

Environmental Provisions in Trade Agreements: Effects on Andean and Southern Common Market Members*

Disposiciones Ambientales en Acuerdos Comerciales: Efectos en los Miembros de la Comunidad Andina y del Mercado Común del Sur

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ABSTRACT

This article investigates the impact of environmental clauses in regional trade agreements on the international trade of CAN and MERCOSUR countries between 2001

* We would like to express our gratitude for the invaluable support provided to this project by the Pontifical University of Peru through the Concurso Anual de Proyectos (CAP). Enviado: 8 de diciembre de 2023. Aceptado: 28 de diciembre de 2023

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and 2019. We use a gravity model estimated with the PPML estimator to analyze the relationship between environmental provisions in trade agreements and total exports. We find that the simple inclusion of environmental provisions does not have a significant effect on trade. However, the presence of a Preferential Trade Agreement (PTA) in the midst of compliance is associated with a negative and significant effect on total exports. This result is accentuated if the trade occurs in a South-North structure. This finding complements previous research and provides a more complete understanding of the impact of environmental clauses on international trade in the countries of the region.

Keywords: environmental clauses – regional trade agreements – international trade – Latin America – development.

JEL Classification: Q56, F13, F55

RESUMEN

Este artículo investiga el impacto de las cláusulas ambientales en los acuerdos comerciales regionales en el comercio internacional de los países de la CAN y MERCOSUR entre 2001 y 2019. Utilizamos un modelo de gravedad estimado con el estimador PPML para analizar la relación entre las disposiciones ambientales en los acuerdos comerciales y las exportaciones totales. Encontramos que la simple inclusión de disposiciones ambientales no tiene un efecto significativo en el comercio. Sin embargo, la presencia de un Acuerdo Comercial Preferencial (PTA, por sus siglas en inglés) en medio del cumplimiento se asocia con un efecto negativo y significativo en las exportaciones totales. Este resultado se acentúa si el comercio se lleva a cabo en una estructura Sur-Norte. Este hallazgo complementa investigaciones anteriores y

proporciona una comprensión más completa del impacto de las cláusulas ambientales en el comercio internacional en los países de la región.

Palabras clave: cláusulas ambientales – acuerdos comerciales regionales – comercio internacional – América Latina – desarrollo.

Clasificación JEL: Q56, F13, F55

1.- INTRODUCTION

Latin America hosts half of the world's biodiversity, leaving the region's countries in a highly fragile and vulnerable position when it comes to climate change (Grazzi & Sasso, 2020). CEPAL (2020) estimates that by 2050 the economic cost of climate change in Latin America will represent between 1.5% and 5% of regional GDP. Meanwhile, UNCTAD (2021) has calculated that the costs associated with adaptation to climate change in developing countries will vary between US \$140 and 300 billion per year in 2030.

Climate change and its consequences are forcing a reconfiguration of economic and commercial activities. And while the impetus of trade has served to revitalize national economies, its growth has caused concerns about its impacts on the environment and climate change. Thus, the relationship between trade and the environment tends to be complex. On the one hand, unregulated trade can increase environmental pollution; on the other, as the WTO has highlighted, greater levels of trade can potentially bring about technological advances and efficiency gains that ultimately promote sustainable development (WTO, 2020).

The impact of trade liberalization on the wellbeing of a country depends on whether it has implemented appropriate environmental policies that are compatible with an open trade regime, as this enables the creation of markets for the export of environmental goods (OCDE, 2021). As well as environmental policies, there is a need for effective institutional frameworks and regulatory harmonization, in that conflicting internal regulations could hamper trade and become obstacles to it.

As the effects of climate change become increasingly serious, regional and multilateral commitments and negotiations are including environmental clauses that affect international trade (Berger, Brandi, Morin & Schwab, 2020). The effects depend on the characteristics of the productive structure and the international projection of each country, but also on the commitments adopted in multilateral forums and in integration agreements.

