Multilateralism, Bilateralism and Regime Design

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Abstract

Different international regimes are built from legal instruments that vary in terms of whether they are multilateral, bilateral or a combination thereof. We investigate the reasons for such variation. The choice between multilateralism and bilateralism is a function of the trade-off between each instrument's relative flaw. Multilateralism is wasteful in incentives, as the same agreement is offered to all states regardless of their compliance costs. Bilateralism mitigates this problem by allowing for more tailored agreements but in the process multiplies transaction costs by requiring many of them. We use a formal model to generate propositions on the design of "lateralism" and the related issue of membership size, and offer illustrations in the context of four regimes: foreign direct investment, human rights, climate change, and international trade.

International regimes are built on instruments that vary in terms of whether they are multilateral, bilateral or a combination thereof. For example, the current trade regime has a strong multilateral component as its core, centered on the World Trade Organization (WTO), while the foreign direct investment (FDI) regime is primarily constituted of bilateral agreements. Notably, many regimes combine two or more instruments: the nuclear nonproliferation regime combines a multilateral treaty with bilateral security guarantees proffered mostly by the United States.

The question of "lateralism" relates to whether countries should be treated equally under international law or differently. Multilateralism, according to Ruggie, implements "generalized principles of conduct" whereas bilateralism "differentiates relations case-by-case based principally on a priori particularistic grounds or situational exigencies" (1992: 571). How this issue is addressed in practice is usually seen as a result of prevailing norms or of bargaining power, with some states advocating more uniform rights and obligations and others calling for differential treatment.

In an attempt to understand why, we point to two key factors: transaction costs and a new concept, the member surplus. The member surplus captures the idea that the multilateral strategy can be wasteful in incentives, since incentives are calculated to elicit the participation of the state that is burdened with the highest cost of compliance, thereby creating rents for the other members. The bilateral strategy, in contrast, allows the customization of rights and obligations to each individual member state. But because the bilateral strategy is more wasteful in transaction costs than the multilateral strategy, states face a trade-off.

This allows us to make three central claims: (1) multilateralism is most attractive with high transaction costs and a low member surplus, (2) bilateralism is most attractive when transaction costs are low and the member surplus is high, and (3) we encounter combinations of multilateralism and bilateralism when both transaction costs and the member surplus are high. Such combinations come in two forms, regimes that contain a mix of multilateral and bilateral agreements and regimes that rely on multilateral agreements that are customized to the needs of different members. A fourth claim is that regimes with both high transaction costs and a high member surplus exhibit the highest rate of exclusion because of the cost of attracting members. We develop a formal model to capture the logic behind these institutional outcomes.

The next section situates our topic in the theoretical literature. We then introduce the notions of transaction costs and member surplus and present the model and a set of predictions that flow

from it. In an empirical section, we demonstrate the plausibility of our claims in the context of four prominent regimes: the foreign direct investment regime, the human rights regime, the climate change regime, and the trade regime.

1 Lateralisms in the Literature

We adopt the standard definition of international regimes, which grounds them in a set of norms or goals that guide state behavior in a given issue area (Krasner 1983; Keohane 1984). Most regimes have at their origins a market imperfection, making a mutually efficient outcome unreachable through standard competitive behavior. Our approach also complements work on regimes that views them as created by a hegemonic state (Krasner 1976; Keohane 1984), a small group of great powers (Snidal 1985), the market-oriented Anglo-Saxon subset (Cowhey and Klimenko 2000), or the North at large (Sell 2007). We assume that most regimes are organized by a small group of founders who try to enlist the cooperation of a larger group of regular members. The founders take the lead on account of their larger resources, greater interest in the regime, or principled concern over the issue.

Most treatments of international regimes simply assume that they rest on multilateral agreements. The impetus behind this approach is at least partly normative. International law scholars have a general legal obligation to approach their international relations multilaterally (Dupuy 2000). Indeed, multilateral agreements seem to carry special symbolic power and legitimacy, partly because they promote uniformity and equal treatment of states (Blum 2008). Ruggie (1992) and Finnemore (2003) point to a norm of multilateralism that has predominated since World War II, as reflected in the proliferation of multilateral institutions and a tendency of states to work through them. Others see much less multilateralism in the system and explain the choice of lateralism in power-based terms. For example, Realists point to the end of the Cold War and the unrivaled power of the United States to explain its shift toward bilateralism and unilateralism in recent years.[1] Gruber (2000) and Guzman (1998) describe how powerful states use bilateral bargaining to gain leverage over weaker counterparts.

We look at variation in multilateralism versus bilateralism and address the question from a strategic and efficiency perspective. This is consistent with the approach of Yarbrough and Yarbrough (1992), who consider the different forms of lateralism during different historical periods

in the context of trade cooperation. Like Kahler (2004), we also take seriously the possibility that these outcomes are not mutually exclusive but can coexist at a given point in time and even within a single regime. We build on the insight of Conybeare (1980) and Oye (1992) that decentralized bargaining offers a viable substitute for multilateral agreements in some situations.

Some authors do try to account for the choice of lateralism at a given time. Distinguishing between coordination and PD-like problems, Ruggie (1992) suggests that the former generate transaction costs that can easily be solved through multilateralism, whereas the latter require a normative change in conjunction with multilateralism. Studying the double taxation regime, Rixen (2010) endorses Ruggie's proposition that a multilateral organization minimizes transaction costs but argues that distributive issues are better accommodated through bilateral bargaining, provided that such bargaining produces no externalities on third parties, in which case multilateralism is more appropriate (see also Rixen and Rohlfing 2007).

Another general cause for decentralized bargaining is preference heterogeneity. The idea comes from the literature on fiscal federalism, according to which decentralized provision of a public good is more efficient than uniform provision through the central government whenever individuals have preferences that are heterogenous and inter-jurisdictional policy externalities or scale economies are small (Oates 1999). Central to the argument is the assumption that citizens' preferences are better known by local than central agencies.[2] However, Harstad (2007) makes information revelation endogenous and obtains the opposite result: incomplete information makes uniformity preferable because it deters individuals from strategically delaying the revelation of their preferences. By making incomplete information irrelevant, uniformity minimizes negotiating costs.

Our paper also touches on the problem of membership – which states to include, which to exclude–and the apparent trade-off between the depth and breadth of cooperation (Downs, Rocke, and Barsoom 1998). The lack of credibility of the threat of punishment that would have all countries withdraw cooperation in response to noncompliance is responsible for limiting participation to states with an immediate interest in supplying the public good–Schelling's (1978) "k group." As Barrett (2003: 205) argues, the punishment threat is only credible if the net gain of cooperation is small, for if it is large, the threat and the tolerance for self-inflicted pain must also be large. The preference for a broad yet shallow agreement may reflect concerns for fairness or fast-increasing marginal costs (Barrett 2003: 304).

The breadth-versus-depth dilemma disappears if the regime founder is able and willing to turn the public good into a club good and discriminate against non-participants. Each member's fear of being discriminated against elicits broad participation. A good example is non-MFN-based bilateral trade agreements. The discriminatory feature built into a club good has some economists promote bilateralism as a surer way to reach global free trade than MFN-based multilateralism when countries have asymmetric endowments (Aghion, Antràs, and Helpman 2007; Saggi and Yildiz 2010). Bilateralism is an effective way to bring small countries into the fold, for they would free ride under a multilateral bargain. Such is in part why some legal scholars viewed the use of bilateralism in the late 1980s as a constructive complement to multilateral trade negotiations (Hudec 1990; Sykes 1992). Endogenizing the club or public format of the good, Stone, Slantchev, and London (2008) argue that a hegemon on the decline reaches a tipping point before which it prefers to offer a club good (a discriminatory regime), but past which it is better off with a public good (a non-discriminatory regime).

The breadth-versus-depth dilemma also evaporates if one suspends the requirement of uniformity of obligations among members (Gilligan 2004). Allowing countries to choose the level of their contribution makes for a regime that is both deep (members with an interest in the provision of the good contribute to that effect) and broad (members willing to contribute less or free ride altogether may still join in). In other words, the customization of obligations–a hybrid of the multilateral and bilateral strategies–elicits greater participation.

This quick review of existing research on lateralism and membership reveals a vibrant diversity from which we retain and further develop the two following ideas: first, multilateralism is a solution to high transaction costs, including the costs of negotiating and enforcing agreements; second, bilateralism may be a solution to several flaws incurred under multilateralism: free riding or exclusion in the case of a public good and inefficient uniformity in the face of preference heterogeneity, asymmetric endowments, distributive concerns, or high marginal costs. The present theory and model tackle these ideas in a way that strives to be intuitive and mathematically tractable.

2 Transaction Costs and the Member Surplus

One of the key concepts that generate our results, transaction costs, is commonly used in the regime literature and requires little introduction. The second concept, member surplus, is new and in need

of lengthier introduction. The trade-off that these two factors produce and the various solutions that are conceivable provide the basis for our theoretical claims.

Our definition of transaction costs is borrowed from Williamson's (1985: 20) work. Transaction costs are "the costs of negotiating, drafting, and safeguarding an agreement," with safeguarding broadly defined to include what is necessary to make the agreement enforceable–the setup and running costs of monitoring, dispute settlement, renegotiation in the face of uncertainty, and, in Williamson's (1985: 21) terms, "the bonding costs of effecting secure commitments." While some safeguarding costs are only incurred after an agreement is reached, the prospect of facing such problems complicates and prolongs matters during the negotiation phase as well (Fearon 1998). Transaction costs have scale economies in the sense that they make the signing of n dyadic treaties costlier than the signing of one treaty with n participants.

The multilateral strategy has the advantage of saving on transaction costs (Keohane 1984; Ruggie 1992; Rixen 2010). This is true because only one set of negotiations is required, and because most multilateral treaties incorporate forums that facilitate further decision-making and provide economies of scale in monitoring and dispute resolution. The multilateral strategy saves on transaction costs also because coordinated negotiations allow more bargaining possibilities to be on the table at once, promoting issue-linkage and chances that every offer finds a corresponding match (Martin 1992). The bilateral strategy, in contrast, multiplies transaction costs, since a new contract has to be negotiated, drafted, and safeguarded for each participant, while some participants' bids may be left with no attractive counterpart. Last, by treating members identically, the multilateral strategy helps avoid the posturing and costly delays that beset bilateral negotiations in the presence of information asymmetry (Harstad 2007).

