


Taking it seriously: commitments to the environment in South-South preferential trade agreements

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ABSTRACT

Conventional wisdom suggests that preferential trade agreements (PTAs) contain environmental standards because the highly regulated North imposes these standards on the reluctant South. But what about the increasing occurrence of environmental standards in South-South trade agreements? Are they simply a product of a diffusion process from North-South PTAs? Or do environmental standards in South-South PTAs signal real commitment to both environmental regulation and performance? We test these two perspectives against each other by quantitatively examining original data on environmental provisions in 479 PTAs. Using performance-based indicators our results support the notion that if developing countries take on the obligation of committing to environmental. When relying on a measure on commitment levels in the Paris Agreement on Climate Change, the results rather point to the diffusion-based perspective. In contrast to the conventional wisdom, the study shows that environmental protection is not always extrinsically motivated by developed countries.

KEYWORDS Preferential trade agreements; environmental commitment; developing countries; Paris agreement on climate change

Introduction

The widespread occurrence of environmental clauses in preferential trade agreements (PTAs) provides trade policy analysts with several puzzles. Most basically, why are these standards included in agreements regulating trade at all? The literature tends to answer this question with reference to the idea that countries with high levels of regulation, i.e., mostly industrialized countries in the global North, rely on their power to include such regulations in agreements with less developed and thus low regulating countries in the global South (Jinnah and Lindsay 2016, Bastiaens and Postnikov 2017, Brandi *et al.* 2019). Whether these standards are included because of genuine

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environmental concern (Khanna 2001, Jinnah 2011) or to protect domestic industries from (unfair) competition based on low standards of production – or both – is still a matter of debate (Mosley and Uno 2007, Lechner 2016).

However, if we accept this conventional wisdom that PTAs contain environmental clauses because the highly regulated North imposes them on the reluctant but, in the end, indulgent South, another puzzle emerges, namely the widespread occurrence of such standards in South-South agreements. Increasingly developing countries include environmental protection clauses in South-South PTAs, as the red line in Figure 1 illustrates.¹ In 2015, the average South-South PTA had only two environmental clauses less than the average North-South PTA.

Yet the pattern displayed in Figure 1 immediately raises additional questions: Is this commitment meaningful? Do developing countries deliberately and purposefully include these clauses in PTAs with their peers to signal commitment to high levels of environmental protection? Or are South-South commitments primarily a result of a diffusion process from their North-South PTAs and therefore no credible signal of any additional environmental protection efforts? To answer these questions, we outline two possible explanations, which we then test against each other.

The first explanation sees the adoption of strict environmental clauses in South-South PTAs as a mere continuation of a country's prior experience with such clauses in its other (North-South) PTAs. Experience and cost-calculation should induce countries with already committed environmental

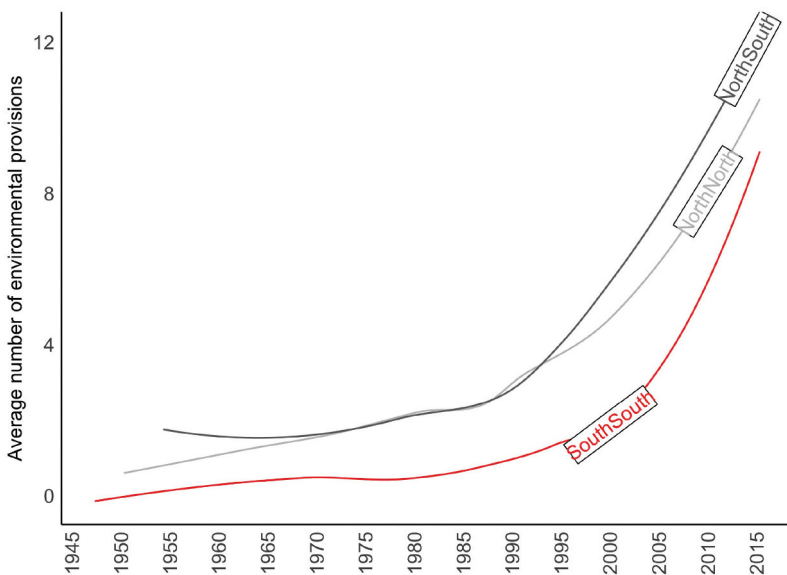


Figure 1. Average number of environmental clauses in PTAs over time.

clauses in an agreement with the global North to adopt such standards also in their South-South agreements. From this perspective, policy continuation seems more intuitive than dis-continuation since countries must make an intentional decision to change their past treaty commitments; a rationale in line with recent research on diffusion processes in general (Graham *et al.* 2013) and of environmental clauses in PTAs in particular (Morin *et al.* 2019). Therefore, this first explanation would attribute little to no additional value to countries' South-South environmental clauses since any meaningful impetus for (or signal of) higher domestic commitment and performance should have come with the prior North-South commitment.

The second explanation, in contrast, argues that the inclusion of environmental clauses in South-South PTAs is unlikely to be a hollow commitment. For one, negotiating PTAs is a rare and costly endeavor: On average, developing countries only have nine South-South PTAs and average duration to negotiate these agreements is three years (Lechner and Wüthrich 2018).² Hence negotiators should not simply rely on the basic text of their North-South PTAs as a blueprint and copy-paste these clauses from one agreement to another without carefully thinking about their consequences and adapting them to their needs.³ Furthermore, countries should be reluctant to include strict environmental provisions in their South-South PTAs without deliberately committing to these standards since various actors, such as environmental NGOs, can rely on these clauses to pressure governments for policy change. Notably, in South-South settings, governments can hardly blame industrialized countries for imposing these standards. They should therefore only deliberately include these standards if they want them to be part of an agreement. From this perspective, these standards should signal higher environmental commitment and performance.

