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Negotiating environmental protection in trade agreements: A regime shift or a tactical linkage?

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Abstract
The prolific literature on the relationship between the trade and environmental regimes suffers from three shortcomings. First, it myopically focuses on multilateral institutions, while the vast majority of trade and environmental agreements are bilateral. Second, when studies consider preferential trade agreements' (PTAs) environmental provisions, they are often limited to USA and EU agreements. Third, it examines how the trade and environmental regimes negatively affect each other, leaving aside their potential synergies. Conversely, this article assesses the potential contribution of PTAs to international environmental law. Several PTAs include a full-fledged chapter devoted to environmental protection and contain detailed commitments on various environmental issue areas. One possible scenario is that countries that are dissatisfied with traditional settings for environmental lawmaking engage in a process of "regime shifting" toward PTAs to move forward on their environmental agenda. The alternative is that PTAs' environmental provisions are the result of "tactical linkages" and merely duplicate extant obligations from international environmental law to serve political goals. We shed light on this question by building on two datasets of 690 PTAs and 2343 environmental treaties. We investigate four potential contributions of PTAs to environmental law: the diffusion of multilateral environmental agreements (MEAs), the diffusion of existing environmental rules, the design of new environmental rules, and the legal prevalence of MEAs. The article concludes that the contribution of PTAs to the strengthening of states' commitments under international environmental law is very modest on the four dimensions examined.

Keywords Trade agreements · International environmental agreements · Tactical linkages · Institutional interactions · Regime shifting

Abbreviations

CAFTA	Central America Free Trade Agreement
CBD	Convention on Biological Diversity

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CCAMLR	Convention on the Conservation of Antarctic Marine Living Resources
CITES	Convention on International Trade in Endangered Species of wild fauna and flora
COMESA	Common Market for Eastern and Southern Africa
EC	European Communities
IEA	International environmental agreement
MARPOL	International Convention for the Prevention of Pollution from Ships
MEA	Multilateral environmental agreement
NAFTA	North American Free Trade Agreement
OECD	Organization for Economic Cooperation and Development
PTA	Preferential trade agreement
TREND	TRade and ENvironment Database
UNFCCC	United Nations Framework Convention on Climate Change
VCLT	Vienna Convention on the Law of Treaties
WTO	World Trade Organization

1 Introduction

This article assesses the contribution of environmental provisions included in preferential trade agreements (PTAs) to advancements in international environmental law. More specifically, it investigates whether PTAs' environmental provisions effectively result in the extension of international environmental law, either through the creation of new environmental institutions or through the subscription to existing environmental rules and treaties by new countries.

This question emerged following the observation that PTAs increasingly include environmental obligations (OECD 2007). Since 1945, each new generation of PTAs includes more environmental clauses than the previous one. The average number of environmental clauses per PTA has been increasing since the 1990s and accelerated in the last decade (Morin et al. 2018). Recent PTAs now include a full-fledged chapter devoted exclusively to environmental protection. Some of these chapters are more specific, comprehensive and enforceable than several International environmental agreements (IEAs).

The nature of these environmental clauses is also changing. Traditionally, the environmental provisions in most PTAs were exceptions to trade commitments designed to maintain certain domestic environmental measures that might have trade-restrictive effects. Increasingly, however, PTAs include environmental clauses that are unrelated to trade. For example, some recent PTAs include commitments related to migratory species, whaling, and coral reef ecosystems, three environmental issues that have limited relation to trade. This begs the following question: Do these environmental provisions contribute to the development of international environmental law?

There are two broad points of view on this matter. The first suggests that PTAs institutionalize new developments in environmental cooperation. This is what we call a "meaningful regime shift". The second view suggests that PTAs merely duplicate existing obligations from international environmental law. We refer to this second view as "tactical

linkages".[1] Theoretical expectations and anecdotal evidence provide partial support for both views, as the literature review below explains. However, only a detailed and exhaustive empirical investigation can provide a convincing answer.

This article takes up the challenge to assess the contribution that PTAs make to international environment law. Importantly, it does not examine trade negotiators' motivations, the domestic implementation of the environmental commitments included in the PTAs, or the restrictions posed by trade law on environmental lawmaking. Instead, it assesses the significance of PTAs' environmental provisions in reference to existing conventional environmental law.

The rest of the article is divided into six parts. The first reviews gaps in the existing literature and presents two alternative views on PTAs' environmental clauses. The second part presents our empirical strategy. Each of the remaining four parts examines a different contribution that PTAs could make to international environmental law, including MEA diffusion, rule diffusion, regulatory innovation, and MEA prevalence.

2 Gaps in the current literature

There is a rich and prolific body of literature on the relationship between trade and environmental regimes. It has discussed prominent case studies, clarified several ambiguities, and led to significant conceptual advancements, notably regarding the fragmentation of international law (Pauwelyn 2003) and the notion of regime complexes (Raustiala and Victor 2004). However, the literature has three main weaknesses.

The first is its myopic focus on multilateral institutions.[2] Countless studies published in the 1990s and the early 2000s examine the relations between World Trade Organization (WTO) agreements and MEAs, such as the Cartagena Protocol on biosafety (e.g., Oberthür and Gehring 2006). Some commentators maintain that the WTO profoundly restricts the development of environmental law (e.g., Conca 2000). Others argue that the WTO leaves sufficient room for maneuver for environmental lawmakers (e.g., Young 2005). More recently, analysts have also underlined the inability of the WTO to restrict the use of fossil fuel subsidies (e.g., De Bièvre et al. 2017). However, the focus on multilateralism overlooks important developments elsewhere. Trade and environmental regimes are highly fragmented and the vast majority of related treaties are bilateral. The trade regime includes more than 700 PTAs (Dür et al. 2014) and the environmental regime covers more than 2000 IEAs (Mitchell 2003). Trade law and international environmental law are complex systems that should be analyzed in their entirety (Kim 2013; Morin et al. 2017).