However, the multilateral strategy will be expensive for the founder in another sense–this is where the member surplus comes in. Multilateralism in its pure form offers only one deal and this deal is the same for everyone (there are exceptions to this rule, which we address later). As a result, participants are offered an incentive that is calculated to elicit the participation of the state that is burdened with the highest cost of compliance. The problem is similar to the one that occurs in competitive markets, where the law of one price for a particular good confers a surplus on all producers who would have been willing to sell for less. This surplus is known in economics as the "producer surplus."[3] In direct analogy, we call it the "member surplus." Unlike the multilateral

approach, the bilateral approach is immune to the member surplus because it gives to each state the incentive it needs to participate and no more. Bilateralism corresponds in market economics to an extreme case of market fragmentation, where a monopolist offers her reservation value to each consumer.

To see this, imagine a situation with no transaction costs. Then the founder would always prefer the bilateral approach to the multilateral approach. This is easily seen in Figure 1, featuring on the horizontal axis an ordering of all members according to their compliance cost z_i and on the vertical axis the cost to the founder $t(z_i)$. The slope of the curve is positive, since the higher a member's compliance cost, the higher its participation price. Assume that the founder wants to include country N and all those to its left. By construction, the N^{th} country is the most expensive member to be included in the regime. The cost of wooing countries with compliance cost less than or equal to N by means of a multilateral contract is equal to the rectangle, because the multilateral approach forces the founder to pay the transfer it pays to the N^{th} member to all other members. In contrast, by means of bilateral contracts alone, this same cost would be no more than the triangle situated below the curve, only half the size of the rectangle. The triangle above the curve is the member surplus that results from the multilateral approach.

[Figure 1]

Assume for the sake of simplicity that any single deal, bilateral or multilateral, costs constant T to process, with T positive. There are now two possibilities. One possibility is that the N bilateral contracts could be costlier than one multilateral contract for everyone. This case is represented in Figure 2A, where the cost of the multilateral contract is the same as before plus the transaction cost incurred once $(z_N t(z_N) + T)$, while the cost of the bilateral contracts is the former triangle augmented with the transaction cost incurred N times $\left(\sum_{i=1}^{N} (t(z_i) + T)\right)$. The other possibility is that the bilateral approach is the less costly of the two. As N increases, it is easy to verify that so does the relative size of the f$bt(z_N)$ triangle relative to the fde triangle. In Figure 2B, the same graph is drawn so that the founder is indifferent between offering members a multilateral or N bilateral incentives.

[Figure 2]

We have assumed so far that the choice between multilateralism and bilateralism was of the either-or type. We now investigate the possibility of combining instruments, that is, offering both multilateralism and bilateralism to various members. Two options need be considered depending on whether it is the low- or high-cost members who are given a bilateral deal.

In a first case, it is the high cost members who are treated differently. The founder offers multilateralism to all members while reserving the right with a subset of them to top off the multilateral deal with bilateral ones. Consider Figure 3A: the N members are offered the multilateral deal, while each of the $N - x^*$ members is offered a bilateral incentive in addition. In a second case, it is the low-cost members who receive the customized deal. This case is represented in Figure 3B, where, unlike the prior case of Figure 3A, there is no common multilateral deal shared by all members.

[Figure 3]

The two options raise the question of their respective occurrence. To that effect, it is important to note that, as the two panels of Figure 3 suggest, the two regimes have the same cost for the founder–the aggregate shadowed areas add up to the same on both sides. This indifference is not inevitable, but reflects the assumption we made in drawing all the figures so far with a compliance function $t(z_i)$ that is linear. The linearity assumption makes the relative intensity of the member surplus constant across the membership range. Since the transaction cost is also constant across the range, the trade-off between member surplus and transaction cost is also constant.

The linearity assumption, so far made for reasons of exposition, is not realistic. It is unlikely that compliance costs would be distributed homogeneously. Convexity is a more common distribution; sketched in Figure 4A, a majority of countries more or less share a moderate cost of compliance, except for a minority that face very high costs. Convexity divides the range into two sub-ranges. The left side features a rather flat distribution of compliance costs for which the member surplus is less likely to be of concern than the transaction costs–multilateralism is the more appropriate instrument in that region. The right side features a steep distribution, with a serious potential cost in member surplus, a problem to which bilateralism is the more efficient response.

[Figure 4]

Less common yet possible is the reverse, concave case represented in Figure 4B, where most countries have high compliance costs, except for a few blessed with very low ones. The optimal distribution is the reverse of the convex case: bilateral instruments are used to address the acuity of the member surplus with low compliance cost members, whereas the multilateral instrument is targeted to the flatter area of the curve where transaction costs are more of a problem than the member surplus. We show below that if each member's utility function displays diminishing returns, increasing costs, or both, they yield on aggregate a founder's cost curve of the convex type. Another strike against the concave case is that the multilateral instrument does not guarantee a baseline treatment to all members, a feature at odds with most multilateral regimes.[4]

There is one last assumption we have made but which can now be discarded, the idea that the founder seeks to include all potential members in the regime. In reality, a third possibility is open to the founder: exclusion. The founder need not provide an incentive to all countries but may exclude as many as it wants. Exclusion offers the advantage of reducing the founder's cost of building the regime and, given a convex distribution, would typically affect states with the highest marginal costs of compliance–precisely those which would be candidates for bilateral deals.

The final template, of a regime combining multilateralism, bilateralism and exclusion, is shown in Figure 5. On the left-hand side of the graph, in the $[z_1, z_x]$ segment, the incentive that has to be given to a member is sufficiently low that it makes sense to seek compliance by offering a single generic contract, minimizing transaction costs, yet providing a surplus to all the members to the left of x. In the middle part of the graph, in the $[z_{x+1}, z_y]$ interval, the incentive is too high in relation to the fixed transaction cost for overlooking the surplus. Rather than offering a more generous multilateral contract, the founder merely supplements the existing multilateral contract with bilateral ones, an approach that economizes on the member surplus (since the bilateral contracts are customized to each member of the interval) yet is wasteful in transaction costs. Finally, on the right-hand side of the graph, in the $[z_{y+1}, z_N]$ interval, the incentive is so high that the founder is better off excluding potential members. To put it succinctly, the regime should obey the following generic condition $0 \leq x \leq y \leq N$, with x the member that makes the founder indifferent between offering and not offering bilateral incentives in addition to multilateral incentives, and y the member that makes the founder indifferent between including and excluding that member.

[Figure 5]

This discussion has several implications for the depth-versus-breadth trade-off. First, the pure multilateral component of a regime, by which we mean the set of uniform obligations across members, is likely to be shallow. Depth, which is only relevant in relation to members with high compliance costs, is more efficiently achieved through the adjunction of bilateral instruments than by asking for a general increase in effort level. Second, depth calls for exclusion and thus narrowness, because the logic that leads to the adjunction of bilateral instruments is the same as that behind exclusion: both features are called for to alleviate the costs of a large member surplus. Breadth is only possible if the slope of the curve in Figure 5 is close to being flat.

The notion of member surplus is a comprehensive and potentially powerful tool to explain lateralism and exclusion. The only problem is that it is a synthetic concept, the product of a cocktail of parameters, which one should ascertain with greater analytical precision. More specifically, we need to determine the functional form of the slope of the curve drawn in Figure 5. To that effect, we build a founder-member model.

3 A Founder-Member Model of Instrument Choice

We posit a simple bargaining structure inspired from Aghion, Antràs, and Helpman (2007), featuring a leading country–the founder–deciding whether to negotiate with the rest of the world–the potential members. While in Aghion et al. the leader chooses between negotiating sequentially or simultaneously with other countries, here the founder chooses between negotiating bilaterally or multilaterally.[5] The founder has agenda-setting power, making take-it-or-leave-it offers. The founder has the ability to compensate other countries for the abandoning of suboptimal agreements, while being a residual claimant on the surplus from the global provision of the public good.

The members are indexed $i \in [1, N]$ with $N > 1$ a positive integer. Each member i maximizes her individual utility $u_i(s_i, s_j) = f(s_i, s_j) - c(s_i)$, with $s_i \geq 0$ a continuous choice variable. Function f, which is assumed to be strictly concave, makes each member i's utility a function of both her choice s_i and the choice of all other members s_j, with j standing for all members other than i. For the sake of calculating point predictions, we opt for the following specific functional forms, combining a decreasing marginal return with a constant cost: $f(s_i, s_j) = a_i\sqrt{s_i} - \rho\sum_{j\neq i} s_j$ and $c(s_i) = cs_i$, with c the marginal cost. Variable s_i may be thought of as an investment in a polluting technology

or any activity producing an externality, for instance fishing in the high seas, setting protective tariffs, or curbing human rights. In each case, an investment s_i generates a negative externality ρs_i inflicted upon every other member. Parameter ρ is the externality index; it is greater than or equal to zero, with a value of zero indicating no externalities and a value greater than zero indicating their presence. Variable a_i scales member i's marginal gain for engaging in the activity based on the activity. (Note that the model would equally work and yield the same comparative statics if we had opted for a different mix of marginals, i.e., constant gains and marginally increasing costs, or a different sign on the externality.)

In the absence of a founder, each member maximizes $u_i(s_i, s_j)$ with respect to her choice variable s_i such that $s_i, s_j \geq 0$. This version of the game yields a competitive equilibrium in which every member produces $s_i^{\#} = \left(\frac{a_i}{2c}\right)^2$. This quantity is greater than the individual production level that would maximize the social optimum, $\sum_{i=1}^{N} u_i$, which is equal to $s_i^{\circ} = \left(\frac{a_i}{2(c+\rho(N-1))}\right)^2$ (see the appendix for the demonstration of both results). As one would expect, the presence of a negative externality yields a competitive equilibrium that is economically inefficient because members overinvest in the activity that causes the negative externality.

