A springboard or a safeguard?
The repercussions of affinity on treaty adaptability

Noémie Laurens

Laval University, Political Science Department

Abstract

International negotiations face the inevitable challenges of incomplete contracting and uncertainty. Therefore, if an international agreement is to remain relevant and effective over time, the institutional capacity to adjust it to changing circumstances, referred to in this paper as adaptability, is an important asset. Adaptability varies significantly across treaties. While some of them provide for periodic reviews, create joint bodies, and include detailed amendment procedures, others include none of these features. This paper argues that the degree of affinity, i.e., the varying sense of connection between prospective partners, is a major driver of such variation. Two rationales may explain why negotiators make a treaty more adaptable. When affinity is low, negotiators likely perceive adaptability as a safeguard in the event that cooperation does not go according to plan or as a means to gather more behavioral information before further cooperation. By contrast, when affinity is high, they can use adaptability as a springboard for long-term adaptive cooperation. In other words, the first rationale leads to hypothesize a negative association between affinity and adaptability, whereas the second rationale leads to hypothesize a positive association. I test both hypotheses on a sample of 1137 international environmental agreements concluded between 1945 and 2015. The results support the safeguard rationale. This provides important lessons as to how states build upon their existing connection to others to shape their cooperation frameworks.

Keywords

Institutional design; institutional adaptability; affinity; trust; environmental governance

1. Introduction

The fate of international agreements is plagued with uncertainty. At the time of signature, international agreements reflect an acceptable compromise among differing state preferences. However, nothing guarantees that these preferences will remain stable over time. In addition, some of the cooperation problems that international agreements try to solve are surrounded by high scientific uncertainty. Environmental issues epitomize this "uncertainty about the state of the world" (Koremenos et al. 2001; Bodansky 2010: 187). Environmental issues and the environmental impact of anthropogenic activities are better understood today than fifty years ago. However, uncertainty about the scientific nature of the problems, their political dimensions, and appropriate policies remains high. Many environmental issues are changing rapidly and are difficult to predict. As a result, it is hard to make environmental treaties stay relevant and effective over time. Nevertheless, the challenge is not insurmountable and can be anticipated, at least to some extent. As Young puts it, "we should think ahead in order to have well-designed options in hand when [regime] state changes open up windows of opportunity for introducing major changes in prevailing institutional arrangements." (2010: 379)

Negotiators can ramp up the ability of their treaties to evolve and adapt to their new circumstances with various provisions. This feature is referred to in this paper as institutional adaptability. It helps drafters overcome the impossibility of specifying "all the relevant contingencies" *ex-ante* in the treaty (Hart and Moore 1988). It is also expected to reduce unwanted adaptation delays (Polizzi 2020: 245). Institutional adaptability varies significantly among international agreements. For instance, the 2013 Minamata Convention on Mercury stands out as an adaptable treaty. It provides for a review of its annexes five years after entry into force (art. 4 para 8; art. 5 para 11) and periodic reviews of compliance through the Implementation and Compliance Committee (art. 15). It also requires the Conference of the Parties to periodically evaluate the effectiveness of the convention (art. 22), which can further help states monitor the potential need for treaty updates. Lastly, the Minamata Convention includes procedures for adopting amendments (art. 26) and additional annexes (art. 27). By contrast, a significant number of treaties

contains none of these tools. This paper asks *why some treaties are more adaptable than others.*

Two main rationales may explain why states decide to make a treaty adaptable.[1] On the one hand, adaptability can increase the effectiveness of and pave the way for a long-lasting relationship. I refer to this rationale as the *springboard* hypothesis. On the other hand, adaptability allows for postponing tough decisions or gathering more information on the behavior of other partners before further cooperation. I refer to this rationale as the *safeguard* hypothesis. While the two rationales are rivals in the context of a single treaty, they are not mutually exclusive *across* treaties. Drawing on the literature on trust in International Relations (IR) and its various conceptions, this paper argues that the degree of affinity, i.e., the pre-existing sense of (dis-)connection between prospective partners, is a key explanatory factor in the rationale behind treaty adaptability. Under the *springboard hypothesis*, adaptability is expected to be a feature of treaties between like-minded or similar countries who are keen to cooperate over time on a specific issue (i.e., there is a positive association between affinity and adaptability). Under the *safeguard hypothesis*, adaptability is expected to be a feature of treaties that bring together unlike-minded or relatively unrelated partners (i.e., there is a negative association between affinity and adaptability).

I test both hypotheses on a sample of 1137 international environmental agreements (IEAs) concluded between 1945 and 2015. Using the empirical case of environmental governance to test hypotheses on institutional adaptability offers several advantages. First, environmental governance is one of the most prolific areas in terms of number of international agreements. Second, the issues covered by IEAs are more heterogeneous than those addressed in more standardized sets of treaties, such as preferential trade agreements or investment treaties. Third, environmental issues arguably require more institutional agility than more stable governance domains (Schiele 2014: 28). Therefore, the case of

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[1] Some scholars equate adaptability with institutional change (e.g., Van de Graaf and Lesage 2009). By contrast, institutional adaptability refers here to design tools that *may* facilitate institutional change. This paper does not investigate whether adaptability in design leads to actual adaptation. Rather, it strives to explain why some agreements are designed to be more adaptable (at least on paper) than others. Put simply, the paper focuses on the causes and components of adaptability, not its impacts.

environmental governance allows to observe and account for important variations and to draw conclusions that could apply to broader samples of treaties.

The increasing complexity of interstate and state-environment relationships in the context of globalization and planetary environmental crisis calls for designing adaptive treaties able to respond to the evolving intellectual, political, and environmental contexts. Against this background, the article sheds light on the various institutional strategies that countries can exploit to enhance treaty dynamism. Tackling why some treaties contain all available tools to change more effectively while others do not provides additional insight into the long-standing question of "how and why international institutions are designed as they are" (Koremenos et al. 2001: 769). It also lays the basis for investigating in future research how adaptability in design affects adaptation in practice. Lastly, the argument on the two potential articulations between adaptability and affinity offered in this paper has not been proposed and empirically explored in the IR literature.[2] As such, the paper contributes to our limited understanding of causal mechanisms between interstate relationships and institutional design. The article finds that high affinity between countries tends to be associated with lower levels of treaty adaptability. Conversely, the results suggest that negotiators typically increase institutional adaptability when they are suspicious of the trustworthiness of their partners. This supports the *safeguard hypothesis* and provides important lessons as to how states build upon their existing connection to others to shape their cooperation frameworks.

The rest of this article proceeds as follows. Section 2 delineates the boundaries of institutional adaptability and distinguishes it from other concepts explored in the literature on institutional design. Section 3 presents the *springboard* and the *safeguard* hypotheses to explain the varying degree of adaptability across international agreements. Section 4 describes the data and the methodology used for the empirical analysis. Section 5 presents the findings. Lastly, section 6 concludes with a discussion of avenues for further research.

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[2] As an exception, Green and Colgan (2013) investigate the association between institutional delegation and preference heterogeneity. However, as demonstrated in the present paper, these two concepts constitute only one aspect of adaptability and affinity, respectively.

2. The conceptual boundaries of adaptability

Adaptability, also called adaptive capacity or dynamic capabilities, has been originally investigated in sociology (Parsons 1964) and management studies (Chakravarthy 1982; Teece et al. 1997). Earlier works describe it as a condition for success "for it maintains a repertoire of potential solutions to unforeseen problems and unpredictable variations, and allows for learning and adjustment" (Engle 2011: 648). More recently, and unsurprisingly, adaptive capacity has become a central concept in the literature on climate change adaptation. Although most of the literature on adaptive capacity focuses on societal adaptability (e.g., Yohe and Tol 2002; Mortreux and Barnett 2017), a few studies investigate the adaptive capacity of institutions (e.g., Gupta et al. 2010).[3] The concept is also discussed in the policy literature, which draws similar conclusions about the building blocks of adaptability (e.g., Swanson et al. 2009; Bennear and Wiener 2019). For instance, Swanson et al. portray adaptive policies as anticipating "the array of conditions that lie ahead through robust up-front design using (1) *integrated and forward-looking analysis*; (2) *multi-stakeholder deliberation* and (3) by monitoring key performance indicators to trigger *automatic policy adjustments*" (2009: 15, emphasis added in text).

This paper defines institutional adaptability as *a design feature that anticipates or eases the possibility for states to adjust an international agreement collectively during its lifetime*. Adaptable agreements can be considered a work in progress. They are endowed with tools that help states adapt their cooperation framework to a changing environment and new information without dismantling it. Like architects, negotiators can "anticipate what will be needed in the future" with "wiring that allows new rooms to be easily added." (Roberts and St John 2021: 27) This characteristic is sometimes referred to as a "living agreement approach," particularly in free trade agreement negotiations.[4] It is also akin to Chambers' concept of "robustness," defined as the ability of a treaty to evolve and "strengthen itself towards achieving its objectives." (2004: 526)

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[3] For a more detailed synthesis of the literature on adaptive institutions, see Koontz et al. (2015).

[4] The "living agreement" designation has been used, in particular, to describe the Trans-Pacific partnership (e.g., Elms 2013; Allee and Lugg 2016) and free trade agreements concluded by New Zealand and Australia (e.g., Government of Australia 2015). See also Brown Weiss (1998) in the context of environmental governance.