The second weakness, which is related to the first, is a focus on negative externalities. Several studies examine whether MEAs provide legitimate grounds for trade restrictions or whether WTO agreements significantly restrict environmental lawmaking (e.g., Eckersley 2004). Clearly, there is some friction between the trade and environmental regimes. However, an emerging generation of scholarship explores the positive impact of PTAs on environmental governance (e.g., Jinnah and Morgera 2013). In particular, PTAs with

[1] To be clear, these two concepts are meant to describe the contribution (or absence of contribution) of PTAs to international environmental law, rather than negotiators' intentions, insofar as both "regime shift" and "tactical linkage" can result from purely strategic motivations.

[2] Some notable exceptions include Durán and Morgera (2012) and Jinnah and Lindsay (2016).

comprehensive chapters devoted to environmental protection are potentially useful for developing environmental law.

Finally, the few studies paying attention toward the positive contributions of PTAs to environmental governance typically focus on EU and USA agreements (see, e.g., Jinnah and Morgera 2013; Poletti and Sicurelli 2016; Morin and Rochette 2017; Bastiaens and Postnikov 2017; Jinnah and Morin 2020). Both the USA and the EU are champions in terms of including environmental provisions in their PTAs. However, as this article shows, some South–South PTAs also include sophisticated environmental provisions that should be taken into account.

There are good theoretical reasons to expect PTAs to make a positive contribution to the development of environmental law. Countries that are dissatisfied with traditional IEAs can engage in a process of "regime shifting". This is commonly defined as an "attempt to alter the status quo ante by moving treaty negotiations, lawmaking initiatives, or standard-setting activities from one international venue to another" (Helfer 2004: 14). Classic examples of regime shifting include the extension of intellectual property law in trade agreements (Morse and Keohane 2014) and the development of international law on indigenous people under the International Labor Organization (Swepston 1990). For proponents of environmental cooperation, PTAs offer interesting opportunities for regime shifting. First of all, trade talks generate their own momentum at the highest level of decision-making. In political terms, it may also be easier to insert a few important environmental provisions in an ongoing trade negotiation than to start a separate negotiation that focuses exclusively on the environment. Moreover, trade agreements have a broad scope and negotiations typically involve trade-offs between issue areas. For this reason, when trade negotiations are underway, concessions on environmental issues can be obtained in exchange for greater market access. This type of bargaining is more difficult in the context of treaties that focus exclusively on environmental protection.

There is some empirical evidence to suggest that a regime shift toward PTAs might be taking place. In 2014, the OECD published the results of a survey in which trade negotiators were asked to rank their objectives for including environmental provisions in PTAs. While trade-related goals were ranked first, such as ensuring that environmental regulations are not actually disguised protectionist measures, most negotiators also stated that promoting environmental cooperation in its own right is important (George 2014). Several case studies support this. Poletti and Sicurelli show that the EU uses its PTAs to promote high international environmental standards on biofuels (2015). Jinnah and Lindsay (2016) argue that the USA takes advantage of its PTAs to set more specific requirements on endangered species, which go beyond the provisions of the CITES. Morin and Gauquelin (2016) have identified PTA commitments related to genetic resources that go beyond any multilateral requirements, including the provisions set out in the Nagoya Protocol. These cases exemplify what we label "meaningful regime shift," in that they show how PTAs can contribute to the development of international environmental law.

However, the introduction of environmental provisions in PTAs may be more to do with tactical linkages than a meaningful regime shift. A tactical linkage involves associating inherently disconnected issues for political gain (Haas 1980; Aggarwal 2013). For example, negotiators may strategically link trade liberalization with environmental protection to appease critics of free trade, including civil society groups and parliamentarians who are concerned about the impact that PTAs may have on environmental regulations (Postnikov 2019). Negotiators may also strategically include environmental provisions in PTAs to protect domestic industries (Bhagwati 1995). Finally, several scholars suggest that negotiators tend to include environmental provisions in PTAs when the costs of compliance are low

(Milewicz et al. 2016). In these cases, the primary aim of PTA environmental provisions is to ensure that existing environmental regulations can be maintained. These provisions are unlikely to have a significant impact in terms of advances in environmental law. Simply duplicating former commitments may suffice to make PTAs palatable to concerned environmental and business groups.

Some anecdotal evidence suggests that the introduction of environmental provisions in PTAs could be the result of this kind of tactical linkage. A well-documented case is the 1992 North American Free Trade Agreement (NAFTA). President Bill Clinton notoriously argued in favor of the conclusion of an environmental side agreement in order to obtain the necessary political support for the ratification of NAFTA (Gallagher 2004). Studies have also shown that the pressure exerted by industries with protectionist interests is a determining factor for the inclusion of environmental provisions in PTAs (Lechner 2016). This is consistent with studies showing that PTAs do not include commitments on climate change that have not already been agreed under MEAs (Morin and Jinnah 2018). Therefore, the literature fails to answer the question as to whether PTAs' environmental provisions provide a significant contribution to international environmental law. The next section presents a method in order to shed light on this question.

3 Method of assessment

PTAs can contribute to international environmental law in various ways. As illustrated in Table 1, we classified PTAs' potential contributions into two groups that reflect two different dimensions. The first concerns the field of contribution, whereby PTAs can either extend the geographical reach of existing environmental institutions, by diffusing them to new countries; or develop the substantive scope of international environmental law, by introducing new institutions. The second concerns the level of contribution. PTAs' potential contribution can affect either entire treaties or specific rules within these treaties. By rules, we mean any type of prescription or proscription of behavior, irrespective of the degree of precision, obligation or enforceability.[3]

By combining the two dimensions, a typology emerges showing four different types of potential contribution. The first (top left in Table 1) is the diffusion of existing MEAs. Some PTAs require their parties to ratify or accede to existing IEAs. In doing so, they can potentially contribute to an increase in the membership of these IEAs. The second type of contribution is the diffusion of existing rules. By replicating rules from existing IEAs, PTAs can help diffuse IEA rules in countries that are not yet party to these IEAs. The third type of contribution is the introduction of new rules that are unprecedented in other conventional sources of international law. The last type is the introduction of a legal hierarchy in which selected MEAs prevail over PTAs in the event of legal incompatibility.

We use two publicly available datasets to assess PTAs' four potential contributions. The first is the TRade and ENvironment Database (TREND). It covers 286 types of environmental provisions in 690 trade agreements signed between 1947 and 2016 (Morin et al. 2018). These agreements include free trade agreements, sectoral trade agreements, customs unions, as well as their environmental annexes and side agreements. The second dataset is the IEA Database, introduced and updated by Mitchell (2018). It includes more than 2300

[3] This broad definition of rules includes principles, norms, and procedures.