Enter the founder, intent on designing a regime that would lead a large number of members to reduce their excessive investment level. We use the social optimum to operationalize the founder's optimum, yet it is important to note that the model and results can accommodate any notion of optimum as long as it is socially more desirable than the competitive equilibrium. The founder achieves this result by offering an incentive to each member. For the sake of simplicity, we assume the incentive to be a positive transfer–a payment– $t(s_i)$. We posit the following functional form for transfers: $t(s_i) = ts_i$, with ts_i the transfer given to member i and t a positive variable standing for the subsidy rate.[6]

As shown in Figure 5, the transfer can be given in several ways: through a multilateral instrument in which members are treated uniformly (they are given the same transfer); through a series of bilateral agreements by which the founder is able to customize transfers to each member's need; or through a combination of multilateral and bilateral instruments, where a subset of members is treated identically and another is treated based on individual need. We model the distribution of instruments according to the template of Figure 5. As above, we assume that any single instrument, bilateral or multilateral, costs constant T to process.

On the founder's side, we assume that the founder values at constant V any member i's investment that conforms with the founder's notion of what is optimal. For the sake of convenience, we also assume that V is sufficiently large for the founder not to run into a budget constraint.

The founder moves first, offering a contract to all members simultaneously. Then the members simultaneously decide to reject or accept the offer. No subset of members has the capacity to organize a coordinated response to the founder's offer. If a member rejects, there is no contract with that member. If a member accepts, the contract is executed as written; we are not giving the founder the capacity to make the signing of a contract with one (or more) member(s) contingent on the acceptance of all contracts by all other members.[7] There is no room for shirking once the member has accepted the founder's offer–signing an international instrument makes the commitment credible for both sides. Credibility is the result of a costly signaling game or a reputation game that is not modelled here.

A strategy for the founder specifies the (t, x, y) regime she proposes, that is, choosing cutpoints x and $y \in \mathbb{Z}^+$ and subsidy rate $t \in \mathbb{R}^+$ that maximize her aggregate utility while simultaneously offering transfer levels sufficiently high to induce the y members to invest optimally. A strategy for any member i is a mapping specifying for every combination of institution and subsidy rate an investment level in the activity causing the externality that maximizes her individual utility. The solution concept is the subgame perfect Nash equilibrium. Formally, it means for the founder and the members to simultaneously solve the program

$$P = \begin{cases} 1. \ \max\limits_{1\leq x\leq y\leq N, t\geq 0} U_P = xg\left(x\right) - T + \sum_{z=x+1}^{y}\left(g\left(z\right) - T\right), \\ 2. \text{ with } g\left(i\right) = \delta V - t\left(s_i^{\#} - s_i\right), \text{ and } \begin{cases} \delta = 1 & \text{if} \quad s_i = s_i^{\circ} \\ \delta = 0 & \text{if} \quad s_i \neq s_i^{\circ} \end{cases}, \\ 3. \ \max\limits_{s_i\geq 0} u_i = a_i\sqrt{s_i} - \rho\sum_{j\neq i} s_j - cs_i + t\left(s_i^{\#} - s_i\right), \text{ for all } i, j \in [1, N], \\ 4. \text{ with } s_i^{\#} = \left(\frac{a_i}{2c}\right)^2 \text{ for all } i \in [1, N], \text{ and } s_i^{\circ} = \left(\frac{a_i}{2(c+\rho(N-1))}\right)^2, \\ \text{subject to:} \\ 5. \ a_i\sqrt{s_i} - \rho\sum_{j\neq i} s_j - cs_i + t\left(s_i^{\#} - s_i\right) \geq a_i\sqrt{s_i^{\#}} - \rho\sum_{j\neq i} s_j - cs_i^{\#}, \\ \text{for all } i, j \in [1, N]. \end{cases}$$

The first clause formalizes the founder's maximization problem, choosing subsidy rate t and

cutpoints x and y so as to offer a single multilateral treaty to members 1 to x, and bilateral contracts to members $x+1$ to y.[8] Clause 2 specifies the founder's utility function, earning positive constant V for every member who cuts activity down to the level required to implement the social optimum, at the cost of transfer $t\left(s_i^{\#}-s_i\right)$ given to each member.

Clause 3 features the maximization problem for included member i, who now receives transfer $t\left(s_i^{\#}-s_i\right)$, calculated to give her an incentive to reduce activity below the competitive equilibrium, $s_i^{\#}$, whose value is reported in clause 4, along with that for the socially optimum value s_i°.

Clause 5 specifies the incentive constraint for each included member, insuring that none of them has an interest in unilaterally deviating from the founder-induced optimum equilibrium.

The program is solved in the appendix. The equilibrium value of the subsidy rate, t^*, is equal to $(N-1)\rho$, which can be interpreted as the externality rate, since each member causes $N-1$ externalities, each time with marginal impact ρ.

Assuming, to arrive at an explicit solution, the following functional form for marginal gains, $a_i = ia$, with $i \in [1, N]$ and $a > 0$, we are ready to state the solution.

Proposition 1 *There exists a subgame perfect equilibrium in which the founder offers*

(1) transfer $t^* s_x^{\circ}$ to members i indexed 1 to x^* and in which these members invest social optimum s_i°;

(2) transfer $t^* s_i^{\circ}$ to members i indexed x^*+1 to y^* and in which these members invest social optimum s_i°;

(3) no transfer to members i indexed y^*+1 to N and in which these members invest competitive equilibrium $s_i^{\#}$;

with $t^* = (N-1)\rho$, $s_i^{\circ} = \left(\frac{a_i}{2(c+\rho(N-1))}\right)^2$, $s_i^{\#} = \left(\frac{a_i}{2c}\right)^2$, $x^* \in [\underline{x}, \overline{x}]$, $\overline{x} = \underline{x}+1$, $y^* \in [\underline{y}, \overline{y}]$, $\overline{y} = \underline{y}+1$, $\underline{x} = \frac{1}{4}\frac{\sqrt{\left(a^2\rho^3(N-1)^3+32Tc^2(c+\rho(N-1))^2+2ca^2\rho^2(N-1)^2\right)}}{a\rho(N-1)\sqrt{2c+\rho(N-1)}} - \frac{1}{4}$, $\underline{y} = 2\frac{c}{a\rho}\frac{\sqrt{V-T}}{\sqrt{2c+\rho(N-1)}}\frac{c+\rho(N-1)}{N-1} - 1$.

Note the convexity of the founder's cost curve of Figure 5, $t(z_i) = t^*\left(s_i^{\#}-s_i^{o}\right)$, confirming, to the extent that the model builds on realistic assumptions, the choice of the model in Figure 4A as more plausible than the one in Figure 4B.

4 Asymmetric Information

The model assumes complete information. What if, instead, the founder were ignorant of each member's compliance cost and dependent on their declarations? We argue that in such conditions it is in the interest of each member to claim a cost greater than his actual one and thereby extract a higher payment. Asymmetric information operates like a transaction cost, disqualifying customization in favor of uniformity (Harstad 2007).

To see this, imagine that the founder has a good sense of the overall distribution of marginal-gain scalar a_i. We further assume that the founder does not know where any given member i is located on that distribution. Hence, even if the founder has a good sense of the nature and scope of the instruments that she should use to build the regime, she does not know which instrument to offer to which member. A rational strategy for any member under such circumstances is to claim to be the high marginal gain type a_y, with y being the presumed highest-marginal-gain member to be included in the regime. As a result, all agents with an actual marginal gain located on and to the left of cutpoint y would claim to be at that very cutpoint.

The founder's best response to such misrepresentation is to give up on bilateralism and offer a multilateral deal calculated to include the member with marginal gain a_y. In response to such an offer, all agents with marginal gains inferior or equal to a_y accept the regime and all those with marginal gains above that threshold stay out. The multilateral instrument is optimal here because it functions like a partial information revelation mechanism. It leads each member to truthfully sort themselves out into a camp of members and a camp of nonmembers. The revelation is partial, however, because nothing is revealed on how agents are distributed within each camp. But note that such information is unnecessary in the context of the multilateral instrument, which treats everyone the same way and thus can be used successfully in the absence of any information on members' individual characteristics.

The situation is very different for bilateral instruments. Individualized information is needed in order to tailor the bilateral incentive to each member's type. In the case where all agents claim to be the a_y type, the bilateral strategy is suboptimal: it does not enable the founder to save on the member surplus, since all agents are given the transfer that corresponds to the a_y claim, thus multiplying transaction costs for no offsetting benefits. Bilateralism fails in the presence of

asymmetric information. Our static model reproduces Harstad's dynamic result, according to which information asymmetry leads to posturing and delaying tactics during negotiations, thereby raising transaction costs.

5 Comparative Statics and Predictions

The model produces three sets of comparative statics that are relevant to the mix of lateralisms and exclusion:

(1) Transaction costs (information asymmetry and T): We have modelled two sources of transaction costs, information asymmetry and the negotiating and governance costs (T). We saw that information asymmetry raises the cost of the bilateral approach, making a multilateral treaty a more efficient method. Similarly, a rise in T causes both an increase in x^*, that is, a greater scope for multilateralism, and a drop in y^*, that is, a rise in exclusion. In contrast, if T is low, holding everything else constant, the bilateral approach is dominant (the "Coase Theorem").

(2) Member surplus (a, c, ρ, N): One may approximate the member surplus by the slope of the $t(z)$ curve of Figure 5. We found that $t(z) = t^* \left(s_i^{\#} - s_i^o \right)$, which means that the member surplus is a positive function of marginal gain multiplier a, the externality rate ρ, and the number of countries producing externalities N, while a negative function of marginal cost c. We consider each parameter successively.

Parameter a is the multiplier of the marginal gain of investing in the activity generating the externality. A higher a means that the member surplus is larger. It is easy to check that an increase in the value of a yields a reduction in y^* ($\partial y/\partial a < 0$), that is, more exclusion. Likewise it can be shown that an increase in a yields a reduction in x^* ($\partial x/\partial a < 0$), that is, a decrease in multilateralism.

