



Environmental-agreement design and political ideology in democracies

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Abstract

Does the political ideology of negotiating parties influence the design of international environmental agreements? This article distinguishes between leftist and rightist executives in democracies to develop a twofold argument. First, left-leaning democratic governments tend to be generally more environmental-friendly, which implies that they should favor designs that are more conducive to effective institutions. Second, leftist democratic executives are commonly less concerned about sovereignty costs. Both mechanisms suggest that environmental treaties likely comprise “legalized,” i.e., hard-law elements when left-wing democracies negotiate their design. The empirical implication of the theory is tested with quantitative data on international environmental agreements since 1975. The findings report an association between leftist ideology in democracies and agreement legalization, although this is driven by aspects of sovereignty delegation. This article contributes to the literatures on environmental institutions, international cooperation more generally, as well as party politics.

Keywords International environmental agreements · Design · Legalization · Political ideology

1 Introduction

The design of international environmental agreements is one of the most crucial determinants of their effectiveness (Wettestad, 1999; Koremenos et al., 2001; Mitchell, 2006; Young & Stokke, 2020). A treaty that is poorly designed likely has little impact on addressing the problem it has been created for in the first place. Conversely, a well-crafted institution usually furthers impact and efficacy, thus effectively dealing with environmental issues (Miles et al., 2001; Böhmelt & Pilster, 2010). The design of international environmental agreements is not random, but driven by rather strategic considerations of their “masters:” the nation states (see Fearon, 1998; Leeds, 1999; Koremenos et al., 2001; Grigorescu, 2007; Lupu et al., 2014; Chiba et al., 2015; Tallberg et al., 2016; Rapport & Rathbun, 2020; Young & Stokke, 2020). An extensive body of research reports here that *inter alia*

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country features, characteristics of the environmental problem at hand, as well international influences all play a role in shaping institutional design (see, e.g., Murdoch et al., 2003; Bernauer et al., 2010, 2013; Tallberg et al., 2016; Spilker & Koubi, 2016; Carbonell & Allison, 2015; Böhmelt & Spilker, 2016; Böhmelt & Butkutė, 2018; Wagner, 2001; Wangler et al., 2013).

This article seeks to make a contribution particularly to this stream in the literature, but also other fields including international cooperation generally and party politics, as I shed light on a prominent, but previously overlooked aspect: the political ideology of the governments negotiating a treaty. Political ideology is one of the most robust factors for predicting general legislative action at the domestic level (see, e.g., Knill et al., 2010; Jensen & Spoon, 2011; Knill et al., 2012; Leinaweaver & Thomson, 2016), and several studies link political ideology to environmental politics as well as policy-making in particular. While some suggest that left-leaning ideology is rather unrelated to environmental policy (output) except when concentrating on green parties as such (Knill et al., 2010; Jensen & Spoon, 2011; Farzin & Bond, 2014; Jahn, 2016; Leinaweaver & Thomson, 2016; Mourao, 2019), several works have identified a more systematic pattern. For example, building on the pioneering research by King and Borchardt (1994), Scruggs (1999), Jahn (1998), and Crepez (1995), Neumayer (2003) provides empirical evidence that parliamentary green and left party strength is associated with lower pollution levels. In a follow-up study, Neumayer (2004) finds that leftist political parties are more likely to refer to environmental issues in their party manifestos and that more left-wing¹ individuals tend to be more “pro-environment” on several dimensions. These results are in line with Tobin (2017, 28) who reports that “the presence of a left-wing government is shown to be sufficient for ambitious climate policy,” highlighting that “climate change remains a party-identified political issue.” Ward and Cao (2012) focus on environmental taxes and show that more leftist legislative bodies are more strongly linked to higher taxation. And there is work that consistently links more leftist ruling ideologies to better environmental performance at the outcome level (e.g., Garmann, 2014; Chang et al., 2015; Wen et al., 2016; Kammerlander & Schulze, 2021)

While there is, hence, a well-established literature on party ideology and environmental politics, our understanding of whether and how the political orientation of the executive influences institutional design is limited. I seek to address this shortcoming and focus on the concept of legalization (Abbott & Snidal, 2000; Abbott et al., 2000; Spilker & Koubi, 2016; Böhmelt & Butkutė, 2018) to capture treaty design as well as political ideology in democracies. I argue that predominantly leftist democratic governments are more likely to push for the inclusion of more “legalized,” i.e., hard-law elements in international environmental agreements. On the one hand, left-leaning executives in democracies tend to be generally more environmental-friendly than their right-wing and center counterparts, which implies that they probably favor designs that are more conducive to effective institutions. Soft-law elements can be effective under some circumstances when, e.g., they allow for greater flexibility (e.g., Skjærseth et al., 2006; Pickering et al., 2019; Wanner, 2021), but it is generally hard law and more legalized treaties that are seen as facilitators of effective problem-solving institutions (see Wettestad, 1999; Koremenos et al., 2001; Mitchell, 2006; Young & Stokke, 2020; Miles et al., 2001; Böhmelt & Pilster, 2010; Young, 2011; Böhmelt & Butkutė, 2018; Böhmelt & Spilker, 2016). On the other hand, leftist democratic governments are usually less concerned about sovereignty costs. Both mechanisms suggest that environmental treaties should include more “legalized,” i.e., hard-law, elements when

¹ I use the terms “left wing” and “left leaning” interchangeably.

left-wing democratic governments negotiate their design. The empirical analysis is based on 111 international environmental agreements since 1975 and the political ideology of those states that participated in an institution's negotiations. I find support for the theory, namely that international environmental treaties are more likely to include hard law when left-leaning democracies contribute to negotiating their design.

This finding mainly contributes to the research on environmental agreements. First, I shed light on a previously overlooked determinant of institutional design. In turn, although not the focus of this article, there could be some implications for the research on institutional impact and effectiveness (see Wettestad, 1999; Koremenos et al., 2001; Miles et al., 2001; Mitchell, 2006; Böhmelt & Pilster, 2010; Young & Stokke, 2020) and, en route, the broader literature on political ideology and environmental politics (King & Borchardt, 1994; Scruggs, 1999; Jahn, 1998, 2016; Crepaz, 1995; Neumayer, 2003, 2004). Finally, I contribute to the study of international cooperation as well as party politics more generally. While political ideology is a central factor for the analysis of party politics and legislative action at the domestic level (see, e.g., Knill et al., 2010, 2012), few have considered its influence on international treaties, their design, and their effectiveness. I return to these points in the conclusion.