Table 1 Typology of potential PTAs' contribution to international environmental law

	Geographical extension	Substantive development
Treaty level	1. Diffusion of MEAs	4. Prevalence of MEAs
Rule level	2. Rule diffusion	3. Regulatory innovation

IEAs concluded between the nineteenth century and 2017. All the treaties included in the IEA Database share the objective of protecting the natural world or the sustainable use of natural resources.

To allow for a comparison between the IEA Database and TREND, we excluded from the list of IEAs the environmental side agreements that are part of TREND. We also examined the IEA Database to identify 41 specific rules that are similar to those documented in TREND (see "Appendix"). For example, these rules include the polluter pays principle, the adoption of emission trading schemes, scientific cooperation between parties, the exchange of information on the state of the environment, and financial assistance to developing countries for environmental projects. We did not include rules that had no relevance beyond the context of a trade agreement, such as environmental exceptions to service liberalization. Using the IEA Database as a baseline, this empirical strategy allows us to assess the contribution made by PTAs to conventional environmental law.

4 Diffusion of MEAs

PTAs can strengthen international environmental law by requiring their parties to ratify MEAs. These PTAs provisions have the potential to increase the number of parties to MEAs. In turn, with more parties, these MEAs gain more visibility, legitimacy, and effectiveness. In some cases, pressure to ratify an MEA may even favor the early entry into force of this MEA, as an MEA's entry into force often requires a minimal number of ratifications.

We identified in PTAs the requirements to ratify or implement 14 MEAs (listed in Table 2). We found 5 PTAs that require the ratification of at least one of these MEAs and 56 PTAs that require the implementation of at least one of these MEAs. To determine whether these PTAs actually increased the membership of the MEAs, we compared the signature date of the PTA with the ratification date of the MEA to which it refers. Our data show that 84% of PTAs including a provision on the implementation or ratification of a major MEA are concluded between countries that ratified the MEA beforehand. Nevertheless, it is important to highlight some significant exceptions, as shown in Table 2.

The first exception is the treaty establishing the Common Market for Eastern and Southern Africa (COMESA) concluded between 23 African countries in 1993. COMESA's Articles 124 and 125 (3) provide, respectively, that member states agree to: "accede to the UNCED Agreements relating to the Conventions on climatic change and biodiversity" and "accede to the Montreal Protocol on the Environment."(sic) Following the signature of COMESA, 17 of its parties ratified the UNFCCC, 19 ratified the CBD, and 12 ratified the Montreal Protocol. Time intervals between the PTA signature and the MEA ratification range from 1 to 16 years.

A second notable exception is the fourth Lomé Convention (Lomé IV), concluded between the European Economic Community and 68 African, Caribbean and Pacific countries in 1989. Lomé IV states that "The Contracting Parties shall make every effort to sign and ratify as quickly as possible the Basle Convention on the Control of Transboundary

Table 2 Major MEAs of which ratification or implementation is required in PTAs

Name of the MEA	Number of PTAs requiring its implementation or ratification	Number of countries that have ratified the MEA after the signature of a PTA requiring its ratification or implementation	PTA involved
1946 International Convention for the Regulation of Whaling	4	1	Colombia–USA (2006)
1971 Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention)	4	0	NA
1973 Convention on International Trade in Endangered Species of wild fauna and flora (CITES)	15	1	EU Maastricht (15) enlargement (1994)
1978 Protocol to the International Convention for the Prevention of Pollution from Ships (MARPOL)	5	0	NA
1980 Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR)	4	1	Panama–USA (2007)
1987 Montreal Protocol on Substances that Deplete the Ozone Layer	10	12	COMESA (1993)
1989 Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention)	16	72	Lomé IV (1989)
		1	EC–Poland (1991)
		1	EC–Bulgaria (1993)
		1	Costa Rica–Mexico (1994)
		1	EC–Lithuania (1995)
1992 United Nations Framework Convention on Climate Change (UNFCCC)	7	17	COMESA (1993)
1992 Convention on Biological Diversity (CBD)	31	19	COMESA (1993)
1997 Kyoto Protocol to the United Nations Framework Convention on Climate Change	13	0	NA

Table 2 (continued)

Name of the MEA	Number of PTAs requiring its implementation or ratification	Number of countries that have ratified the MEA after the signature of a PTA requiring its ratification or implementation	PTA involved
1998 Convention on the Prior Informed Consent Procedure for certain Hazardous Chemicals and Pesticides in International Trade (Rotterdam Convention)	5	0	NA
2000 Cartagena Protocol on Biosafety to the Convention on Biological Diversity	2	0	NA
2001 Convention on Persistent Organic Pollutants (Stockholm Convention)	3	0	NA
2010 Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization	1	1	China–Korea (2014)

Movements of Hazardous Wastes and their Disposal". (1989, annex IX) All the signatories of Lomé IV either ratified the Basel Convention after signing the PTA or have yet to ratify it. Time intervals between the signature of Lomé IV and the ratification of the Basel Convention range from 1 to 24 years.

Lastly, three bilateral PTAs may have contributed to MEA ratification. Colombia acceded to the Whaling Convention 2 years after signing a PTA with the USA requiring its implementation. Panama acceded to the Convention on the Conservation of Antarctic Marine Living Resources 6 years after concluding a PTA with the USA requiring its implementation. Finally, the 2014 PTA between China and South Korea requires the implementation of the Nagoya Protocol. This PTA was signed a year before China ratified the Protocol and South Korea has yet to ratify it.

It is important not to overstate the significance of the above exceptions. Only 10 PTAs out of 690 may have had an impact on the ratification of an MEA. In addition, the possible causal link between the signature of PTAs and the ratification of MEAs is undermined by the lengthy time intervals between the two. To put it differently, that an MEA is ratified following a PTA signature is a necessary but insufficient evidence that this PTA has led to the ratification of this MEA, since other factors that this paper does not cover could also explain MEA ratification. Consequently, PTAs appear to make a marginal contribution to the diffusion of MEAs, at best.

Although PTAs may not actually require accession to an MEA, they can nevertheless help diffuse specific rules that stem from MEAs. This possibility is explored in the next section.

