizing state-of-the-art methodologies and a newly developed global database with extensive coverage of Latin America, this study contributes to the existing literature on this topic.

Furthermore, this study introduces a novel trade indicator grounded in well-established theoretical frameworks and can be utilized for trade policy formulation and broader analytical purposes. The study's approach to weighing and aggregating tariffs and all other (non-tariff) measures provided an alternative to endogeneity issues in measurement.

The analysis also reveals a significant global trade cost reduction over the past 25 years, resulting in increased integration. This integration is mainly intra-regional, but more significant progress has also been made in extra-regional trade cost reduction.

Although trade costs tend to be lower in developed economies such as North America and Europe, emerging economies, particularly in Asia, have experienced the most significant benefits of globalization in recent decades. These economies have successfully leveraged globalization and reduced trade costs, enhancing not only regional but global presence. This progress is typically accomplished through a combination of tariff trade policies and complementary strategies, such as non-tariff measures.

While the benefits of tariff reduction may appear nearly exhausted, the reduction of other non-tariff trade costs has contributed to deeper global integration in recent years. However, Latin America and the Caribbean remain the only region that has not improved its access as exporters through the reduction of tariff barriers with the rest of the world. This indicates a lack of progress in their access to global markets despite efforts to deepen regional integration.

The limited impact of trade policy on global integration provides an opportunity for global integration agendas. While protectionist trade policies may receive attention in public discourse, the results emphasize that achieving greater integration depends on deeper trade policies and other integration actions that reduce trade costs.

The study's analysis and comparison of regional performance provide insight into the heterogeneity of international trade openness across different regions. The results reveal notable differences in the levels and dynamics of variables among the subregions and countries in Latin America and the Caribbean, indicating that the region is not homogenous.

South American countries show poor results in their cost reduction and have the challenge of improving their regional integration in the non-tariff component, where it is the only region to experience an increase in intra-regional costs. Atlantic coastal countries appear to lag within the region and are less integrated than Pacific countries. Central America and the Caribbean are heterogeneous and more integrated. Mexico stands out as an exception in several regards, especially concerning trade and trade costs, which can be attributed to its extensive integration with the economies of North America.

Our analysis of the benefits for consumers and producers within an economy revealed that exporters experienced more generalized and homogeneous gains than consumers. Although there was variability, consumers in Asian countries may have benefited the most, while those in Latin American and Pacific countries benefited the least.

There are still many opportunities for further development of trade cost indicators and their application in analyses. The characterization of preferential trade policy in different channels, such as Free Trade Agreements or Customs Unions, is an area that could be better understood and incorporated into these indicators.

Further segmentation of non-tariff components of trade costs could also be explored, distinguishing between fixed factors such as geography and time-varying factors such as changing tastes and preferences.

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Appendix A - Tables

Table A.1. Main indicators for sub-regions. 2017-1995

	Product (Yi=Xii+Xi)			(Ei=Xii+Mi) **Expend.**			**Export** (Xi)			**Import** (Mi)			**Internal Trade** (Xii)		
Sub-Reg Code	**Values[a]**	**Part.[b]**	**Growth[c]**	**Values**	**Part.**	**Growth**	**Values**	**Part.**	**Growth**	**Values**	**Part.**	**Growth**	**Values**	**Part.**	**Growth**
AFR	533	1.1	4.5	676	1.4	4.9	138	1.2	7.2	281	2.4	7	395	1.1	3.8
CAC	162	0.3	5	220	0.5	4.8	49	0.4	6.4	106	0.9	5.3	113	0.3	4.4
CSEA	3,604	7.5	8.3	3687	7.6	8.4	625	5.3	9.5	708	6	9.7	2979	8.2	8.1
EUR	8,815	18.2	2.3	8820	18.3	2.3	4440	37.4	4.3	4446	37.5	4.5	4375	12	0.9
MES	554	1.1	3.7	682	1.4	4	156	1.3	8	284	2.4	6.8	398	1.1	2.7
NAM	7,187	14.9	2.7	7901	16.3	3.1	1804	15.2	4.9	2518	21.2	6	5382	14.8	2.1
PAC	338	0.7	2.5	437	0.9	3.6	113	1	4.5	212	1.8	6.7	225	0.6	1.8
SAM	1,546	3.2	4.2	1633	3.4	4.3	278	2.3	5.3	365	3.1	5.4	1268	3.5	4
SEEA	25,589	52.9	7.2	24274	50.2	7.1	4264	35.9	7.8	2949	24.8	6.7	21325	58.5	7.2
World	**48,328**	**100**	**4.9**	**48,328**	**100**	**4.9**	**11,869**	**100**	**5.7**	**11,869**	**100**	**5.7**	**36,459**	**100**	**4.7**

	Prod. Opening (Xi /Yi)			**Consumption opening** (Mi /Ei)			**Regional export orientation** (xRR/Xi)			**Regional import orientation** (mRR/Mi)			**Regional integration** ((xRR+mRR)/(Xi +Mi))		
Sub-Reg Code	**Values 1995[d]**	**Values 2017[d]**	**Var.(17-95)[e]**	**Values 1995**	**Values 2017**	**Var.(17-95)**	**Values 1995**	**Values 2017**	**Var.(17-95)**	**Values 1995**	**Values 2017**	**Var.(17-95)**	**Values 1995**	**Values 2017**	**Var.(17-95)**
AFR	14.6	25.9	11.4	26.8	41.6	14.8	5.9	9.1	3.2	2.8	4.5	1.7	3.8	6.0	2.3
CAC	22.3	30.2	7.8	43.9	48.4	4.6	17.2	25.9	8.8	6.3	11.9	5.6	9.2	16.3	7.1
CSEA	13.7	17.4	3.6	14.7	19.2	4.5	7.3	11.5	4.2	6.7	10.2	3.4	7.0	10.8	3.8
EUR	32.9	50.4	17.5	31.9	50.4	18.5	73.3	66.5	-6.8	76.6	66.4	-10.2	74.9	66.5	-8.5
MES	11.5	28.1	16.6	23.3	41.6	18.3	5.7	8.8	3.1	2.4	4.9	2.4	3.4	6.3	2.8
NAM	15.9	25.1	9.3	17.1	31.9	14.8	43.7	49.6	5.9	40.0	35.6	-4.4	41.8	41.4	-0.4
PAC	22.1	33.5	11.4	25.1	48.5	23.4	13.9	10.2	-3.7	11.8	5.4	-6.3	12.7	7.1	-5.6
SAM	14.4	18.0	3.6	17.6	22.3	4.7	29.8	24.9	-4.8	23.3	19.0	-4.3	26.2	21.6	-4.6
SEEA	15.0	16.7	1.7	13.1	12.1	-1.0	42.9	43.6	0.7	50.1	63.1	12.9	46.2	51.6	5.3
World	**20.9**	**24.6**	**3.7**	**20.9**	**24.6**	**3.7**	**56.1**	**49.7**	**-6.4**	**56.1**	**49.7**	**-6.4**	**56.1**	**49.7**	**-6.4**

(a) Values are in billions of current dollars. (b) Part. Is participation in percentage. (c) Average cumulative growth rate for 1995-2017 for the variables measured in current dollar values.
(d) Values in percentages. (e) Change in value of the indicator between 1995 and 2017 in percentage points.
Regions: Africa (AFR), Central America and the Caribbean (CAC), North America (NAM), South America (SAM), Central Asia + Eurasia + South Asia (CSEA), Europe (EUR), Middle East (MES), Pacific (PAC), and South East Asia and East Asia (SEEA).
Xi: exports; Mi: imports; Yi: production; Ei: expenditure; Xii: internal trade; xRR: intra-regional exports; mRR: intra-regional imports.
Source: own elaboration

Table A.2 Main indicators for countries. 2017-1995

		Product (Yi=Xii+Xi)			(Ei=Xii+Mi) **Expend.**			**Export** (Xi)			**Import** (Mi)			**Internal Trade** (Xii)		
Country	**Country Code**	**Values**[a]	**Part.**[b]	**Growth**[c]	**Values**	**Part.**	**Growth**	**Values**	**Part.**	**Growth**	**Values**	**Part.**	**Growth**	**Values**	**Part.**	**Growth**
Argentina	ARG	268	11.8	3.6	283	11.8	3.8	43	6.1	4.6	58	7.1	5.5	225	14.3	3.4
Bolivia	BOL	13	0.6	6.4	18	0.8	6.6	3	0.4	6.6	8	1	6.9	10	0.6	6.3
Brazil	BRA	857	37.7	4.3	854	35.7	4.2	131	18.7	5.5	128	15.5	5.1	726	46.2	4.1
Chile	CHL	91	4	4.5	102	4.3	4.8	42	6	6.3	53	6.5	6.7	48	3.1	3.3
Colombia	COL	112	4.9	4.7	138	5.7	4.9	14	2	5.2	40	4.8	5.5	98	6.2	4.6
Costa Rica	CRI	21	0.9	5.5	26	1.1	5.5	9	1.3	8	13	1.6	6.9	12	0.8	4.3
Cuba	CUB	30	1.3	5.4	34	1.4	5.7	1	0.2	1.7	5	0.6	5.6	29	1.8	5.7
Dominican Republic	DOM	25	1.1	4.5	32	1.3	5.4	8	1.1	5.2	15	1.8	7.3	17	1.1	4.2
Ecuador	ECU	41	1.8	4.3	50	2.1	4.6	8	1.1	6.9	17	2.1	6.6	33	2.1	3.8
El Salvador	SLV	8	0.4	3.7	11	0.5	3.5	6	0.8	9	9	1.1	6.1	2	0.1	-1.1
Guatemala	GTM	23	1	6.7	32	1.3	6.7	7	1.1	8.3	16	1.9	7.3	16	1	6.1
Haiti	HTI	8	0.4	6.8	10	0.4	6.8	1	0.2	9.8	3	0.4	7.5	7	0.4	6.5
Honduras	HND	15	0.7	6.3	19	0.8	6.2	6	0.9	8.2	10	1.2	7.2	9	0.6	5.3
Jamaica	JAM	4	0.2	1.8	7	0.3	4.1	1	0.2	-1	5	0.6	4.2	3	0.2	3.9
Mexico	MEX	564	24.8	4.9	541	22.6	5	376	53.4	8.1	352	42.8	8.8	189	12	1.7
Nicaragua	NIC	7	0.3	6.6	9	0.4	6.8	4	0.6	11.2	6	0.8	9.6	2	0.2	3.2
Panama	PAN	9	0.4	3.9	31	1.3	2.7	0	0	-4.4	22	2.6	2.1	9	0.6	4.3
Paraguay	PRY	34	1.5	9.5	41	1.7	7.8	4	0.5	9.9	11	1.3	5.1	30	1.9	9.4
Peru	PER	86	3.8	5.7	97	4.1	5.8	22	3.1	8.4	33	4	7.8	64	4.1	5.1
	TTO	12	0.5	2.3	11	0.4	1.7	5	0.7	4.7	3	0.4	3.5	8	0.5	1.2
Uruguay	URY	16	0.7	3.4	18	0.7	3.5	7	1	5.5	8	1	5.6	9	0.6	2.2
Venezuela	VEN	30	1.3	-0.2	33	1.4	0.1	5	0.7	-2.8	8	1	-1.1	25	1.6	0.6
LAC	**Total**	**2,273**	**100**	**4.4**	**2,393**	**100**	**4.5**	**703**	**100**	**6.7**	**823**	**100**	**6.5**	**1,570**	**100**	**3.7**

