Constructed Peer Groups and Path Dependence in International Organizations:

The Case of the International Climate Change Negotiations

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Abstract

International organizations sometimes institutionalize country groupings by specifying differentiated rules and commitments that may, in turn, generate new negotiation dynamics. Drawing on socialization and incentive-based arguments, we develop a "constructed peer group" hypothesis suggesting that by creating these groups those organizations may actually construct new lines of confrontation over and above the substance-based disagreements existing between countries in the first place. This generates a particular type of path dependence rendering broad-based international agreements more difficult in the future.

We analyze this question at the example of the United Nations Framework Convention on Climate Change (UNFCCC)'s increasingly politicized split between Annex I and non-Annex I countries. Using a self-coded dataset of country oral statements during the negotiation rounds between December 2007 and December 2009 we assess whether Annex I membership influences a country's stance towards other countries' arguments. To disentangle the effect of group construction from the effect of various background characteristics that may drive countries' preferences and, simultaneously, the affiliation to Annex I, we complement our regression analysis with quasi-experimental methods drawn from the treatment evaluation literature. We find that, over and above the ex ante differences in preferences, the split between Annex I and non-Annex I countries has indeed influenced negotiation behavior and thereby amplified the existing divide between developing and industrialized countries.

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1. Introduction

In the international relations literature, a sustained debate exists on whether and how intergovernmental organizations (IGOs) may influence national state behavior. While realist scholars argue that IGOs are mainly a reflection of the international balance of power and that their influence on behavior is therefore limited (Mearsheimer 1994/95), rationalists believe that institutions may exert influence by rewarding norm-complying behavior and punishing norm violations (Schimmelfennig 2005); finally, constructivists posit that beyond instrumental explanations, the institutions created by IGOs affect member state interests and behavior by themselves (see e.g. Wendt 1994). While much research has been done on how the European institutions affect member states' interests and behavior (see e.g. Checkel 2005a), research that looks at other IGOs in this context is still limited (good examples are the recent analyses at UN level by Bearce and Bondanella 2007 and Greenhill 2010). Furthermore, this literature is mostly limited to analyzing whether membership to an organization affects state behavior, and / or analyzes the microprocesses in which socialization within that organization takes place (cf. role-playing, normative suasion, and strategic calculation, see Checkel 2005b).

In this paper, we will draw from this literature to consider whether socialization processes affect the members' behavior within the organization itself, and thereby, the IGO's future development and its chances to reach its objectives. We focus on the institutional design of the organization, notably with respect to the subgroups it generates, its impact on the way socialization will take place, and the consequences for the members' future attitudes within the organization.

With the exception of the European institutions, little research has been done so far on how institutional design affects member state behavior. In addition, the existing research only considers the effectiveness of institutional structures purposefully designed to achieve a certain goal (such as, e.g., socialization with European norms; see Schimmelfennig 2000).

In this article, we go one step further and posit that the way in which IGOs are designed affects state interests and behavior, even if this was not intended in the first place. We will show that such has been the case within the negotiations under the United Nations Convention of Climate Change (UNFCCC). Anecdotal evidence of the negotiation process under the UNFCCC suggests that by grouping OECD and transition countries in Annex I of the Convention as a means of differentiating them from 'non-Annex I' countries with respect to their greenhouse gas reduction and reporting commitments, an unnecessarily deep divide between these different groups of countries has been generated. Observers argue that over time, the distinction has become more and more politicized and rigid, and discuss some of the implications of being included in one or the other group (Höhne 2005, especially p. 37, Baumert et al. 1999 and 2002; and Gupta 2010). Furthermore, legal scholars have examined the normative perspective on whether country differentiation should be pursued and how this should be done (e.g., Rajamani 2000).

However, we are not aware of any systematic theoretical and empirical assessment of the effects of institutionalized country differentiation on the future negotiation process itself. As noted by Odell (2011) in a recent review of the negotiations literature, there is a general lack of research combining the insights of macro conditions (like the institutional negotiation structure) and micro processes of negotiation. Thus Odell (2011, p. 40) explicitly calls for the

introduction of "hypotheses about how international institutional differences (as conceived by either rationalists or constructivists) affect individual negotiator behavior".

We respond to this call drawing from both, the institutionalist literature and negotiation research, and propose a "constructed peer group" hypothesis, whereby the "constructed" peer group is itself an institution created within an IGO, and stands in contrast to "natural" peer groups based on country characteristics that lead to similar preferences and coalitions[1]. Our hypothesis suggests that once these groups are constructed and institutionalized, negotiation behavior of countries that are party to the IGO may follow the delimiting lines between these groups. More specifically, we expect that the group building process itself alters the countries' incentives, and, as a consequence, their negotiation behavior. For instance, countries in groupings initially granted certain exemptions from economic or financial adjustment obligations will have an incentive to jointly lobby for the continuation of this preferential treatment in subsequent negotiation rounds, whereas countries with such obligations will feel encouraged to lobby for the abolition of the preferential treatment. In addition, creating such country groupings may imply increased discussions within these groups and thereby enhance mutual understanding and support, leading to socialization effects and accentuating a group profile that may, in fact, have been relatively flue in the first place. Eventually, the decision to form specific country groups may drive the discussions in a different direction than they would have taken otherwise (path dependence) and render broad-based international agreements even more difficult.

Empirically, we will use the example of the UNFCCC to assess to what extent the ex-ante categorization of member countries may indeed have amplified the divide between them. The empirical challenge is to differentiate between the effect of institutionalized groupings and the impact of policy preferences that can be explained by different country characteristics. To do so, we examine the factors leading countries to openly express support for other countries' positions during the UNFCCC negotiation rounds from December 2007 to December 2009. Based on protocols of the negotiations published in the Earth Negotiations Bulletin (ENB), we code all statements by countries declaring support for other countries' previous interventions. We then assess the impact of Annex I membership and various country characteristics on this variable in a multivariate censored regression framework. Moreover, we complement this analysis by an econometric evaluation using propensity score matching. As a fully non-parametric method this estimation strategy is independent of functional form assumptions. In addition, the matching approach limits our comparison to actually comparable countries – thereby eliminating a potentially important source of bias.

In the following, we will first describe the context of our UNFCCC example (Section 2) and present other multilateral settings in which such constructed groups have been created (Section 3). In Section 4 we then propose a theoretical framework describing our "constructed peer group" hypothesis and linking it to existing sociological, structural and incentive-based arguments from the broader literature on institutions, cooperation and international negotiations. This constructed peer group hypothesis is then assessed based on data described in Section 5. Section 6 explains the empirical estimation approach and presents the results of our analysis. Section 7 completes the paper with the main conclusions and a discussion of policy implications for international negotiation processes in general.

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[1] Coalitions are in this context defined as groups of countries that are voluntarily formed with the aim of defending the same position in international negotiation settings, see Odell (2011, p. 19ff).

2. Setting the scene: Different countries, different rules – the background of Annex I

"Why shouldn't I date an Annex I guy?" asked Leela Raina in an article written during the UN climate negotiations in Bangkok (Raina 2009). The Indian climate activist lists a couple of reasons: Annex I guys are not willing to commit, they usually take more space in the relationship, they refuse to finance dinners, they are possessive and want daily records and they have a consumption-oriented lifestyle. With her article, Raina neatly captures a deep divide between developed and developing countries in international climate policy, which was not foreseen when the UNFCCC was agreed upon.

The ultimate goal of the UNFCCC is the "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner" (UNFCCC 1992, Art. 2).

In Article 4 of the Convention, all countries commit to publish inventories of greenhouse gases (GHGs), as well as national measures taken in order to mitigate or adapt to climate change. They agree to cooperate in technology development and transfer, in the management and conservation of GHG sinks[2], in adaptation, and in research and education related to climate change (UNFCCC 1992, Art. 4.1).

In addition to these general commitments of all UNFCCC member countries, the Convention stipulates additional efforts for those countries which, in 1992, were recognized as historically responsible for most of the emissions and wealthy enough to bear the bulk of the greenhouse gas mitigation costs. Accordingly, the Convention's first guiding principle is "common but differentiated responsibilities":

"[…] the developed country Parties should take the lead in combating climate change and the adverse effects thereof." (UNFCCC 1992, Art. 3.1)

The developed countries supposed to take the lead – basically the then OECD members plus selected countries of the former Soviet Union – were listed in Annex I of the Convention (for the individual countries belonging to this group, see Figure 1). Article 4.2 of the Convention defines the objective of returning CO_2 emissions of Annex I countries to 1990 levels by 2000. The Kyoto Protocol in 1997 led to additional binding targets for a list of countries that widely corresponds to UNFCCC, Annex I (Annex B of the Kyoto Protocol).[3] A subset of Annex I countries further agreed to provide financial support to developing countries to assist them with their reporting requirements, provide technology transfer and contribute to adaptation processes in particularly vulnerable countries, e.g., small island countries (UNFCCC 1992, Art. 4.3).

While some procedural mechanisms for regular revisions of Annex I were foreseen within the Convention, there was no in-built graduation principle related, e.g., to per capita income or emission levels. Correspondingly, there has been little change over time. A few European countries joined Annex I in 1997 when they joined the Convention: the Czech Republic and Slovakia – replacing Czechoslovakia, as well as Croatia, Liechtenstein, Monaco, and Slovenia (UNFCCC 2000). Otherwise, changes of the country list in Annex I have proven to be

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[2] 'Sinks' are natural carbon stores that sequester carbon from the atmosphere (forests, soils and oceans).
[3] While the US is listed in Annex B, it did not ratify the Protocol. Turkey is the only Annex I country that ratified the Kyoto Protocol, but, for exceptional reasons, is not included in Annex B (UNFCCC n/d).

extremely contentious. No move between non-Annex I and Annex I has ever taken place so far. In 1998 Argentina and Kazakhstan proposed to take up emission targets (thereby joining Annex I), but this was prevented through the fierce opposition of other developing countries. The latter feared that this would generate a precedent eventually leading to commitments for developing countries (Grubb 1999, pp. 251f.).

In subsequent years, the distinction between Annex I and non-Annex I countries became more and more rigid (Höhne et al. 1997, p. 9, Höhne 2005, p. 37). Contentious issues such as the financing of mitigation and adaptation in developing countries, further reporting requirements, the accounting of avoided deforestation, and the adoption of future commitments, all were discussed along these lines. As Gupta (2010, p. 641) describes it, "the division of the world into developed and developing (based on OECD membership) was amateurish—there were no clear criteria for this division, and this has proved to be a major stumbling block in subsequent periods as countries resisted their inclusion in Annex I (e.g., Turkey) or are reluctant to change their status subsequently".

Thus, initially, listing countries in Annex I was meant to be used only as an interim vehicle to differentiate the emission reduction and related reporting commitments. However, in practice it may have created a lasting divide between two static country groups.

In the framework of international climate negotiations, a number of other country groups have become relevant, too. As opposed to Annex I, these groups are not defined by the Convention itself. Their main purpose is to exchange information between like-minded countries, to increase their negotiating power by expressing joint positions, and to ease the burden of small and / or poor countries that may not be able to send a sufficient number of delegates to be represented in all the different negotiation groups for discussing the different policy issues at stake. In some cases, such groups have reached special treatment for particular policy issues. Both the Least Developed Countries (LDCs) and the group of Small Island Developing States (SIDSs) are explicitly recognized as particularly vulnerable to the impacts of climate change, and thus enjoy certain specific provisions. For instance, there is a special seat being reserved for SIDSs on the Executive Board of the Clean Development Mechanism (CDM), or a waiver of registration cost for CDM projects in LDCs.

