

Pursuing Environmental and Social Objectives through Trade Agreements

Joseph Francois, Bernard Hoekman,
Miriam Manchin and Filippo Santi

WTI working paper no. 08/2022

u^b

^b
UNIVERSITÄT
BERN

Pursuing Environmental and Social Objectives through Trade Agreements *

Joseph Francois, Bernard Hoekman,

Miriam Manchin and Filippo Santi

November 20, 2022

Abstract: Using a large dataset covering more than 180 countries and spanning several decades, we employ a SDID estimator to identify the extent to which trade agreements incorporating non-trade provisions (labor standards, environmental protection and civil and political rights) are associated with improvements in corresponding non-trade performance indicators. We distinguish between binding (enforceable) and non-binding provisions in trade agreements, and also control for the allocation of official development assistance targeting these three non-trade policy areas. Overall, the results suggest that efforts made to date to include non-trade provisions in trade agreements have not resulted in consistent desired (better) non-trade outcomes.

Keywords: Non-trade policy objectives, trade agreements, trade and environment, trade and human rights, trade and labour rights

JEL codes: F13, F16, F17, F18, F35, O19

*corresponding email: miriammanchin@gmail.com

We are grateful to Ryan Abman, Keith Maskus, Michele Ruta and participants in the World Bank conference Deep Trade Agreements: Effects Beyond Trade for comments on an earlier draft. This paper has benefited from support from the World Bank's Umbrella Facility for Trade trust fund financed by the governments of the Netherlands, Norway, Sweden, Switzerland and the United Kingdom, and builds on research supported by the European Union Horizon 2020 research and innovation program (RESPECT).
Joseph Francois, WTI University of Bern, 3012 Bern, CH

Bernard Hoekman, EUI, Via della Badia dei Roccettini, 9, 50014 Fiesole FI, IT

Miriam Manchin, Politecnico di Milano, Piazza Leonardo da Vinci 32, 20133 Milano IT

Filippo Santi, EUI, Via della Badia dei Roccettini, 9, 50014 Fiesole FI, IT

1 Introduction

The number of preferential trade agreements (PTAs) has been increasing steadily since the 1980s, as has both the number of signatories and the number of non-trade policy areas included in such agreements. (Dür *et al.*, 2014; Lechner, 2018; Mattoo *et al.*, 2020). Indeed non-trade provisions (NTPs) are a prominent feature of the more recent PTAs concluded by the EU and the US, as well as by many other OECD member countries. They pertain to such matters as environmental protection, labor standards and human rights, and have become central to the underlying political support and ratification process surrounding negotiated PTAs. (Hoekman and Rojas-Romagosa, 2022). Figure 1 highlights this trend, showing growth in the inclusion of provisions on civil rights, environmental protection, and labor rights in trade agreements.¹ Given the central role of such issues in recent public policy debate on globalisation in general and trade agreements in particular, whether the inclusion of NTPs actually supports the realisation of underlying non-trade policy objectives (NTPOs), i.e. have they actually worked to promote climate and socioeconomic goals, is a fundamental policy question.

While NTPs are trending features of trade agreements, the same cannot be said for national performance itself in the same areas. Figure 2 provides a snapshot of changes over time and across countries in outcomes, using aggregate indexes constructed for the three main issue areas of interest in this paper.² The maps in Figure 2 depict changes in non-trade outcomes over time for all countries worldwide between 1995 and 2015. They reveal that for several developing countries in Africa, Asia and South-America, there was a significant improvement in environmental outcomes, while the trend appears to be less positive in terms of labor and civil rights protection. There is also clearly significant heterogeneity across indicators and countries, with deterioration in non-trade outcomes observed in numerous cases. Thus, although PTAs have increasingly focused on non-trade issues, it is not immediately clear that performance in terms of non-trade outcomes has broadly improved.

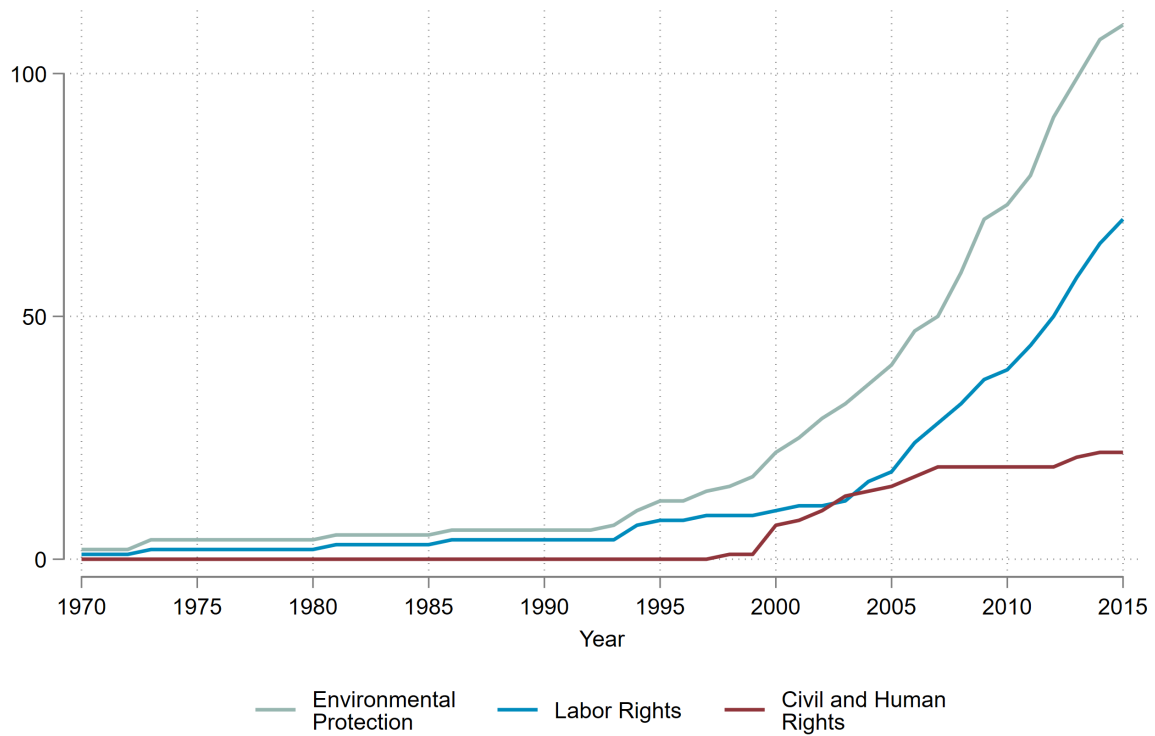
In this paper we examine the relationship between NTPs in PTAs (Figure 1) and a range of specific outcome indicators (in particular those underlying Figure 2) that are associated with different NTPOs, utilising new data on trade agreement coverage (Mattoo *et al.*, 2020) combined with the synthetic difference in difference (SDID) estimator recently proposed by Arkhangelsky *et al.* (2021). We focus on three questions. First, has the inclusion of NTPs in PTAs actually led to improvement in associated non-trade outcomes? Second, are NTPs more effective if they constitute hard (binding, enforceable) commitments? Third, what is the relationship between the nature of NTPs – hard or

¹The underlying data for Figure 1 come from the dataset used later in this paper, as discussed in Section 2.

²The underlying data for the changes shown in Figure 2 are a composite of our source data used later in this paper, as discussed in Section 2.

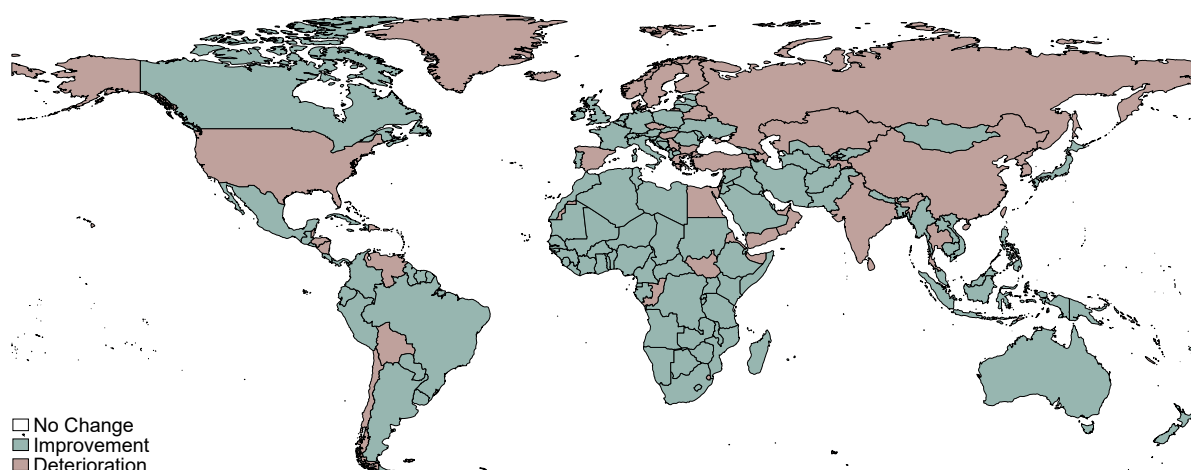
soft – and official development assistance targeting projects and programs that seek to improve performance in a given non-trade area?

Figure 1: *Evolution of provisions on environment, labor, civil and political rights in PTAs*

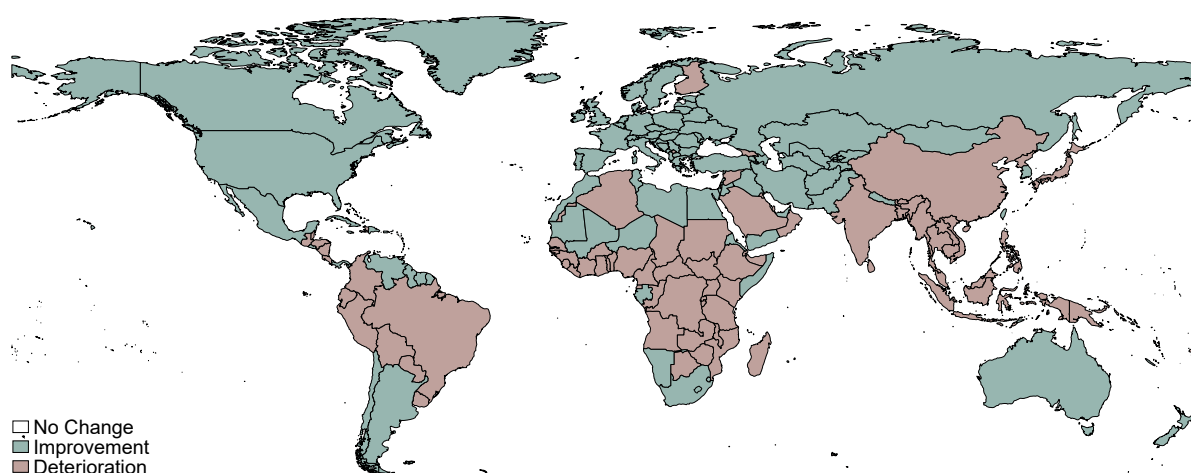


Notes: Number of issue specific provisions signed in PTAs by countries in our sample over the period 1970-2015. Source: [Hofmann et al. \(2019\)](#).