5 Rule diffusion

PTAs can extend the geographical scope of international environmental law at the rule level by diffusing certain obligations to countries that have not previously accepted them in an earlier treaty. Milewicz et al. (2016) find that countries are more willing to include a rule in a given treaty if they are already party to an agreement which incorporates that rule. This is partly because the implementation of this commitment is less costly.

An example of such rule diffusion is the inclusion of a commitment devoted to genetic resources and traditional knowledge in the 2006 Peru–USA Trade Promotion Agreement. The USA is one of the few countries that has not ratified the 1992 Convention on Biological Diversity, which requires its parties to share the benefits arising out of the use of genetic resources fairly and equitably (1992, art. 15). By signing a PTA that contains similar language, the USA has thus formally subscribed to the benefit-sharing principle. We examine whether such diffusion of environmental rules to countries which have not previously subscribed to them constitutes an exception.

We analyzed 41 environmental rules identified in both trade and environmental agreements (see "Appendix"). For each country, we identified whether it first adopted a given environmental rule in a PTA or in an MEA. The results presented in Table 3 are based on a comparison of the *signature dates* of PTAs and MEAs. However, the notorious refusal of the USA to ratify the Convention on Biological Diversity illustrates that the signature of a treaty is not always followed by its ratification. Thus, we ran another analysis based on the *ratification dates* of MEAs. The discussion below takes stock of the trends observed in both analyses.

Table 3 Adoption of environmental rule by signing a PTA

Rule	Number of countries to first adopt the rule by signing a PTA	PTA involved
Mutual supportiveness between environment and trade or development	15	Cotonou agreement (2000)
Polluter pays principle	1	Single European Act (1986)
	1	Faroe Islands–Finland (1992)
	12	Common Market for Eastern and Southern Africa (1993)
Coherence between environmental measures and trade or investment policies	25	Lomé IV (1989)
Sovereignty over resources	14	Lomé II (1979)
	3	CARICOM (1973)
Interaction between gender and the environment	55	Lomé IV (1989)
Prohibition of the export of an environmental good from a Party where its use or import is prohibited within that Party's territory	2	Lomé IV (1989)
Use of voluntary label, standards and certification	1	NAFTA (1992)
	22	Common Market for Eastern and Southern Africa (1993)
	1	Canada–Chile (1996)
	1	Jordan–USA (2000)
	5	CAFTA (2004)
	1	CAFTA–Dominican Republic (2004)
	1	Morocco–USA (2004)
	2	New Zealand–Thailand (2005)
	3	CARIFORUM–EC (2008)
	1	China–New Zealand (2008)
	1	ASEAN–Australia–New Zealand (2009)
	1	EFTA–Montenegro (2011)
Joint scientific cooperation related to the environment	5	West African Economic Community (1973)
	9	Lomé II (1979)
Exchange of scientific information related to the environment	8	Lomé II (1979)
Harmonization of environmental measures	1	West African Economic Community (1973)

Table 3 (continued)

Rule	Number of countries to first adopt the rule by signing a PTA	PTA involved
Negotiation of environmental agreements	2	Lomé II (1979)
Environmental education or public environmental awareness	2	Lomé III (1984)
Technical assistance, training or capacity-building	2	Lomé II (1979)
Emergency assistance in case of natural disaster	6	EC (1957)
	17	Yaoundé I (1963)
	1	Lomé I (1975)
	4	Lomé II (1979)
Creation of joint research institutions	40	Lomé II (1979)

Our analysis reveals that the Peru–USA case is not an isolated occurrence. PTAs have contributed to the diffusion of 15 out of the 41 environmental rules examined to countries that had not previously adopted them. For example, the conclusion of the West African Economic Community in 1973 was the first time that Burkina Faso formally considered the harmonization of domestic environmental law.[4] This trade agreement states that "the Secretary-General of the Community is commissioned, in particular, to promote […] [the] harmonization of national policies on the protection of wildlife." (1973, protocol A, art. 2).

In some cases, the signature of PTAs has led to the adoption of rules by more countries. The 1993 COMESA Treaty stands out as an efficient vehicle for diffusing environmental rules. It provided the opportunity for 12 African states[5] to subscribe to the polluter pays principle for the first time [Article 122 (6)]. Likewise, 22 countries first endorsed the idea of encouraging the use of environmental labeling and standards in the COMESA treaty.[6] [1993, art. 124 (2)]. Finally, no fewer than 55 countries[7] first linked gender and environmental policies through the signature of Lomé IV (1989, art. 153).

However, 79% of the identified cases of environmental rule diffusion can be attributed to only four influential PTAs: the 1979s Lomé Convention, the 1989 fourth Lomé Convention, the 1993 COMESA Treaty, and the 2000 Cotonou Agreement.[8] Three of these PTAs were designed as development-oriented PTAs between the European Community and African, Caribbean and Pacific countries and are therefore characterized by a strong asymmetry. This finding suggests that the promotion of environmental rules through PTAs typically occurred from European countries to economically dependent countries.

In sum, a limited number of PTAs have served as a means to promote environmental rules to new countries. In most cases, it is unclear whether these environmental rules were imposed on rule takers. However, it is important to note that our analysis is strictly limited to the formal level and findings may be very different at the impact level. For instance, Jinnah and Lindsay (2016) report that the USA has used NAFTA, CAFTA and the Peru–USA PTA to promulgate norms on public participation in environmental policymaking and effective enforcement of environmental laws. Our data show that USA trading partners had already subscribed to these rules through the earlier ratification of IEAs. However, Jinnah and Lindsay explain that these rules were not actually implemented until the signature of the PTAs.

6 Regulatory innovation

PTAs could also function as an "experimentalist" form of governance (Sabel and Zeitlin 2008) by allowing, on a small scale, for the design of environmental rules that are not included in any previous IEA. The experience gained with such PTAs could in turn provide

[4] If we consider the ratification date of MEAs instead, the Treaty instituting the West African Economic Community contributed to the adoption of the rule on harmonization by 5 countries, i.e., when the PTA was signed, 4 countries had already signed but not yet ratified MEAs including this rule. The duration of the MEAs ratification process probably explains this discrepancy.

[5] 20 countries in the analysis based on ratification date.