Parameter c, the marginal cost, works in the exact opposite direction of a. Taken together, these two parameters determine the conditions for when a broad and shallow agreement is feasible: a marginal gain that is fast-decreasing or a marginal cost that is large.[9] The fight against terror provides a good instance of decreasing marginal gains calling for a broad and shallow regime, as a dollar spent by Yemen on spying on terrorist organizations goes further than the same dollar spent by Washington. It is more efficient for the United States to enlist the support of other states than to further increase already high investments in covert and military operations.

Parameters ρ and N together measure the aggregate size of the externality. The larger either one of these parameters is, the larger the consumer surplus and, by implication, bilateralism and exclusion are ($\partial x/\partial \rho < 0$ and $\partial x/\partial N < 0$; $\partial y/\partial \rho < 0$ and $\partial y/\partial N < 0$).

These comparative statics yield the following four predictions:

1. If transaction costs alone are high, multilateralism should be the instrument of choice.
2. If the member surplus alone is high, bilateralism should be the instrument of choice.
3. If both transaction costs and the member surplus are high, some combination of lateralisms should be the outcome.
4. If both transaction costs and the member surplus are high, exclusion is greatest. If only one of these values is high, exclusion occurs but at more moderate levels.

The case where neither transaction costs nor member surplus are high is likely to yield indeterminacy, as it leaves outcome open to the influence of parameters not included in our model.

[Figure 6]

We illustrate the logic of our theoretical argument by focusing on four prominent cases: a case of bilateralism, the FDI regime; a case of multilateralism, the human rights regime; and two cases of combined bilateralism and multilateralism, the climate change regime and the trade regime. In addition to offering variation on the dependent variables, these cases demonstrate the generalizability of the model by covering a broad range of issue areas. We include two cases of combined lateralisms because we believe these are more common in practice than the pure cases, and including two gives us more opportunity to explore the different ways in which these institutional forms can be combined. Specifically, we note that the trade regime relies mostly on *mixing* a multilateral agreement with many bilateral ones, while the climate regime relies on the *customization* of obligations within the context of multilateral instruments.

We use the predictions generated by the model and presented in the previous section to guide the empirical discussion. We begin by establishing the values of the key independent variables for each of the regimes and then assess whether our model's predictions are accurately reflected in the design of each regime.

6 Independent Variables

To operationalize our two key independent variables, transaction costs and member surplus, we look at the properties of the policy issues in question for a given regime. Transaction costs are high when bargaining must reconcile the interests of many actors, especially those at the domestic level (Moravcsik 1999: 301). Transaction costs are also high when monitoring and enforcement are costly. Finally, information asymmetries, regarding preferences and behavior, further increase the costs of forging agreements. To capture the member surplus, we ask whether there is substantial variation across countries in terms of the gains or costs of modifying their behavior to conform to the goals of the regime and how steep the externality is. Other things begin equal, if the compliance gains and costs are uniform while the externality is low, the member surplus is small. Based on these criteria, we propose that transaction costs are relatively high for three of the regimes under consideration, climate, trade, and human rights, but are lower in the case of FDI; and that the member surplus is high in climate, trade, and FDI but low in human rights.

Climate change involves high bargaining costs and high safeguarding costs. Negotiations over climate are notoriously difficult. Addressing the issue requires policy changes at the domestic level that affect a wide range of domestic sectors and, indeed, domestic actors have consistently posed obstacles during negotiations (Sprinz and Weiss 2001). Further complicating negotiations is the uncertainty over the political constraints facing governments in other countries (for example, see Hovi et al. Forthcoming). Negotiations are also hampered by the scientific complexity of climate change, the pervasive uncertainty behind its causes and effects, and the distributive implications of choosing different approaches to addressing the issue (Depledge 2005). States have incentives to free ride and, in the face of private information, tactical advantages to promise little (Grundig, Ward and Zorick 2001). Beyond the bargaining phase, few international regimes pose a more severe monitoring and enforcement problem than climate change, where emissions and carbon "sinks" must be tracked around the world. Indeed, the costs of monitoring and accounting have been major obstacles to effective implementation (OECD 2000).

Trade cooperation also entails high transaction costs. Domestic interest groups are highly affected by and involved in negotiations (Grossman and Helpman 2002). Governments have incentives to adopt unrealistic and aggressive negotiating positions as a way to appeal to domestic

groups, causing delay and deadlock (Zahrnt 2007). A further problem with trade agreements is that they are by necessity multi-faceted, involving various sectors and sub-issues (investment, intellectual property, labor, human rights, the environment, etc.). Recently completed trade negotiations between the United States and South Korea were stalled for years over issues as far-ranging as mad cow disease, tax policy, and rules of origin. As one study of Japanese free trade agreements notes, the need for a variety of government agencies to be involved results in "very high negotiation or transaction costs" (Pekkanen, Solis and Katada 2007: 959). Safeguarding costs are also high in trade cooperation, traditionally modeled as a prisoners' dilemma (Dixit 1996). This problem is compounded by the opacity of various nontariff barriers to trade, the monitoring and measurement of which are very difficult (Deardorff and Stern 1998).

In the area of human rights, we argue that bargaining costs are high because the tools traditionally used to forge agreements–linkage and side-payments–are impractical. Human rights negotiations revolve around matters of principle and legitimacy and thus are "lumpy" or indivisible–an action or policy is either right or wrong, making agreement difficult to reach (Goddard 2006; Bibas 2004; Guzman and Simmons 2002). Moreover, because they involve "taboo trade-offs" (Fiske and Tetlock 1997) and depend on their normative weight to matter, they do not lend themselves to side-payments, the most common tactic for overcoming indivisibility.

Transaction costs also arise from the difficulty of monitoring and enforcing human rights law. Human rights practices are difficult to monitor since the relevant behavior is occurring at the domestic level in other states. Even when governments have evidence of violations, this information may not be viewed as impartial and credible by third-party governments. It is also difficult for individual governments to punish rights violators through the normal bilateral channel of tit-for-tat retaliation. While in some issue-areas a government can respond in kind to noncompliance–for example, by suspending concessions in trade–there are no direct reciprocal benefits to be withdrawn in human rights (Hathaway 2007: 589). And a pro-human rights government cannot credibly threaten to mistreat its own population in response to equivalent action by another government. The result is a regime that is both difficult to monitor and lacking in mechanisms of self-regulation.

Forging agreements to govern FDI, in contrast, involves much lower transaction costs. Such agreements are focused on a narrow set of investment issues (Yackee 2010: 5), implicating few domestic interest groups. Bargaining costs are further reduced because most FDI cooperation

deals with a familiar set of substantive issues, which means that virtually all investment treaties follow the same general structure (Salacuse 2009). Rather than negotiating from the ground up, most investor countries offer a "model" structure as a starting point for negotiations. Although parties to negotiations regularly modify the terms of those model agreements, the default uniformity minimizes negotiating costs and reduces the governance costs of managing the treaty over time by making implementation and interpretation more straightforward (UNCTAD 1998: 24). Monitoring costs are further reduced because, in almost all cases, violations of the agreement are noticed almost immediately by the affected firm, whose presence on the ground supplies a built-in "fire alarm" system of inexpensive monitoring (McCubbins and Schwartz 1984; Dai 2002). This is especially influential in the case of FDI because the very parties harmed by violations, and not third parties, are those conducting the monitoring.

Turning to the member surplus variable, we see the widest distribution of gains and costs in climate, trade, and FDI. In climate, the cost of reducing greenhouse gas emissions varies widely across countries, making it difficult to attract participation from those who place a high value on emitting without generating a member surplus for those more willing to curb emissions. Developing countries in particular were reluctant from the start to join the regime, fearing that efforts to tackle climate change would compromise their prospects for economic growth (Bodansky 2007; Najam, Huq and Sokona 2003). Even among industrialized countries, the costs of reducing emissions are widely variable. Among the major emitters, the United States, Canada, Japan and Australia have higher emissions per capita, rely heavily on coal for energy, and have steeper emissions projections than European countries (Cooper et al. 1999). Hence, once Kyoto was signed, projections for the EU suggested that " business-as-usual" —i.e., no efforts at abatement—would lead to an 8-percent increase in emissions over 1990 levels, whereas similar projections for the United States predicted a 30-percent increase (Hourcade and Grubb 2000: 174). Economies in transition, especially Russia, also faced a greater risk of disrupting their more fragile economic growth by accommodating climate concerns.

We see a similar pattern in trade and FDI. Some countries benefit more from free trade than others, depending on their size, on how competitive they are at the international level, and on how much they value social protection and other goals (Alesina, Spolaore and Wacziarg 2005; Rodrik 1997). The same is true of FDI, where some countries are much better positioned to

attract and protect investment as a function of domestic political and legal institutions (Stasavage 2002; Bénassy-Quéré, Coupet and Mayer 2007) and characteristics of the market and regulatory environment (Asiedu 2002). States also vary in the ideological orientation of their governments and the influence of labor and business interests, factors that influence the political costs and benefits of liberalization.

In contrast to the other three issue areas, human rights agreements do not generate a substantial member surplus. Recall that the member surplus is a positive function not only of the potential members' marginal gain (a) for engaging in the activity to be regulated but also of the extent to which these activities produce an externality (ρ). Human rights policies do have some cross-border effects, but in comparison to economic, environmental, and security issues, human rights agreements deal mostly with the internal activities of governments and with policies that have only modest externalities (Moravcsik 2000: 217). The fact is that the regime founders, the western democracies, have a low utility for improving human rights practices in other countries and are normally unwilling to pay a high price to shape the human rights practices of other states.

Table 1 lists the four regimes, the values of the independent variables that we assign to them, and our corresponding theoretical predictions in terms of lateralism and exclusion.

[Table 1]

7 Institutional Outcomes

FDI. Since the 19th century there has existed an international investment regime consisting of a set of "widely shared standards regarding the proper treatment of foreign capital" (Lipson 1985: 81). Nevertheless, despite efforts by the United States in particular to promote rules on seizure and compensation, there exists no multilateral treaty or comprehensive customary law on the treatment of foreign direct investment (Guzman 1998; Sornarajah 2004: 167). Instead, over the last fifty years rules governing FDI have rested overwhelmingly on more than 2,600 bilateral investment treaties (BITs). Consistent with predictions 1 and 2, relatively low transaction costs and a large member surplus combine to make bilateralism the design of choice. And because it is easy to conclude new BITs, there is only a moderate incentive to exclude states from participating in the regime (prediction 4).