Institutional adaptability shares common features with flexibility, an attribute that has been the subject of much scholarly discussion. However, some clarifications are required.[5] In the rational design literature, flexibility has repeatedly been equated with the option that states have to suspend or terminate their individual commitments unilaterally. According to Baccini et al. (2015: 766), flexibility provisions give "legally accepted opt-outs without leading to a de jure breach of an agreement". Similarly, Kucik and Reinhardt (2008: 477) define flexibility provisions as "any provision of an international agreement that allows a country to suspend the concessions it previously negotiated without violating or abrogating the terms of the agreement".[6] This conception of flexibility as a low-cost option to "loosen the ties that bind" (Koremenos 2001) contrasts with adaptability's potential to limit the future discretion of states since changes to a treaty may lead to additional and stricter commitments. In this sense, flexibility allows more leeway for individual goals, whereas adapting the treaty involves collective decisions.[7] Lastly, flexibility shortens the time horizons of contracting parties (Kuyper 2013), whereas adaptability lengthens the shadow of the future.

Admittedly, some scholars distinguish adaptive flexibility from transformative flexibility. The former "allow[s] certain actors to depart from institutional rules while the institution itself remains stable". By contrast, transformative flexibility "allows the institution itself to be changed" (Thompson 2010: 270-271; see also Koremenos et al. 2001: 773; Marcoux 2009: 211-213; De Bruyne et al. 2020: 325; Debre and Dijkstra 2021: 5). Although adaptability is undoubtedly closer to transformative flexibility conceptually, many scholars associate transformative flexibility with amendment procedures operationally.[8] This narrow operationalization masks important components of

[5] For a distinction of both concepts in the context of regime complexes, see Keohane and Victor (2011: 15). In the context of the investment treaty system, see Roberts and St John (2021).
[6] This definition corresponds to how Rosendorff and Milner (2001: 830) define an escape clause. However, Rosendorff and Milner acknowledge that escape clauses are only one type of "flexibility-enhancing device" along with sunset and renegotiation provisions, for example. See also Pelc (2016) for a similar appreciation of flexibility.
[7] Helfer (2012) introduces a distinction between unilateral and collective flexibility mechanisms. I consider some of the collective mechanisms he describes as adaptability strategies.
[8] A notable exception is the literature on freshwater treaties, which tends to associate flexibility with a broader set of measures. For example, De Bruyne et al. (2020: 325) consider that "[t]he role of transformative flexibility in institutional design is conceptualized with the presence of amendment, periodic review, and conflict resolution mechanisms." (see also McCaffrey 2003; and Fischhendler 2004)

institutional adaptability. For example, delegating lawmaking to intergovernmental treaty bodies is a core element of institutional adaptability that remains largely overlooked in discussions on transformative flexibility. The ability of intergovernmental committees to collect, monitor, and respond to new information is an essential source of treaty adaptation though (Gehring 2008: 474; Wiersema 2009: 271-273; Kim and Mackey 2014: 14-15; Schiele 2014: 43-44; van Asselt 2015: 259). As a result, adaptability partially overlaps with the concept of pooling, which encompasses "joint decision making among [member states]" (Hooghe and Marks 2015: 307). However, pooling involves intergovernmental decision-making rules and procedures, whereas adaptability involves tools allowing or facilitating the adjustment of the institution, which include but are not limited to intergovernmental bodies.

In summary, adaptability does not simply reflect how easy it is to modify the rules and procedures of a treaty. As is elaborated below, adaptability also captures design devices able to monitor and process signals that a treaty needs to be adapted. Therefore, adaptability is multifaceted. In this paper, I investigate four types of adaptability strategies.

First, *monitoring* can provide early warnings to states about the need to adjust a given treaty (Sabel and Zeitlin 2008; Bodansky 2010: 188). Monitoring provisions include impact assessments of the treaty, requirements for the parties to issue regular reports about their implementation, and periodic collective reviews of the treaty's operations. For example, the 1946 International Convention for the Regulation of Whaling requires its parties to "transmit […] scientific information available to that Government with respect to whales and whaling" (art. VIII para 3). *Monitoring* provisions allow states to obtain information about their partners' behavior, the issue at stake, and the effectiveness of their commitments. These provisions can reduce uncertainty gradually and help states make the necessary adjustments to the terms of cooperation in the light of new information or scientific knowledge.

Second, *external feedback* strategies aim to involve a wider range of actors in treaty implementation than only government representatives. External feedback strategies are especially relevant in the context of environmental governance. Environmental issues affect diverse stakeholders whose experience and expertise can inform state decisions and

increase state awareness that treaty provisions are outdated, ineffective, or incomplete. External feedback provisions typically consist of public participation requirements and the establishment of more formal advisory, scientific, or stakeholder committees. For example, the 1992 Convention on the Transboundary Effects of Industrial Accidents requires its parties to "give the public in the areas capable of being affected an opportunity to participate in relevant procedures with the aim of making known its views and concerns on prevention and preparedness measures" (art. 9 para 2).

Third, *anticipatory strategies* provide a framework for the future adaptation of the agreement. More specifically, international agreements can explicitly acknowledge that amending the treaty or its annexes is possible and set out the procedures to do so. If the treaty does not mention options for amendment, the amendment rules established under article 40 of the Vienna Convention on the Law of Treaties apply. However, numerous treaties deviate from these residual rules (Boockmann and Thurner 2006; Fitzmaurice and Merkouris 2020). Treaties can also anticipate their future adaptation through the adoption of additional instruments, such as supplementary agreements, protocols, or annexes. The 1951 International Plant Protection Convention, for example, provides that "Supplementary agreements applicable to specific regions, to specific pests, to specific plants and plant products, to specific methods of international transportation of plants and plant products, or otherwise supplementing the provisions of this Convention, may be proposed by the [FAO] on the recommendation of a contracting party or on its own initiative" (art. III para 1).

Lastly, *institution-building* strategies allow to centralize decision-making and information-gathering within one or more treaty bodies. In international environmental governance, the most well-known example is the creation of a Conference of the Parties,[9] which periodically brings together state representatives (see, e.g., Churchill and Ulfstein 2000; Brunnée 2002). Joint bodies are also frequent in other areas of governance, such as international trade. A treaty's institutional apparatus can be further fleshed out by establishing a secretariat and subsidiary bodies to assist the intergovernmental committee. These institutions are a central component of adaptability since they are usually in charge

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[9] Other common designations include Committees, Commissions, and Meetings of the Parties.

of overseeing monitoring, feedback, and amendment processes. They constitute a forum for dialogue and decision-making, which may help uncover cooperation problems and discuss potential solutions. According to Gehring (2008: 474), the increasing number of institutional arrangements established under the framework of IEAs results from the negative experience of early "sleeping treaties," which failed to create their own apparatus. This explains why in the trade literature, the "living agreement approach" is often likened to the existence of treaty bodies (e.g., Chauffour and Maur 2011: 12).

Figure 1 below shows how the inclusion of adaptability provisions in IEAs has evolved since the end of the Second World War. External feedback provisions constitute the least popular strategy, whereas amendment and addendum provisions are included in more than half of the IEAs concluded in the same period (see Table 1). The inclusion of the four types of provisions in IEAs follows a similar pattern. Immediately after the Second World War, the proportion of IEAs that included the provisions was high but unstable due to the low number of treaties concluded. The proportion of IEAs became more stable in the 1960-1970s when the number of treaties concluded each year rose. It then increased slowly but steadily until 2015.

Table 1 Proportion of IEAs with adaptability-enhancing provisions (1945-2015)

	Monitoring	External feedback	Anticipatory mechanisms	Institution-building	All strategies	No adaptability
Proportions of IEAs	38.17 %	18.91%	54.97%	43.18%	8.18%	25.59%

While the four types of provisions have typically been investigated separately, they all form part of a broader underlying dimension of institutional design and result from various negotiation trade-offs. Therefore, I argue that scholars should examine them jointly to shed new light on the goals states seek to fulfill when they shape international institutions. To be sure, *monitoring*, *external feedback*, and *institution-building* provisions can serve other purposes than increasing the ability of states to adapt a treaty. In particular, they can enhance country accountability and treaty visibility. Nevertheless, this does not rule out that these tools help states collect information that can inform treaty adaptation

and, as such, increase the overall degree of adaptability of a treaty. This article tackles why some treaties include more adaptability provisions than others.

Fig. 1 Proportion of IEAs with adaptability-enhancing provisions 1945-2015 (2-year moving average)
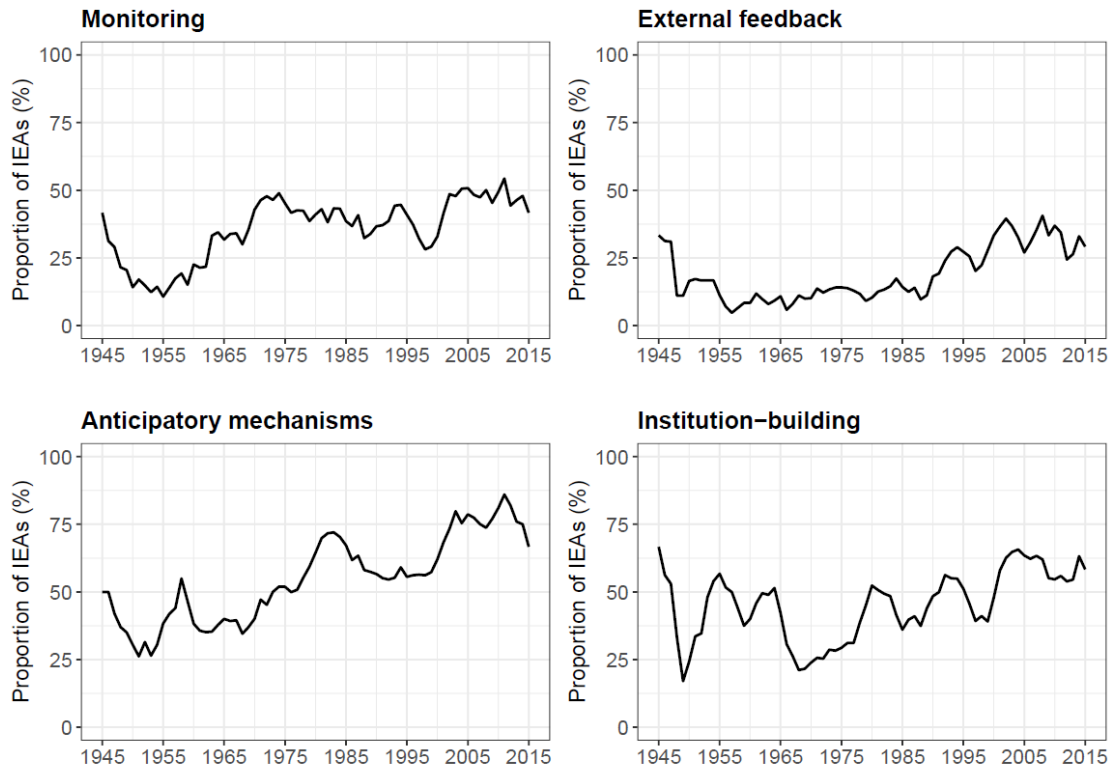
3. A theory of affinity and institutional adaptability

This section presents a theory to explain the variation in treaty adaptability. First, it introduces the three-legged concept of affinity, i.e., the strength of the connection between prospective partners, which is expected to prevail in the choice of adaptability strategies. Second, it presents and justifies two rival hypotheses on the association between affinity and adaptability.