The aim of this article is to identify the impact of regional environmental clauses on the international trade of members of the Andean Community (CAN) and the Southern Common Market (MERCOSUR) between 2001 and 2019. The hope is that the results can serve as an input for the quantification and construction of empirical evidence concerning these variables, and for the design of national and regional integration policies for Latin American nations.

The rest of the paper is organized as follows. Section 2 reviews the closely related literature. In Section 3 the empirical application is presented, including the description of the data and variables, whereas Section 4 outlines the main results. Finally, Section 5 discusses the results and concludes.

2.- LITERATURE REVIEW

Latin America is characterized by an export structure that is largely oriented towards primary exports. This exacerbates the strain of vulnerability, intensifying the impacts of climate change on natural resources and people's livelihoods (Lebdoui, 2022). Since the mid-nineties, multilateral institutions and platforms have promoted the inclusion of environmental protection and conservation in different international trade agreements and treaties. According to the WTO's annual trade report for 2022, the organization is currently promoting three key environmental initiatives: trade and plastics pollution, trade and environmental sustainability, and the reform of fossil fuel subsidies reform. This underlines the importance of the multilateral trade system as a global response to climate change and environmental challenges (WTO, 2022).

The effects of liberalization policies on international trade, as well as the impacts of environmental clauses on regional trade agreements and international trade, has been the focus of rigorous and diverse research. As such, given the current regional context, there is a need for further research on to identify and explain the relationship between environmental agreements, environmental clauses, and trade liberalization in the region in order to tackle the effects of climate change.

Kohl, Brakman & Garretsen (2016) sought to explain the heterogeneity of trade agreements using a gravity model and evidence from 296 such agreements. They found that the more comprehensive the agreement, the greater the stimulus for trade. However, they also detected that not all provisions within the agreements were beneficial for trade. For their part, Berger et al. (2020) conducted a general and exhaustive analysis of environmental provisions in commercial agree-

ments, providing an overview of their inclusion and influence on international trade.

However, their study spanned a broad set of countries and longer periods, and a specific exploration of the CAN and MERCOSUR contexts is necessary. Brandi, Schwab, Berger & Morin (2020) examined how environmental clauses impacted environmental sustainability in other regional contexts, contributing a valuable analysis of their effects on their environment. Our approach differs by centering on the relationship between environmental clauses and international trade in Latin American regional agreements.

Meanwhile, Velazquez (2014) examined the different factors that influence the integration of environmental policy, including multilateral agreements within the framework of the Convention on Biological Diversity, and identified prevailing cognitive and political institutional barriers. Along similar lines, Safdar, Khan & Andlib (2022) found that with good governance, natural resource rents can reduce greenhouse gas emissions and have a significant positive relationship with economic and social growth.

At present, focuses on green trade and green growth within the sustainable development framework have emerged as alternatives and possible solutions to climate change. Liu, Lei & Zhou (2022) studied the impact of trade in environmental goods and found that it can help reduce levels of pollution for the case of 277 Chinese cities; this, the effects of this “green trade” are limited by purchasing power, the absorption capacity of each city, and the classification of the environmental goods themselves.

This study combines and contextualizes earlier research and applies it to the specific sphere of regional trade agreements in Latin America (Andean Community and the Southern Common Market) and to the analysis of enforcement clauses in order to determine their effects on international trade. The results stand to enrich the academic debate and trade policies in the field.

The study incorporates the CAN and MERCOSUR countries with the aim of contributing to filling the void in the literature for the region. As such, it seeks to contribute to economic knowledge of the region, offering relevant approaches and perspectives for trade agreements and the environmental dimension. Moreover, it can serve as an input for future studies, along similar lines to that by Barros & Martínez-Zarzoso (2022), related to sustainable development objectives.

3.- EMPIRICAL STRATEGY

3.1.- Data and Variables

This study draws on data from the Trade Map database for the 2001-2019 period. Trade Map, produced by the World Trade Center, provides information on commercial performance, international demand, and alternative and competitive markets, among other indicators. As such, we employ its annual data on imports and exports for CAN and MERCOSUR member states as well as their trading partners.