[6] 21 countries in the analysis based on ratification date.

[7] 61 countries in the analysis based on ratification date.

[8] 70% in the analysis based on ratification date, another 13% being attributable to the 1984 third Lomé Convention.

useful feedback and contribute to the revision of the rules before they are applied on a larger scale and in other branches of international law.

For each of the 41 rules listed in "Appendix", we trace back their original introduction, either in a trade or in an environmental agreement.[9] The 41 rules were selected on the basis of the initial TREND coding. This creates a bias in favor of the observation of regulatory innovation in PTAs, and this bias provides an opportunity for a most likely scenario logic. Gerring defines a most likely case as "one that, on all dimensions except the dimension of theoretical interest, is predicted to achieve a certain outcome, and yet does not" (2006: 115). In other words, our biased data suggests that we should find that several rules were first introduced in a PTA. This should especially be the case for trade-related environmental rules—for example, rules related to the import and export of environmental goods. If they rather originate from an IEA, we can safely infer that other regulatory innovations we do not analyze here originate from IEAs as well. Table 4 shows the date when the 12 trade-related rules in our datasets first appeared.

Overall, only one of the 41 rules investigated was first designed in trade laboratories, namely the inappropriateness to relax environmental measures to encourage trade or investment. This trade-related environmental rule is fairly well spread across the PTAs, appearing in 93 agreements. Interestingly, this rule only appears in PTAs, and it has not diffused to the environmental regime. This confirms the reluctance of states to include the "non-regression principle" in IEAs, i.e., the commitment not to lower extant levels of environmental protection (Prieur 2011). This principle was partially recognized in the Rio + 20 outcome document (paragraph 20) despite the reticence expressed by the USA, Canada, Japan and the EU (Rehbinder 2012). However, its formalization in IEAs remains particularly slow.

In addition, 80% of the rules investigated were introduced into the environmental regime more than 20 years before being introduced into the trade regime. For example, a rule on the participation of the public in the implementation of the agreement's environmental measures was first included in an IEA in 1947,[10] whereas it did not appear in a PTA until 1992.[11] Out of the 41 investigated, 33 were introduced in the environmental regime before the 1972 United Nations Conference on the Human Environment. In comparison, all but one rules (on emergency assistance in the case of a natural disaster) were introduced into the trade regime after 1972. Thus, several states concluded multiple and detailed IEAs long before 1972, whereas their PTAs did not include key rules and principles from international environmental law until recently.

Therefore, the trade regime does not constitute an institutional laboratory for environmental rule design. Instead, it appears to be a mediocre incubator for regulatory innovation in environmental law. This is the case even for regulating issues that are at the crossroads between trade and the environment.

[9] To be sure, several of these rules existed in domestic law, soft law, or case law well before their first inclusion in a trade or environmental treaty. However, tracing back their true origin is beyond the scope of this article, which focuses on conventional international law only.

[10] Agreement Establishing the South Pacific Commission, 1947, art. 124 (2).

[11] North American Agreement on Environmental Cooperation, 1992, art. 17.

Table 4 Emergence of 12 trade-related environmental rules

Rule	First IEA to include it	First PTA to include it
Mutual supportiveness between trade and the environment	Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (1998)	Cotonou Agreement (2000)
Polluter pays principle	Agreement between Finland and Sweden Concerning Frontier Waters (1971)	Single European Act (1986)
Cost–benefit analysis	Agreement Between the Republic of Syria and the Hashemite Kingdom of Jordan Concerning the Utilization of the Yarmuk Waters (1953)	Single European Act (1986)
Coherence between environmental measures and trade policies	International Plant Protection Convention (1951)	Single European Act (1986)
Inappropriateness to relax environmental measures to encourage trade or investment	Never included in an international environmental agreement	NAFTA (1992)
Prohibition to import an environmental good from a Party where its use or export is prohibited by that Party	Agreement for the Conservation of Fauna and Flora in the Amazonian Territories of the Federative Republic of Brazil and the Republic of Peru (1975)	Jordan–Tunisia (1998)
Prohibition to export an environmental good from a Party where its use or import is prohibited within that Party's territory	Treaty between the Government of Socialist Federal Republic of Yugoslavia and the Government of the People's Republic of Poland on Cooperation in the Area of Veterinary Medicine (1960)	Lomé IV (1989)
Encouragement for trade in environmental goods or services	Montreal Protocol on Substances that Deplete the Ozone Layer (1987)	Lomé IV (1989)
Use of voluntary label, standards and certification	Convention on The Protection of the Marine Environment of the Baltic Sea Area (1974)	NAFTA (1992)
Specific economic or market instruments	Montreal Protocol on Substances that Deplete the Ozone Layer (1987)	EC Hungary (1991)
Equitable sharing of benefits arising from the use of natural or genetic resources	Treaty between Australia and the Independent State of Papua New Guinea Concerning Sovereignty and Maritime Boundaries in the Area between the Two Countries (1978)	Panama–Taiwan (2003)
Prevention of subsidies harmful to the environment	Montreal Protocol on Substances that Deplete the Ozone Layer (1987)	Trans-Pacific Partnership (2016)

7 MEA prevalence

PTAs have a fourth potential contribution to make to strengthening environmental law. This concerns legal hierarchy in the event that the provisions in a PTA conflict with existing IEAs. Indeed, the extension of trade law and the proliferation of IEAs have led to numerous overlaps between the two branches of international law, which create concerns regarding legal incompatibility. Considering ambiguities in international law on how such legal conflict should be resolved (Borgen 2005; Michaels and Pauwelyn 2011), some treaties include a clause stating that its own provisions or the provisions of another agreement should prevail. In this section, we focus on the latter and assess whether the drafting of PTAs effectively avoids legal conflict with IEAs in a way that reinforces international environmental law.

Only 29 PTAs (or 4% of the total number of PTAs analyzed) include a rule stating that some or all of the provisions of at least one of the 14 MEAs (listed in Table 2) should prevail in the event of a conflict with PTA provisions. The first PTA to include such a rule was NAFTA, which states that "In the event of any inconsistency between [NAFTA] and the specific trade obligations set out in [the CITES, the Montreal Protocol and the Basel Convention], such obligations shall prevail to the extent of the inconsistency, provided that where a Party has a choice among equally effective and reasonably available means of complying with such obligations, the Party chooses the alternative that is the least inconsistent with the other provisions of this Agreement" [1992, art. 104 (1)]. Interestingly, the three MEAs mentioned in NAFTA article 104 are the most frequently mentioned in PTAs, in terms of legal prevalence (see Fig. 1).

