

Environmental provisions in trade agreements: Defending regulatory space or pursuing offensive interests?

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Abstract: The increasing uptake of environmental provisions in preferential trade agreements (PTAs) is well documented, but little is known about why countries prefer certain types of provisions over others. This contribution exploits a fine-grained dataset on environmental provisions in PTAs and hypothesizes that environmental provisions are more likely to be adopted when they aim at preserving countries' regulatory sovereignty. It finds that the likelihood of adoption is indeed higher for defensive provisions, but this likelihood decreases if there is a large variation in PTA members' stringency of environmental regulations, and in particular, for PTAs with asymmetric power relationships. The results suggest that, while countries first and foremost attempt to preserve their regulatory sovereignty when adopting environmental provisions, countries with stringent environmental regulations and strong bargaining power *vis-à-vis* their trading partners also try to level the playing field and pursue more offensive interests.

Key words: trade agreements, environmental provision, issue linkage, regulatory space, PTAs, power asymmetry

Introduction

Trade agreements frequently include detailed environmental provisions.ⁱ For example, the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), concluded in March 2018 by 11 nations from the Pacific Rim region, includes a chapter of 26 pages on the environment. This chapter provides specific commitments on a wide variety of environmental issues, including fisheries conservation, endangered species protection, forest governance, ship pollution, invasive species mitigation, ozone layer preservation, and energy efficiency. In some respects, the CPTPP includes environmental provisions that are more precise and more enforceable than those of multilateral environmental agreements.

The effects of these environmental provisions are not trivial. Recent studies suggest that preferential trade agreements (PTAs) with environmental provisions are associated with lower emissions of greenhouse gas and atmospheric particulate matter than PTAs without such provisions (Baghdadi *et al.* 2013; Zhou *et al.* 2017; Martinez-Zarzoso and Oueslati 2018). Brandi *et al.* (2019) find that PTAs with environmental provisions promote environmental domestic legislation, particularly in developing countries. Bastiaens and Postnikov (2017) show that PTAs initiated by the United States (US), with their insistence on enforcement of domestic environmental standards, are more likely to lead to pollution reduction prior to their ratification, while European PTAs, with their more cooperative approach, are more likely to have a positive effect after their ratification.

It remains unclear, however, what trade negotiators' motivations are for including such significant environmental provisions in their PTAs. The literature mentions a plethora of explanations, typically based on single case studies. The North American Free Trade Agreement (NAFTA) and its side agreement on environmental cooperation informed a generation of scholars in the 1990s. NAFTA was undoubtedly a groundbreaking PTA for its

innovative environmental standards, and it provided a model that trade negotiators around the world replicated many times in other PTAs. Yet, 25 years later, it is necessary to go beyond single case study analysis as countries have concluded more than 430 PTAs with increasingly diverse environmental provisions (Morin *et al.* 2018). One cannot assume that explanations that hold for NAFTA's environmental provisions are generalizable to the entire population of PTAs. Since large-N data on the content of trade agreements is just starting to become available, the quantitative literature on the drivers of PTAs' environmental provisions is still in its infancy. Furthermore, the scope of existing large-N studies is limited to explaining the adoption of environmental provisions in the aggregate and therefore cannot disentangle the motivations for different types of provisions.

We contribute to the literature on the design of environmental provisions by asking whether the character of environmental provisions can explain their adoption in PTAs, and ultimately why some types of provisions are more likely to be adopted than others. For this purpose, we introduce a distinction between defensive and offensive environmental provisions. Defensive provisions focus on protecting governments' policy space for adopting environmental regulation. In contrast, offensive provisions prescribe specific environmental policies and aim at leveling the playing field. We hypothesize that the likelihood of these provisions being adopted is a function of power asymmetry and regulatory alignment. Our results support our expectations.

We divide the remainder of the contribution into four parts. The next section reviews the literature on the motivations for including environmental provisions in PTAs. Section 3 distinguishes defensive and offensive provisions and articulates hypotheses on their likelihood of adoption. The fourth section introduces the data and the methodology. The last section discusses our main results, and then the conclusion outlines avenues for future research.

Explaining PTAs' environmental provisions

The prolific literature on the trade and environment linkage lists several possible explanations for the inclusion of environmental provisions in PTAs. One of the most frequently mentioned explanations is that environmental provisions expand the coalition of interests in favor of PTAs. In several countries, a majority of the population believes that their government should do more to protect the environment (Bättig and Bernauer 2009) and supports the inclusion of environmental provisions in PTAs (Bernauer and Nguyen 2015). However, citizens that are particularly concerned about the environment also tend to favor more protectionist attitudes in trade policy (Bechtel *et al.* 2012). Given this political context, Daniel Esty argues that taking environmental issues seriously is 'a political necessity for free traders [as they] cannot risk diminishing further the already narrow coalition in favor of freer trade' (2001: 116; see also Roozendaal 2009). NAFTA is the prime example of such a coalition between free-traders and environmentalists. At the time of NAFTA's ratification, Bill Clinton obtained the political support of key environmental groups by promising to conclude an environmental side agreement, and in doing so managed to secure a congressional vote in favor of the trade deal (Gallagher 2004; Charnovitz 1994; Hufbauer *et al.* 2000; Blair 2008). Similar pressure from citizens can explain why democratic countries tend to include more environmental provisions in their PTAs than autocratic ones (Morin *et al.* 2018).

A second line of explanation sees environmental provisions as adaptive reactions to trade disputes (Pauwelyn 2014). Indeed, several of the most prominent trade disputes concern domestic environmental regulations. At the time of negotiating NAFTA, the US was already respondent in six disputes under the General Agreements on Tariffs and Trade (GATT) directly related to US environmental measures. These disputes included the notorious Tuna-Dolphin Case concerning a restriction on the imports of tuna products from countries that did not meet

specific dolphin protection standards. Several NAFTA environmental provisions are reactions to these disputes and aim at protecting the US regulatory sovereignty on environmental matters (Morin and Rochette 2017). NAFTA itself, and in particular its Chapter 11 on investment protection, gave rise to numerous controversial investor-state disputes over environmental regulations, such as the Metalclad, the Myers, and the Methanex cases. In response, recent US and Canadian trade agreements include new environmental safeguards that substantially reduce the likelihood that a foreign investor would win a case regarding an environmental measure (Henckels 2012). Likewise, several of the most controversial World Trade Organization (WTO) disputes in Europe concern environmental measures, such as the cases on hormones in beef, Genetically Modified Organisms (GMOs), and seal furs. One can read the insistence of the European Union (EU) on the ‘precautionary principle’, and more recently on the ‘right to regulate’ in its PTAs can be read as an adaptive reaction to these disputes (Poletti and Sicurelli 2015). Under this interpretation, decision-makers’ desire to maintain their domestic regulatory equilibrium and their capacity to adjust to new circumstances drives PTAs’ environmental provisions.