That is, the sample is limited to identifying trade (imports and exports) between CAN (Bolivia, Colombia, Ecuador, and Peru) and MERCOSUR (Argentina, Brazil, Paraguay, and Uruguay) members and 44 other countries over the period

2001-2019. The total sample for this database contains 6,536 observations: 344 per year.

Table 1: Groups of countries by origin and destination

Exporting countries	Importing countries
Argentina, Bolivia, Brazil, Colombia, Ecuador, Paraguay, Peru, Uruguay.	Argentina, Australia, Austria, Bolivia, Brazil, Canada, Chile, China, Colombia, Costa Rica, Denmark, Ecuador, El Salvador, Germany, France, Guatemala, Honduras, Hong Kong (China), India, Indonesia, Israel, Italy, Japan, Korea (Republic of), Malaysia, Mexico, Netherlands, Norway, New Zealand, Panama, Paraguay, Peru, Poland, Portugal, Russia, United Arab Emirates, United Kingdom, United States of America, Singapore, Spain, Sweden, Switzerland, Uruguay.

Source: TradeMap

To characterize the depth of the preferential trade agreements (PTAs) we employ the depth index proposed by Dür, Baccini, and Elsig (2014) and compiled in the Design of Trade Agreements (DESTA) database. This additive index combines three key provisions that can be included in PTAs. The first determines whether the agreement establishes that all tariffs, with some limited exceptions, must be reduced to zero, which means that the objective is to establish a complete free trade zone. The other six clauses cover cooperation beyond tariff reductions in areas such as trade in services, investments, standards, public procurement, competition, and intellectual property rights.

For each of these areas, we evaluate whether the agreements contain important provisions. To this end, we employ the scale of 1 to 7 presented in the table below.

Table 2: Operationalization of depth (additive index)

Variable	Value
More than a partial agreement?	0/1
Substantive provision in services?	0/1
Substantive provision in investments?	0/1
Substantive provision in standards?	0/1
Substantive provision in public procurement?	0/1
Substantive provision in competition?	0/1
Substantive provision in intellectual property rights?	0/1
Total range	0/7

Source: Dür, Baccini, & Elsig (2014)

The TRade and ENvironment (TREND) database that records more than 300 different environmental clauses taken from the unabridged text of some 630 PTAs signed from 1945. At time of writing, it was most recently updated in December 2022. The analysis carried out in TREND is based on a comprehensive data set prepared by Morin (2018).

The present study uses this database to obtain information about environmental provisions and regulatory–environmental enforcement clauses in PTAs between CAN and MERCOSUR members and 44 of their trading partners.

On the one hand, we are interested in capturing the effect of a preferential trade agreement containing an environmental clause. This variable is represented as a dummy variable whose value is 1 if the group of countries in the specified year has this clause in its trade agreement, and 0 otherwise.

In contrast, the other clause of interest is concerns commitment to enforcing environmental variables, which includes binding and non-binding obligations that form part of the domestic execution's measures¹. Finally, this variable presents itself as a dummy whose value is 1 if the group of countries in the specified year has this clause in its trade agreement, and 0 otherwise.

The GeoDist database was employed, which forms part of the database set provided by CEPII (Centre d'Etudes Prospectives et d'Informations Internationales). This database yields useful information for empirical research, including geographical elements and variables; in particular, it includes valid variables for pairs of countries. Therefore, the data is drawn from the i) common language, ii) shared borders and iii) land area of the exporting and importing country database on CAN and Mercosur countries along with their 44 trading partners.

The Foreign Trade Information System is used to compile information on free trade agreements (TLC) active over the 2001-2019 period (in which the countries of origin include Argentina, Bolivia, Brazil, Colombia, Ecuador, Paraguay, Peru, and Uruguay). These agreements constitute a more in-depth approach to PTAs, as noted earlier, given their greater level of organization and cooperation in spheres such as the environment. The list of treaties and the date of the entry into force of each one is included in Appendix 2. Meanwhile, the number of active treaties per country over the study period is shown in the Table 3.