2 Treaty Design and Political Ideology in Democracies: Theory

The argument I develop leads to the empirical expectation that democratic left-leaning executives are more likely to agree to more legalized, i.e., hard-law designs in environmental agreements. Governments represent states in international politics, they are the “masters” of a treaty and responsible for its implementation at the domestic level, and they negotiate an agreement in the first place (Wangler et al., 2013). To conceptualize treaty design, I focus on the idea of legalization (e.g., Abbott et al., 2000; Abbott & Snidal, 2000; Shaffer & Pollack, 2010). This concept is based on two “types” of law, i.e., hard and soft law, which are commonly defined as two extremes of an underlying latent and unobserved legalization dimension.² A treaty's level of precision, obligation, and aspects of delegation jointly shape this dimension and, eventually, an agreement's level of “softness” or “hardness” (e.g., Abbott et al., 2000; Skjærseth et al., 2006; Bernauer et al., 2013; Spilker & Koubi, 2016; Böhmelt & Butkutė, 2018). That is, first, there is precision, i.e., how ambiguously or clearly states' required actions stemming from an environmental agreement are defined. Second, obligation refers to an institution's degree of bindingness. Are the terms merely “recommendations” with a voluntary character or are they and compliance with them obligatory, making monitoring and enforcement necessary? Third, delegation shifts sovereignty and authority of implementation, interpretation, and rule application to a third party. Some treaties refer here to external bodies, including the *International Court of Justice*, while others have internal procedures. In sum, an agreement is of hard-law character if it is highly legalized by comprising these three elements in its design. Conversely, a treaty is “soft” if most or all of these features are missing or only weakly established (e.g., Abbott et al., 2000; Abbott & Snidal, 2000; Shaffer & Pollack, 2010).

² According to international treaty law, all written agreements, in their entirety, are seen as hard law, with soft law being declarations, etc., that are neither signed nor ratified (Aust, 2013, 49f). The understanding of soft law and hard law as derived from, e.g., Abbott et al. (2000) or Abbott and Snidal (2000), focuses more on the actual design of treaties and, thus, differs from the modern-law perspective.

An environmental agreement's degree of legalization is usually tied to its effectiveness, and it affects state sovereignty and decision-making power (see von Stein, 2008; Young & Stokke, 2020). This induces what is commonly referred to as a "rigidity and flexibility" trade-off (see Downs et al., 1996; Rosendorff & Milner, 2001; Skjærseth et al., 2006; Cooley & Spruyt, 2009; Bernauer et al., 2013; Spilker & Koubi, 2016). That is, hard law transfers power from states to institutions and it allows for little flexibility due to its stronger commitments (Abbott & Snidal, 2000, 422). Conversely, soft law is most often not associated with obligatory and precise commitments, but flexibility and few constraints (see Downs et al., 1996; Rosendorff & Milner, 2001; Skjærseth et al., 2006; Bernauer et al., 2013; Spilker & Koubi, 2016; Böhmelt & Spilker, 2016; Böhmelt & Butkutė, 2018). As a result, hard law is more costly and less attractive to states when sovereignty is valued (Downs et al., 1996; Abbott & Snidal, 2000; Koremenos et al., 2001; Skjærseth et al., 2006; von Stein, 2008; Spilker & Koubi, 2016). Having said that, fewer sovereignty costs usually imply that an agreement's effectiveness is lower as well. Soft law requirements are not enforceable and ambiguous by nature. Although soft-law elements can be effective when, e.g., flexibility is enhanced or political pressure on laggards is increased (e.g., Skjærseth et al., 2006; Pickering et al., 2019; Wanner, 2021), it tends to be seen as less suitable for solving an institution's underlying problem effectively (see Wettestad, 1999; Koremenos et al., 2001; Young & Stokke, 2020; Miles et al., 2001; Böhmelt & Pilster, 2010; Young, 2011; Böhmelt & Butkutė, 2018). Hard law is potentially more effective as it can be enforced and, thus, is "more credible"—as states are willing to make greater concessions and accept more cuts into own sovereignty, they signal more convincingly that they will abide by an agreement's terms. Böhmelt and Spilker (2016, 74) summarize this discussion as "soft law may not necessarily be effective in solving an underlying problem. However, it should appear attractive to states due to its lower sovereignty costs. On the other hand, hard law is unlikely to be the most preferred option for states in decision-making, although it is potentially better suited to effectively address the problem an institution has been created for in the first place."

As indicated above, environmental agreement negotiations primarily involve a state's government as the main actor (Wangler et al., 2013). The party ideology of the executive is likely of importance here due to two different mechanisms that are tied to the "rigidity and flexibility" trade-off (see Downs et al., 1996; Rosendorff & Milner, 2001; Skjærseth et al., 2006; Cooley & Spruyt, 2009; Bernauer et al., 2013; Spilker & Koubi, 2016). On the one hand, left-leaning parties' views on more or less effective treaty designs (rigidity) and, on the other hand, how they see constraints and sovereignty costs (flexibility). In the following, I develop both mechanisms for democratic states.

First, primarily leftist parties and ideology in democracies are linked with pro-environmental positions as well as policies. More left-wing views are thus "greener" than right-wing or center party platforms. There are several arguments linking leftist democratic ideology with pro-environmental positions, although the most prominent ones can be summarized as follows. On the one hand, "leftwing parties tend to be more interventionist in their economic policy making, they might find it easier to accept that governments need to install environmental protection instruments such as command-and-control, environmental taxes or tradable pollution permits in order to correct market failures" (Neumayer, 2003, 204). On the other hand, "environmental pollution hits the poor and the working class more than the rich who can isolate themselves better from the damaging effects of environmental pollution" (Neumayer, 2003, 205). Both claims mirror Chang et al. (2015) and Wen et al. (2016) for why left-leaning governments should pursue stricter environmental policies: more restrictions on the economic system are necessary to promote

environmental policies, the working class is disproportionately affected by environmental pollution, and polluting industries must pay more to improve environmental performance. Only left-wing platforms can address these aspects effectively as they are likely to intervene in the market and restrict the economic system more than their right-wing and center counterparts, they are the traditional representatives for the working class, and they are less reluctant to impose costs on business to protect the latter (see also Kammerlander & Schulze, 2021, 2).