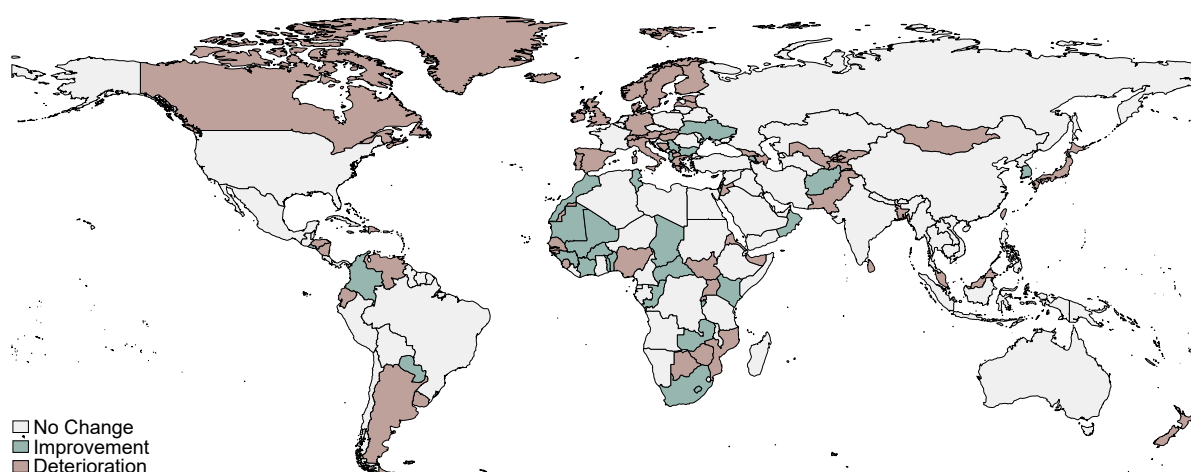
Figure 2: *Non-trade outcomes across the world, 1995-2015*



Civil Rights



Environmental Protection



Labor Rights

Notes: Percentage variation in Civil Rights, Environmental, and Labor Rights Protection which occurred between 1990 and 2015.

The effectiveness of NTPs depends on the nature of the commitments. These often take the form of soft law provisions that provide a framework for policy dialogue on the matters covered. Many proponents of NTPs argue that effectiveness calls for commitments on non-trade issues to be binding and enforceable through dispute settlement procedures.³ Others argue soft law provisions that are not subject to dispute settlement processes are more likely to be effective in improving non-trade outcomes insofar as they involve (support) a process of active engagement between the governments and stakeholder groups concerned. In practice such engagement centres on non-trade policy instruments. In the case of PTAs that encompass developing countries, official development assistance (ODA) can also be an important instrument for targeting specific non-trade goals.

Robust empirical evidence on the effects of NTPs is both relatively scarce and limited in scope. Much of the economic and political science literature adopts a cross-PTA approach combined with a focus on a specific NTPO of interest when seeking to identify causal relationships. Examples include [Baghdadi *et al.* \(2013\)](#), [Abman and Lundberg \(2020\)](#), [Abman *et al.* \(2021\)](#), and [Abman *et al.* \(2022\)](#) on environmental and air quality; [Van den Putte \(2015\)](#), [Aissi *et al.* \(2018\)](#), and [Lundberg *et al.* \(2022\)](#) on labor and workers' rights and [Zerk \(2019\)](#) on civil and human rights. More recent studies focus on even more specific and narrowly defined non-trade outcome or performance measures, such as geo-located tree coverage ([Abman *et al.*, 2021](#)).⁴ Most of the empirical studies in this area fail to apply methods that actually permit identification of a causal relationship between PTAs and NTPOs. Those that do generally find no effects, and sometimes negative effects on policy outcomes of interest.⁵ When viewed collectively, the limited econometric evidence is not promising, and suggests that including NTPs in trade agreements is not

³The literature on the effectiveness of binding vs. non-binding provisions in treaties (and the associated institutional conflict resolution mechanisms) goes well beyond PTAs. For example, [McLaughlin Mitchell and Hensel \(2007\)](#) find that peaceful resolution of disputes between states is more likely if pertinent treaties establish binding conflict resolution mechanisms services by an international organisation. This was also illustrated in a recent review of the EU's policy on Trade and Sustainable Development (TSD). The review centred on both the consultation processes associated with trade policy formation and implementation in the EU ([Marx *et al.*, 2016](#); [Hoekman and Rojas-Romagosa, 2022](#)) and the design and content of TSD chapters included in EU PTAs ([Velut *et al.*, 2022](#)). The EU has announced its intention to pursue greater emphasis on compliance and enforcement in future negotiations.

⁴Yet another set of studies is built largely around case studies, focusing on specific countries or specific provisions of PTAs. (See e.g. [Hafner-Burton, 2009](#); [Kim, 2012](#); [Spilker and Böhmelt, 2013](#); [Postnikov, 2014](#)) [Hafner-Burton \(2009\)](#) argues that binding human rights clauses in trade agreements are more likely to induce compliance. This finding has been qualified by [Spilker and Böhmelt \(2013\)](#), who show that the positive effect decreases if account is taken of potential selection bias.

⁵For instance, [Abman *et al.* \(2021\)](#) explore the causal impact of environmental provisions in PTAs, specifically looking at the impact of environmental protection obligations on forest coverage loss. Their estimates suggest that PTAs tend to increase pressure on the environment (especially, via deforestation in developing countries), although this negative impact can be at least partially offset by the inclusion of binding environmental protection obligations. [Tian *et al.* \(2022\)](#) estimate that the growth in production and trade flows created by the regional comprehensive economic partnership (RCEP) will lead to an increase in global CO2 emissions, dominating any potential mitigation commitments from its members.

associated with substantive improvement in targeted policy outcomes.⁶

We break with the recent literature by adopting a broader perspective, focusing collectively on three policy domains: environmental protection, labor market regulation, and civil, social and human rights promotion. We also seek to identify (test for) explicit causal relationships between NTPs and a broad range of associated non-trade outcomes across these three policy areas. In doing so, we make a number of contributions. First, based on data provided by [Mattoo *et al.* \(2020\)](#) we are able to differentiate between NTPs according to whether or not they are actually enforceable. We classify NTPs as binding if they can be invoked in a formal (legal) dispute settlement mechanism, and non-binding otherwise. Second, we explicitly allow for heterogeneity when estimating the effects of NTPs in a PTA. Such heterogeneity in effects may reflect the power relationship between trading partners as much the type of commitment made. Specifically, we differentiate between the average total effect of including a NTP in a PTA that has EU or the US as a signatory, from those that do not include the EU or the US, also distinguishing between binding and not binding provisions. Finally, we evaluate the relationship between NTPs and official development assistance (ODA) allocated to the respective policy area of interest, assessing whether ODA allocations differ depending on whether NTPs are binding or not.

Based on average treatment estimates using the Synthetic Difference in Difference (SDID) estimator proposed by [Arkhangelsky *et al.* \(2021\)](#), we find that NTPs dealing with labor, civil and human rights have no effect on associated outcome indicators, with the exception of binding NTPs in EU PTAs. With EU PTAs we find a significant reduction in worker protection. We also find only mixed evidence on whether NTPs improve environmental outcomes, with coefficient estimates for binding versus non-binding NTPs sometimes having opposite signs, suggesting the type of NTP – hard or soft – may matter for different types of activities and thus outcomes. Overall, our findings suggest an absence of consistent and statistically significant causal relationships between NTPs and labor and civil rights, and indicative evidence of ambiguous effects of environment-related NTPs and certain types of environmental outcomes. Differences in estimates for binding vs. non-binding NTPs suggest this dimension of NTPs may be important for environmental outcomes. In addition, we find that ODA tends to decrease after signing a binding NTP, and to increase with non-binding NTPs, although the relationship is statistically significant only in some issue areas. This is consistent with the notion that soft law provisions will be associated with other instruments if they are to be effective.

The rest of the paper proceeds as follows. Section 2 introduces our data on NTPs in PTAs and on indicators that measure different dimensions of the non-trade issues asso-

⁶This does not apply to trade commitments, i.e., so-called WTO-plus provisions that deepen PTAs relative to the WTO. For example, [Breinlich *et al.* \(2022\)](#) adopt a machine learning approach to study the effect of WTO-plus PTA provisions, finding positive effects for provisions on areas covered by the WTO, such as subsidies and product standards.

ciated with those NTPs. In Section 3 we discuss our methodology and present empirical results. We first analyse non-binding NTPs, comparing signatory countries to other countries that did not sign any PTA with the NTP of interest, and then assess binding NTPs. This is followed by a SDID analysis focusing on the relationship between binding vs. non-binding provisions and ODA. We conclude in Section 4.

2 Data

We combine information from three sources. Data on NTPs come from the World Bank Deep Trade Agreement Database (Hofmann *et al.*, 2019; Mattoo *et al.*, 2020), which covers all non-trade related provisions included in 279 agreements signed between 1958 and 2015.⁷ The dataset covers 14 “core” provisions that reconfirm existing WTO disciplines or impose additional obligations in policy areas that are covered by the WTO, as well as 38 provisions in areas that go beyond the WTO. In addition to reporting on the existence of an obligation on a certain subject, the dataset also provides information on the legal nature of provisions, including their enforceability. We focus on three WTO-extra provisions in PTAs – those related to civil and human rights protection (CHR), labor rights protection (LAB), and environmental protection (EP). We reduce the original bilateral dataset to a panel defined at *country*year* level. For each country, we consider the year it signs a PTA containing the provisions of interest, the partner country (whether it includes the EU, the US, or other countries), and whether the obligations arising from the agreement can be considered as binding (i.e., if they are subject to some form of legal enforceability). In case a country signs more than one agreement, we consider the first one in which a provision is signed and assume that it stays in force even when additional agreements (possibly with different sets of partners and different sets of obligations) are signed. We allow for the level of legal enforceability to change over time with subsequent agreements.

We merge these data on country level PTA provisions with the NTPOID_v2 dataset (Manchin, 2021) on non-trade related outcomes. The TPOID_v2 dataset contains data along economic, political, environmental, and social dimensions for a broad range of indicators. The data were themselves constructed by integrating multiple sources from the economics and the international political economy literatures.⁸ We further integrate both datasets with the Environmental Performance Index (EPI) score database (Wendling

⁷The data includes information about legal enforceability for 52 selected policy areas in total. An extended version of the dataset provides more detailed indicators for a subset (18) of these policy areas, and covers the period 1958-2017. For our purpose we work with the agreements signed in the period 1995-2015. See <https://datatopics.worldbank.org/dta/about-the-project.html>.

⁸In particular, the Political Institutions 2017 Codebook (DPI) database, the International Political Economy Data Resource database - Version 3.0 (IPE), the Structural policy indicators database for economic research (SPIDER), the 2018 Quality of Government dataset (QoG) and the World Bank World Development Indicators.

et al., 2020). The EPI score data provide several indicators related to climate, environmental health, and ecosystem vitality, and assign scores based on their performance (from 0 to 100 - from worst to best) to each country. We map the relevant outcomes to each of the three policy domains of interest, provided they are available for a long enough time-span for a large number of countries. The conditions of continuity and sufficient time span reduce the set of suitable indicators for labor, civil and human rights, which are mostly covered by indices characterised by limited variability, a short time span, or periodic breaks. Nonetheless, we are able to work with a range of indicators for all three policy areas. (See Table A-5 for the final list of indicators.)