Canada replicated this NAFTA's provision in its 1996 trade agreement with Chile, which in turn copied it in its PTA with Honduras, Guatemala, El Salvador, Costa Rica, and Nicaragua in 1999. In contrast, the USA did not incorporate NAFTA's wording in subsequent PTAs. The first time a rule on prevalence reappeared in a USA PTA was in the 2006 agreement with Peru. The new stricter wording adds a reference to GATT principles: "In

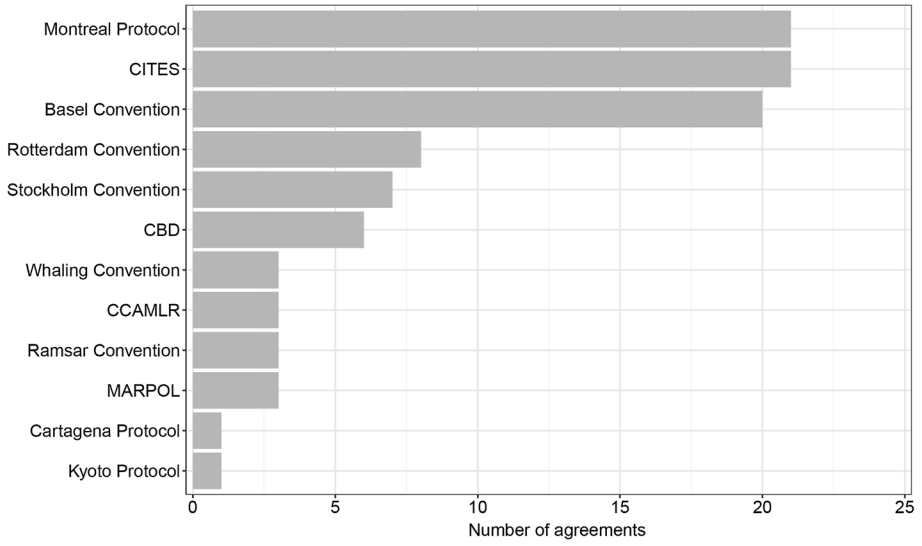

Fig. 1 Total number of PTAs including a rule on the prevalence of 14 major MEA provisions

the event of any inconsistency between a Party's obligations under this Agreement and a covered agreement [i.e. MEAs], the Party shall seek to balance its obligations under both agreements, but this shall not preclude the Party from taking a particular measure to comply with its obligations under the covered agreement, *provided that the primary purpose of the measure is not to impose a disguised restriction on trade*" (emphasis added) [2006, art. 18.3 (4)]. Canada then adopted a similar provision in a PTA concluded in 2009 with Jordan stating that the measures taken must be necessary to comply with MEA obligations and should not be applied "in a manner that would constitute arbitrary or unjustifiable discrimination or a disguised restriction on international trade" [2009, art. 1–5 (1)].

In comparison, only 15 IEAs include a rule suggesting that a trade agreement should prevail in case of incompatibility. Six of these IEAs reiterate the rights or obligations set out in GATT or WTO agreements. For example, the Inter-American Convention for the protection and conservation of sea turtles requires the parties, in implementing the agreement, to "act in accordance with the provisions of the Agreement establishing the World Trade Organization (WTO)" [1996, art. XV (1)]. Other environmental agreements are vaguer and provide for the prevalence of treaties dealing with trade matters.

In sum, rules on the prevalence of MEA provisions are rare in PTAs. They do not even appear in the 105 agreements concluded by the European Union, with the exception of the PTA concluded in 2012 with Colombia and Peru [art. 270 (4)]. In addition, states are increasingly seeking to avoid unreasonable trade restrictions. These strategies tend to weaken prevalence rules, and the legal treatment that should be given to inconsistent provisions consequently becomes unclear. Therefore, these findings corroborate the hypothesis that PTAs make a modest contribution to international environmental law.

8 Conclusion

This study offers empirical evidence that PTAs' environmental provisions allow for some advancements in international environmental law, but to a strikingly modest extent. First, when a PTA includes a requirement to implement or ratify an MEA, the parties to this PTA are typically already parties to this MEA. Second, very few PTAs promote environmental rules to countries that have not already accepted them in an IEA. Third, most PTAs replicate environmental rules that already exist in environmental law rather than designing new rules. Fourth, PTAs rarely provide for the prevalence of MEA provisions over their own provisions. Therefore, our results suggest that environmental provisions are included in PTAs as a tactical linkage, and not with a view to producing a meaningful regime shift in order to further develop international environmental law.

Johnson and Urpelainen (2012) offer one possible explanation for the absence of regime shifting. They argue that states integrate different regimes when negative spillovers exist between regimes, i.e., when "cooperation in one issue area undermines the pursuit of objectives in another issue area" (2012: 646). However, Johnson and Urpelainen argue that states have few incentives to create positive synergies between different regimes. This conjecture is consistent with the observation that trade agreements include detailed environmental exceptions to minimize the adverse effect of trade liberalization on environmental protection. However, when it comes to enhancing environmental protection, PTAs stick to familiar geographical and legal territories.

This article focuses strictly on the normative contribution of PTAs to international environmental law. It does not investigate how PTAs contribute to environmental governance in

other ways. For instance, there is a consensus among scholars that PTAs tend to have more stringent dispute settlement mechanisms than environmental agreements (Jinnah 2011; Johnson 2015). Thus, PTAs have the potential to contribute to a more effective enforcement of environmental provisions. In fact, a few USA agreements already bring environmental provisions under the main dispute settlement mechanism of the PTA.[12] The conclusion of a PTA can also favor the implementation of MEAs by bringing additional assistance and technology to developing countries. This explains why some studies associate PTAs with an improvement in terms of environmental outcome (Bastiaens and Postnikov 2017; Martínez-Zarzoso and Oueslati 2018; Yoo and Kim 2016).