Second, governments generally value their decision-making power and sovereignty (Slaughter, 2004; Wangler et al., 2013; Böhmelt & Spilker, 2016; Rapport & Rathbun, 2020). However, democratic leftist parties view sovereignty costs somewhat differently than more rightist parties in democracies, which affects how they exercise power, especially internationally, when in government (Grieco et al., 2009; Potrafke, 2009; Hanania, 2019). The arguments for this link between left-leaning platforms in democratic states and a lower concern about sovereignty costs are located at several levels of analysis and are all based on the assumption that “[s]overeignty sensitivity is a function of [...] distrust” (Rapport & Rathbun, 2020, 282). When trusting less and believing more that others could take advantage of them, people will be more protective of their sovereignty. And rightist individuals have indeed “a more pessimistic view of human nature” (Jost et al., 2007; Rapport & Rathbun, 2020, 282).

At the individual level, more rightist people trust less and are more interested in reducing uncertainty than more leftist people (Jost et al., 2007; Rapport & Rathbun, 2020). The latter then tend to have a more egalitarian view.³ In addition, more leftist individuals have a stronger need to “provide for others” (Janoff-Bulman et al., 2008; Rapport & Rathbun, 2020, 282).⁴ These patterns seem to transfer to and materialize at the state level when analyzing the political ideology of democratic governments and their behavior in international affairs. Rathbun (2011) reports that democratic executives on the left of the political-ideology spectrum tend to be more multilateralist and this influences “how they choose to design international institutions” (Rapport & Rathbun, 2020, p. 282). Conversely, right-leaning democratic governments see national sovereignty more important than leftist governments in international affairs, and they are more likely to oppose multilateralism and pressures from international institutions (Hooghe et al., 2002); even if right-wing governments have somewhat of an international outlook, they will “favor unilateralism so as to avoid potential opportunistic exploitation” (Rapport & Rathbun, 2020, p. 282). As Rapport and Rathbun (2020, p. 282) report, rightist democratic governments are less willing “to allow foreign actors influence over matters that were previously decided unilaterally.” This makes them less likely to see the benefits that institutionalized forms of international cooperation can provide.

Ultimately, the first mechanism stresses that more leftist democratic governments are “greener” as such; the second mechanism emphasizes that more leftist executives in democracies will have fewer concerns about cuts into their sovereignty and are more willing than rightist democratic executives to pursue effective multilateral approaches in international politics. When subscribing to the first argument that primarily leftist parties are more environmental-friendly, they should also pursue such policies when in power—domestically and beyond. At the latter level, this comprises the design of international

³ In the words of Lipset et al. (1954, 1135): “[b]y ‘left’ we shall mean advocating social change in the direction of greater equality - political, economic, or social. By ‘right,’ we shall mean supporting a traditional, more or less hierarchical social order, and opposing change towards greater equality.”

⁴ Note the link here to the claim about the association between the working class and leftist parties above.

environmental agreements if they participate in negotiations leading to a treaty. Given the evidence that more hard-law designs are more effective in addressing environmental problems (Wettestad, 1999; Koremenos et al., 2001; Young & Stokke, 2020; Miles et al., 2001; Böhmelt & Pilster, 2010; Böhmelt & Spilker, 2016; Young, 2011; Böhmelt & Butkutė, 2018), leftist democratic governments should thus pursue more legalized designs when negotiating international environmental agreements. The same holds true for the second argument, albeit for somewhat different reasons: more leftist executives in democracies are *per se* more willing than more conservative democratic governments to accept constraints on their decision-making power and sovereignty if a more effective collective approach is possible. Indeed, as Rapport & Rathbun (2020, p. 282) write, “[l]eft-wing leaders will feel that they can reap the gains of collective action by limiting their own sovereignty because they are less concerned about how others will take advantage of them.” Hence, there are higher chances to observe hard-law designs as well if left-wing democratic governments negotiate international environmental treaties. Both mechanisms lead to the following hypothesis:

Hypothesis Leftist democratic governments’ are more likely than other democratic executives to pursue legalized designs when negotiating international environmental agreements.

3 Research Design

The main data source for my empirical analysis is Koubi et al. (2020) who compiled time-series cross-sectional information on 178 international environmental agreements and their design characteristics in 1950–2011. Due to missing values of the explanatory variables, my final sample eventually comprises 111 agreements in 1975–2011. This data set is an extension of Spilker and Koubi (2016) and originally based on treaty documents and texts in the International Environmental Agreements database (Mitchell, 2008).⁵ International treaties are included in these data if they were open for ratification globally and primarily deal with environmental issues. As the design of treaties does not change over time in the data (Koubi et al., 2020), I use a cross-sectional structure with the treaty-negotiating country as the unit of analysis. That is, for the following analysis, each treaty is paired with each country that participated in the negotiations of that agreement. If a country was not part of the original negotiations leading to an agreement, even if it signed or ratified an agreement afterward, it is not paired with a treaty and, hence, not part of the analysis. I do not include repeated treaty-negotiating country observations over time and any time-variant covariate information is based on the first year a treaty is open for ratification. This type of data structure has been widely used in the literature (see, e.g., Bernauer et al., 2010; Spilker & Koubi, 2016; Koubi et al., 2020) as it allows for the joint consideration of both treaty and country characteristics without aggregating information. A shortcoming of this approach, however, is that it induces dependencies in the data, since, e.g., countries nested in the same treaty negotiation are not independent from each other. Hence, in appendix, I present a robustness check that uses the treaty as the unit of analysis and, thus, a more aggregated variable on negotiating countries. I also discuss the issues of hierarchies in the data and dependencies across levels in detail there. The results based on a hierarchical model or

⁵ See online at: <https://iea.uoregon.edu/>. The replication materials from Koubi et al. (2020) can be accessed at: <https://ib.ethz.ch/data/treaties.html>.

different specifications of the standard errors are qualitatively the same as the ones discussed below.