The resulting dataset includes several environmental outcome indicators, including measures of different types of pollution, habitat preservation, and forest protection. In the analysis that follows we use 14 environmental outcome indicators. Three of these are obtained from the World Bank World Development Indicators: the ratio of CO₂ emissions in kg to GDP (in PPP \$), forest area (% of land area) and SO₂ emissions. Eleven additional outcome measures are sourced from the EPI data. These include 2 measures related to Climate Change mitigation - black carbon intensity and greenhouse gas emissions (measured in terms of average annual rate of increase); 3 indicators related to Environmental Health (PM2.5 exposure, NOx Intensity, and Ozone Exposure, all measured using the number of age-standardised disability-adjusted life-years lost per 100,000 persons due to exposure to ground-level ozone pollution); and 6 measures of Ecosystem Vitality - the protected areas representativeness index (the proportion of biologically scaled environmental diversity included in a country's terrestrial protected areas, with higher values reflecting better performance), the species habitat index (the proportion of suitable habitat within a country that remains intact for each species in that country relative to a baseline set in the year 2001), the sustainable nitrogen management index measuring the efficiency in application of nitrogen fertiliser with maximum crop yields (higher values indicating worse performance), a species protection index (SPI) measuring the species-level ecological representativeness of each country's protected area network, tree cover loss (five-year moving average of the percentage of forest lost relative to forest cover in 2000), and wetland loss (quantified using a five-year moving average of the percentage of gross losses in wetland areas relative to a 1992 baseline). In all cases, sometimes counterintuitively, a higher value indicates a better performance with respect to the outcomes of interest.⁹

For labor rights we work with two outcome variables: the *Mosley-Uno labor rights* indicator, a measure of collective labor rights, and the *QOG worker rights* indicator, an composite index measuring: freedom of association in the workplace; the right to bargain collectively and a prohibition on the use of any form of forced or compulsory labor; a minimum age for the employment of children; and acceptable conditions of work with

⁹See further details on the dataset at <https://epi.yale.edu/>.

respect to minimum wages, hours of work, and occupational safety and health.

For civil and human rights, we use an electoral democracy index – *polyarchy* – a measure of freedom of expression, obtained from the *Variety of Democracy database*, which ranges between zero and one, with higher values indicating better outcomes; a female political participation (*empowerment*) index; a *political liberties* index; and an index for the *freedom of association*. The latter measures the right of citizens to assemble freely and to associate with other persons in political parties, trade unions, cultural organisations, or other special-interest groups.

In order to improve the match between treated countries and their synthetic counterfactual, we also include additional controls capturing a broad set of country characteristics. We compute measures of country-level economic openness using trade data from the UN COMTRADE database (excluding gas and oil trade), as well as measures of market and country size (population, GDP, per capita GDP, income group). Finally, data on Official Development Assistance provided to a country are sourced from the OECD Creditor Reporting System, which includes disaggregated data on aid allocated to specific policy areas and sectors. In the analysis we use ODA allocated for environmental projects, labor protection and for political and civil rights.¹⁰

The resulting combined dataset covers more than 120 countries for which we have an uninterrupted series for both the outcome and the explanatory variables required for the analysis and for which we have a long enough stretch of pre-treatment and post-treatment observations. In order to balance the scope of our analysis with our data availability, we focus on all PTAs signed between 1995 and 2010. Thus we set the pre- and post- treatment periods to a minimum of 5 years respectively.¹¹ We restrict the partner countries in PTAs that include the EU, US or other OECD countries to a set of low and middle income non-EU countries.¹² When we look at the EU, US, and rest-of-world (ROW) agreements, we further restrict the sample of potentially treated countries by excluding all those with socio-economic conditions comparable to the EU or the US.¹³ The rationale for this additional restriction is that such countries might already apply high standards in the non-trade outcomes of interest. For instance, with respect to the EU or the US, we exclude high income countries such as Canada, New Zealand and Australia. The countries that are not considered in each exercise are listed in Table A-1 in the appendix.

¹⁰Since the the Synthetic DID algorithm includes country and time fixed effects, we are also able to control for time invariant country characteristics such as geographic location.

¹¹Despite the limited temporal span, in a few cases we nonetheless were forced to partially impute some covariates and outcome indicators to preserve a minimum sample size.

¹²We exclude EU accession countries from the sample, given the special nature of the provisions on their agreements with the EU.

¹³ROW refers to all agreements signed with all possible non-EU, non-US partners. This includes but is not limited to other OECD countries such as Australia, Japan, Switzerland and Korea, and all partners in South-South PTAs involving non-OECD countries.

Table 1 summarises the number of PTAs with binding or non-binding NTPs in our sample, as well as the number of countries which have accepted such provisions. While the EU has both binding and non-binding provisions (except in civil and human rights areas where it only has non-binding provisions), the US only has binding NTPs in its PTAs, and does not include provisions on civil and human rights. Most provisions overall are in environment. Similarly, most countries signed environmental provisions, with close to 80 countries signing both binding and non-binding environmental provisions. Annex Table A-2 provides further information on signatories of PTAs with NTPs, including the number of “overlapping provisions” – instances where a country has accepted NTPs in more than one PTA.

Table 1: *Agreement and Signatories by provision*

Panel A: Agreements with active provision								
	ALL		EU		USA		ROW	
	Not Binding	Binding	Not Binding	Binding	Not Binding	Binding	Not Binding	Binding
Environment	57	54	18	16	0	12	39	26
Labor	20	50	4	15	0	12	16	23
CHR	21	2	16	0	0	0	5	2
Panel B: Countries with active provision								
	ALL		EU		USA		ROW	
	Not Binding	Binding	Not Binding	Binding	Not Binding	Binding	Not Binding	Binding
Environment	78	77	17	26	0	18	73	63
Labor	30	66	2	26	0	18	35	52
CHR	53	8	18	0	0	0	38	8

Notes: Panel A reports the number of agreements including either an Environmental, a Labor, or a CSHR related provision. Panel B lists instead the number of signatories. The notation “Binding” refers to all provisions that also establish some form of legal mechanisms to guarantee the compliance.

3 Empirical specification and results

3.1 Synthetic difference in difference estimation

Evaluating the existence, sign and magnitude of the causal effect of NTPs on corresponding non-trade outcomes in partner countries is a major challenge. On the one hand, countries that commit to a given NTP might differ from those who do not, violating the parallel trends assumption that is necessary in most causal inference applications. This implies that identifying a suitable counterfactual scenario (what would have happened if a country did not sign a PTA with the provision of interest?) is usually very difficult. On the other hand, the staggered nature of PTA adoption by countries makes it difficult to create control units across time needed for counterfactual analysis (i.e., how to estimate the effect of signing a given NTP, when countries may do so at different points in time

and possibly, accept the same type of provision with different partners?). To address both of these issues, we apply the Synthetic Difference-in-Differences (SDID) estimator proposed by [Arkhangelsky et al. \(2021\)](#).

The SDID estimator combines the desirable features of difference in difference estimators (DID) and the flexibility of the synthetic control methodology. In non-technical terms, the SDID can be regarded as a “doubly-weighted” two-way fixed effects (TWFE)-DID estimator, where unit- and time-specific weights are computed from the data to (a) *align* pre-exposure trends in outcomes for treated (in our case, countries signing a PTA with a given NTP) and non-treated countries; and (b) *balance* pre-exposure and post-exposure time periods to reduce the influence of the staggered nature of signing PTAs. These two forms of “weighting” turn the TWFE estimator from being “global” to “local” by constructing a suitable control group, giving more relevance to countries that are more similar to the “treated” ones, and more weight to time periods that are proximate to the treatment itself.

The constructed comparability that derives from the double-weighting procedure allows the SDID estimator to potentially compensate for a lack of parallel pre-trends between treated and untreated units in the raw data, an issue that might affect the robustness of traditional DID estimators. At the same time, because of the inclusion of two-way fixed effects and of a different weighting algorithm, it does not require an exact match of pre-treatment trends of treated and non-treated units, a rarely satisfied requirement of the synthetic control method ([Hollingsworth and Wing, 2020](#); [McClelland and Mucciolo, 2022](#)).

Equation 1 presents the basic optimization process implemented by the SDID estimator to identify the average causal effect of the treatment on the treated countries (referred to as τ)

$$(\hat{\tau}, \hat{\mu}, \hat{\alpha}, \hat{\beta}) = \arg \min_{\tau, \mu, \alpha, \beta} \left\{ \sum_{i=1}^N \sum_{t=1}^T (Y_{i,t} - \mu - \alpha_i - \beta_t - W_{i,t}\tau)^2 \hat{\omega}^{sdid} \hat{\lambda}_t^{sdid} \right\} \quad (1)$$

The part of equation 1 in parentheses reports the TWFE component of the SDID estimator, where the term $Y_{i,t}$ refers to the pre-exposure trend in the outcome variable of interest for the signatory (i.e. the performance of a PTA signatory country with respect to a given nontrade outcome of interest); α_i is the equivalent of the [Abadie et al. \(2010\)](#) term for the effect of the intervention for the country i , while β_t controls for the difference between exposed and unexposed countries (i.e between those countries who signed a given PTA provision and those that did not) at time t ; and $W_{i,t}\tau$ denotes the exposure to a (binary) treatment, taking value 1 in the post-signing period. The first term outside of the parentheses ($\hat{\omega}^{sdid}$) is similar to the unit weights in [Abadie and Gardeazabal \(2003\)](#) used to construct the synthetic counterfactual. Finally, $\hat{\lambda}_t^{sdid}$ represents the time weight used to discount the distance in time across different treatment periods across

countries. While the latter term is a new addition compared to previous estimators, the two parameters allow weighting the difference between treated and control units (from the TWFE component) by how much the two are comparable.¹⁴

We use the SDID estimator to identify the average treatment effect on the treated (hereafter, the ATT) of signing a PTA containing at least one NTP addressing one of the three policy domains of interest: environmental protection, labor market regulation, and civil and human rights promotion. We consider a country as “treated” (or “exposed”) if it signs an agreement that includes the provision of interest in a given year.¹⁵

Following the synthetic control and DID literature, we include a set of additional country characteristics to improve the matching between PTA signatories and control units. Table A-3 in annex A reports the basic summary statistics for the covariates included in the matching algorithm of the SDID. We include three measures of market size and wealth (GDP, population and GDP per capita), a measure of government accountability to proxy for the government commitment to comply with international agreements (from the WDI database), the value of total exports and the share of total exports accounted by the EU and the US, respectively. Keeping everything else equal, a larger reliance on trade is likely to increase compliance with non-trade provisions. Similarly, greater reliance on trade with the EU and the US (the two top NTP advocates globally) is more likely to improve compliance.

As discussed above, we also consider a potential complementary mechanism, in the form of ODA projects targeting environmental protection, labor market regulation, and civil and human rights promotion. ODA constitutes a potentially important instrument to support efforts by countries that sign PTAs with NTPs to implement provision-related policy changes. In the case of soft law NTPs we expect ODA to be an important channel for efforts to improve outcomes in an area, given that partner countries do not undertake binding policy (or performance) commitments. In the cases where NTPs are binding, the enforceable nature of the commitments may also be complemented by ODA-related support, but a binding NTP might also be regarded by a donor country as a substitute for ODA, inducing a reduction in the rationale for assistance. Alternatively, insofar as countries accept binding NTPs they may already have better underlying performance, or there may be a presumption that ODA is no longer needed to attain a particular norm, and that what is needed is assurance of sustained implementation or compliance.

¹⁴Most of the tests showing the consistency of SDID under different weighting schemes performed by Arkhangelsky *et al.* (2021) are based on a single treated unit. We exploit the foundation for the staggered treatment scenario in their Appendix A, where they allow for multiple treated units and multiple treatment periods. Pailańir and Clarke (2022) implement both procedures in STATA, allowing for the inclusion of additional covariates to improve the matching in the pre-treatment period.

¹⁵If a country has signed more than one agreement containing the same provision in the period of interest, the earlier one is chosen.

3.2 *Non-binding provisions*

We first investigate the impact of non-binding NTPs on indicators of related non-trade outcomes. We compare outcomes in countries signing non-binding NTPs to those observed in countries that do not sign any agreements with the relevant NTPs considered (i.e., we exclude those countries that, at some point over the period we are considering or before it, sign a PTAs with binding NTPs). Table 2 provides the average treatment on the treated (ATT) effect of signing into a non-binding provision, distinguishing between environmental protection, labor market regulation, and civil and human rights outcomes.