The heuristics of affinity

Incomplete contracting and uncertainty are pervasive and inescapable challenges in international negotiations and, perhaps to a greater extent, in environmental governance. Neither states nor other actors negotiating an agreement can anticipate every contingency that may arise (Hart and Moore 1988). However, uncertainty alone cannot fully explain the

varying degree of treaty adaptability. This paper focuses on a factor that differs arguably more significantly from one treaty to another: the pre-existing relationship between negotiating countries and their trust in one another. Although the condition of anarchy "makes the establishment and sustenance of trusting relationships between states much more difficult than between persons or [organizations] acting within the domestic sphere" (Ruzicka and Keating 2015: 9), many scholars have recognized that trust between countries is a social reality worthy of scientific inquiry.

Trust is an elusive phenomenon. However, I argue that it rests on concrete heuristics, which boundedly rational states draw on to form an opinion on the trustworthiness of other states (Simon 1972; Tversky and Kahneman 1974). I group these cognitive shortcuts under the label "affinity,"[10] which I define as *the sense of connection between countries*. Affinity is threefold and consists of 1) *political affinity*, a connection based on a community of interests and preferences; 2) *experiential affinity*, a connection based on prior shared negotiation experience; and 3) *cultural affinity*, a connection based on shared cultural identity. While the three aspects form part of the overall sense of connection between countries, they constitute distinct dimensions of the relationship and, as elaborated below, contribute to different forms of trust. Therefore, I theorize and empirically investigate them separately. From a rationalist point of view, affinity can mitigate uncertainty about preferences and behavior because it entails a strong informational power. This is especially true for experiential and cultural affinities since political "dis-affinity" arguably provides as much information on state preferences as its positive counterpart. In addition, affinity holds a more social and emotional dimension, a sense of belonging that goes beyond the negotiation situation and remains overlooked in the rational design literature.

Before examining each dimension of affinity in detail, two points deserve emphasis. First, I consider the association between affinity and trust probabilistic, not deterministic. I expect that the presence of one or several affinity dimensions likely influences the perception of trustworthiness and design choices. Second, the three affinity pillars and the resulting forms of trust are not mutually exclusive (Kydd 2005: 22; Ruzicka and Wheeler

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[10] The term "affinity" is frequently used by scholars measuring the similarity of countries' voting behavior in the United Nations General Assembly (e.g., Gartzke 1998). The concept I develop in this paper is broader and multidimensional.

2010: 74; Rathbun 2012: 30). On the contrary, they can complement each other, further reinforcing the relationship between countries.

Political affinity contributes to strategic trust, a situational type of trust based on cost-benefit calculations. This conception of trust is embodied in the work of Andrew H. Kydd, who claims that "trust depends on having confidence that one's interests are not in too much conflict with the other side" (2010: 2680).[11] States pursue outcomes that match their preferences "over the principles [international] institutions should advance" (Voeten 2021: 6). For instance, some countries might favor economic development or gains over environmental protection on a given issue. They may enter IEA negotiations to ensure that the treaty protects their interests (Roberts et al. 2004). States that instead prioritize environmental protection may be wary of the cooperative behavior of such partners. This kind of distrust is at the heart of North-South IEA negotiations (Najam 1994; Najam 2005) and is acknowledged by high-ranking decision-makers (Ki-Moon 2009). Trade in wildlife, such as tigers and whales, might increase the threat of extinction. Yet, some populations may consider it to be part of their cultural heritage or as a means to generate foreign revenue for developing countries that trade in wild animals (Duffy 2013). Naturally, mercantilist interests can drive developed countries too. Some industries in developed countries are interested in accessing fish resources, genetic resources, or luxury animal-based raw materials (ivory, crocodile skin) at least cost. By contrast, resource-providing countries have an interest in protecting their local biodiversity (Schroeder and Pogge 2009). Developed countries may have divergent interests too. The European Union and the United States, for instance, hold different views on climate change (Skjærseth et al. 2013). Such divergent interests render compromise tougher, incentivize less satisfied participants to defect or withdraw from cooperation, and heighten strategic distrust.

Prior shared negotiation experience also contributes to strategic trust. It allows countries to observe how their counterparts behave when negotiating and implementing a treaty. It also makes defection more costly by lengthening the shadow of the future (Axelrod 1984; Keohane 1984). Although rational design theories generally fail to account

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[11] Similarly, Hardin understands trust as an "encapsulated interest": "I trust you because I think it is in your interest to take my interests in the relevant matter seriously" (2002: 3). Other scholars prefer the term "reliance" to describe this rationalist appreciation of trust (e.g., Lahno 2001; Mercer 2005: 95; Michel 2013).

for the institutional context, prior successful negotiation experience likely influences later cooperation and design choices (Copelovitch and Putnam 2014: 472). Furthermore, while strategic trust is "all about reducing transaction costs by gaining additional information" (Uslaner 2002: 22), experiential affinity can also contribute to social trust, a type of trust "not grounded in calculations of predictability, but conceptions of the identity relationship between the parties" (Weinhardt 2015: 33). Rathbun, for instance, contends that "[s]uccessful experience with specific reciprocity might build deeper trust and allow more diffuse reciprocity in the future." (2012: 11)

Lastly, *cultural affinity* may enhance what Uslaner (2002) calls "particularized trust," a social and relational type of trust that Rathbun describes in the following terms: "We trust others like us and fear those who are different from us" (2018: 692). Particularized trust is in line with the constructivist argument that "trust evolves as the result of collective identity formation" (Wendt 1999: 359). For instance, countries in the same region usually cooperate on various issues, including education exchanges, transnational labor markets, customs duties, and transboundary environmental issues (Hettne and Söderbaum 2000). They also tend to establish common institutions. To cite but a few telling examples of this type of cultural identification, the motto of the Association of Southeast Asian Nations is "One vision, one identity, one community"; the East African Community's vision is "One people, one destiny"; and the Caribbean Community's four pillars are economic integration, foreign policy coordination, human and social development, and security. These groups of countries frequently negotiate international agreements as a bloc (Cable and Henderson 1994). The influence of cultural affinity (or lack thereof) on treaty negotiation has already been documented. Weinhardt (2015), for example, explains how distrust complicated the negotiations of an economic partnership agreement between West African countries and the European Union. West African officials admitted that they felt more comfortable with their regional partners than their European peers because of their "shared interests, shared values and shared beliefs" with the former (Weinhardt 2015: 38).

The association between affinity and adaptability

Two rival hypotheses on the association between affinity and adaptability can be formulated. They are represented by the two diagonals in Figure 2. On the one hand, when

affinity is high, adaptability can be used as a *springboard* for continued adaptive cooperation. Adaptability provides the necessary tools to ensure that states can adapt the agreement smoothly to its future circumstances. This hypothesis implies that states take a leap of faith, which is unlikely if strategic or social distrust is high.

On the other hand, if states are risk-averse and affinity is low, cautious negotiators may perceive the institutional ability to modify an agreement as a *safeguard* in the event that cooperation does not go according to plan. It may also be a means to gather more behavioral information about other parties before taking further cooperative action. This protective strategy amounts to using adaptability as a substitute for (or to complement) flexibility.

In both cases, adaptability allows a treaty to be adapted once new information is available. The difference is the relational context in which the treaty is negotiated and, thus, the perceived utility of adaptability. To be sure, states with little affinity can also see adaptability as a springboard to foster adaptive cooperation on an issue they are particularly vulnerable to. Similarly, states with high affinity can use adaptability as a safety net, following the well-known Russian proverb "trust but verify". However, the four possible configurations in Figure 2 represent ideal types, which can explain a general trend in the inclusion of adaptability provisions in international agreements. This paper does not report data on negotiators' motivations. Instead, it investigates the theoretical implications of both hypotheses, which are tested empirically in the next section.

As shown in Figure 2, the *springboard* hypothesis expects that:

High affinity is associated with high treaty adaptability.

This first hypothesis is plausible for several reasons. First, states with high affinity might be more willing and confident to create a dynamic treaty that can be adapted as the issue at stake evolves. For example, the close geographical, cultural, institutional, and political ties between Canada and the United States make them ideal candidates to use adaptability as a springboard for adaptive cooperation. In the context of environmental cooperation, the US Environmental Protection Agency's website reports that "The U.S.-Canada border includes four of the five Great Lakes, many rivers and lakes, major airsheds, and migratory routes for wildlife species," requiring "close cooperation among many U.S. states,

Canadian provinces, U.S. Tribes, First Nations, and local and federal governments" (EPA 2021). Therefore, it is not surprising that the Treaty Concerning Pacific Salmon concluded by the parties in 1985 creates a wide variety of treaty bodies, including a Pacific Salmon Commission (art. II para 1), a committee on research and statistics (art. II para 17), specific panels (Annex I), and various joint technical committees (Annex IV). In addition, the treaty requires parties to prepare annual national reports (art. IV para 1) and provides for the possibility of revising and amending the Annexes (art. XIII para 2).