Some of these groups are well-established regional or political country groupings such as the EU, the G77 and China, OPEC or the LDCs that also act as groups in other international fora. There are also an African group, a Central Asian group (CACAM) and two Latin American groups, the Bolivarian Alliance of Latin American Countries (ALBA) and the Central American Integration group (Sistema de Integración Centroamericana, SICA), whereby the former is based on ideological, the second on geographical grounds. Other groups have formed specifically in the climate negotiation process, driven by joint interests in this field, such as the Alliance of Small Island States (AOSIS[4]), a group of the large emerging countries Brazil, China, India and South Africa (BASIC), or the Umbrella group – an alliance of industrialized countries in favor of market based mechanisms rather than regulation.

While there are a large number of (partially overlapping) groups within non-Annex I, and also a few groups within Annex I, only a single (small) group bridges the gap between these two. This is the Environmental Integrity Group composed of South Korea, Mexico, Liechtenstein and Switzerland. An overview of all the different groups is provided in Figure 1.

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[4] AOSIS is an ad hoc negotiating coalition that represents the interests of SIDSs. While both groups are very similar, they are not identical: the UN list of SIDSs includes Bahrain and several non-UN members and associate members of the regional commissions that are not members of AOSIS.

Figure 1: Country coalitions within the UNFCCC

Azerbaijan
Cyprus
The former Yugoslav Republic of Macedonia
Israel
Kyrgyzstan
Montenegro
San Marino
Serbia
Tajikistan

Cook Islands
Nauru
Niue
Palau

Kiribati
Tuvalu

LDCs

Afghanistan
Bangladesh
Bhutan
Cambodia
Lao P. D. R.
Myanmar
Nepal
Yemen

Antigua and Barbuda
Bahamas
Barbados
Cuba
Dominica
Dominican Republic
Fiji
Micronesia
Grenada
Guyana
Jamaica
Marshall Islands
Papua New Guinea
Singapore
Saint Kitts and Nevis
Saint Lucia
Saint Vincent and the Grenadines
Suriname
Tonga
Trinidad and Tobago

Haiti
Maldives
Samoa
Solomon Islands
Timor Leste
Vanuatu

African Group

AOSIS

Argentina
Bahrain
Bosnia and Herzegovina
Brunei Darussalam
Chile
Colombia
D. P. R. Korea
Indonesia
Jordan
Lebanon
Malaysia
Mongolia
Oman
Pakistan
Paraguay
Peru
Philippines
Sri Lanka
Syrian Arab Republic
Thailand
Uruguay
Viet Nam

Comoros
Guinea Bissau
Sao Tome and Principe

Benin
Burkina Faso
Burundi
Central African Republic
Chad
D. R. Congo
Djibouti
Equatorial Guinea
Eritrea
Ethiopia
Gambia
Guinea
Lesotho
Liberia
Madagascar
Malawi
Mali
Mauritania
Mozambique
Niger
Rwanda
Senegal
Sierra Leone
Somalia
Sudan
Tanzania
Togo
Uganda
Zambia

Cape Verde
Mauritius
Seychelles

Belize

SICA

Costa Rica
El Salvador
Guatemala
Honduras
Panama

Brazil
China
India

South Africa

Botswana
Cameroon
Congo
Côte d'Ivoire
Egypt
Gabon
Ghana
Kenya
Morocco
Namibia
Swaziland
Tunisia
Zimbabwe

BASIC

Nicaragua

Turkmenistan

Bolivia

Albania
Armenia
Georgia
Kazakhstan
Republic of Moldova
Uzbekistan

ALBA

Algeria
Libya
Nigeria

Angola

Ecuador
Venezuela

Iran
Iraq
Kuwait
Qatar
Saudi Arabia
United Arab Emirates

OPEC

CACAM

G77 / China

Mexico
South Korea

non-Annex I

Liechtenstein
Switzerland

Australia
Canada
Iceland
Japan
New Zealand
Norway
Russia
Ukraine
United States

Austria, Belgium, Bulgaria,
Czech Republic, Denmark,
Estonia, Finland, France,
Germany, Greece, Hungary,
Ireland, Italy, Latvia,
Lithuania, Luxembourg,
Malta, Netherlands, Poland,
Portugal, Romania,
Slovakia, Slovenia, Spain,
Sweden, UK

Belarus
Croatia
Monaco
Turkey

Environmental Integrity Group

Umbrella

EU

Annex I

3. Beyond the climate negotiations: institutionalized country groupings in other IGOs

The UNFCCC is not the only intergovernmental organization that has adopted differentiated rules for groups of countries. In fact, several other multilateral environmental agreements, including the 1982 United Nations Convention on the Law of the Sea, the 1983 International Undertaking on Plant Genetic Resources, the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer, the 1992 Convention on Biological Diversity and the 1994 United Nations Convention to Combat Desertification, have incorporated the notion of differentiated responsibility of states with respect to the protection of the environment. The basis of this differentiated responsibility is the recognition of the different circumstances of countries participating in the respective agreement, such as the future development needs of poor countries, other special needs of certain countries, or simply the different contribution of countries to the specific environmental problem at hand. The resulting differential treatment usually consists of differences in the stringency of certain obligations, different timing of the application of provisions (grace periods or delayed implementation of obligations, or priority implementation in particularly affected countries), and international assistance in terms of financing, capacity building or technology transfer (Matsui 2002, Hepburn and Ahmad 2005).

Another notable example is the World Trade Organization with its "Special and Differential Treatment" provisions, which are based on the notion that countries at different levels of development have different trade policy needs (Page and Kleen 2005). The 1979 Enabling Clause formally established differential treatment for developing countries and, among them, for Least Developed Countries (LDCs). In recent negotiation rounds on specific trade areas, however, different sub-groups of developing countries, according to different criteria, have been granted preferential treatment. In this context, it has been noted that the existing country categories have become rigid and are being considered as negotiation goals themselves. As a result, there has been a discussion about how to make this differential treatment more flexible and dynamic and how to establish differentiation categories and graduation rules to allow this flexibility (see, e.g., Hoekman et al. 2004, Kasteng et al. 2004, Page and Kleen 2005, Hoekman and Özden 2006).

The next section describes the theoretical foundations of our peer group hypothesis.

4. A theory of why institutionalized groupings could affect the future negotiation process: the constructed peer group hypothesis

Clearly, countries' characteristics and related preferences affect the positions they will take up in the negotiation process, the statements they will approve of, and, eventually, the outcomes of the negotiation process. Countries within distinct groups usually share a certain number of economic, political or geographical characteristics, and these similarities lead to common positions on certain aspects of the policy issues at stake.

Our theoretical idea now is that, over and above the effect of similarities in country characteristics and related preferences, the existence of institutionalized country groupings may have an effect of its own. We call this the "constructed peer group" hypothesis. The construction of such groups by the regime itself (in contrast to the natural coalitions described above) results in new commonalities among their member countries, which lead to a group identity similar to that of a peer group, in analogy to what institutional socialization theory posits for participation in intergovernmental organizations itself (e.g. Bearce and Bondanella

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2007). This in turn affects the negotiation dynamics, and leads eventually to the persistence of these constructed groups, even for other purposes than those intended initially. We thus expect path dependence between initial institutional decisions and later negotiation structures and dynamics. In the climate change context, it seems that the creation of the Annex I list of countries with specific emission reduction and reporting commitments, and the corresponding non-Annex I group without such commitments, have made subsequent negotiation rounds reinforce the differences between these two groups more and more across different policy areas.

Our constructed peer group hypothesis rests on the tradition of the institutionalist literature in international relations, and on theoretical considerations about how groups behave in negotiations or similar situations, and about how the creation of new groups generates new incentives which, in turn, influence negotiation dynamics. We consider three arguments that back up our hypothesis: (i) socialization and group psychology, (ii) a changed negotiation structure resulting from the existence of groups, and (iii) new incentives created by the new groups. Note that we do not seek to assess the relative importance of any of these arguments. Our data does not allow us to test them individually. Rather, we consider that all of them can motivate our constructed peer-group hypothesis, and it may well be that all of them are similarly relevant for the phenomenon at hand.

(i) Socialization and group psychology

Countries in a given group will meet more often and exchange positions. As they already share some common characteristics, they will feel more closely related. The reduced number of participants also facilitates the creation of personal relationships between country representatives and the emergence of social capital (Coleman 1990; Schimmelfennig et al. 2006). In the words of Mantzavinos et al. (2004, p. 76): "individuals in a given sociocultural environment continually communicate with other individuals while trying to solve their problems. The direct result of this communication is the formation of shared mental models", which lead to a common understanding of reality. Through experiments, social psychologists have indeed shown that group discussion increases the chances of cooperation (Orbell et al. 1988). Researchers of intergovernmental organizations have adopted these arguments for explaining strengthening ties between all members of IGOs. They argue that membership of IGOs creates networks between countries, provides communication channels that allow them to share information about interests and intentions, and generate a sense of mutual identity that leads to cooperation (see e.g. Keohane 1986; Caporaso 1992; Russet et al. 1998; Young 1999; and Dorussen and Ward 2008). The institutional socialization hypothesis goes further and suggests that IGOs, by means of formal and informal exchange at meetings, make member states internalize new norms and rules that are accepted within that IGO, affecting their identity over time, thus making their interests converge (Checkel 1999; Johnston 2001; Bearce and Bondanella 2007).

This all induces a more trustful atmosphere conducive to fruitful deliberations. We posit that this should not only happen for members of an IGO as a whole, but even more so for smaller subgroups. Once a group exists, this reinforces cohesion among its members, and a unified group position is likely to emerge. If, in addition, the group is challenged from the outside, questioning the very foundations and the "raison d'être" of the group, this may even further weld together its members.

The smaller the group and the clearer the similarities of members' preferences at the outset, the stronger should be these effects. This is in line with Mantzavinos et al.'s (2004) argument

that trust is more likely to exist in smaller groups than in larger societies, and with Olson's (1971) theory that smaller groups are more easily able to organize for tackling collective action problems.

Within the UNFCCC framework, a coalition like AOSIS including only countries that are extremely vulnerable to climate change, appears to be a good example. At the same time, the arguments also appear plausible for bigger and less homogeneous groups, even if the effects may be somewhat reduced: The creation of Annex I artificially split UNFCCC members into two distinct groups: Annex I and non-Annex I countries. It thereby generated two separate fora for discussion in addition to the already existing ones. Since non-Annex I countries enjoy some privileges (no own commitments, and external funding for their own mitigation and adaptation activities), their status has been challenged repeatedly in the past. This resulted in a strong response by the group as a whole. The above mentioned developing country resistance against Argentina or Kazakhstan's proposed move from non-Annex I to Annex I is a key example. Leela Raina's statements on reasons "not to date an Annex I guy" (quoted in Section 2 of this paper) more generally show the psychological and ideological divide that has emerged between the two groups.

Arguably, these psychological and sociological arguments rather apply to individuals than to countries, as pointed out by Johnston (2001, pp. 506-507). However, a relevant part of country delegations remains stable over a certain number of years (see, e.g., Michaelowa and Michaelowa 2012). These delegates sit together in the different subgroup contexts shaping their ideas and, eventually, the statements they will make on behalf of their countries. We will focus on these statements, and thus the micro-level underpinnings of negotiation theory, in the empirical part of this article.