A multilateral instrument to deal with FDI is potentially attractive insofar as it would set uniform rules and thereby dampen race-to-the-bottom effects that come with competition among host governments (Elkins, Guzman and Simmons 2006). However, the Group of 77 rejected the universal application of the "Hull Rule" (requiring "prompt, adequate and effective compensation") and subsequent efforts to negotiate a Multilateral Agreement on Investment. A multilateral approach would either generate a substantial member surplus or would have to be too watered down in an effort to include hosts with the highest compliance costs. The WTO's agreement on Trade-Related Investment Measures (TRIMs) illustrates precisely this point; it addresses only a narrow range of FDI issues and imposes only "rudimentary disciplines" (Neumayer and Spess 2005: 1571).

The alternative is bilateral treaties that can be both deeper and more customized, and therefore less wasteful in incentives. Despite their common structure, as Salacuse (2009: 126) notes, "the specific provisions of individual investment treaties are not uniform and some investment treaties restrict host country governmental action more than others." BIT provisions are tailored to the political and economic needs of signatories (in particular, of the developing-country parties) in terms of what is counted as an "investment," the standards of treatment and protection that are applied, and the nature of dispute settlement (UNCTAD 2007; Allee and Peinhardt 2010). The possible downside of bilateralism, transaction costs, is mitigated by the low costs of concluding BITs.[10]

Our theoretical model offers no reason to expect high rates of exclusion from the regime. Indeed, BITs have proliferated rapidly along with the globalization of capital. By the mid-1990s, 162 countries had concluded BITs and today the number stands at 176. Only a handful of countries, mostly least-developed and politically unstable, lie outside of the regime, and these nonmembers are, in any case, unattractive destinations for FDI.

Human Rights. The international human rights regime is governed by a broad and growing set of multilateral instruments, centered around the basic norm that individual human beings should be protected regardless of their nationality or location (Morsink 1999). In addition to the UN Charter, which calls for "universal respect" for human rights, the three core agreements are the Universal Declaration of Human Rights (1948), the International Covenant on Civil and Political Rights (1966), and the International Covenant on Economic, Social and Cultural Rights (1966).

These are complemented by more specific treaties on genocide (1948), racial discrimination (1973), discrimination against women (1979), torture (1984), rights of the child (1989), rights of migrant workers (1990), and rights of persons with disabilities (2006).

To accommodate the high bargaining costs that come with human rights, state have employed a multilateral approach to negotiations, often in the context of the UN. The General Assembly was used as a venue for the final negotiations of the Universal Declaration, facilitating agreement across most of the international community. The UN's Human Rights Commission has been used to generate draft texts for many human rights treaties, often with the administrative support of secretariat officials, who have proven crucial in reconciling diverse views on human rights and producing draft texts that serve as focal points for intergovernmental negotiations. Given the difficulties, noted above, of using bilateral mechanisms to safeguard the regime, the primary mechanisms for promoting compliance in human rights are reputation concerns and shaming, both of which are more effective in multilateral contexts (Guzman 2008: 64; Johnston 2001). Accordingly, the various human rights treaties establish an array of institutions–UN bodies, as well as independent committees and commissions–that provide centralized monitoring and reporting. Their findings, though not binding, do have legal and normative significance that "puts pressure on states" (Buergenthal 2006: 791). None of this would be possible with a series of bilateral treaties.

While the logic of transaction costs helps explain why the regime is primarily multilateral, following the logic of prediction 1, there is still the possibility that multilateral instruments would be complemented by bilateralism. And, to some extent, they are, as rich countries sometimes tie the choice of foreign aid recipients to their human rights practices (Gomez 2007; Abrams and Lewis 1993) and free trade agreements pursued by the United States and Europe increasingly include human rights provisions (Hafner-Burton 2009). But the extent of these exceptions should not be overstated. Other motives, both economic and political, drive aid decisions more than human rights concerns (Neumayer 2005; Milner 2006), and rich democracies typically are not willing to pay a high price to shape the human rights practices of reluctant states. Low externalities result in a set of broad yet shallow multilateral treaties combined with modest bilateral efforts to expand participation. Consistent with prediction 4, the relative ease of adding members to the regime results in high participation rates: except for the two newest treaties, on migrant workers and persons with disabilities, all have been ratified by more than 100 countries.

Climate Change. From the beginning, the Europeans have assumed a leadership role in establishing international treaties and calling for the deepest cuts in greenhouse gas emissions (Gupta and Grubb 2000). We use the case to illustrate that a combination of multilateralism and bilateralism is a logical result of situations where both transaction costs and the member surplus are high (prediction 3).

The main multilateral component of the regime is its two core treaties, the 1992 UN Framework Convention on Climate Change and the 1997 Kyoto Protocol, and their associated institutions. These treaties are overseen by the Climate Secretariat, whose functions are to provide information, to facilitate negotiations, and to promote implementation–all geared toward reducing transaction costs (Busch 2009). During the negotiation phase, the Secretariat provides background information and coordinates the activities of national delegations (Depledge 2005). When it comes to compliance, parties must submit national reports to the Secretariat on their efforts to reduce and track emissions. Industrialized countries are further monitored by "expert review teams" and a Compliance Committee of member-states, which can investigate and identify violations. Incentives to comply include public reporting of noncompliance, a penalty of additional emissions reduction requirements, and suspension from use of the emissions trading mechanism.

While this multilateral approach helps address transaction costs, it does not accommodate the member surplus problem. To attract the participation of the states with the highest compliance costs, the Framework Convention noted that countries should address climate change in accordance with their "common but differentiated responsibilities and respective capabilities" (Section 3.1) – in other words, developing countries should be expected to do less than their richer counterparts. This principle was carried over to Kyoto, which imposes binding obligations only on industrialized countries. Both treaties also encourage richer countries to transfer technology and financial resources to help developing countries with the costs of emissions abatement. The Kyoto Protocol's Clean Development Mechanism (CDM) does this with a project-based approach, allowing industrialized countries to earn credits by investing in emissions-reducing projects in the developing world. Developing countries benefit from the transfer of capital and technology under CDM, which in effect pays them to address global warming (Victor 2007).

Even among industrialized countries, Kyoto customizes obligations across members to bring those with high compliance costs on board. Two mechanisms were used to achieve customization.

First, targets for emissions vary substantially across countries; the EU's target is set at eight percent below 1990 levels while, for example, Australia's is set at eight percent above. Political factors obviously played a role in setting these targets, but they can also be understood in efficiency terms. Jeffrey Frankel (2010: 58-9) notes that the costliness of emissions cuts outlined in Kyoto nicely correlates with countries' GDP per capita, a rough proxy for compliance costs. The second mechanism used for customization was bilateral enticements to Japan, Canada, and Russia, who were allowed to count additional sources of carbon sinks toward their Kyoto targets.[11] These allowances, which substantially reduced the compliance costs for their beneficiaries, represented a major concession by the EU – one that succeeded in prompting all three of these hold-outs to ratify the Kyoto treaty.

Finally, because both transaction costs and the member surplus are high in the climate case, we expect to see relatively high levels of exclusion from the regime (prediction 4). If we conceive of participation in terms of the adoption of emissions reduction commitments, this is clearly the case: only 38 countries have assumed reduction targets. No developing country has yet agreed to assume any obligations (though some have now made nonbinding "pledges") and the United States has not ratified Kyoto and is therefore not bound by its target. This means that the two largest emitters of greenhouse gases, China and the United States, remain excluded. More generally, ratifications for Kyoto were slow in coming and the treaty did not enter into force until 2005, eight years after it was signed, reflecting the difficulty of bringing participants on board.

Trade. The norm of free trade has existed in Europe since the 19th century and is now widely accepted. Britain in the 19th century and, since the Second World War, the United States and a growing cast of advanced industrialized countries have been opening their economies and convincing others do so as well. We focus on the postwar era since this is the period during which a coherent and widespread regime can be said to exist. The trade regime has always involved a combination of multilateral and bilateral instruments and thus represents a "combination," case reflecting the importance of both transaction costs and the member surplus (prediction 3).

Historically, some of the transaction costs of bilateralism have been offset through the application of the most-favored nation (MFN) principle as a sort of multilateralizing feature of bilateral agreements. By automatically extending lower-tariff treatment to other trading partners who also

have MFN status (though not to others), MFN made countries more willing to negotiate concessions bilaterally because they knew the benefits would not be impaired by subsequent, more generous concessions to other countries (Schwartz and Sykes 1996: 29). However, as the volume of trade increased over time, and as the risk of opportunism increased with greater trade-related investments in the modern era (Yarbrough and Yarbrough 1992), MFN alone proved inadequate to extend and safeguard trade agreements.

The GATT enshrined the MFN principle in Article I and evolved a set of multilateral institutions that further reduced transaction costs in at least three ways. First, cooperating through one large agreement not only reduces the number of discussions that must take place, it provides an established and predictable forum for negotiations and offers opportunities for side-payments and issue linkage to grease the skids of agreement. Second, the WTO secretariat plays a central role in monitoring and transparency, especially through the Trade Policy Review Mechanism (TPRM). Although not designed to detect violations and trigger dispute settlement cases directly, the TPRM promotes compliance through reputation concerns and peer pressure (Qureshi 1995). Finally, centralized dispute settlement, which began under the GATT and has been enhanced with the WTO, has deservedly received much attention as a key feature of the multilateral trading system. All of these centralized functions provide economies of scale when it comes to reducing the costs of trade cooperation.