		Prod. Opening (Xi /Yi)			Consumption opening (Mi /Ei)			Regional export orientation (xRR/Xi)			Regional import orientation (mRR/Mi)			Regional integration (xRR+mRR)/(Xi +Mi))		
Country	**Country code**	**Values 1995[d]**	**Values 2017[d]**	**Var.(17-95)[e]**	**Values 1995**	**Values 2017**	**Var.(17-95)**	**Values 1995**	**Values 2017**	**Var.(17-95)**	**Values 1995**	**Values 2017**	**Var.(17-95)**	**Values 1995**	**Values 2017**	**Var.(17-95)**
Argentina	ARG	0.13	0.16	0.03	0.14	0.21	0.07	0.48	0.37	-0.10	0.29	0.36	0.06	0.38	0.36	-0.02
Bolivia	BOL	0.2	0.21	0.01	0.42	0.45	0.03	0.37	0.42	0.05	0.59	0.53	-0.06	0.53	0.50	-0.03
Brazil	BRA	0.12	0.15	0.03	0.13	0.15	0.02	0.26	0.29	0.04	0.20	0.14	-0.05	0.23	0.22	-0.01
Chile	CHL	0.32	0.47	0.15	0.35	0.52	0.17	0.22	0.22	0.00	0.25	0.19	-0.06	0.24	0.20	-0.03
Colombia	COL	0.11	0.12	0.01	0.25	0.29	0.04	0.54	0.52	-0.02	0.27	0.23	-0.04	0.34	0.31	-0.03
Costa Rica	CRI	0.25	0.42	0.17	0.39	0.52	0.13	0.34	0.37	0.02	0.25	0.23	-0.02	0.28	0.28	0.00
Cuba	CUB	0.1	0.05	-0.05	0.16	0.15	-0.01	0.10	0.08	-0.01	0.31	0.20	-0.11	0.23	0.18	-0.05
Dominican Republic	DOM	0.28	0.32	0.04	0.32	0.47	0.15	0.01	0.18	0.17	0.12	0.17	0.05	0.07	0.17	0.11
Ecuador	ECU	0.11	0.2	0.09	0.23	0.34	0.11	0.33	0.32	-0.01	0.33	0.28	-0.05	0.33	0.29	-0.04
El Salvador	SLV	0.24	0.73	0.49	0.47	0.81	0.34	0.64	0.57	-0.07	0.30	0.30	0.00	0.39	0.39	-0.01
Guatemala	GTM	0.23	0.32	0.09	0.43	0.49	0.06	0.14	0.28	0.14	0.22	0.35	0.13	0.19	0.32	0.13
Haiti	HTI	0.07	0.13	0.06	0.27	0.31	0.04	0.01	0.06	0.05	0.09	0.36	0.27	0.08	0.29	0.21
Honduras	HND	0.27	0.41	0.14	0.42	0.52	0.1	0.03	0.05	0.02	0.16	0.19	0.03	0.10	0.16	0.06
Jamaica	JAM	0.56	0.3	-0.26	0.63	0.64	0.01	0.07	0.06	-0.01	0.02	0.03	0.00	0.05	0.04	-0.01
Mexico	MEX	0.34	0.67	0.33	0.3	0.65	0.35	0.22	0.26	0.04	0.39	0.49	0.11	0.33	0.40	0.07
Nicaragua	NIC	0.25	0.63	0.38	0.42	0.73	0.31	0.50	0.70	0.20	0.06	0.22	0.16	0.07	0.22	0.15
Panama	PAN	0.1	0.02	-0.08	0.79	0.7	-0.09	0.19	0.25	0.06	0.32	0.24	-0.08	0.27	0.25	-0.03
Paraguay	PRY	0.1	0.11	0.01	0.47	0.27	-0.2	0.64	0.51	-0.13	0.54	0.41	-0.12	0.55	0.44	-0.11
Peru	PER	0.15	0.25	0.1	0.23	0.34	0.11	0.52	0.47	-0.05	0.32	0.38	0.06	0.37	0.41	0.04
Trinidad & Tobago	TTO	0.23	0.38	0.15	0.19	0.28	0.09	0.32	0.21	-0.11	0.10	0.13	0.03	0.22	0.18	-0.04
Uruguay	URY	0.28	0.44	0.16	0.3	0.47	0.17	0.58	0.36	-0.21	0.57	0.38	-0.19	0.57	0.37	-0.20
Venezuela	VEN	0.31	0.17	-0.14	0.33	0.25	-0.08	0.43	0.17	-0.25	0.24	0.25	0.00	0.33	0.22	-0.11
LAC	**LAC**	**0.19**	**0.31**	**0.12**	**0.22**	**0.34**	**0.12**	**0.22**	**0.18**	**-0.05**	**0.18**	**0.15**	**-0.03**	**0.20**	**0.16**	**-0.04**

(a) Values in current dollar values. (b) Part. Is participation in percentage. (c) Average cumulative growth rate for 1995-2017 for the variables measured in current dollar values.
(d) Values in percentages. (e) Change in value of the indicator between 1995 and 2017 in percentage points.
Xi: exports; Mi: imports; Yi: production; Ei: expenditure; Xii: internal trade; xRR: intra-regional exports; mRR: intra-regional imports.
Source: own elaboration

Table A.3 Descriptive data over country 2017 – 1995

Region	Count ry	Output			Expenditure			Internal trade			Export			Import		
		Value[a]	Part.[b]	Var.[c]	Value	Part.	Var.	Value	Part.	Var.	Value	Part.	Var.	Value	Part.	Var.
Africa																
africa	AGO	13,667	0.03	17.7	23,583	0.05	13.5	12,607	0.03	20.2	1,060	0.01	9.0	10,977	0.09	10.4
africa	BEN	3,075	0.01	8.0	7,587	0.02	9.0	2,815	0.01	7.7	260	0.00	15.4	4,772	0.04	9.9
africa	VIC	12,557	0.03	4.8	16,361	0.03	5.3	8,221	0.02	4.7	4,336	0.04	5.0	8,140	0.07	6.0
africa	CMR	11,286	0.02	4.5	14,427	0.03	5.1	10,087	0.03	4.5	1,199	0.01	4.7	4,340	0.04	6.9
africa	CPV	284	0.00	2.7	941	0.00	4.8	191	0.00	1.1	93	0.00	11.2	751	0.01	6.4
africa	EGY	89,820	0.19	5.8	122,354	0.25	5.8	71,595	0.20	5.3	18,225	0.15	8.3	50,759	0.43	6.6
africa	ETH	16,353	0.03	12.2	22,995	0.05	10.9	15,606	0.04	12.6	747	0.01	7.1	7,389	0.06	8.5
africa	GMB	211	0.00	- 0.2	1,553	0.00	6.0	181	0.00	0.1	30	0.00	- 2.0	1,372	0.01	8.0
africa	GNB	449	0.00	9.1	742	0.00	8.9	436	0.00	20.1	13	0.00	- 6.6	306	0.00	5.0
africa	KEN	22,284	0.05	5.9	34,938	0.07	7.2	20,341	0.06	5.9	1,942	0.02	5.2	14,597	0.12	9.9
africa	SEA	50,289	0.10	3.0	62,526	0.13	3.6	27,219	0.07	1.1	23,070	0.19	7.4	35,307	0.30	7.5
africa	MDG	3,736	0.01	7.2	5,301	0.01	7.3	2,067	0.01	6.2	1,668	0.01	8.7	3,233	0.03	8.2
africa	MUS	3,775	0.01	2.0	6,247	0.01	3.9	1,713	0.00	2.6	2,062	0.02	1.5	4,534	0.04	4.5
africa	MWI	3,227	0.01	7.4	4,964	0.01	7.6	3,108	0.01	7.9	118	0.00	1.6	1,856	0.02	7.2
africa	NGA	70,344	0.15	8.1	98,390	0.20	8.8	66,859	0.18	8.2	3,485	0.03	5.6	31,531	0.27	10.3
africa	SEN	10,581	0.02	3.8	16,398	0.03	5.2	9,108	0.02	3.5	1,472	0.01	6.6	7,290	0.06	9.2
africa	TUN	22,242	0.05	2.7	25,671	0.05	2.9	8,608	0.02	0.6	13,634	0.11	4.9	17,063	0.14	4.7
africa	TZA	12,187	0.03	11.0	17,772	0.04	9.5	9,613	0.03	10.6	2,574	0.02	13.1	8,159	0.07	8.4
africa	UGA	14,097	0.03	11.7	17,870	0.04	10.6	13,478	0.04	11.9	620	0.01	9.2	4,393	0.04	8.0
africa	ZAF	172,553	0.36	2.6	175,392	0.36	2.3	110,931	0.30	1.1	61,622	0.52	8.3	64,460	0.54	5.5