A third line of scholarship sees PTAs’ environmental provisions as a forum-shifting strategy to promote environmental priorities outside of traditional environmental fora (Jinnah and Lindsay 2016; Johnson 2015; Morin and Jinnah 2018). While environmental negotiations progress slowly in UN fora, trade negotiations between a limited number of countries enable the advancement of far-reaching environmental obligations by facilitating bargaining and trade-offs across issue-areas and by circumventing obstructing countries. For example, some provisions related to endangered species in the US-Peru trade agreement are more precise and enforceable than those found in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) agreement. Studying the implementation of these provisions in Peru, Sikina Jinnah concludes that they ‘have the potential to enhance environmental regime

effectiveness in ways that have been impossible under environmental treaties alone' (Jinnah 2011: 191). This finding is consistent with a survey that the Organisation for Economic Co-operation and Development (OECD) conducted, in which government representatives claimed that trade agreements' environmental provisions aim to support environmental policy objectives (George 2014).

Other scholars believe that environmental provisions are cases of window dressing that cover protectionist motivations. Countries concerned about the competition resulting from trade agreements may use such provisions to protect their domestic firms' competitive advantage or to reduce the competitiveness of foreign firms. Either way, environmental provisions can restrict imports and provide a cover of legitimacy to protectionist interests. Several studies have found relationships between the existence of protectionist interests and the prominence of environmental provisions in PTAs (Bhagwati 1995; Ederington and Minier 2003; Lechner 2016).

There are also less strategic explanations for the increasing number of environmental provisions per PTA. It might be that this expansion is simply a function of the expanding depth of PTAs (Dür *et al.* 2014). As PTAs cover an increasing number of economic regulatory issues, such as public procurement, foreign investment, and intellectual property, they include by extension an increasing number of environmental exceptions to these new commitments. A related explanation is that trade negotiators tend to quickly duplicate in their own agreement provisions introduced by third countries (Allee and Elsig 2016). As a result of network effects, the introduction of a single new environmental provision in one PTA can quickly diffuse in the trade system and lead to a general increase in the average number of environmental provisions per agreement (Milewicz *et al.* 2016). Scholars have found such diffusion effects to be particularly strong in the case of intercontinental agreements (Morin *et al.* 2019).

These various explanations for the inclusion of environmental provisions in PTAs are not mutually exclusive. It is likely that different types of provisions serve different objectives. A recent WTO study distinguishes several types of PTAs' environmental provisions, including exceptions to trade commitments, cooperative mechanisms, references to multilateral environmental agreements, and obligations concerning domestic environmental law (Monteiro 2016). Yet, the handful large-N studies exploring trade negotiators' motivations for the inclusion of environmental provisions coalesce these various provisions together and fail to account for their differences (Lechner 2016; Milewicz *et al.* 2016; Morin *et al.* 2018). The dependent variable of these studies is typically the number of environmental provisions included in the PTA, irrespective of their nature. We go beyond this by providing evidence at the provision-level, assuming that the type of environmental provisions included in a PTA provides a clue to understanding why they are likely to be adopted or not.

Hypotheses on the adoption of offensive and defensive provisions

To illuminate the explanations for the inclusion of environmental provisions in PTAs, we introduce a novel distinction between defensive and offensive environmental provisions.ⁱⁱ This classification echoes a classic distinction in trade analysis between policies that aim at protecting the status quo at home (defensive) and those that seek to promote policy reforms abroad (offensive). Trade circles consider anti-dumping duties to be 'defense instruments', while they typically view using trade sanctions to force domestic reforms in a foreign country as an 'offensive strategy'. Building on this martial metaphor, we define defensive environmental provisions as those that negotiators design to protect a country's policy space for maintaining its environmental regulations and adopting new ones. A well-known example of defensive environmental provisions is the exception to trade commitments for domestic measures necessary to protect the life of plants and animals (GATT article XX(b)). The

precautionary principle is another defensive provision as it protects parties' right to regulate even when there is a lack of scientific certainty over the negative externalities of the regulated subject matter. In contrast, offensive provisions prescribe specific environmental policies and ensure their enforcement. Examples of offensive provisions include commitments to reduce public subsidies to fisheries, to adopt specific emissions standards for vehicles, to implement a list of environmental agreements, and to make available judicial proceedings to remedy violations of environmental law.

For the purpose of this contribution, we understand 'provisions' as a rule included in an international treaty. A treaty paragraph can include several rules, and thus different provisions. Defined this way, a single provision cannot be equally defensive and offensive, as a rule cannot simultaneously protect a country's regulatory sovereignty and prescribe specific measures. However, a PTA can include a combination of offensive and defensive environmental provisions.

It is important to note that defensive provisions are not necessarily greener and that they are not necessarily more trade restrictive than offensive provisions. We are interested in negotiators' intentions for adopting different types of environmental provisions, but we do not make any claim on the actual impact of these provisions. We also reject the notion that environmental concerns drive one type of provision and economic considerations fuel the other type. Negotiators can adopt defensive provisions to mitigate environmental impacts of trade, and offensive provisions to advance environmental objectives worldwide. Thus, both types of provision can contribute to environmental protection.ⁱⁱⁱ Both types of provision can also aim at economic objectives. Defensive provisions can facilitate the protection of domestic firms. For example, a PTA provision allowing export restrictions on hazardous waste can address environmental risks associated with such exports but can also benefit less competitive waste

management firms. Likewise, offensive provisions could aim to increase environmental standards in foreign countries, but also nullify their regulatory competitive advantage. For example, forcing a GMO-exporting country to implement the Cartagena Protocol on Biosafety can lead to a reduction in its exports of agricultural products. Therefore, we do not anticipate that countries' interests in environmental protection or trade protection *per se* can explain the frequency of a certain type of provision.

As most countries fear targeting by foreign plaintiffs for their domestic environmental measures, we expect that the introduction in a PTA of defensive provisions is more easily accepted than the introduction of offensive provisions. Studies in psychology as well as in political economy have established that the protection of the status quo faces less resistance than the introduction of novel and prescriptive rules (Kahneman *et al.* 1991). Few countries oppose provisions such as exceptions to trade commitments for the protection of natural resources or limits to foreign investment protection on legitimate environmental grounds, even though their trade partners can mobilize these measures to justify the adoption of trade restrictive measures. Defensive provisions protect parties' regulatory space, and the fear of being prevented from protecting the environment or domestic firms motivates such provisions. The specific constraints that a PTA imposes on current and future regulations are sometimes difficult to predict and can only reveal themselves through trade disputes. Thus, as mentioned above, defensive environmental provisions reduce the risks of potentially long and costly trade disputes. When one of these unexpected disputes arises over an environmental regulation, it is not uncommon that the responding countries will introduce a new defensive provision in their subsequent PTAs and that third countries will pay notice and follow suit to avoid being targeted as well (Pauwelyn 2014).