While multilateralism helps address some of the inefficiencies that arise from bilateralism, it comes with its own downside. Specifically, it does not effectively address the problem of variable compliance costs that lies behind the member surplus problem. As in the climate case, this is done partly through customization in the form of the GATT/WTO's "special and differential treatment" for developing countries. It is also done through the use of separate agreements of a bilateral and regional nature, which have proliferated in recent years (Mansfield and Milner 1997; Trakman 2008). Many larger trading countries use bilateral agreements as a way to entice their less-developed counterparts to undertake free trade commitments. For instance, the United States offers Bolivia, Colombia, Ecuador and Peru duty-free access to its market on almost all goods, going beyond the U.S. Generalized System of Preferences program (USTR 2007). The EU goes even further, using bilateral trade agreements as a major policy vehicle for distributing aid and other transfers to transition and developing economies. Through its Aid for Trade program, the EU

provides over 70 billion euros per year to these trading partners to help them with infrastructure and technical assistance projects designed to boost exports (European Commission 2009).

The trade regime also offers a unique feature, rarely encountered in other regimes: reverse transfers. In the 1970s, the founders no longer were the only beneficiaries of the regime and in some cases were outflanked by crafty newcomers, especially the so-called "Asian tigers," who were able to turn free trade rules to their advantage to an extent that was deemed disproportionate in Washington and Brussels. The latter responded to this new competition by requesting bilateral compensation in the form of Orderly Market Agreements and Voluntary Export Restraint Agreements, de facto curbing Asian exports to core markets.[12]

Finally, prediction 4 suggests that we should see high levels of exclusion in the trade case. This is only partly true. The regime certainly began with a very limited membership—only 23 countries signed the original GATT agreement. Other than a jump in the 1960s that reflected decolonization, the growth of membership was steady but relatively slow for forty years. The rate of joining then increased dramatically during the Uruguay Round (1986-1994) to reach more than three-quarters of all states. Nevertheless, some states are still excluded from the regime for reasons consistent with our logic. These nonparticipants are mostly least-developed countries (18 of WTO nonmembers fall into this category), failed states (Sudan, Iraq and Afghanistan), and statist economies (North Korea, Serbia, and Iran). The high cost of attracting these countries, even through separate bilateral agreements, leads to exclusion. Belarus, for example, is not a WTO member and in 2007 the EU suspended bilateral trade preferences with its government over issues of labor and political repression.

8 Conclusion

In this paper we shed further light on a source of variation in the design of international regimes that has attracted the attention of lawyers, economists, and political scientists. Regimes vary widely with respect to whether the legal instruments that support them are bilateral, multilateral, and to how inclusive they are. Along with a growing literature, we argue that multilateral agreements are not the only way to design regimes; bilateral agreements, as in the case of FDI, are viable alternatives. Moreover, the different instruments are not incompatible, as is too often believed, but complementary, as the trade and climate regimes illustrate.

We offer an explanation for the variation in lateralisms, arguing that transaction costs favor multilateralism, that high variation in compliance gains and costs and high rates of externality (with the potential of generating a "member surplus") favors bilateralism, and that combinations of lateralisms are likely when both transaction costs and the member surplus are high. With regard to membership size, we argue that the concurrence of transaction costs and member surplus is most likely to produce exclusion from a regime. Turning to empirical illustrations, we attributed the bilateral nature of the FDI regime to low transaction costs, the multilateral nature of the human rights regime to the existence of limited negative externalities (and thus a low member surplus), and the mixed nature of the trade and climate change regime to the coexistence of high transaction costs and surplus.

Our discussion of the trade and climate regimes raises new questions for future research. Although both multilateral regimes harbor a substantial bilateral component, they do so differently– outside the multilateral framework in the case of trade, embedded within the multilateral treaty in the case of climate change. The two possibilities can be thought of as mixed lateralisms and customized multilateralism, respectively. This raises the question of what approach is better for the founder. A multilateral treaty that treats everyone identically, supplemented with bilaterals to accommodate members with particular needs, may shelter the founder from having to justify the nature and extent of each side-payment since this can be done separately and more or less privately. In contrast, a single instrument institutionalizing differential treatment has a better chance of addressing the economic inequality that exists among nations and may be more appealing to developing countries. A multilateral setting allows them to negotiate as a group, where they stand a better chance of resisting pressure from their richer counterparts.

Moreover, the climate regime includes members that have no ambition to contribute to the provision of the regime good. In contrast, in the trade regime, as in most other regimes, de facto non-contributors are non-participants. This raises the question of what advantage to the founders there is to include non–contributors as signatories rather than leaving them out of the regime. On the one hand, we suppose that leaving them out makes them liable to discrimination and thus offers a potential incentive to join. On the other hand, bringing them in may make them subject to collective coercion through majoritarian voting procedures or more subtle forms of community pressure.

Appendix: Proofs

9 Competitive equilibrium

Each member $i \in [1, N]$ chooses her level of $s_i \geq 0$ to maximize her utility $u_i = a_i\sqrt{s_i} - \rho \sum_{j \neq i} s_j - cs_i$, a function that is twice-differentiable and concave. Assuming $\lambda_i \geq 0$ to be the Lagrangian parameters, the optimal level of s_i, $s_i^{\#}$, satisfies the necessary and sufficient first-order conditions $a_i \frac{1}{2} s_i^{-\frac{1}{2}} - c + \lambda_i = 0$ and the Kuhn-Tucker conditions $s_i \lambda_i = 0$ for any $i \in [1, N]$, thus forming a system of $2N$ equations and $2N$ variables (s_i and λ_i). There is no solution possible in which, for any member $i \in [1, N]$, $\lambda_i > 0$, because it would imply $s_i^{\#} = 0$, making the corresponding first-order condition indeterminate. Therefore, the only possible determinate solution has $\lambda_i = 0$ and $s_i^{\#} = \left(\frac{a_i}{2c}\right)^2$ for all $i \in [1, N]$.

10 Social optimum

In any Pareto optimal allocation, the optimal level of s_i, s_i°, must maximize the joint surplus of the N members and so must solve $\max_{s_i \geq 0, i \in [1,N]} \sum_{i=1}^{N} \left(a_i\sqrt{s_i} - cs_i\right) - \sum_{i=1}^{N} \rho \sum_{j \neq i} s_j$. This problem gives the necessary and sufficient first-order conditions $a_i \frac{1}{2} s_i^{-\frac{1}{2}} - c - (N-1)\rho + \gamma_i = 0$, with $\gamma_i \geq 0$ the Lagrangian parameters, and the Kuhn-Tucker conditions $s_i \gamma_i = 0$ for all $i \in [1, N]$. The problem is solved like the precedent, yielding interior solution $s_i^{\circ} = \left(\frac{a_i}{2(c+\rho(N-1))}\right)^2$ for all $i \in [1, N]$.

11 Solving program P

11.1 The subsidy rate

We start by determining the optimal subsidy rate, t^*. The rate must satisfy two conditions: first, it must be large enough to entice each member to abandon the competitive equilibrium for the social optimum; second, it must be high enough to deter any member from defecting to the competitive equilibrium while holding constant the optimal activity of other members. To meet the first condition, t must make the equilibrium activity under the socially optimal equilibrium at least equal to the equilibrium activity under the competitive equilibrium. Comparing the first-order conditions for each equilibrium (see above), it is straightforward to see that the condition for the optimal equilibrium is the same as that for the competitive equilibrium minus expression $(N-1)\rho$. Therefore, $t^* \geq (N-1)\rho$.

To meet the second condition, the incentive constraint in program P must be met for $s_i^* = s_i^\circ$. This means that $a_i\sqrt{s_i^\circ} - \rho\sum_{j\neq i} s_j^\circ - cs_i^\circ + t\left(s_i^\# - s_i^\circ\right) \geq a_i\sqrt{s_i^\#} - \rho\sum_{j\neq i} s_j^\circ - cs_i^\#$. Substituting the values of $s_i^\#$ and s_i° into the constraint yields $t^* \geq \frac{c(N-1)\rho}{2c+(N-1)\rho}$. Since the right hand side term is smaller than $(N-1)\rho$, it follows that this second constraint is not binding, only the first is, and thus $t^* = (N-1)\rho$.

11.2 Convexity

To show that program P is convex with respect to x and thus has a fixed-point solution, one needs to show that the founder's utility function, in which we have substituted the values for $s_i^\#, s_i^\circ$, and t^*, is concave with respect to variables x and y. Concavity requires that for any pair of distinct points (x_1, y_1) and (x_2, y_2) in the domain of U_P, and for $0 < \theta < 1$, the following weak inequality holds: $\theta U_P(x_1, y_1) + (1-\theta) U_P(x_2, y_2) \leq U_P(\theta(x_1, y_1) + (1-\theta)(x_2, y_2))$. Developing U_P and rearranging yields $U_P = Ax^3 + Bx^2 + Cx + Dy^3 + Ey^2 + Fy + G$ with $A = -\frac{1}{6}R$, $B = \frac{1}{8}R$, $C = T + \frac{1}{24}R$, $D = -\frac{1}{12}R$, $E = -B$, $F = V - C$, $G = -T$, and $R = \rho^2(N-1)^2 a^2 \frac{2c+\rho(N-1)}{c^2(c+\rho(N-1))^2}$.

This and all subsequent calculations use the functional form for an member's marginal gain $a_i = ai$.

Concavity thus requires $\theta\left(Ax_1^3 + Bx_1^2 + Cx_1 + Dy_1^3 + Ey_1^2 + Fy_1 + G\right) + (1-\theta)$ $\left(Ax_2^3 + Bx_2^2 + Cx_2 + Dy_2^3 + Ey_2^2 + Fy_2 + G\right) \leq A(\theta x_1 + (1-\theta)x_2)^3 + B(\theta x_1 + (1-\theta)x_2)^2 + C(\theta x_1 + (1-\theta)x_2)$ $+ D(\theta y_1 + (1-\theta)y_2)^3 + E(\theta y_1 + (1-\theta)y_2)^2 + F(\theta y_1 + (1-\theta)y_2) + G$. Rearranging and simplifying, one obtains $(x_1 - x_2)^2((x_1(1+\theta) + x_2(2-\theta))A + B) + (y_1 - y_2)^2((y_1(1+\theta) + y_2(2-\theta))D - B) \leq 0$, which is true since both components of the addition are negative. The first term is negative because $A + B < 0$ and A's coefficient is greater than one, while the second term is negative because $D < 0$, and both D's coefficient and B are positive. It follows that U_P is concave with respect to x and y and that there exists a unique internal maximum (x^*, y^*).