1 Appendix 1 presents a breakdown of the variable specification in the TREND database, which can also be seen using the following link: https://www.chaire-epi.ulaval.ca/sites/chaire-epi.ulaval.ca/files/publications/codebook_0.pdf

Table 3: Number of active treaties per country, 2001–2019

Country	Number of treaties
Argentina	6
Bolivia	2
Brazil	6
Colombia	13
Ecuador	1
Paraguay	5
Peru	15
Uruguay	7

Source: FTIS-OEA

Note: No other formalized trade relations—such as multilateral agreements, customs unions, framework agreements, or preferential trade agreements—are included. Only those trade treaties for the countries of origin in this study are taken into account. In the case of Ecuador, the only active treaty established before 2019 is that with the European Union.

The description, units of measurement and source of the variables are presented in Table 4.

Table 4: Source of variables used in the study

Endogenous variables	Unit	Source
Exports	Expressed in levels	Trade Map
Exogenous variables		
<i>Environmental provision (Env_Prov)</i>	1: The countries present an environmental protection clause 0: The countries do not present an environmental protection clause	TREND

<i>Depth (Depth)</i>	Variable with values ranging from 0 to 7 1: Partial trade agreement 2: Substantive provision of services 3: Substantive provision of investments 4: Substantive provision of standards 5: Substantive provision of public procurement 6: Substantive provision of competition 7: Substantive provision of intellectual property	DESTA
<i>Compliance with environmental regulation (Enforcement)</i>	1: The countries agree on mechanisms for compliance with the environmental law 0: The countries agree on mechanisms for compliance with the environmental law	TREND
<i>Free Trade Agreement (FTA)</i>	1: The countries possess a FTA 0: The countries do not possess a FTA	Organization of American States (OAS)

Compiled by authors.

Finally, the Table 5 presents the descriptive statistics of the variables used in the study in the empiric application.

Table 5: Descriptive Statistics

Variable	N (1)	Mean (2)	SD (3)	Min (4)	Max (5)
Exports (by levels)	6,536	1672399	6076114	3	67,800,000
Env_prov	6,536	0.07	0.26	0	1
Depth_index	6,536	0.45	1.53	0	7
Enforcement	6,536	0.01	0.12	0	1
FTAs	6,536	0.13	0.34	0	1

Compiled by authors

3.2.- Methodology

To analyze the impact of the PTAs on trade between the CAN and MERCOSUR, this study employs a panel database that contains information on bilateral trade between the blocks of countries and on environmental provisions between the country pairs. In addition, to control for heterogeneous relationships within the panel, fixed effects by country pairs and by time are included. This strategy was also used by Berger, Brandi, Morin and Schwab (2020) for a larger sample of countries.

The present study makes two further modifications to the control variables utilized in the base model of Berger et al. (2020). First, the PTA variable has been approximated using the FTA variable. Second, the variable “commitment to enforcing environmental measures,” has been included along with combinations of both new variables. These changes are based on the literature, which highlights the importance not only of having environmental legislation in place but also

of enforcing these measures, which is crucial to assuring credibility and effectiveness (Carrère & de Melo 2015; Hovi, Spriz & Underdal 2009; Sánchez-Triana, Afzal & Smith 2010; Laffont & Tirole 1994).

