

Design Trade-Offs Under Power Asymmetry: COPs and Flexibility Clauses

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Abstract

Negotiating parties to an environmental agreement can manage uncertainty by including flexibility clauses, such as escape and withdrawal clauses. This article investigates a type of uncertainty so far overlooked by the literature: the uncertainty generated by the creation of a Conference of the Parties (COP) in a context of sharp power asymmetry. When negotiating an agreement, it is difficult for powerful states to make a credible commitment to weaker states, whereby they will not abuse their power to influence future COP decision-making. Flexibility clauses provide a solution to this credibility issue. They act as an insurance mechanism in case a powerful state hijacks the COP. Thus we expect that the creation of a collective body interacts with the degree of power asymmetry to make flexibility clauses more likely in environmental agreements. To test this argument, we draw on an original data set of several specific clauses in 2,090 environmental agreements, signed between 1945 and 2018. The results support our hypothesis and suggest that flexibility clauses are an important design feature of adaptive environmental agreements.

Why do international environmental agreements (IEAs) vary in their degree of flexibility? Flexibility mechanisms are a set of contractual clauses that allow states to withdraw from cooperation, fully or partially, in response to new circumstances (Koremenos 2005). They include exceptions, reservations, and escape and withdrawal clauses. The literature on IEAs rightly presents flexibility clauses as a double-edged sword (e.g., Boockmann and Thurner 2006). On one hand, they contribute to more ambitious commitments and wider ratification by providing reassurances that parties will remain relatively free to retreat from cooperation. On the other hand, negotiators must use flexibility clauses sparingly to avoid undermining the agreement's objectives. If an IEA includes several broad exceptions, for example, it is unlikely to improve the state of the environment even if it has been signed by several parties. Thus negotiators must find the right balance in terms of flexibility in order to encourage cooperation without undermining effectiveness.

Earlier studies have found that the balance in the degree of flexibility depends on the level of uncertainty (Koremenos 2005; Marcoux 2009; Thompson

2010). When uncertainty is high, negotiators tend to include flexibility clauses. However, there are different types of uncertainty. The original research program on the design of institutions conjectured that “flexibility increases with uncertainty about the state of the world” (Koremenos et al. 2001, 793). This article focuses on a type of uncertainty that is endogenous to the treaty design itself; that is, it results from another design feature of the agreement under negotiation.

One design feature that can generate uncertainty is the creation of a collective body, such as a Conference of the Parties (COP). Collective bodies are a frequent feature of IEAs. They provide parties (or a subset of parties) with the opportunity to increase their cooperative activities as needed, for example, when new scientific evidence is provided or new technology is available. Once established, they often lead to the adoption of amendments, resolutions, annexes, and decisions, which incrementally intensify environmental cooperation (Wiersema 2009). However, consensus around the creation of a collective body can be difficult to achieve when sharp power differentials are present. Negotiators anticipate that, once such a collective body has been created, powerful states might influence the decision-making process in their favor. Weaker parties to the negotiation might want to create a collective body to facilitate adaptation, but they may be reluctant to expose themselves to undue pressure from more powerful states. For weaker states, a static IEA without any collective body might appear less risky. Powerful states may not plan to exploit their power advantage to influence the collective body, but it is difficult for them to make this commitment credible. Tying their hands with procedural rules is not sufficient, as they can often circumvent these rules by exercising informal, structural, or coercive power.

We argue that flexibility clauses provide insurance against the risk of powerful states abusing their power to unduly influence a collective body. When parties with sharp power differentials negotiate the creation of a COP, flexibility clauses provide them with a mutually beneficial solution. Based on this argument, we expect the creation of a collective body (independent variable) to interact with the degree of power asymmetry (moderating variable) in order to make IEAs more flexible (dependent variable).

This article is one of the first to explore how power asymmetries between negotiating parties affect the institutional design of an IEA. It is also one of the few to study the relation between different design features. It builds on the most comprehensive and fine-grained data set of IEA design features, made available to all researchers with the publication of this article.

Our results show that power asymmetry and the creation of a collective body interact to make flexibility provisions more likely. This finding highlights the presence of a trade-off between design features, which reflects the preferences of both powerful and weaker states. It also suggests that flexibility clauses are instrumental for the successful conclusion of adaptive IEAs negotiated under power asymmetry.

Theoretical Framework

Negotiating Design Features Under Power Asymmetry

Power asymmetry stems from the uneven distribution of resources among parties. Resources relevant to negotiating contexts are multidimensional. They can include a combination of expert knowledge, natural resources, economic capacity to offer side payments, and military force—many of which are positively correlated with gross domestic product (GDP) levels.

Several IEAs have been negotiated under asymmetrical bargaining conditions. Forty-four percent of IEAs concluded from 1945 to 2018 brought together developed and developing countries,¹ illustrating the prevalence of some degree of power asymmetry among negotiating parties. Previous research shows that such power asymmetry affects the length and ease of international negotiations (Rubin and Zartman 1995). However, it remains unclear how it affects the design of IEAs.

Some authors argue that negotiation outcomes primarily reflect the preferences of powerful states (Drezner 2008). Others highlight that weaker states can also achieve important gains, even under power asymmetry (Schneider 2011). Weaker states can earn concessions by “gnawing” away at the details of issues that matter to them, threatening to walk out of a negotiation, deploying linkage tactics, building coalitions, or creating alternative institutions with other partners (Habeeb 1988). Thus outcomes often reflect—though not necessarily equally—powerful states’ and weaker states’ preferences.

The design of IEAs’ institutional features may be subject to bargaining between powerful and weaker parties. However, these bargains have not been thoroughly investigated by the existing literature on the design of institutions (Koremenos et al. 2001). As contributors and critics alike have pointed out, much of this literature has neglected to account for the role of power in explaining design outcomes (Thompson 2010; Vabulas and Snidal 2013).² This neglect was initially justified by the literature’s legitimate focus on variables that had previously been omitted and the desire to “keep other elements of the context (including the bargaining component) as simple as possible” (Koremenos 2001, 296). With other elements of institutional design now well understood, it is relevant to shift attention toward negotiation dynamics and how power impacts institutional design outcomes.

The few studies that have looked at the impact of power asymmetry on specific design features have generated mixed results. One study finds that power asymmetry increases the likelihood of delegation to an independent secretariat (Hooghe and Marks 2015), while another draws the opposite conclusion

1. See the International Environmental Agreements Database Project, <https://iea.uoregon.edu/>, last accessed April 19, 2021.
2. An exception is Koremenos (2016, chapter 10).