The dependent variable refers to treaty design and, as discussed above, captures an agreement's degree of legalization (Abbott et al., 2000; Abbott & Snidal, 2000). Legalization is defined as a system of institutionalized rules, norms, and regulations that characterize a treaty along precision, obligation, and delegation. These three variables are included in the original data (Koubi et al., 2020; Spilker & Koubi, 2016). First, in terms of precision, a dichotomous variable receives the value of 1 if a treaty specifies quantitative targets or clear provisions. Ambiguous or no specifications at all of what has to be achieved are coded as 0. Second, with regard to obligation, a measure captures whether the treaty establishes an enforcement and monitoring mechanism (1) or not (0). The emphasis of the monitoring-and-enforcement component in Koubi et al. (2020) is indeed on obligation. Is a treaty legally binding and, if so, is compliance monitored and enforced? Conversely, if there are no monitoring-and-enforcement devices in a treaty, this is because they are not needed: an agreement is legally not binding and monitoring/enforcement is unnecessary. Finally, delegation is captured by a variable on whether a treaty provides a third-party dispute settlement body (1) or not (0). Based on these variables, I created the aggregated index *Legalization* that receives a value of 1 if all three items are coded as 1 (0 otherwise). In my sample, 313 out of 1,813 observations (17.26%) are coded as hard law. However, Böhmelt and Butkutė (2018), for instance, show that the delegation of sovereignty to an independent dispute settlement body is the decisive component when democracies consider opting for a particular agreement design. Hence, disaggregation is important and I also present analyses that focus on the individual variable components of the legalization index. Due to the binary scale of each outcome variable, I use logistic regression models and cluster the standard errors by negotiating country to capture intra-group dependencies. For example, a government participates in negotiations of two treaties and, hence, could seek to implement designs matching its preferences in either agreement. Clustering the standard error at the country level accounts for this.⁶

I employ two core variables of interest, which are based on the World Bank's Database of Political Institutions (Scartascini et al., 2018). These data provide information on political leaders' (chief executive party) and the largest government party's political orientation, distinguishing between left, center, right, and other. The classification follows the typical left-right spectrum, while "other" mostly refers to non-democratic leaders and systems where this scale cannot fully be applied. I use this information to create two dichotomous variables, which receive a value of 1 if both a political leader and the largest executive party in a democracy are coded as left and right, respectively. As both a political leader and the largest government party must have the same ideology for either variable to be coded as 1, I address concerns about minority governments affecting the results or political coalitions being overly influential. I omit cases where no coding is provided and, thus, by including *Right-Wing Executive* and *Left-Wing Executive* in my models, state executives of the center are the reference category for comparison.⁷ In light of the hypothesis formulated above, I have few expectations about the impact of *Right-Wing Executive* on either of the dependent variables, but I expect *Left-Wing Executive* to be positively signed and significantly related to the dependent variables.

⁶ Appendix considers several alternatives to address dependencies in the data.

⁷ Note that these variables only capture positions of governments on the "traditional" left-right spectrum. They do not code populist executives at either end of this scale. I return to this issue in the conclusion.

I also include a number of control variables at the country or treaty level. The rationale for including these items is to control for alternative mechanisms shaping agreement design and, thus, they help to tease out the real effect of political ideology in democracies on treaty design. On the one hand, there are variables for the political power of a country, its wealth, trade openness, and regime type. Political power is captured by a country's GDP (logged) as taken from Koubi et al. (2020). The higher a country's GDP, the more influence it has politically and, in turn, more likely to shape treaty negotiations according to its own interests (Wangler et al., 2013; Bernauer et al., 2010, 2013; Spilker & Koubi, 2016). In addition, more powerful countries are especially sensitive to their sovereignty and, hence, I expect the effect of *GDP* to be negative on *Legalization* and its components. That is, more economic power is related to less legalized designs. Wealth is captured by a state's GDP per capita and is also based on the World Bank Development Indicators. The literature commonly refers to the Environmental Kuznets Curve (Grossman & Krueger, 1995; Selden & Song, 1994; Dasgupta et al., 2002) when discussing income in the context of environmental politics. Depending on sample countries, years, and the environmental item used as the dependent variable, income may have a positive, negative, or even a curvilinear impact. I do not model this directly, but control for an income effect nonetheless. Therefore, I have no *ex-ante* expectations about a positive or negative income effect in my analysis. Trade openness pertains to a state's embeddedness in the international trade network and is operationalized as the sum of the absolute shares of imports and exports to GDP. The final variable is log-transformed and originally taken from them Penn World Tables. The more embedded a country is in the global trade network, the more dependent on trade and industry production it may be, making it to oppose more stringent environmental regulations also in international environmental agreements. Hence, I expect *Trade Openness* to be negatively associated with the legalization variable and its components. A counterargument could be based on the notion that industries may want to export their countries' strictest regulations so that competitors will be similarly constrained (see DeSombre, 2000). If this effect applies, the effect of *Trade Openness* could be positive. Regime type data are taken from the Polity V project and code countries on a -10 to 10 scale in terms of their degree of democracy: higher values stand for more democratic countries. As I omit non-democratic countries for the analysis, the variable *Polity Score* only ranges between 5 and 10 in my sample. Böhmelt and Butkutė (2018) demonstrate that democratic regimes may be reluctant to agree to hard-law treaty designs in environmental politics. Thus, we may expect a negative impact of *Polity Score* in my models. However, as the sample in the following analysis is more constrained in that I only focus on democratic forms of government, it may well be that an insignificant effect materializes.