The first two columns report the ATT from non-binding NTPs included in all the agreements signed over our period of interest, as well as the estimated average percentage changes that the ATT translates into, compared to the sample average. The second two columns pertain to non-binding provisions included in EU trade agreements (with no subsequent provisions being signed with the US.) Finally, the last two columns report results for PTAs with countries other than the EU or the US, again limiting the sample to countries that have not signed NTPs with the EU or the US.¹⁶

The results for environmental performance indicators are heterogeneous. When considering all agreements, just 6 out of the 14 indicators considered point to a positive association with environmental NTPs. A statistically significant improvement (at the 10% confidence level) however is only observed for greenhouse gases. Conversely, we find that signing a PTA without a binding environmental provision leads, on average, to a significant deterioration in four more indices of environmental quality; CO2 emissions, ozone exposures, protected areas and sustainable nitrogen management in agricultural production.¹⁷

Figure 3 complements the table reporting the standardised coefficients and their statistical significance for the sample of all PTAs. The standardised coefficients highlight that among environmental outcomes, the most pronounced estimated change is the increase in CO2 emissions. Other estimated changes are smaller in magnitude and in relative terms.

In the case of EU PTAs with non-binding NTPs, none of the outcomes changed significantly, except tree coverage, for which there is a significant deterioration, equivalent to an 11% decrease compared to the mean (see Table 2). Results for other countries' PTAs are somewhat more similar to those of the overall results for all PTAs, in that the estimates suggest a significant increase in CO2 emissions, deterioration in ozone exposure, protected areas, and nitrogen management, coupled with a smaller improvement in the greenhouse gases emissions (of about 40% and 4.09% respectively). In addition, there is an estimated reduction in forests, equivalent to about 2.7% of the average in the sample

¹⁶We do not look separately at US agreements as the US does not have non-binding NTPs in its PTAs. The full Synthetic DID output tables are reported in annex section B.

¹⁷The (+)/(-) sign reported next to each indicator in Tables 2 and 3 refers to the direction associated to an improvement in the related indicator. Overall, a negative sign points to an improvement only for CO2 and SO2 emissions.

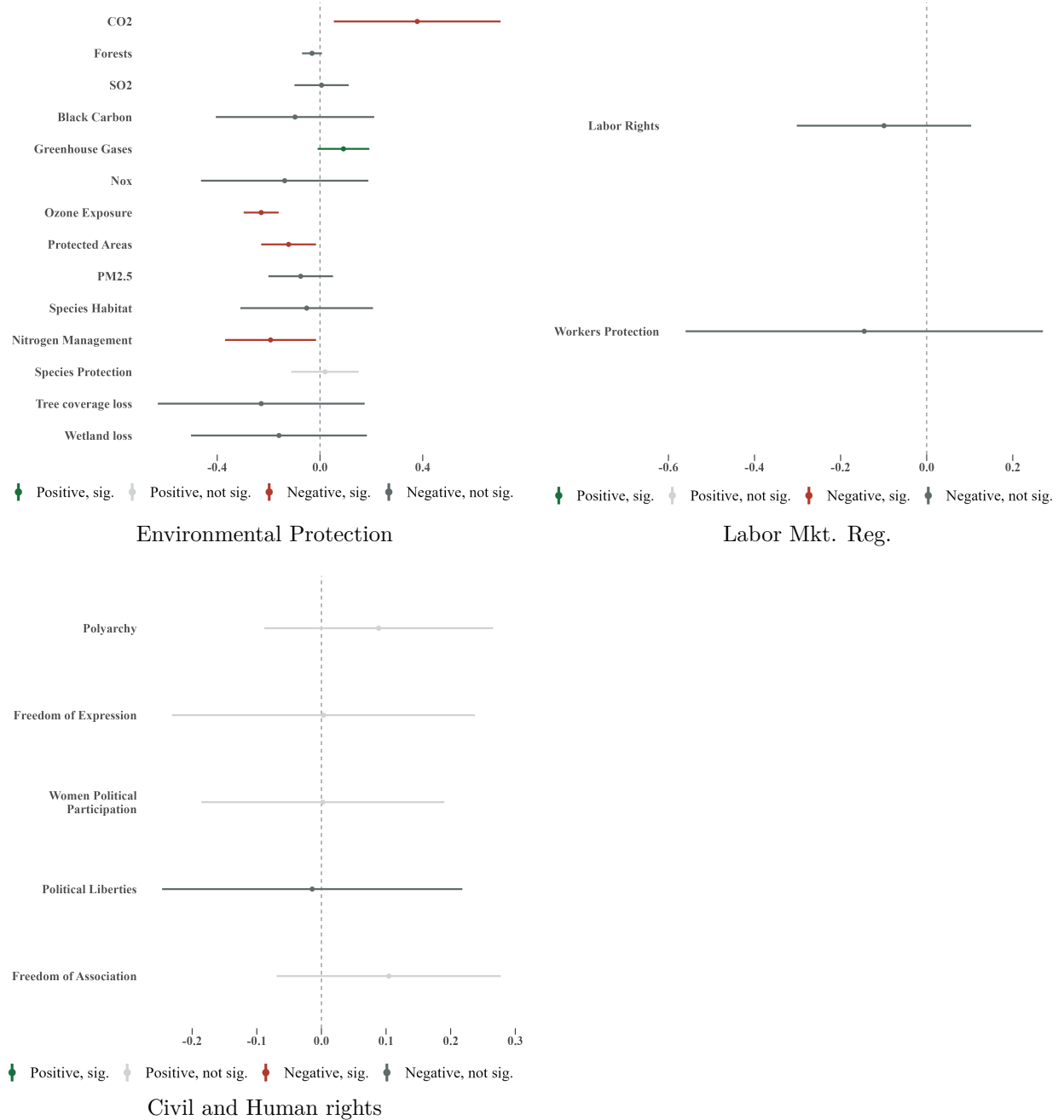
and an increase in wetland loss. These findings are consistent with the the literature, and points to the pressure put on the environment by the increase in production and trade associated with the signing of a PTA. Basically, we take this to mean that while the core commitments of the trade agreements studied led to pressure for environmental degradation, the flanking features of those agreements, in the form of non-binding NTPs, failed to ameliorate those pressures. No significant effects are found for the other two issue areas, labor and worker rights and political and civil rights.

Table 2: *Average Treatment Effect on signatories - Non-Binding Provisions.*

	Variable		All agreements		EU		Rest of the World	
			ATT	δ pct.	ATT	δ pct.	ATT	δ pct.
Environment	CO2	(-)	0.141	48.17%	-0.007	-2.33%	0.116	39.84%
	Forests	(+)	-0.766	-2.35%	0.314	0.96%	-0.878	-2.70%
	SO2	(-)	3.870	0.80%	10.261	-2.13%	3.695	0.77%
	Black Carbon	(+)	-2.350	-4.56%	-5.995	11.65%	-1.083	-2.10%
	Greenhouse Gases	(+)	2.315	3.93%	-1.059	1.80%	2.408	4.09%
	Nox	(+)	-2.809	-5.98%	6.296	13.42%	-3.340	-7.12%
	Ozone Exposure	(+)	-4.556	-9.10%	1.467	2.93%	-3.807	-7.61%
	Protected Areas	(+)	-1.779	-6.64%	0.823	3.07%	-1.523	-5.68%
	PM2.5	(+)	-1.105	-2.72%	1.264	3.11%	-1.212	-2.98%
	Species Habitat	(+)	-0.557	-0.60%	2.334	2.51%	1.813	1.95%
	Nitrogen Management	(+)	-2.563	-7.68%	4.698	14.08%	-3.393	-10.17%
	Species Protection	(+)	0.487	0.74%	-0.583	-0.89%	-0.282	-0.43%
	Tree coverage loss	(+)	-3.854	-9.68%	-4.321	-10.86%	-2.336	-5.87%
	Wetland loss	(+)	-3.985	-6.96%	5.184	9.06%	-7.130	-12.45%
Labor Market Regulation	Labor Rights	(+)	-0.770	-3.35%			-1.172	-5.10%
	Workers Protection	(+)	0.094	9.86%			-0.0668	-6.98%
Civil and Human rights	Polyarchy	(+)	0.020	4.29%				
	Freedom of Expression	(+)	0.001	0.15%				
	Women Political Participation	(+)	0.000	0.07%				
	Political Liberties	(+)	-0.004	-0.65%				
	Freedom of Association	(+)	0.096	8.55%				

_Notes: Average Treatment effect on the Treated (ATT) of non-binding provision signatories. Percentage change refers to the relative change compared to the outcomes' sample averages. Bold changes signal statistically significant effects. Bold changes signal a statistically significant effects. The sign in brackets refers the direction denoting an improvement in the related outcome. Table A-5 in the annex reports the sources and summarizes the signe indicating and improvement for each outcome variable considered. Data issues prevent the estimation of EU's ATT. No US agreement include non binding provisions on Civil and Human Rights related provisions.

Figure 3: *Average Treatment Effect on the Treated - Non-Binding Provisions*



Notes: Standardized ATT effect. Plotted coefficients refer to the column “*All Agreement*” from Table 2.

3.3 *Binding provisions*

Table 3 replicates the exercise from Table 2, except that we are now focusing on binding NTPs. Similar to the previous specification, we again distinguish between all PTAs, EU agreements without US, US agreements without EU, and ROW agreements that do not include the EU or the US.

First focusing on the full sample, we find that binding NTPs are associated with a small but significant increase in forest coverage, as well as in an improvement in both PM2.5 emissions and ozone exposure index. Figure 4 plots the standardised coefficients for the sample of all agreements.

The results for all agreements and countries mask once more important heterogeneity across provisions. In the case of EU agreements we find a large and significant improvement in SO₂ emissions, equivalent to a 85% change relative to the sample average. We also find a significant improvement in NO_x emissions and ozone exposure, as well as in species habitat protection. On the other hand, in the case of the US, binding provisions lead to a significant increase in CO₂ emissions (similarly to non-binding provisions in the case of other countries), amounting to a 32% increase compared to partners not signing an agreement with the US. Furthermore, PM2.5 emissions, species protection and habitat improve significantly. Finally, looking at non-EU, non-US countries' binding provisions, the only significant impact can be found in a 4% improvement in PM2.5 emissions. Unlike in the case of non-binding provisions, there is no other significant change, despite the direction and large magnitude of the non-significant coefficients.