To test these different perspectives, we rely on newly collected data on 55 environmental provisions in 479 PTAs signed between 1945 and January 2016. The detailed coding of environmental provisions not only allows us to assess whether countries include environmental provisions but also how stringent these clauses are. To measure our dependent variable, additional environmental commitment and domestic environmental performance, we rely on four different indicators to ensure we indeed capture meaningful environmental protection efforts. First, we use a novel measure of commitment levels in the Paris Agreement on Climate Change. Since the Paris Agreement is the only international environmental cooperation effort that allows countries to specify their own national commitment level, the so-called nationally determined contributions (NDCs), we observe commitment levels, which vary individually by country, a unique and crucial feature of the Paris Agreement. Second, we rely on three indicators of actual environmental performance: The Environmental Performance Index (EPI), SO₂, and CO₂ emissions per capita.

The results of our quantitative analysis based on 168 non-OECD countries show stark differences between our measure of additional environmental commitment in the Paris Agreement and our three measures of environmental performance. When relying on countries' NDCs as dependent variable, we find weak evidence for the first and no support for the second perspective. However, if we rely on any of the three performance-based measures, EPI, SO₂, and CO₂ emissions, the second perspective receives strong support. Even if we rely on selection models to consider the process behind the inclusion of environmental clauses into South-South PTAs, our findings indicate that developing countries with stricter environmental commitments in their South-South PTAs tend to have higher scores on the EPI and lower SO₂ and CO₂ emissions per capita. This suggests that, in contrast to the conventional wisdom found in the literature, environmental commitment does not necessarily need to be imposed by the high regulating North. If developing countries take on the obligation of committing to environmental protection in the context of their own South-South PTAs, this indeed seems to signal real commitment to environmental protection.

Our paper contributes to various strands of the literature on environmental politics and governance. First, by focusing on international environmental commitment levels, our research adds to the numerous studies on international environmental cooperation (Bernauer *et al.* 2010, Cao and Ward 2017). Second, we contribute to the growing field of research concentrating on environmental politics in developing countries focusing on how trade and environmental commitment interact (Cao and Prakash 2010, Spilker 2012, 2013, Prakash and Potoski 2017, Brandi *et al.* 2019). Third and finally, our study speaks to those scholars of environmental politics analyzing voluntary environmental commitments (Khanna 2001, Prakash and Potoski 2006).

What do PTAs have to do with environmental protection?

While the most direct form of international cooperation to foster environmental protection are international environmental treaties (Bernauer *et al.* 2010), the literature has long acknowledged the crucial connection between international trade (agreements) and the environment. While some studies argue that international trade can potentially result in better environmental standards, the so-called trading-up hypothesis (Vogel 2009), other research states that trade competition can lead to pollution havens, a regulatory chill, or even a regulatory race to the bottom (Esty and Girardin 1998, Drezner 2001, Taylor 2005).⁴ Specifically for environmental provisions in PTAs, it has been shown that investor decisions are partly influenced by the design of these PTAs (Lechner 2018).⁵

Notwithstanding whether regulatory competition actually leads to a race to the bottom between trading partners, strong protests by environmental groups surrounding the negotiation of PTAs, who fear this outcome, has been one impetus for policymakers to include environmental clauses into these agreements (Morin *et al.* 2019). However, pure environmental concern is not the only driver underlying these decisions. For example, Lechner (2016) shows that several other domestic actors, e.g., the import-competing industry and labor unions, have a strong interest in including environmental provisions in PTAs. In their calculus, however, these clauses serve the vital function of shielding their products from ‘unfair’ international competition due to lax environmental standards and thus to preserve market share and employment and not necessarily protect the environment.

Independent of whether these clauses are included because of genuine environmental concern (Jinnah 2011, Jinnah and Lindsay 2016) or to protect domestic industries in industrialized countries from (unfair) competition based on low standards of production (Mosley and Uno 2007, Lechner 2016), both arguments share the assumption that the impetus for including environmental provisions in PTAs stems from the highly regulated North. The nascent literature on environmental provisions in trade agreements and their effect on the natural environment tends to share this assumption (e.g., Jinnah and Lindsay 2016, Brandi *et al.* 2019), as does the literature focusing on the reasons why and which particular environmental provisions are included in PTAs and how they diffuse from one PTA to another (Morin *et al.* 2019, Blümer *et al.* 2020). Hence, the literature to date has a strong focus on perceiving these clauses as something desired by industrialized countries and (reluctantly) agreed to by developing countries in exchange for market access (Prakash and Potoski 2006, Bastiaens and Postnikov 2017).

Based on these studies, we derive the first theoretical perspective below. The gist of the argument is that any meaningful impetus for or signal of higher environmental commitment and performance should come with ratifying a North-South PTA. Consequently, any additional South-South commitment in PTAs should have little to no further implications for developing countries’ environmental protection efforts.

In contrast, the second perspective below builds on recent research that adds an important nuance to the findings discussed above. For instance, whereas Brandi *et al.* (2019) argue that strong environmental provisions in developing countries’ North-South PTAs should be most influential, their findings indicate that it is the South-South PTAs that are significantly related to higher domestic environmental regulation. This is a finding in line with Zhou *et al.* (2017)’s study on how PTAs with and without environmental clauses affect PM2.5 convergence. Therefore, these findings provide the background for our second argument that South-South commitments should signal real environmental commitment. The idea behind this argument is

that the inclusion of environmental clauses in PTAs is a costly signal. Developing countries should only include such provisions in their South-South PTAs if they intend to indeed live up to their commitment.

Perspective 1: strong South-South commitment as a diffusion process

This section outlines an argument that perceives the adoption of strict environmental clauses in South-South PTAs as a mere continuation of countries' experience with such clauses in their prior (North-South) PTAs. From this perspective, little to no additional value is attributed to countries' South-South commitment since any meaningful impetus for or signal of higher environmental commitment and performance should have come with the prior North-South commitment. The rationale behind this argument is that if countries have already ratified PTAs with strong environmental clauses as part of their liberalization process with the global North, reasons pertaining to both cost calculation and experience should make it more likely that these countries also adopt such standards in their South-South agreements. Any meaningful changes to domestic environmental commitment and performance should thus come with the prior North-South commitment and not with the South-South commitment.