Asia																
central_asia + eurasia + south_asia	BGD	131,298	0.27	9.0	129,242	0.27	9.0	92,269	0.25	8.4	39,028	0.33	10.7	36,972	0.31	10.9
central_asia + eurasia + south_asia	IND	1,857,901	3.84	9.5	1,855,611	3.84	9.5	1,627,931	4.47	9.3	229,969	1.94	11.0	227,680	1.92	11.2
central_asia + eurasia + south_asia	KAZ	34,818	0.07	7.1	50,282	0.10	8.9	18,706	0.05	4.8	16,111	0.14	13.7	31,575	0.27	17.1
central_asia + eurasia + south_asia	KGZ	3,535	0.01	9.8	9,799	0.02	13.1	2,071	0.01	11.2	1,465	0.01	8.3	7,728	0.07	13.7
central_asia + eurasia + south_asia	NPL	4,565	0.01	5.6	11,719	0.02	9.7	3,843	0.01	6.1	722	0.01	3.5	7,876	0.07	13.6
central_asia + eurasia + south_asia	PAK	115,922	0.24	6.2	136,071	0.28	7.0	96,461	0.26	6.4	19,461	0.16	5.1	39,610	0.33	8.8
central_asia + eurasia + south_asia	RUS	759,682	1.57	7.5	751,862	1.56	7.4	570,628	1.57	7.2	189,054	1.59	8.5	181,234	1.53	8.2
central_asia + eurasia + south_asia	TKM	4,424	0.01	1.3	7,024	0.01	3.3	3,499	0.01	0.3	925	0.01	12.2	3,525	0.03	13.6
central_asia + eurasia + south_asia	TUR	664,861	1.38	7.3	703,649	1.46	7.3	543,485	1.49	7.0	121,376	1.02	9.0	160,164	1.35	8.7
central_asia + eurasia + south_asia	UZB	27,493	0.06	5.2	31,744	0.07	5.5	20,202	0.06	3.9	7,291	0.06	15.0	11,542	0.10	11.1
middle_east	IRN	147,211	0.30	6.5	176,266	0.36	6.8	129,545	0.36	6.2	17,666	0.15	10.6	46,721	0.39	9.0
middle_east	ISR	133,326	0.28	4.4	136,377	0.28	4.2	85,279	0.23	3.2	48,047	0.40	8.1	51,098	0.43	6.7
middle_east	JOR	24,393	0.05	8.2	33,975	0.07	7.6	18,919	0.05	7.9	5,474	0.05	9.6	15,057	0.13	7.2
middle_east	KWT	43,733	0.09	8.3	55,391	0.11	8.2	31,301	0.09	9.2	12,432	0.10	6.6	24,090	0.20	7.2
middle_east	LBN	14,226	0.03	6.6	28,432	0.06	6.3	12,115	0.03	6.2	2,111	0.02	10.1	16,318	0.14	6.3
middle_east	OMN	15,351	0.03	- 7.7	25,545	0.05	- 5.7	6,697	0.02	- 11.1	8,654	0.07	9.4	18,849	0.16	7.8
middle_east	SAU	148,330	0.31	5.4	189,649	0.39	5.2	88,013	0.24	4.4	60,317	0.51	7.5	101,636	0.86	6.1
middle_east	SYR	12,432	0.03	1.6	16,316	0.03	1.6	12,076	0.03	1.7	355	0.00	- 1.7	4,239	0.04	1.3
middle_east	YEM	14,599	0.03	11.7	19,629	0.04	10.1	13,871	0.04	12.2	728	0.01	6.7	5,758	0.05	7.2
south_east_asia + east_asia	CHN	18,498,618	38.28	14.5	17,126,270	35.44	14.5	16,316,862	44.75	14.7	2,181,756	18.38	12.9	809,407	6.82	11.3
south_east_asia + east_asia	HKG	24,306	0.05	- 1.7	525,815	1.09	5.9	22,715	0.06	- 1.4	1,590	0.01	- 4.1	503,099	4.24	6.9
south_east_asia + east_asia	IDN	550,829	1.14	5.4	536,638	1.11	5.2	425,688	1.17	5.1	125,141	1.05	6.5	110,950	0.93	5.9
south_east_asia + east_asia	JPN	3,065,384	6.34	- 0.5	2,855,686	5.91	- 0.6	2,452,908	6.73	- 1.0	612,477	5.16	2.0	402,778	3.39	3.4
south_east_asia + east_asia	KOR	1,811,589	3.75	5.8	1,562,912	3.23	5.3	1,261,340	3.46	5.3	550,250	4.64	7.3	301,572	2.54	5.4

south_east_asia + east_asia	LAO	4,144	0.01	11.6	7,989	0.02	11.9	2,164	0.01	11.6	1,980	0.02	11.6	5,825	0.05	12.0
south_east_asia + east_asia	MYS	414,326	0.86	7.9	343,105	0.71	6.3	207,574	0.57	7.7	206,751	1.74	8.1	135,531	1.14	4.8
south_east_asia + east_asia	PHL	199,507	0.41	6.4	209,196	0.43	6.2	117,469	0.32	5.3	82,038	0.69	8.6	91,727	0.77	7.7
south_east_asia + east_asia	SGP	276,551	0.57	5.0	427,585	0.88	5.5	178,105	0.49	4.9	98,445	0.83	5.4	249,480	2.10	6.0
south_east_asia + east_asia	THA	471,817	0.98	5.6	413,892	0.86	4.7	267,939	0.73	4.6	203,878	1.72	7.5	145,953	1.23	5.0
south_east_asia + east_asia	VNM	271,613	0.56	15.8	264,592	0.55	14.4	71,759	0.20	10.6	199,854	1.68	21.1	192,833	1.62	17.3
Europe																
europe	AUT	208,171	0.43	2.8	227,676	0.47	3.1	101,327	0.28	2.1	106,844	0.90	3.6	126,348	1.06	4.1
europe	AZE	5,728	0.01	6.1	11,904	0.02	8.8	4,416	0.01	5.0	1,312	0.01	15.3	7,488	0.06	15.0
europe	BEL	248,873	0.51	1.1	375,815	0.78	2.7	96,040	0.26	- 0.1	152,833	1.29	2.1	279,775	2.36	4.2
europe	BIH	10,249	0.02	11.9	11,409	0.02	10.0	5,076	0.01	8.6	5,173	0.04	23.8	6,333	0.05	11.5
europe	BLR	39,364	0.08	4.4	32,707	0.07	3.5	12,674	0.03	- 0.4	26,690	0.22	14.4	20,033	0.17	12.4
europe	CHE	312,215	0.65	2.7	226,298	0.47	1.4	26,780	0.07	- 5.8	285,434	2.40	6.2	199,518	1.68	5.0
europe	CYP	3,121	0.01	1.3	10,777	0.02	3.2	1,108	0.00	- 1.6	2,013	0.02	4.3	9,669	0.08	4.3
europe	CZE	229,311	0.47	7.1	179,607	0.37	6.0	57,590	0.16	2.9	171,721	1.45	10.3	122,017	1.03	8.7
europe	DEU	2,194,007	4.54	1.9	2,032,335	4.21	1.8	1,204,621	3.30	0.7	989,387	8.34	4.0	827,714	6.97	4.0
europe	DNK	114,829	0.24	1.9	138,203	0.29	2.7	67,214	0.18	2.2	47,615	0.40	1.6	70,989	0.60	3.3
europe	ESP	578,832	1.20	2.6	560,515	1.16	2.3	311,717	0.85	1.0	267,115	2.25	5.6	248,798	2.10	4.9
europe	EST	14,886	0.03	7.9	22,398	0.05	8.5	7,568	0.02	8.7	7,319	0.06	7.3	14,831	0.12	8.5
europe	FIN	148,964	0.31	2.2	130,570	0.27	2.6	82,195	0.23	2.1	66,770	0.56	2.5	48,375	0.41	3.6
europe	FRA	998,998	2.07	1.5	978,140	2.02	1.5	525,179	1.44	0.4	473,819	3.99	3.1	452,961	3.82	3.4
europe	GBR	680,617	1.41	0.8	825,675	1.71	1.6	352,858	0.97	- 0.4	327,760	2.76	2.7	472,818	3.98	3.9
europe	GEO	4,225	0.01	4.4	8,470	0.02	7.2	2,067	0.01	1.2	2,158	0.02	16.8	6,403	0.05	15.9
europe	GRC	48,829	0.10	0.3	60,105	0.12	0.2	25,483	0.07	- 1.7	23,346	0.20	4.8	34,622	0.29	2.4
europe	HRV	24,961	0.05	3.2	34,360	0.07	3.7	17,504	0.05	2.8	7,457	0.06	4.6	16,856	0.14	4.8

europe	HUN	113,200	0.23	6.3	102,823	0.21	5.6	26,657	0.07	2.1	86,542	0.73	9.2	76,166	0.64	8.0
europe	IRL	291,379	0.60	7.7	208,980	0.43	7.1	140,393	0.39	9.4	150,986	1.27	6.5	68,587	0.58	4.4
europe	ISL	7,698	0.02	4.6	8,200	0.02	5.2	2,223	0.01	3.2	5,475	0.05	5.3	5,977	0.05	6.2
europe	ITA	1,034,854	2.14	1.6	886,071	1.83	1.3	575,388	1.58	0.5	459,465	3.87	3.6	310,683	2.62	3.4
europe	LTU	25,564	0.05	8.4	34,149	0.07	8.4	14,267	0.04	7.3	11,297	0.10	10.4	19,882	0.17	9.5
europe	LVA	11,705	0.02	7.0	19,343	0.04	8.8	4,395	0.01	6.0	7,309	0.06	7.7	14,948	0.13	10.1
europe	MDA	4,244	0.01	5.3	6,402	0.01	7.3	2,221	0.01	5.4	2,022	0.02	5.1	4,181	0.04	8.7
europe	NLD	403,795	0.84	2.7	641,155	1.33	3.8	257,818	0.71	2.8	145,977	1.23	2.6	383,337	3.23	4.7
europe	NOR	96,870	0.20	2.7	119,731	0.25	3.3	52,103	0.14	2.3	44,766	0.38	3.2	67,628	0.57	4.3
europe	POL	329,022	0.68	6.1	298,356	0.62	5.5	119,990	0.33	2.6	209,032	1.76	11.0	178,365	1.50	9.6
europe	PRT	107,788	0.22	2.1	108,411	0.22	1.9	50,543	0.14	0.5	57,245	0.48	4.3	57,868	0.49	3.5
europe	ROU	129,189	0.27	7.1	146,711	0.30	7.7	84,438	0.23	6.4	44,750	0.38	8.7	62,273	0.52	10.2
europe	SVK	80,088	0.17	7.3	77,823	0.16	7.0	18,328	0.05	2.9	61,760	0.52	10.3	59,495	0.50	9.7
europe	SVN	32,497	0.07	3.7	39,381	0.08	4.6	12,004	0.03	2.9	20,492	0.17	4.2	27,377	0.23	5.7
europe	SWE	212,039	0.44	1.3	176,772	0.37	1.3	73,562	0.20	- 0.6	138,477	1.17	2.9	103,210	0.87	3.5
europe	UKR	68,657	0.14	1.2	78,977	0.16	1.9	38,809	0.11	- 0.9	29,848	0.25	8.8	40,168	0.34	10.7
Latin America & Caribbean																
caribbean + central_america	CRI	21,260	0.04	5.5	25,511	0.05	5.5	12,294	0.03	4.3	8,967	0.08	8.0	13,218	0.11	6.9
caribbean + central_america	CUB	29,938	0.06	5.4	33,737	0.07	5.7	28,564	0.08	5.7	1,374	0.01	1.7	5,173	0.04	5.6
caribbean + central_america	DOM	24,625	0.05	4.5	31,677	0.07	5.4	16,639	0.05	4.2	7,986	0.07	5.2	15,037	0.13	7.3
caribbean + central_america	GTM	23,451	0.05	6.7	31,520	0.07	6.7	15,997	0.04	6.1	7,454	0.06	8.3	15,523	0.13	7.3
caribbean + central_america	HND	15,050	0.03	6.3	18,638	0.04	6.2	8,919	0.02	5.3	6,132	0.05	8.2	9,720	0.08	7.2
caribbean + central_america	HTI	8,041	0.02	6.8	10,129	0.02	6.8	6,961	0.02	6.5	1,080	0.01	9.8	3,168	0.03	7.5
caribbean + central_america	JAM	3,707	0.01	1.8	7,250	0.02	4.1	2,581	0.01	3.9	1,126	0.01	- 1.0	4,669	0.04	4.2
caribbean + central_america	NIC	6,502	0.01	6.6	8,837	0.02	6.8	2,396	0.01	3.2	4,106	0.03	11.2	6,441	0.05	9.6