In our analysis, we have also excluded mere references to a specific environmental issue area, such as desertification, endangered species, or climate change. Nevertheless, it is worth noting, for example, that three PTAs mentioned climate change even before the conclusion of the UNFCCC in 1992.[13]

Lastly, the trade regime's contribution to environmental law is not always apparent in the PTA texts. For example, the trade regime can reinforce the environmental regime during the bargaining process. This occurred when the EU stated that its support of Russia's accession to the WTO was conditional on Russia's ratification of the Kyoto Protocol—a ratification necessary for the protocol to enter into force (Vogler 2005). In addition, trade agreements can have an indirect impact on environmental law. Egger et al. (2011) show that countries with a strong inclination toward trade, notably through PTA membership, have more incentives to engage in MEAs than other countries. Additional research is needed to further our understanding of PTAs' indirect contributions to environmental governance.

Appendix: List of 41 rules identified in PTAs and MEAs

Rule	Example	References
1. Mutual supportiveness between the environment and trade or development	"The Parties recognize the mutual supportiveness between trade and environment policies and the need of implementing this Agreement in a manner consistent with environmental protection and conservation and sustainable use of their resources"	Free Trade Agreement between Canada and Colombia [2008, art. 1701 (2)]
2. Recognition of a development gap or of different capabilities	"Recognizing the difference in levels of development between the coastal States, and taking account of the economic and social imperatives of the developing countries"	Protocol for the Protection of the Mediterranean Sea Against Pollution from Land-Based Sources (1980, preamble)

[12] For example, the PTA between Colombia and the USA [2006, art. 18.12 (6)], the Trans-Pacific Partnership [2016, art. 20.23 (1)], and the recent United States–Mexico–Canada Agreement [2018, art. 24.32 (1)].

[13] Namely, the Fourth Lomé Convention (1989, art. 41), the European Association Agreement between the European Communities and Poland [1991, art. 80 (2)], and the European Association Agreement between the European Communities and Hungary [1991, art. 79 (2)].

Rule	Example	References
3. Polluter pays principle	"The Contracting Parties agree that the polluter in the Areas of Contracting Parties, should, in principle, bear the cost of pollution"	Energy Charter treaty [1994, art. 19 (1)]
4. Cost–benefit analysis	"Parties […] shall endeavour to evaluate the costs, benefits and other consequences that can result from eco-tourism at selected wetlands with concentrations of populations listed in Table 2"	Agreement on the Conservation of African-Eurasian Migratory Waterbirds (1995, art. 4.2.2)
5. Coherence between environmental measures and trade or investment policies	"Recognizing that this Agreement should be implemented with a view toward raising the standard of living, creating new job opportunities, and promoting sustainable development in a manner consistent with environmental protection and conservation"	Free Trade Agreement between China and Chile (2005, preamble)
6. Inappropriateness to relax environmental measures to encourage trade or investment	"Neither Party may encourage trade or investment by weakening or reducing the levels of protection afforded in its environmental laws"	Free Trade Agreement between Canada and Jordan (2009, art. 5)
7. Precautionary principle	"Acknowledging that, where there are threats of serious or irreversible damage, the lack of full scientific certainty should not be used as a reason for postponing protective measures"	Trade Agreement between the EU, Colombia And Peru (2012, art. 278)
8. Prevention principle	"Each State Party shall ensure that activities within its jurisdiction or control do not cause damage to the wildlife resources of other states or in areas beyond the limits of national jurisdiction"	Protocol on Wildlife Conservation and Law Enforcement to the Treaty of the Southern African Development Community [1999, art. 3 (1)]
9. Sovereignty over resources	"States have the sovereign right to exploit their own resources pursuant to their policies on the environment"	Framework Convention on Environmental Protection for Sustainable Development in Central Asia (2006, art. 4)
10. Common but differentiated responsibilities principle	"The extent to which developing country Parties will effectively implement their commitments under this Convention will […] take fully into account the fact that economic and social development and eradication of poverty are the first and overriding priorities of the developing country Parties"	Convention on Biological Diversity [1992, art. 20(4)]

Rule	Example	References
11. Interaction between gender and the environment	"Stressing the important role played by women in regions affected by desertification and/ or drought [….] and the importance of ensuring the full participation of both men and women at all levels in programmes to combat desertification and mitigate the effects of drought"	Convention to Combat Desertification (1994, preamble)
12. Interaction between indigenous community and the environment	"The Parties recognize the importance of respecting and preserving traditional knowledge and practices of indigenous and other communities that contribute to the conservation and sustainable use of biological diversity"	Trade Promotion Agreement between the USA and Colombia [2006, art. 18.11 (3)]
13. Prohibition of the import of an environmental good from a Party where its use or export is prohibited by that Party	"The two Governments […] undertake to curb the import into or transit through their respective territories of natural products, originating in either Party, the export of which is banned in the territory of that Party"	Agreement for the Conservation of Fauna and Flora in the Amazonian Territories of Brazil and of Peru (1975, art. V)
14. Prohibition of the export of an environmental good from a Party where its use or import is prohibited within that Party's territory	"The Contracting Parties shall vigorously oppose the export […] of waste and environmentally hazardous materials to the extent that it is contrary to the law of one of the Contracting Parties"	Agreement between the government of Poland and the Federal Republic of Germany on Cooperation in Environmental Protection (1994, art. 8)
15. Encouragement for trade in environmental goods and services	"The Parties shall encourage trade and dissemination of environmental products and environment-related services in order to facilitate access to technologies and products that support the environmental protection and development goals"	Agreement on Free Trade and Economic Partnership between Japan and the Swiss Confederation [2009, art. 9 (1)]
16. Use of voluntary label, standards and certification	"In accordance with its domestic law and policy, each Party shall promote the development, establishment, maintenance, or improvement of performance goals and standards used in measuring environmental performance"	Agreement on Environmental Cooperation between Canada and Honduras [2013, art. 11 (2)]
17. Emission trading schemes	"Cooperation shall seek to facilitate joint initiatives in the area of climate change mitigation and adaptation to its adverse effects, including the strengthening of carbon market mechanisms"	Agreement Establishing an Association between Central America and the European Union [2012, art. 50 (3) (d)]