11.3 Lower and Upper Bounds of x^*

Since x^* is the unique maximum over the relevant domain, it yields a utility to the founder that is greater than the utility yielded either by $x^* - 1$ or by $x^* + 1$. Formally, we have $U_P(x) \geq U_P(x+1)$ and $U_P(x) \geq U_P(x-1)$. After developing and rearranging terms in each inequality, we obtain a lower and an upper bound for x^* of the form $\underline{x} \leq x \leq \overline{x}$, with $\underline{x} = \frac{1}{4}\frac{\sqrt{\left(a^2\rho^3(N-1)^3 + 32Tc^2(c+\rho(N-1))^2 + 2ca^2\rho^2(N-1)^2\right)}}{a\rho(N-1)\sqrt{2c+\rho(N-1)}} -$

$\frac{1}{4}$, $\overline{x} = \frac{1}{4}\frac{\sqrt{\left(a^2\rho^3(N-1)^3+32Tc^2(c+\rho(N-1))^2+2ca^2\rho^2(N-1)^2\right)}}{a\rho(N-1)\sqrt{2c+\rho(N-1)}} + \frac{3}{4}$. Given that $\underline{x}+1=\overline{x}$ and that x^* is an integer, the value of x^* may fall anywhere in the closed interval $[\underline{x},\overline{x}]$.

11.4 Lower and Upper Bounds of y^*

The equilibrium value is what makes the founder indifferent between extending the offer to y^{th} member and earning $V - t^*\left(s_y^{\#} - s_y^{\circ}\right) - T$ and not extending the offer and earning 0. Equating the two outcomes and substituting the corresponding values for transfer and investment into the equation yields the upper bound value $\overline{y} = 2\frac{c}{a\rho}\frac{\sqrt{V-T}}{\sqrt{2c+\rho(N-1)}}\frac{c+\rho(N-1)}{N-1}$, and thus the lower bound value $\underline{y} = 2\frac{c}{a\rho}\frac{\sqrt{V-T}}{\sqrt{2c+\rho(N-1)}}\frac{c+\rho(N-1)}{N-1} - 1$. The value of y^* may fall anywhere in the closed interval $\left[\underline{y},\overline{y}\right]$.

11.5 Domain

Since x^* must fall in interval $[1,N]$, we infer the domain of the function for which this result is verified. $\underline{x} \geq 1$ yields condition $T \geq \frac{3}{4}a^2\rho^2(N-1)^2\frac{2c+\rho(N-1)}{c^2(c+\rho(N-1))^2} \equiv \underline{T}$, while $\overline{x} \leq N$ yields condition $T \leq \frac{1}{4}a^2\rho^2(2N-1)(N-1)^3\frac{2c+\rho(N-1)}{c^2(c+\rho(N-1))^2} \equiv \overline{T}$. $\underline{y} \geq 1$ yields $T \leq V - \frac{1}{4}N^2a^2\rho^2(N-1)^2\frac{2c+\rho(N-1)}{c^2(c+\rho(N-1))^2} \equiv \overline{\overline{T}}$, while $\overline{y} \leq N$ yields $T \geq V - a^2\rho^2(N-1)^2\frac{2c+\rho(N-1)}{c^2(c+\rho(N-1))^2} \equiv \underline{\underline{T}}$. Also, $x^* = \begin{cases} N & \text{if} \quad T > \overline{T} \\ 1 & \text{if} \quad T < \underline{T} \end{cases}$ while $y^* = \begin{cases} N & \text{if} \quad T < \underline{\underline{T}} \\ 1 & \text{if} \quad T > \overline{\overline{T}} \end{cases}$. One last condition must be met: $T = \arg\text{solve}\,\underline{x} \leq \underline{y} \equiv \widehat{T}$. Too long to be reported here, this condition is available from the authors.

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Notes

[1]For an overview of these arguments, see Ikenberry 2003.

[2]For an application to international unions, see Alesina, Angeloni, and Etro 2005.

[3]The producer surplus is the amount that producers benefit by selling at a market price that is higher than they would be willing to sell for.

[4]See the trade case below (and note 12) for a partial exception.

[5]In the case of multiple founders, their interaction is left out of this type of model; they are assumed to act like a single player by means of an iterated play. We are making this assumption for reasons of tractability and so we can focus on the less-studied design issues that are our main concern.

[6]The model and the empirical illustrations refer to regimes that rely on positive incentives. If, instead of offering a reward, the founder merely threatened to sanction nonparticipation, the model would still work provided that one thinks of sanctions as negative prices. Generally speaking, positive incentives set the member's reservation value to zero, whereas negative incentives set the reservation value below zero. Except for this, the two forms of incentive are interchangeable (author).

[7]In most multilateral treaties a clause stipulates a minimum number of signatories for the treaty to enter into force. This design feature, however, lacks generalizability, for it is not feasible when the regime relies in part or in toto on bilateral treaties.

[8]To build the summation term, we took advantage of the mathematical identity between offering each of the $y - x - 1$ members (1) a multilateral treaty and a supplementary bilateral treaty or (2) a bilateral treaty with incentives that subsume those of the multilateral treaty.

[9]And fast-increasing a fortiori (Barrett 2003: 304).

[10]It should be noted that there is an important multilateral component to the FDI regime when it comes to dispute settlement. About two-thirds of treaty-based disputes are filed with the International Centre for Settlement of Investment Disputes (UNCTAD 2010). This is therefore not a case of pure bilateralism.

[11]These countries used the threat of nonparticipation to negotiate carbon sink allowances in the amounts of 12 million, 13 million and 33 million metric tons of carbon per year, respectively (UN Doc. FCCC/CP/2001/L.7; UN Doc. FCCC/CP/2001/12/Add.1: 64). In contrast, no other industrialized state had a cap larger than 1.24 million.

[12]Graphically, this is equivalent to drawing the function in Table 5 in the form of an inverted S-curve: sharply concave near the origin, where the "tigers" with very low (or negative) compliance costs were located, then tapering off toward the middle where the founders with moderate compliance costs were located, and then turning convex on the right hand side of the graph, where countries with high compliance costs such as LDC's were located. Bilateralism, in this configuration, occurs at both extremes.

Table 1. Values of Independent Variables and Predictions				
			Prediction	
Regime	**Transaction Costs**	**Member Surplus**	**Lateralism**	**Exclusion**
FDI	Low	High	Bilateralism	Moderate
Human Rights	High	Low	Multilateralism	Moderate
Climate	High	High	Combination	Higher
Trade	High	High	Combination	Higher