(ii) Changed negotiation structure

Negotiation research has so far only in few cases looked at the role of structural factors of the negotiation process on the bargaining outcomes. An important exception is again the work on negotiations in the EU, in which extensive analysis of the role of contextual factors and negotiation rules exists (e.g., Elgström and Smith 2000). Another exception, in the area of multilateral environmental agreements, is Susskind (1994). Susskind attempts to identify the institutional and procedural shortcomings of multilateral environmental talks that are responsible for the failure of environmental negotiations up to the early 1990s, focusing on the consensus voting procedures, imbalance between political and scientific considerations, limited scope for issue linkages, and lack of effective monitoring and enforcement. Finally, Tallberg (2006), also studying the EU negotiations, discusses the leadership role of the negotiation chair and his power as an agenda-setter, as a mediator for agreements, and as a representative of the member states vis-à-vis third parties.

Nonetheless, we can draw from studies of voting within democratic states to illustrate negotiation behavior in multilateral settings. Ever since Downs' (1957) seminal work on the "Economic Theory of Democracy", it has been well established in both political science and economics that the electoral system influences the positions adopted by political parties. Within Downs' model itself, it can be shown that the voting process will no more lead to the adoption of the median voter position, if, prior to the general election, the party positions have to be accepted by a majority of the party members – at least if these members are not evenly distributed over the policy space, but clustered at two different ends due to ideological preferences. In this context, the party positions adopted will typically lie around the median position within each party, rather than at the median of the overall population. During the

general elections, voters will then be confronted with two distinct party propositions, and one of these will eventually be accepted. As opposed to the median voter scenario, this outcome will correspond to the preferences of some voters on one or the other side of the ideological spectrum, rather than to the intermediate preferences of the median voter.

Group-wise discussions in international negotiation processes can be conceived as analogous to primary elections within parties, where instead of party members we have the countries belonging to a specific group, and instead of parties we have the groups themselves. Institutionalized groupings thus affect the structure of the negotiation process. Rather than having all participants deliberate jointly about the issues at stake, the formation of opinions then happens at an earlier stage within the different groups. If these groups are clustered around different positions in the policy space, and if group discussions in the first stage lead to relatively fixed positions fed into the overall negotiation process in the second stage, reaching consensus there – a requirement for adopting decisions in the UNFCCC and most other IGOs – will become much more difficult.

Just as the discussion on group psychology, within the UNFCCC this argument refers to all groups in a similar way, and is especially relevant for regional or political coalitions such as AOSIS or the G77, who hold regular meetings to coordinate positions during the negotiation rounds. However, again, the formation of new groups such as Annex I and non-Annex I can amplify the effect.

(iii) New incentives

New incentives are generated when group formation goes hand in hand with specific privileges attached to group membership. For all members of the group, the protection of these privileges becomes a new and common objective. For instance, groupings initially granted certain exemptions from economic or financial adjustment obligations will have an incentive to jointly lobby for the continuation of this preferential treatment in subsequent negotiation rounds, or for the expansion of the preferential treatment to other issue areas. New incentives can also work in the opposite direction: countries in the group with financial or environmental obligations will lobby for the abolishment of the preferential treatment, or for increased flexibility for fulfilling their commitments. In both cases, the common objective strengthens cohesion within the group.

While within the UNFCCC group psychology and the changed negotiation structure were relevant for all groups and the creation of the Annex I - non-Annex I distinction simply amplified their number, new incentives only arose in the context of Annex I - non-Annex I. This is because membership in Annex I was linked, from the beginning, to specific responsibilities and duties while non-membership was linked to privileges. For non-Annex I members, this created new stakes, the idea that concessions obtained at one point should not be weakened, and thus the incentive to fight for the perpetuation of the status quo (Gupta 2010). This fight takes place by the group as a whole since the demand for the change in status of individual non-Annex I countries is perceived as a threat for many others. They fear that any weakening of the once-defined dividing line between countries with and without commitments will pave the way for further pressure on developing countries, for requests with respect to more and more countries taking up commitments, and eventually, for a suppression of the principle of common but differentiated responsibilities.

Again, resistance against Argentina or Kazakhstan's proposed move from non-Annex I to Annex I could be quoted here as an example. Another example is the deadlock of negotiations

about mitigation commitments for China. No serious discussion has been possible in this area so far, despite the fact that, ever since 2007, China has the highest CO_2 emissions of any country in the world (Netherlands Environmental Assessment Agency 2008), and despite China's steadily rising level of per capita income that will soon reach the level of the poorer countries in Annex I (e.g., the Ukraine) (World Bank 2009). A further example from the recent negotiation dynamics is the fierce defense, by non-Annex I countries, of the continuation of the Kyoto Protocol that sets binding emission reduction commitments only for the developed countries, in contrast to the preference of these last ones for a complete new protocol with a larger set of countries taking on commitments (see e.g. Rajamani 2009 and Reuters 2010).

The result: Deepening of group divisions and institutional path dependence

The three arguments presented above support the hypothesis that, once new country groupings have been institutionalized within an IGO, negotiation behavior of member parties will in turn make such groups more and more pervasive in the discussions, hence deepening the differences and disagreements across groups. Eventually, the decision to form specific country groups may drive the discussions in a different direction than they would have taken otherwise and render broad-based international agreements even more difficult.

These results concur with North's (1994) theories on institutional change and path dependence. He argues that the "political and economic organizations that have come into existence in consequence of the institutional matrix typically have a stake in perpetuating the existing framework" (p. 7), due not only to the fact that actors rationalize the existing institutional framework and thus favor policies that keep it in place (the mental models of Mantzavinos et al., op.cit.), but also because of complementarities, economies of scope, network externalities, and the own interests of the existing organizations. As Pierson (2000, p. 255) points out, "Established institutions generate powerful inducements that reinforce their own stability and further development".

We have now shown the different channels through which the creation of institutionalized groups may affect the dynamics of the negotiation process. While socialization and group psychology and the negotiation structure arguments should be relevant for all groups, including regional or political coalitions, the new incentives argument is relevant only in the context of newly constructed groups whose membership comes along with specific benefits or duties. In the UNFCCC context, Annex I / non-Annex I is the key example. Only there, new stakes have been generated along with the creation of the group.

These additional stakes which generate a new unifying objective are important for the empirical identification of the group effect as opposed to the effect of country characteristics and related preferences. As long as group building only generates stronger cohesion among countries anyway linked by homogeneous preferences, the impact of the group itself will be difficult to identify. The definition of Annex I, however, has generated two groups that are not overly homogeneous, so that we find some overlap in the relevant country characteristics between the two groups (see e.g. Gupta 2000 for a detailed description of the differences and commonalities among developing countries in the climate regime). While membership of Annex I (and non-Annex I) was not randomly selected, but rather decided in terms of greenhouse gas emissions levels and levels of economic development, these two groups are themselves not homogeneous in many respects, including individual countries' greenhouse gas emissions, income, or vulnerability to climate change (see Table 2 for a comparison of country characteristics between Annex I and non-Annex I). This heterogeneity results in

varying interests and preferences regarding the climate regime within each group. Yet, based on the above theoretical arguments, we hypothesize that the preferential treatment of non-Annex I countries has generated a strong common objective for all these countries that opposes them to Annex I, and vice versa. This makes countries within each group overcome their differences in preferences in order to reach a stronger negotiation position in pursuit of the common goal of keeping (or eliminating) the preferential treatment. Using an appropriate econometric estimation approach should enable us to observe this distinct "constructed peer-group" effect suggested in our theoretical analysis.

5. Data and variables

In order to test whether Annex I membership plays a role – over and above country characteristics and related preferences – for countries' negotiation behavior, we need to define both, our understanding of "negotiation behavior", and the relevant country characteristics.

Negotiation behavior encompasses many different aspects of deliberation and strategic action in the negotiation process. To be able to handle the concept in our empirical analysis we narrow it down to one measurable dimension: the amount of statements by countries declaring support to other countries' previous statements. We assume that openly expressing support for a country's previous statements indicates closeness in terms of negotiation positions.

To generate the corresponding variable, we hand-code the negotiation reports published in the Earth Negotiations Bulletins (ENB) (International Institute for Sustainable Development, IISD 2007-2009) for the UNFCCC Conferences of the Parties (COPs) and intersessional negotiation meetings from December 2007 to December 2009. The ENBs provide very detailed daily reports of the negotiations. For all meetings that are open to observers, the reports contain summaries of statements made by the different delegations on behalf of their countries, and of reactions by others. Our variable on statements by country i supporting country's j positions is a dummy that is coded 1 whenever a country is reported to 'support' another country's statement, to 'associate itself' with this statement, to say something "with" another country, or to even 'speak on behalf' of another country.

As an example, a passage on the ENB reporting the negotiations on 5th June 2008 says "The EU, supported by JAPAN, proposed a pilot phase approach" (on carbon, capture and storage). To create the dependent variable that measures support for the EU, we code this unit of text as 1 in terms of support by Japan for the EU. We do the same for the negotiations between December 2007 and December 2009, so that we have a variable counting how many times Japan (and each of the 173 "countries"[5] participating in the negotiations) expressed support for the EU. This variable is then normalized in terms of how often the EU itself said something in the negotiations (by dividing by the total number of EU interventions). In this way, we avoid the bias that would be caused by the countries' different levels of participation in the multilateral negotiations. Otherwise, much higher levels of supportiveness for the EU's positions would be observed than for a country like Croatia (even if both have similar

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[5] As explained in Section 2, countries are complemented by coalitions in our list of observations. For simplicity, we will not always refer to both terms, and the term "countries" is meant to encompass both, actual countries and coalitions, whenever coalitions are not stated separately. In addition, we excluded all EU-27 countries from our dataset, as European Union countries are always represented by the EU speaker and almost never make individual statements in the negotiations.

positions), just because Croatia only participated actively four times in the open negotiations (against 540 interventions by the EU), so that other countries almost never had the opportunity to express support for Croatia's interventions.

We did not just generate a dependent variable that measures support towards the EU, but did it also for eight other distinct countries and coalitions that are among the most active in the negotiation process, and that represent a wide variety of interests and positions. This makes our coding more reliable than for countries that do not intervene much in plenary. These nine countries and coalitions are: the EU, the US and Russia, who are among the major actors in Annex I; Tuvalu, AOSIS and the African Group, who represent ambitious developing countries with low per capita emissions but high vulnerability to climate change; China and India, who are among the most active emerging economies in the UNFCCC; and Saudi Arabia, who as an oil-exporting economy represents special interests within the non-Annex I group. Russia, the US and, above all, Saudi Arabia are known as laggards, while the EU tries to portray itself as a climate frontrunner. Table A1 in Appendix A lists the 25 countries and coalitions that were most active in the climate negotiations in the period of analysis, highlighting the ones that were chosen for the empirical analysis.

We treat the information obtained as nine different dependent variables. We will thus perform separate regressions on how frequently each of these nine countries/coalitions has been supported by all the other countries participating in the negotiation meetings.

One of the limitations of the dataset is that it only covers the negotiation meetings that are open to external observers. Our analysis works only under the assumption that the behavior of parties in the open negotiations represents their behavior in all meetings. We believe that this assumption is plausible. The real decisions are arguably taken in closed or informal negotiation meetings, for which no information on what individual parties have said is available. However, the open meetings are generally used to either introduce the topics that will be discussed during the following week of negotiations, or summarize and debate the progress made during the past negotiation days. Thus, positions expressed in the closed negotiation meetings are not expected to deviate substantially from the ones observed in open meetings.