Fig. 2 Two rival hypotheses on the association between affinity and adaptability
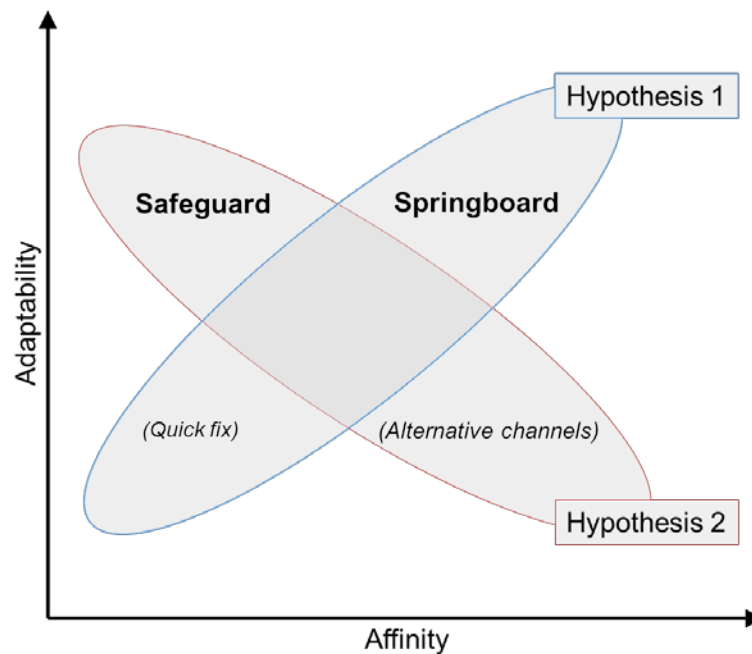
Second, countries with experiential affinity may agree more easily on specific obligations by using previous provisions that have proved useful in the past. In other words, adaptability-enhancing provisions from earlier treaties can become templates for future negotiations. Authors have documented this "boilerplate" process in international trade (e.g., Morin et al. 2017; Peacock et al. 2019) and environmental governance (e.g., Ovodenko and Keohane 2012). For instance, some adaptability provisions included in the Convention on Long-Range Transboundary Air Pollution are copy-pasted from one protocol to the next. The review process mentioned in the 1988 Protocol on Nitrogen Oxides (art. 5) is reproduced verbatim in the 1991 Protocol on Volatile Organic Compounds (art. 6). A more sophisticated review process was later established and

reproduced in subsequent protocols on sulphur emissions (art. 8), heavy metals (art. 10), persistent organic pollutants (art. 10), and acidification, eutrophication, and ground-level ozone (art. 10).

Third, and at the other end of the association, the *springboard* hypothesis expects *low affinity to be associated with low treaty adaptability.* Low affinity may raise transaction costs because it involves collecting information on prospective partners and prolongs the negotiations. This means that when affinity is low, the cost of including adaptability provisions in the treaty is likely higher. When negotiating subsequent protocols, amendments, or annexes, states must meet again and agree on additional provisions. Put differently, when trust is lacking, every negotiation round and revision is expected to be equally challenging. Under such circumstances, states may be reluctant to leave open opportunities to ratchet up obligations in the future. They may decide to agree on a "*quick fix*" to tackle the problem without any intention to go further and, hence, no need for adaptability (see bottom left quadrant of Figure 2).

By contrast, the *safeguard* hypothesis expects that:

Low affinity is associated with high treaty adaptability.

Here, adaptability is likely perceived as a safeguard against other parties' uncertain or undesirable behavior. This hypothesis is just as credible as the former. First, when there is low political affinity, states are more likely to be dissatisfied with the negotiated outcome. Setting the path for future treaty adaptations may be a way to attract more ratifications by reassuring less satisfied states that the treaty is not written in stone and that further intergovernmental discussions will take place in the future. Second, low affinity may also make it difficult to reach and maintain decisions. It often requires an incremental negotiation approach (Zartman 1985: 130-133). States may anticipate the need to reconvene to amend or revise a treaty, either after failing to agree on shared goals during the initial negotiations or because the consensus reached is fragile. If this is the case, it is in their interests to multiply tools to ease and inform the adaptation process.

An example illustrating the *safeguard* hypothesis is the 1996 Inter-American Convention for the Protection and Conservation of Sea Turtles. The treaty is highly adaptable and was concluded in a climate of divergent interests among "States in the

Americas". The treaty was drafted in response to US Public Law 101-162, enacted in 1989 to "level the playing field for U.S. shrimpers competing with foreign caught shrimp" (Donnelly 1996). Section 609 of this law requires 14 countries in the Caribbean and Atlantic to use Turtle Excluder Devices (TEDs) in their shrimp trawls to avoid US import prohibition. Although drafters considered turtle conservation measures, the first two rounds of negotiation of the convention mostly centered on US trade sanctions related to the use of TEDs (Naro-Maciel 1998: 172). The convention is equipped with an elaborate institutional apparatus comprising a yearly meeting of the parties (art. V), a secretariat (art. IV), a consultative committee of experts (art. VII), and a scientific committee (art. VIII). In addition, the possibility of amending the agreement is mentioned several times (art. 5 para 3, d; art. XXIV; art. XXVI para 2). Lastly, the treaty requires the creation of national monitoring programs (art. IX) and reports on implementation (art. XI). According to Donnelly, preference divergence was a significant factor behind the treaty's adaptability: "the participants agreed to resolve their differences by addressing TED requirements in the Annexes, thus allowing modification by consensus during subsequent meetings" (1996: 19).

At the other end of the relationship, the *safeguard* hypothesis expects *high affinity to be associated with low treaty adaptability*. If adaptability is considered a safeguard and affinity is high, the need for protection might not appear as pressing. Furthermore, pre-existing institutions, neighboring cooperation, and political affinities may have created "*alternative channels*" of treaty adaptation, which can constitute a substitute for adaptability provisions (see bottom right quadrant of Figure 2). For instance, the 1970 Benelux Convention on the Hunting and Protection of Birds does not include any adaptability provisions. Nevertheless, it was amended several times by decision of the Committee of Ministers of the Benelux Economic Union. Therefore, the Committee of Ministers acts as a cooperation channel that can fulfill the role of a Conference of the Parties without creating additional treaty bodies. A further example is the five Nordic countries of Denmark, Finland, Iceland, Norway, and Sweden. They have established a Nordic Council to allow member states to cooperate on various issues, including legislation harmonization, innovation, culture, research, and environmental protection. This may

explain why the regional IEAs between the Nordic countries[12] contain few adaptability provisions.

Lastly, although the subsequent evolution of a treaty does not necessarily reveal drafters' initial motivations, adaptation practice also points to both hypotheses. In some cases, treaty adaptations make it possible to take further cooperative steps, e.g., the gradual addition of hazardous wastes to the list of the 1989 Basel Convention. In other instances, adaptations are used as a safeguard to protect domestic interests. For example, the 2010 Nagoya Protocol to the Convention on Biological Diversity and the 1990 amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer were adopted to better reflect the needs and circumstances of developing countries (Pfluger 2010; Daßler et al. 2019). Therefore, compelling theoretical reasons and anecdotal evidence suggest that both approaches to adaptability could be at work. This paper seeks to assess whether one dominates the other.

To sum up, both adaptability and affinity are multidimensional and continuous constructs. I consider a treaty that mobilizes the four adaptability strategies (monitoring, feedback, anticipation, and institution-building) more adaptable than a treaty that only includes one or two. Similarly, groups of countries with convergent political interests, past successful negotiation experience, and cultural similarities have more affinity than groups of countries that share only one of these dimensions. If the *springboard* hypothesis holds, we should observe a *positive* association between adaptability and affinity, i.e., *higher* degrees of adaptability associated with higher degrees of affinity. Conversely, if the *safeguard* hypothesis holds, we should observe a *negative* association between adaptability and affinity, i.e., *lower* degrees of adaptability associated with higher degrees of affinity. The next section assesses how each of the two ideal-type hypotheses performs when subject to a statistical test.

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[12] e.g., the 1974 Convention on the Protection of the Environment; the 1993 Agreement on Cooperation in Combatting Pollution of the Sea Caused by Oil or Other Harmful Substances; the 1998 Agreement on the Nordic Environment Finance Corporation.

4. Data and method

The exploratory empirical analysis relies on an original dataset of the adaptability-enhancing provisions included in 1137 IEAs concluded between 1945 and 2015. The text of these IEAs is primarily drawn from the International Environmental Agreements Database Project (IEADB, Mitchell 2002-2020; Mitchell et al. 2020). All IEAs in the sample are legally binding agreements under international law concluded by at least two sovereign states. I exclude amendments and protocols because they constitute "adaptations" of existing IEAs. As such, their design is likely influenced by affinity relationships established under the framework of the initiating agreement. Further, amendments and protocols often use the adaptability provisions of the initiating agreement.

Following the IEADB criteria, the primary purpose of the treaties examined in this paper is environmental protection. I choose the IEA as the unit of analysis rather than the dyad-year or the IEA-country-year because design-related variables in the dataset are time and country invariant. Therefore, the IEA unit allows to avoid artificially inflating the number of observations (Baccini et al. 2015: 771 use a similar approach with preferential trade agreements). In the Appendix, Table 7 lists the various sources of data aggregated for all variables considered in this paper.