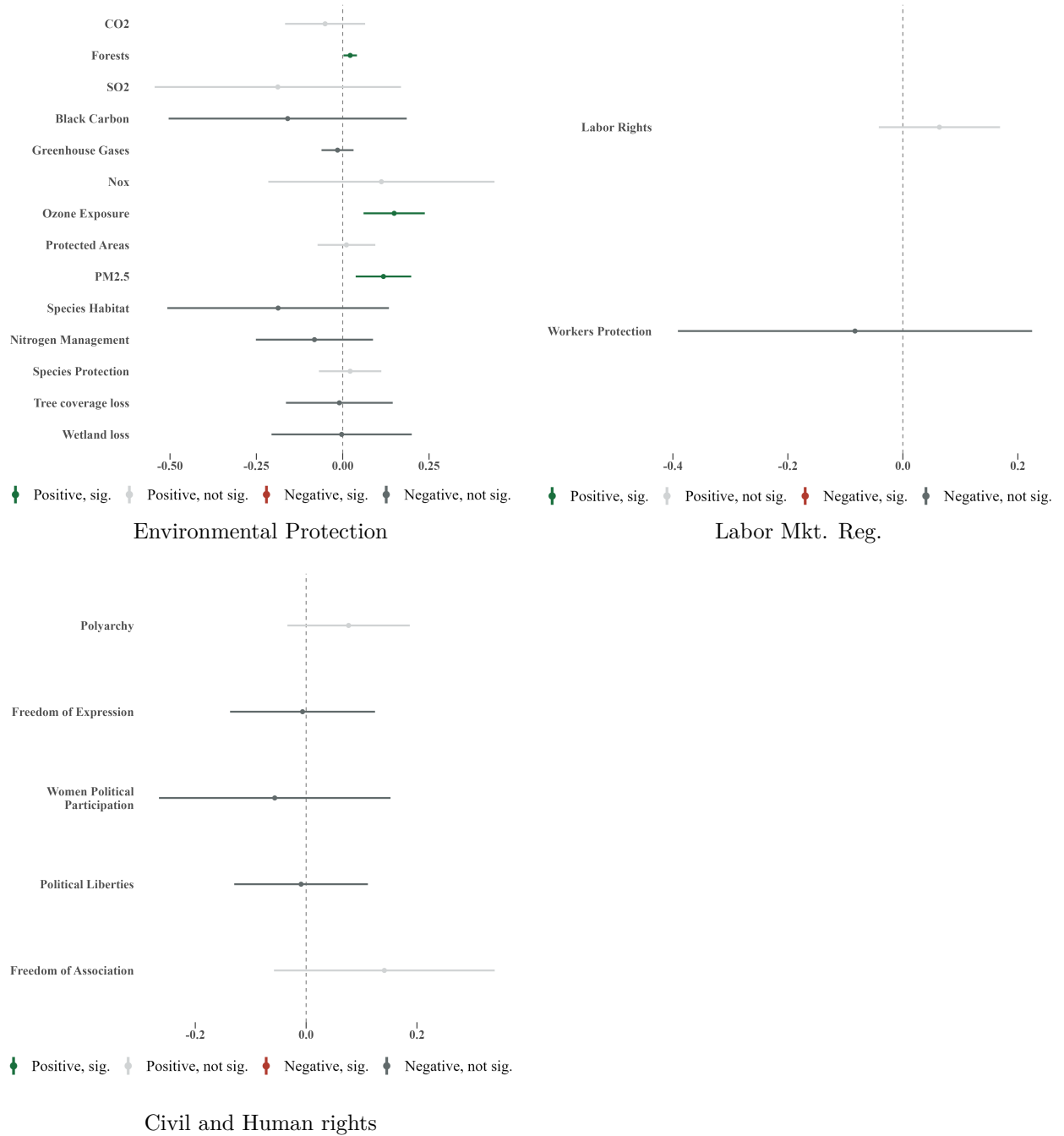
We again do not find any significant impact on political and civil right outcomes. Regarding labor market regulation and workers' protection, we find that binding provisions in EU agreements have a small but significant impact in terms of improved labor rights (the indicator used is a measure of collective labor rights), but a large deterioration in the broader measure of worker protection, which includes occupational safety and health, hours of work, and minimum age for employment of children. This latter index tends to measure more outcomes in actual work conditions. The estimated impact is a 27% decrease in this index.

Table 3: *Average Treatment Effect on signatories - Binding Provisions.*

	Variable		All Agreements		EU		USA		Rest of the World	
			ATT	δ pct.	ATT	δ pct.	ATT	δ pct.	ATT	δ pct.
Environment	CO2	(-)	-0.018	-6.08%	-0.018	-6.23%	0.094	32.17%	-0.006	-2.18%
	Forests	(+)	0.549	1.69%	0.104	0.32%	0.025	0.08%	0.162	0.50%
	SO2	(-)	-403.147	-83.81%	-411.207	-85.49%	96.687	20.10%	-787.828	-163.78%
	Black Carbon	(+)	-3.929	-7.63%	7.013	13.62%	-8.570	-16.65%	-6.579	-12.78%
	Greenhouse Gases	(+)	-0.395	-0.67%	0.305	0.52%	0.565	0.96%	-1.943	-3.30%
	Nox	(+)	2.341	4.99%	14.782	31.49%	-0.371	-0.79%	-5.692	-12.13%
	Ozone Exposure	(+)	3.147	6.29%	5.081	10.15%	0.064	0.13%	0.999	2.00%
	Protected Areas	(+)	0.179	0.67%	2.119	7.90%	0.107	0.40%	-0.064	-0.24%
	PM2.5	(+)	1.720	4.23%	-0.865	-2.13%	4.119	10.13%	1.553	3.82%
	Species Habitat	(+)	-2.679	-2.89%	2.978	3.21%	2.164	2.33%	-2.664	-2.87%
	Nitrogen Management	(+)	-1.092	-3.27%	0.589	1.77%	0.418	1.25%	-0.268	-0.80%
	Species Protection	(+)	0.511	0.78%	-0.517	-0.79%	1.483	2.26%	-1.155	-1.76%
	Tree coverage loss	(+)	-0.159	-0.40%	-0.593	-1.49%	-1.793	-4.51%	-0.758	-1.91%
	Wetland loss	(+)	-0.077	-0.13%	1.941	3.39%	-5.545	-9.68%	-5.718	-9.99%
Labor Market Regulation	Labor Rights	(+)	0.489	2.13%	0.212	0.93%	-0.125	-0.54%	0.333	1.45%
	Workers Protection	(+)	-0.050	-5.23%	-0.264	-27.53%	0.152	15.78%	-0.125	-13.08%
Civil and Human rights	Polyarchy	(+)	0.017	3.78%					-0.004	-0.81%
	Freedom of Expression	(+)	-0.002	-0.31%					-0.009	-1.65%
	Women Political Participation	(+)	-0.013	-2.02%					-0.111	-17.77%
	Political Liberties	(+)	-0.002	-0.42%					0.003	0.46%
	Freedom of Association	(+)	0.130	11.59%					0.338	30.21%

_Notes: Average Treatment effect on the Treated (ATT) of binding provision signatories. Percentage change refers to the relative change compared to the outcomes' sample averages. Bold changes signal a statistically significant effects. The sign in brackets refers the direction denoting an improvement in the related outcome. Table A-5 in the annex reports the sources and summarizes the signe indicating and improvement for each outcome variable considered.

Figure 4: *Average Treatment Effect on the Treated - Binding Provisions*



Notes: Standardized ATT effect. Plotted coefficients refer to the column “*All Agreement*” from Table 3.

3.4 *Discussion*

Overall we find that NTPs do not have a clearly identifiable impact on labor or civil rights, whether binding or non-binding, with the exception of EU binding provisions, which are actually linked to a deterioration of worker protections. In addition, there is some evidence that NTPs may affect certain environmental indicators, although there is no real indication of a structurally consistent impact across the range of environmental outcome indicators. Many estimated changes in outcomes just are not significant. Those that are significant are rather heterogeneous, with a mix of positive and negative estimates for some indicators, and with differences across EU, US and ROW agreements. Some of the statistically significant estimates imply that inclusion of NTPs is actually associated with a worsening of outcomes. A comparison of the estimates for non-binding and binding NTPs suggests that non-binding NTPs may lead to improved performance in some areas where binding provisions do not do so. Conversely, binding provisions may help improve performance in an area where non-binding NTPs do not. This suggests that the efficacy of the two types of NTPs are in the end issue-specific. Alternatively, our findings may reflect the use or non-use of complementary policies that support the implementation of NTPs and improvement of non-trade outcomes. Finally, the interaction between the basic trade provisions and NTPs needs to be better understood.

The results above highlight a need for better understand of the incentive effects and effectiveness of binding NTPs that are accompanied by legal enforcement mechanisms as compared to cooperation motivated by soft law types of NTPs. To some extent, the impact of NTPs may also be influenced by the use of complementary instruments that seek to improve non-trade outcomes. In the next section we undertake an exploratory analysis of one such instrument that may play a role in influencing whether NTPs are implemented: official development assistance.

3.5 *Development assistance and NTPs*

Development assistance-funded projects and programs that aim at improving the performance of partner countries in issue areas addressed by NTPs may influence both performance as reflected by outcome indicators the effectiveness of NTPs included in PTAs. ODA may and is provided to countries for projects in all three of the non-trade areas that are the focus of this paper. Recipients may or may not have a PTA with the donor, and these may or may not include NTPs, which may be binding or non-binding. Of interest is not only whether ODA varies with (type of) NTPs but whether ODA flows are affected by signing a NTP or a change in the type of NTP that a partner country signs.

Figure 5 plots the the average amount of ODA received by countries that have not signed PTAs that include NTPs, those that have agreed to non-binding NTPs and those

accepting binding provisions.¹⁸ There is a different pattern for environmental provisions and for all other provisions. Countries signing binding environmental provisions receive significantly more ODA than those signing non-binding provisions (or no provisions), while the opposite is true in other areas. In other words, in the case of civil and human rights and labor rights, countries with non-binding provisions receive more ODA than countries with binding provisions (or with no provisions). These differences are statistically significant, with the exception of comparing no provisions versus binding provisions in the case of labor right.

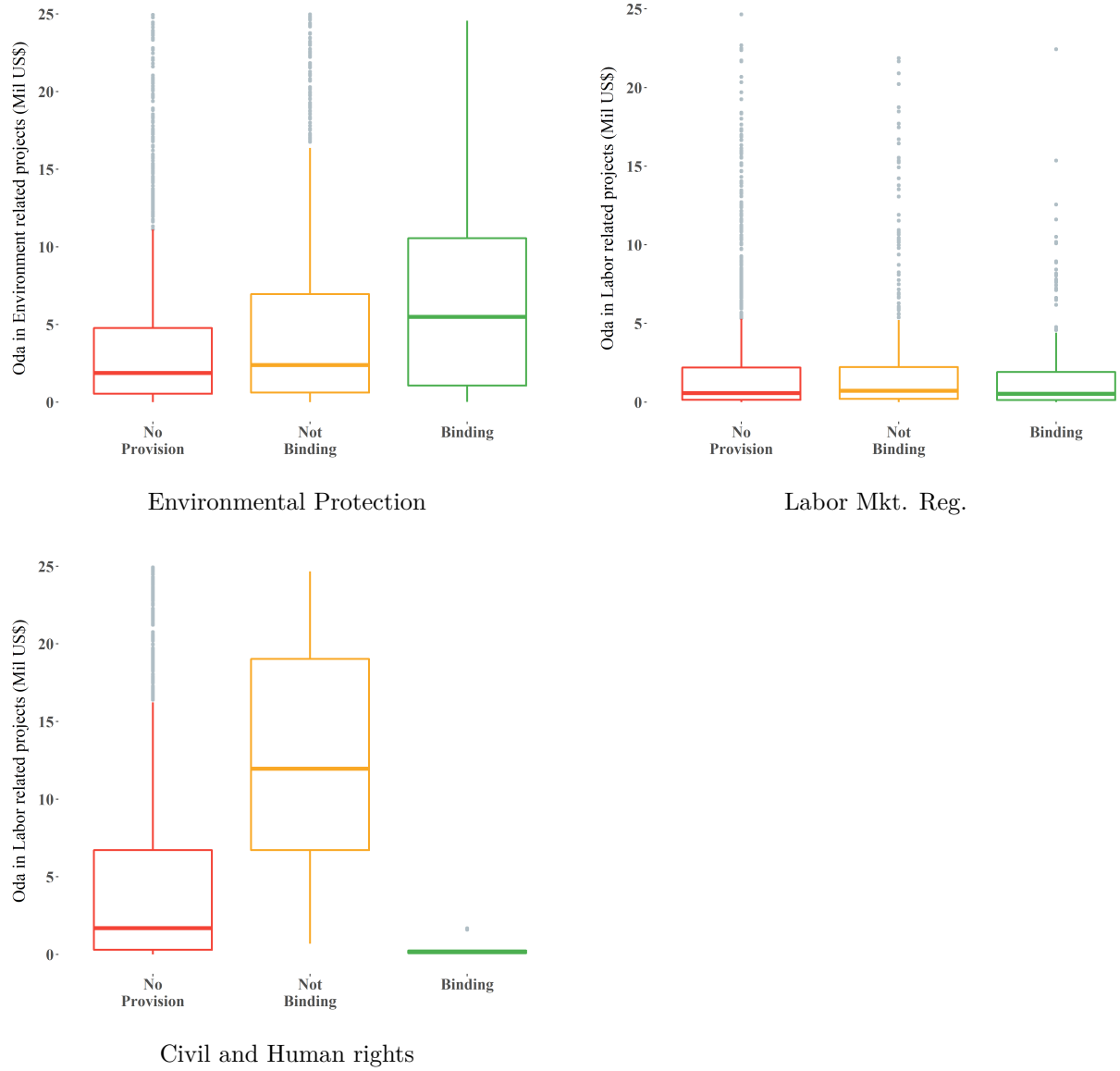
Table 4 presents SDID estimates with environment, labor and civil rights related ODA received by signatories as outcomes. The first three rows focus on the relationship between issue specific ODA and the corresponding NTP addressing the area. The last three rows instead look at the impact of issue specific provisions on total ODA. The aim is to see whether signing an agreement affects the amount of development assistance received by beneficiaries, and whether a difference exists in this respect between signing a binding provision and a non-binding one.