On the other hand, there are several treaty-level variables that are all taken from Koubi et al. (2020). This set of items controls for the fact that an institution's underlying problem structure influences its design (e.g., Koremenos et al., 2001; Mitchell, 2006; Miles et al., 2001; Böhmelt & Pilster, 2010). In addition, issue complexity does vary by problem field and issue area and dummy variables that indicate whether a treaty addresses a specific problem control for this.⁸ I consider binary items for (1) matters of environmental

⁸ In light of the claim that leftist executives are more likely to pursue environmental-friendly policies, note the following selection issue that is related to issue complexity: left-wing platforms may be more likely to participate in environmental agreements than center/right governments. As a result, the latter only participate in treaty negotiations with more parties, while left governments could rather prefer to negotiate with fewer parties. If that is the case, the effect of leftist ideology I argue for could be driven by negotiation complexity rather than ideology. Indeed, there is evidence suggesting that cooperation efforts decline with a larger number of parties (see Olson, 1965; Koremenos, 2005; Axelrod, 2011). I return to this issue in

Table 1 Descriptive statistics

Variable	Obs.	Mean	SD	Min.	Max.	VIF
Legalization	1813	0.173	0.378	0	1	
Precision	1804	0.736	0.441	0	1	
Obligation	1001	0.367	0.482	0	1	
Delegation	1804	0.745	0.436	0	1	
Right-Wing Executive	1206	0.440	0.497	0	1	1.82
Left-Wing Executive	1206	0.343	0.475	0	1	1.72
GDP	1803	1.325	2.311	-5.150	6.236	2.60
GDP per capita	1803	0.881	0.968	-2.627	2.737	4.08
Polity Score	1611	9.000	1.523	5	10	2.14
Trade Openness	1702	-0.879	0.779	-3.677	0.684	2.50
Public Good	1804	0.697	0.460	0	1	2.19
Pollution	1813	0.358	0.480	0	1	1.82
Species	1813	0.227	0.419	0	1	1.60
Energy	1813	0.153	0.360	0	1	1.79
Weapons	1813	0.114	0.317	0	1	2.27

VIF variance inflation factor

pollution, (2) the protection or management of human interactions with plant and animal species, (3) energy production, including nuclear energy, (4) matters pertaining to the environmental consequences of bacteriological methods of warfare, chemical weapon, toxin weapons, or nuclear weapons, and (5) other issue areas (including, e.g., freshwater resources or matters pertaining to the oceans and ecosystems).⁹ I use these variables as proxies for the different problem structures environmental treaties may have (Miles et al., 2001). As the reference category, I rely on “other issue areas.”¹⁰ Finally, I consider a variable on whether a treaty addresses a global public good or not. Environmental problems characterized as a public good may make free-riding patterns more likely and, thus, could affect the design in specific ways (see Campbell et al., 2019). If an agreement deals with a public good, it may be more difficult to agree on more legalized design elements and, thus, I expect this variable to be negatively signed. The descriptive statistics of the variables discussed so far are presented in Table 1. The last column in that table summarizes the explanatory variables’ variance inflation factor scores. Each item is well below the commonly used cutoff point of 5, which suggests that collinearity among the various independent variables is not too strongly pronounced.

Footnote 8 (Continued)

appendix where I examine the relationship between ideology and the number of negotiating parties thoroughly.

⁹ See online at: <https://iea.uoregon.edu/international-environmental-agreements-ieas-defined>.

¹⁰ Ideally, I would like to control for different types of cooperation problems (see Koremenos, 2007). However, the data I rely on are not sufficiently precise here: while I can say that the type of cooperation problem likely varies by problem field, I cannot assign different problem types (e.g., externality vs symmetrical commons) to different issue areas with certainty. As a result, while I thus control for environmental issue areas and problem structures, I cannot formulate *ex-ante* expectations about their effects in the models. Note, however, that the last control variable on public goods may capture different types of cooperation problems to some degree.

Table 2 Political ideology and environmental treaty design

	Model 1 Legalization	Model 2 Precision	Model 3 Obligation	Model 4 Delegation
Right-Wing Executive	− 0.423 (0.409)	− 0.031 (0.164)	− 0.856** (0.389)	0.074 (0.179)
Left-Wing Executive	0.569* (0.332)	0.163 (0.186)	0.515 (0.368)	0.503*** (0.194)
GDP	− 0.034 (0.113)	− 0.070 (0.055)	− 0.065 (0.107)	− 0.038 (0.073)
GDP per capita	0.508* (0.262)	0.393** (0.157)	0.730*** (0.270)	0.044 (0.176)
Polity score	− 0.058 (0.104)	− 0.069 (0.084)	0.165 (0.130)	− 0.291*** (0.082)
Trade openness	0.057 (0.248)	− 0.144 (0.129)	− 0.199 (0.340)	0.208 (0.142)
Public good	3.875** (1.882)	− 2.623*** (0.366)	0.805 (0.617)	0.705*** (0.168)
Pollution	4.987*** (1.652)	− 0.145 (0.182)	1.696*** (0.213)	0.163 (0.115)
Species	4.175** (1.819)	0.807*** (0.230)	0.901*** (0.298)	0.385** (0.174)
Energy	2.182** (1.132)	− 1.292*** (0.243)	− 1.429** (0.577)	0.488*** (0.118)
Weapons	14.652*** (3.998)	1.577 (1.041)	8.836*** (1.881)	4.515*** (1.053)
Constant	− 10.408*** (3.715)	3.632*** (0.900)	− 5.033*** (1.499)	2.875*** (0.730)
Observations	1122	1122	640	1122
Log Pseudolikelihood	− 256.375	− 530.703	− 235.404	− 576.405
Prob χ^2	0.000	0.000	0.000	0.000

Robust standard errors clustered on country in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

4 Empirical analysis

The main models of the analysis are summarized in Table 2. All models in this table are identical in terms of their explanatory variables, but I vary the dependent variable analyzed: Model 1 focuses on the aggregate legalization index, Model 2 is about the index's precision component, Model 3 concentrates on obligation, while the delegation of sovereignty to third parties is the dependent variable in Model 4. The table entries are coefficients, which allow for a direct reading of their direction and statistical significance. Substantive quantities of interest, which help to assess a variable's strength and impact, are displayed in Figs. 1, 2, and 3: for the core variable of interest (*Left-Wing Executive*), Fig. 1 presents predicted probabilities and Fig. 2 summarizes simulated predicted probabilities; Fig. 3 shows first difference estimates for the control covariates. My discussion of the results follows this setup in that I begin with the main findings, including the disaggregated