Dependent variable

The dependent variable combines 11 binary items to measure the degree of ADAPTABILITY of a given treaty (see Table 2 below). I construct three ADAPTABILITY measures. The first one ranges *between 0 and 4* and captures how many adaptability strategies – among monitoring, external feedback, anticipation, and institution-building – drafters employed in the treaty. Given the ordinal nature of this measure, I fit an ordinal logistic regression model.[13]

Second, I measure ADAPTABILITY with a simple *additive index* of the 11 binary items. While this variable can theoretically range between 0 and 11, the observed values range

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[13] Results from an ordered probit model are similar (available upon request).

between 0 and 10. I also fit an ordinal logistic regression model with this second measure as the dependent variable.

The third measure relies on *item response theory* (IRT). IRT models assume that the items of a measure are related to an underlying dimension (the latent trait). They aim to position the subjects under study on the latent trait continuum. With IRT models, weights can be assigned to the different items based on their difficulty getting selected, which is not permitted by other scaling methods. I fit a two-parameter logistic model (2PL, Birnbaum 1968) to the data using the marginal maximum likelihood method of estimation of the item parameters.[14] Then, I use the expected a posteriori method to obtain the score of each treaty on the ADAPTABILITY index (Bock and Aitkin 1981: 452-454). Lastly, I rescale the index by removing negative values to facilitate interpretation. Final scores range between 0 and 3.55 and are highly correlated with scores from the *0-4 adaptability index* (r = 0.95) and the simple *additive index* (r = 0.98). Given the continuous nature of the third measure, I use ordinary least squares (OLS) regression. Figure 3 shows the distribution of the three ADAPTABILITY measures.

Table 2 Adaptability-enhancing provisions coded in IEAs

Strategies	Binary items included
Monitoring	National report; impact assessment; review process; joint research institution
External feedback	Public participation; stakeholder, scientific, or advisory committee
Anticipation	Amendment; addendum
Institution building	Intergovernmental committee; secretariat; subsidiary body

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[14] The fit of the 2PL model was compared to other IRT models suited for dichotomously scored items. The Akaike information criterion (AIC), Bayesian information criterion (BIC), and log-likelihood confirm that a 2PL model is more appropriate than a Rasch and a three-parameter logistic model.

Fig. 3: Distribution of the three ADAPTABILITY measures
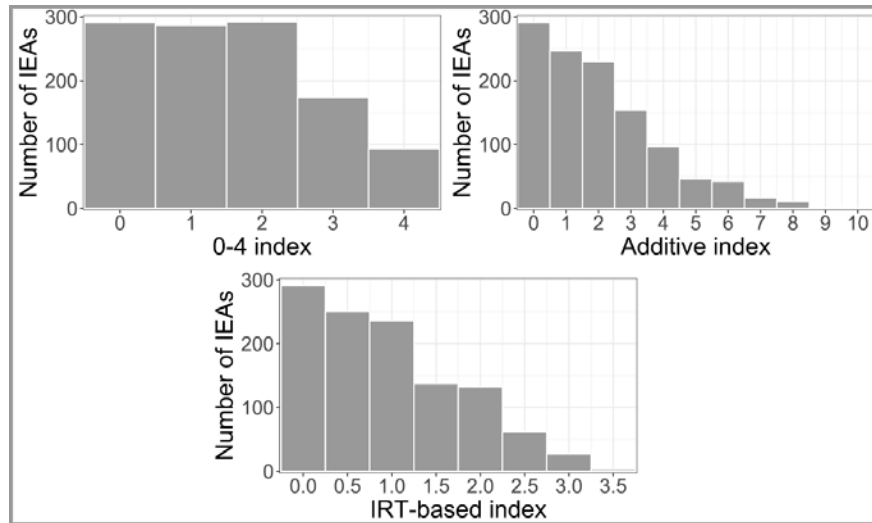
Independent variables

The regression models include three main independent variables, which each capture a dimension of affinity. First, I measure preference divergence by computing the standard deviation of the signatories' United Nations General Assembly (UNGA) ideal point estimates (Bailey et al. 2017). I consider ideal point estimates to be good proxies for country preferences for two reasons. First, UNGA votes cover, among a broad array of issues, environmental protection (e.g., RES/40/200;[15] RES/55/8;[16] RES/61/201;[17] RES/72/224[18]). Second, UNGA sessions also address strategic non-environmental issues on which state preferences may influence IEA design, such as trade (e.g., RES/61/186[19]), migration (e.g., RES/67/219[20]), development (e.g., RES/43/182[21]), and human rights (e.g., RES/61/166[22]). Therefore, the measure captures general foreign policy alignments. To obtain a measure of POLITICAL AFFINITY, I subtract the standard deviation of ideal point

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[15] UNGA, Resolution 40/200 of 17 December 1985. Retrieved online.
[16] UNGA, Resolution 55/8 of 30 October 2000. Retrieved online.
[17] UNGA, Resolution 61/201 of 20 December 2006. Retrieved online.
[18] UNGA, Resolution 72/224 of 20 December 2017. Retrieved online.
[19] UNGA, Resolution 61/186 of 20 December 2006. Retrieved online.
[20] UNGA, Resolution 67/219 of 21 December 2012. Retrieved online.
[21] UNGA, Resolution 43/182 of 20 December 1988. Retrieved online.
[22] UNGA, Resolution 61/166 of 19 December 2006. Retrieved online.

estimates from 1 so that the highest values of preference divergence become the lowest values of POLITICAL AFFINITY. Then, I rescale the variable to take positive values.[23]

Second, I measure EXPERIENTIAL AFFINITY as the logged average number of IEAs previously concluded between the signatories. For bilateral agreements, I take the number of agreements that the dyad concluded before the signature of the observed IEA. For multilateral agreements, I first compute the number of IEAs concluded between each pair of signatories and then take the average. To be sure, the mere existence of past cooperation is not sufficient to generate affinity and trust. Past cooperation that led to defection, for instance, may have the opposite effect. However, the successful nature of past experience is challenging to measure. Moreover, it seems reasonable to expect that higher numbers of jointly negotiated IEAs correlate, on average, with higher experiential affinity.

Lastly, I measure CULTURAL AFFINITY by subtracting the number of geographic subregions[24] involved in the negotiations from 1. In this way, the higher the number of subregions represented in the negotiations, the lower the measure of CULTURAL AFFINITY. Then, I rescale the variable to take positive values. This variable also captures the size of the membership since the higher the number of regions involved, the higher the number of parties to the table of negotiations.

In the Appendix, I use alternative measures of the three affinity variables as robustness checks. More specifically, I measure POLITICAL AFFINITY based on civil society participation indices; EXPERIENTIAL AFFINITY based on the weakest link assumption, i.e., the lowest number of IEAs concluded by a pair of signatories; and CULTURAL AFFINITY based on the average geographical distance between signatories.

Controls

I also add several control variables in the regression models. First, although uncertainty is unavoidable in international negotiations, some factors may make the negotiation setting more challenging. The political instability of some partners, even in

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[23] It should be noted that subtracting the standard deviation from 1 and rescaling the measure to take positive values only changes the sign of the estimate concerned, not its magnitude. This allows to observe the effect of affinity rather than the effect of divergence, which greatly eases result interpretation.

[24] The 22 subregions are defined in the United Nations publication "Standard Country or Area Codes for Statistical Use" (M49).

conditions of high affinity, creates "uncertainty about behavior" (Koremenos et al. 2001). Another factor is the lack of hindsight on the environmental issue addressed by the IEA – or "uncertainty about the state of the world" (Koremenos et al. 2001) – especially when there are few or no institutional models to build on. Both factors may call for closer behavioral and environmental monitoring and increase the probability that the agreement will need an update once more information is available. I measure POLITICAL INSTABILITY as the proportion of signatories that underwent political unrest in the ten years preceding the conclusion of the IEA. Episodes of political unrest include revolutionary wars, ethnic wars, adverse regime changes, and genocides and politicides (Marshall et al. 2019). PRIOR HINDSIGHT corresponds to the number of IEAs dealing with the same issue concluded before the signature of the observed IEA.

Second, POWER ASYMMETRY is expected to rub off on the relationship regardless of the degree of affinity between partners and, hence, influence treaty design (Krasner 1991; Moe 2005). The creation of treaty bodies, for instance, may allow powerful states to maintain some control over the future shape of the treaty. Although powerful states do not necessarily plan to overly influence joint body decisions when they negotiate a treaty, in reality, their capacities for research, funding, and the size of their delegation can give their interests disproportionate weight in decision-making (Miller and Dolšak 2007; Morin et al. 2022). In addition, monitoring provisions make it possible to survey the behavior of weaker states, which often lack the institutional capacity to comply with the treaty. Therefore, I expect POWER ASYMMETRY to increase ADAPTABILITY. It is measured as the Gini coefficient of the parties' GDPs (Bolt and van Zanden 2020).

Third, DEPTH, "the extent to which [a treaty] requires states to depart from what they would have done in its absence" (Downs et al. 1996: 383), may also influence the degree of IEA ADAPTABILITY. On the one hand, one might expect deeper agreements to be adaptable because the more commitments there are and the stricter they are, the more likely they will need adjustments in the future. On the other hand, following the "convention-protocol" approach, states may deliberately conclude shallow agreements with a view to setting more specific obligations in subsequent instruments (e.g., Sebenius 1991) and consequently increase adaptability to ease the adaptation process. I measure DEPTH with an

additive index of 8 binary items. The items indicate whether the IEA contains restrictions on one of the following activities: trade, production, extraction, selling, consumption, transport, construction, and pollutant emissions (Author et al., forthcoming). The more restrictive an IEA is, the higher the extent to which it requires changes in behavior from parties.