The conference days covered by our coding add up to around 90 days of negotiation from Bali 2007 to Copenhagen 2009. As explained in the EU example above, we aggregate the information on statements on all these conference days into a single observation per country. To do so, we sum up all statements by country i in support of country j's position. To make the variables more easily comparable across the nine countries supported, we then consider this sum as a percentage of total interventions of country j.

Formally, if we define z_{ij} as the dummy variable for a statement made by country i in support of country j's position, and n_j as the total number of statements by country j during the negotiation rounds between December 2007 and December 2009, we can express our dependent variables, i.e. the percentage of supportive statements, as:

$$y_{ij} = \frac{\sum_i z_{ij}}{n_j} \cdot 100 \ , \qquad\qquad i=1,\dots,173 \quad j=1,\dots,9 \qquad\qquad\qquad (1)$$

Table 1 provides some descriptive statistics for these dependent variables. It shows that the average share of statements supporting the selected countries ranges from 0.42% of all US statements to 0.95% of all Chinese statements. These small numbers are driven by the fact that the most common behavior for most countries is not to react at all on some other countries' statements. However, as can be seen in the last column, some individual countries have lent considerable support to some others. Most prominently, some countries have explicitly expressed support for 20% of the statements made by India or China respectively.

As we are interested in the effect of Annex I (or non-Annex I) membership on these supportive statements, our central independent variable is a dummy variable that takes the value of 1 if a country is listed in Annex I of the Convention.

Table 1: Statements declaring support for selected countries' positions (as % of their number of interventions)

Percentage of statements supporting:	Obs	Mean	Std. Dev.	Min	Max
USA	173	0.42	1.60	0	10.50
Tuvalu	173	0.44	1.09	0	7.14
EU	173	0.45	1.35	0	8.89
AOSIS	173	0.53	1.43	0	10.39
Russia	173	0.55	1.95	0	12.86
African Group	173	0.60	1.77	0	12.12
Saudi Arabia	173	0.63	1.71	0	15.42
India	173	0.70	2.05	0	20.00
China	173	0.95	2.62	0	20.68

Note: Countries / coalitions sorted by mean support.

As discussed above, the effect of this variable can be easily confounded with the effect of a number of country characteristics that simultaneously influence country preferences and Annex I or non-Annex I membership. The most prominent variables to be considered in this context are those that capture the intentions behind the construction of Annex I, namely a differentiated treatment depending on income and emissions: both UNFCCC and the Kyoto Protocol rely on the principle of "common but differentiated responsibilities and respective capabilities", which, broadly interpreted, entails that countries should act to prevent climate change according to their contribution for causing the problem (emissions) and to their capability to act (income) (Gupta 2010). Income is expressed in terms of GNI per capita, as this measure better incorporates the notion of equity and fairness entailed in the Convention's principles than gross income. For emissions we try two specifications, total CO_2 emissions and CO_2 emissions per capita, as there are different theoretical arguments regarding which of these two measures should be used (see e.g. Ott et al. 2004; Karousakis et al. 2008; and Bakker et al. 2009).

In addition, we consider a large number of variables that capture other potentially relevant country characteristics. Country size (in terms of population) and education (measured as net secondary enrollment) are used to capture the role of country power resources and bargaining skills of its delegation in influencing the negotiations (Snyder and Diesing 1977; Keohane and Nye 1989; Mastenbroek 1991; Steinberg 2002). Three other variables are included to more specifically model the delegation's negotiation skills: dummy variables indicating whether the country's national or official language is English or French, as language is frequently

considered a barrier for communication and understanding during the technically complex climate negotiations; the number of memberships to international agreements, as an indicator of the country's experience and activity in other international negotiation settings; and the number of oral interventions during the UNFCCC negotiations between December 2007 and December 2009, as a direct measure of activity within the climate regime.

Measures of political freedom and government ideology (left-right) are used to control for the possible effect of ideological influences on country positions and behavior in the negotiations (for example, left-wing Latin American administrations such as Bolivia and Venezuela tend to use the UNFCCC as a forum to disassociate themselves from what they consider as neoliberal imperialism, see Vihma 2010, pp. 7-8).

Two indicators of vulnerability to climate change (the composite Environmental Vulnerability Index[6] and the relevance of income from agriculture as % of GDP), as well as characteristics related to potential benefits from specific areas under discussion (such as the use of flexible market mechanisms, the accounting of forests as sinks, the use of renewable energy, or the amount of coal and oil exported by a country) are also included to control for issue-specific interests of parties.

Finally, we consider the role of bilateral political and/or economic relationships in other areas such as aid, trade, colonial past or voting in the UN General Assembly, as these variables might influence the relationships of parties in the climate regime and thus their behavior in terms of agreeing with other parties' positions.

If not otherwise indicated, all of these variables are measured for the year 2007, the start of the coding period for our dependent variables. For a more detailed description of all variables, their descriptive statistics and data sources, see Table A2 in Appendix A.

Since country coalitions are included as single observations just as individual countries, we generate values for the respective variables by using the averages of their member countries. Only in the case of population, which is included to represent a country's power, we use the sum rather than the average to reflect the overall size of the coalition.

The available information is generally rather complete. For a few variables, we replace some missing values by linear imputation using related indicators (such as gross secondary enrolment to impute for net secondary enrolment).

Table 2 compares the country characteristics of Annex I and non-Annex I countries on the basis of selected variables considered as potentially relevant controls. A full set of variables with detailed descriptions and sources is provided in Appendix A of this paper.

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[6] The Environmental Vulnerability Index (EVI), developed by the South Pacific Applied Geoscience Commission and the United Nations Environment Programme, combines 50 indicators to estimate countries' vulnerability of the environment to future shocks. It does not include indicators for the social or economic vulnerability.

Table 2: Comparing country characteristics for Annex I and non-Annex I countries

Variable	Annex I				Non-Annex I			
	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max
Country size, political and econ. development								
Population (millions)	114.60	196.43	0.03	680.10	97.29	578.76	0.002	6861.37
GDP (current US$ trillions)	1.68	3.48	0.004	14.00	0.09	0.33	0	3.4
GNI per capita (int. $ thousands, PPP)	33.57	23.84	6.83	107.55	7.81	11.36	0.28	78.85
Freedom House index (1=free,..., 7=unfree)	1.96	1.64	1	6.50	3.77	1.79	1	7.00
Net secondary enrolment (%)	88.17	8.71	69.50	103.11	57.83	22.88	2.6	104.54
Emissions								
CO_2 emissions (giga tonnes)	0.77	1.48	0.002	5.80	0.10	0.55	0.000004	6.5
CO_2 emissions (t/capita)	9.92	4.79	3.91	19.28	3.94	8.24	0.02	76.80
Vulnerability								
Value added from agriculture/GDP (%)	4.91	3.58	0	12.20	17.89	14.70	0	76.90
Climate change vulnerability, EVI index	3.60	0.72	2.73	5.50	3.33	0.77	1.67	5.13
(EVI index/GDP per capita)*10^3	0.16	0.13	0.04	0.57	1.61	2.90	0.04	29.72
Factors of interest for specific areas under discussion								
Use of flexible mechanisms	0.28	0.98	0	4.04	0.05	0.32	0	4.03
Proportion of land area covered by forests	0.30	0.17	0	0.68	0.29	0.24	0	0.95
Renewable energy production in % of energy consumption	0.25	0.33	0	1.03	0.02	0.12	0	1.18
Negotiation experience and activity								
Participation in int. agreements (no of memberships)	70.89	21.69	20	99.00	56.88	17.18	16	95.00
No of interventions in UNFCCC, Dec. 2007-Dec. 2009	133.82	149.99	0	540	23.32	54.40	0	382

As demonstrated by the comparison in Table 2, on average, Annex I and non-Annex I countries do indeed differ on many characteristics that may be relevant for their preferences and thus, for their statements in the negotiations. As expected, on average, Annex I countries are considerably more advanced economically and in terms of human capital (secondary enrollment). They also tend to have a more democratic regime as indicated by a considerably lower Freedom House index. Emission levels are higher both in absolute terms and per capita, and vulnerability to climate change is less prevalent, at least when considered relative to income or in terms of the relevance of the agricultural sector. Annex I countries also make

more frequent use of flexible mechanisms and of renewable energy. They tend to be members of a higher number of international agreements and also participate more actively in the debates within the UNFCCC conferences.

Despite all these differences between the mean values of the variables for Annex I and non-Annex I countries, the range of values for these variables (minimum and maximum values in the last two columns for each of the two groups) indicates that there is a wide overlap. Within Annex I, GNI per capita for instance, ranges from 6830$ (PPP) for Ukraine to 107549$ for Liechtenstein. Within non-Annex I, it ranges from 280$ for Liberia to 78851$ for Qatar. While the poorest non-Annex I countries and the richest Annex I countries do not find an appropriate match, a number of countries have incomes that are comparable between the two groups. The same is true for all other variables in Table 2. Given the large variety of countries in non-Annex I the range of country characteristics is frequently wider there than for Annex I. For different variables, this implies that both the smallest and the largest values are to be found in non-Annex I countries. As non-Annex I also includes all oil-exporting Arab countries, this is notably the case for per capita CO_2 emissions.

All in all, the comparison of country characteristics in Table 2 highlights the importance of an appropriate control for these factors in our empirical estimation strategy. Moreover, it indicates that the overlap between both groups should be strong enough to allow us to refine the estimation strategy by using a set of truly comparable countries, in order to test the robustness of our results.

6. The impact of Annex I membership: Estimation methods and results

In order to test the effect of Annex I membership we first run multivariate regressions controlling for a large number of context variables. We use a tobit model to take into account that the percentage of joint statements is censored at zero (a share smaller than zero cannot be observed)[7]. In a second step, we use propensity score matching to test the robustness of our results.

In principle, the advantage of regression analysis is that we get an impression of the effect of our control variables, along with our explanatory variable, so that we can get an idea of the plausibility of the model as a whole. Unfortunately, it turns out that correlations between the different right hand side variables are very high (see Appendix A, Table A3) so that we can make sense of the coefficients only when we avoid entering too many variables at once. Since all of the variables in Appendix A, Table A2 appear theoretically relevant as controls we revert to a mechanical forward selection procedure including all variables with p-values ≤ 0.2. Only our central dummy variable for Annex I membership is included per default, independently of this threshold.

Table 3 presents the results for these parsimonious regressions. Numbers represent the marginal effects estimated at the means of the sample, i.e.:

$$\frac{\partial E(y_{ij})}{\partial x_i} \quad , \qquad \text{with } y_{ij}=0 \text{ if } x_i\text{'}b + u_i \leq 0, \text{ and } y_{ij} = x_i\text{'}b + u_i \text{ otherwise.}$$

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[7] While theoretically the dependent variable is also censored at 100, all our observations are well below this threshold, so that we do not need to account for censoring from above.