(Manulak 2017). The relationship between power asymmetry and individual design features is not clear-cut. This may be because power asymmetry provides a favorable context for trade-offs between design features rather than having a consistent effect on individual features, a possibility that previous studies have not accounted for.

Creating Collective Bodies: Benefits and Risks

One important design feature of several IEAs is the creation of a collective body. According to our estimates, 41 percent of IEAs concluded from 1945 to 2018 created a collective body. IEAs employ different terms to describe these collective bodies, including Commissions, Assemblies, Committees, Meetings of Parties, and Conferences of the Parties. Some bring together all parties, and others comprise only a subset of parties. All these entities regularly convene representatives of the parties to perform various governance tasks. These tasks can include amending the original agreement, adopting specific regulations, expressing recommendations, sharing information, instructing research, overseeing a secretariat, adopting arrangements with intergovernmental organizations, establishing subsidiary bodies, monitoring compliance, enforcing rules, and adjudicating disputes (Churchill and Ulfstein 2000).

The creation of such a collective body is related to—but distinct from—what the literature refers to as pooling and delegation. The term *pooling* relates to the voting rules associated with collective decision-making (Hooghe and Marks 2015) rather than to the dichotomous decision of whether to create a collective body at all—our focus here. The creation of a collective body should also be differentiated from delegation from states to an external third party, such as an international secretariat or a nongovernmental entity, as they have different causes and consequences (Lake 2007). Delegation involves the granting of authority from a principal to an agent that will act on the principal's behalf, while in a collective body, principals act on their own behalves.

Collective bodies are beneficial to environmental cooperation due to the incomplete contracting problem. Owing to uncertainty and practical limitations, it is impossible for negotiators to specify all potential matters that may arise in the future (Hart and Moore 1988). This makes IEAs necessarily incomplete. Collective bodies help to mitigate this incomplete contracting problem by reducing transaction costs associated with further cooperation and facilitating adaptation to changing circumstances. They enable the adaptation of IEAs when, for example, a new substance is found to be harmful or a new species is found to be endangered. Parties can then amend their obligations through the IEA's collective body (Wiersema 2009).

The expected benefits of collective bodies come at the price of restricted sovereignty for all states involved. Parties do not know in advance what a given collective body's future agenda and decisions will be. Accordingly, the alternative, an IEA without a collective body, is more static but poses less uncertainty.

Negotiating Collective Bodies Under Power Asymmetry

In a context of sharp power asymmetry, the political risk of creating a collective body is often more acute for weaker states than for powerful ones. The latter states are in a privileged position to informally influence the outcomes from within to suit their interests—which might be different from those of weaker states. Bilateral bodies and collective bodies made up of only a subset of the parties to the IEA are particularly susceptible to power imbalances, as powerful states tend more easily to dominate decision-making in smaller settings, where there are fewer states to win over.

A notorious case of a powerful state influencing a collective body is the adoption of the moratorium on commercial whaling by the International Whaling Commission (IWC). In the 1970s and 1980s, the United States used the threat of reducing fishing quotas to coerce a number of IWC members to support its anti-whaling view. A sufficient number of IWC members voted in favor of a moratorium on commercial whaling in 1982, turning what was originally a whalers' club into an organization devoted to whale protection (Caron 1995). In the following decades, Japan attempted to use bilateral aid to other members as a side payment to encourage them to reverse the moratorium (Miller and Dolšák 2007). Yet, Japan does not have the United States' material and ideational resources and never managed to rally a sufficient number of countries to its cause.

The IWC is not a typical case. The capacity of the United States to exercise influence over this specific collective body was made easier by the IWC's three-quarter majority decision-making rule, which meant that the United States did not need to convince every state to agree to its own position. Most other collective bodies adopt decisions based on consensus. Even when a majority vote is possible for one step of the decision-making process (e.g., putting an amendment proposal on the agenda), consensus is usually required for subsequent steps (e.g., adopting the amendment). Only a handful of IEAs formally allow for nonconsensual lawmaking (Brunnée 2002; Helfer 2008). Relative to majoritarian decision-making rules, consensus rules better protect weaker states from the risk of powerful countries' undue influence.

Yet, even in consensus-based collective bodies, it remains easier for powerful states than for weaker states to influence the outcome. Decision-making rules might change the degree and the type of influence available to powerful states, but powerful states can still rely on three types of power to influence the outcomes produced by consensus-based collective bodies. First, they can use informal mechanisms to gain advantages within collective bodies themselves. For example, their greater scientific and diplomatic resources allow them to better prepare reports in line with their interests. Second, powerful states can rely on their coercive power outside of collective bodies to exercise influence behind the scenes. This may include implicit threats to reduce development assistance to weaker parties that do not vote in accordance with their preferences. Third, powerful states enjoy greater ideational power in the broader structure within which

collective bodies operate. This often allows them to frame issues and to set the agenda of collective bodies.

For these reasons, the creation of a collective body is riskier for weaker states than for powerful ones, regardless of the voting rules within the body. We expect weaker states to be aware of this risk and be reluctant to establish a collective body when negotiating with more powerful states. They may see benefits associated with creating a collective body related to the facilitation of future collective action but fear that powerful states will capture it in one way or another. In turn, powerful states might not have the intention to overtly exercise influence over a collective body when they negotiate new IEAs. It might nevertheless be difficult for powerful states to convince their weaker prospective partners that they will not abuse their power if such a body is created. As a result of this commitment problem, asymmetrical parties might not be able to agree on the creation of a collective body, despite the associated benefits for their cooperation.

Using Flexibility Clauses to Insure Against the Risks Inherent to Collective Bodies

We theorize that in asymmetric negotiations, the introduction of flexibility provisions, which states can invoke unilaterally, provides insurance against the risks associated with collective bodies. It is difficult for a powerful state to make a credible commitment to refrain from unduly influencing a collective body. As a result, negotiating parties have an incentive to secure flexibility provisions in the agreement. This way, if weaker states are concerned that more powerful states will abuse their power to push the collective body in a direction that is not in line with the weaker states' interests, the possibility of withdrawal (in part or in full) from their commitments should provide some reassurance. While collective bodies have the potential to infringe on state sovereignty in unforeseen ways, flexibility clauses open the prospect of reclaiming sovereign decision-making in the area regulated by the agreement. Therefore the introduction of flexibility clauses offers a solution to the credibility issue of the powerful parties' commitment.