The equation to be estimated is as follows:

$$EXP_{ijt} = Exp (\beta_0 + \beta_1 ProvAmb_{ijt} + \beta_2 Depth_{ijt} + \beta_3 Enfor_{ijt} + \beta_4 FTA_{ijt} + \beta_6 Enfor_{ijt} * FTA_{ijt} + \beta_7 ProvAmb_{ijt} * TLC_{ijt} + \alpha_{it} + \delta_{jt} + Y_{ij}) * \varepsilon_{ijt} \quad (1)$$

where EXP_{ijt} is the dependent variable for exports from country i to importer country j in the year t . The environmental provision ($ProvAmb_{ijt}$), environmental regulation with enforcement ($Enfor_{ijt}$) and FTA (FTA_{ijt}) variables are specified as dummy variables that report a value equal to 1 if countries i and j report this relationship in their respective agreements in period t , and 0 otherwise. In addition, the model incorporates fixed effects at country level in time (α_{it} , δ_{jt}) and at pairs of countries level (Y_{ij}), in order to control for other factors that may be related to their bilateral relations.

The model is estimated based on its multiplicative structure using the Pseudo Poisson Maximum Likelihood (PPML) methodology, in line with Chelala and Martínez-Zarzoso (2017, 2021), Fairlie, Portocarrero, and Paredes (2023), and Santos Silva and Tenreyro (2006). This decision runs counter to the log-log structure employed by Berger, Brandi, Morin, and Schwab (2020).

One of the key factors on which this choice is based is that log-linearization of the dependent variable can cause the loss of zero-value terms within the sample, which do not

necessarily represent missing data but rather may denote trade frictions between two countries.

In turn, Santos Silva and Tenreyro (2006) stressed that estimation of the gravity model in its log-linear form can be subject to problems of heteroscedasticity, since the logarithmic transformation affects the behaviour of the errors. By contrast, the use of PPML estimators presents an advantage in that it can be interpreted following the same pattern as in linear models (ESCAP, 2016).

Consequently, the PPML resolves both potential problems that could arise when performing the log-linearization of the main equation to be estimated, and is considered a suitable choice for this analysis of the international economy.

On the other hand, it is important to recall that trade relations can vary significantly depending on whether the trade partner is classed as a developed or a developing country, as Banco Mundial (2000) has indicated. In this context, two further regressions are included to examine how exports may also be affected by the SOUTH–SOUTH and SOUTH–NORTH trade structure.

For the analysis of SOUTH–SOUTH and SOUTH–NORTH trade, Table 6 presents a classification of import countries according to their trade structure. The purpose of this classification is to distinguish trade with developed countries (NORTH) from that with developing countries (SOUTH). On the basis of this distinction, one can obtain a more accurate picture of how trade dynamics are influenced by the relative locations of the countries involved.

Table 6: Importing countries by trade structure

SOUTH-NORTH structure	SOUTH-SOUTH structure
Australia, Austria, Canada, China (Hong Kong), Denmark, France, Germany, Greece, Italy, Israel, Japan, Korea (Republic of), Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Arab Emirates, United Kingdom, United States of America.	Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, India, Indonesia, Malaysia, Mexico, New Zealand, Panama, Paraguay, Peru, Poland, Russia, Singapore, Uruguay.

Source: List of countries by World Bank country group classification (as of 2000).

4.- MAIN RESULTS

In this section, we present the main results regarding the impact of environmental provisions and FTAs on the trade of CAN and MERCOSUR members. It also includes two additional regressions for identification of how the type of trade has differential effects according to its direction (SOUTH-SOUTH and SOUTH-NORTH). First, the effects of these regulations on overall trade were evaluated. The results are revealed in Table 7. The next step was to analyze the effects of the regulations on SOUTH-SOUTH trade. The results are presented in Table 8. Finally, Table 9 shows the effects of the regulations on SOUTH-NORTH trade.

First, the results presented in Table 7 find that the presence of environmental provisions, in themselves, within FTAs does

not have significant effects on trade between countries, as specified in Model 4. However, a negative impact on trade is observed only when the FTA contains both an environmental clause and an enforcement clause for compliance with environmental regulations between countries. Specifically, the presence of a PTA with enforcement measured is associated with an average negative and significant coefficient of 0.948, which represents a decrease of 61 percent on average over total exports on overall exports.