Under binding provisions, we find that both issue specific and total ODA decreases significantly in case of civil and human rights, while we find no significant effect for environment and labor provisions. On the other hand, our estimates show the opposite for non-binding provisions, where we observe a significant increase in ODA both in the case of environmental and civil and human rights provisions for total ODA. The magnitude of the estimated changes is non-negligible both in the case of binding and non-binding provisions.

This finding is consistent with the low efficacy of NTPs in delivering systematic, positive changes, and is also consistent with the idea that using trade policy to “enforce” non-trade related policy objectives requires other forms of support, spanning from technical to financial schemes (Yildirim *et al.*, 2021).

¹⁸Table A-6 in the Annex reports the means with t-test for the significance in mean differences.

Figure 5: *ODA and NTPs*



Notes: ODA at constant values, received by beneficiaries before and after signing an agreement. The category *No Provision* includes ODA received both by signatory countries before signing an agreement with the provision of interest and beneficiaries that never signed such provision. The remaining two categories refer to the amount of ODA received after signing an agreement including a non-binding or a binding provision respectively.

Table 4: *Average Treatment Effect on ODA recipients*

	ATT	Std. Error	δ Pct.
Binding Provisions			
ODA: Environment Protection	2.35	11.10	70.28%
ODA: Labor Rights Protection	2.41	2.20	271.61%
ODA: Civil and Human Rights	-23.06	11.59	-256.68%
Total ODA - Environment Provision	119.51	119.71	63.66%
Total ODA - Labor Mkt. Provision	-13.97	99.95	-7.44%
Total ODA - Civil, Human Rights Provision	-229.28	58.18	-122.13%
Non-Binding provisions			
ODA: Environment Protection	0.96	3.50	28.48%
ODA: Labor Rights Protection	-0.28	1.12	-31.70%
ODA: Civil and Human Rights	26.81	21.49	298.44%
Total ODA - Environment Provision	192.53	82.49	102.56%
Total ODA - Labor Mkt. Provision	10.02	180.76	5.34%
Total ODA - Civil, Human Rights Provision	236.10	133.22	125.76%

_Notes: Average Treatment effect on the Treated (ATT) on ODA received by signatories of binding provision. The sample is limited to countries that are eligible to receive ODA from the DAC donors. The first 3 rows (ODA) refer to sector specific disbursements. Percentage change refers to the relative change compared to the received ODA sample averages. Statistically significant effects are reported in bold.

4 Conclusions

While non-trade policy objectives increasingly are incorporated in developed countries trade policies and PTAs, it is an open question whether this is effective in improving non-trade outcomes. The existing empirical evidence is mixed, context specific, and depends on the specific indicator considered (Ferrari *et al.*, 2021).

In this paper we assess the causal impact of NTPs on corresponding outcomes in PTA signatory countries. We use the Synthetic Difference in Difference estimator proposed by (Arkhangelsky *et al.*, 2021) to establish causality, working with a dataset of non-trade outcome indicators and information on the inclusion of both binding and non-binding non-trade provisions in PTAs, focusing on labor rights, environmental protection, and civil rights.

The results suggest that inclusion of NTPs in trade agreements does not have consistent, clear (i.e. significant) effects on non-trade outcomes in partner countries in the area of labor and civil rights, with the exception of EU agreements where we actually find a significant deterioration in case of workers protection with binding provisions. Some evidence is obtained that NTPs are associated with specific environmental outcomes, many of the estimates are not statistically significant, those which are significant are heterogeneous, with some indicators improving while some deteriorating, and there is no generally consistent pattern.

Our results also suggest non-binding NTPs may do more to improve performance in some areas than binding provisions, and vice versa. The efficacy of these two types of NTPs is therefore possibly issue-specific, with one type of NTP potentially being “better” than the other. We also find some evidence that development assistance increases with

non-binding provisions while decreasing in certain areas with binding provisions. This is consistent with the idea that other factors may play a role in making PTAs with non-binding NTPs more effective in improving non-trade outcomes.

University of Bern and CEPR;

Robert Schuman Centre (European University Institute) and CEPR;

Politecnico di Milano and University College London;

Robert Schuman Centre (European University Institute) and University of Turin.

References

- Abadie, A., Diamond, A. and Hainmueller, J. (2010). ‘Synthetic control methods for comparative case studies: Estimating the effect of california tobacco control program’, *Journal of the American statistical Association*, vol. 105(490), pp. 493–505.
- Abadie, A. and Gardeazabal, J. (2003). ‘The economic costs of conflict: A case study of the basque country’, *American economic review*, vol. 93(1), pp. 113–132.
- Abman, R. and Lundberg, C. (2020). ‘Does free trade increase deforestation? the effects of regional trade agreements’, *Journal of the Association of Environmental and Resource Economists*, vol. 7(1), pp. 35–72, doi:10.1086/705787.
- Abman, R., Lundberg, C. and Ruta, M. (2021). ‘The effectiveness of environmental provisions in regional trade agreements’, World Bank, Washington, DC.
- Abman, R., Lundberg, C. and Szmurlo, D. (2022). ‘Trade, emissions, and environmental spillovers: Issue linkages in regional trade agreements’, The World Bank, forthcoming.
- Aissi, J., Peels, R. and Samaan, D. (2018). ‘Evaluating the effectiveness of labour provisions in trade agreements: An analytical and methodological framework’, *International Labour Review*, vol. 157(4), pp. 671–698.
- Arkhangelsky, D., Athey, S., Hirshberg, D.A., Imbens, G.W. and Wager, S. (2021). ‘Synthetic difference-in-differences’, *American Economic Review*, vol. 111(12), pp. 4088–4118, doi:10.1257/aer.20190159.
- Baghdadi, L., Martinez-Zarzoso, I. and Zitouna, H. (2013). ‘Are rta agreements with environmental provisions reducing emissions?’, *Journal of International Economics*, vol. 90(2), pp. 378–390.
- Breinlich, H., Corradi, V., Rocha, N., Ruta, M., Santos Silva, J. and Zylkin, T. (2022). ‘Machine learning in international trade research-evaluating the impact of trade agreements’, CEPR Discussion Paper No. DP17325.
- Dür, A., Baccini, L. and Elsig, M. (2014). ‘The design of international trade agreements: Introducing a new dataset’, *The Review of International Organizations*, vol. 9(3), pp. 353–375.
- Ferrari, A., Fiorini, M., Francois, J., Hoekman, B., Lechner, L.M., Manchin, M. and Santi, F. (2021). ‘Eu trade agreements and non-trade policy objectives’, The European University Institute, Robert Schuman Centre for Advanced Studies Research Paper No. RSC 2021/48.

- Hafner-Burton, E.M. (2009). *Forced to be good : why trade agreements boost human rights.*, Ithaca: Cornell University Press.
- Hoekman, B. and Rojas-Romagosa, H. (2022). ‘Eu trade sustainability impact assessments: Revisiting the consultation process’, *Journal of International Economic Law*, vol. 25(1), pp. 45–60.
- Hofmann, C., Osnago, A. and Ruta, M. (2019). ‘The content of preferential trade agreements’, *World Trade Review*, vol. 18(3), p. 365–398, doi:10.1017/S1474745618000071.
- Hollingsworth, A. and Wing, C. (2020). ‘Tactics for design and inference in synthetic control studies: An applied example using high-dimensional data’, *SSRN*.
- Kim, M. (2012). ‘Ex Ante Due Diligence: Formation of PTAs and Protection of Labor Rights’, *International Studies Quarterly*, vol. 56(4), pp. 704–719, ISSN 0020-8833, doi: 10.1111/j.1468-2478.2012.00758.x.
- Lechner, L.M. (2018). ‘The European Union’s inclusion of Non-Trade Issues in Preferential Trade Agreements’, RESPECT mimeo.
- Lundberg, C., McLaren, J., Abman, R. and Ruta, M. (2022). ‘Child labor standards in regional trade agreements: theory and evidence’, The World Bank, forthcoming.
- Manchin, M. (2021). ‘Description of version 2 of the panel dataset on non-trade policy outcome indicators’, *EUI RSCAS Working Paper*.
- Marx, A., Lein, B. and Brando, N. (2016). ‘The protection of labour rights in eu bilateral trade agreements. a case study of the eu-colombia agreement’, *EU Trade Policy at the Crossroads: between Economic Liberalism and Democratic Challenges*.
- Mattoo, A., Rocha, N. and Ruta, M. (2020). *Handbook of deep trade agreements*, World Bank Publications.
- McClelland, R. and Mucciolo, L. (2022). ‘An update on the synthetic control method as a tool to understand state policy’, Tax Policy Center.
- McLaughlin Mitchell, S. and Hensel, P.R. (2007). ‘International Institutions and Compliance with Agreements’, *American Journal of Political Science*, vol. 51(4), pp. 721–737, ISSN 0092-5853, doi:10.1111/j.1540-5907.2007.00277.x, publisher: John Wiley & Sons, Ltd.
- Pailańir, D. and Clarke, D. (2022). ‘Sdid: Stata module to perform synthetic difference-in-differences estimation, inference, and visualization’, Boston College Department of Economics.
- Postnikov, E. (2014). *The design of social standards in EU and US preferential trade agreements*, chap. 22, UK: Edward Elgar Publishing, david deese edn., pp. 531–549.
- Spilker, G. and Böhmelt, T. (2013). ‘The impact of preferential trade agreements on governmental repression revisited’, *The Review of International Organizations*, vol. 8(3), pp. 343–361.

- Tian, K., Zhang, Y., Li, Y., Ming, X., Jiang, S., Duan, H., Yang, C. and Wang, S. (2022). ‘Regional trade agreement burdens global carbon emissions mitigation’, *Nature communications*, vol. 13(1), pp. 1–12.
- Van den Putte, L. (2015). ‘Eu bilateral trade agreements and the surprising rise of labour provisions’, *International Journal of Comparative Labour Law and Industrial Relations*, vol. 31(3).
- Velut, J., Baeza-Breinbauer, D., De Bruijne, M., Garnizova, E., Jones, M., Kolben, K., Oules, L., Rouas, V., Tigere Pittet, F. and Zamparutti, T. (2022). ‘Comparative analysis of trade and sustainable development provisions in free trade agreements’, London School of Economics.
- Wendling, Z.A., Emerson, J.W., de Sherbinin, A., Esty, D.C., Hoving, K., Ospina, C., Murray, J., Gunn, L., Ferrato, M., Schreck, M. *et al.* (2020). ‘Environmental performance index’, *New Haven, CT: Yale Center for Environmental Law And Policy. epi.yale.edu*.
- Yildirim, A., Basedow, R., Fiorini, M. and Hoekman, B. (2021). ‘Eu trade and non-trade objectives: New survey evidence on policy design and effectiveness’, *JCMS: Journal of Common Market Studies*, vol. 59(3), pp. 556–568.
- Zerk, J. (2019). ‘Human rights impact assessment of trade agreements’, *London, England: Royal Institute of International Affairs, Chatham House*.