This argument is based on the literature on policy diffusion, which argues that policy choices of one actor, mostly countries, are shaped by the previous policy decisions of other actors (Dobbin *et al.* 2007, Graham *et al.* 2013). Various mechanisms can lead to such diffusion processes: Constructivists, for example, argue that new policies spread if the norms underlying these policies become socially accepted. A second mechanism is coercion, whereby powerful actors urge countries to adopt a specific policy using aid conditionality or trade ties to apply pressure. Economic competition is yet another mechanism as countries competing for the same investor base or the same export markets may adopt similar policies out of necessity. A fourth mechanism of diffusion is learning from one's own experiences or from other countries. In the context of learning, international institutions, such as PTAs, can play a crucial role since '(...) either as agents or as sets of rules that enhance transparency, appear to have had important effects on information flows and policy transmission' (Dobbin *et al.* 2007, p. 462). Finally, there is emulation, which differs from learning in that the adopter does not take any potential new circumstances into account when deciding for the new policy but simply copy-pastes the existing policy.

For an argument based on the diffusion rationale, both coercion and learning/emulation should play decisive roles. For one, an element of coercion is present in the context of first adopting environmental clauses in North-South agreements, as outlined in detail in the previous section. Whether such

North-South commitment is indeed associated with an actual increase in either domestic environmental commitment or performance is not necessarily important for this argument. However, what is essential for this argument is that if a developing country decides to increase its domestic environmental commitment/performance, it will already come with the North-South commitment and not later with its additional South-South commitment. Thus, for a developing country prepared to adhere to the environmental commitment as part of its North-South PTA, this impetus should suffice such that this country adheres to this commitment. Any additional South-South commitment should, from this perspective, not matter much in addition since for most environmental clauses, e.g., the commitment to biodiversity or measures to mitigate climate change, adherence is a matter of nation-wide regulation. Therefore case-wise, adherence is often hardly possible. Hence it hardly makes sense for firms to comply with environmental standards only in the circumstances relevant for the specific PTA and not otherwise as either firms restructure their production process entirely according to the new rules, or not. Hence, first adoption of most environmental clauses implies that the cost for subsequent compliance should be much lower. Thus, any further (South-South) commitment should not matter much.

In addition, learning and/or emulation, in the form of copy-pasting, should become relevant. Using automatic text analysis, Allee and Elsig (2019) find that up to 90% of PTA texts are taken from previous agreements. For two reasons, countries might perceive such copy-pasting an attractive option: First, using existing text is less time-consuming than drafting new texts. Second, predictability should be higher for existing texts simply due to higher levels of experience with the old text. Uncertainty over how a specific legal text affects member states should thus be lower if similar texts have been applied in other contexts (e.g., past agreements). This additional diffusion pathway would therefore explain why developing countries would opt after the initial commitment to environmental provisions in their North-South PTAs to include such clauses also in future South-South agreements. Policy continuation seems simply more intuitive than discontinuation since countries would have to make an intentional decision to break with commitment from the past, which, from a diffusion perspective, they are unlikely to do; a rationale in line with recent research on the diffusion of environmental clauses in PTAs (Morin *et al.* 2019).

Taken together, the argumentation presented in this section results in the following hypothesis:

Hypothesis 1: Any higher domestic environmental commitment or performance should be related to North-South PTA commitment to environmental standards and not to additional environmental provisions in South-South agreements.

Perspective 2: strong South-South commitment as real commitment

The second perspective, in contrast, argues that committing to environmental clauses in South-South PTAs entails specific costs and should not be undertaken if these standards were merely a hollow commitment. We develop this argument in several steps.

First, the negotiation of a PTA is a process that is important for the partner countries. PTAs bind their member countries for many years to the negotiated commitments, have significant consequences, and are negotiated by experts. Average negotiation time for these treaties is three years (Lechner and Wüthrich 2018) and countries fight hard about the contents of these agreements.⁶ Thus, it is rather unlikely that countries include specific standards without considering their consequences and without deliberately wanting them inside these agreements. While countries might want to copy-paste specific formulations, the inclusion of specific standards without intending them to be part of the agreement is rather unlikely. Therefore, this perspective argues that developing countries should only include strict environmental clauses in their South-South PTAs if they purposefully want these standards to be included. Inclusion of these standards should thus signal that the parties to the agreement consider them important and that these standards are meant to be credible commitment devices intended to induce the desired policy changes (Guzman 2005).

Of course, countries do not necessarily and under all circumstances intend to comply with their international commitments and could simply include these clauses in their South-South PTAs to increase their reputation. Yet committing to such standards is rarely costless (Hollyer 2011, Spilker and Böhmelt 2013). For example, it might be that specific actors, such as (international) environmental NGOs, hold governments accountable to environmental clauses in PTAs (Simmons 2009), and a government suddenly finds itself in a dilemma to either not comply with its international commitment or to comply with something it did not intend to. While this dilemma can arise in North-South PTAs too, developing country governments, in this case, have the possibility to blame the partner in the North, which pressured for the respective clauses, in case it does not want to comply (Vreeland 2003). However, this strategy is hardly possible if countries have committed deliberately to such clauses. Consequently, this second perspective argues that in South-South PTAs, the reputational costs of non-compliance with such standards are larger than in cases of North-South agreements (Guzman 2002).⁷ Thus, developing countries should only include these clauses if they want to signal real environmental commitment. Otherwise, they should simply refrain from including these standards, which is the less costly option if a country does not want to comply with these standards anyways.

Furthermore, since in our empirical analysis, we identify environmental standards in PTAs as those standards that go beyond GATT/WTO Article XX on General Exceptions, these standards are not simply vague commitments but rather clearly defined obligations. Therefore, these standards typically leave little ambiguity regarding what is required for implementation (Chayes and Chayes 1993). As a result, all relevant actors, e.g., legislative bodies, courts, as well as involved firms and interest groups, should have a precise understanding of which actions align with the respective standards and which do not. This diminished treaty ambiguity gives all actors reduced leeway to implement less stringent policies and find loopholes in regulations. In addition, civil society actors have a clear standard to which to hold government and firms accountable. This should allow NGOs, other concerned civil society actors, and the general public to better lobby governments to implement and adhere to the required changes, as argued already in the preceding paragraph (Simmons 2009).