caribbean + central_america	PAN	9,354	0.02	3.9	30,793	0.06	2.7	9,207	0.03	4.3	147	0.00	- 4.4	21,587	0.18	2.1
caribbean + central_america	SLV	8,011	0.02	3.7	11,083	0.02	3.5	2,149	0.01	- 1.1	5,862	0.05	9.0	8,934	0.08	6.1
caribbean + central_america	TTO	12,301	0.03	2.3	10,525	0.02	1.7	7,609	0.02	1.2	4,692	0.04	4.7	2,916	0.02	3.5
north_america	MEX	564,355	1.17	4.9	540,945	1.12	5.0	188,789	0.52	1.7	375,566	3.16	8.1	352,157	2.97	8.8
south_america	ARG	267,769	0.55	3.6	283,289	0.59	3.8	225,021	0.62	3.4	42,748	0.36	4.6	58,268	0.49	5.5
south_america	BOL	12,704	0.03	6.4	18,292	0.04	6.6	10,012	0.03	6.3	2,692	0.02	6.6	8,280	0.07	6.9
south_america	BRA	856,964	1.77	4.3	853,618	1.77	4.2	725,800	1.99	4.1	131,164	1.11	5.5	127,818	1.08	5.1
south_america	CHL	90,784	0.19	4.5	101,772	0.21	4.8	48,447	0.13	3.3	42,337	0.36	6.3	53,325	0.45	6.7
south_america	COL	111,557	0.23	4.7	137,560	0.28	4.9	97,739	0.27	4.6	13,818	0.12	5.2	39,821	0.34	5.5
south_america	ECU	40,528	0.08	4.3	49,618	0.10	4.6	32,549	0.09	3.8	7,979	0.07	6.9	17,070	0.14	6.6
south_america	PER	86,055	0.18	5.7	97,126	0.20	5.8	64,385	0.18	5.1	21,671	0.18	8.4	32,742	0.28	7.8
south_america	PRY	34,017	0.07	9.5	41,076	0.08	7.8	30,153	0.08	9.4	3,864	0.03	9.9	10,923	0.09	5.1
south_america	URY	16,378	0.03	3.4	17,511	0.04	3.5	9,196	0.03	2.2	7,183	0.06	5.5	8,316	0.07	5.6
south_america	VEN	29,616	0.06	- 0.2	32,829	0.07	0.1	24,579	0.07	0.6	5,037	0.04	- 2.8	8,250	0.07	- 1.1
Northern_america																
north_america	CAN	620,502	1.28	3.3	633,820	1.31	3.8	335,837	0.92	3.1	284,665	2.40	3.5	297,983	2.51	4.6
north_america	USA	6,001,961	12.42	2.5	6,725,952	13.92	2.9	4,857,717	13.32	2.1	1,144,243	9.64	4.5	1,868,235	15.74	5.9
Oceania																
pacific	AUS	277,897	0.58	2.6	371,853	0.77	3.7	193,330	0.53	1.9	84,567	0.71	4.5	178,523	1.50	7.0
pacific	FJI	1,670	0.00	3.3	2,891	0.01	5.7	960	0.00	4.4	711	0.01	2.1	1,931	0.02	6.5
pacific	NZL	58,613	0.12	2.5	61,375	0.13	2.7	30,570	0.08	1.1	28,043	0.24	4.6	30,805	0.26	5.2
pacific	TON	89	0.00	2.1	189	0.00	3.1	86	0.00	2.1	3	0.00	2.0	103	0.00	4.0
pacific	WSM	202	0.00	0.1	522	0.00	3.9	**162**	0.00	0.5	40	0.00	- 1.2	359	0.00	7.1
World	**World**	**48,328,468**	**100.00**	**4.9**	**48,328,468**	**100.00**	**4.9**	**36,459,426**	**100.00**	**4.7**	**11,869,042**	**100.00**	**5.7**	**11,869,042**	**100.00**	**5.7**

(a) Values in current dollar values. (b) Part. Is participation in percentage. (c) Average cumulative growth rate for 1995-2017 for the variables measured in current dollar values.
Regions: Africa (AFR), Central America and the Caribbean (CAC), North America (NAM), South America (SAM), Central Asia + Eurasia + South Asia (CSEA), Europe (EUR), Middle East (MES), Pacific (PAC), and South East Asia and East Asia (SEEA).

Xi: exports; Mi: imports; Yi: production; Ei: expenditure; Xii: internal trade; xRR: intra-regional exports; mRR: intra-regional imports.
Source: own elaboration

Table A.4. Trade costs ranking and variation (1995 -2017), by subregions as exporter

Region	Rank	Total			Non-tariff			Tariff		
		Overall	Regional	Extra	Overall	Regional	Extra	Overall	Regional	Extra
AFR	8	-12.6	-20.7	-11.8	-12.0	-9.3	-11.3	-0.6	-10.4	-0.5
CAC	9	-9.1	-13.6	-7.9	-9.9	-11.1	-8.7	0.7	-2.3	0.7
CASE	4	-23.0	-20.1	-22.7	-23.3	-11.2	-23.1	0.2	-8.2	0.4
EUR	3	-1.9	-11.2	-3.2	-2.0	-9.2	-2.9	0.1	-1.8	-0.3
MES	7	-11.6	-14.0	-11.7	-11.7	-8.7	-11.8	0.0	-4.8	0.1
NAM	1	-4.2	-15.9	-0.3	-3.2	-14.1	1.2	-0.8	-1.7	-1.2
PAC	5	-7.2	-10.3	-7.6	-5.0	-8.6	-5.4	-1.9	-1.5	-1.9
SAM	6	-4.9	-5.4	-5.8	-5.4	0.9	-6.5	0.4	-5.1	0.6
SEEA	2	-16.2	-8.0	-20.6	-13.9	-5.1	-18.8	-2.2	-2.5	-1.8
World*		**-10.3**	**-5.9**	**-13.9**	**-9.1**	**-4.1**	**-12.3**	**-1.4**	**-1.9**	**-1.9**

*- World average measures. Regions as exporters. a- Variation in percentage from 2017 values to 1995. Rank: ranking over overall total trade cost. 1-lowest trade costs 6-hihest trade costs.
Source: own elaboration

Table A.5. Eta Macro Region and Global from export and import flows.

Flow	Region	Total			Non-tariff			Tariff		
		Overall	Regional	Extra	Overall	Regional	Extra	Overall	Regional	Extra
Exports	Africa	-12.6	-20.7	-11.8	-12.0	-9.3	-11.3	-0.6	-10.4	-0.5
	Asia	-17.6	-11.4	-22.7	-16.9	-10.3	-21.3	-0.7	-0.9	-1.5
	Europe	-1.9	-11.2	-3.2	-2.0	-9.2	-2.9	0.1	-1.8	-0.3
	Latin_america_C	-7.4	-7.1	-7.9	-8.0	-2.0	-8.8	0.5	-4.3	0.8
	Northern_america	-2.3	-14.0	-0.8	-0.7	-12.8	1.5	-1.4	-1.1	-1.9
	Oceania	-7.2	-10.3	-7.6	-5.0	-8.6	-5.4	-1.9	-1.5	-1.9
Total exports		**-10.3**	**-5.9**	**-13.9**	**-9.1**	**-4.1**	**-12.3**	**-1.4**	**-1.9**	**-1.9**
Imports	Africa	-10.1	-20.6	-9.7	-2.9	-13.5	-2.4	-6.1	-6.7	-6.1
	Asia	-13.5	-9.5	-15.0	-7.5	-2.8	-9.6	-5.3	-5.7	-4.9
	Europe	-1.4	-10.2	-5.3	1.7	-7.1	-1.5	-2.5	-2.7	-3.2
	Latin_america_C	-6.9	-6.9	-7.3	-2.9	-2.0	-3.3	-3.4	-4.1	-3.3
	Northern_america	-6.2	-13.7	-6.6	-3.1	-12.6	-3.0	-2.6	-1.1	-3.0
	Oceania	-9.6	-6.8	-10.6	-6.3	-7.6	-7.3	-2.9	0.7	-3.0
Total imports		**-9.0**	**-5.6**	**-11.6**	**-6.3**	**-9.0**	**-3.5**	**-1.8**	**-0.9**	**-1.9**

a-Values of the Eta measures. b- Variation in percentage from 2017 to 1995.
Source: own elaboration

Table A.6. Trade costs (η) variation 1995 -2017 (%), by sub-regions. Role of importer

Region	Total			Non tariff			Tariff		
	Overall	**Regional**	**Extra**	**Overall**	**Regional**	**Extra**	**Overall**	**Regional**	**Extra**
AFR	-10.1	-20.6	-9.7	-2.9	-13.5	-2.4	-6.1	-6.7	-6.1
CAC	-4.6	-12.3	-3.7	0.0	-10.2	0.9	-3.8	-1.9	-3.8
CES	-20.2	-16.2	-20.1	-14.6	-11.0	-14.4	-5.4	-4.8	-5.4
EUR	-1.4	-10.2	-5.3	1.7	-7.1	-1.5	-2.5	-2.7	-3.2
MES	-8.5	-15.1	-8.3	-3.0	-6.4	-2.9	-4.6	-7.7	-4.6
NAM	-7.6	-16.1	-7.6	-3.3	-12.6	-2.8	-3.7	-3.2	-4.1
PAC	-9.6	-6.8	-10.6	-6.3	-7.6	-7.3	-2.9	0.7	-3.0
SAM	-5.0	-5.6	-5.7	-1.7	0.9	-2.5	-2.8	-5.3	-2.7
SEEA	-13.2	-8.1	-13.4	-6.4	0.8	-8.4	-6.0	-7.3	-4.5
World_avg	**-9.0**	**-5.6**	**-11.6**	**-6.3**	**-9.0**	**-3.5**	**-1.8**	**-0.9**	**-1.9**

Regions: Africa (AFR), Central America and the Caribbean (CAC), North America (NAM), South America (SAM), Central Asia + Eurasia + South Asia (CSEA), Europe (EUR), Middle East (MES), Pacific (PAC), and South East Asia and East Asia (SEEA).
Source: own elaboration

Table A.7. - Trade cost measures and variation by country as exporters. Measures at 2017; Variations in percentage 2017/1995. Role of exporter.