Fourth, I control for the environmental issue under negotiation with a categorical variable, SUBJECT, which takes on the following values: Agriculture (the reference category), Energy, Biodiversity, Fisheries, Freshwater and ocean, Pollution, and Other issues (Mitchell et al. 2020).

Fifth, I control for the YEAR of conclusion of the treaty, as trends in IEA ADAPTABILITY may change over time. Lastly, I further control for the agreement's membership by distinguishing BILATERAL agreements from multilateral ones. As Morin et al. (2022: 29) explain, "adding a third party creates political dynamics and calls for formalized procedures that would not be necessary in a bilateral setting". Therefore, I expect multilateral treaties to include more adaptability provisions than bilateral ones. Table 8 in the Appendix presents descriptive statistics for the variables included in the models.

5. Results

Table 3 presents simplified models, which include only the main independent variables and basic controls for the year of signature and the bilateral nature of IEAs. Table 4 shows the results with all controls. Both result tables include three models, each based on a different measure of adaptability. Model 1 uses the 0-4 adaptability index as the dependent variable; Model 2 uses the 0-10 additive index; and Model 3 uses the IRT-based index. In the simplified models, the three AFFINITY variables have a significant negative effect on ADAPTABILITY at the 0.01 level or higher.

In the models with all controls, both POLITICAL and CULTURAL AFFINITY have a negative and significant effect on ADAPTABILITY at the 0.01 level or higher. Evidence on EXPERIENTIAL AFFINITY is less straightforward. The effect of the variable is negative in all three models, but only significant at the 0.1 level in the first ordered logit model (Model 1)

and the OLS model (Model 3). It is statistically significant at the 0.05 level in the second ordered logit model (Model 2).

Table 3 Regression results on IEA adaptability (simplified models)

	0-4 Index (1)	Additive Index (2)	IRT-based Index (3)
Political affinity	**-0.401 (0.074)***	**-0.363 (0.073)***	**-0.132 (0.026)***
Experiential affinity	**-0.286 (0.061)***	**-0.305 (0.060)***	**-0.102 (0.025)***
Cultural affinity	**-0.061 (0.021)**	**-0.067 (0.021)**	**-0.026 (0.007)***
Bilateral	-1.351 (0.142)***	-1.637 (0.144)***	-0.650 (0.049)***
Year	0.041 (0.000)***	0.045 (0.000)***	0.016 (0.001)***
(Intercept)			-29.604 (2.917)***
Num.Obs.	1067	1067	1067
R2			0.333
R2 Adj.			0.330
AIC	2999.0	3608.5	2086.5
BIC	3043.7	3683.1	2121.3
Log.Lik.	-1490.485	-1789.236	-1036.266

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The table presents results from ordered logistic regressions (Models 1 and 2) and ordinary least square regression (Model 3) with robust standard errors in parenthesis.

To clarify the magnitude of the impact of AFFINITY variables on ADAPTABILITY, Tables 5 and 6 show predicted probabilities for each ordered logit model (Models 1 and 2), holding all control variables at the mean. In Model 1, when POLITICAL AFFINITY is set at its minimum value, the probability that a treaty includes the four adaptability strategies (monitoring, external feedback, anticipation, and institution-building) is 9%. This probability decreases to 2% when POLITICAL AFFINITY is set at its maximum value. This means that as POLITICAL AFFINITY increases, the probability that the treaty is highly adaptable becomes closer to 0.

Similarly, the probability of a treaty employing the four ADAPTABILITY strategies is 5% when EXPERIENTIAL AFFINITY is set at its minimum value, and 3% when EXPERIENTIAL AFFINITY is set at its maximum value. Here again, this result shows a decreasing effect of EXPERIENTIAL AFFINITY on ADAPTABILITY, but the effect is small and not highly significant. Lastly, the probability of using the four ADAPTABILITY strategies is 14% when CULTURAL AFFINITY is set at its minimum value, and drops to 3% when CULTURAL AFFINITY is set at its maximum value.

Table 6 shows similar patterns in the predicted probabilities of Model 2, which uses the 0-10 additive adaptability index as the dependent variable. However, the decreasing effect of the AFFINITY variables is more visible when observing middle-range values of the additive ADAPTABILITY index (between 3 and 6). This can be explained by the fact that the probability of a treaty including more than six adaptability provisions is very low, regardless of the level of affinity between partners.

In light of the foregoing, the results provide strong support to the *safeguard* hypothesis. They suggest that when signatories share convergent political interests or cultural similarities, they may be more confident about the future behavior of their partners or do not feel the need to protect themselves against their partners' behavior. Thus, they use fewer adaptability provisions. The results are more conclusive for political and cultural affinities than experiential affinity. A plausible explanation may lie in the fact that political and cultural affinities create a general sense of trust between *countries*, whereas experiential affinity rather generates trust between *individuals*. Therefore, experiential affinity may be more sensitive to frequent changes in interlocutors.

Turning to control variables, the *safeguard* approach is further supported by the positive effect of POLITICAL INSTABILITY in the three models. The political instability of some partners likely increases the utility of safeguards, and states appear to consider that adaptability provisions can provide at least part of such protection.

Unlike expected, the effect of PRIOR HINDSIGHT is positive in the three models. This means that the existence of numerous IEAs covering the same issue is associated with increased ADAPTABILITY in subsequent agreements. This result may point to a certain diffusion effect of adaptability provisions across IEAs dealing with the same problem.

However, this interpretation should be nuanced as the effect of PRIOR HINDSIGHT is not significant in the OLS model (Model 3).

The results also indicate that deep agreements tend to be more adaptable than shallow ones. There is a potential simultaneity bias between DEPTH and ADAPTABILITY. However, it seems likely that provisions related to monitoring, amendments, and institution-building are negotiated once the substantive content of the treaty has been agreed upon. Therefore, the findings suggest that adaptability is perceived as a tool to adjust deeper treaties rather than to complement shallow ones. Nonetheless, this result is inconclusive with regard to the *springboard* and *safeguard* rationales. It may both indicate that countries include *safeguards* in a treaty when their hands are more tightly tied; or that countries that are able to negotiate a deep agreement in the first place are more inclined to include *springboards* for further additions.

Lastly, regarding the negotiation context, most environmental SUBJECTS are associated with a decrease in ADAPTABILITY compared to the reference category of Agriculture. This could indicate that delegates tend to be more protective when negotiating agricultural issues. One possible explanation is that issues such as plant protection and crop management are more volatile and thus may call for more frequent treaty updates than other issues. BILATERAL agreements, for their part, tend to be less adaptable than multilateral agreements. This, again, provides support to the *safeguard* hypothesis and is hardly surprising. Bilateral settings allow to collect more information about the political interests and preferences of the partner than negotiations between higher numbers of participants do. Likewise, in most cases, adapting a bilateral treaty to altered circumstances is less challenging than engaging in multilateral negotiations of subsequent instruments. This, in turn, likely reduces the perceived need for safeguards in the bilateral context.

Table 4 Regression results on IEA adaptability (full models)

	0-4 Index (1)	Additive Index (2)	IRT-based Index (3)
Political affinity	-0.406 (0.077)***	-0.383 (0.076)***	-0.135 (0.026)***
Experiential affinity	-0.132 (0.068)+	-0.152 (0.068)*	-0.049 (0.027)+
Cultural affinity	-0.075 (0.023)**	-0.075 (0.022)***	-0.029 (0.007)***

	0-4 Index (1)	Additive Index (2)	IRT-based Index (3)
Political Instability	0.527 (0.057)***	0.602 (0.051)***	0.243 (0.107)*
Prior hindsight	0.219 (0.073)**	0.173 (0.071)*	0.065 (0.043)
Power asymmetry	0.293 (0.223)	0.229 (0.219)	0.101 (0.074)
Depth	0.469 (0.081)***	0.517 (0.076)***	0.166 (0.026)***
Energy	-0.652 (0.164)***	-0.578 (0.163)***	-0.189 (0.091)*
Biodiversity	-0.514 (0.182)**	-0.730 (0.178)***	-0.216 (0.097)*
Fisheries	-1.019 (0.138)***	-1.041 (0.134)***	-0.329 (0.088)***
Freshwater and ocean	-0.256 (0.130)*	-0.284 (0.130)*	-0.064 (0.079)
Pollution	-0.643 (0.177)***	-0.638 (0.177)***	-0.195 (0.103)+
Others issues	0.196 (0.166)	0.033 (0.161)	0.053 (0.106)
Bilateral	-1.436 (0.153)***	-1.759 (0.155)***	-0.668 (0.052)***
Year	0.023 (0.000)***	0.030 (0.000)***	0.010 (0.003)***
0|1	41.691 (0.027)***	54.264 (0.024)***	
1|2	43.109 (0.083)***	55.529 (0.079)***	
2|3	44.559 (0.113)***	56.659 (0.102)***	
3|4	46.045 (0.159)***	57.605 (0.124)***	
4|5		58.486 (0.150)***	
5|6		59.187 (0.178)***	
6|7		60.347 (0.248)***	
7|8		61.434 (0.253)***	
8|9		63.224 (0.255)***	
9|10		63.923 (0.255)***	
(Intercept)			-17.709 (5.290)***
Num.Obs.	1042	1042	1042
R2			0.372

	0-4 Index (1)	Additive Index (2)	IRT-based Index (3)
R2 Adj.			0.362
AIC	2889.5	3474.2	2004.9
BIC	2983.5	3597.9	2089.0
Log.Lik.	-1425.748	-1712.088	-985.432

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The table presents results from ordered logistic regressions (Models 1 and 2) and ordinary least square regression (Model 3) with robust standard errors in parenthesis.