Rule	Example	References
18. Equitable sharing of benefits arising from the use of natural or genetic resources	"The Contracting Parties agree that benefits arising from the use, including commercial, of plant genetic resources for food and agriculture under the Multilateral System shall be shared fairly and equitably"	International Treaty on Plant Genetic Resources for Food and Agriculture [2001, art. 13 (2)]
19. Commitment to enforce domestic environmental law	"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 […]"	Free Trade Agreement between Chile and the USA [2003, art. 19.2 (1) (a)]
20. Prevention of subsidies harmful to the environment	"Progressive reduction or phasing out of […]subsidies in all greenhouse gas emitting sectors that run counter to the objective of the Convention"	Kyoto Protocol to the United Nations Framework Convention on Climate Change [1997, art. 2 (1) (v)]
21. Joint scientific cooperation related to the environment	"The Parties exchange results of scientific studies through arranging joint seminars and scientific conferences, organization of joint publications or in another form"	Agreement between Estonia and the Russian Federation on Cooperation in the Field of Protection and Sustainable Use of Transboundary Watercourses (1997, art. 8)
22. Exchange of scientific information related to the environment	"Cooperation shall concern […] systems of information on the state of the environment"	Free Trade Agreement between the European Communities and Bulgaria [1993, art. 81 (2)]
23. Other exchange of information related to the environment	"Each Party shall facilitate the exchange of: […] technical, economic and legal information concerning mercury and mercury compounds"	Minamata Convention on Mercury [2013, art. 17 (1) (a)]
24. Establishment of contact point on environmental matters	"Each Party shall designate a contact point for environmental matters to facilitate communication between the Parties"	Free Trade Agreement between Korea and Australia [2014, art. 18.6 (1)]
25. Harmonization of environmental measures	"The Parties shall cooperate bilaterally […] to harmonize standards for motor vehicle environmental performance and safety"	Free Trade Agreement between the USA and the Republic of Korea [2007, art. 9.7 (1)]
26. Environmental impact assessment of the agreement	"The Parties shall conduct a comprehensive review and assessment of this Agreement, and its implementation, during the fifth year after its entry into force"	Agreement between Canada and the USA on Air Quality [1991, art. X (2)]
27. Negotiation of environmental agreements	"The Parties also recognize the continuing importance of current and future environmental cooperation activities in other fora"	Central America Free Trade Agreement [2004, art. 17.9 (5)]

Rule	Example	References
28. Participation of the public in the implementation of the agreement	"The Parties should also endeavour to promote the participation of their public and their nature conservation organizations in appropriate measures which are necessary for the protection of the areas concerned"	Protocol Concerning Mediterranean Specially Protected Areas and Biological Diversity in the Mediterranean (1982, art. 11)
29. Commitment to communicate with the public on the implementation	"Each Party may develop mechanisms, where appropriate, to inform its public of activities undertaken pursuant to this Agreement in accordance with its laws, regulations, policies and practices"	Free Trade Agreement between New Zealand and Malaysia [2009, art. 4 (9)]
30. Environmental education or public environmental awareness	"Each Contracting Party shall promote education and disseminate general information on the need to conserve species of wild flora and fauna and their habitats"	Convention on the conservation of European wildlife natural habitats [1979, art. 3 (3)]
31. Technical assistance, training or capacity-building	"The Parties shall strive to strengthen and to enlarge the capacity of national institutions responsible for the conservation and sustainable use of biological diversity, through instruments such as the strengthening of capacities and technical assistance"	Trade agreement between the EU, Colombia and Peru [2012, art. 272 (6)]
32. Technology transfer in the field of the environment	"Parties undertake to co-operate actively, subject to their national laws, regulations and policies, in the transfer of technology in respect of oil pollution preparedness and response"	International Convention on Oil Pollution Preparedness, Response and Co-Operation [1990, art. 9 (2)]
33. Financial assistance in the field of the environment	"The developed country Parties shall provide new and additional financial resources to enable developing country Parties and Parties with economies in transition to meet the agreed full incremental costs of implementing measures which fulfill their obligations under this Convention"	Stockholm Convention on Persistent Organic Pollutants [2001, art. 13 (2)]
34. Emergency assistance in case of natural disaster	"In case of environmental emergencies of possible transboundary impact, the Parties shall inform each other and take immediate coordinated actions in order to eliminate the consequences of such emergencies"	Agreement between Latvia, Estonia and Lithuania on cooperation in the field of environment [2010, art. 5 (2)]

Rule	Example	References
35. International secretariat on environmental issues	"The Council shall have a Secretariat which shall consist of a Secretary-General and such technical and clerical staff as may be required for the working of the Council"	African Migratory Locust Convention [1952, art. IV (1)]
36. Intergovernmental committee on environmental issues	"The Participants establish an Environment Committee comprising senior officials of their government agencies responsible for environmental matters"	Thailand-New Zealand Closer Economic Partnership Agreement (2005, art. 3.1)
37. Advisory and stakeholder international committee on environmental issues	"Each Contracting Party may establish an Advisory Committee for its national section to be composed of persons who shall be well informed concerning North Pacific fishery problems of common concern"	International Convention for the High Seas Fisheries of the North Pacific Ocean [1952, art. II (8)]
38. Creation of joint research institutions	"There shall be established an independent international organization entitled the 'Center for International Forestry Research' […]"	Establishment agreement for the center for international forestry research (1993, art. 1)
39. Non-jurisdictional dispute settlement mechanisms	"Should any issue arise between the Parties over the interpretation or implementation of this Agreement, the Parties will make every effort to settle it amicably through cooperation, consultation, and dialogue"	Environmental Cooperation Agreement between China and New Zealand [2008, art. 4 (1)]
40. Arbitrage, courts and tribunals	"Any dispute between Contracting Governments relating to the interpretation or application of the present Convention which cannot be settled by negotiation shall be referred at the request of either party to the International Court of Justice for decision unless the parties in dispute agree to submit it to arbitration"	International Convention for the Prevention of Pollution of the Sea by Oil (1954, art. XIII)
41. Sanction or suspension of benefits	"The Commission may suspend the voting rights of any Contracting Party when its arrears of contributions equal or exceed the amount due from it for the two preceding years"	International Convention for the Conservation of Atlantic Tunas [1966, art. X (8)]

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