When a negotiation does not involve the creation of a collective body (scenarios 1 and 2 in Table 1), the need to counterbalance political risks with flexibility clauses is less acute, all other things being equal. When negotiations do not involve power differentials, the risk that one player will take over a common decision-making mechanism is lower, which reduces the need to counterbalance this risk with flexibility mechanisms (scenario 3). Our argument concerns scenario 4:

Table 1
Interaction of Collective Body and Power Asymmetry

	<i>Symmetrical Power</i>	<i>Asymmetrical Power</i>
No collective body	(1)	(2)
Collective body	(3)	(4)

when an IEA under negotiation is expected to include a collective body and partners exhibit high asymmetric power levels. In these situations, flexibility provisions might provide a useful insurance mechanism.

Let us consider two IEAs that are similar in many ways: the 1957 Agreement Between the USSR and Norway on Measures for Regulating the Catch and Conserving Stocks of Seals and the 1976 Agreement Between the USSR and Norway Concerning Mutual Relations in the Field of Fisheries. They were signed by the same countries, under conditions of sharp power asymmetry, and they share similar objectives. However, their institutional design varies greatly. The former established an intergovernmental commission that issues recommendations on regulations, research, and enforcement (scenario 4). It also includes several flexibility clauses, such as broad exceptions, the possibility of expressing reservations, and the option to end the agreement unilaterally in a short space of time. In contrast, the latter agreement did not create a collective body (scenario 2) and did not include specific flexibility clauses. For Norway, the flexibility clauses in the first agreement likely offset the risk of creating a collective body with the USSR, whereas the second agreement did not require similar safeguards.

The Convention on International Trade in Endangered Species of World Fauna and Flora (CITES) is another IEA characterized by power asymmetry. Its drafters made an explicit connection between the creation of a collective body and flexibility clauses. They established a COP with the authority to amend lists of protected species, but they made clear that any party has ninety days to introduce a reservation to such an amendment (article XV(3)). As any insurance mechanism, this opt-out option was not expected to be widely used (Legislative Developments 1974). However, it made the CITES acceptable to all negotiating parties by mitigating its risks.

Our argument rests on the assumption that the negotiation process takes place in different stages, from debates over the general features of the future agreement to the formal negotiation of its more specific provisions. Debates over the creation of some form of a collective body typically occur in an early stage that Zartman (1992, 116) calls the “phase of formulation,” during which parties discuss the future agreement’s general features and overall structure. Of course, as the saying goes, nothing is agreed before everything is agreed. Nevertheless, we assume that a convergence of expectations regarding the creation of some sort of a collective body occurs in the early stages of the negotiation process, even though provisions regarding this collective body’s composition, functions, and procedures can remain bracketed until the last stages. In contrast, flexibility clauses are by nature more specific. They are also contingent on other design features, as they temper the main obligations set out in an agreement. For these reasons, some flexibility clauses are likely to remain bracketed long after the general idea of creating a collective body was provisionally accepted. It is therefore during these subsequent stages of the negotiation process that drafters are most likely to introduce additional flexibility clauses if a provisional consensus emerged at an earlier stage around the creation of a collective body.

In the example of CITES, the right to introduce a reservation to a COP decision only makes sense if there is a COP in the first place. Hence the provisional consensus to create some sort of collective body had to emerge before its specific procedures and flexibilities could be negotiated.

To be clear, our argument does not imply that flexibility clauses benefit weaker states more than powerful states, nor does it imply that collective bodies benefit powerful states more than weaker states. Instead, our argument is that flexibility clauses solve the credible commitment problem created by the negotiation of a collective body under conditions of power asymmetry. The sharper this asymmetry is, the more the prospect of a future collective body makes flexibility attractive to all parties. It is not the creation of a specific type of collective body that directly causes the adoption of flexibility clauses; it is the power differential that accentuates the need to offset the risks inherent in collective decision-making with flexibility clauses. Accordingly, we hypothesize that the creation of a collective body interacts with the degree of power asymmetry to increase the likelihood of flexibility clauses:

H: Collective body × Asymmetry of power → Flexibility

An alternative solution to the credible commitment problem would be for powerful states to offer side payments to less powerful ones (Urpelainen 2012). However, this alternative is an inferior solution, as it is costly for the powerful states and could be interpreted as a license to exploit their power over the collective body.

Other studies present similar arguments about the relationship between institutional design features (Stone 2011; Urpelainen 2012; Vabulas and Snidal 2013). However, this article is the first to argue that the relationship between collective bodies and flexibility is conditioned by power asymmetry. It is also the first to test this relationship using a large number of agreements and several control variables.

Research Design

To test the preceding hypothesis, we rely on an original data set of collective bodies and flexibility clauses in IEAs that compose the largest IEA data set ever used for a study on institutional design. Quantitative studies on the institutional design of IEAs typically look at a relatively small or unrepresentative subset of agreements: Marcoux (2009), for example, studies the design of 53 IEAs selected on the basis of available data; Green and Colgan (2013) work on a random sample of 152 IEAs; Bernauer et al. (2013) survey a selection of 211 IEAs with universal scope; Zawahri et al. (2016) analyze 391 agreements on freshwater governance; and Boockmann and Thurner (2006) investigate a sample of 400 IEAs selected for their importance. Our data set covers all the 2,090 IEAs concluded between 1945 and 2018 that we could find in full text in any language.

The full texts of most of these IEAs were drawn from the International Environmental Agreements Database Project,³ supplemented by additional searches where necessary. All IEAs in the sample are legally binding agreements under international law and were concluded by at least two sovereign states. The primary purpose of these 2,090 IEAs is to protect the natural world or ensure the sustainable use of natural resources. They include agreements on nuclear energy safety, waste disposal, water management, fishing quotas, invasive plants, and endangered species. We excluded amendment and prolongation agreements, as they introduce bias into our analysis of the bargaining underlying the original agreement.

We relied on human coding to collect information on the collective bodies and flexibility clauses provided in each of our 2,090 IEAs.⁴ We instructed a team of trained coders to read each agreement using the software NVivo and a detailed codebook. We weeded out false positive results by using different coders to analyze the selected provisions. Last, we assessed the frequency of false negatives by asking a different coder to code 10 percent of the agreements a second time. Intercoder reliability for this double coding, as measured by Cohen's kappa, is 0.706, which is considered a substantial level of agreement (Landis and Koch 1977).