All in all, this second perspective, therefore, argues that developing countries that intentionally include environmental clauses in their South-South PTAs should be more interested in the adoption of these standards than developing countries that were pressured to do so. Therefore, we expect that countries that deliberately include such standards in their PTAs should live up to these commitments and thus be more likely to improve their domestic environmental performance.⁸

Hypothesis 2: Developing countries with higher environmental commitments in their South-South PTAs are likely to also maintain higher environmental commitment and performance than countries with lower environmental commitments in their South-South PTAs irrespective of their North-South PTA commitment.

Meaningful diffusion? An empirical assessment

With our empirical tests, we assess whether environmental commitments in South-South PTAs are mere mirrors of North-South commitments that have no real-world relevance or whether such commitments imply an intrinsic motivation to protect the natural environment. To this end, we rely on a quantitative analysis including 168 non-OECD countries. We test our argument in two ways: First, we rely on a cross-sectional analysis using countries' commitment levels in the Paris Agreement on Climate Change. Second, we use time-series cross-section analysis based on three measures of domestic environmental performance that, in contrast to the Paris Agreement commitment levels, vary over time.

We measure environmental commitment using both Intended Nationally Determined Contributions (INDCs) and Nationally Determined Contributions (NDCs) in the context of the Paris Agreement. In the lead-up to the adoption of the Paris Agreement in 2015, 160 countries submitted their intended goals, which were converted to Nationally Determined Contributions once countries formally joined the agreement. We chose the Paris Agreement's INDCs and NDCs for two major reasons: First, since the Paris Agreement was only negotiated in 2015, it is a recent example of environmental cooperation and thus allows us to incorporate most PTAs in our sample. Second and more importantly, the Paris Agreement is the only international environmental cooperation effort that allows countries to specify their own national commitment level. While other international environmental agreements specify obligations for all countries alike or for specific groups, the Paris Agreement allows all member countries to provide their own commitment levels. Consequently, we observe commitment levels that vary by country, a unique and crucial feature of the Paris Agreement.

We rely on data provided by Pauw *et al.* (2016), who collected information on 68 items or aspects that are part of any (I)NDC. Countries either mentioned or not mentioned these items or completely refused to submit an NDC. Among those countries that mention an item, some strongly bind themselves to the obligation by means of conditionality while others avoid such conditionality. The dataset accounts for these different commitment levels. Items range from aspects on climate change mitigation, climate change adaption over finance and support to the planning process of future NDC formulations. We aggregate the individual data points to one final index on INDC and one on NDC commitment levels.⁹ Since not all countries submitted NDCs and because countries had the chance to update the content, the INDC-score and the NDC-score vary slightly, yet with high correlation ($r = 0.81$).¹⁰ Figure 2 shows the commitment levels across countries – with India, Morocco, Uganda, Vietnam, and Zambia signaling the greatest ambitions in fighting climate change.

To analyze whether commitment levels in South-South PTAs also relate to de facto environmental protection levels, we rely on three additional dependent variables. First, we use the most recent data for the Environmental Performance Index (EPI) for the years 1990–2017 provided by Hsu (2016). This variable measures countries' environmental performance relating to various aspects, such as waste-water treatment, tree-cover loss, fish stock exploitation, terrestrial biome area protection, and population-weighted exposure to PM2.5. Second, we use SO₂ emission per capita, a commonly used proxy of domestic environmental quality (Bernauer *et al.* 2010, Spilker 2012) relying on data from Stern (2005). Third, we take Carbon Dioxide (CO₂) per capita as the third dependent variable in terms of performance, provided by the World Bank Indicators Database. Since CO₂ per capita is

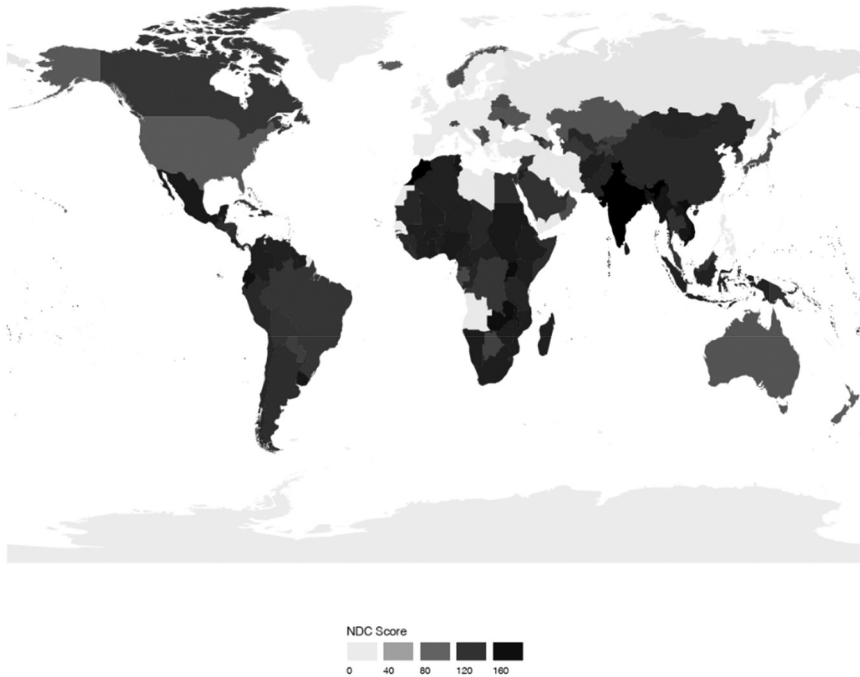


Figure 2. NDC scores (data from Pauw *et al.* 2016).

harder to disentangle from economic growth than SO_2 per capita (Jaunky 2011), the results relating to CO_2 per capita should be interpreted with some caution.

We capture environmental commitment in South-South and North-South PTAs using data collected by Lechner (2016). Lechner coded 55 items on environmental protection in 644 PTAs and aggregated these using latent trait analysis.¹¹ The resulting index captures the degree to which a PTA regulates environmental protection issues, whereby a higher degree of regulations means higher precision, obligation, and delegation of environmental aspects (see Abbott *et al.* 2000) for further details on the legalization concept).