		CHB		CTB		eta		eta_R		eta_E		eta_ntb		eta_t	
Macro	**country**	**Value**	**var.**	**Value**	**var.**	**Value**	**var.**	**Value**	**var.**	**Value**	**var.**	**Value**	**var.**	**Value**	**var.**
Africa	AGO	1578	-74.7	0.2	-49.4	7.1	-14.3	4.3	-16.9	7.3	-14.0	6.9	-12.0	1.0	-2.1
Latin_america_C	ARG	141	22.5	0.2	17.7	4.4	0.9	2.6	0.9	5.0	-0.6	4.0	-1.0	1.1	1.6
Oceania	AUS	92	13.7	0.3	50.4	3.6	-6.0	1.5	-8.1	3.7	-6.7	3.4	-1.1	1.0	-4.1
Europe	AUT	100	16.9	0.5	29.4	3.2	-2.2	2.3	-12.1	4.2	-4.6	3.0	-2.9	1.1	0.6
Europe	AZE	2597	-52.9	0.4	-8.4	7.2	-13.8	6.0	-19.3	7.7	-14.4	6.6	-13.5	1.1	-0.3
Europe	BEL	52	29.9	0.6	19.0	2.7	2.0	1.9	-8.0	3.6	-3.0	2.5	1.4	1.1	0.5
Africa	BEN	5742	-56.8	0.1	8.4	11.4	-18.5	5.1	-25.8	13.4	-12.6	11.1	-17.1	1.0	-1.4
Asia	BGD	254	-67.2	0.3	187.1	4.4	-38.3	6.1	-33.8	3.7	-43.6	4.2	-38.7	1.0	0.5
Europe	BIH	2059	-64.7	0.5	-0.1	6.3	-20.6	4.4	-29.5	10.1	-20.6	5.9	-20.9	1.1	0.2
Europe	BLR	542	-26.8	0.6	96.6	4.5	-19.7	3.7	-23.6	4.9	-22.7	4.1	-20.5	1.1	0.9
Latin_america_C	BOL	2082	-28.0	0.2	-6.8	7.7	-5.6	4.6	-8.5	8.8	-4.7	7.2	-6.1	1.1	0.5
Latin_america_C	BRA	47	10.9	0.2	30.2	3.5	-3.5	2.1	-3.4	3.8	-4.2	3.2	-4.9	1.1	1.2
Northern_america	CAN	36	0.5	0.5	31.5	2.6	-5.8	1.7	-14.1	3.4	-5.0	2.4	-4.0	1.1	-1.6
Europe	CHE	47	26.1	0.8	23.6	2.5	0.4	2.0	-5.6	2.7	-2.2	2.3	2.8	1.0	-1.8
Latin_america_C	CHL	224	-24.6	0.5	47.8	3.8	-13.9	2.7	-13.2	4.0	-14.6	3.7	-10.5	1.0	-3.1
Asia	CHN	2	-84.9	0.2	14.0	1.8	-36.2	1.7	-35.1	1.8	-36.7	1.7	-35.5	1.1	-0.9
Africa	CIV	1910	-6.7	0.4	-1.3	6.8	-1.2	3.4	-10.7	7.3	1.9	6.3	-2.5	1.1	1.0
Africa	CMR	2972	-4.2	0.1	4.5	9.6	-1.9	6.0	-11.4	9.8	-0.9	9.0	-3.5	1.1	1.3
Latin_america_C	COL	300	-4.9	0.1	59.4	5.4	-10.8	3.2	-12.6	6.3	-11.0	5.1	-11.5	1.1	0.6
Africa	CPV	29518	-0.8	0.4	6.2	11.9	-1.5	7.1	-11.5	12.3	-0.2	11.2	-3.4	1.1	1.6
Latin_america_C	CRI	879	-28.3	0.5	27.0	5.2	-11.9	3.4	-15.5	5.6	-11.1	5.0	-9.2	1.0	-2.5
Latin_america_C	CUB	1298	-16.5	0.1	27.8	8.3	-9.0	6.7	-4.7	8.5	-10.0	7.6	-9.9	1.1	0.8
Europe	CYP	1686	-17.8	0.6	85.2	5.8	-16.5	4.5	-24.9	6.6	-15.0	5.4	-16.5	1.1	0.0

Europe	CZE	95	-40.5	0.7	23.6	3.0	-15.0	2.1	-24.5	4.5	-14.8	2.8	-14.8	1.1	-0.2
Europe	DEU	13	49.3	0.5	53.3	2.1	-0.6	1.5	-9.4	2.5	-3.8	1.9	-0.9	1.1	0.2
Europe	DNK	183	32.4	0.5	29.0	3.8	0.6	2.8	-9.2	4.7	-1.1	3.5	0.0	1.1	0.5
Latin_america_C	DOM	946	-15.7	0.4	11.9	5.7	-6.1	4.4	-14.8	5.8	-4.9	5.3	-7.3	1.1	1.1
Latin_america_C	ECU	792	1.3	0.2	28.1	6.4	-5.1	4.0	-7.4	7.0	-4.8	6.0	-6.0	1.1	0.8
Africa	EGY	326	-24.6	0.2	90.9	5.3	-18.7	3.3	-25.7	5.4	-18.1	5.0	-19.1	1.1	0.5
Europe	ESP	51	41.8	0.4	45.2	2.9	-0.5	2.1	-9.6	3.6	-4.5	2.7	-1.1	1.1	0.4
Europe	EST	856	-47.5	0.6	-5.8	5.0	-12.2	3.7	-21.8	6.3	-10.1	4.7	-11.6	1.1	-0.5
Africa	ETH	1846	-71.4	0.1	28.2	8.5	-28.3	7.3	-34.8	8.5	-28.2	8.3	-27.1	1.0	-1.4
Europe	FIN	190	37.3	0.5	26.5	3.8	1.8	2.9	-6.5	4.4	-0.6	3.5	1.1	1.1	0.6
Oceania	FJI	8697	-5.2	0.5	-9.6	8.8	1.1	3.9	-12.7	9.8	5.1	8.2	-0.2	1.1	1.1
Europe	FRA	26	57.3	0.5	47.4	2.4	1.5	1.8	-7.3	2.9	-1.9	2.2	1.0	1.1	0.4
Europe	GBR	31	58.9	0.5	45.8	2.5	1.9	1.9	-7.8	2.9	2.2	2.3	1.5	1.1	0.4
Europe	GEO	3573	-45.9	0.4	31.7	7.7	-17.9	6.4	-26.7	8.3	-15.2	7.1	-17.1	1.1	-0.8
Africa	GMB	27039	-19.8	0.1	-3.5	15.1	-4.0	7.3	-10.7	16.7	-0.8	14.2	-5.8	1.1	1.5
Africa	GNB	61734	-54.4	0.1	-41.3	22.2	-5.4	10.4	-16.4	25.2	0.7	21.6	-3.1	1.0	-2.0
Europe	GRC	481	106.1	0.4	101.8	4.8	0.5	3.7	-8.5	5.7	-1.0	4.5	-0.1	1.1	0.5
Latin_america_C	GTM	1058	-36.8	0.3	26.8	6.1	-14.3	3.5	-15.8	7.3	-14.9	5.7	-14.8	1.1	0.5
Asia	HKG	83	-22.0	0.1	59.5	4.5	-14.7	4.4	-14.5	4.8	-11.8	4.1	-15.0	1.1	0.3
Latin_america_C	HND	1477	-33.0	0.4	23.7	6.1	-12.7	4.3	-18.6	6.4	-11.4	5.7	-13.4	1.1	0.6
Europe	HRV	981	8.8	0.3	85.4	6.0	-11.2	4.3	-21.3	8.8	-8.4	5.6	-11.1	1.1	-0.1
Latin_america_C	HTI	4049	-29.2	0.2	-17.3	9.6	-3.4	9.4	-11.7	9.6	-2.9	9.0	-5.2	1.1	1.6
Europe	HUN	134	-39.0	0.7	20.2	3.2	-14.0	2.3	-23.4	4.5	-13.7	3.0	-14.4	1.1	0.3
Asia	IDN	68	-17.3	0.3	64.8	3.5	-14.2	3.4	-7.3	3.5	-18.9	3.4	-11.1	1.0	-2.8
Asia	IND	23	-63.2	0.1	83.1	3.2	-30.0	3.4	-26.2	3.0	-34.0	2.9	-30.5	1.1	0.6
Europe	IRL	88	-30.5	0.6	-5.2	3.0	-6.7	2.3	-16.1	3.5	-5.7	2.8	-7.2	1.1	0.5
Asia	IRN	244	-38.2	0.1	357.8	5.5	-35.9	5.1	-31.3	6.7	-34.6	5.1	-36.6	1.1	0.9
Europe	ISL	1700	4.8	0.7	-3.7	5.6	1.9	4.1	-8.9	7.6	2.1	5.4	5.7	1.0	-2.9