Our main independent variable of interest is *COLLECTIVE BODY*. Coders identified clauses that either create a new collective body involving all parties, establish a collective body with a subset of parties, or provide new functions to an existing collective body. The resulting variable is binary. It is coded 1 if one of these clauses is present in the IEA, and 0 otherwise.⁵ The later section on robustness checks presents alternative measures.

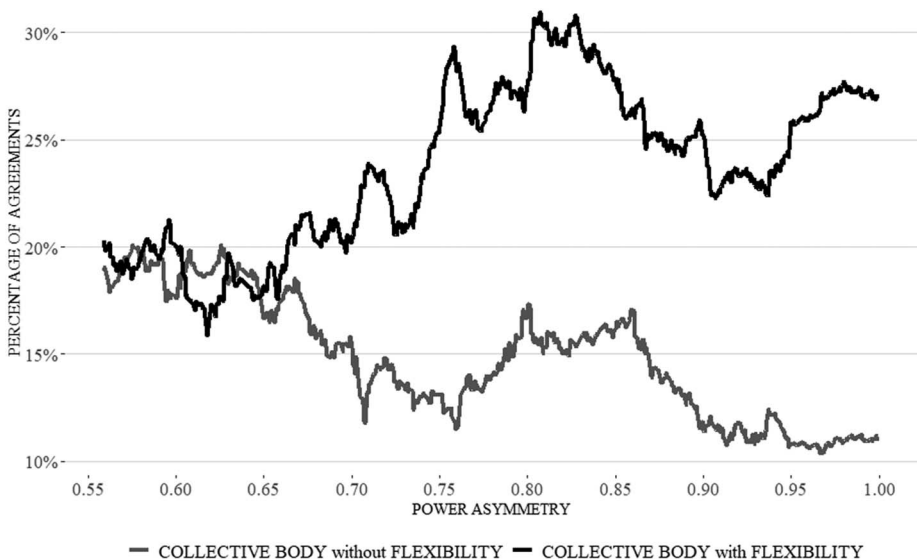
We measure *POWER ASYMMETRY*, our moderating variable of interest, by dividing the highest GDP by the total sum of GDP for all the parties to the IEA⁶. Despite their known limitations, GDP-based measures are widely used proxies for various dimensions of power (e.g., Bernauer et al. 2013) with reliable coverage for our broad sample of countries and years. *POWER ASYMMETRY* is a concentration ratio, one of the most common measures of market or power asymmetry in economics and political science. This formulation of *POWER ASYMMETRY* accounts for the fact that in multilateral negotiations, several weak states can create a coalition and counterbalance the most powerful state in the decision-making process of a collective body. It also functions well as a measure of power asymmetry in bilateral settings. The average value of *POWER ASYMMETRY* is 0.77, suggesting that several IEAs are concluded under sharp power asymmetry. The asymmetry tends to be more pronounced with bilateral agreements; they

3. <https://iea.uoregon.edu/>, last accessed April 19, 2021. See also Mitchell et al. 2020.

4. The result of our coding of the variables *FLEXIBILITY* and *COLLECTIVE BODY* is available for future research at <https://iea.uoregon.edu/>, last accessed April 19, 2021, and <https://www.ieadesign.org/>, last accessed April 19, 2021.

5. The variable *COLLECTIVE BODY* is a binary variable because, as discussed earlier, any form of collective body can potentially allow the most powerful party to influence the outcome of the decision-making process.

6. To calculate this, we use the GDP of each country for the year it signed the treaty.

**Figure 1****COLLECTIVE BODY and FLEXIBILITY in IEAs Under Power Asymmetry**

For visualization purposes, we define flexible agreements as agreements with at least one clear flexibility provision. In addition, Table 1 does not show the 20% of the sample with the lowest values for power asymmetry (less than 0.55), as our argument applies to asymmetric agreements. “COLLECTIVE BODY without FLEXIBILITY” and “COLLECTIVE BODY with FLEXIBILITY” are calculated using moving averages with a window of ± 0.05 .

have an average *POWER ASYMMETRY* of 0.86, compared to 0.56 for multilateral agreements. In our robustness checks, we present alternative measures of power and alternative calculations of power asymmetry.

To measure the degree of *FLEXIBILITY*, our dependent variable, we identified six different types of flexibility clauses, each providing states the opportunity to fully or partially terminate their agreement commitments.⁷ These include, first, exceptions to the main obligations; second, the explicit possibility to make reservations; third, a notification period of less than twelve months to withdraw from the agreement; fourth, a minimum validity period of less than five years; fifth, the possibility to withdraw partially from the agreement; and sixth, a fixed duration for the agreement with the possibility of renewal. From these data, we created an additive flexibility index by giving an additional point for each type of flexibility clause, without arbitrarily weighting one type of clause over another.⁸

Figure 1 presents preliminary descriptive evidence that is consistent with our hypothesis. At low levels of power asymmetry, the creation of a collective

7. For the purposes of this article, we do not include amendment procedures among flexibility measures, as they are not unilateral measures and typically presuppose the creation of a collective body.

8. The variable *FLEXIBILITY* has a maximum value of 3, since only six agreements have an initial score of 4 and none score higher. Scores of 4 were changed for 3.

body does not appear to be a strong predictor for the inclusion of flexibility clauses. However, as power asymmetry increases, more IEAs create a collective body with flexibility clauses than without. When asymmetry is very high, almost all IEAs that create collective bodies include flexibility clauses.

To further test our hypothesis, we create the variable *COLLECTIVE BODY × POWER ASYMMETRY*, that is, an interaction effect between our main independent and moderating variables of interest. When *COLLECTIVE BODY × POWER ASYMMETRY* is positive and statistically significant, it suggests that the creation of collective bodies in more asymmetrical negotiations is associated with more flexible IEAs.