This expected general interest in defensive provisions appears clearly when we distinguish four types of PTA negotiations, based on two dimensions: the asymmetry of economic power and the asymmetry of the stringency of environmental regulations between the partner countries (Table 1). Countries with stringent environmental regulations are probably those with the strongest interest in defensive provisions, as these provisions reduce the risk of being targeted by trade disputes on environmental grounds and give them regulatory space to introduce even more stringent environmental regulations. Powerful countries also have strong interest in defensive provisions as these countries are statistically the most likely to be targeted by trade disputes. On their part, weak countries are traditionally eager to protect their regulatory sovereignty, including their autonomy in regulating natural resources. When a PTA brings together parties with uneven regulatory protection, the country with the weakest environmental regulations might oppose defensive provisions out of fear that its trade partner will exploit its environmental regulations as non-tariff barriers. However, this opposition from the country with weak environmental regulations might not be sufficient if it is also the weakest negotiating party. In this likely circumstance, the country with the strongest environmental regulations would use its asymmetric power to force the inclusion of defensive provisions into the PTA. It would take the unlikely scenario of a PTA uniting a powerful country with low environmental regulation with a weak country with strong environmental regulations to expect the rejection of defensive provisions. In other cases, the PTA members are likely to reproduce defensive provisions from earlier PTAs or include defensive provisions inspired by recent trade disputes.

Our expectations are quite different for offensive provisions. In situations of regulatory asymmetry, countries with stringent environmental regulations have a strong interest in exporting their environmental policies to their trading partners with laxer regulations (Copeland 2000). By leveling the playing field, countries with stringent regulations can simultaneously reduce trade pressure from countries with weaker regulations and bring them into the fold of

global environmental efforts. In contrast, countries with weak environmental regulations are likely to oppose the inclusion of offensive provisions in their PTA. They have a competitive advantage in exporting pollution-intensive goods and they might fear that provisions prescribing specific environmental regulations would hurt their exports. Moreover, the implementation of PTAs’ offensive provisions can constitute a financial and administrative burden for countries with weak environmental regulations. As the OECD observes: ‘One major difficulty encountered by some developing countries was the need to negotiate environmental chapters in RTAs while their own national environmental management system was in its infancy’ (2007: 3).

Table 1: Expected adoption of defensive and offensive environmental provisions

		Economic power	
		Symmetric	Asymmetric
Domestic environmental regulations	Equal	(1) Defensive Provisions	(3) Defensive Provisions
	Unequal	(2) Defensive Provisions	(4) Defensive and offensive provisions

In this context, power asymmetry is likely to be a decisive factor in explaining whether countries with strong environmental regulations can successfully impose offensive provisions on countries with weaker environmental regulations. Several case studies on EU and US trade negotiations, two powerful entities with relatively strong domestic environmental regulations, highlight the importance of power asymmetry. Sophie Meunier and Kalypso Nicolaïdis argue that central to EU trade strategy is the use of ‘trade power to achieve non-trade objectives’ (2006: 912). Likewise, Vinod Aggarwal finds that ‘large asymmetry in power among countries proved to be crucial for the US ability to reopen [NAFTA] negotiations and secure side

agreements' (2013: 102). It is presumably thanks to their asymmetrical bargaining power that several European and American PTAs include offensive provisions, such as the 2008 PTA between the EU and Bosnia and Herzegovina with its provisions on 'pollution caused by heavy goods vehicles' (Art. 11) and the 2000 US-Jordan PTA with its provisions on the protection of 'fragile coral reef ecosystems in the Gulf of Aqaba' (Annex 1).

If a PTA unites countries with unequal environmental regulations but similar bargaining power, it is unlikely that the country with the weakest environmental regulation will accept provisions intruding their sovereignty. Conversely, if a PTA unites countries with similar environmental regulations, they will not have strong interests to insert offensive provisions in their PTA. Their only interest for offensive provisions would be to prevent a race to the bottom, in which all countries vainly attempt to gain a competitive advantage by constantly lowering their environment regulations (Esty 2001: 121). However, various institutional mechanisms already create ratchet effects on environmental regulations and regulatory races to the bottom are rare (Vogel 1997). As such, there is little interest in preventing this unlikely problem in a PTA. The clearest situation in which a country has both the interest and the capacity to include offensive provisions in a PTA is in the context of imbalanced environmental regulations and asymmetric power relations.

We can therefore distinguish four cases, which Table 1 depicts. (1) Two countries that are equal in terms of power and environmental regulations will opt for defensive provisions to avoid trade disputes; there is no need to level the playing field and thus no demand for offensive provisions. An example is the treaty signed between Albania and Macedonia in 2002, which includes no offensive provisions but 16.7% of the defensive provisions in our dataset. (2) In the case of two countries with equal power but unequal environmental regulations, the country with stringent environmental regulations has an interest to protect them, and the country with low

environmental standards has an interest to keep its regulatory sovereignty, so both opt for defensive provisions; the country with the strongest regulations is not powerful enough to force the inclusion of offensive provisions. An example is the agreement between the European Free Trade Association (EFTA) and the Gulf Cooperation Council signed in 2009 with an adoption of 16.4% of defensive and only 1.0% of offensive provisions. (3) In the case of countries with unequal power but similar environmental regulations, both countries will opt to keep their environmental regulations and thus agree on defensive provisions; there is no need to level the playing field. We observe this pattern for the PTA between Mexico and Panama signed in 2014, which includes 20.3% of defensive and 1.0% of offensive provisions identified in our dataset. (4) When asymmetric power meets asymmetric environmental regulations, the more powerful country will push the weaker country to include offensive provisions while ensuring protection for its own regulations (assuming that the powerful country is the country with the stronger environmental regulations). One case in point is the 2014 agreement between the EU and Georgia which incorporates a high share of defensive (25.4%) and offensive provisions (33.0%,) that exist in the treaty universe.

Overall, we expect that environmental provisions are more likely to be adopted when they are defensive, given the wide interest and weak opposition towards including them in PTAs. Only in the case of PTAs in which the powerful country has stringent environmental regulations can we expect offensive provisions to be included, potentially in addition to defensive provisions. Overall, this leads us to make two hypotheses:

H1: Environmental provisions are more likely to be adopted when they have a defensive nature.

H2: *Offensive environmental provisions are more likely to be adopted in PTAs bringing together countries with unequal environmental regulations and asymmetrical power relations.*