Where x_i denotes the vector of right hand side variables for country i in regression j (considering the statements by country i in support of the positions of country j), and u_i is the corresponding error term.[8]

Table 3: Determinants of supportive statements (in %)

Support for:	EU	USA	Russia	AOSIS	African Group	Tuvalu	China	India	Saudi Arabia
Annex I	0.646 **	0.362	3.969 ***	-0.215 ***	-0.322 ***	-0.211 ***	-0.538 ***	-0.497 ***	-0.183
No of interventions	0.005 ***	0.001 **	0.001 *	0.006 ***	0.006 ***	0.004 ***	0.015 ***	0.009 ***	0.008 ***
Population	0.000 ***	0.000	0.000	0.000 ***	0.000 *	0.000 *	0.000 ***	0.000 *	
GNI per capita	0.003		-0.004 *						0.015 ***
Education	0.002		0.002	-0.005 **					
English language	0.145 **	0.061							
French language							-0.351 ***	-0.412 ***	-0.276 ***
Intl. agreements		0.001		0.006 **			0.014 ***	0.015 ***	0.009 **
CO2 emissions				0.231 ***	0.306 ***	0.088 *	1.157 ***	0.645 ***	0.498 ***
Freedom House	-0.028 *	-0.010		-0.080 ***		-0.092 ***			
Right government									
Left government							0.196		0.287 **
Agriculture									
Vulnerability	-0.123 ***		-0.030						
UNGA voting	0.417						-1.947		-3.353 ***
Colony									
Fossil exports							1.029		
Forests			-0.238 *		0.405	0.244			-0.488 *
Renewables	0.235		-0.214				-1.436 **	-0.697 *	-0.808 *
Flexible mechanisms				0.155		0.118	0.275 *	0.258 *	
Aid from the EU									
Aid from USA		-3.309 **							
Observations	155	154	155	155	155	155	155	155	145
Left censored	103	122	135	107	113	115	96	101	93
Log likelihood	-89	-63	-60	-115	-137	-103	-142	-146	-123
Pseudo R2	0.475	0.525	0.423	0.355	0.209	0.317	0.390	0.298	0.355

Notes: Tobit regressions, values are for marginal effects, with $y_{ij}=0$ if $x_i'b + u_i \leq 0$, and $y_{ij} = x_i'b+u_i$ otherwise. Significance at the 1%, 5% and 10% level is denoted by ***, ** and * respectively. Constant not reported. For variable descriptions, see Appendix A, Table A2.

Table 3 shows that even after controlling for a number of relevant control variables, membership to Annex I remains significant in seven out of nine regressions. The direction of the effect of membership to Annex I is in all cases as expected: coefficients are positive for the EU, USA and Russia, and negative for AOSIS, the African Group, Tuvalu, China, India and Saudi Arabia. This makes sense, since it implies that, after controlling for country characteristics that may make their preferences and positions similar, Annex I members more frequently support other Annex I members (EU, USA and Russia), but less frequently support those countries or coalitions that are not part of Annex I (all the others). The size of the

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[8] In Appendix B, Tables B2-B3 we also report marginal effects for strictly positive values of y_{ij}. Such marginal effects show the effect of our explanatory variables on the percentage of statements supporting country j by those countries i that at least expressed such support once. In these models the observed relationships are even stronger than in Table 3 above, both substantively and in terms of statistical significance.

coefficients is substantial in several cases. For example, the expected percentage of statements supporting Russia is about 4 percentage points larger for Annex I countries than for non-Annex I countries. This corresponds to about two standard deviations. The EU is supported 48% of a standard deviation more frequently by Annex I than by non-Annex I countries. In the case of AOSIS, the African Group, Tuvalu, China and India, the percentage of supportive statements is between 15 and 24% of a standard deviation smaller for Annex I than for non-Annex I countries. In the case of Saudi Arabia, both the size of the coefficient and the statistical significance indicate that there is no important effect of being (or not being) in Annex I on the percentage of supportive statements. This is in line with the observation that Saudi Arabia frequently blocks progress in the negotiations, and thus neither Annex I nor most non-Annex I countries usually support its views. Saudi Arabia fears that climate change mitigation efforts may affect its oil-based economy, and also represents the view that measures to compensate countries for the negative effects of climate change policies should be considered as measures to adapt to climate change, position that is not shared by most other developing countries.

The signs of our central control variables correspond to what we should expect: Countries who generally intervene more frequently in the negotiation process also do so more frequently in support of other countries' arguments, so that the coefficient for the number of interventions is positive (and statistically significant) in all regressions. Similarly, English speaking, larger countries and countries with a higher level of education and with more participation in international organizations (with better negotiation skills and more political power, and probably also represented by a higher number of negotiators) also tend to make more supportive statements (in the case of AOSIS, the negative sign of the education variable may be related to a high support by other poor and vulnerable countries, such as Least Developed Countries, which also display low levels of education).[9] French speaking countries, on the contrary, tend to make less supportive statements, which may be related to the fact that such countries have more difficulties in participating in the oral negotiations due to language barriers. The fact that countries with more CO_2 emissions – thus those that are more responsible for causing climate change – appear to show more support for the non-Annex I countries among our sample (AOSIS, Africa, Tuvalu, China, India), may be related to the fact that the largest emitter – China – belongs to non-Annex I, and thus frequently supports the positions of peers in this group.

In addition, we observe that more democratic countries (i.e. countries with a lower value on the Freedom House index) tend to support the EU's opinions more, but also those of AOSIS and Tuvalu. This may be related with public opinion in these countries expressing concern about the effects of climate change on small island states. More vulnerable countries lend less support to the EU and Russia, probably due to their – in the view of vulnerable countries – insufficient commitment towards deeper cuts in emissions. While we don't find significant effects of being exporters of coal and oil, countries with a high share of renewable energy (solar, tide, wave and wind) in national energy consumption tend to lend less support to China, India and Saudi Arabia, which is not surprising, since these are mainly European and other Annex I countries. It is also interesting that the variable measuring agreement with the US in the UN General Assembly, which is highly correlated with our Annex I dummy (see Table A3 in the Appendix), has a large negative effect on support for China and Saudi Arabia,

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[9] While the overall number of interventions is already controlled for, these variables may convey additional information on the potential to be active in the negotiations. They may, for instance, capture some non-linearities related to the overall number of interventions.

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but that at least for China, the effect of Annex I is still noticeable and significant. We do not find a clear pattern for the other control variables.

Thus, overall, the results of the regressions appear reasonable and increase our confidence in the model as a whole and in the appropriateness of the selected controls. A table with results for a more complete set of right hand side variables is provided for comparison in Appendix B (Table B1). Comparing the log likelihood and the pseudo R² shows that the inclusion of further variables does not substantially improve the overall regression fit, which is confirmed through Wald and likelihood ratio tests. Due to the strong multicollinearity, many variables become insignificant individually (for a correlation matrix, see Appendix A, Table A3). However, our most relevant variable indicating the effect of Annex I membership is still significant (with the expected sign) in six of the regressions.

Other robustness checks included using total GDP instead of total population, CO_2 emissions per capita instead of total emissions, and generating the population value for the country coalitions using the mean (as for other variables) rather than the sum. We also tried dropping the country coalitions from the dataset; taking logs from the dependent variable and from the variables No. of interventions, population and CO_2 emissions; and transforming the main control variables into Euclidean distance measures[10]. The results for our main explanatory variable, Annex I, remain robust to these different specifications, and are available on request.

The tobit regressions thus clearly indicate a role of Annex I versus non-Annex I membership that holds over and above the influence of relevant country characteristics. However, a problem with our regression analysis may be undue extrapolation that leads us to compare countries that are not really fully comparable. As discussed above and illustrated in Table 2 a number of countries within Annex I and non-Annex I do not find appropriate matches in the other group and regression results may be problematic if they are driven by these observations. In addition, especially in Table 3, the preoccupation with multicollinearity may have led us to omit relevant control variables thereby trading off the unbiased coefficients of the Annex I dummy against the overall interpretability of regression results. And finally, besides the assumptions of normality of residuals and homoscedasticity, which are critical for the tobit to be consistent, we also assumed a linear relationship between the percentage of supportive statements and the right hand side variables while our theoretical framework provides no indication that the relationship should really be linear.

To take these issues into account, we now proceed with a nonparametric matching analysis. Following the terminology of the treatment evaluation literature, Annex I membership is considered as a "treatment" to which the country (or country coalition) is subjected. The empirical strategy attempts to select other countries as controls that correspond in their characteristics to those countries that received the treatment. If all variables simultaneously influencing the treatment decision (i.e. the decision about which country is part of Annex I) and the share of joint statements are taken into account, the "selection on observables"

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[10] Our theory provides no indication of the functional form of the effect of country preferences on the amount of supportive statements made. So far, we have assumed a linear relationship. It could also be the case that a measure of distance between the preferences of the supporting country and the preferences of the supported country is more appropriate. For example, this would take into account the fact that countries with significantly less emissions than, say, India may have opinions as different to it as countries with significantly more emissions. Our measure of distance is calculated as the absolute value of the difference between country i's and country j's value for each of the original control variables (with the exception of the variables that were used to represent bargaining ability, for which the theoretical considerations outlined here does not apply).

(Heckman and Robb 1985) or "conditional independence" (Lechner 1999) assumption (CIA) is satisfied and the impact of Annex I membership can be identified.

Let Y_{ij}^0 denote the percentage of statements supporting country j, made by any given country i if it were not in Annex I, and let Y_{ij}^1 denote the percentage of supportive statements if the same country i were in Annex I. The difference $Y_{ij}^1 - Y_{ij}^0$ in these potential outcomes represents the impact of Annex I membership. Let X denote all the confounding variables which simultaneously influence these potential outcomes and the probability that country i is member of Annex I, including income, emissions and all other relevant characteristics mentioned above. As our data set is very rich and includes all variables we could think of as potentially important for either selection into Annex I or the share of joint statements, we are confident that the CIA is satisfied. By conditioning on X, the potential outcomes are then identified as:

$$E[Y_j^1 \,|X] = E(Y_j \,|D{=}1, X) \qquad \text{and} \qquad E[Y_j^0 \,|X] = E(Y_j \,|D{=}0, X),$$

where D denotes the observed status of Annex I membership of country i ($D{=}1$ for Annex I countries, $D{=}0$ for non-Annex I countries). With this relationship and by averaging with respect to the population distribution of X, the average treatment effect on the treated (ATT) is identified as:

$$\text{ATT} = \int [E(Y_j^1 \mid X) - E(Y_j^0 \mid X)] \cdot dF_{X|D=1} = \int [E(Y_j \mid D=1,X) - E(Y_j \mid D=0,X)] \cdot dF_{X|D=1} \,. \,(2)$$

This effect can be distinguished from the treatment effect on the untreated (ATU), i.e. the effect of Annex I membership on countries that are not members so far:

$$\text{ATU} = \int [E(Y_j^1 \mid X) - E(Y_j^0 \mid X)] \cdot dF_{X|D=0} = \int [E(Y_j \mid D=1,X) - E(Y_j \mid D=0,X)] \cdot dF_{X|D=0} \,.(3)$$

Since Annex I and non-Annex I countries differ in a number of characteristics, the effect of having been selected as an Annex I country (ATT) and the effect of being selected among current non-Annex I countries may be different so that it may be interesting to look at both.

As demonstrated by Rosenbaum and Rubin (1983), the estimation of the treatment effect can be facilitated if the information incorporated in the relevant control variables is first projected into a single variable, the propensity score p(x)=P(D=1|X=x). They showed that if matching on X is consistent, matching with respect to the propensity score p(x) is consistent as well. The multidimensional problem of matching on X is thereby reduced to the one-dimensional problem of matching on p(X). The propensity score is usually estimated by a probit regression, i.e., in our case by a probit regression of the binary treatment variable "Annex I membership" on X.