This result complements the findings of Berger et al. (2020) and Brandi et al. (2020) that the mere presence of PTAs with environmental provisions does not appear to have a negative effect on commercial relations between countries. Rather, our analysis finds that the negative effect only arises when such environmental provisions are supported and enforced with specific regulations. This result is in keeping with Bombardini and Li (2020) and Taylor (2005) for the Chinese case, both of which detected that free trade worsens that country's pollution when environmental protection enforcement clauses are weak and its companies transfer their polluting industries.

Table 7: Results of estimation of export analysis

Variables	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4
FTA (=1)	0.323* (0.173)	0.293* (0.177)	-0.0440 (0.259)	0.0364 (0.264)
Depth_index		0.0294 (0.0382)	-0.00650 (0.0444)	0.00605 (0.0452)
Env_provision (=1)			0.484* (0.283)	0.161 (0.306)

FTA_env (=1)				0.243 (0.314)	0.529 (0.341)
Enforcement (=1)					0.495* (0.281)
FTA_enfor (=1)					-0.948*** (0.307)
FIXED EFFECTS PER GROUP	YES	YES	YES	YES	
FIXED EFFECTS COUN- TRY-YEAR	YES	YES	YES	YES	
Observations	6,536	6,536	6,536	6,536	

The results in Tables 8 and 9 reinforce the notion that direction of trade regulation conditions the results thereof. Indeed, Table 8 shows that South–South trade or that between developing countries is not affected by current legislative measures unless they feature an enforcement clause. Meanwhile, the results in Table 9 points towards the relations with limited bargaining power that can arise between CAN and MERCOSUR countries and their developed trading partners, in that the southern parties bear the brunt of the negative effects.

Similarly, to what we found in our estimation for the entire sample of countries, the results of the analysis of SOUTH–NORTH exports show that the presence of FTAs with environmental enforcement clauses generates a reduction in total exports of 0.01% on average. These results compliment those obtained by Berger et al. (2020), who noted that the incorporation of environmental clauses has a negative and significant effect of 0.5% on overall SOUTH–NORTH exports, while in other cases (NORTH–NORTH, NORTH–SOUTH, and SOUTH–SOUTH) they are not significant.

A negative relationship in SOUTH–NORTH trade in the case of FTAs with environmental and enforcement clauses may be because stricter environmental regulations and rigorous enforcement thereof can impose additional costs on exports from countries in the South to the developed countries.

Table 8: Results of estimation of export analysis in SOUTH–SOUTH trade

Variables	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4
FTA (=1)	0.270 (0.217)	0.211 (0.212)	0.207 (0.309)	0.296 (0.308)
Depth_index		0.0650 (0.0483)	0.0644 (0.0557)	0.0655 (0.0555)
Env_provision (=1)			0.0111 (0.433)	-0.0143 (0.456)
FTA_env (=1)			2.89e-06 (0.444)	-0.0490 (0.440)
Enforcement (=1)				0.115 (0.539)
FTA_enfor (=1)				-0.410 (0.568)
FIXED EFFECTS PAIR	YES	YES	YES	YES
FIXED EFFECTS COUN- TRY-YEAR	YES	YES	YES	YES
Observations	3,059	3,059	3,059	3,059

These environmental regulations may require that companies in the South adopt more sustainable practices or make investments in clean technologies to meet the standards set.

As a result, production costs may increase, thus reducing the competitiveness of these firms in international markets.

Moreover, enforcement clauses in FTAs can involve sanctions or restrictions for those countries that do not comply with the environmental clauses established. This can discourage trade between countries in the South and those in the North if countries in the former region face obstacles to meeting the environmental requirements and, as a result, are excluded or limited in their access to markets in the North.

Therefore, the combination of environmental and enforcement clauses in FTAs could cause a negative relationship in SOUTH–NORTH trade—at least in the short term—by increasing costs and barriers to trade from countries in the South to developed countries in the NORTH, or difficulties in complying with higher environmental standards, which could negatively affect exports to the latter region.