Data and methodology

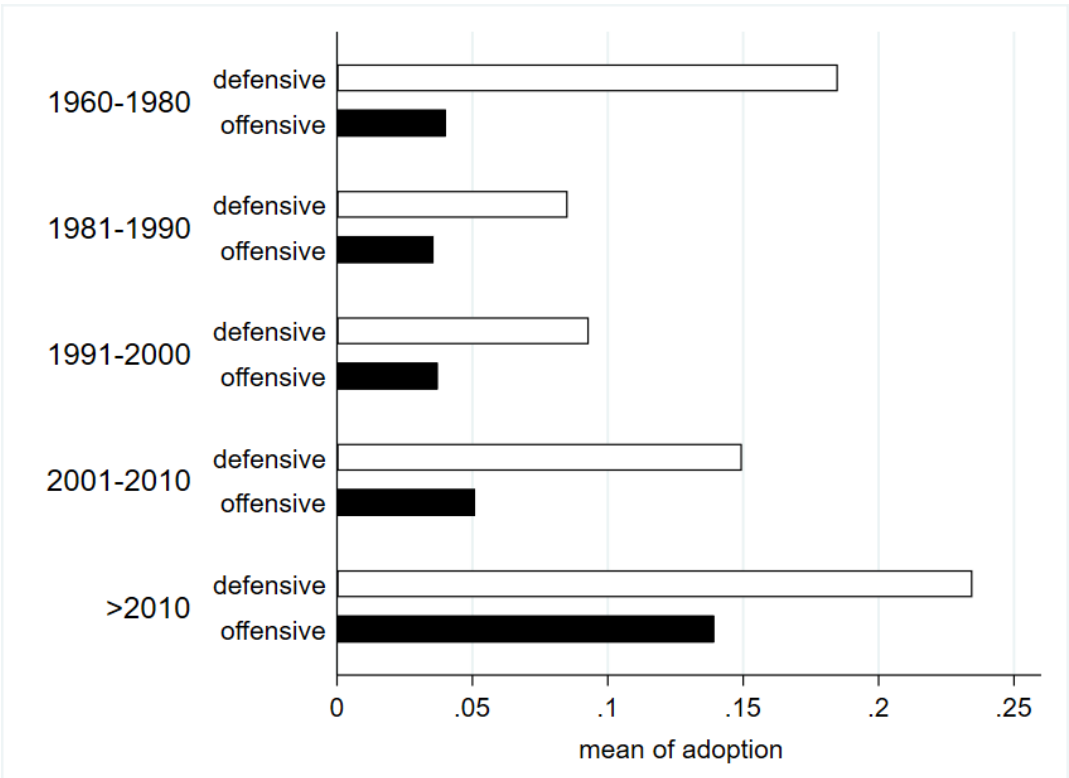
We take our data on environmental provisions from the Trade and Environment Database (TREND) introduced by Morin *et al.* (2018). TREND relies on manual content-based coding and is to the best of our knowledge the most comprehensive and fine-grained dataset of environmental provisions in PTAs. TREND identifies the presence of more than 250 environmental provisions in 680 PTAs. This list of PTAs is itself based on the Design of Trade Agreements (DESTA), which is by far the most comprehensive collection of PTAs (Dür *et al.* 2014).

Our main explanatory variable is the binary indicator $defensive_i$, which indicates whether the environmental provision aims to defend the countries' policy space. In addition, we also construct a binary variable indicating whether the environmental provision aims to pursue offensive interests. The variables are mutually exclusive such that a provision that is classified as defensive cannot be offensive at the same time. A non-defensive provision, however, is not necessarily offensive, as there are also neutral provisions that score a zero in both indicators. From the 252 types of environmental provisions included in our dataset, we classify 105 as offensive, 60 are classified as defensive, and the remaining are classified as neutral (see the Appendix for the complete list of offensive, defensive and neutral provisions^{iv}).

Figure 1 illustrates the share of environmental provisions that are adopted in PTAs, broken down by the different categories and time periods. Across all periods, defensive

provisions are more frequent than offensive provisions. Defensive environmental provisions were already very popular before the 1980s. This is not surprising, as among the first environmental provisions introduced in trade law were the exception to protect animal or plant life. After a downturn in the following decades, on average 23.3% of defensive environmental provisions in our sample have been adopted in PTAs signed since 2010. However, the adoption of offensive provisions has increased continuously since the 1980s. While on average only 3.6% of PTAs concluded in 1981-1990 include offensive provisions, the share has increased to 13.9% on average in the years after 2010. Mirroring this trend, the recent literature assumes that PTAs can act as vectors for the diffusion of prescriptive environmental standards (Jinnah 2011; Jinnah and Lindsay 2016; Morin and Jinnah 2018). The scholarly debate on trade and environmental governance is less about how to protect the capacity of countries to adopt environmental regulations from the constraints of trade law, and more about how to use trade law to increase environmental performance.

Figure 1: Adoption of environmental provisions by category and time period



At the PTA-level, we measure economic power, environmental regulations and democracy levels. We measure economic power by GDP in constant 2010 USD downloaded from the World Bank Indicators (World Bank 2018). We measure environmental regulations by the share of multilateral environmental agreements (MEAs) the countries have ratified as a proxy, as calculated from the IEA database, which includes more than 1,300 MEAs (Mitchell 2017). In the absence of a direct measure of domestic environmental regulations for several countries and years, we use MEAs ratification as a reliable approximation, which also shows a high correlation with measures of environmental performance. Since it is possible that the adoption of environmental provisions has an impact on economic development and environmental regulations, we measure the respective variables prior to the signature of PTA j to reduce concerns about simultaneity bias. We also average GDP variables over three years to smooth out economic fluctuations. For democracy levels, which are positively associated with the inclusion of environmental provisions (Morin *et al.* 2008), we construct variables based on the polity2 indicator from the Polity IV Project (Marshall *et al.* 2016). All variables at the PTA-level are averages or standard deviations across PTA members. Where regional economic communities such as the EU sign PTAs with third countries, we treat them as single actors.^v

In addition to the defensive or offensive nature of environmental provisions, we measure the degree of specificity of a provision, *issue – specific_i*. We coded provisions as specific if they address a specific environmental issue, for example, fisheries or soil degradation, or if they constitute an exception to a specific trade-related issue, such as public procurement, intellectual property or services. On the other side of the spectrum are general provisions, such as a commitment to not derogate from environmental standards to encourage trade or investment. We believe that specificity decreases the likelihood of adoption. First, a specific issue area may only be of interest to a smaller range of countries and specific environmental exceptions on public procurement, say, can only occur in PTAs that address public procurement. Second,

specific provisions tend to come with concrete and measurable commitments that countries may be more hesitant to adopt.

In Section 2, we presented one line of argument that sees the adoption of environmental clauses as a function of increasing PTA depth. We include the depth index from the DESTA database in our empirical analysis to take such PTA heterogeneity into account (Dür *et al.* 2014). Given that the number of environmental provisions included in PTAs increases over time, with templates being revised to become more ambitious and countries learning from past experiences, we control for the year the PTA was signed and the year the provision first appeared in our empirical analysis. For sensitivity checks, we also assess our results with respect to their robustness regarding path dependence. To do so, we construct variables on the share of PTAs in the trade system that have previously adopted the provision (past adoption in the system) and the share of past treaties signed by PTA members that already include the provision (past adoption by members).

Our analysis includes 252 distinct environmental provisions and 478 PTAs signed from the 1960s onwards. We exclude WTO agreements from the dataset, as our focus is on PTAs only. Table 2 reports the descriptive statistics.