Table 5 Predicted probabilities based on the 0-4 adaptability index

Values of the 0-4 adaptability index	Minimum political affinity	Maximum political affinity	Minimum experiential affinity	Maximum experiential affinity	Minimum cultural affinity	Maximum cultural affinity
0	0.11 [0.07-0.17]	0.33 [0.28-0.39]	0.20 [0.13-0.28]	0.32 [0.26-0.40]	0.07 [0.03-0.18]	0.28 [0.24-0.32]
1	0.23 [0.16-0.32]	0.34 [0.29-0.40]	0.31 [0.21-0.42]	0.34 [0.27-0.42]	0.17 [0.07-0.36]	0.34 [0.29-0.38]
2	0.35 [0.25-0.46]	0.22 [0.18-0.27]	0.31 [0.22-0.42]	0.23 [0.18-0.29]	0.34 [0.16-0.58]	0.26 [0.22-0.30]
3	0.22 [0.15-0.30]	0.08 [0.06-0.10]	0.14 [0.09-0.21]	0.08 [0.06-0.11]	0.28 [0.13-0.51]	0.10 [0.08-0.12]
4	0.09 [0.06-0.14]	0.02 [0.02-0.03]	0.05 [0.03-0.08]	0.03 [0.02-0.04]	0.14 [0.06-0.31]	0.03 [0.03-0.04]

The table presents predicted probabilities for each affinity variable's minimum and maximum values, with confidence intervals in brackets.

Table 6 Predicted probabilities based on the 0-10 additive adaptability index

Values of the additive adaptability index	Minimum political affinity	Maximum political affinity	Minimum experiential affinity	Maximum experiential affinity	Minimum cultural affinity	Maximum cultural affinity
0	0.12 [0.08-0.18]	0.34 [0.28-0.40]	0.19 [0.13-0.28]	0.34 [0.27-0.42]	0.07 [0.03-0.18]	0.28 [0.24-0.33]
2	0.27 [0.19-0.37]	0.20 [0.17-0.25]	0.27 [0.18-0.37]	0.20 [0.16-0.26]	0.25 [0.11-0.46]	0.23 [0.19-0.27]
4	0.11 [0.07-0.16]	0.04 [0.03-0.05]	0.07 [0.05-0.11]	0.04 [0.03-0.05]	0.15 [0.06-0.32]	0.05 [0.04-0.06]
6	0.03 [0.02-0.05]	0.01 [0.01-0.01]	0.02 [0.01-0.03]	0.01 [0.01-0.01]	0.06 [0.02-0.13]	0.01 [0.01-0.02]
8	0.00 [0.00-0.01]	0.00 [0.00-0.00]	0.00 [0.00-0.00]	0.00 [0.00-0.00]	0.01 [0.00-0.02]	0.00 [0.00-0.00]

The table presents predicted probabilities for each affinity variable's minimum and maximum values, with confidence intervals in brackets.

In sum, the results confirm the initial intuition that affinity matters when it comes to adaptability-related decisions. A trend that emerges from the analysis is that when affinity affects adaptability choices, it primarily does so negatively, even when controlling for the negotiation context and period. In other words, the evidence points towards a general tendency among negotiators to increase institutional adaptability when they have reason to be concerned about the trustworthiness of other countries. Consequently, adaptability is more likely conceived as a safety net, just like flexibility.

In addition, political and cultural affinities are found to be more strongly associated with treaty adaptability than shared prior negotiation experience. This suggests that past environmental cooperation may not be the best predictor of a treaty's ability to be adjusted over time. Conversely, this indicates that, on average, like-minded and similar partners are less prone to equip their IEAs with tools for adaptation, which casts doubt on the hypothesis that negotiators perceive adaptability provisions as a springboard for long-term adaptive cooperation.

6. Conclusion

This paper presents a first attempt to explain why some treaties include more provisions facilitating the possibility for future adjustments than others. It contends that institutional adaptability overlaps with but differs conceptually and operationally from other design features discussed in the rational design literature. As a result, it deserves further and separate investigation. The paper also develops the concept of affinity, i.e., the strength of the relationship between prospective partners, which is expected to help build trust between them. This aspect is rarely discussed in accounts of institutional design. Yet, international agreements are negotiated by social human beings who likely make decisions based on some combination of cost-benefit assessments and emotions. Thus, the fine-grained empirical analysis breaks down three distinct dimensions of affinity: preference and interest convergence, prior shared negotiation experience, and shared cultural identity. The study also considers various negotiation characteristics, which remain poorly addressed in statistical modeling on institutional design despite early calls to better capture the problem structure (Mitchell 2006).

The results lend support to the *safeguard* hypothesis, which expects higher levels of institutional adaptability when there is low affinity and little trust between prospective partners. This provides reasons to believe that the rationale for including adaptability provisions in IEAs is protective. This strategy is likely to matter in the subsequent stages of treaty-based cooperation. Although the question deserves more empirical investigation, it seems plausible that using design as a shield could be less conducive to substantive treaty change based on new knowledge about the state of the world than having a springboard perspective. Therefore, the safeguard perspective could limit the capacity of IEAs to tackle rapidly changing issues effectively and may explain why environmental institutions "often remain in place long after mismatches between regimes and the biophysical and socioeconomic settings with which they interact become severe and widely understood." (Young 2010: 379)

This paper presents a preliminary treatment of the complex relationship between affinity and institutional design. The question calls for more research though. In particular, future research could use process tracing to disentangle the causal mechanisms that link adaptability and each facet of affinity. This would allow to examine if specific factors make one dimension of affinity prevail over the other two and why. Such research endeavor would also greatly benefit from interview data on negotiators' motivations to include adaptability-enhancing provisions in their treaties and the perceived trustworthiness of their partners. In addition, IEAs are numerous, heterogeneous, and cover a wide variety of issues. Therefore, the results of this paper could apply to other fields of governance. Trust may be even more decisive in adaptability choices made in more sensitive negotiation contexts, such as the negotiations of a nuclear weapon treaty (Ruzicka and Wheeler 2010). Therefore, the empirical analysis could usefully be extended to other sets of treaties, including trade, human rights, and investment treaties, or, as Koremenos (2016) does, a random sample of agreements in multiple issue areas. Finally, this paper examines design tools that *can* facilitate the subsequent adaptation of a treaty. The relationship between treaty design and adaptation remains to be more thoroughly and systematically explored.

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Appendix

Table 7 Sources of data

Variable or item name	Source
Monitoring provisions	Laurens and Morin (2019)
External feedback provisions	Author et al. (forthcoming)
Anticipatory provisions	Author et al. (forthcoming)
Institution-building provisions	Laurens and Morin (2019)
UNGA ideal point estimates (political affinity)	Bailey et al. (2017)
Number of IEAs (experiential affinity)	Mitchell (2002-2020)
Number of subregions (cultural affinity)	United Nations Statistics Division
Geographical distance (cultural affinity)	Mayer and Zignago (2011)
Political instability	Marshall et al. (2019)
GDP (power)	Bolt and van Zanden (2020)
Democracy / civil society participation	Coppedge et al. (2022)
Depth	Author et al. (forthcoming)
Subject of the treaty	Mitchell (2002-2020)

Table 8 Descriptive statistics

	Min	Max	Mean	SD	Histogram
Adaptability (0-4)	0	4	1.55	1.25	
Adaptability (additive index)	0	10	1.99	1.88	
Adaptability (IRT)	0.00	3.55	0.97	0.80	
Political affinity	0.00	3.38	2.51	0.80	
Experiential affinity	0.00	5.07	2.77	0.97	
Cultural affinity	1	22	20.26	3.37	
Political instability	0.00	1.00	0.11	0.20	
Prior hindsight	0.00	6.71	4.82	1.09	
Power asymmetry	0.00	1.00	0.67	0.27	
Depth	0	6	0.63	0.81	
Bilateral	0	1	0.67	0.47	

	N	%
Agriculture	102	9.0
Biodiversity	92	8.1
Energy	114	10.0
Fisheries	390	34.3
Freshwater and ocean	221	19.4
Pollution	91	8.0
Other issues	127	11.2

Robustness checks

I use alternative measures of the three affinity variables. First, I measure POLITICAL AFFINITY by subtracting the standard deviation of the signatories' civil society participation indices from 1 (Coppedge et al. 2022). Then, I rescale the variable to take positive values. Democracy has been demonstrated to be a good proxy for the level of international environmental commitments (Neumayer 2002; Carbonell and Allison 2015). Therefore, it is expected to reflect reasonably well preference convergence in IEA negotiations. The civil society participation index from the V-Dem project is preferred (though highly correlated) to simple democracy scores. It captures whether policymakers routinely consult civil society organizations, a prominent actor in global environmental governance (Eastwood 2018). The results are presented in Table 9 below.

With this alternative measure of POLITICAL AFFINITY, and when all other measures remain the same, the significant negative effects of POLITICAL and CULTURAL AFFINITY remain. The predicted probabilities are also similar.[25] POLITICAL INSTABILITY and DEPTH are still positively associated with ADAPTABILITY in the three models. However, the association between EXPERIENTIAL AFFINITY and ADAPTABILITY is not statistically significant in any model. This confirms the overall findings presented in Table 4 and discussed in Section 5 of the article.

Regarding EXPERIENTIAL AFFINITY, for multilateral agreements, I take the lowest number of IEAs concluded by a dyad of signatories (following the "weakest link" assumption) instead of the mean. The results are presented in Table 10. When all other measures remain the same as in the main analysis, the negative effect of the three dimensions of affinity becomes significant. Therefore, this result is in line with the

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[25] In Model 1 in Table 9, the predicted probability of a treaty having the highest value of ADAPTABILITY on the 0-4 index is **5%** when POLITICAL AFFINITY is set at its minimum value and **3%** when POLITICAL AFFINITY is set at its maximum value (instead of, respectively, **9%** and **2%** in the main analysis). Similarly, the probability of having the highest value of ADAPTABILITY is **15%** when CULTURAL AFFINITY is set at its minimum value and drops to **3%** when CULTURAL AFFINITY is set at its maximum value (instead of, respectively, **14%** and **3%** in the main analysis).

safeguard argument. The magnitude of the effect of the three AFFINITY variables remains similar.