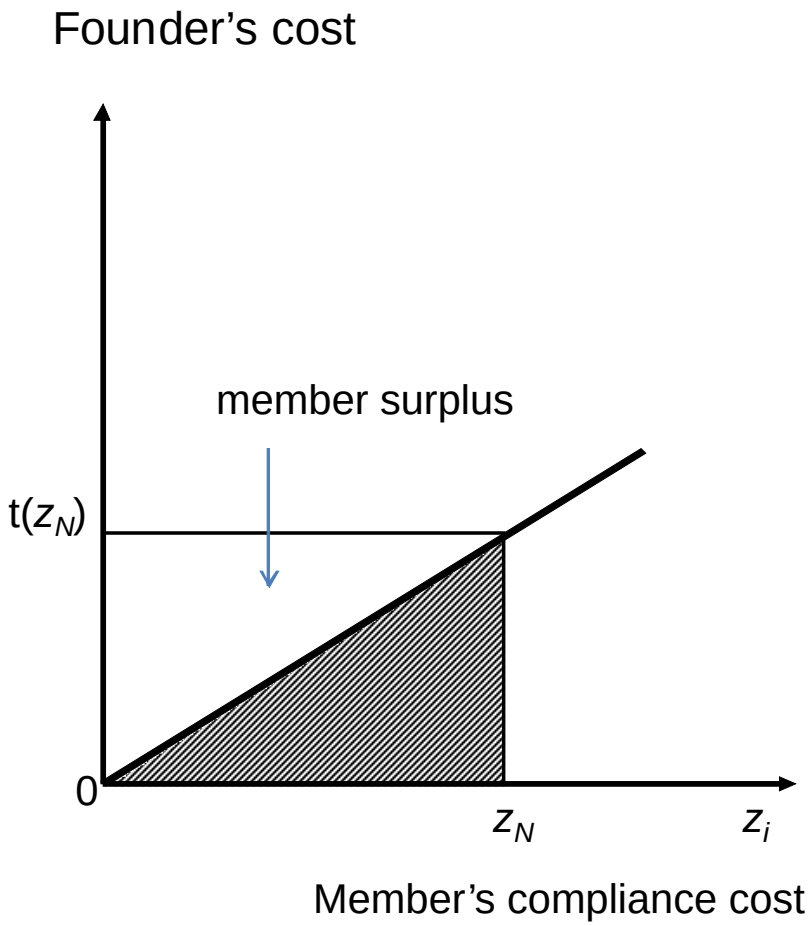

Figure 1: The Member Surplus

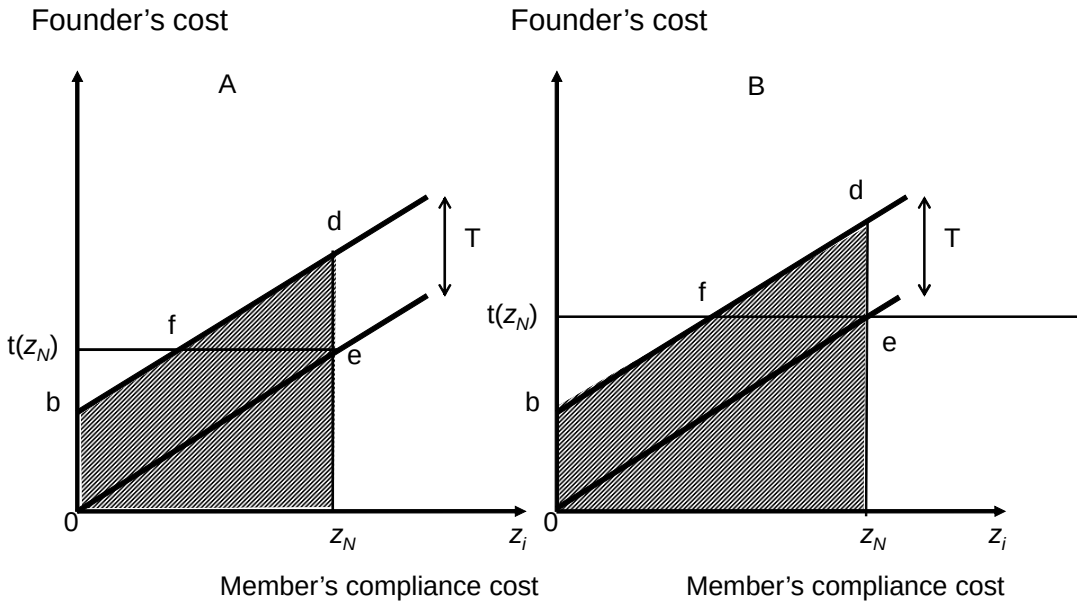

Figure 2: Trade Off Between Member Surplus and Transaction Costs in Pure Regimes

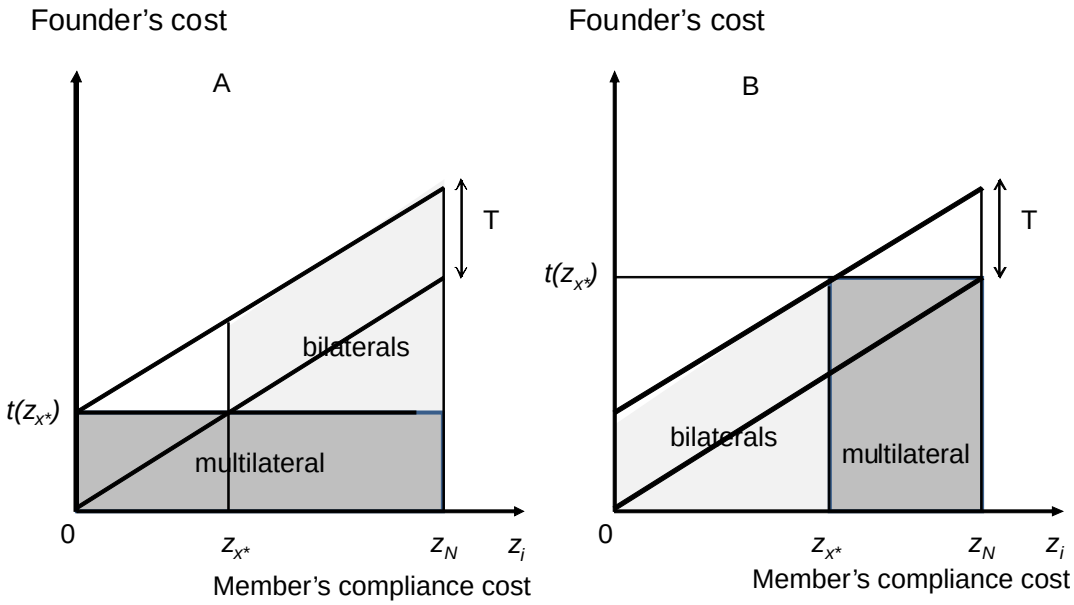

Figure 3: Regimes Combining Instruments

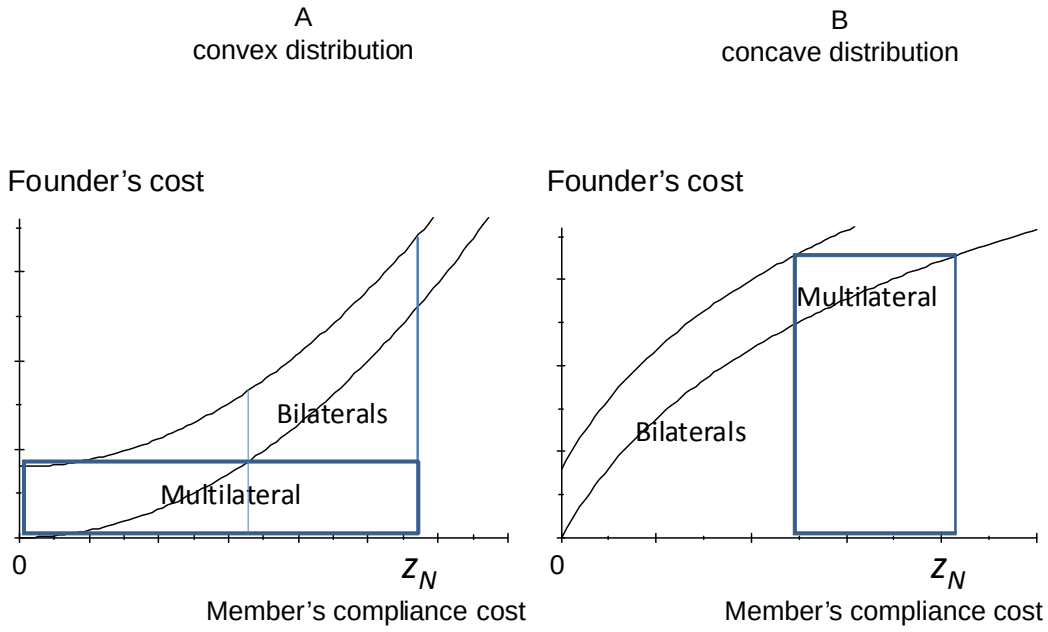

Figure 4: Curvature and Instrument Mix

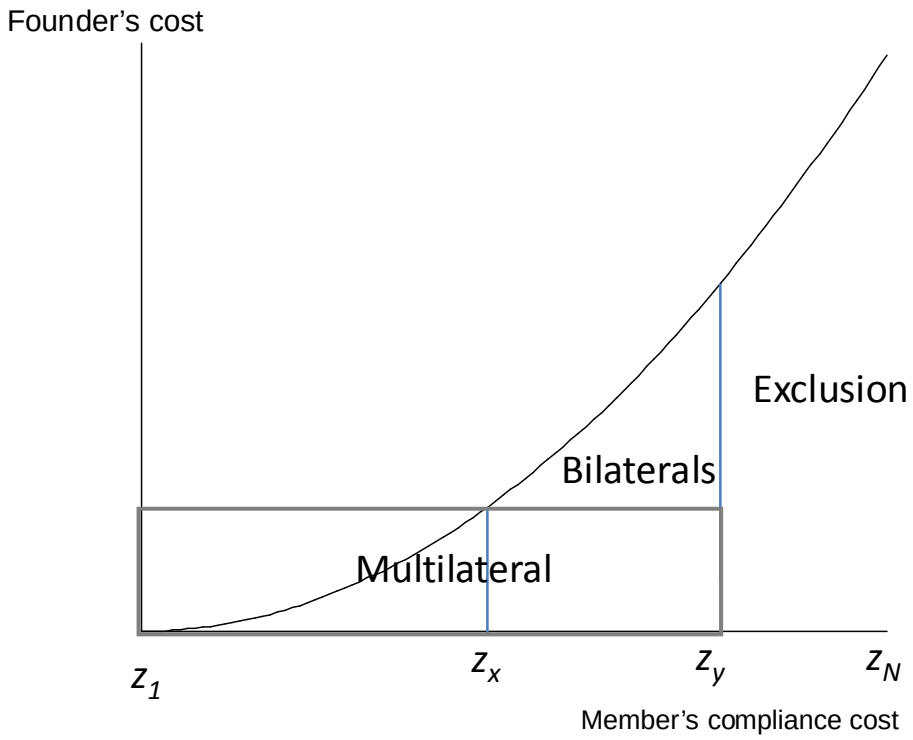

Figure 5: Template of a regime combining instruments (with convex distribution of compliance costs)

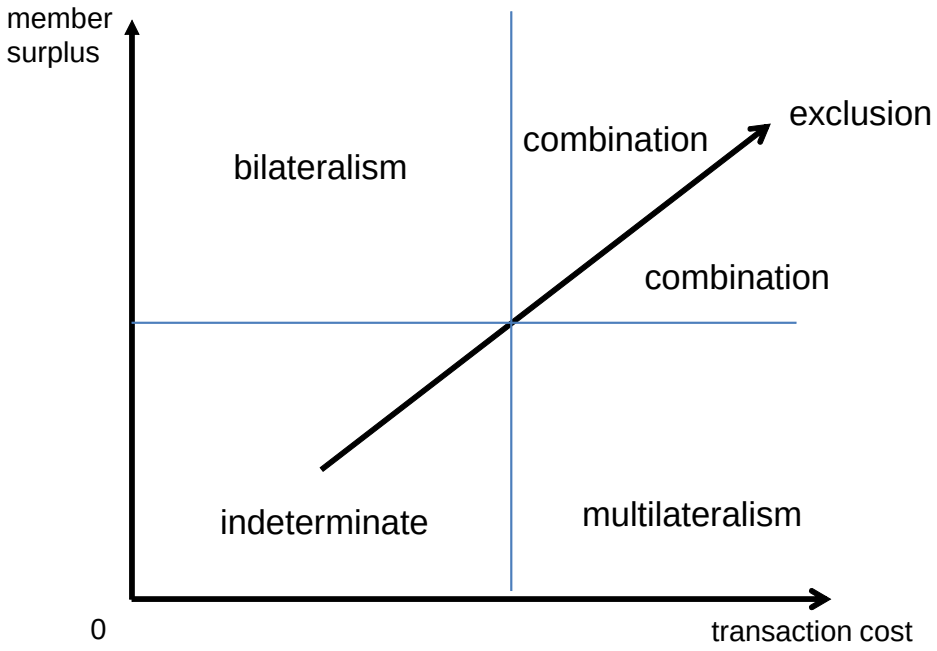

Figure 6: Predictions