Annex

A Additional data description

Table A-1: *Countries Considered*

Partners in RTA	Countries	Countries Excluded
BDI,BEN,BFA,BLR,BRB,CHL,CHN,CIV,COL, CRI,DOM,DZA,EGY,GNB,GTM,GUY,HND,IDN, IND,JAM,JOR,KAZ,KEN,KGZ,KWT,LAO,LBN, MEX,MMR,MYS,MLI,NER,NIC,OMN,PAN,PER, PHL,QAT,RUS,RWA,SAU,SGP,SEN,SLV,SUR, THA,TJK,TTO,VNM,TGO,TUN,TZA,UGA,ZAF	Other EU countries (Including accession)	USA, JPN,NZL,NOR,LIE,KOR,ISL,CHE,CAN, AUS

Notes: The countries considered as potentially treated, reported in the first columns, signed an agreement including at least one of the provisions of interest with either the EU, the US, or either OECD and high income countries as a partner. No country belonging to the latter group (listed in the column *Countries Excluded*) is considered in the “treated” or in the donor pool. Potentially treated countries are included as potential control units in the donor pool, which also include countries that never signed a PTA (overall, with the EU, or with the US).

Table A-2: *Countries with active agreement with both EU and USA*

Country	Environmental Protection				Labor Market Regulation				Human and Civil Rights			
	EU		USA		EU		USA		EU		USA	
	Not Bind.	Bind.	Not Bind.	Bind.	Not Bind.	Bind.	Not Bind.	Bind.	Not Bind.	Bind.	Not Bind.	Bind.
Chile	1	0	0	1	0	0	0	1	1	0	0	0
Colombia	1	0	0	1	1	0	0	1	1	0	0	0
Costa Rica	0	1	0	1	0	1	0	1	1	0	0	0
Guatemala	0	1	0	1	0	1	0	1	1	0	0	0
Honduras	0	1	0	1	0	1	0	1	1	0	0	0
Israel	1	0	0	0	0	0	0	0	1	0	0	0
Jordan	1	0	0	1	0	0	0	1	1	0	0	0
Republic of Korea	0	1	0	1	0	1	0	1	0	0	0	0
Morocco	1	0	0	1	0	0	0	1	1	0	0	0
Mexico	1	0	0	1	0	0	0	1	1	0	0	0
Nicaragua	0	1	0	1	0	1	0	1	1	0	0	0
Peru	1	0	0	1	1	0	0	1	1	0	0	0
Salvador	0	1	0	1	0	1	0	1	1	0	0	0

_Notes: The 13 countries reported here signed an agreement with both the EU, EU member states, and the US.

Table A-3: *Matching Covarirates used in Synthetic Diff-in-Diff*

Variable	Mean	Std. Deviation	Min	Max	Obs
Export Share to EU	0.239152	0.176254	0.005185	0.871214	3422
Export Share to USA	0.076059	0.095722	0	0.671639	3422
Environmental Law Provision L.E.	0.463808	0.829501	0	2	3422
Labor Mkt. Provision L.E.	0.440085	0.824812	0	2	3422
CHR Provision L.E.	0.029805	0.241105	0	2	3422
GDP current (Log)	24.02366	2.292423	18.42872	30.49477	3422
Governance	0.905488	1.409029	-2.46429	4.270286	3422
GDPcap	9320.000	15000.000	22.700	103000.000	3422
Population	44.607	150.674	0.071	1397.029	3422
GDPc (Log)	21.70597	1.661391	16.93909	25.35765	3422
Population (Log)	2.317693	1.691523	-2.65039	7.237138	3422
Total ODA (US\$ mil.)	618.000	1280.000	0.000	21700.000	3179
Total Trade (US\$ mil.)	48600.000	24600.000	17800.000	88900.000	3422
ODA: Environment Protection (US\$ mil.)	11.600	47.900	0.000	853.000	3179
ODA: Labor Market Regulation (US\$ mil.)	2.978	18.600	-5.051	507.000	3179
ODA: Civil and Human Rights (US\$ mil.)	28.8000	96.400	0.017	2050.000	3179
ODA to GDP: Total ODA	0.0411	0.075	0.000	1.126	3179
ODA to GDP: Environment Protection	0.0006	0.001	0.000	0.038	3179
ODA to GDP: Labor Market Regulation	0.0001	0.000	0.000	0.008	3179
ODA to GDP: Civil and Human Rights	0.0016944	0.0051576	-0.00005	0.0988238	3179

Table A-4: *Summary statistics: NTO*

<i>Environmental Protection NTPOs</i>					
Variable	Mean	SD	Min	Max	N
CO2	0.292338	0.19624	-1.35997	2.638186	7774
Forests	32.53986	18.44064	0	98.98526	7774
SO2	505.4478	2132.555	-2040.19	29989.1	7774
Black Carbon	51.47063	21.04038	0	100	7774
Greenhouse Gases	58.84966	26.44156	0	129.1304	7774
NOx	46.93604	21.01648	0	100	7774
Ozone Exposure	50.04097	15.96843	0	100	7774
Protected Areas	26.80994	14.3315	0	100	7774
PM2.5	40.65553	13.92697	0	100	7774
SO2 Trend	58.32562	21.90723	0	100	7774
Species Habitat	92.82481	8.956446	0	100	7774
Nitrogen Management	33.35488	14.12421	0	99.47662	7774
Species Protection	65.63925	16.71921	0	100	7774
Tree Coverage loss	39.79158	11.6473	0	100	7774
Wetland loss	57.25232	19.01902	0	100	7774
<i>Labor Market Regulation NTPOs</i>					
Labor Rights	22.96748	6.242013	0	36.81034	7774
Workers Protection	0.95846	0.586932	0	2	7774
<i>Civil and Human Rights Promotion NTPOs</i>					
Polyarchy	0.462098	0.268917	0.013789	0.94937	7774
Freedom of Expression	0.570917	0.29947	0.014093	0.988696	7774
Women Political Participation	0.627106	0.228782	0.047552	0.999952	7774
Political Liberties	0.588804	0.302271	0.01185	0.993807	7774
Freedom of Association	1.146401	0.665681	0	2.040891	7774

Table A-5: *Non-Trade Policy Outcomes*

Environmental Protection Law		
Outcome	Source	Sign for Improvement
CO2	<i>World Development Indicators</i>	–
Forests	<i>World Development Indicators</i>	+
SO2	<i>World Development Indicators</i>	–
Black Carbon	<i>Environmental Protection Index</i>	+
Greenhouse Gases	<i>Environmental Protection Index</i>	+
Nox	<i>Environmental Protection Index</i>	+
Ozone Exposure	<i>Environmental Protection Index</i>	+
Protected Areas	<i>Environmental Protection Index</i>	+
PM2.5	<i>Environmental Protection Index</i>	+
Species Habitat	<i>Environmental Protection Index</i>	+
Nitrogen Management	<i>Environmental Protection Index</i>	+
Species Protection	<i>Environmental Protection Index</i>	+
Tree coverage loss	<i>Environmental Protection Index</i>	+
Wetland loss	<i>Environmental Protection Index</i>	+
Labor Market Regulation		
Outcome	Source	Sign for Improvement
Labor Rights	<i>QOG Institute</i>	+
Workers Protection	<i>QOG Institute</i>	+
Human Rights Protection		
Outcome	Source	Sign for Improvement
Polyarchy	<i>International Political Economy Data Resource V3</i>	+
Freedom of Expression	<i>International Political Economy Data Resource V3</i>	+
Women Political Participation	<i>International Political Economy Data Resource V3</i>	+
Political Liberties	<i>International Political Economy Data Resource V3</i>	+
Freedom of Association	<i>QOG Institute</i>	+

Table A-6: *Differences in Mean - T-test*

	No Provision vs Non Binding		No Provision vs Binding		Non Binding vs Binding	
	t-crit	p-val	t-crit	p-val	t-crit	P-val
Environment	-4.34	0.00	-6.43	0.00	-4.15	0.00
Labor Market	-1.09	0.28	1.62	0.11	2.06	0.04
CSHR	-13.97	0.00	21.06	0.00	21.26	0.00

_Notes: T-test on ODA averages by type of provisions.

B Additional Results

All Agreements

Table B-1: *ATT from Non Binding Provisions*

Environment	ATT	Std. Error	t-crit	P-Value	Lower CI	Upper CI
CO2	0.141	0.062	2.29	0.02	0.02	0.26
Forests	-0.766	0.488	1.57	0.12	-1.72	0.19
SO2	3.870	33.670	0.11	0.92	-62.12	69.86
Black Carbon	-2.350	3.806	0.62	0.55	-9.81	5.11
Greenhouse Gases	2.315	1.300	1.78	0.08	-0.23	4.86
Nox	-2.809	3.399	0.83	0.41	-9.47	3.85
Ozone Exposure	-4.556	0.691	6.59	0.00	-5.91	-3.20
Protected Areas	-1.779	0.792	2.25	0.02	-3.33	-0.23
PM2.5	-1.105	0.945	1.17	0.25	-2.96	0.75
SO2 trend	-5.649	3.740	1.51	0.13	-12.98	1.68
Species Habitat	-0.557	1.418	0.39	0.71	-3.34	2.22
Nitrogen Management	-2.563	1.204	2.13	0.03	-4.92	-0.20
Species Protection	0.487	1.653	0.29	0.78	-2.75	3.73
Tree coverage loss	-3.854	3.456	1.12	0.27	-10.63	2.92
Wetland loss	-3.985	4.361	0.91	0.37	-12.53	4.56
Labor Market	ATT	Std. Error	t-crit	P-Value	Lower CI	Upper CI
Labor Rights	-0.76991	0.802418	0.96	0.342	-2.34264	0.802834
Workers Protection	0.094497	0.125805	0.75	0.462	-0.15208	0.341076
Civil and Human Rights	ATT	Std. Error	t-crit	P-Value	Lower CI	Upper CI
Polyarchy	0.019821	0.020212	0.98	0.332	-0.01979	0.059436
Freedom of Expression	0.000869	0.032032	0.03	0.978	-0.06191	0.063652
Women Political Participation	0.000443	0.020196	0.02	0.986	-0.03914	0.040027
Political Liberties	-0.00381	0.031723	0.12	0.912	-0.06599	0.058365
Freedom of Association	0.095609	0.081169	1.18	0.24	-0.06348	0.2547

_Notes: Average Treatment effect on the Treated (ATT) in response to signing a non-binding provision. Bold ATT refer to statistically significant effects.

Table B-2: *ATT from Binding Provisions*

Environment	ATT	Std. Error	t-crit	P-Value	Lower CI	Upper CI
CO2	-0.01776	0.0206022	0.86	0.397	-0.05814	0.022621
Forests	0.549063	0.2512702	2.19	0.028	0.056574	1.041553
SO2	-403.147	390.4396	1.03	0.307	-1168.41	362.1147
Black Carbon	-3.92905	4.336667	0.91	0.369	-12.4289	4.570819
Greenhouse Gases	-0.39533	0.6239059	0.63	0.54	-1.61819	0.827526
Nox	2.34134	3.491818	0.67	0.513	-4.50262	9.185303
Ozone Exposure	3.147339	0.9559039	3.29	0.001	1.273767	5.020911
Protected Areas	0.17913	0.7075864	0.25	0.814	-1.20774	1.565999
PM2.5	1.719509	0.5980004	2.88	0.004	0.547428	2.89159
SO2 trend	8.15026	4.315405	1.89	0.058	-0.30793	16.60845
Species Habitat	-2.67891	2.344744	1.14	0.257	-7.27461	1.916786
Nitrogen Management	-1.0918	1.154168	0.95	0.348	-3.35396	1.170374
Species Protection	0.510788	1.093949	0.47	0.651	-1.63335	2.654928
Tree coverage loss	-0.15936	1.286582	0.12	0.912	-2.68106	2.362341
Wetland loss	-0.07688	2.586414	0.03	0.978	-5.14625	4.992489
Labor Market	ATT	Std. Error	t-crit	P-Value	Lower CI	Upper CI
Labor Rights	0.489115	0.4133784	1.18	0.24	-0.32111	1.299337
Workers Protection	-0.05014	0.094709	0.53	0.608	-0.23577	0.135492
Civil and Human Rights	ATT	Std. Error	t-crit	P-Value	Lower CI	Upper CI
Polyarchy	0.017481	0.0128477	1.36	0.175	-0.0077	0.042663
Freedom of Expression	-0.00177	0.0183558	0.1	0.927	-0.03775	0.034203
Women Political Participation	-0.01264	0.0237998	0.53	0.608	-0.05929	0.034006
Political Liberties	-0.00249	0.0168085	0.15	0.89	-0.03544	0.030452
Freedom of Association	0.129613	0.0932787	1.39	0.165	-0.05321	0.312439

__Notes: Average Treatment effect on the Treated (ATT) in response to signing a binding provision. Bold ATT refer to statistically significant effects.