Table 9: Results of estimation of export analysis in South-North trade

Variables	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4
FTA (=1)	0.0234 (0.227)	0.0113 (0.237)	-0.817** (0.402)	-0.806** (0.406)
Depth_index		0.00948 (0.0420)	-0.0628 (0.0480)	-0.0305 (0.0530)
Env_provision (=1)			0.886** (0.352)	0.335 (0.372)
FTA_env (=1)			0.837 (0.520)	1.425*** (0.519)

Enforcement (=1)				0.533* (0.316)
FTA_enfor (=1)				-1.114*** (0.378)
FIXED EFFECTS PAIR	YES	YES	YES	YES
FIXED EFFECTS COUNTRY-YEAR	YES	YES	YES	YES
Observations	3,477	3,477	3,477	3,477

5.- DISCUSSION AND CONCLUSIONS

This study produces significant findings on the impact of environmental clauses in regional trade agreements on the international trade of CAN and MERCOSUR member states between 2001 and 2019. The results reveal the importance of enforcement clauses in the relationship between environmental provisions and total exports.

It is necessary to contextualize these results by taking into account previous studies by Berger et al. (2020) and Brandi et al. (2020), who focused on a large sample of countries in comparison to that analyzed in this study. The present research complements these earlier findings by focusing specifically on the CAN and MERCOSUR countries, exploring international trade from the perspective of FTAs and focusing on both the incorporation of environmental clauses and their enforcement.

The identification of negative effects on total exports associated with an FTA containing environmental and enforcement clauses is verified by this analysis of a subsample that

expresses the dynamics of South–North trade. These results suggest that such agreements may have heterogeneous effects depending on the trade dynamics between developed and developing countries. This information is crucial to improving our understanding of trade and environmental interactions in the Latin American region.

The implications of these results for trade and environmental policymaking in the region are significant. To promote sustainable trade and environmental protection it is vital to consider the unique characteristics of each trade agreement and its application in specific contexts. Strengthening enforcement capacity and harmonizing environmental regulations among participating countries can contribute to maximizing the trade and environmental benefits of these agreements, even if there are short-term negative effects associated with adaptation to these higher environmental standards or with transition towards the formalization of agreements by some companies that must meet more stringent traceability criteria.

In conclusion, the present study, alongside previous analyses by Berger et al. (2020) and Brandi et al. (2020), lays solid foundations for a more complete and enriching understanding of the impact of environmental clauses on international trade in the region, offering new perspectives for future research and the formulation of effective and equitable policies. These findings are important for promoting domestic trade policies and those involving international forums that foster sustainable development and environmental conservation.

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APPENDICES

Appendix 1. TREND specifications

5. Enforcement of domestic measures

Enforcement refers to the identification and sanctioning of persons violating environmental measures at the domestic level. Enforcement should be distinguished from implementation. Norms in this section do not concern the implementation of the trade agreement or the implementation of other international treaties. This section only includes norms applying to the environment in general, not to specific environmental issues such as desertification, biodiversity, climate change, etc.

5.01 Commitment to enforce environmental measures

- *Refers to the general commitment of States to enforce their environmental measures.
- *Failure to enforce includes “derogating from” or “waiving” environmental measures.
- *Mere affirmations of environmental obligations under domestic law are not sufficient.
- *Excludes norms on judicial sovereignty. See 1.09 instead.
- *Excludes norms on voluntary standards. See 6.02 instead.
- *Excludes commitments to implement international agreements. See section 14.02 instead.
- *Excludes dispute settlement for failure to enforce domestic environmental measures. See 13.03 instead.

5.01.01 *Binding obligations*

*Includes shall, should, must, have to, etc.

US-Chile, art. 19.2: “(a) A Party shall not fail to effectively enforce its environmental laws, through a sustained or recurring course of action or inaction, in a manner affecting trade between the Parties [...]”

NAAEC, art. 5: “With the aim of achieving high levels of environmental protection and compliance with its environmental laws and regulations, each Party shall effectively enforce its environmental laws and regulations through appropriate governmental action, [...]”