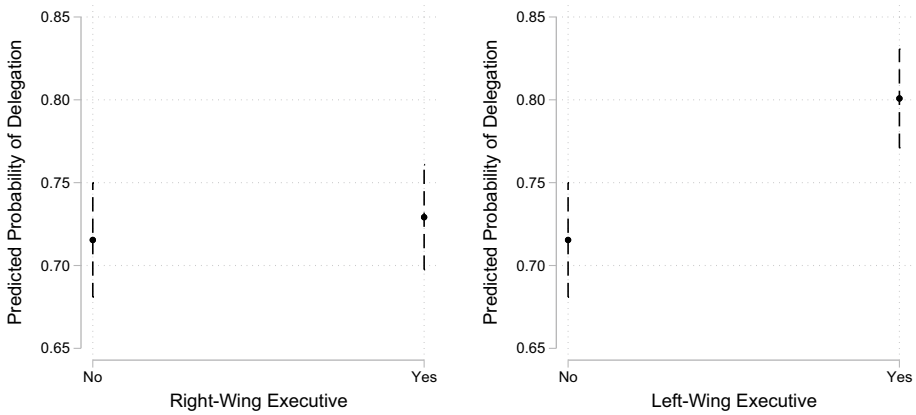
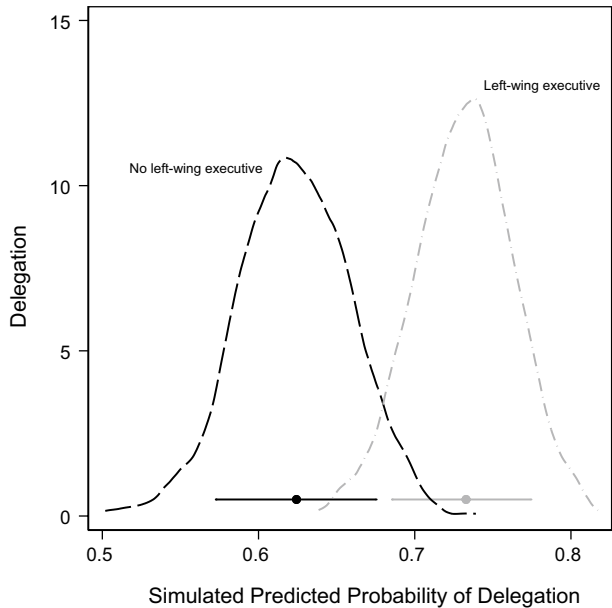


Fig. 1 Predicted Probability of *Delegation*. Note: graph displays predicted probabilities of *delegation*. Vertical dashed bars capture 95% confidence intervals. Confidence intervals adjusted according to MacGregor-Fors and Payton (2013). Values are calculated for Model 4 while holding all other covariates constant at their means

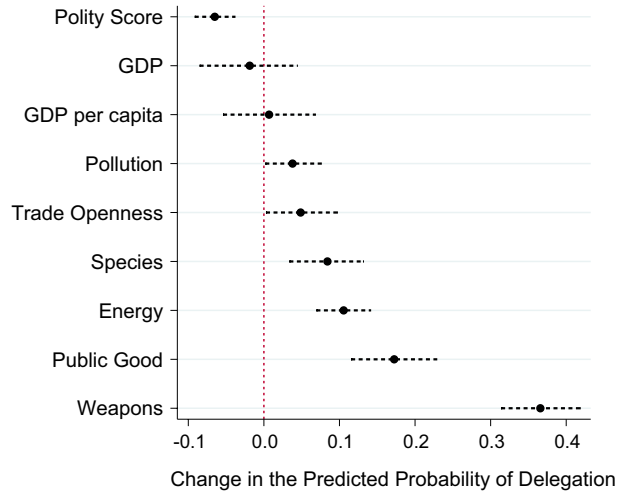
Fig. 2 Simulated Predicted Probability of *Delegation*. Note: Graph displays distribution of simulated predicted probabilities of *delegation* for values of *Left-Wing Executive* ($N = 1000$ simulations). Horizontal bars capture 95% confidence intervals. Confidence intervals adjusted according to MacGregor-Fors and Payton (2013). Values are calculated for Model 4 while holding *Right-Wing Executive* at 0 and all other covariates constant at their medians



findings, insignificant results, and corresponding effect estimates. Afterward, I turn to the control variables.

Focusing on the core variable of interest, *Left-Wing Executive*, and its comparison categories, Table 2 shows that *Left-Wing Executive* is positively signed and significant in Model 1, but *Right-Wing Executive* cannot be distinguished from governments in the center. In substantive terms, moving from a non-left democratic government to a left-government, the probability to have a hard-law design increases by about 3% points from

Fig. 3 First Difference Estimates. Note: Graph displays first difference estimates and 95% confidence intervals. The estimates are sorted by mean of each first difference. Confidence intervals adjusted according to MacGregor-Fors and Payton (2013). Calculations are based on Model 4 and done when changing a variable from its 25th percentile to its 75th percentile (minimum to maximum for dichotomous items). All other variables held constant at their medians