Agreements With the EU as signing partner

Table B-3: *ATT from Non Binding Provisions - Agreements with EU as Signatory partner*

Environment	ATT	Std. Error	t-crit	P-Value	Lower CI	Upper CI
CO2	-0.007	0.045	0.15	0.89	-0.095	0.081
Forests	0.314	0.366	0.86	0.40	-0.403	1.031
SO2	-10.261	99.813	0.1	0.93	-205.894	185.371
Black Carbon	-5.995	7.984	0.75	0.46	-21.644	9.655
Greenhouse Gases	-1.059	0.862	1.23	0.22	-2.748	0.630
Nox	6.296	5.907	1.07	0.29	-5.281	17.874
Ozone Exposure	1.467	1.151	1.27	0.21	-0.789	3.723
Protected Areas	0.823	0.892	0.92	0.36	-0.926	2.572
PM2.5	1.264	1.009	1.25	0.21	-0.713	3.241
SO2 trend	5.532	7.050	0.78	0.44	-8.287	19.351
Species Habitat	2.334	2.382	0.98	0.33	-2.335	7.003
Nitrogen Management	4.698	3.613	1.3	0.20	-2.384	11.779
Species Protection	-0.583	0.848	0.69	0.50	-2.245	1.079
Tree coverage loss	-4.321	2.311	1.87	0.06	-8.850	0.207
Wetland loss	5.184	7.762	0.67	0.51	-10.030	20.398
Civil and Human Rights	ATT	Std. Error	t-crit	P-Value	Lower CI	Upper CI
Polyarchy	0.020	0.031	0.66	0.52	-0.040	0.080
Freedom of Expression	-0.001	0.062	0.02	0.99	-0.123	0.121
Women Political Participation	-0.003	0.039	0.09	0.93	-0.080	0.073
Political Liberties	-0.002	0.064	0.03	0.98	-0.127	0.124
Freedom of Association	0.129	0.100	1.29	0.20	-0.067	0.326

_Notes: Average Treatment effect on the Treated (ATT) in response to signing a non-binding provision. Bold ATT refer to statistically significant effects. It was not possible to estimate the ATT for non-binding Labor Market related provisions.

Table B-4: *ATT from Binding Provisions - EU*

Environment	ATT	Std. Error	t-crit	P-Value	Lower CI	Upper CI
CO2	-0.014	0.017	0.81	0.426	-0.047	0.019
Forests	0.114	0.156	0.73	0.475	-0.191	0.419
SO2	-322.757	155.133	2.08	0.037	-626.819	-18.696
Black Carbon	6.214	8.367	0.74	0.468	-10.185	22.614
Greenhouse Gases	-0.017	1.607	0.01	0.993	-3.168	3.133
Nox	12.445	5.105	2.44	0.015	2.438	22.451
Ozone Exposure	4.344	1.020	4.26	0	2.345	6.343
Protected Areas	1.582	1.387	1.14	0.257	-1.136	4.300
PM2.5	-0.803	0.524	1.53	0.126	-1.830	0.225
SO2 trend	9.131	10.633	0.86	0.397	-11.710	29.972
Species Habitat	2.676	1.529	1.75	0.08	-0.321	5.674
Nitrogen Management	0.283	1.599	0.18	0.867	-2.852	3.417
Species Protection	-0.444	0.434	1.02	0.312	-1.295	0.406
Tree coverage loss	-0.195	1.527	0.13	0.905	-3.187	2.798
Wetland loss	1.942	4.504	0.43	0.68	-6.887	10.771
Labor Market	ATT	Std. Error	t-crit	P-Value	Lower CI	Upper CI
Labor Rights	0.163	0.068	2.4	0.016	0.030	0.297
Workers Protection	-0.212	0.100	2.11	0.035	-0.408	-0.015

_Notes: Average Treatment effect on the Treated (ATT) in response to signing a binding provision. Bold ATT refer to statistically significant effects. It was not possible to estimate the ATT for binding, Civil and Human rights protection-related provisions.

Agreements With the US as signing partner

Table B-5: *ATT from Binding Provisions - USA*

Environment	ATT	Std. Error	t-crit	P-Value	Lower CI	Upper CI
CO2	0.028399	0.036708	0.77	0.45	-0.04355	0.100346
Forests	0.24378	0.68086	0.36	0.732	-1.09071	1.578265
SO2	275.5559	236.2318	1.17	0.245	-187.458	738.5702
Black Carbon	-1.85771	5.702112	0.33	0.754	-13.0338	9.318433
Greenhouse Gases	0.941502	1.01159	0.93	0.358	-1.04121	2.924219
Nox	1.602137	5.402121	0.3	0.777	-8.98602	12.19029
Ozone Exposure	3.324542	1.183079	2.81	0.005	1.005707	5.643377
Protected Areas	0.003143	0.913218	0	1	-1.78676	1.79305
PM2.5	2.5335	1.142401	2.22	0.026	0.294394	4.772606
SO2 trend	12.45017	3.300849	3.77	0	5.980506	18.91983
Species Habitat	0.568695	2.591109	0.22	0.837	-4.50988	5.647268
Nitrogen Management	-1.39872	1.350941	1.04	0.303	-4.04657	1.249123
Species Protection	3.640571	2.473755	1.47	0.142	-1.20799	8.489131
Tree coverage loss	-1.272	2.894777	0.44	0.673	-6.94576	4.401768
Wetland loss	1.996312	3.001094	0.67	0.513	-3.88583	7.878456
Labor Market	ATT	Std. Error	t-crit	P-Value	Lower CI	Upper CI
Labor Rights	-0.2938	0.829378	0.35	0.739	-1.91938	1.331779
Workers Protection	0.060735	0.140436	0.43	0.68	-0.21452	0.33599

_Notes: Average Treatment effect on the Treated (ATT) in response to signing a binding provision. Bold ATT refer to statistically significant effects. It was not possible to estimate the ATT for binding, Civil and Human rights protection-related provisions.

Agreements With all countries excluded the EU, the US as signing partners

Table B-6: *ATT from Non Binding Provisions - Agreements Among non EU, non US countries*

Environment	ATT	Std. Error	t-crit	P-Value	Lower CI	Upper CI
CO2	0.129245	0.041899	3.08	0.002	0.047123	0.211368
Forests	-0.93871	0.488261	1.92	0.054	-1.8957	0.018286
SO2	7.3654	24.42961	0.3	0.777	-40.5166	55.24744
Black Carbon	-4.99189	2.774301	1.8	0.071	-10.4295	0.445738
Greenhouse Gases	2.681199	1.132112	2.37	0.018	0.462259	4.900139
Nox	-3.1096	2.784895	1.12	0.266	-8.56799	2.348798
Ozone Exposure	-4.17789	0.54844	7.62	0	-5.25283	-3.10294
Protected Areas	-1.68004	0.749064	2.24	0.025	-3.14821	-0.21187
PM2.5	-1.02904	0.99164	1.04	0.303	-2.97265	0.914577
SO2 trend	-5.70608	2.923449	1.95	0.051	-11.436	0.023877
Species Habitat	-0.2494	1.44293	0.17	0.875	-3.07754	2.578747
Nitrogen Management	-3.03963	1.014901	2.99	0.003	-5.02883	-1.05042
Species Protection	0.780171	1.554832	0.5	0.63	-2.2673	3.827642
Tree coverage loss	-2.6246	2.780202	0.94	0.353	-8.07379	2.8246
Wetland loss	-7.14907	4.996949	1.43	0.153	-16.9431	2.644955
Labor Market	ATT	Std. Error	t-crit	P-Value	Lower CI	Upper CI
Labor Rights	-0.78825	0.804666	0.98	0.332	-2.36539	0.788899
Workers Protection	-0.09021	0.124893	0.72	0.481	-0.335	0.154585
Civil and Human Rights	ATT	Std. Error	t-crit	P-Value	Lower CI	Upper CI
Polyarchy	0.016847	0.01657	1.02	0.312	-0.01563	0.049323
Freedom of Expression	0.008372	0.021726	0.39	0.71	-0.03421	0.050955
Women Political Participation	-0.00038	0.017686	0.02	0.986	-0.03505	0.034281
Political Liberties	0.003367	0.017361	0.19	0.86	-0.03066	0.037394
Freedom of Association	0.051205	0.11223	0.46	0.658	-0.16877	0.271176

_Notes: Average Treatment effect on the Treated (ATT) in response to signing a non-binding provision. Bold ATT refer to statistically significant effects.

Table B-7: *ATT from Binding Provisions - Agreements Among non EU, non US countries*

Environment	ATT	Std. Error	t-crit	P-Value	Lower CI	Upper CI
CO2	-0.01389	0.017878	0.78	0.444	-0.04893	0.021146
Forests	0.571814	0.318321	1.8	0.071	-0.0521	1.195723
SO2	-465.032	477.7811	0.97	0.337	-1401.48	471.4189
Black Carbon	-4.39428	4.813709	0.91	0.369	-13.8291	5.040594
Greenhouse Gases	-0.73606	0.752863	0.98	0.332	-2.21167	0.739552
Nox	-4.36918	3.594744	1.22	0.224	-11.4149	2.676514
Ozone Exposure	2.279647	1.069882	2.13	0.033	0.182678	4.376616
Protected Areas	-0.6553	0.771309	0.85	0.403	-2.16706	0.856467
PM2.5	1.477123	0.560081	2.64	0.008	0.379363	2.574883
SO2 trend	5.895188	4.333213	1.36	0.175	-2.59791	14.38829
Species Habitat	-3.95925	2.81741	1.41	0.159	-9.48137	1.562875
Nitrogen Management	-1.45454	1.647489	0.88	0.386	-4.68362	1.774541
Species Protection	0.594122	1.326157	0.45	0.666	-2.00515	3.19339
Tree coverage loss	-1.20712	1.060469	1.14	0.257	-3.28564	0.871395
Wetland loss	-2.8613	3.082695	0.93	0.358	-8.90338	3.180787
Labor Market	ATT	Std. Error	t-crit	P-Value	Lower CI	Upper CI
Labor Rights	0.322519	0.389044	0.83	0.414	-0.44001	1.085045
Workers Protection	-0.07003	0.095573	0.73	0.475	-0.25735	0.117292
Civil and Human Rights	ATT	Std. Error	t-crit	P-Value	Lower CI	Upper CI
Polyarchy	-0.00373	0.02158	0.17	0.875	-0.04603	0.038566
Freedom of Expression	-0.00945	0.014175	0.67	0.513	-0.03723	0.018337
Women Political Participation	-0.11143	0.089539	1.24	0.217	-0.28693	0.064061
Political Liberties	0.002686	0.012681	0.21	0.845	-0.02217	0.027541
Freedom of Association	0.337724	0.303473	1.11	0.27	-0.25708	0.93253

_Notes: Average Treatment effect on the Treated (ATT) in response to signing a non-binding provision. Bold ATT refer to statistically significant effects.