Due to the different nature of our dependent variables, we rely on two different measures of environmental commitment in PTAs: For all analyses using dependent variables that capture overall environmental performance, i.e., the INDC, NDC, and EPI models, we rely on an overall measure of environmental commitment in PTAs. For all analyses using a dependent variable that captures more specific forms of environmental performance, i.e., SO_2 per capita and CO_2 per capita, we use a more precise measure on pollution reduction in PTA instead. The overall measure takes all 55 data points into account. The more particular pollution measure uses two data points capturing whether the PTA calls for pollution reduction in the main

text and whether the signatory parties refer to international treaties that deal with pollution reduction. Appendix B illustrates the coding with some PTA examples.

We test our two hypotheses from three different angles: In the first model, we use the maximum mode of legalization index in South-South PTAs (EP in South-South PTA (max)) and the maximum index in North-South PTAs (EP in North-South PTA (max)) as main explanatory variables.¹² In the second model, we add the interaction-term of these variables – South-South and North-South PTA environmental commitment – to test whether the inclusion of strong commitment to environmental standards in South-South PTAs is in fact related to higher domestic environmental commitment or performance when going beyond the North-South commitment. In the third model, we rely on a measure that captures the degree to which a country goes beyond any commitment it has experienced with a Northern country. More precisely, we count only those provisions that a particular country uses in its South-South PTAs but has never committed to in past North-South agreements. Costa Rica, Uganda, and Zambia are examples of countries that in their South-South PTA commitment go beyond their environmental commitments in North-South PTAs.¹³

In addition to the main explanatory variables, we add several control variables. First and most importantly, the model includes a dummy variable capturing whether countries did not commit to environmental provisions in PTAs at all. We also control for the number of environmental treaties a country is a member of to capture the salience of environmental protection for the country more generally. We combine data from the UN homepage (UN body environmental treaties), the Kyoto Protocol, the Basel Convention, and the Convention on Biodiversity websites.¹⁴ In the model using INDC as dependent variable, we add SO₂ emissions per capita at year t-1 to account for past domestic environmental performance. The Polity 2 score provided by Marshall *et al.* (2012) accounts for the level of democracy since a large body of literature shows that democracies tend to have higher levels of environmental commitment (Bättig and Bernauer 2009, Povitkina 2018).

Moreover, we expect that environmental NGOs might influence environmental commitment and performance. Thus, we include the number of such groups registered in a country provided by Böhmelt *et al.* (2015) and Bernauer *et al.* (2013). Due to the stickiness of this variable, we imputed the data with the latest available value. Next, our expanded model covers GDP per capita and GDP growth. Both variables stem from the World Bank. The logic here is that richer countries might find it easier to commit to environmental protection. Export as well as import volume as percentage of GDP accounts for trade vulnerability of a country. As Lechner (2016) has

shown, import competition might, due to protectionist pressures, result in fewer EP clauses. Population density, provided by the World Bank, accounts for pressures on the government to deal with environmental issues.

Furthermore, we include the industry sector, both for agriculture land per total land and for value-added of the manufacturing industry as percentage of GDP to account for domestic economic pressures against higher environmental commitments. The data source is again the World Bank. Finally, the models on EPI, SO₂ per capita, and CO₂ per capita cover year-fixed effects.

We lag the explanatory and control variables by one year to account for potential time lags between PTA ratification and the increase in environmental commitment.

Findings

Table 1 shows the results of a linear regression model using Nationally Determined Contributions (NDCs) as the dependent variable. Since countries have so far only submitted one set of NDCs, the model is cross-sectional with all independent variables measured in 2014. The findings in Table 1 provide no support for Hypothesis 2 and at best weak evidence for Hypothesis 1. Tentatively, the results show that the commitments in North-South PTAs correlate positively with stronger commitments in the context of the Paris Agreement. For commitments in South-South PTAs, we observe the contrary: Higher commitments in PTAs are sometimes even negatively associated with climate change pledges in the context of the Paris Agreement. Also, columns 2–3 in Table 1 and Figure 2, which is based on Model 2 in Table 1, suggest that additional South-South commitment correlates – if at all – negatively with NDC commitment levels.¹⁵

In contrast to environmental commitments in the form of NDCs, the results in Table 2 and Figure 4, which show the findings of linear time-series cross-section regression models, provide clear support for Hypothesis 2, suggesting that environmental standards in South-South PTAs are not merely cheap talk. Higher environmental standards in South-South PTAs are related to a higher EPI score and lower SO₂ per capita emissions. This applies to all set-ups: The inclusion of the separate terms (e.g., EP in South-South PTA and EP in North-South PTA), the design difference to past North-South PTAs, and the interaction effect. The coefficients in the model using CO₂ per capita as outcome variable have the same sign but fail to meet standard significance levels. As noted above, since, in contrast to SO₂, it is much more difficult for countries to decouple CO₂ from economic growth, this result is as expected.

Concerning the control variables, we find that no environmental commitment in PTAs correlates with lower commitments in the context of the Paris Agreement and poorer environmental performances. Thus, countries not showing any meaningful commitment to environmental standards

Table 1. Baseline model: environmental commitment.

	NDCs Model 1	NDCs Model 2	NDCs Model 3
EP in S-S PTA (max)	-11.29*** (3.19)	11.07 (8.94)	
EP in N-S PTA (max)	3.60 (2.21)	18.59*** (6.02)	
EP in S-S PTA x EP in N-S PTA (max)		-4.07*** (1.53)	
Design diff. to past N-S PTA			-0.18 (0.27)
No EP commitment in PTA	-70.79** (29.23)	12.74 (42.41)	-43.15 (28.13)
Environmental Treaty Membership	-6.74 (4.17)	-6.16 (4.08)	-10.94*** (4.07)
SO ₂ per capita	1.37* (0.80)	1.50* (0.78)	1.43* (0.83)
Polity 2 score	-1.57** (0.63)	-1.33** (0.62)	-1.95*** (0.64)
GDP per capita	-0.00* (0.00)	-0.00 (0.00)	-0.00 (0.00)
GDP growth	1.94** (0.76)	2.14*** (0.75)	2.15*** (0.79)
Exports (perc. of GDP)	-1.20*** (0.31)	-1.25*** (0.30)	-1.28*** (0.32)
Imports (perc. of GDP)	0.42 (0.29)	0.41 (0.29)	0.45 (0.31)
Agriculture	-0.05 (0.17)	-0.01 (0.17)	-0.04 (0.18)
Manufacturing	-0.31 (0.65)	-0.28 (0.64)	-0.51 (0.67)
Population Density	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
R2	0.47	0.49	0.42
Adj. R2	0.42	0.44	0.37
Num. obs.	154	154	154