Our model includes several relevant control variables. Seven variables concern the IEAs' characteristics. First, given that historical trends affect treaty design, we take into account the *TIME OF THE CONCLUSION* of each IEA. We group our IEAs into fifteen five-year periods between 1945 and 2018. Second, we control for the *NUMBER OF PARTIES* and remove the countries that joined an existing IEA without taking part in the original negotiation. Since records of negotiations are often unavailable, for our purposes, we consider that the negotiating parties are those that signed or ratified the agreement before its entry into force.⁹ Third, by including the variable *BILATERAL*, we acknowledge that when it comes to the design of an IEA, there is a qualitative difference between bilateral and a plurilateral negotiation settings distinct from any membership size effect captured by the *NUMBER OF PARTIES*. Adding a third party creates political dynamics and calls for formalized procedures that would not be necessary in a bilateral setting. Fourth, *OPENNESS* is a dummy variable indicating whether the IEA is explicitly open to accession, given that the possibility of adding new parties creates uncertainty for future political dynamics within the agreement. Fifth, we distinguish *PROTOCOLS* from other IEAs. Protocols build on the institutional legacy of framework conventions, which affect their design. Sixth, we account for the different environmental issues addressed by each IEA, as they imply different problem structures and levels of uncertainty (Hooghe and Marks 2015). We distinguish between ten different categories of environmental issues and convert them into mutually exclusive *ISSUE* dummy variables: *BIODIVERSITY CONSERVATION*, *AGRICULTURE*, *ENERGY*, *FISHERIES*, *FRESH WATER*, *HABITAT*, *POLLUTION*, *WEAPONS*, *ENVIRONMENTAL GOVERNANCE*, and *OTHER ISSUES*. Seventh, we control for the *NUMBER OF WORDS* in the IEAs, which varies substantially from 135 words to more than 80,000 words. The *NUMBER OF WORDS* is a good indicator of the complexity and the overall sophistication of the IEA, which is an important factor when it comes to predicting the presence of multiple design features (Koremenos 2008; Koremenos et al. 2001). We use the logarithm of the *NUMBER OF WORDS* because we believe it has a decreasing marginal impact.

We also control for state-related variables at the IEA level. As democracies have different policy preferences concerning institutional design (Koremenos 2008), we measure the *AVERAGE LEVEL OF DEMOCRACY* among parties to an IEA using

9. When both the European Union and its member states have signed an agreement, we consider only the European Union.

Table 2
Descriptive Statistics

<i>Variable</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>Min.</i>	<i>Max.</i>
FLEXIBILITY	2,090	0.878	0.944	0	3
POWER ASYMMETRY	2,090	0.768	0.22	0.132	1
NUMBER OF PARTIES (LOG)	2,090	6.001	15.48	2	194
NUMBER OF WORDS (LOG)	2,090	3,163	4,039	135	81,555
AVERAGE LEVEL OF DEMOCRACY	2,088	4.465	5.166	-9.375	10
IDEAL POINTS AT THE UN	1,947	1.170	1.945	0	11.42
DEVELOPMENT RATIO	2,090	8.571	25.35	1	439.22

data from the Polity IV Project. SOVEREIGNTY is a dichotomous variable that indicates whether one of the negotiating parties obtained its sovereignty fewer than ten years before the IEA was concluded (Bailey et al. 2017). We expect these parties to be less likely to compromise on their recently acquired sovereignty when designing an IEA. Finally, we include two variables related to the degree of heterogeneity among parties. Heterogeneous parties are less likely to trust each other, and their distrust calls for certain design features (Hooghe and Marks 2015). These two variables are the variance in states' IDEAL POINTS AT THE UN General Assembly (Bailey et al. 2017) and the DEVELOPMENT RATIO obtained by dividing the GDP per capita of the richest party with the poorest. The final sample size used in our analysis is 1,946 because of missing values in IDEAL POINTS AT THE UN and AVERAGE LEVEL OF DEMOCRACY.¹⁰ Tables 2 and 3 present descriptive statistics for our variables.

To test our hypothesis, we use two types of models. First, we use the full FLEXIBILITY index as the dependent variable in an ordinary least squares model with robust standard errors. This is a straightforward and efficient way of analyzing the relationship between the independent variables and the full flexibility index. However, it has the disadvantage of giving predicted values that can go beyond the dependent variable's standard range. Three percent of predicted values are below 0 (but always above -1), and none are above 3. Second, we use a logistic regression model where the dependent variable is equal to 0 if there is no flexibility clause, and 1 otherwise.¹¹ The dependent variable is well balanced in the

10. The sample is larger for some models in the robustness section.

11. We do not use an ordinal logistic regression model as the number of observations at different scale levels is unbalanced, meaning that most specifications would fail the proportional odds assumption. By testing the model with a higher threshold in the robustness section, we verify that the relationship holds at every scale level just as well as with an ordinal logistic regression model.

Table 3

Descriptive Statistics (Binary Variables)

<i>Variable</i>	<i>N</i>	<i>Yes</i>	<i>Percentage</i>	<i>No</i>
bilateral	2,090	1480	71%	610 (29%)
collective body	2,090	865	41%	1225 (59%)
openness	2,090	330	16%	1760 (84%)
protocol	2,090	376	18%	1714 (82%)
sovereignty	2,090	133	6%	1957 (94%)
issue: fisheries	2,090	690	33%	1400 (67%)
issue: agriculture	2,090	259	12%	1831 (88%)
issue: fresh water	2,090	249	12%	1841 (88%)
issue: environmental governance	2,090	226	11%	1864 (89%)
issue: energy	2,090	188	9%	1902 (91%)
issue: pollution	2,090	181	9%	1909 (91%)
issue: biodiversity conservation	2,090	150	7%	1940 (93%)
issue: habitat	2,090	125	6%	1965 (94%)
issue: other issues	2,090	16	1%	2074 (99%)
issue: weapons	2,090	6	0%	2084 (100%)
time of conclusion: 1945–49	2,090	30	1%	2060 (99%)
time of conclusion: 1950–54	2,090	51	2%	2039 (98%)
time of conclusion: 1955–59	2,090	73	3%	2017 (97%)
time of conclusion: 1960–64	2,090	75	4%	2015 (96%)
time of conclusion: 1965–69	2,090	101	5%	1989 (95%)
time of conclusion: 1970–74	2,090	140	7%	1950 (93%)
time of conclusion: 1975–79	2,090	204	10%	1886 (90%)
time of conclusion: 1980–84	2,090	119	6%	1971 (94%)
time of conclusion: 1985–89	2,090	144	7%	1946 (93%)
time of conclusion: 1990–94	2,090	301	14%	1789 (86%)
time of conclusion: 1995–99	2,090	315	15%	1775 (85%)
time of conclusion: 2000–04	2,090	262	13%	1828 (87%)
time of conclusion: 2005–09	2,090	149	7%	1941 (93%)
time of conclusion: 2010–14	2,090	113	5%	1977 (95%)
time of conclusion: 2015–18	2,090	6	0%	2084 (100%)