Lastly, regarding CULTURAL AFFINITY, I subtract the average geographical distance between the signatories' capitals from 1 (Mayer and Zignago 2011) before removing negative values. I also add a control for the NUMBER OF SIGNATORIES in these models. In contrast with the number of subregions, the average geographical distance does not capture membership size. The results are presented in Table 11. With this specification, CULTURAL AFFINITY loses its significant effect in the three models (although the estimate is still negative). This may suggest that regional effects, which are better captured in the main analysis, are more influential than the number of kilometers separating countries. When geographical distance is used, POLITICAL AFFINITY is still found to have a significant negative effect on ADAPTABILITY, regardless of the measure of ADAPTABILITY or the type of model. In addition, the NUMBER OF SIGNATORIES has a positive and highly statistically significant effect in the three models. Therefore, the larger the number of participants, the higher the perceived need for adaptability provisions. This is in line with the *safeguard* hypothesis because affinity (especially political and cultural affinities) is likely to be much lower among large groups of participants than in smaller settings.

Table 9 Regression results on IEA adaptability (Political affinity robustness)

	0-4 Index (1)	Additive Index (2)	IRT-based Index (3)
Political affinity	-0.932 (0.015)***	-1.037 (0.018)***	-0.328 (0.113)**
Experiential affinity	-0.004 (0.068)	-0.033 (0.068)	-0.011 (0.027)
Cultural affinity	-0.079 (0.023)***	-0.078 (0.022)***	-0.031 (0.007)***
Political Instability	0.787 (0.054)***	0.810 (0.051)***	0.313 (0.107)**
Prior hindsight	0.074 (0.071)	0.042 (0.069)	0.026 (0.043)
Power asymmetry	0.159 (0.221)	0.136 (0.218)	0.049 (0.076)
Depth	0.472 (0.079)***	0.518 (0.075)***	0.172 (0.027)***
Energy	-0.551 (0.161)***	-0.429 (0.161)**	-0.150 (0.096)

	0-4 Index (1)	Additive Index (2)	IRT-based Index (3)
Biodiversity	-0.433 (0.178)*	-0.592 (0.174)***	-0.186 (0.101)+
Fisheries	-0.791 (0.135)***	-0.776 (0.131)***	-0.263 (0.091)**
Freshwater and ocean	-0.243 (0.129)+	-0.222 (0.129)+	-0.055 (0.084)
Pollution	-0.679 (0.175)***	-0.623 (0.174)***	-0.200 (0.107)+
Others issues	-0.128 (0.160)	-0.207 (0.156)	-0.030 (0.107)
Bilateral	-1.396 (0.148)***	-1.724 (0.150)***	-0.668 (0.052)***
Year	0.023 (0.000)***	0.030 (0.000)***	0.010 (0.003)***
0|1	41.959 (0.032)***	55.430 (0.028)***	
1|2	43.271 (0.079)***	56.610 (0.075)***	
2|3	44.682 (0.107)***	57.671 (0.097)***	
3|4	46.158 (0.153)***	58.603 (0.118)***	
4|5		59.499 (0.145)***	
5|6		60.209 (0.174)***	
6|7		61.368 (0.244)***	
7|8		62.450 (0.250)***	
8|9		64.233 (0.252)***	
9|10		64.931 (0.252)***	
(Intercept)			-17.999 (5.222)***
Num.Obs.	1073	1073	1073
R2			0.351
R2 Adj.			0.342
AIC	3003.0	3592.7	2112.3
BIC	3097.6	3717.2	2196.9
Log.Lik.	-1482.514	-1771.374	-1039.136

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

The table presents results from ordered logistic regressions (Models 1 and 2) and ordinary least square regression (Model 3) with robust standard errors in parenthesis.

Table 10 Regression results on IEA adaptability (Experiential affinity robustness)

	0-4 Index (1)	Additive Index (2)	IRT-based Index (3)
Political affinity	-0.422 (0.077)***	-0.400 (0.076)***	-0.141 (0.026)***
Experiential affinity	-0.288 (0.066)***	-0.318 (0.065)***	-0.103 (0.025)***
Cultural affinity	-0.050 (0.024)*	-0.048 (0.023)*	-0.019 (0.007)**
Political Instability	0.404 (0.057)***	0.478 (0.048)***	0.200 (0.105)+
Prior hindsight	0.219 (0.074)**	0.175 (0.073)*	0.067 (0.042)
Power asymmetry	0.206 (0.223)	0.140 (0.219)	0.072 (0.074)
Depth	0.453 (0.081)***	0.502 (0.076)***	0.161 (0.026)***
Biodiversity	-0.413 (0.181)*	-0.632 (0.177)***	-0.181 (0.097)+
Energy	-0.617 (0.165)***	-0.548 (0.164)***	-0.176 (0.091)+
Fisheries	-0.949 (0.139)***	-0.969 (0.135)***	-0.306 (0.087)***
Freshwater and ocean	-0.214 (0.129)+	-0.243 (0.128)+	-0.047 (0.079)
Pollution	-0.601 (0.176)***	-0.609 (0.176)***	-0.179 (0.102)+
Others issues	0.250 (0.166)	0.074 (0.161)	0.068 (0.105)
Bilateral	-1.210 (0.160)***	-1.519 (0.161)***	-0.584 (0.056)***
Year	0.028 (0.000)***	0.035 (0.000)***	0.012 (0.003)***
0|1	52.175 (0.027)***	65.451 (0.024)***	
1|2	53.602 (0.084)***	66.725 (0.080)***	
2|3	55.065 (0.114)***	67.864 (0.103)***	
3|4	56.568 (0.160)***	68.823 (0.125)***	
4|5		69.716 (0.152)***	
5|6		70.423 (0.179)***	

	0-4 Index (1)	Additive Index (2)	IRT-based Index (3)
6|7		71.592 (0.249)***	
7|8		72.687 (0.254)***	
8|9		74.476 (0.256)***	
9|10		75.175 (0.256)***	
(Intercept)			-21.099 (5.124)***
Num.Obs.	1042	1042	1042
R2			0.380
R2 Adj.			0.371
AIC	2877.3	3459.5	1991.4
BIC	2971.4	3583.2	2075.5
Log.Lik.	-1419.673	-1704.725	-978.709

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

The table presents results from ordered logistic regressions (Models 1 and 2) and ordinary least square regression (Model 3) with robust standard errors in parenthesis.

Table 11 Regression results on IEA adaptability (Cultural affinity robustness)

	0-4 Index (1)	Additive Index (2)	IRT-based Index (3)
Political affinity	**-0.399 (0.080)***	**-0.382 (0.079)***	**-0.145 (0.027)***
Experiential affinity	**-0.132 (0.068)+**	**-0.151 (0.068)***	**-0.048 (0.027)+**
Cultural affinity	**-0.087 (0.057)**	**-0.067 (0.056)**	**-0.003 (0.019)**
Political Instability	0.487 (0.059)***	0.587 (0.053)***	0.246 (0.107)*
Prior hindsight	0.247 (0.073)***	0.197 (0.072)**	0.071 (0.042)+
Power asymmetry	0.301 (0.217)	0.231 (0.214)	0.107 (0.073)
Depth	0.463 (0.081)***	0.503 (0.076)***	0.160 (0.026)***
Biodiversity	-0.528 (0.181)**	-0.684 (0.178)***	-0.200 (0.097)*
Energy	-0.700 (0.164)***	-0.594 (0.163)***	-0.187 (0.091)*

	0-4 Index (1)	Additive Index (2)	IRT-based Index (3)
Fisheries	-1.086 (0.137)***	-1.060 (0.134)***	-0.328 (0.087)***
Freshwater and ocean	-0.239 (0.134)+	-0.251 (0.134)+	-0.068 (0.080)
Pollution	-0.551 (0.176)**	-0.543 (0.175)**	-0.178 (0.103)+
Others issues	0.200 (0.166)	0.053 (0.160)	0.049 (0.106)
Bilateral	-1.473 (0.150)***	-1.773 (0.151)***	-0.674 (0.050)***
Year	0.021 (0.000)***	0.028 (0.000)***	0.010 (0.003)***
Number of signatories	0.015 (0.004)***	0.017 (0.004)***	0.007 (0.001)***
0|1	37.995 (0.016)***	52.238 (0.014)***	
1|2	39.414 (0.079)***	53.503 (0.076)***	
2|3	40.864 (0.109)***	54.634 (0.099)***	
3|4	42.362 (0.153)***	55.581 (0.120)***	
4|5		56.472 (0.146)***	
5|6		57.183 (0.173)***	
6|7		58.342 (0.240)***	
7|8		59.357 (0.247)***	
8|9		61.452 (0.251)***	
9|10		62.151 (0.251)***	
(Intercept)			-17.589 (5.252)***
Num.Obs.	1047	1047	1047
R2			0.385
R2 Adj.			0.376
AIC	2898.3	3489.6	2009.1
BIC	2997.4	3618.4	2098.2
Log.Lik.	-1429.151	-1718.822	-986.539

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

The table presents results from ordered logistic regressions (Models 1 and 2) and ordinary least square regression (Model 3) with robust standard errors in parenthesis.

As a second set of robustness checks, I include only one measure of AFFINITY in each model. This specification allows to mitigate the multicollinearity risk between the main independent variables. The results are available upon request and confirm the statistically significant negative effect of POLITICAL AFFINITY and CULTURAL AFFINITY. Like in the main analysis, EXPERIENTIAL AFFINITY is not statistically significant even when included separately from the other affinity measures.

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