***p < 0.01; **p < 0.05; *p < 0.1.

independent of the partner country being an industrial or a developing country generally seem less eager to protect their domestic natural environment, a finding in line with both perspectives presented above. Moreover, we see a positive effect for environmental treaty membership and numbers of NGOs on protection levels, but not for commitment. The effect of democracy varies between the different dependent variables: While it has no or even a negative effect on the commitment level in the Paris Agreement, it has a positive effect on the EPI and a negative, i.e., emission-reducing, effect for SO₂ as well as CO₂. This finding is only partly in line with existing research, which argues that the positive effect of democracy should be larger for climate change policies than for climate change action, i.e., performance (Bättig and Bernauer 2009). However, in our case, we observe the opposite: the positive effect is larger for all types of performance measures compared to our commitment level (NDCs). Trade tends to affect the environment negatively though not always significantly so. A strong agriculture sector has a negative effect on the

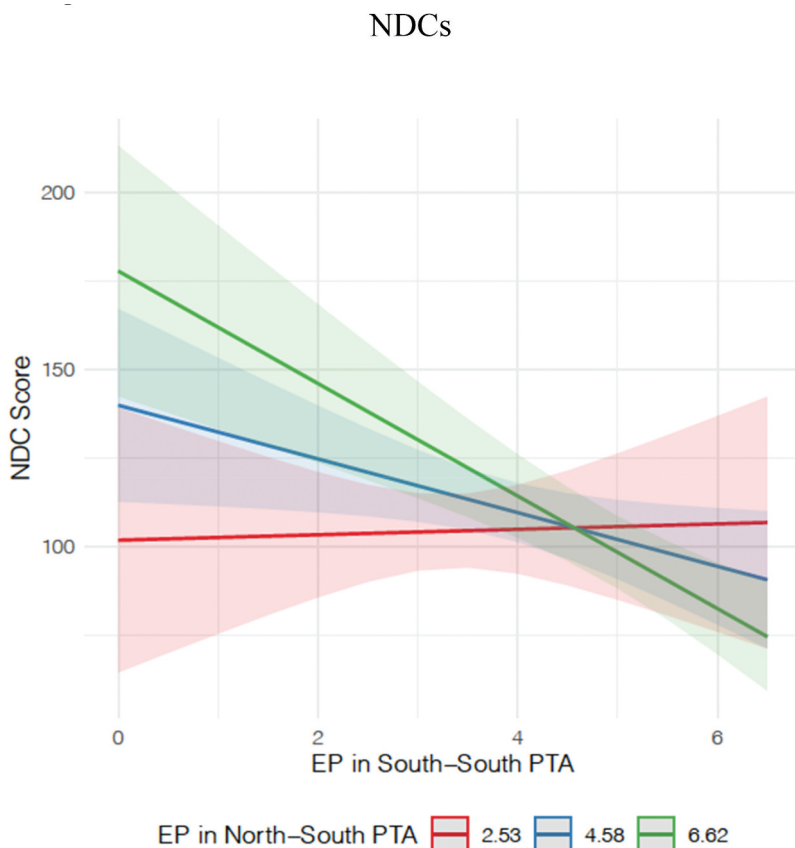


Figure 3. Moderating effect of North–South commitments over South–South commitments on NDCs. Note: [Figure 3](#) is based on Model 2 in [Table 1](#) and shows the marginal effect of an increase in the number of environmental provisions (EPs) in North–South PTAs conditional on the number of EPs in South–South PTAs on countries NDC scores for three scenarios: the lower quantile, the median and the upper quantile of the number of EPs in North–South PTAs.

Environmental Protection Index and a small positive, i.e., emission-reducing, effect on SO_2 and CO_2 emissions. Manufacturing shows the exact opposite effect, as expected.

Robustness checks

To test the robustness of our results, we estimate a range of alternative specifications. First, we use the latest instead of the maximum environmental commitment in PTAs. Next, we drop emerging economies. More specifically, we create a subset with all developing countries except BRICs (Brazil, Russia, India, and China) and the next eleven countries in terms of GDP per capita

Table 2. Baseline model: environmental performance.

	EPI	EPI	SO ₂ per Capita	SO ₂ per Capita	CO ₂ per Capita	CO ₂ per Capita
EP in S-S PTA (max)	1.72*** (0.13)					
EP in N-S PTA (max)	-0.31*** (0.09)					
Design diff. to past N-S PTA		0.12*** (0.01)		-0.02*** (0.00)		-0.00*** (0.00)
Pollution reduction in S-S PTA (max)			-0.25*** (0.06)		-0.02 (0.01)	
Pollution reduction in N-S PTA (max)						
No EP commitment in PTA	-0.04 (0.87)	-3.96*** (0.79)	1.13*** (0.16)	0.14 (0.10)	-0.17*** (0.03)	-0.15*** (0.02)
Environmental Treaty Membership	0.30*** (0.09)	0.35*** (0.09)	-0.06** (0.02)	-0.04* (0.02)	0.01* (0.01)	0.01* (0.01)
Number of NGOs	0.10*** (0.04)	0.10*** (0.04)	-0.03*** (0.01)	-0.03*** (0.01)	0.00* (0.00)	0.00* (0.00)
Polity 2 score	0.57*** (0.03)	0.60*** (0.03)	-0.00 (0.01)	-0.00 (0.01)	-0.01*** (0.00)	-0.00*** (0.00)
GDP per capita	0.00* (0.00)	0.00* (0.00)	0.00* (0.00)	0.00* (0.00)	0.00* (0.00)	0.00* (0.00)
GDP growth	0.06*** (0.02)	0.06*** (0.02)	-0.01 (0.01)	-0.01 (0.01)	-0.00 (0.00)	-0.00* (0.00)
Exports (perc. of GDP)	0.06*** (0.01)	0.07*** (0.01)	0.01*** (0.00)	0.02*** (0.00)	0.00*** (0.00)	0.00*** (0.00)
Imports (perc. of GDP)	-0.06*** (0.01)	-0.06*** (0.01)	0.00 (0.00)	0.00 (0.00)	0.00*** (0.00)	0.00*** (0.00)
Agriculture	-0.02*** (0.01)	-0.03*** (0.01)	-0.01*** (0.00)	-0.01*** (0.00)	-0.01*** (0.00)	-0.01*** (0.00)
Manufacturing	0.10*** (0.02)	0.09*** (0.02)	0.03*** (0.01)	0.03*** (0.01)	0.00 (0.00)	0.00 (0.00)
Population Density	0.00*** (0.00)	0.00*** (0.00)	0.00*** (0.00)	0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)
Num. obs.	4555	4555	5556	5556	5556	5556
R ₂ (full model)	0.56	0.55	0.56	0.55	0.51	0.51
R ₂ (proj model)	0.22	0.21	0.08	0.07	0.50	0.50
Adj. R ₂ (full model)	0.55	0.54	0.55	0.55	0.51	0.51
Adj. R ₂ (proj model)	0.22	0.20	0.07	0.06	0.49	0.49
Num. groups: year	28	28	38	38	38	38