Table 4
Baseline Models

	<i>OLS</i>		<i>Logistic</i>	
	(1)	(2)	(3)	(4)
COLLECTIVE BODY	0.372*** (0.046)	-0.334** (0.140)	0.803*** (0.121)	-0.650 (0.396)
POWER ASYMMETRY	-0.305** (0.124)	-0.714*** (0.143)	-0.669** (0.335)	-1.501*** (0.400)
COLLECTIVE BODY × POWER ASYMMETRY		0.894*** (0.173)		1.883*** (0.489)
NUMBER OF PARTIES (LOG)	-0.021 (0.055)	-0.028 (0.055)	-0.017 (0.154)	-0.039 (0.152)
BILATERAL	0.428*** (0.081)	0.439*** (0.082)	1.095*** (0.232)	1.103*** (0.232)
PROTOCOLS	-0.535*** (0.050)	-0.533*** (0.050)	-1.465*** (0.162)	-1.477*** (0.164)
AGRICULTURE	0.610*** (0.208)	0.654*** (0.195)	0.971 (0.621)	1.078* (0.621)
FRESH WATER	-0.425** (0.208)	-0.368* (0.196)	-1.608*** (0.619)	-1.501** (0.618)
NUMBER OF WORDS (LOG)	0.038* (0.022)	0.043** (0.022)	0.243*** (0.065)	0.250*** (0.065)
AVERAGE LEVEL OF DEMOCRACY	-0.009** (0.004)	-0.010** (0.004)	-0.015 (0.011)	-0.016 (0.011)
SOVEREIGNTY	0.222** (0.089)	0.213** (0.088)	0.577** (0.249)	0.554** (0.250)
IDEAL POINTS OF THE UN	0.009 (0.012)	0.008 (0.012)	0.014 (0.029)	0.012 (0.030)
DEVELOPMENT RATIO	-0.0005 (0.001)	0.0002 (0.001)	-0.002 (0.003)	-0.001 (0.003)
OPENNESS	0.216*** (0.074)	0.262*** (0.073)	0.723*** (0.221)	0.816*** (0.222)
Constant	0.909*** (0.326)	1.119*** (0.313)	-2.104* (1.256)	-1.659 (1.260)

Observations	1,946	1,946	1,946	1,946
R^2	0.222	0.232	0.237	0.242
Adjusted R^2	0.208	0.218		
Log likelihood			-1,099.399	-1,091.955
Akaike inf. crit.			2,268.798	2,255.909
Residual SE	0.842 ($df = 1,911$)	0.837 ($df = 1,909$)		
F -statistic	16.041***	16.501***		

We used MacFadden's pseudo- R^2 for the logistic model. OLS = ordinary least squares.

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

second model, as 54 percent of values are equal to 1. Since linear and logistic models rely on different sets of assumptions and are subject to different pitfalls, conclusive results in both models would be a sign of their robustness.

Results

We find strong evidence to support our hypothesis. Table 4 presents our two baseline models, with and without the interaction term, and Table 5 presents the marginal effects for the logistic model.¹² To facilitate readability, the tables do not display the time fixed effects and environmental issue-related dummy variables that have no statistically significant effect. Figure 2 displays the marginal effect of COLLECTIVE BODY in the logistic model at different values of POWER ASYMMETRY. A similar figure for the linear model is included in the online appendix.

In Table 4, the results for the models without interaction effects (models 1 and 3) show that COLLECTIVE BODY and POWER ASYMMETRY both have statistically significant effects on FLEXIBILITY. COLLECTIVE BODY has a strong positive effect. Conversely, POWER ASYMMETRY has a negative effect on FLEXIBILITY. Adding in the interaction effect COLLECTIVE BODY \times POWER ASYMMETRY (models 2 and 4) reverses the main effect coefficient of COLLECTIVE BODY, making it negative. The negative and statistically significant main effect of COLLECTIVE BODY in models 2 and 4 shows that in symmetrical contexts (i.e., when power asymmetry is coded 0), the presence of a COLLECTIVE BODY is related to lower flexibility scores (scenario 3 in Table 1). This indicates that, as expected, the positive relationship between the creation of collective bodies (independent variable) and flexibility clauses (dependent variable) is conditional on the level of power asymmetry (moderating variable). Hence we observe such a relationship only under scenario 4 of Table 1.

We refer to Figure 2 to interpret the statistical significance of the average marginal effects at different levels of power asymmetry. Figure 2 and Table 5 are based on the results of model 4. See Figure A1 in the online appendix for the marginal effects plot corresponding to model 2.

In models 2 and 4, which include the interaction effect COLLECTIVE BODY \times POWER ASYMMETRY, the marginal effects are statistically significant at the 95 percent level when POWER ASYMMETRY is above a score of 0.55. This threshold corresponds to the situation where the most powerful actor has more power than all the others combined. Intuitively, this is also when the likelihood that the most powerful actor captures the collective body increases significantly. Below this threshold, there is no evidence that COLLECTIVE BODY has an effect on FLEXIBILITY. For model 4, this result is visible in Figure 2, where below the value of 0.55, the confidence intervals around the POWER ASYMMETRY estimate include zero, indicating that the average marginal effect of COLLECTIVE BODY ON FLEXIBILITY for these

12. The excluded reference categories are YEAR-2015–2018 for the time period controls and OTHER ISSUES for the subject controls.

Table 5
Average Marginal Effects

	<i>Logistic, with Interaction Term (4)</i>
COLLECTIVE BODY	0.15*** (0.02)
POWER ASYMMETRY	-0.14** (0.06)
NUMBER OF PARTIES (LOG)	-0.01 (0.03)
BILATERAL	0.21*** (0.04)
PROTOCOLS	-0.28*** (0.03)
AGRICULTURE	0.20* (0.12)
FRESH WATER	-0.28** (0.12)
NUMBER OF WORDS (LOG)	0.05*** (0.01)
AVERAGE LEVEL OF DEMOCRACY	0.00 (0.00)
SOVEREIGNTY	0.11** (0.05)
IDEAL POINTS OF THE UN	0.00 (0.01)
DEVELOPMENT RATIO	-0.00 (0.00)
OPENNESS	0.15*** (0.04)