Asia	ISR	230	-0.2	0.4	43.3	4.2	-7.7	5.1	-5.7	3.7	-14.2	3.9	-8.8	1.1	0.9
Europe	ITA	31	67.6	0.4	54.1	2.6	1.9	1.9	-7.1	3.1	-0.3	2.4	1.4	1.1	0.4
Latin_america_C	JAM	3692	9.4	0.4	11.4	7.4	-0.4	7.5	-4.3	7.4	-0.2	6.9	-2.1	1.1	1.4
Asia	JOR	1023	-50.6	0.3	70.8	6.2	-24.1	6.2	-17.9	6.1	-29.1	5.8	-23.6	1.1	-0.5
Asia	JPN	13	183.3	0.2	80.1	2.4	10.6	2.5	27.5	2.4	3.2	2.2	13.5	1.1	-2.1
Asia	KAZ	472	-61.2	0.5	15.3	4.6	-21.5	4.5	-20.7	4.7	-20.6	4.2	-22.0	1.1	0.5
Africa	KEN	1207	-41.7	0.1	87.2	7.6	-22.8	3.3	-26.7	9.1	-19.4	7.1	-23.9	1.1	1.1
Asia	KGZ	3076	-70.5	0.4	-36.2	7.4	-15.7	7.6	-18.1	7.1	-16.6	6.8	-15.7	1.1	0.0
Asia	KOR	21	-18.6	0.3	39.9	2.5	-11.3	2.5	-5.8	2.6	-13.7	2.4	-10.1	1.0	-1.2
Asia	KWT	558	-47.0	0.4	-7.4	5.1	-11.7	4.8	-3.5	6.1	-15.4	4.7	-12.7	1.1	0.9
Asia	LAO	3030	-76.6	0.5	3.9	6.9	-28.2	6.5	-23.3	8.0	-28.1	6.7	-26.6	1.0	-1.8
Asia	LBN	1299	-28.6	0.2	24.1	6.8	-11.6	7.5	-6.8	6.2	-17.5	6.3	-11.9	1.1	0.3
Europe	LTU	864	-52.3	0.4	3.2	5.5	-15.7	4.1	-24.9	7.0	-14.0	5.1	-15.1	1.1	-0.6
Europe	LVA	961	-54.1	0.6	-1.7	5.1	-15.6	3.7	-25.4	6.7	-11.5	4.8	-14.9	1.1	-0.6
Africa	MAR	465	-10.9	0.4	271.7	4.8	-27.2	3.6	-31.4	4.8	-27.0	4.5	-27.5	1.1	0.3
Europe	MDA	3103	-43.8	0.6	6.0	6.7	-13.1	5.1	-22.0	7.9	-11.8	6.2	-13.0	1.1	-0.1
Africa	MDG	5940	-38.4	0.3	-3.0	8.7	-9.6	5.9	-12.8	8.8	-9.4	8.5	-8.0	1.0	-1.4
Latin_america_C	MEX	39	-25.1	0.6	32.2	2.6	-11.9	2.3	-11.7	2.6	-12.0	2.4	-12.0	1.1	0.1
Africa	MUS	2309	-42.4	0.7	95.8	6.0	-23.8	3.6	-30.0	6.2	-22.9	5.6	-25.0	1.1	1.3
Africa	MWI	8984	-45.3	0.1	91.3	13.3	-24.3	6.2	-26.0	15.1	-23.3	13.0	-23.0	1.0	-1.4
Asia	MYS	67	-46.0	0.5	53.8	2.9	-20.8	2.9	-14.8	3.0	-24.4	2.8	-18.6	1.0	-2.2
Africa	NGA	451	-57.4	0.1	138.7	6.8	-31.8	4.5	-35.1	6.9	-31.7	6.3	-32.5	1.1	0.8
Latin_america_C	NIC	2522	-45.5	0.5	24.9	6.5	-16.8	4.4	-18.6	7.0	-16.7	6.1	-17.4	1.1	0.5
Europe	NLD	48	19.0	0.4	12.0	2.9	1.4	2.1	-8.8	3.9	-3.3	2.7	0.8	1.1	0.5
Europe	NOR	211	19.3	0.5	24.7	3.9	-1.0	2.9	-9.6	4.6	-3.7	3.6	-0.9	1.1	0.0
Asia	NPL	3418	-63.1	0.2	4.9	9.0	-20.7	8.8	-24.4	9.4	-16.1	8.8	-19.1	1.0	-1.7
Oceania	NZL	408	18.4	0.5	56.9	4.5	-6.1	2.2	-12.4	4.7	-5.7	4.3	-0.3	1.0	-4.8
Asia	OMN	1681	855.6	0.1	189.4	8.5	30.4	8.1	38.8	9.3	29.2	7.8	29.6	1.1	0.5

Asia	PAK	290	-40.8	0.2	77.2	5.1	-21.6	5.8	-18.5	4.6	-26.7	4.8	-21.2	1.1	-0.4
Latin_america_C	PAN	1375	46.1	0.1	267.9	7.9	-18.6	4.6	-20.6	9.3	-17.9	7.4	-19.4	1.1	0.8
Latin_america_C	PER	361	-28.5	0.3	72.8	4.9	-17.8	3.5	-18.7	5.2	-18.0	4.8	-15.8	1.0	-2.0
Asia	PHL	138	-38.0	0.4	52.8	3.7	-18.2	3.6	-11.6	3.7	-22.8	3.5	-15.3	1.0	-2.8
Europe	POL	75	-33.2	0.5	38.3	3.0	-14.9	2.1	-24.5	4.3	-14.9	2.8	-15.3	1.1	0.3
Europe	PRT	224	42.4	0.5	53.5	3.9	-1.7	2.8	-11.2	5.1	-5.6	3.6	-2.2	1.1	0.5
Latin_america_C	PRY	1047	-47.9	0.1	60.7	7.7	-22.1	4.5	-22.9	9.0	-23.3	7.1	-22.8	1.1	0.7
Europe	ROU	218	-49.7	0.3	30.1	4.2	-19.1	3.0	-27.9	5.6	-18.6	3.9	-20.4	1.1	1.4
Asia	RUS	46	-44.6	0.3	23.5	3.1	-16.3	3.4	-15.3	2.8	-20.8	2.8	-17.0	1.1	0.6
Asia	SAU	141	-25.9	0.4	48.7	3.6	-14.3	3.5	-7.9	3.8	-17.9	3.3	-15.3	1.1	0.9
Africa	SEN	2618	-5.8	0.1	-7.8	9.3	0.5	4.8	-5.2	10.0	2.3	9.1	2.7	1.0	-1.8
Asia	SGP	72	-22.7	0.4	35.4	3.2	-11.7	3.1	-4.0	3.5	-16.1	3.1	-7.1	1.0	-4.1
Latin_america_C	SLV	1393	-24.7	0.7	58.9	5.4	-15.3	3.3	-18.9	6.3	-13.5	5.1	-15.9	1.1	0.6
Europe	SVK	185	-41.6	0.7	5.0	3.4	-12.2	2.4	-21.6	5.1	-14.8	3.2	-12.1	1.1	-0.2
Europe	SVN	469	-19.8	0.6	25.1	4.4	-9.4	3.1	-19.2	6.4	-10.4	4.1	-9.4	1.1	0.0
Europe	SWE	102	47.8	0.6	36.7	3.1	1.8	2.3	-7.6	3.8	-0.2	2.9	1.1	1.1	0.5
Asia	SYR	2257	67.9	0.2	195.0	7.7	-11.8	7.8	-6.6	7.5	-16.2	7.1	-11.7	1.1	-0.1
Asia	THA	65	-24.2	0.4	84.5	3.0	-17.9	3.0	-11.4	3.1	-22.5	2.9	-15.5	1.0	-2.4
Asia	TKM	5059	31.8	0.3	25.8	8.9	1.0	9.3	2.3	8.5	-2.4	8.2	1.4	1.1	-0.3
Oceania	TON	239564	44.7	0.1	53.3	29.0	-1.3	13.2	-15.8	31.5	2.1	27.0	-2.6	1.1	1.1
Latin_america_C	TTO	2208	35.5	0.5	70.6	6.4	-5.0	4.4	-8.0	6.8	-4.5	6.0	-6.8	1.1	1.6
Africa	TUN	685	-10.9	0.6	72.3	4.7	-13.6	3.7	-22.7	4.7	-13.3	4.4	-13.9	1.1	0.3
Asia	TUR	57	-38.7	0.2	-2.2	3.6	-9.9	4.5	-6.8	3.2	-16.6	3.4	-10.9	1.1	1.0
Africa	TZA	2111	-63.9	0.2	42.0	7.6	-26.2	3.6	-27.5	8.5	-25.8	7.4	-25.1	1.0	-1.3
Africa	UGA	2532	-69.2	0.1	33.9	10.5	-27.8	5.2	-37.5	11.5	-24.5	10.2	-26.6	1.0	-1.4
Europe	UKR	302	27.0	0.5	90.4	4.1	-8.6	3.6	-14.4	4.3	-8.4	3.8	-8.4	1.1	-0.2
Latin_america_C	URY	1602	12.0	0.4	36.6	6.2	-4.3	3.8	-4.1	7.1	-6.3	5.8	-5.8	1.1	1.3
Northern_america	USA	6	42.0	0.2	39.7	2.1	0.4	1.2	-8.6	2.2	0.9	1.9	2.1	1.1	-1.4

Asia	UZB	1266	-17.3	0.2	48.9	7.3	-12.2	7.1	-10.4	7.5	-12.0	6.7	-12.1	1.1	-0.1
Latin_america_C	VEN	1013	140.0	0.3	55.8	6.0	10.1	4.1	11.4	6.4	8.9	5.6	8.1	1.1	1.5
Asia	VNM	81	-80.3	0.6	-16.0	3.0	-27.6	3.2	-21.3	2.9	-33.1	2.9	-24.8	1.0	-3.1
Oceania	WSM	67235	19.5	0.3	10.4	15.7	1.8	5.8	-5.9	22.6	7.4	15.4	4.3	1.0	-2.0
Asia	YEM	2223	-66.5	0.1	28.3	9.3	-25.8	9.0	-18.4	9.8	-31.6	9.0	-24.3	1.0	-1.7
Africa	ZAF	179	36.3	0.4	114.2	4.0	-9.6	2.5	-14.2	4.1	-8.9	3.7	-9.0	1.1	-0.5
World	**World_avg**	**4905**	**-6**	**0.4**	**45.6**	**6.0**	**-11.1**	**4.3**	**-14.6**	**6.6**	**-11.8**	**5.6**	**-10.9**	**1.1**	**-0.2**

Rank:position from 1 to 114, considering world average as a country. 1- Lowest value 114-highest.
Source: own elaboration