***p < 0.01; **p < 0.05; *p < 0.1.

(Bangladesh, Egypt, Indonesia, Iran, Mexico, Nigeria, Pakistan, Philippines, South Korea, Turkey, and Vietnam). In another model, we omit all control variables.

Finally, we consider that developing countries might systematically select themselves into PTAs including strong environmental commitments. We, therefore, estimate both a regular two-stage Heckman selection model or a two-stage Heckman selection model for panel data (Heckman 1977; Wooldridge 1995). With this alternative modeling strategy, we acknowledge that a country's decision to include environmental clauses in its South-South

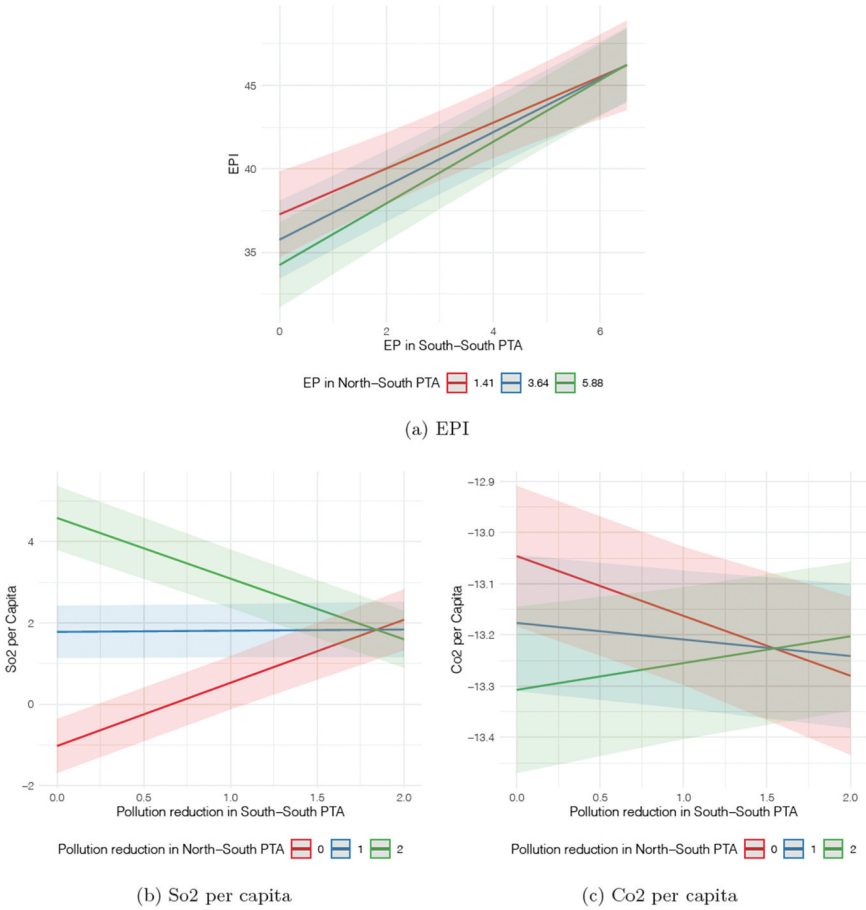


Figure 4. Moderating effect of North-South commitments over South-South commitments on environmental performance. Note: Figure 4 is based on the results in Table A.2 in the Appendix and shows the marginal effect of an increase in the number of environmental provisions (EPs) in North-South PTAs conditional on the number of EPs in South-South PTAs on countries NDC scores for three scenarios: the lower quantile, the median and the upper quantile of the number of EPs in North-South PTAs.

PTAs is likely driven by similar factors as its domestic environmental protection level. For a longer discussion on why we use a Heckman model and its specification, see section E in the online Appendix.

Across all these specifications, our results remain stable in terms of sign, significance, and magnitude. We report all tables and figures in Appendix E.

Conclusion

The inclusion of environmental standards in preferential trade agreements has been treated in the literature as a mechanism for the highly regulated North to impose these standards on the reluctant but indulgent South. However, what happens if the South is not so reluctant after all? Based on the nascent but growing literature on environmental clauses in PTAs (Bastiaens and Postnikov 2017, Brandi *et al.* 2019), we evaluate two perspectives on the implications of such South-South commitment. Perspective 1 sees high South-South commitment to environmental standards in PTAs mostly as a continuation, i.e., diffusion, from countries' North-South commitment. Perspective 2, in contrast, suggests that developing countries that deliberately commit to environmental standards in their economic ties with other developing countries should be more likely to mean what they write and thus show higher domestic environmental commitment and performance.