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

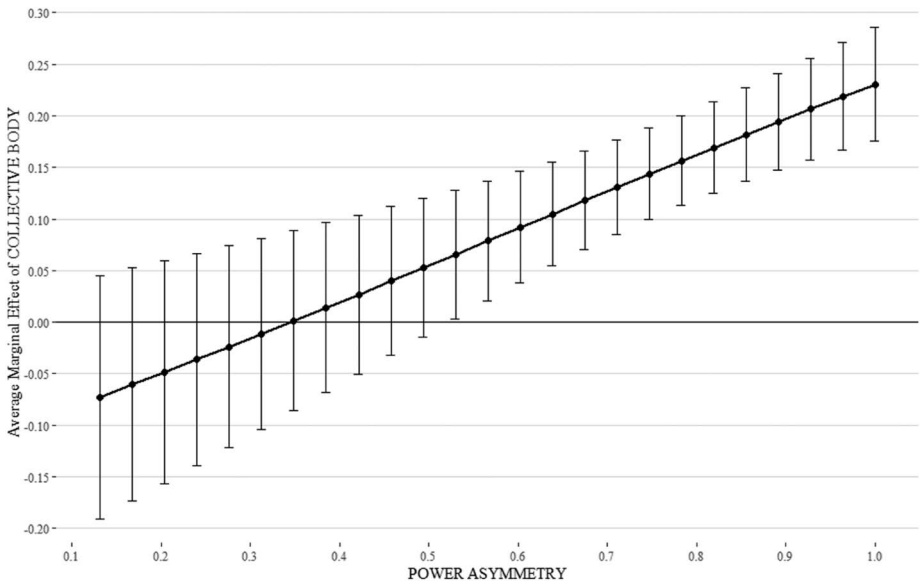


Figure 2
Average Marginal Effect of COLLECTIVE BODY (Logistic Model)

values is indistinguishable from zero. This finding is in line with the reasoning that when there is no strong bargaining imbalance (scenario 3 in Table 1), flexibility clauses are not used as insurance against the risk of collective bodies' capture. Hence it constitutes evidence that a high level of power asymmetry (scenario 4) is a necessary condition for a connection between these two design features.

In model 4, we find that the presence of a COLLECTIVE BODY increases the probability of the presence of a flexibility clause by on average 15 percent (see average marginal effects in Table 5). When POWER ASYMMETRY is high (e.g., a score of 0.9), COLLECTIVE BODY increases the probability of flexibility by approximately 20 percent. POWER ASYMMETRY has a linear effect on the marginal effect of COLLECTIVE BODY, which need not be the case with a logistic model. A rise of 0.1 in the POWER ASYMMETRY score increases the probability of flexibility caused by COLLECTIVE BODY by approximately 3.6 percent. Hence, the more asymmetrical the agreement, the more the presence of a COLLECTIVE BODY increases the likelihood of FLEXIBILITY, which supports our hypothesis. This is also reflected in the linear model (model 2), where the effect of POWER ASYMMETRY on the marginal effect of COLLECTIVE BODY is even stronger. In highly asymmetrical relations (e.g., a score of 0.9), COLLECTIVE BODY increases the level of FLEXIBILITY by almost 0.5.

Our controls perform largely as expected and are generally consistent across our model specifications. Since it is our most efficient, balanced, and intuitive model, we use model 4 and its related average marginal effects to interpret the effects of these variables. The model shows that BILATERAL agreements are 21 percent more likely to have a FLEXIBILITY provision than other agreements. However, the NUMBER OF PARTIES (LOG) coefficient is not statistically significant in the model, which indicates that we find no evidence that the number of parties affects the level of FLEXIBILITY, except in the case of bilateral agreements. PROTOCOLS are 28 percent less likely to include flexibility clauses. This supports the notion that protocols are simpler agreements in terms of design and are, as a consequence, less likely to include specific flexibility clauses. Protocols might also incorporate flexibility clauses by reference to the framework agreement to which they are related. As expected, NUMBER OF WORDS (LOG) has a positive relationship with FLEXIBILITY. More complex agreements are more likely to include flexibility clauses. In model 4, this leads to an increase of 0.05 percent in the probability of the presence of flexibility clauses for every 1 percent increase in the NUMBER OF WORDS (LOG). SOVEREIGNTY has a statistically significant effect across models. In model 4, when at least one state that is party to the IEA became sovereign in the last ten years, a FLEXIBILITY provision is 11 percent more likely. This is in accordance with our expectation that young sovereign states are particularly likely to push for flexibility clauses to protect their sovereignty. OPENNESS also has a positive and statistically significant effect on FLEXIBILITY across all models. In open agreements, the probability of including at least one flexibility clause increases by 15 percent (model 4). The year fixed effects show a small and inconsistent increase in FLEXIBILITY over time (see the online appendix for the full table with the year fixed effects).

Robustness Checks

Testing the General Model Specification

To test the reliability of our model, we checked several different specifications.¹³ First, we sequentially excluded all variables from the model, including the fixed effects, except *POWER ASYMMETRY*, *COLLECTIVE BODY*, and their interaction. We then exchanged the variance of the *IDEAL POINTS AT THE UN* for the number of world regions covered by the negotiating parties (Arel-Bundock et al. 2018), as an alternative way of measuring the heterogeneity of preferences. We also controlled for the presence of an international secretariat and its interaction with *POWER ASYMMETRY* to verify if this kind of delegation drives our results. We found no statistically significant effects. In addition, we included a control for the presence of at least one explicit majority voting rule for the adoption of a new annex or amendment.¹⁴ The results suggest that voting rules have no statistically significant effect on flexibility. We also added linear terms for the *NUMBER OF WORDS* and the *NUMBER OF PARTIES*, as well as a squared term for *POWER ASYMMETRY*—a standard robustness test for interactions with a continuous variable. All these tests had minimal effects on the coefficients of *COLLECTIVE BODY*, *POWER ASYMMETRY*, and their interaction.

We ran linear models with state-level effects. Each of these binary variables took a value of 1 if the state in question was part of the agreement, and 0 otherwise. Although the fixed effects estimations were imprecise, having high standard errors and related multicollinearity problems, the effects found for the coefficients of interest were very similar to the baseline models.

Finally, we ran logistic regression models where, rather than considering the presence or absence of flexibility clauses, we considered whether IEAs have at least two types of flexibility clauses. The resulting models gave results that are similar to the logistic regression model presented in Table 4. The interaction coefficient is slightly smaller but remains statistically significant.

Testing the FLEXIBILITY Index

To further our understanding of the impact of *COLLECTIVE BODY* and *POWER ASYMMETRY* on the level of *FLEXIBILITY*, we broke down the flexibility index into two kinds of flexibility. The first type includes exceptions and reservations, both of which relate to the implementation of the agreement. The second type includes notification periods, validity periods, and withdrawal possibilities, which are all related to possible future exit from the agreement. The first and second indices take values between 0 and 2 and between 0 and 3, respectively. We ran logistic regression models with these two indices as the dependent variables. For the first index, we find that the coefficient for the interaction effect is smaller in the logistic

13. See the online appendix for the full results tables corresponding to our robustness checks.

14. Note that we could only identify ten agreements that allow for nonconsensual lawmaking.

model, with a p -value of 0.065. The second index gives results very similar to those presented in the baseline models. This suggests that flexibility provisions relating to agreement exit have a clearer impact on the presence of collective bodies than the type of flexibility provision relating to implementation.