Table 2: Descriptive statistics

Variables	Obs.	Mean	Std. Dev.	Min.	Max.
Adoption _{ij}	93,912	0.0843	0.2779	0	1
Real GDP _j	93,077	25.5571	2.0422	20.3474	31.4443
GDPstd _j	82,001	1.5263	1.0914	0.0034	5.7450
Env. regulations _j	93,912	0.1576	0.0594	0	0.3071
ENVstd _j	92,271	0.0450	0.0356	0.000	0.1953
Democracy _j	92,536	15.5356	4.5218	0	20
DEMOCstd _j	77,285	2.7082	2.5678	0.0677	9.8027
PTA depth _j	87,065	3.0373	2.1335	0	7
Year of PTA signature _j	93,912	2001.6950	7.8020	1960	2016

Year provision was first introduced _{<i>i</i>}	93,912	1988.1660	10.6209	1947	2015
Issue – specific _{<i>i</i>}	93,912	0.4926	0.4999	0	1
Defensive _{<i>i</i>}	93,912	0.2276	0.4193	0	1
Offensive _{<i>i</i>}	93,912	0.4062	0.4911	0	1
Past adoption by members _{<i>i</i>}	93,912	3.6337	9.3943	0	100
Past adoption in the system _{<i>i</i>}	93,912	3.0360	6.4379	0	76.4964

The dependent variable $Adoption_{ij}$ is a binary indicator that takes the value 1 if the environmental provision i is adopted in PTA j , and 0 otherwise. Given the binary nature of the dependent variable, we estimate a probit model to estimate the likelihood of adopting an environmental provision given by

$$P(Adoption_{ij} = 1 | defensive_i, ENVstd_j, z_{ij})$$

$$= \theta(\beta_1 defensive_i + \beta_2 ENVstd_j + \beta_{12} defensive_i * ENVstd_j + z_{ij} \delta)$$

where $Adoption_{ij}$ indicates whether provision i is adopted by PTA j , $defensive_i$ indicates whether provision i is of a defensive nature, $ENVstd_j$ measures the standard deviation in environmental regulations (approximated by MEA ratification) between the members of PTA j , z_{ij} combines all other control variables related to provision i or PTA j including a constant, and θ is the standard normal cumulative distribution function. Standard-errors are clustered at the PTA-level. Based on Hypothesis 1 that defensive provisions increase the likelihood of adopting an environmental provision, we expect a positive sign on β_1 . Based on Hypothesis 2 that offensive provisions are more likely to be adopted with unequal environmental regulations, we expect that the effect of $defensive$ on adopting an environmental provision decreases with a higher standard deviation in PTA members' environmental regulations. A negative sign on β_{12} would indicate this.

Empirical analysis

Table 3 reports the coefficients and average marginal effects computed after estimating the probit model introduced in Section 4.^{vi} The coefficients β_1 and β_{12} have the expected signs (Columns 1 and 2) lending support to H1 and H2.^{vii} According to the average marginal effects (Columns 3 and 4), a switch from a non-defensive to a defensive provision will increase the likelihood of adoption by almost six percentage points. This is in line with H1 and suggests that one of the countries' main intentions is to preserve their sovereign policy space for environmental purposes when signing PTAs.

Table 3: Coefficients and average marginal effects

VARIABLES	(1) Adoption (coefficients)	(2) Adoption (coefficients)	(3) Adoption (AME)	(4) Adoption (AME)
Real GDP _j	0.0746*** (0.0229)	0.0313 (0.0214)	0.0106*** (0.00318)	0.00423 (0.00284)
GDPstd _j	0.161*** (0.0347)	0.0733** (0.0320)	0.0229*** (0.00517)	0.00990** (0.00432)
Env. regulations _j	1.575* (0.851)	-0.345 (0.764)	0.224* (0.121)	-0.0467 (0.103)
ENVstd _j	2.723** (1.186)	2.070* (1.145)	0.165 (0.155)	0.0321 (0.134)
Democracy _j	0.0295* (0.0152)	0.00287 (0.0147)	0.00420** (0.00211)	0.000387 (0.00197)
DEMOCstd _j	0.00727 (0.0181)	-0.00119 (0.0173)	0.00103 (0.00257)	-0.000161 (0.00234)
PTA depth _j		0.259*** (0.0205)		0.0349*** (0.00308)
Year of PTA signature _j	0.0322*** (0.00556)	0.00424 (0.00551)	0.00458*** (0.000793)	0.000572 (0.000745)
Year provision was first introduced _i	-0.0285*** (0.00115)	-0.0314*** (0.00120)	-0.00406*** (0.000161)	-0.00424*** (0.000170)
Issue – specific _i	-0.179*** (0.0312)	-0.197*** (0.0331)	-0.0254*** (0.00441)	-0.0266*** (0.00445)
Defensive _i	0.586*** (0.0562)	0.658*** (0.0611)	0.0580*** (0.00554)	0.0590*** (0.00535)
Defensive _i * ENVstd _j	-4.941*** (1.009)	-5.826*** (1.104)	Not reported	Not reported
Constant	-12.20 (10.44)	50.47*** (10.67)	Not reported	Not reported
AIC	35781.01	31076.62	35781.01	31076.62
Observations	68,450	62,575	68,450	62,575