The control variables X are selected on the basis of the common relevance for selection into Annex I and for supportive statements. The discussion of the results of the tobit model already gave us some initial idea about variables relevant in the latter context. But to ensure that the

CIA is satisfied, we also look at the correlates of Annex I membership. Just as in the case of our tobit regressions, we do so by first identifying a large number of theoretically plausible variables which we then reduce to a smaller number running a mechanical statistical selection procedure, setting the cut-off at a p-value of 20%, and carrying out both, forward and backward selection eventually using all variables that have been included in either of the two. In addition, we include some variables that appear particularly pertinent from the joint statements tobit regressions.. Results of the final probit estimation are presented in Appendix B, Table B4.

For the estimation of the conditional expectation function we use nearest neighbor matching with the five nearest neighbors, i.e., we compare each observation for an Annex I country, with the five non-Annex I observations that have the most similar propensity score, and vice versa. We opt for nearest neighbor matching rather than kernel matching or radius matching simply because this option generated the most convincing matches whereby treated and untreated countries no longer significantly differ in any of the relevant characteristics. Table 4 presents the comparison of means among Annex I and non-Annex I members as in Table 2 and compares them to the means after the matching procedure[11].

Table 4: Comparison of means before and after matching

Variable	Sample	Mean		%bias	% reduct	t-test	
		Treated	Control		|bias|	t	p>|t|
GNI per capita	Unmatched	28.64	7.47	168.60		6.87	0.00
	Matched	18.60	17.03	12.50	92.60	0.22	0.83
GDP	Unmatched	1.79	0.09	67.00		5.64	0.00
	Matched	0.43	0.58	-5.60	91.60	-0.33	0.75
CO_2 emissions per capita	Unmatched	9.92	3.78	90.60		2.81	0.01
	Matched	8.55	8.11	6.40	92.90	0.11	0.92
CO_2 emissions	Unmatched	0.77	0.10	60.30		3.59	0.00
	Matched	0.37	0.70	-29.60	50.90	-0.44	0.67
Education	Unmatched	87.67	57.28	175.00		5.08	0.00
	Matched	82.58	79.79	16.10	90.80	0.55	0.59
English language	Unmatched	0.40	0.39	2.80		0.10	0.92
	Matched	0.14	0.09	11.50	-314.30	0.31	0.76
French language	Unmatched	0.20	0.23	-6.60		-0.24	0.81
	Matched	0.00	0.06	-13.70	-107.10	-0.60	0.56
Vulnerability	Unmatched	3.41	3.30	17.90		0.57	0.57
	Matched	3.36	3.29	10.50	41.00	0.18	0.86
Renewables	Unmatched	0.27	0.03	95.30		5.84	0.00
	Matched	0.08	0.09	-2.10	97.80	-0.04	0.97
Intl. agreements	Unmatched	76.75	58.01	120.10		4.25	0.00
	Matched	67.29	72.34	-32.40	73.00	-0.58	0.57

For variable descriptions, see Appendix A, Table A2.

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[11] Values between Table 2 and Table 4 may differ due to missing values in some of the variables used in the matching procedure.

This highly convincing matching result does, however, come at a cost. In fact, to compare only those countries that are comparable at all, we impose common support, i.e., we delete all observations from the dataset that are outside the range of characteristics for the comparison group. Table 5 shows that the actual number of countries that are eventually used in our analysis thereby shrinks considerably to about 39. Moreover, we had to exclude two potentially important variables: number of interventions and UNGA voting with the US. As soon as No. of interventions is included in the analysis, the matching procedure is unable to find convincing matches. This may be problematic as the number of interventions is clearly important as a determinant of supportive statements. At the same time, it was generally not significant in the probit regressions we estimated to find the most appropriate equation for the propensity score, as soon as the other variables were controlled for. In addition, there are no theoretical reasons why the present number of interventions could be important for selection into Annex I. The variable UNGA voting has several missing values among countries within Annex I, which results in an even smaller common support during the matching procedure. However, it was found to be significant only for supportive statements with Saudi Arabia, and we also don't have any theoretical reasons why voting behavior in the general assembly should influence selection into Annex I. We therefore believe that the CIA is satisfied even without inclusion of these variables as controls.

The results of our nonparametric matching estimator, for both ATT and ATU are also presented in Table 5. The matching analysis was carried out using the corresponding Stata module prepared by Leuven and Sianesi (2003).

Table 5: Estimation results of propensity score matching

% of supportive votes for:	ATT		ATU		off support		on support	
					untreated	treated	untreated	treated
EU	1.606		1.606		115	6	31	8
USA	1.273		0.446		114	7	32	7
Russia	5.388	***	5.503	***	119	7	27	7
AOSIS	-0.903		-0.406		113	8	32	7
African Group	-1.169	*	-0.554		113	8	32	7
Tuvalu	-0.975	**	-0.521	*	113	8	32	7
China	-1.429		-1.142		114	8	31	7
India	-2.885	**	-1.567	**	113	8	32	7
Saudi Arabia	-1.787	*	-1.170		113	8	32	7

Notes: Significance at the 1%, 5% and 10% level is denoted by ***, ** and * respectively.

Our results show that, at least for statements in support of some countries (Russia, African Group, Tuvalu, India and Saudi Arabia) either ATT or ATU (or both) are significant. In some other cases, the estimates are very close to significant at the 10% level (e.g., ATT for AOSIS, with a t-value of 1.46, and ATU for Saudi Arabia, with a t-value of 1.63). Even for a very restricted set of comparable countries, and when comparing each country only to those countries that are the most similar in all relevant country characteristics, it appears that the effect of Annex I membership cannot be neglected. All significant treatment effects are sizeable and show the expected sign. With 5.4 percentage points, ATT corresponds to 2.8 standard deviations of the support for Russia, with -2.9%, ATT corresponds to 1.4 standard deviations of support for India. In the other cases with significant treatment effects, these correspond to 50-100% of the standard deviations. Even in cases where the ATT was not found to be statistically significant, it is sizable: in the EU and USA, the ATT corresponds to

1.2 and 0.8 standard deviations of support, respectively. Thus, while the matching exercise – notably through the reduction in the number of observations – led to lower levels of significance, the estimated impacts are even higher than in the tobit regressions presented above. Even if, in our matching analysis, the impact is not discernible for statements supporting all nine different countries considered here, it is well discernible for some.

This implies that the split between Annex I and non-Annex I membership has indeed been responsible for some of the negotiation dynamics observed during the UNFCCC negotiations. For given country characteristics, Annex I membership played a role for positions supported in the negotiation process. Since, at given country characteristics, Annex I countries tend to support other Annex I countries, while non-Annex I countries tend to support them less, the mere existence of the split between Annex I and non-Annex I seems to have amplified the existing divide between developing and industrialized countries.

More generally, this implies that the creation of new country groups within an international negotiation process has institutional consequences that require some in-depth reflection. Short-term agreements found via differential treatment of specific country groups may come at a cost during later negotiation rounds. While our evidence for the UNFCCC does not suggest that the consequences of the Annex I / non-Annex I divide have been disastrous for the negotiation outcomes, it still suggests that they exist.

7. Conclusions

International organizations sometimes institutionalize country groupings by specifying differentiated rules and commitments that may, in turn, generate new negotiation dynamics. We propose a theoretical explanation for such dynamics through our "constructed peer group hypothesis" and advance three complementary theoretical arguments in its support. These are: (i) socialization and group psychology (closer relationships through exchange within groups), (ii) changes in the structure of the negotiation process (initial group discussions leading to more distanced positions debated at the global level), and (iii) new incentives (fighting for the preservation of new group-related privileges). We believe that both rationalist and constructivist explanations are possible for the way in which institutional design affects negotiation behavior.

While our empirical analysis does not allow us to distinguish between these three causal mechanisms, it allows us to assess the general idea that state interest and negotiation behavior within an IGO are influenced by the institutional design. To do so, we consider the example of the UNFCCC's split between Annex I and non-Annex I countries. Using a self-coded dataset of country statements during the climate change negotiation rounds between December 2007 and December 2009 we assess whether Annex I membership influences a country's stance towards other countries' arguments. The challenge of the econometric estimation is to disentangle the effect of group construction from the effect of various background characteristics that may drive countries' preferences and, simultaneously, the affiliation to Annex I. As a response, we do not only carry out multivariate tobit regression analysis, but also apply propensity score matching, i.e., a quasi-experimental method allowing us to avoid functional form assumptions and to restrict the sample to effectively comparable observations.

We find that, over and above the ex ante differences in country characteristics and preferences, the split between Annex I and non-Annex I countries has indeed influenced negotiation behavior and thereby amplified the existing divide between developing and

industrialized countries. The deliberate creation of new country groups in the institutional design of the UNFCCC has thus had unintended long-term consequences for the future development of the negotiations within the organization. This supports our constructed peer group hypothesis, and thereby the idea of path dependence for negotiation structures and dynamics. In the future, paying more careful attention to institutional design could strengthen the IGOs' contribution to achieving certain goals within the international community.

While we cannot disentangle between the three causal mechanisms postulated in our theoretical discussion, such distinction appears to be relevant for more detailed policy recommendations. If new incentives due to the privileges for non-Annex I countries are the driving force of our results, negotiators may be able to mitigate or even avoid the negotiation dynamics described above, by agreeing on automatic 'graduation rules' from one group to the other, or, in any case, on attaching privileges to the relevant country characteristics rather than to fixed country lists. As Rajamani (2006) discusses, differential treatment needs to work within a controlled framework, in which it does not obstruct the general purpose of the treaty, it responds to real differences across pre-determined country categories, and it ceases to exist when these differences cease to exist. If the socialization and group psychology or the negotiation structure arguments are more relevant, it may be more promising to channel the formal and informal negotiations in an open, transparent and inclusive way, and to build bridges through cross-cutting working groups like the Environmental Integrity Group. It may be worthwhile to follow these questions in further research. To reach more general conclusions, such research could also compare the case of the UNFCCC elaborated here, to more detailed case studies of other international organizations such as the WTO.

List of abbreviations

ALBA	Bolivarian Alliance of Latin American Countries
AOSIS	Alliance of Small Island States
ATT	Average treatment effect on the treated
ATU	Average treatment effect on the untreated
BASIC	Group of Brazil, China, India and South Africa
CACAM	Central Asia and the Caucasus, Albania and Moldova
CDM	Clean Development Mechanism
CIA	Conditional independence assumption
COP	Conference of the Parties to the UNFCCC
EIG	Environmental Integrity Group
ENB	Earth Negotiations Bulletin
EU	European Union
EVI	Environmental Vulnerability Index
GHGs	Greenhouse gases
IISD	International Institute for Sustainable Development
LDCs	Least Developed Countries
OECD	Organization for Economic Co-operation and Development
OPEC	Organization of the Petroleum Exporting Countries
SICA	Central American Integration System
SIDSs	Small Island Developing States
SOPAC	South Pacific Applied Geoscience Commission

UNFCCC	United Nations Framework Convention on Climate Change
UNGA	United Nations General Assembly
US	United States
WTO	World Trade Organization

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Appendix A: Variables and Sources

Table A1: Countries most active in the negotiations

Country	Number of interventions	Group
European Union	540	Annex I
G-77	382	Non-Annex I
Japan	320	Annex I
Australia	285	Annex I
China	266	Non-Annex I
United States of America	238	Annex I
AOSIS	231	Non-Annex I
Saudi Arabia	227	Non-Annex I
Brazil	225	Non-Annex I
Canada	216	Annex I
India	205	Non-Annex I
New Zealand	198	Annex I
Norway	160	Annex I
African Group	132	Non-Annex I
South Africa	130	Non-Annex I
Tuvalu	126	Non-Annex I
Switzerland	109	Annex I
LDCs	109	Non-Annex I
Colombia	89	Non-Annex I
Bolivia	79	Non-Annex I
Argentina	78	Non-Annex I
Bangladesh	72	Non-Annex I
Mexico	72	Non-Annex I
Russian Federation	70	Annex I
Venezuela	62	Non-Annex I

Note: Countries in bold letters are those that have been chosen for the empirical estimation as dependent variables.