Our empirical testing strategy is based on original data on 55 environmental provisions in 479 PTAs and a novel measure on commitment levels in the Paris Agreement on Climate Change and three indicators of domestic environmental performance – the EPI, SO₂, and CO₂ per capita emissions. The results of our analysis backed up by various robustness checks show a clear pattern, which, however, is only partly in line with the two perspectives. With regard to environmental commitment, which we operationalize using the NDCs submitted under the Paris Agreement, we find weak support for the first perspective and no support for the second. Seen from this angle, our findings seem to suggest that if at all it is the North-South commitment that matters for additional environmental protection efforts. However, this picture completely changes if we look at any of the performance-based measures. In this case, our results provide strong evidence in favor of the second perspective: Developing countries that intentionally include stringent environmental standards in their PTAs seem to do so with real intentions since they also have higher environmental protection levels.

These findings are in several ways noteworthy, if not partially surprising. First, while some studies actually find that environmental clauses in South-South PTAs are associated with higher environmental performance (Zhou *et al.* 2017, Brandi *et al.* 2019), these findings were either unexpected or even in contrast to what authors argued. To the best of our knowledge, our paper is therefore the first to provide an explicit theoretical perspective to rationalize these findings and test this perspective against the alternative view that such South-South commitment merely happens as result of a diffusion process. Second and somewhat surprisingly, we find, in contrast to what much literature argues (e.g., Bättig and Bernauer 2009), that the positive effect of South-South PTA commitment to protect the environment is larger for performance measures compared to climate change policies (NDCs). One

potential reason for this result could be the particular nature of the NDCs. We chose NDCs as our commitment measure in the first place because they allow us to compare the same type of environmental commitment across a large set of various different country contexts. Comparing domestic environmental commitment levels is otherwise often difficult since different countries regulate different environmental topics unequally, making it hard to compare such commitments. This positive aspect of relying on NDCs as our measure of environmental commitment could, however, be outweighed by the fact that certain countries might make too strong promises in their NDCs without really intending to comply with all of them. Seen from this angle, the performance measures might be more meaningful since they show real environmental protection efforts.

Due to its focus on environmental commitment and performance in the global South, our paper serves as a bridge between several strands of the literature that have been rather unrelated. In particular, we combine the literature on non-trade clauses in PTAs (Lechner 2016, Bastiaens and Postnikov 2017) with the growing field of research concentrating on environmental politics in developing countries (Cao and Prakash 2010, Spilker 2012, 2013, Prakash and Potoski 2017) as well as with scholars of environmental politics analyzing voluntary environmental commitments (Khanna 2001, Prakash and Potoski 2006). An implication of our findings is to provide some positive news for policymakers since they suggest that even without the North imposing environmental clauses on developing countries, the latter often intrinsically commit to environmental protection in their trade agreements. Environmental protection clauses in South-South PTAs are – in the end – more credible than previously assumed. These ambitions in protecting the environment are also reflected in real-world events and seem to be more than ink on paper: Between 2018 and 2020, nearly 2,400 Fridays for Future demonstrations took place in non-OECD countries (Lechner and Spilker 2021). The pressure for environmental protection in developing countries is thus likely to remain and maybe even grow.

Notes

1. We define countries from the Global North as OECD members and countries from the Global South as non-OECD members. Data stems from Lechner (2016). We discuss details of this dataset in the empirical section and the Appendix. Also note that in the following text, we use the term ‘provision’, ‘clause’ and ‘standard’ interchangeably.
2. Developed countries have on average ten agreements with other developed countries and 36 agreements with developing countries.
3. We show in the empirical section that indeed the design of environmental clauses in countries’ North-South and South-South agreements differ.

4. Empirically, the pollution haven evidence is still disputed with some studies finding little to no evidence in favor of the pollution haven hypothesis (Gamso 2017), some finding support for it (Kolcava *et al.* 2019) and still others finding mixed evidence (Baumert *et al.* 2019).
5. Under the Central American Free Trade Agreement (CAFTA), Pac Rim Caman LLC filed an ISDS-case against El Salvador, who refused the establishment of a gold mine due to environmental concerns. CAFTA covers a provision emphasizing that the signatory parties must live up to their domestic environmental law. In the end, environmental law was prioritized over investment law and the Canadian mining company lost the case (Gallus 2013).
6. We do not claim that environmental standards necessarily prolongate PTA negotiations. Instead, we emphasize that in the context of long negotiations, there is no reason to rush and to copy-paste entire sections without carefully thinking about whether them. We show in the empirical section that in fact many South-South commitments differ in their design to the corresponding North-South commitments.
7. An example that illustrates such public pressure in a country of the Global South is Costa Rica. Here public pressure resulted in a referendum on the CAFTA-DR PTA to which Costa Rica is a member. One worry of those who protested was in fact the potential (negative) environmental consequences from this agreement (Ribando 2005).
8. This theoretical expectation is backed by recent studies on the popular demand of environmental protection in developing countries (e.g., Bernauer and Nguyen 2015).
9. Since all items are ordinal with a higher score signaling stronger commitments, we create the total sum across all 68 items.
10. We use 2014 as baseline year for the INDC models and 2016 for the NDC models. Due to the high correlation, we put the INDC model in the Appendix.
11. Appendix A contains a detailed codebook and further information on the aggregation method.
12. The rationale for using the maximum is that it is the most binding in the sense of most ambitious commitment for the respective countries involved. However, to test the robustness of our results, we also use the latest value of EP commitments in PTAs since this measure might better reflect the current government's priorities.
13. For instance, out of the 55 items in the dataset, Costa-Rica committed to 35 items in its South- South PTAs and has never used those items in its agreements with a Northern partner. Uganda did so for 34 and Zambia for 31 items.
14. Link to Kyoto protocol: <https://unfccc.int/process/the-kyoto-protocol>; Link to Basel Convention: <http://www.basel.int/>; Link to UN body environmental treaties website: http://ozone.unep.org/new_site/en/treaty_ratification_status.php; Link to Biodiversity website: <http://www.cbd.int/information/parties.shtml>.
15. Note that the EP in North-South PTA measure is continuous; only for the purpose of graphical illustration, three arbitrary levels were chosen: here 2.53 (red), 4.58 (blue), and 8.62 (green).

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No potential conflict of interest was reported by the author(s).

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