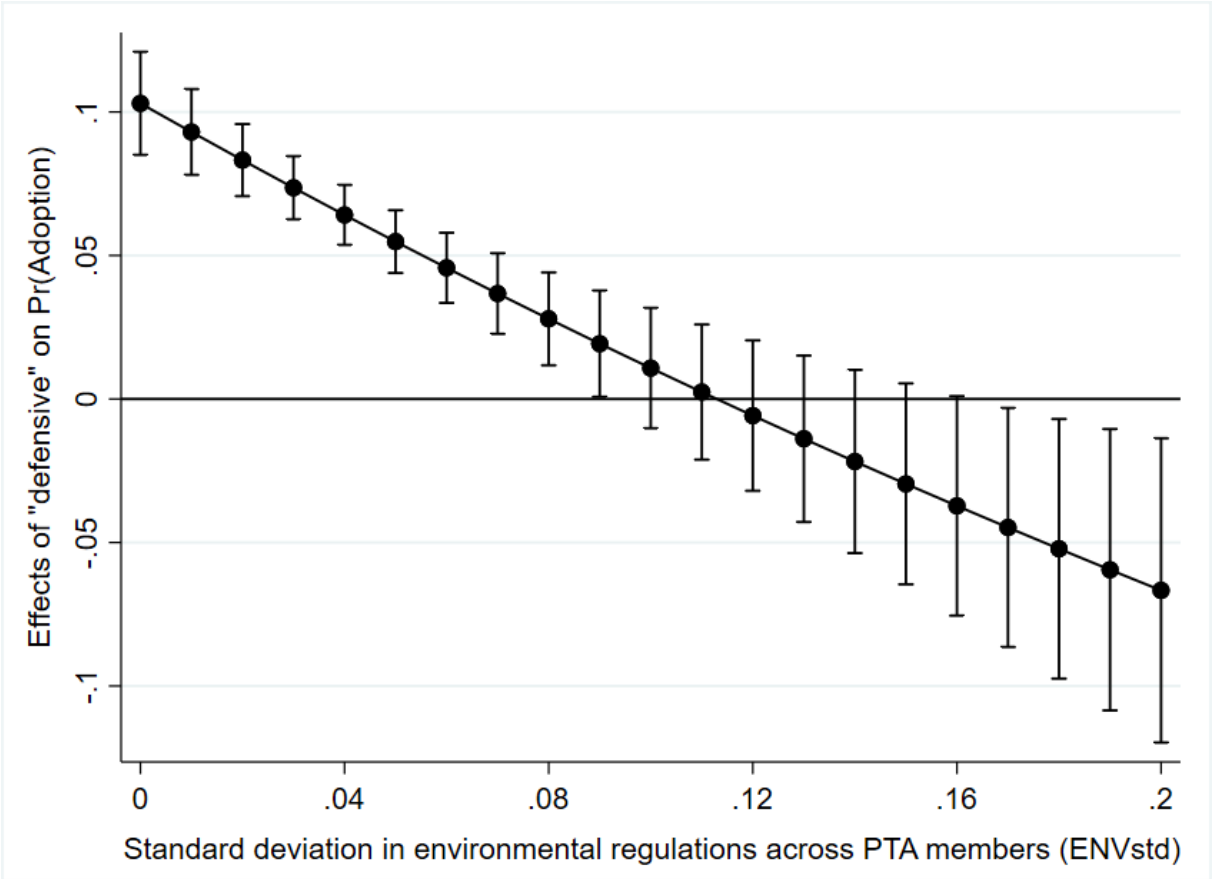
In contrast to defensive provisions, countries seem to be less eager to adopt provisions that involve commitments in specific issue areas. The likelihood of adopting an environmental provision decreases by about 2.5 percentage points when changing from a general to an issue-specific provision. In terms of other control variables, we find that the adoption of environmental provisions is more likely in PTAs in which a high level of democracy (Columns 1 and 3) characterizes members. This is in line with findings from the literature that democracies include more environmental provisions in their PTAs. Moreover, PTAs with a high level of and high variation in economic power are more likely to include environmental provisions. In line with our expectations, the depth of PTAs is positively related to the adoption of environmental provisions. An increase in the depth index by one unit increases the likelihood of adopting an environmental provision by around three percentage points. Finally, whether or not a provision is adopted is positively related to the year when the PTA was signed and negatively related to the year the provision was first introduced to the trade regime. The sooner the provision was introduced and the later the PTA was signed, the more opportunity there is for adopting the provision.

The results show that the likelihood of adopting an environmental provision is significantly higher when the provision is defensive, that is, it aims to preserve the regulatory policy space. However, the number only gives us the average marginal effect and masks potential heterogeneity across different levels of other variables in the model. More precisely, we are interested in how this result might change according to the composition of PTA members. We further investigate H2 by plotting the effect of defensive provisions on the likelihood of adoption against different values of variation in environmental regulations

between PTA members. We do so for the model including the depth index (Columns 2 and 4) as it fits the data better.

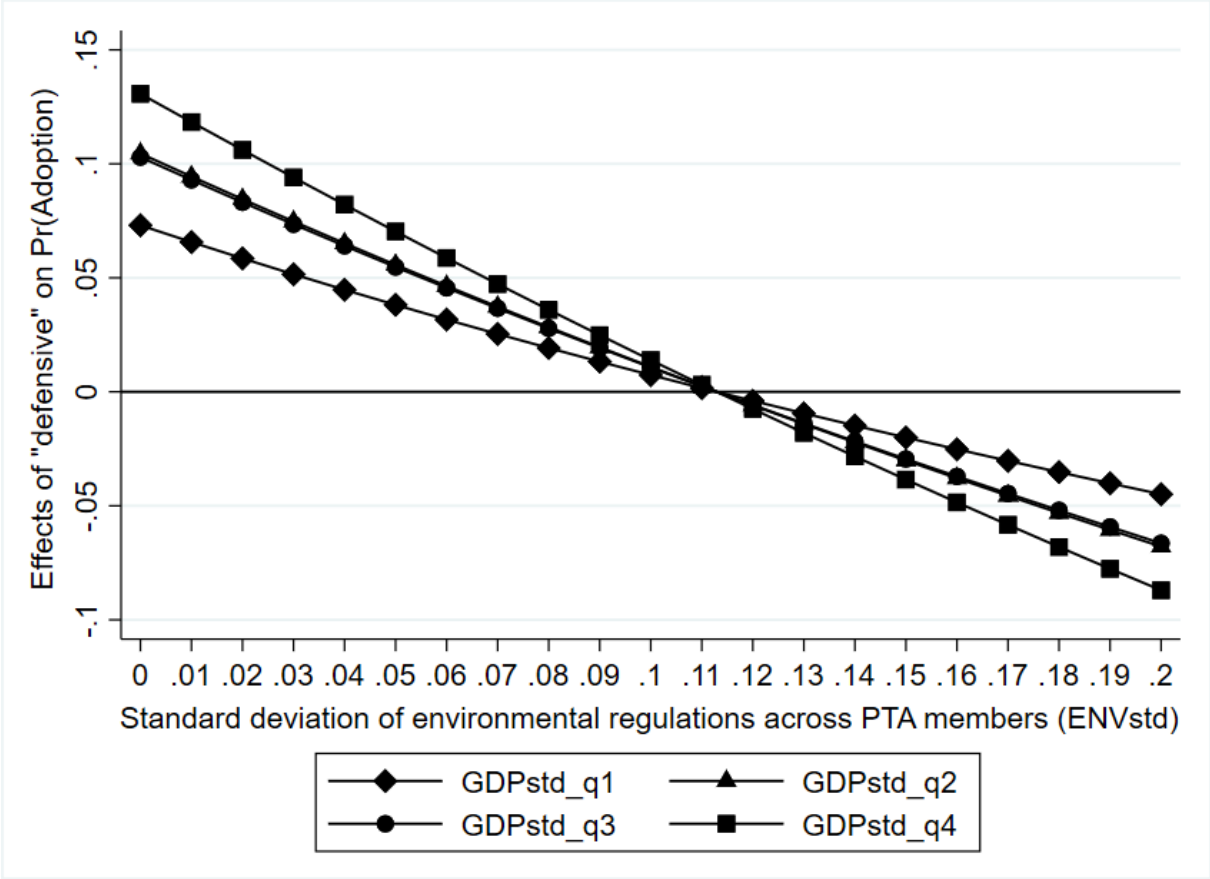
The findings lend support to H2. While a switch from a non-defensive to a defensive provision increases the likelihood of adopting an environmental provision by around six percentage points on average (Table 3), Figure 2 shows that this likelihood strongly decreases with rising variation in PTA members’ environmental regulations. If the standard deviation were zero, that is if all PTA members had the same score on our measure of environmental regulations, then a switch from non-defensive to defensive would increase the likelihood of adopting an environmental provision by around ten percentage points. With a higher variation in environmental regulations this likelihood decreases notably and even drops below zero for very high variations in PTA members’ environmental regulations.^{viii}

Figure 2: Marginal effect of ‘defensive’ at different levels of variation in environmental regulations



In Figure 3 we further disaggregate the effect, splitting the sample into quartiles according to PTA members' power relationships. Quartile 4 (q4) includes the PTAs with the highest standard deviations in real GDP, that is with the highest power asymmetry. We can see that the dampening effect of the variation in environmental regulations on the marginal effect of a defensive provision is most pronounced for the highest quartile (q4). Hence, the lower importance of defensive provisions with rising inequality of environmental regulations across PTA members seems to occur particularly when the countries involved have asymmetric power relationships. However, had we plotted the confidence intervals they would have a large overlap, so that we can speak of statistically significant differences only between the lowest and the highest quartiles.^{ix}

Figure 3: Marginal effect of 'defensive' at different levels of variation in environmental regulations, disaggregated by level of power asymmetry



To strengthen the empirical evidence for H2, we therefore also propose an alternative empirical model. We keep only offensive provisions in our sample and estimate the probability of adopting such offensive provisions by means of probit estimation, with and without interactions between the variations in environmental regulations and economic power (Table 4).