4.4 to 7.6%. This effect is not substantively large, highlighting that *Left-Wing Executive* has—at best—a moderate influence on *Legalization*. And indeed, as Models 2–4 show, this effect is driven by the delegation of sovereignty to third parties. When it comes to precision (Model 2) and obligation (Model 3), there is no systematic effect stemming from political ideology. That said, *Right-Wing Executive* is negatively signed and significant in Model 3, emphasizing that rightist executives in democracies are less likely than center and leftist administrations to negotiate obligation elements in environmental treaty designs. Hence, in light of these results, I conclude that democratic leftist parties in power do indeed push for more legalized environmental treaty designs than their right-wing and center counterparts, but they primarily—if not exclusively—care about the delegation of sovereignty to a third party only. Contrary to my theoretical expectations, leftist executives in democracy are not systematically associated with design elements of precision or obligation. This is an interesting finding on its own and while more systematic research for explaining this pattern is necessary, I offer three plausible reasons here. First, in line with the discussion above, there seems to be a trade-off between precision and obligation on the one hand and, on the other hand, delegation. Cooley and Spruyt (2009) discuss a number of case studies to illustrate this trade-off. Second, it could well be the case that delegation is the decisive component of legalization that drives institutional effectiveness. This could imply, in my context, that obligation and precision elements are less strongly associated with effectiveness than delegation. Policymakers may be aware of this: although not in the context of environmental politics, the World Trade Organization’s (WTO) dispute settlement mechanism is commonly seen as “the jewel in the crown of the WTO.”¹¹ As a result, leftist governments also focus on this component when trying to negotiate agreement designs that facilitate effectiveness. Third, the pattern I identify could be consistent with the claim that a mix of hard and soft-law elements is the most effective design approach (see Skjærseth et al., 2006; Pickering et al., 2019; Wanner, 2021). That is, leftist governments then focus on those hard-law components that increase effectiveness, but leave out other more legalized design aspects that may not be related to higher efficacy. Both mechanism can explain why I obtain a significant effect for *Left-Wing Executive* in Model 4, but not in Models 2 and 3.

¹¹ See online at: https://www.wto.org/english/news_e/pres09_e/pr578_e.htm.

As the delegation component (Model 4) is responsible for the overall result identified in Model 1, I focus on Model 4 and *Delegation* as the outcome variable in the following when discussing the substantive quantities of interest. In Model 4, *Left-Wing Executive* is positively signed and significant, but *Right-Wing Executive* is insignificant. Hence, left-wing executives in democracies differ systematically from center and rightist administrations when it comes to negotiate this design element in international environmental agreements. To have a better understanding of this effect, I have calculated predicted probabilities of seeing the delegation of sovereignty in an environmental agreement's design for either *Left-Wing Executive* or *Right-Wing Executive*. The results are summarized in Fig. 1. On the one hand, moving from the baseline (i.e., non-right wing or center government) to a right-wing executive in a democracy, the probability of delegation increases slightly, but the point estimates' confidence intervals overlap. Hence, the effect of a center government cannot be distinguished from a right-wing government. On the other hand, when moving from a non-leftist, center government in a democracy to a Left-Wing Executive, the probability of delegation increases from about 71% to more than 80%, all else equal. This is an increase of almost 10% points in the likelihood of having delegation in a treaty's design due to the influence of a left-wing democratic executive.

In Fig. 2, I have simulated the predicted probability of *delegation* equaling 1 for two scenarios: a non-leftist government participating in the negotiations and a left-wing government negotiating an agreement. The probabilities are simulated quantities of interest following the approach in King et al. (2000) and are based on 1000 draws from a normal distribution. Figure 2 shows that the predicted probabilities of the two scenarios do not overlap: the confidence intervals of the point estimates at the bottom of the graph are distinct from each other. The simulated probabilities of delegation for a non-leftist government then center around 0.62 (or 62%), which is somewhat lower than the estimate from Fig. 1. For left-wing governments, this probability increases to about 0.73 (or 73%), which is again a smaller value than what I have calculated above. The difference in the effect sizes is driven by the fact that Fig. 2 is based on simulations. Figure 2 also shows that there is only a very small portion of simulated probabilities that overlap between the two scenarios, which further strengthens the confidence in the result that left-wing democratic executives are indeed more likely to negotiate for sovereignty delegation in environmental treaty designs. Linking these findings back to the theory and the hypothesis, I find support for my theoretical expectations, but only when it comes to the delegation of power in agreement designs. I find little support for the hypothesis when we focus on obligation or precision elements. This pattern is consistent with the findings in, e.g., Böhmelt and Butkutė (2018) and the two *ad hoc* explanations outlined above may apply.

Coming to the control variables, Fig. 3 presents changes in the predicted probability of *delegation* equaling 1 based on Model 4. The estimates are sorted by the mean of each first difference. Several interesting results emerge from this graph. First, the more democratic a government is, the less likely it is that we observe delegation in an agreement's design. As stated in the research design, my initial expectations about this variable's effect were not clear due to the sample I employ. However, the negative influence of *Polity Score* is consistent with the findings in Böhmelt and Butkutė (2018): all else equal, due to larger audience costs, it is particularly democracies that may try to avoid more legalized designs in international environmental governance. And this is what I find here as well with regard to *delegation*. Second, *GDP* is negatively signed, but insignificant. The negative sign reflects the argument that particularly powerful states are concerned about their sovereignty and will

try to avoid cuts into their decision-making power.¹² Having said that, the variable is statistically insignificant except for Model 1 that focuses on the aggregate legalization index. Third, *GDP per capita* is also insignificant: the pattern of a significant income effect may thus not translate to the context of the design of environmental agreements. In appendix, I consider the possibility of a curvilinear impact, but find little evidence for this. Fourth, *Trade Openness* is positively signed and significant at the 10% level. The more embedded a country is in the global trade network, the more it seems to bargain for sovereignty delegation in treaty designs. Though not consistent with my initial expectation that there will be a negative effect, there is the argument in DeSombre (2000) that points to a positive influence and we can explain this effect with, e.g., Bernauer et al. (2010) or (2013): these studies document that environmental-treaty designs do diffuse across space and state linkages—also via the trade network—may facilitate information flows and, ultimately, that delegation elements are more likely to be considered across treaty design negotiations. Fifth, if an agreement is about a global environmental public good, the chances to see delegation in its design are higher by about 17% points. Environmental problems characterized as a public good could worsen collective-action problems and states, recognizing that more legalized designs are necessary to overcome these and to increase the chances of dealing with an environmental problem effectively, may then be more likely to negotiate delegation elements in environmental agreements (see Campbell et al., 2019). Finally, environmental treaties dealing with pollution aspects are not more or less likely than other (freshwater, ocean, habitat) issue areas to see delegation; the effect here is slightly less strongly pronounced than for *Trade Openness*. Yet, agreements dealing with the issue areas of weapons (i.e., mostly agreements dealing with environmental aspects of nuclear weapons), species (e.g., Convention on Biological Diversity), and energy (e.g., Energy Charter Treaty) are more likely than other treaties in other issue areas to have a delegation component. While *Weapons* are indeed linked to the largest first-difference estimate, the effect of *Species* and *Energy* is somewhat weaker than for *Public Good*. Explaining these patterns is challenging without additional information, but it seems that these issue-area variables do indeed capture not only different problem fields, but also different types of cooperation problems (see Koremenos, 2007). That is, also in light of the result for *Public Good*, it may be that the agreements on the issue areas of species, energy, and weapons address the most challenging problem areas and, hence, are particularly in need of some more legalized design elements: this could increase the likelihood of seeing delegation in treaty designs and mirrors the positive effect I have identified for *Public Good*.