Brunei-Japan, art. 71: “[...] each Party should not waive or otherwise derogate from such environmental measures as an encouragement for establishment, acquisition or expansion of investments in its Area.”

5.01.02 *Non-binding obligations*

*Includes best efforts, resolve, wish, etc.

*Includes norms in the preamble of the agreement.

*Includes commitments to promoting compliance.

Canada-Panama Agreement on the Environment, Preamble: “Noting further their resolve to [...] enforce environmental laws and regulations”

CETA, Preamble: “Determined to implement this Agreement in a manner consistent with [...] the enforcement of their labour and environmental laws and policies”

Jordan-US, Preamble: “Wishing to promote effective enforcement of their respective environmental and labor law;”

EC- Korea, article 1.1: “The objectives of this Agreement are: [...] (h) to promote foreign direct investment without lowering or reducing environmental, labour or occupational health and safety standards in the

application and enforcement of environmental and labour laws of the Parties.”

Source: Morin (2017).

Appendix 2. Free trade agreements involving CAN and MERCOSUR members

Country	FTAs	Effective date
Argentina	Chile	11/02/17
	MERCOSUR–Colombia AAP. CE N° 72	07/21/17
	MERCOSUR–Egypt	08/02/10
	MERCOSUR–Israel	12/18/07
	MERCOSUR–Peru (ACE 58)	11/30/05
	MERCOSUR–Bolivia (ACE 36)	12/17/96
	MERCOSUR–Chile (ACE 35)	06/25/96
Bolivia	Mexico	05/17/2010
	MERCOSUR	12/17/96
Brazil	Chile	11/21/18
	MERCOSUR–Colombia AAP. CE N° 72	07/21/17
	MERCOSUR–Egypt	08/02/10
	MERCOSUR–Israel	12/18/07
	MERCOSUR–Peru (ACE 58)	11/30/05
	MERCOSUR–Bolivia (ACE 36)	12/17/96
	MERCOSUR–Chile (ACE 35)	06/25/96

Colombia	CAN	1973
	Panama	1993
	Chile	1993
	Mexico	1995
	Mercosur	2005
	Northern Triangle (El Salvador, Guatemala, Honduras)	2009
	EFTA	2011
	Canada	2011
	United States	2012
	European Union	2013
	South Korea	2016
	Costa Rica	2016
	Pacific Alliance	2016
Ecuador	European Union	1/01/2017
Paraguay	MERCOSUR–Colombia AAP. CE N° 72	07/21/17
	MERCOSUR–Egypt	08/02/10
	MERCOSUR–Israel	12/18/07
	MERCOSUR–Peru (ACE 58)	11/30/05
	MERCOSUR–Bolivia (ACE 36)	12/17/96
	MERCOSUR–Chile (ACE 35)	06/25/96
Peru	United States	1/02/2009
	Cuba	9/03/2001
	Mercosur	2/01/2016
	Pacific Alliance	Jun-17
	CAN	-
	Chile	22/08/2006
	Canada	1/08/2009
	Singapore	1/08/2009

	China	1/03/2010
	Thailand	31/12/2011
	Mexico	1/02/2012
	Japan	1/05/2012
	EFTA	2010-2011
	South Korea	1/08/2011
	European Union	1/03/2013
	Panama	1/05/2012
	Costa Rica	1/06/2013
	Venezuela	7/01/2012
Uruguay	Honduras	1/01/2017
	Mexico (ACE 60)	11/15/03
	Chile	10/04/16
	MERCOSUR–Colombia AAP. CE N° 72	07/21/17
	MERCOSUR–Egypt	08/02/10
	MERCOSUR–Israel	12/18/07
	MERCOSUR–Peru (ACE 58)	11/30/05
	MERCOSUR–Bolivia (ACE 36)	12/17/96
	MERCOSUR–Chile (ACE 35)	06/25/96



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