Table A2: Variable descriptions

Variable	Description	Obs	Mean	Std. Dev.	Min	Max	Sources (year of data, if different from 2007)
Support EU	Statements supporting EU in % of all EU statements	173	0.45	1.35	0.00	8.89	IISD 2007-2009 (2007-2009)
Support USA	Statements supporting US in % of all US statements	173	0.42	1.60	0.00	10.50	IISD 2007-2009 (2007-2009)
Support Russia	Statements supporting Russia in % of all Russian statements	173	0.55	1.95	0.00	12.86	IISD 2007-2009 (2007-2009)
Support AOSIS	Statements supporting AOSIS in % of all AOSIS statements	173	0.53	1.43	0.00	10.39	IISD 2007-2009 (2007-2009)
Support Africa	Statements supporting African Group in % of all African Group statements	173	0.60	1.77	0.00	12.12	IISD 2007-2009 (2007-2009)
Support Tuvalu	Statements supporting Tuvalu in % of all Tuvalu statements	173	0.44	1.09	0.00	7.14	IISD 2007-2009 (2007-2009)
Support China	Statements supporting China in % of all Chinese statements	173	0.95	2.62	0.00	20.68	IISD 2007-2009 (2007-2009)
Support India	Statements supporting India in % of all Indian statements	173	0.70	2.05	0.00	20.00	IISD 2007-2009 (2007-2009)
Support Saudi Arabia	Statements supporting Saudi Arabia in % of all Saudi statements	173	0.63	1.71	0.00	15.42	IISD 2007-2009 (2007-2009)
Annex I	Annex I membership	173	0.10	0.30	0.00	1.00	UNFCCC 2010a (2010)
Population	Population (in million)	174	99.37	551.12	0.00	6861.37	World Bank 2009
GDP	GDP [current US$ trillion]	172	0.24	1.17	0.00	14.00	World Bank 2009
GNI per capita	GNI per capita, PPP [in thousands of international $] (imputed using GDP and population)	171	10.34	15.00	0.28	107.55	World Bank 2009
English language	English is national or official language	174	0.39	0.49	0.00	1.00	Lewis 2009 (2009)
French language	French is national or official language	174	0.22	0.41	0.00	1.00	Lewis 2009 (2009)
Education	Net secondary enrolment rates, in % (imputed using GDP and gross secondary enrolment)	172	60.80	23.64	2.60	104.54	World Bank 2009
Agriculture	Value added from agri-culture/GDP	173	16.53	14.51	0.00	76.90	World Bank 2009
Vulnerability	Climate change vulnerability, EVI index	171	3.36	0.77	1.67	5.50	SOPAC 2010
Vulnerability per GDP	[Climate change vulnerability(EVI index)/GDP per capita] *10^3	168	1.46	2.78	0.04	29.72	SOPAC 2010, World Bank 2009
CO_2 emissions	CO_2 emissions, in giga tons	168	0.16	0.70	0.00	6.50	UNSTATS 2010, UNFCCC 2010b
CO_2 emissions per capita	CO_2 emissions [t/capita]	168	4.49	8.14	0.02	76.80	UNSTATS 2010, UNFCCC 2010b, World Bank 2009
Renewables	Energy production from solar, tide, wave and wind in % of energy consumption	173	0.04	0.16	0.00	1.18	US Energy Information Administration 2010
Colony	Former European colony	174	0.60	0.49	0.00	1.00	Michaelowa et al. 2009
Fossil exports	Value of coal and oil exports / GDP	172	0.03	0.09	0.00	0.66	UN Comtrade 2010

Table A2: Variable descriptions (cont.)

Variable	Description	Obs	Mean	Std. Dev.	Min	Max	Sources (year of data, if different from 2007)
Trade with China	Value of exports to and imports from China / GDP	172	0.34	3.49	0.00	45.85	CoW Trade 2007, World Bank 2009
Trade with Saudi Arabia	Value of exports to and imports from Saudi Arabia / GDP	159	1.61	19.99	0.00	252.03	CoW Trade 2007, World Bank 2009
Trade with Tuvalu	Value of exports to and imports from Tuvalu / GDP	174	0.00	0.00	0.00	0.01	CoW Trade 2007, World Bank 2009
Trade with USA	Value of exports to and imports from the US / GDP	161	0.10	0.12	0.00	0.66	CoW Trade 2007, World Bank 2009
Aid from EU	Net bilateral aid flows from EU countries and EU council/GDP	174	0.04	0.07	-0.01	0.49	DAC 2007, World Bank 2009
Aid from USA	Net bilateral aid flows from US/GDP	174	0.01	0.04	0.00	0.39	DAC 2007, World Bank 2009
Freedom House	Freedom House index, 1=free,...,7=unfree	172	3.58	1.86	1.00	7.00	Freedom House 2008
Right government	Right-wing government	174	0.14	0.34	0.00	1.00	DPI 2010 (2009)
Left government	Left-wing government	174	0.26	0.43	0.00	1.00	DPI 2010 (2009)
UNGA voting	Vote share with the US in UN general assembly, 2005-2008	164	0.13	0.11	0.00	0.69	Dreher 2008 (average 2005-2008)
Intl. agreements	Participation in international agreements (no of memberships)	170	58.36	18.08	16.00	99.00	CoW IGO 2005 (2005)
Flexible mechanisms	Use of flexible mechanisms=[No of CDM+JI projects with national entities as buyers or sellers/GDP (in cur. US$)]*$10^9$	174	0.07	0.43	0.00	4.04	UNEP Risoe 2010 (2010)
Forests	Proportion of land area covered by forests	172	0.29	0.23	0.00	0.95	FAO 2005 (2005)
No of interventions	No of interventions in UNFCCC, Dec. 2009-Dec. 2010	174	34.22	76.25	0.00	540.00	IISD 2007-2009 (2007-2009)

Table A3: Correlation matrix

	Annex I	Population	GDP	GNI per capita	English language	French language	Education	Agriculture	Vulnerability	Vulnerability per GDP
Annex I	1.00									
Population	0.01	1.00								
GDP	0.33	0.20	1.00							
GNI per capita	0.41	-0.03	0.21	1.00						
English language	-0.02	0.16	-0.03	-0.04	1.00					
French language	-0.05	0.18	-0.13	-0.13	0.04	1.00				
Education	0.34	-0.03	0.21	0.58	-0.11	-0.34	1.00			
Agriculture	-0.23	0.00	-0.21	-0.52	0.11	0.20	-0.59	1.00		
Vulnerability	0.07	0.02	0.08	0.24	0.07	-0.14	0.36	-0.25	1.00	
Vulnerability/GDP	-0.14	-0.05	-0.13	-0.29	0.02	0.06	-0.26	0.35	-0.09	1.00
CO_2 emissions	0.11	0.21	0.85	0.04	-0.06	-0.11	0.09	-0.11	0.09	-0.07
CO_2 emissions/cap	0.15	-0.02	0.13	0.82	-0.09	-0.17	0.45	-0.41	0.19	-0.20
Renewables	0.40	0.07	0.22	0.21	0.11	-0.03	0.20	-0.16	0.09	-0.10
Colony	-0.41	-0.18	-0.22	-0.37	0.08	0.14	-0.37	0.10	-0.19	0.12
Fossil exports	-0.06	-0.02	0.02	0.29	-0.17	-0.12	0.07	-0.19	0.06	-0.11
Trade with China	-0.03	-0.01	-0.03	-0.05	-0.06	-0.04	-0.02	0.04	0.12	0.07
Trade w Saudi Arabia	-0.03	0.00	-0.03	-0.05	-0.06	-0.04	-0.02	0.03	0.13	0.07
Trade with Tuvalu	-0.03	0.05	-0.03	-0.04	0.15	0.01	0.07	-0.02	0.05	-0.03
Trade with USA	-0.14	0.00	-0.01	0.02	0.05	-0.03	0.07	-0.15	-0.03	-0.10
Aid from EU	-0.16	-0.01	-0.17	-0.30	0.13	0.17	-0.50	0.49	-0.23	0.45
Aid from USA	-0.10	0.01	-0.10	-0.19	0.13	-0.01	-0.26	0.29	-0.15	0.35
Freedom House	-0.27	0.00	-0.07	-0.18	-0.22	0.08	-0.25	0.24	-0.08	0.27
Right government	0.16	-0.02	0.07	0.14	0.12	-0.19	0.21	-0.21	0.12	-0.14
Left government	0.00	0.04	0.13	-0.13	-0.07	-0.10	0.02	-0.02	-0.08	0.07
UNGA voting	0.64	0.00	0.24	0.33	-0.06	-0.16	0.39	-0.27	0.16	-0.20
Intl. agreements	0.25	0.06	0.38	0.12	-0.18	0.11	0.02	-0.18	-0.21	-0.10
Flexible mechanisms	0.01	0.00	0.07	0.26	0.11	-0.06	0.19	-0.11	0.17	-0.06
Forests	-0.01	0.01	0.02	-0.11	0.14	0.04	0.02	0.04	-0.31	-0.01
No of interventions	0.37	0.51	0.47	0.24	0.18	0.10	0.20	-0.19	0.04	-0.14

Table A3: Correlation matrix (cont.)

	CO_2 emissions	CO_2 emissions/cap	Renewables	Colony	Fossil exports	Trade with China	Trade with Saudi Arabia	Trade with Tuvalu	Trade with USA	Aid from EU
CO_2 emissions	1.00									
CO_2 emissions/cap	0.07	1.00								
Renewables	0.10	0.05	1.00							
Colony	-0.17	-0.31	-0.10	1.00						
Fossil exports	0.02	0.42	-0.08	-0.17	1.00					
Trade with China	-0.01	-0.02	-0.02	-0.11	-0.03	1.00				
Trade w Saudi Arabia	-0.01	-0.01	-0.02	-0.11	-0.03	1.00	1.00			
Trade with Tuvalu	-0.02	-0.03	-0.03	0.02	-0.03	-0.01	-0.01	1.00		
Trade with USA	-0.01	0.01	0.02	0.22	0.08	-0.06	-0.07	-0.01	1.00	
Aid from EU	-0.11	-0.23	-0.13	0.09	-0.11	-0.04	-0.05	-0.03	-0.02	1.00
Aid from USA	-0.07	-0.14	-0.09	-0.07	0.02	-0.02	-0.03	-0.01	0.15	0.67
Freedom House	0.09	0.05	-0.27	-0.04	0.22	0.15	0.15	0.03	-0.15	0.10
Right government	-0.02	0.07	0.11	-0.01	0.04	-0.04	-0.03	-0.03	0.28	-0.16
Left government	0.14	-0.13	0.15	0.11	-0.10	0.13	0.13	-0.06	0.01	-0.04
UNGA voting	0.03	0.09	0.37	-0.43	-0.10	-0.06	-0.05	0.02	-0.05	-0.18
Intl. agreements	0.20	-0.03	0.30	0.25	0.01	-0.17	-0.17	-0.09	0.15	-0.17
Flexible mechanisms	0.01	0.07	0.00	-0.13	-0.04	0.00	-0.01	0.02	0.18	-0.06
Forests	-0.03	-0.18	0.02	0.18	-0.28	0.09	0.09	0.11	0.23	0.04
No of interventions	0.36	0.10	0.51	-0.27	0.04	-0.04	-0.03	0.02	-0.05	-0.14

Table A3: Correlation matrix (cont.)