Appendix summarizes a number of robustness checks. First, I control for diffusion effects by including region fixed effects. Second, I assess persistent dependencies in the data by using a hierarchical model and random-effects estimation. Third, I explore a possible curvilinear income effect and how GDP affects the main result. Fourth, I control for the total number of negotiating parties of a treaty. Fifth, I employ the agreement only as the unit of analysis and, finally, estimate models with different types of standard errors. All these additional analyses further support the main finding reported here.

¹² This raises the questions, however, to what degree GDP is also linked with left-wing governments and, if so, how much of the effect stems from that association? In appendix, I explore the correlation between *GDP* and *Left-Wing Executive* and present models that leave out GDP as a control or include an interaction between the two variables. In sum, I can rule out that the finding on leftist ideologies and delegation is driven by GDP as such.

5 Conclusion

Is party ideology in democratic forms of government linked to the design of international environmental agreements? In this article, I have advanced the argument that especially leftist executives in democracies should be more likely to negotiate hard-law designs as they are more environmental-friendly and acceptive of cuts into their own sovereignty than rightist and center democratic parties in power. I have tested the observable implication of these claims using data on 111 environmental agreements since 1975 and found some support for the theory: the likelihood of legalization increases with leftist democratic governments participating in negotiations, but this is driven by the delegation-of-sovereignty component. In fact, when it comes to elements of obligation or precision, there is little evidence for a systematic influence of leftist governments in democracies.

The results contribute to the research on environmental agreements. First, I introduce a previously overlooked determinant of environmental treaty design. Many prominent studies demonstrate that country features, characteristics of an environmental problem, and international influences shape institutional design (see, e.g., Murdoch et al., 2003; Bernauer et al., 2010, 2013; Tallberg et al., 2016; Spilker & Koubi, 2016; Carbonell & Allison, 2015; Böhmelt & Butkutė, 2018; Wagner, 2001; Wangler et al., 2013). However, the political ideology of negotiating parties has not fully been accounted for. I also contribute to the study of international cooperation as well as party politics and political ideology more generally. While political ideology is a central factor for the analysis of domestic politics and legislative action (Knill et al., 2010, 2012), few have considered its influence on international treaties. I have addressed this shortcoming, thus highlighting that the impact of political ideology in democracies extends beyond politics “at home,” and very much can shape the prospects for (effective) institutional designs beyond the nation state, too (Rapport & Rathbun, 2020; Hooghe et al., 2002). The strategic political recommendation in light of my findings is thus straightforward and simple: the inclusion of democratic leftist political ideologies when negotiating international environmental treaties likely facilitates the agreement on designs that are more likely to address environmental problems effectively. En route, cooperation more generally and the successful dealing with collective action problems should be more easily achieved.

Several avenues for research exist. First, further research could study whether a link between left-leaning ideology, international environmental agreement designs, and institutional effectiveness does indeed exist. When subscribing to a causal influence of international institutions on environmental performance, future work in light of my findings may attempt to clarify the mechanisms behind those studies linking leftist ideology with outcome-level behavior (e.g., Garmann, 2014; Chang et al., 2015; Wen et al., 2016; Kammerlander & Schulze, 2021): leftist governments first negotiate policy outputs conducive to environmental-friendly behavior, which in turn affects outcome-level indicators of performance. To this end, my work has direct implications for the broader research on political ideology and environmental politics (King & Borchardt, 1994; Scruggs, 1999; Jahn, 1998; Crepaz, 1995; Neumayer, 2003, 2004).

Moreover, while the results for the aggregate legalization index show that left-leaning governments are linked to more hard-law designs, the disaggregated analyses clearly highlight that not all hard-law components are equally important or driven by the same mechanisms. I have provided some explanations for this above, although future research may address this issue more thoroughly than I can do here and shed light on the question of why

this is the case. This has the potential to produce fascinating policy advice and political recommendations.

Third, the theory I develop above is based on two interrelated, but distinct mechanisms: left-leaning democratic governments are likely more environmental-friendly, while less concerned about sovereignty costs. Both mechanisms suggest the same empirically observable pattern, but I cannot distinguish them empirically with the data at hand. It would be interesting to do so nonetheless, although more detailed data must be collected to address this aspect in more detail in future work.

Fourth, I have left out non-democratic countries as the left-right scale may not always be applicable fully or at least in the same way as in democratic states. Hence, this research adds to our understanding of ideology in the democratic context, but probably not beyond that more broadly. That is, the scope of my article is not about authoritarian countries and, hence, I do not cover the complete range of Left-Wing Executive positions, including the most strongly ideological governments. Employing political ideology in more autocratic states is not without difficulty (see, however, for an individual-level analysis Ziegler, 2017). But it may be an effort worth making to use existing data on authoritarian regime types (e.g., Geddes et al., 2014) and link these to different designs of international environmental agreements.

By the same token, finally, we know that populists from all ideological directions have concerns about sovereignty. In fact, anti-elitism and people's sovereignty are two essential traits of this "thin-centered ideology" (e.g., Mudde, 2004; Wuttke et al., 2020). In another avenue for future research, scholars may thus want to address the relationship between populism and environmental agreement designs. For instance, it would be interesting to see whether populism—as a factor that is increasingly seen as harmful to environmental politics (e.g., Böhmelt, 2021; Jahn, 2021)—cancels out a possible positive effect of left-leaning political ideology in democracies and other forms of government.

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