Table A.8. Trade cost measures and variation by country as exporters. Measures at 2017; Variations in percentage 2017/1995. Role of exporter. Latin American countries. Order by lowest overall trade costs (eta)

	eta		eta_R		eta_E		eta_ntb		eta_t	
Country	**Value**	**var.**	**Value**	**var.**	**Value**	**var.**	**Value**	**var.**	**Value**	**var.**
MEX	2.6	-11.9	2.3	-11.7	2.6	-12.0	2.4	-12.0	1.1	0.1
BRA	3.5	-3.5	2.1	-3.4	3.8	-4.2	3.2	-4.9	1.1	1.2
CHL	3.8	-13.9	2.7	-13.2	4.0	-14.6	3.7	-10.5	1.0	-3.1
ARG	4.4	0.9	2.6	0.9	5.0	-0.6	4.0	-1.0	1.1	1.6
PER	4.9	-17.8	3.5	-18.7	5.2	-18.0	4.8	-15.8	1.0	-2.0
CRI	5.2	-11.9	3.4	-15.5	5.6	-11.1	5.0	-9.2	1.0	-2.5
COL	5.4	-10.8	3.2	-12.6	6.3	-11.0	5.1	-11.5	1.1	0.6
SLV	5.4	-15.3	3.3	-18.9	6.3	-13.5	5.1	-15.9	1.1	0.6
DOM	5.7	-6.1	4.4	-14.8	5.8	-4.9	5.3	-7.3	1.1	1.1
VEN	6.0	10.1	4.1	11.4	6.4	8.9	5.6	8.1	1.1	1.5
GTM	6.1	-14.3	3.5	-15.8	7.3	-14.9	5.7	-14.8	1.1	0.5
HND	6.1	-12.7	4.3	-18.6	6.4	-11.4	5.7	-13.4	1.1	0.6
URY	6.2	-4.3	3.8	-4.1	7.1	-6.3	5.8	-5.8	1.1	1.3
ECU	6.4	-5.1	4.0	-7.4	7.0	-4.8	6.0	-6.0	1.1	0.8
TTO	6.4	-5.0	4.4	-8.0	6.8	-4.5	6.0	-6.8	1.1	1.6
NIC	6.5	-16.8	4.4	-18.6	7.0	-16.7	6.1	-17.4	1.1	0.5
JAM	7.4	-0.4	7.5	-4.3	7.4	-0.2	6.9	-2.1	1.1	1.4
PRY	7.7	-22.1	4.5	-22.9	9.0	-23.3	7.1	-22.8	1.1	0.7
BOL	7.7	-5.6	4.6	-8.5	8.8	-4.7	7.2	-6.1	1.1	0.5
PAN	7.9	-18.6	4.6	-20.6	9.3	-17.9	7.4	-19.4	1.1	0.8
CUB	8.3	-9.0	6.7	-4.7	8.5	-10.0	7.6	-9.9	1.1	0.8
HTI	9.6	-3.4	9.4	-11.7	9.6	-2.9	9.0	-5.2	1.1	1.6

Rank:position from 1 to 114, considering world average as a country. 1- Lowest value 114-highest.
Source: own elaboration

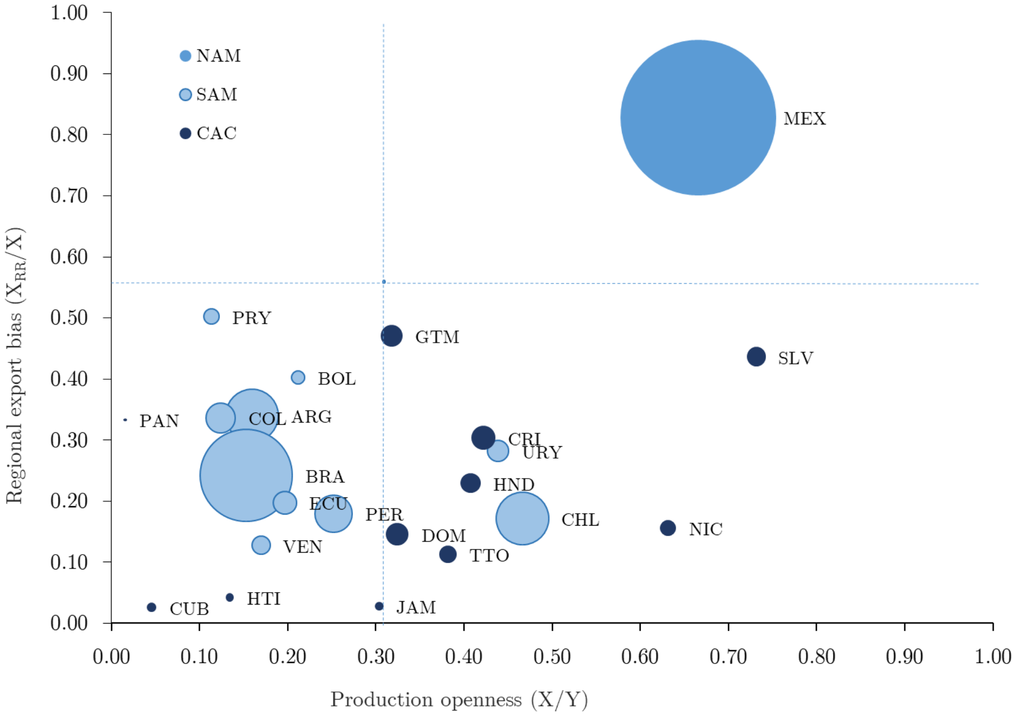
Table A.9. Multilateral resistances Indexes. Measures at 1995 and 2017; Variations in percentage 2017/1995. Latin American countries.

	OMR			IMR		
Country	**Var.(17/95)**	**Rank_95**	**Rank_17**	**Var.(17/95)**	**Rank_95**	**Rank_17**
ARG	-20.1%	37	27	4.2%	24	34
BOL	-23.6%	86	74	-2.9%	84	90
BRA	-16.9%	39	40	-2.0%	12	10
CHL	-19.4%	46	38	-5.5%	40	42
COL	-15.4%	57	64	-6.8%	32	31
CRI	-19.6%	64	63	-5.6%	63	77
CUB	-21.0%	73	65	-3.3%	72	85
DOM	-19.3%	77	73	-3.1%	55	65
ECU	-19.4%	71	67	-0.8%	47	60
GTM	-20.0%	78	70	-8.9%	70	73
HND	-19.2%	83	80	-7.8%	75	78
HTI	-21.8%	93	89	-5.4%	97	100
JAM	-18.5%	94	97	1.2%	78	91
MEX	-20.6%	53	44	-3.5%	8	8
NIC	-20.9%	87	81	-9.0%	95	93
PAN	-0.1%	105	113	-13.4%	23	19
PER	-13.8%	44	49	-13.7%	57	51
PRY	-16.3%	66	72	-17.7%	87	69
SLV	-17.7%	84	86	-5.1%	62	76
TTO	-13.8%	47	54	-0.4%	98	106
URY	-17.4%	55	56	-0.2%	86	97
VEN	-14.8%	80	85	13.7%	28	56