The results support our main argument. As the positive and significant average marginal effects indicate, adopting an environmental provision with offensive interest is more likely the higher the variation in real GDP (*GDPstd*) between PTA members. Since the *average* marginal effect of *ENVstd* on the probability of adopting an offensive provision is not significantly

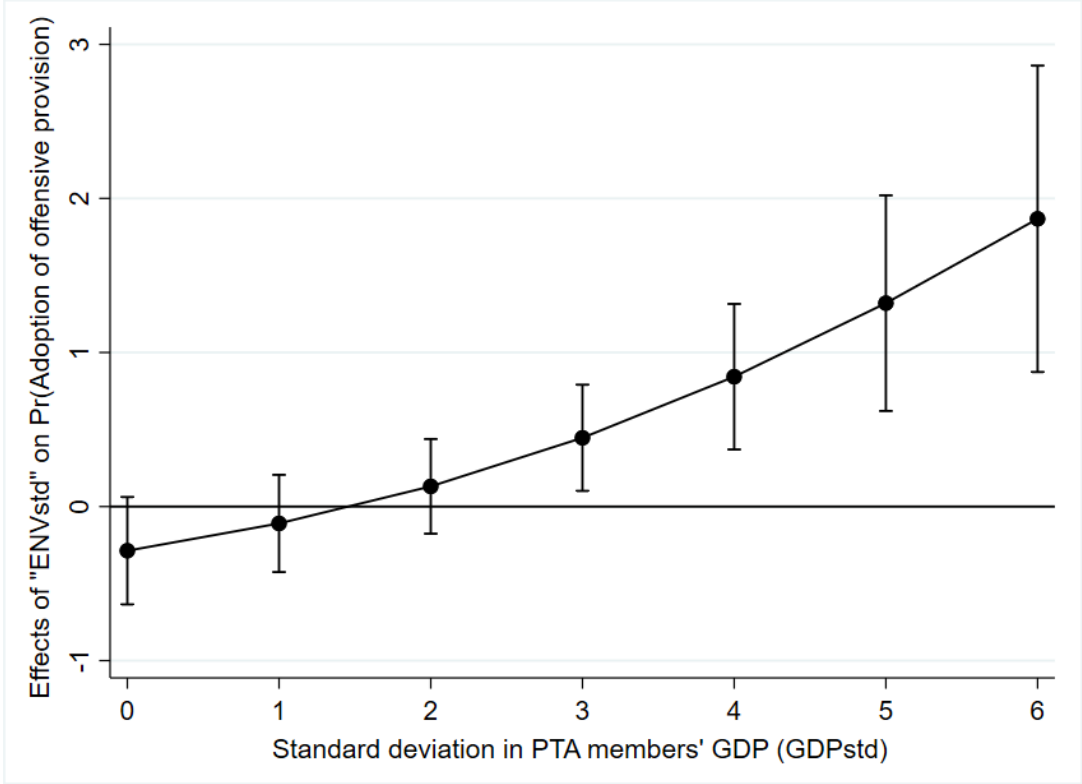
different from zero, again we prefer to plot the average marginal effect across different values of *GDPstd* (Figure 4). The figure illustrates that the marginal effect of the variation in environmental regulations depends positively on the variation in economic power. Only for high values of power asymmetry does the marginal effect become positive, indicating that adopting an offensive provision becomes more likely when PTA members have unequal environmental regulations and at the same time asymmetric power relationships. This suggests, in line with the previous discussion, that, with higher bargaining power, countries with strong environmental regulations push for offensive provisions in PTAs.

Table 4: Average marginal effects

VARIABLES	(5) Adoption of offensive provision	(6) Adoption of offensive provision	(7) Adoption of offensive provision	(8) Adoption of offensive provision
Real GDP _{<i>j</i>}	0.00979*** (0.00324)	0.00501 (0.00308)	0.00887*** (0.00332)	0.00321 (0.00318)
GDPstd _{<i>j</i>}	0.0234*** (0.00521)	0.0132*** (0.00476)	0.0235*** (0.00521)	0.0130*** (0.00461)
Env. regulations _{<i>j</i>}	0.117 (0.122)	-0.127 (0.113)	0.141 (0.126)	-0.0759 (0.118)
ENVstd _{<i>j</i>}	0.210 (0.157)	0.139 (0.158)	0.188 (0.158)	0.112 (0.154)
ENVstd _{<i>j</i>} * GDPstd _{<i>j</i>}			not reported	not reported
Democracy _{<i>j</i>}	0.00248 (0.00244)	-0.00137 (0.00242)	0.00229 (0.00243)	-0.00175 (0.00246)
DEMOCstd _{<i>j</i>}	-0.000986 (0.00299)	-0.00271 (0.00282)	-0.000957 (0.00299)	-0.00258 (0.00283)
PTA depth _{<i>j</i>}		0.0299*** (0.00331)		0.0304*** (0.00332)
Year of PTA signature _{<i>j</i>}	0.00305*** (0.000859)	-0.000382 (0.000856)	0.00308*** (0.000854)	-0.000412 (0.000849)
Year provision was first	-0.00190*** (0.000244)	-0.00198*** (0.000263)	-0.00190*** (0.000243)	-0.00198*** (0.000261)
Issue – specific _{<i>i</i>}	-0.0134** (0.00600)	-0.0123** (0.00619)	-0.0134** (0.00600)	-0.0123** (0.00620)
AIC	11870.36	10280.79	11861.03	10247.91
Observations	27,897	25,489	27,897	25,489

Standard errors (clustered at PTA-level) in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Figure 3: Marginal effects of variation in environmental regulations for different values of power asymmetry



Taken together, the finding suggests that countries are more likely to adopt environmental provisions when they serve the purpose of defending their regulatory policy space. However, when PTA members become more unequal in terms of their environmental regulations, the effect of defensive provisions on adoption dampens. This is most pronounced for PTAs with strong power asymmetries between members. With high inequality in environmental regulations and great power asymmetry, adoption of offensive provisions is more likely. We can interpret this finding as an indication that with higher variation among members' environmental regulations the strong performers with high bargaining power try to push for provisions that allow them to pursue offensive interests and level the playing field.