	Aid from USA	Freedom House	Right government	Left government	UNGA voting	Intl. agreements	Flexible mechanisms	Forests	No of interventions
Aid from USA	1.00								
Freedom House	0.15	1.00							
Right government	-0.09	-0.37	1.00						
Left government	-0.10	-0.03	-0.26	1.00					
UNGA voting	-0.09	-0.52	0.28	0.00	1.00				
Intl. agreements	-0.16	-0.30	0.11	0.14	0.19	1.00			
Flexible mechanisms	-0.04	-0.01	-0.02	-0.03	0.02	-0.04	1.00		
Forests	-0.03	-0.17	0.05	0.14	0.02	0.02	-0.08	1.00	
No of interventions	-0.07	-0.22	0.03	0.14	0.33	0.35	0.02	0.02	1.00

Appendix B: Additional statistical results

Table B1: Determinants of supportive statements (in %), additional tobit regressions

Support for:	EU	USA	Russia	AOSIS	African Group	Tuvalu	China	India	Saudi Arabia
Annex I	0.583 **	0.246	1.635	-0.242 ***	-0.266 **	-0.184 ***	-0.507 ***	-0.442 ***	-0.146
No of interventions	0.005 ***	0.001	0.000	0.006 ***	0.005 ***	0.004 ***	0.014 ***	0.008 ***	0.008 ***
Population	0.000 ***	0.000	0.000	0.000 **	0.000	0.000 *	0.000 ***	0.000 *	0.000
GNI per capita	0.004	0.000	-0.001	0.003	-0.005	-0.006	0.003	-0.006	0.013 **
Education	0.003	0.000	0.001	-0.007 **	-0.005	0.000	0.004	0.004	0.000
English language	0.154 **	0.025	0.031	0.016	0.227	0.012	0.213	0.119	-0.013
French language	-0.013	-0.006	0.008	-0.137	-0.214 *	0.016	-0.290 **	-0.335 ***	-0.307 ***
Intl. agreements	0.003	0.000	0.000	0.008 **	0.013 **	0.001	0.015 **	0.016 ***	0.008 *
CO2 emissions	-0.003	-0.002	-0.002	0.169 **	0.193 *	0.053	1.125 ***	0.625 ***	0.398 ***
Freedom House	-0.028	-0.006	0.001	-0.060 *	-0.041	-0.069 **	-0.042	-0.047	-0.007
Right government	-0.052	0.002	0.002	0.038	-0.171	0.054	-0.075	-0.116	-0.077
Left government	0.015	0.010	0.005	0.098	0.142	0.092	0.189	0.144	0.249 *
Agriculture	0.005	0.001	0.000	0.001	-0.002	-0.003	0.001	-0.002	0.003
Vulnerability	-0.103 **	-0.015	-0.005	0.032	0.094	0.041	-0.078	-0.013	-0.018
UNGA voting	0.399	0.022	0.017	-0.155	-0.560	0.106	-2.494	-1.089	-3.019 **
Colony	0.010	-0.003	-0.062	-0.206	-0.433	-0.022	-0.045	-0.221	0.002
Fossil exports	-0.019	-0.044	-0.008	-1.002	0.392	-0.460	1.008	1.269 *	0.758
Forests	-0.037	-0.036	-0.047	0.134	0.472	0.246	-0.219	0.310	-0.450
Renewables	0.168	-0.039	-0.052	-0.232	-0.438	-0.136	-1.450 **	-0.649 *	-0.957 **
Flexible mechanisms	0.005	0.006	-0.077	0.095	-0.180	0.140	0.179	0.250	0.180
Aid from the EU	-0.501								
Trade with USA		0.066							
Aid from USA		-2.709 *							
Trade with Tuvalu						-33.99			
Trade with China							-0.015		
Trade Saudi Arabia									-1.663 *
Observations	155	154	155	155	155	155	155	155	145
Left censored	103	122	135	107	113	115	96	101	93
Log likelihood	-86	-56	-55	-111	-130	-101	-140	-141	-119
Pseudo R2	0.491	0.573	0.472	0.375	0.250	0.331	0.400	0.319	0.375

Notes: Tobit regressions, values are for marginal effects, with $y_{ij}=0$ if $x_i'b + u_i \leq 0$, and $y_{ij} = x_i'b+u_i$ otherwise. Significance at the 1%, 5% and 10% level is denoted by ***, ** and * respectively. Constant not reported. For variable descriptions, see Appendix A, Table A2.

Table B2: Determinants of supportive statements (in %), additional tobit regressions

Support for:	EU	USA	Russia	AOSIS	African Group	Tuvalu	China	India	Saudi Arabia
Annex I	0.478 **	0.378 **	3.337 ***	-0.229 **	-0.383 **	-0.378 ***	-0.655 ***	-0.704 ***	-0.167
No of interventions	0.005 ***	0.003 ***	0.004 ***	0.005 ***	0.006 ***	0.005 ***	0.012 ***	0.008 ***	0.006 ***
Population	0.000 ***	0.000 **	0.000 *	0.000 ***	0.000 *	0.000 *	0.000 ***	0.000 *	
GNI per capita	0.003		-0.018 ***						0.012 ***
Education	0.002		0.007 **	-0.005 **					
English language	0.125 **	0.121 **							
French language							-0.302 **	-0.404 ***	-0.250 **
Intl. agreements		0.003 **		0.005 **			0.011 ***	0.013 ***	0.007 **
CO2 emissions				0.200 ***	0.290 ***	0.093 *	0.917 ***	0.554 ***	0.411 ***
Freedom House	-0.025	-0.024 *		-0.069 ***		-0.097 ***			
Right government									
Left government							0.155		0.238 **
Agriculture									
Vulnerability	-0.111 ***		-0.120						
UNGA voting	0.377						-1.543		-2.773 ***
Colony									
Fossil exports							0.815		
Forests			-0.949 ***		0.384	0.257			-0.404 *
Renewables	0.212		-0.850 **				-1.138 **	-0.599 *	-0.668 **
Flexible mechanisms				0.134		0.125	0.218 *	0.221 *	
Aid from the EU									
Aid from USA		-7.854 *							
Observations	155	154	155	155	155	155	155	155	145
Left censored	103	122	135	107	113	115	96	101	93
Log likelihood	-89	-63	-60	-115	-137	-103	-142	-146	-123
Pseudo R2	0.475	0.525	0.423	0.355	0.209	0.317	0.390	0.298	0.355

Notes: Tobit regressions, values are for marginal effects, with $y_{ij}>0$. Results after stepwise selection of the explanatory variables. Significance at the 1%, 5% and 10% level is denoted by ***, ** and * respectively. Constant not reported. For variable descriptions, see Appendix A, Table A2.

Table B3: Determinants of supportive statements (in %), additional tobit regressions

Support for:	EU	USA	Russia	AOSIS	African Group	Tuvalu	China	India	Saudi Arabia
Annex I	0.435 **	0.313	1.607 *	-0.284 **	-0.345	-0.307 **	-0.659 ***	-0.634 ***	-0.132
No of interventions	0.004 ***	0.003 ***	0.002 ***	0.005 ***	0.005 ***	0.005 ***	0.011 ***	0.007 ***	0.007 ***
Population	0.000 ***	0.000 **	0.000 **	0.000 ***	0.000	0.000 *	0.000 ***	0.000 *	0.000
GNI per capita	0.004	0.002	-0.017 ***	0.003	-0.005	-0.006	0.002	-0.005	0.011 **
Education	0.003 *	0.001	0.008 **	-0.006 **	-0.005	0.000	0.003	0.004	0.000
English language	0.137 **	0.087 *	0.235 *	0.014	0.222	0.012	0.170	0.103	-0.011
French language	-0.012	-0.028	0.078	-0.128	-0.239	0.016	-0.253 **	-0.331 **	-0.285 ***
Intl. agreements	0.002	0.002	0.007	0.007 **	0.013 **	0.001	0.012 **	0.014 ***	0.007 *
CO2 emissions	-0.003	-0.008	-0.027	0.147 **	0.195 *	0.057	0.912 ***	0.547 ***	0.332 ***
Freedom House	-0.026	-0.025	0.012	-0.052 *	-0.041	-0.074 **	-0.034	-0.042	-0.006
Right government	-0.049	0.009	0.027	0.033	-0.174	0.058	-0.060	-0.102	-0.064
Left government	0.014	0.045	0.066	0.085	0.144	0.098	0.153	0.126	0.207 *
Agriculture	0.004	0.006 ***	-0.002	0.001	-0.002	-0.004	0.000	-0.001	0.003
Vulnerability	-0.097 **	-0.065 *	-0.069	0.028	0.095	0.044	-0.063	-0.011	-0.015
UNGA voting	0.374	0.098	0.239	-0.135	-0.567	0.113	-2.022	-0.955	-2.515 **
Colony	0.010	-0.012	-0.333 *	-0.173	-0.405 *	-0.023	-0.036	-0.188	0.002
Fossil exports	-0.018	-0.194	-0.109	-0.872	0.397	-0.491	0.817	1.112 *	0.632
Forests	-0.035	-0.158	-0.639 **	0.116	0.478	0.263	-0.178	0.272	-0.375
Renewables	0.157	-0.171	-0.713 **	-0.202	-0.443	-0.145	-1.175 **	-0.569 *	-0.797 **
Flexible mechanisms	0.005	0.026	-1.059	0.083	-0.182	0.149	0.145	0.219	0.150
Aid from the EU	-0.470								
Trade with USA		0.291							
Aid from USA		-11.97 ***							
Trade with Tuvalu						-36.26			
Trade with China							-0.012		
Trade Saudi Arabia									-1.385 *
Observations	155	154	155	155	155	155	155	155	145
Left censored	103	122	135	107	113	115	96	101	93
Log likelihood	-86	-56	-55	-111	-130	-101	-140	-141	-119
Pseudo R2	0.491	0.573	0.472	0.375	0.250	0.331	0.400	0.319	0.375

Notes: Tobit regressions, values are for marginal effects, with $y_{ij}>0$. Results including all explanatory variables in the regressions. Significance at the 1%, 5% and 10% level is denoted by ***, ** and * respectively. Constant not reported. For variable descriptions, see Appendix A, Table A2.

Table B4: Estimating the propensity score: probit regression for Annex I membership

	Coefficient	Marginal effect	P-value
GNI per capita	0.040	0.000	0.188
GDP	1.168	0.008	0.207
CO_2 emissions per capita	-0.051	0.000	0.210
CO_2 emissions	-0.330	-0.002	0.555
Education	0.069	0.000	0.041
English language	-0.932	-0.006	0.223
French language	0.413	0.004	0.577
Vulnerability	-0.399	-0.003	0.329
Renewables	1.380	0.009	0.145
Intl. agreements	0.007	0.000	0.769
Constant	-6.297		0.058
Observations	161		
Log likelihood	-19.971		
Pseudo R²	0.599		

Note: For variable descriptions, see Appendix A, Table A2.