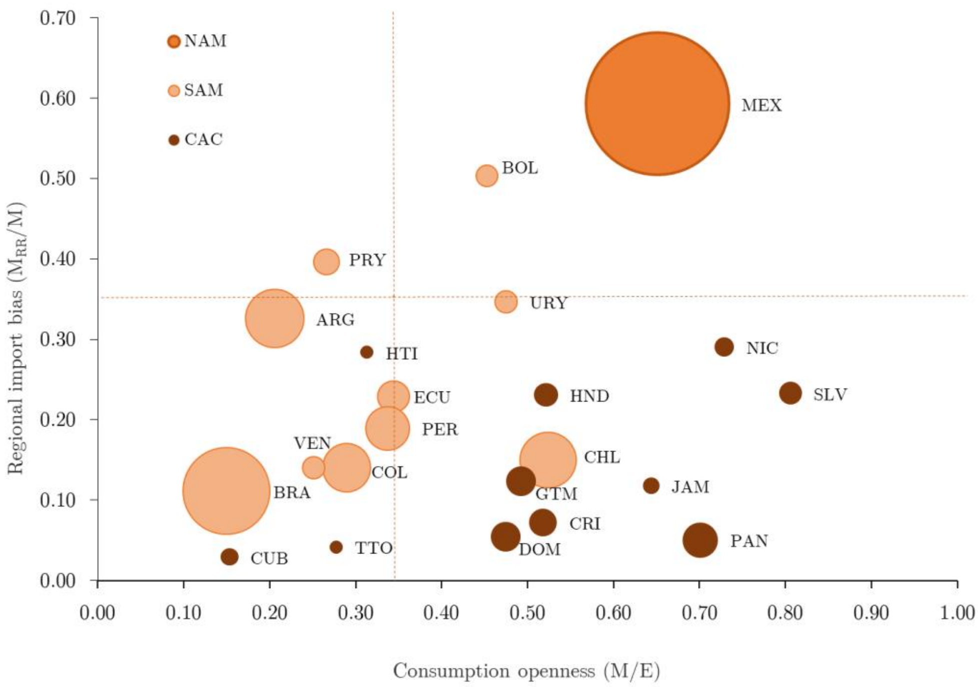
Appendix B - Figures

Figure A.1 Trade Openness and regional orientation, 2017

a) Exports and production

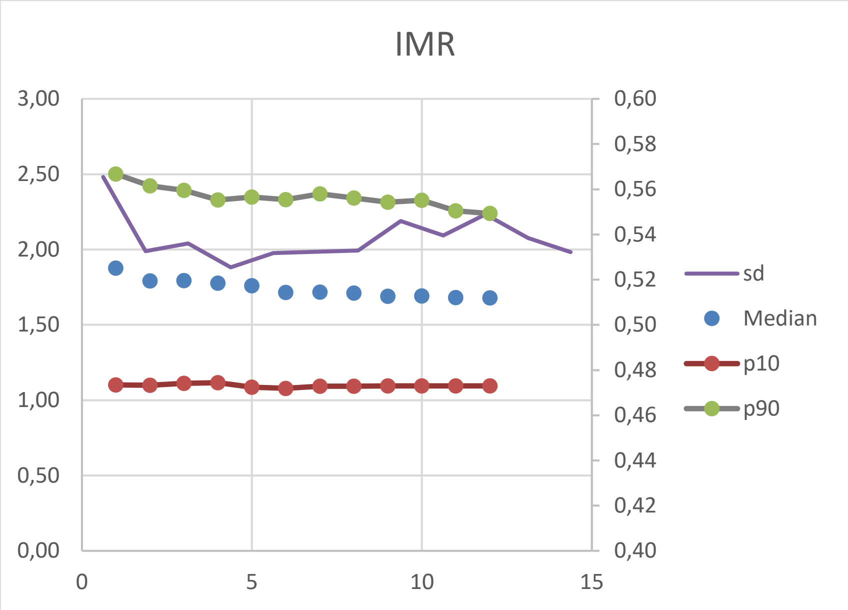


b) Imports and consumption



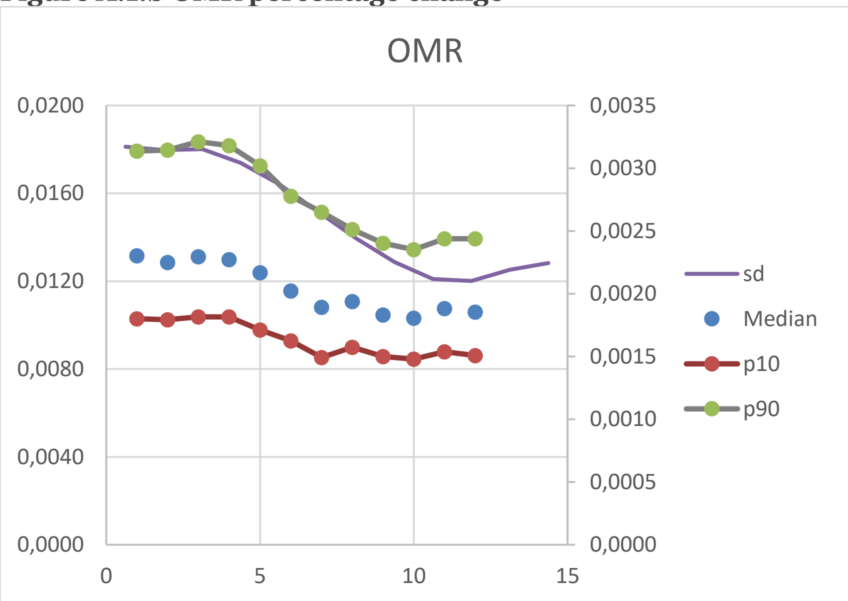
Source: Prepared by the author

Figure A.1.a IMR percentage change



Source: own elaboration

Figure A.1.b OMR percentage change



Source: own elaboration

Appendix C- Data sources and the construction of the database

While there are other databases that include data on domestic transactions, the main reason for building our own dataset was the need to have information on all twenty Latin American countries[30]. Also, we were interested in having information going back to the mid-1990s, in order to capture the beginning of a new wave of regional integration that to took place at that time.

As described in detail in Moncarz et al. (2021), we use the National Accounts Main Aggregates (AMA)[31] database from United Nations Statistics Division (Unstats) for production and value added data; World Development Indicators (WDI)[32] from World Bank for value added data; Input-Output Tables (IOTs)[33] from OECD.Stat for data on production, value added, and gross and net exports; and CEPII's BACI[34] database for bilateral trade data at the six-digit level of the Harmonized System (HS-1992). The resulting database contains information on production, expenditure and bilateral trade flows (including domestic transactions) for manufactured goods, for a sample of 112 countries from 1995 to 2016.

To obtain the values of production, which are critical for the calculation of domestic transactions, the procedure involved the following steps:

1. Using Unstats data on value added (VA_{lc}) and output (Y_{lc}) in current values expressed in local currency, we calculate the ratio VA_{lc}/Y_{lc}.

2. Starting from value added values in current dollars (VA_{usd}) provided by the WDI database, the VA_{lc}/Y_{lc} ratios from step 1 are used to obtain production values in current dollars: $Y_{usd} = VA_{usd}/(VA_{lc}/Y_{lc})$.

3. To account for missing values of production after step 2, we proceeded as follows:

a) Using OECD.Stats data, growth rates of production in current dollars were calculated, and these rates were applied to the data obtained in step 2.

b) For countries for which no record of production was yet available, current dollar data from OECD.Stats using the version 3 of the ISIC were used, which were then completed for subsequent years using the corresponding growth rates of the data expressed in ISIC version 4.

[30] We exclude Latin-American territories which are not a sovereign states.

[31] https://unstats.un.org/unsd/snaama/Index.

[32] https://databank.worldbank.org/source/world-development-indicators.

[33] http://www.oecd.org/sti/ind/input-outputtables.htm.

[34] http://www.cepii.fr/CEPII/en/bdd_modele/presentation.asp?id=37.

c) The calculation of step 2 is applied again, only in this case using the ratio VA_{lc}/Y_{lc} for the year immediately before or after, as necessary. With the new production values in current dollars, and of value added data from the WDI database, the ratios VA_{usd}/Y_{usd} were calculated, which are then used to obtain new production values for the immediately previous or following year using the corresponding value added records in current dollars provided by the WDI database. We then iterate backwards or forwards to complete the production data in current dollars.

d) For the few remaining cases where it has not yet been possible to obtain the value of output in current dollars, but value added data are available from the WDI database, we applied in each year the average ratio of value added to output from Unstats data.

e) Finally, to fill in a few missing records, a weighted average of the values corresponding to the three previous years is used. The weights are 0.5 for the year (t-1); 0.30 for t-2; and 0.20 for t-3.

Once production and export data was available, we calculated domestic transactions. However, an issue to take into account is when reported exports exceeds production or when the resulting domestic transaction was suspiciously low. In these cases we corrected exports (to all destinations) using gross and net export data available in the OECD input-output tables. For Panama, which is not included in the OECD dataset, we exclude exports from the Free Trade Zones system, which were provided by the Latin American Integration Association.

Information on the traditional variables in the gravity model comes from two main sources: CEPII's "Gravity" database, and the "Dynamic Gravity Dataset" (DGD)[35] from USITC. The focus on LA economies led to a revision and correction of the original data on PTAs, which was done using data provided by LAIA and OAS.

Data on applied tariffs were generously provided by Feodora Teti (ifo Institute - Leibniz Institute for Economic Research at the University of Munich).[36]

Indicators on bilateral complementarity between specialization patterns were calculated using bilateral trade data at 4 digits of the HS using BACI.

[35] https://www.usitc.gov/data/gravity/dgd.htm.

[36] Teti (2020).

Appendix D- Model specifications

Table A.IV.1 – Different model specifications with bias correction for odd years (2017 to 1995)

	VARIABLES	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10
TP variables	RTA	0.1157***									
	DTA		0.2978***	0.2972***	0.2901***	0.1095	0.1088*	0.0569	0.2658***	0.2672***	0.2375***
			-0.069	-0.064	-0.063	-0.069	-0.065	-0.064	-0.061	-0.058	-0.057
	FTA		0.0613	0.0884**	0.0900**	-0.1123***	-0.0858**	-0.0937***	0.0433	0.0695**	0.0749**
			-0.038	-0.036	-0.036	-0.039	-0.036	-0.036	-0.034	-0.031	-0.031
	PTA_other		0.0860**	0.0847**	0.0860**	-0.037	-0.0385	-0.0434	0.0634*	0.0626*	0.0669**
			-0.041	-0.04	-0.039	-0.038	-0.037	-0.036	-0.034	-0.033	-0.033
	ln_AT					-3.7065***	-3.7277***	-4.0722***			
						-0.511	-0.514	-0.521			
	ln_NMF								-5.3456***	-5.1957***	-5.4093***
									-0.719	-0.682	-0.662
	NRTAei				0			0.0000*			0
					0			0			0
TC	CD_D	1.4802***		1.4517***	1.4389***		1.4577***	1.3945***		1.3862***	1.3308***
		-0.277		-0.273	-0.28		-0.268	-0.274		-0.265	-0.271
Globalization	t3	0.0998***	0.1091***	0.0995***	0.0987***	0.0775***	0.0677***	0.0604***	0.0466**	0.0383*	0.0324*
		-0.013	-0.011	-0.013	-0.012	-0.015	-0.017	-0.016	-0.018	-0.02	-0.019
	t4	0.1415***	0.1473***	0.1401***	0.1392***	0.1034***	0.0967***	0.0880***	0.0519**	0.0480*	0.0409*
		-0.016	-0.015	-0.016	-0.016	-0.018	-0.02	-0.021	-0.024	-0.025	-0.025
	t5	0.2756***	0.2829***	0.2752***	0.2734***	0.2275***	0.2206***	0.2057***	0.1626***	0.1594***	0.1471***
		-0.025	-0.024	-0.025	-0.024	-0.024	-0.026	-0.025	-0.031	-0.031	-0.031
	t6	0.2848***	0.2845***	0.2852***	0.2826***	0.2112***	0.2123***	0.1917***	0.1411***	0.1459***	0.1292***
		-0.026	-0.029	-0.026	-0.026	-0.026	-0.025	-0.024	-0.032	-0.031	-0.03
	t7	0.3305***	0.3237***	0.3197***	0.3155***	0.2354***	0.2312***	0.2013***	0.1421***	0.1430***	0.1183***

	-0.032	-0.035	-0.032	-0.034	-0.031	-0.029	-0.031	-0.036	-0.035	-0.035
t8	0.3790***	0.3728***	0.3659***	0.3612***	0.2793***	0.2722***	0.2395***	0.1741***	0.1728***	0.1457***
	-0.036	-0.038	-0.037	-0.039	-0.032	-0.032	-0.033	-0.038	-0.038	-0.037
t9	0.3036***	0.3020***	0.2903***	0.2837***	0.2024***	0.1904***	0.1472***	0.0916**	0.0860**	0.0503
	-0.037	-0.039	-0.037	-0.043	-0.036	-0.036	-0.041	-0.042	-0.041	-0.043
t10	0.4396***	0.4350***	0.4251***	0.4177***	0.3311***	0.3213***	0.2737***	0.2172***	0.2140***	0.1748***
	-0.045	-0.044	-0.046	-0.051	-0.041	-0.042	-0.047	-0.046	-0.047	-0.048
t11	0.4364***	0.4418***	0.4215***	0.4113***	0.3316***	0.3116***	0.2498***	0.2133***	0.2007***	0.1499***
	-0.048	-0.046	-0.049	-0.057	-0.045	-0.046	-0.054	-0.052	-0.052	-0.054
t12	0.4525***	0.4593***	0.4377***	0.4265***	0.3512***	0.3294***	0.2624***	0.2372***	0.2226***	0.1677***
	-0.052	-0.053	-0.053	-0.063	-0.052	-0.052	-0.062	-0.055	-0.055	-0.059
t13	0.4936***	0.4988***	0.4776***	0.4656***	0.3870***	0.3657***	0.2942***	0.2791***	0.2649***	0.2067***
	-0.056	-0.056	-0.057	-0.069	-0.055	-0.055	-0.066	-0.057	-0.057	-0.063
	-0.031									
Observations	148.16	148.16	148.16	148.16	148.16	148.16	148.16	148.16	148.16	.

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1