We assess the robustness of our results regarding these phenomena by including two additional variables in our models. To control for policy diffusion effects, we include the

percentage of total agreements in the trade system that have already adopted the provision up to the year before PTA signature. To control for path dependence, we include the percentage of members' past treaties that have already included the same provision (averaged across all PTA members). In line with previous studies, our results (reported in Table 5) show a positive and highly significant effect for both variables. We still find a statistically significant positive effect of defensive provisions on the likelihood of adoption, but the effect is much smaller when controlling for previous adoption of environmental provisions by PTA members and in the trade system.

Table 5: Average marginal effects after controlling for past treaty practice

VARIABLES	(9) Adoption	(10) Adoption
Real GDP _j	0.00425 (0.00265)	0.00398 (0.00279)
GDPstd _j	0.00910** (0.00393)	0.00915** (0.00420)
Env. regulations _j	-0.0652 (0.0985)	-0.0549 (0.103)
ENVstd _j	0.0644 (0.125)	0.0553 (0.134)
Democracy _j	-0.000474 (0.00180)	0.00100 (0.00216)
DEMOCstd _j	-0.000954 (0.00218)	0.000495 (0.00246)
PTA depth _j	-0.00236*** (0.000763)	-0.00213*** (0.000763)
Year of PTA signature _j	0.000298 (0.000183)	-0.000268 (0.000191)
Year provision was first introduced _i	0.0297*** (0.00290)	0.0341*** (0.00312)
Issue – specific _i	-0.0101** (0.00400)	-0.0142*** (0.00445)
Defensive _i	0.00987** (0.00470)	0.0145*** (0.00540)
Defensive _i * ENVstd _j	Not reported	Not reported
Past adoption by members _i	0.00764*** (0.000371)	
Past adoption in the system _i		0.00975***
AIC	25376.13	28481.51
Observations	62,575	62,575

Conclusion

Existing research on environmental provisions in PTAs typically consists of a limited number of case studies, which makes drawing generalizable lessons challenging, or scholarship investigates merely the number of environmental provisions included in PTAs, regardless of their content. We contribute to the literature by going beyond these approaches and investigating the reasons for the uptake of different environmental provisions across a broad sample of PTAs. By distinguishing between offensive and defensive provisions, we provide insights into which types of provisions are adopted, and we can better understand different rationales driving the adoption of environmental provisions in PTAs.

We find that the likelihood of adopting an environmental provision is higher for provisions that safeguard PTA members' policy space. However, this likelihood decreases if there is a larger variation in PTA members' environmental regulations, especially when coupled with a high variation in members' economic power. This suggests that, while in general countries aim to safeguard their regulatory sovereignty, countries with stringent environmental regulations and economic bargaining power tend to shift the balance in favor of offensive provisions as they seek to level the playing field with their trading partners.

These findings partly contrast with a frequent assumption in the literature that PTAs' environmental provisions result from simple boiler plating. While path dependence and diffusion processes are clearly at work and might be driven by a few powerful countries, our results suggest that countries consciously adopt defensive or offensive environmental provisions, based on the parties' relationships.

Our empirical findings are more in line with the literature that views the adoption of environmental provisions as a reaction to trade disputes, with decision-makers seeking to

preserve their ability to modify domestic regulation in favor of environmental protection while avoiding disputes. Our results also substantiate the literature that argues that democracies include more environmental provisions in their PTAs than autocratic states, which is in line with the explanation that environmental provisions broaden the coalition of interests in favor of trade agreements.

The fact that trade negotiators are more likely to adopt defensive provisions illustrates that countries value the freedom to adjust their environmental regulations in accordance with their policy goals, social norms and economic capabilities. Defensive provisions allow for the divergence of environmental measures across countries, and one might interpret them as safeguards for the democratic process. At the same time, the rise in offensive environmental provisions might contribute to the upward convergence of domestic standards (Vogel 1997). They level the trade playing field and bring environmental free riders into the fold.

There are nevertheless reasons to believe that offensive provisions might never become as ambitious as some environmentalists hope. The rise of offensive provisions in the last decades is largely the result of changes in the structure of trade negotiations. Until the 1990s, most PTAs were intra-regional and were concluded among countries with similar levels of development and environmental standards. In contrast, most recent trade agreements are inter-regional and connect countries that are very diverse. This new context increased the need – and opportunity – to level the regulatory playing field, especially between high income and developing countries. However, for offensive provisions to increase environmental standards in all countries involved rather than merely level the playing field, they would need inclusion in PTAs connecting countries with equally high standards. This is not what we are witnessing. The fact that power and regulatory asymmetries drive the adoption of offensive provisions by might explains why PTAs can be highly precise, prescriptive and enforceable on issues like

biodiversity conservation and forestry, which high-income countries see as insufficiently addressed in a number of developing countries, while being remarkably modest on issues such as climate change (Morin and Jinnah 2017).

Future research could more closely investigate the effects of the inclusion of different types of environmental provisions in PTAs, especially from the perspective of weaker developing countries. Moreover, a research agenda for future provision-level analysis should put the spotlight not only on the drivers of adoption but also on its environmental and economic effects and the broader consequences for different aspects of world politics, for instance the prospect of multilateralism.

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ⁱ For an overview of the uptake of environmental provisions, see www.trendanalytics.info.

ⁱⁱ Esty (1994: 3) also makes use of this terminology in the context of the trade-environment interplay but refers to the defensive agenda as seeking to ensure that 'trade liberalization does not harm the environment' while the offensive one means that trade is used to 'advance environmental goals'.

ⁱⁱⁱ Countries can use some defensive provisions to resist the implementation of strong environmental standards. However, most defensive provisions are designed to ensure that trade commitments do not restrict the ability of countries to adopt environmental standards.

^{iv} The appendix can be downloaded from the publisher webpage.

^v Regional economic communities (RECs) include the Andean Community, the Association of Southeast Asian Nations (ASEAN), EU/EC, the European Free Trade Agreement (EFTA), Golf Cooperation Council, Southern Common Market (MERCOSUR) and the Southern African Customs Union. The variables calculated at REC-level are population-weighted averages.

^{vi} Note that the size of the coefficients has no meaningful interpretation in the probit model but reporting the size is still useful to see how well the model fits our data. We also report the average marginal effects alongside the coefficients, except for the interaction term which has no useful immediate interpretation and will be given more attention below.

^{vii} Note that, in the presence of an interaction term, the coefficient β_1 measures the relationship between defensive provisions and the likelihood of adoption in the case where there is no variation in the PTA members' environmental commitments (ENVstd=0).

^{viii} Note, however, that only two PTAs in our sample have a standard deviation in MEA ratification that goes beyond 0.16, namely Latvia-Sweden 1992 and Latvia-Norway 1992.

^{ix} We get the same results when interacting defensiveness with variation economic power. The higher the standard deviation in economic power, the lower the marginal effect of 'defensive' on the likelihood of adoption. This is more pronounced for a higher standard deviation in environmental standards. The results are not reported here but are available from the authors upon request.