Because agreements with a flexibility score of 0 might also be generally less complex, we ran linear models without them. Even though this leaves us with a smaller sample of 1,083 observations, we find a smaller but statistically significant interaction term.

Finally, we ran models with FLEXIBILITY as an independent variable and COLLECTIVE BODY as the dependent variable. Using both logistic and linear models, we found statistically significant positive effects for the interaction term.

Testing the Impact of POWER ASYMMETRY

We ran a model with only bilateral agreements and found an even larger coefficient for the interaction term of POWER ASYMMETRY \times COLLECTIVE BODY. This highlights that the relationship we witness in our baseline models is also present in bilateral agreements alone. We also ran the baseline models with only multilateral agreements and did not find significant effects. This is likely because the sample of multilateral agreements is small and power asymmetry is harder to measure when numerous parties are involved.

Given that the variable POWER ASYMMETRY has many high values, we ran the models without observations in the top quartile of the distribution. This gives us a sample of 1,466 IEAs, all with a POWER ASYMMETRY below 0.963. While the coefficient for the interaction term became smaller, it remained statistically significant at the 5 percent level.

Since power dynamics were different during and after the Cold War, we also ran separate models for the two time periods. We find results similar to those presented in our baseline models, although the p -value of the interaction term in the Cold War-era model is 0.081. This is not surprising, considering that fewer agreements were concluded during this period.

We also used alternative formulas to calculate POWER ASYMMETRY: the Herfindahl index and a max./min. ratio.¹⁵ With these alternative metrics, we obtained results very close to our baseline models. We also used different measures of inequality. We found null results for the Gini index and the coefficient of variation but statistically significant results for the Atkinson index that are similar to, albeit slightly smaller than, the baseline results. Finally, we used the Composite Index of National Capability, which is an alternative measure of states' power (Singer et al. 1972), and obtained results similar to the models with GDP.

15. We divided the max./min. ratio by its maximum value to obtain an index between 0 and 1. We also censored the highest 5 percent of values of both indices to reduce the impact of extreme values.

Testing Different Forms of Collective Bodies

Our measure of the variable *COLLECTIVE BODY* depends on the presence of at least one of the following: first, the creation of a new collective body involving all parties; second, the provision of new functions to an existing collective body; or third, the establishment of a body involving a subset of parties. We tested the individual effects of each one of these clauses and found statistically significant results similar to the baseline models for the first two types of clauses. The models showed that the effect is slightly larger for the creation of new collective bodies than for the provision of new functions related to existing bodies, but the difference is not statistically significant. Although only twenty-nine IEAs create a subset body, we find effects of the expected sign and statistically significant at the 5 percent level for this variable and its interaction with *POWER ASYMMETRY*.

Conclusions

Environmental cooperation often requires the creation of collective bodies to remain adaptive. For example, an IEA can stipulate that a COP will meet periodically to add new substances to a list of prohibited pollutants. We theorize that when an IEA is being negotiated among partners with varying degrees of power, all parties involved are aware that more powerful states may be able to disproportionately influence the collective body's future decision-making process, even when decision-making procedures require a formal consensus. Powerful states that do not have any intention of abusing their power cannot make this commitment in a credible manner. In this context, flexibility clauses are particularly attractive for negotiating parties, as they solve powerful states' credible commitment problem and act as an insurance policy for weaker parties. In this way, the presence of flexibility clauses can contribute toward successful bargaining in global environmental governance and beyond.

Using a large sample of IEAs, we find strong evidence in support of our argument: under high levels of power asymmetry, the creation of collective bodies is more likely to be accompanied by increases in a treaty's degree of flexibility. We cannot definitely reject the possibility that reverse causality might in part drive our results. It is possible that, in some cases, a consensus around a flexibility clause led to the creation of a collective body. However, we are unable to conceive of a convincing argument as to why and how flexibility clauses would lead directly to the creation of collective bodies under the specific condition of power asymmetry. We also have good reasons to believe that the provisional decision to create a collective body precedes the negotiation of specific flexibility clauses. Thus we are confident that it is the introduction of a collective body that increases the need for flexibility clauses, not the other way around. More fundamentally, even if flexibility clauses sometimes lead to the creation of collective bodies, a key conclusion would remain unchanged: power asymmetry creates the need for a trade-off between these two design features.

Overall, our results suggest that power differentials create a context conducive to bargaining across specific design features where weaker states and their more powerful counterparts must find creative solutions to reach consensus. In this way, we show that both powerful and weaker states contribute to institutional design outcomes. In doing so, this article makes a significant contribution to the literature on the design of international institutions, which has so far paid little attention to power asymmetry and the bargaining process itself.

Addressing how power asymmetry impacts negotiated agreement outcomes is especially relevant in global environmental politics today. Many of the world's most pressing environmental challenges require the cooperation of broad coalitions of states of varying levels of power. A better understanding of how power asymmetry impacts IEA design choices is therefore an essential step toward providing recommendations for future IEAs.

Our findings contribute to this task by helping us to understand the conditions under which states are able to agree to collective bodies. As IEAs have generally become more ambitious incrementally, via successive waves of amendments and protocols, collective bodies play an important role in helping states to broaden and deepen their commitments over time. We provide evidence that flexibility is a key ingredient to successfully conclude an IEA with collective bodies in the context of power asymmetry. In other words, without flexibility clauses, global environmental governance would probably have fewer IEAs with collective bodies, and perhaps fewer IEAs in general. By showing how flexibility can reduce concerns in asymmetric bargaining, we point to a recipe for successful bargaining.

Counterbalancing the risks associated with the creation of collective bodies by incorporating flexibility clauses is not problematic in and of itself. However, by carefully designing collective bodies that are less susceptible to being captured by powerful states, it is more likely that powerful and weaker states will be able to agree to commitments that are harder to terminate.

Going beyond the role of power asymmetry in institutional design, our findings suggest that institutional design choices should be evaluated as interdependent decisions and need to be studied in context. While this study focused on the relationship between the creation of collective bodies and flexibility mechanisms, it is likely that other institutional design choices covary, rather than being pure reflections of the underlying problem structure, a topic that we expect will lead to fruitful future research.

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