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Working Paper

Strategic delegation and voting rules

Discussion Paper, No. 1442

Provided in Cooperation with:

Kellogg School of Management - Center for Mathematical Studies in Economics and Management Science, Northwestern University

Suggested Citation: Harstad, Bård (2007) : Strategic delegation and voting rules, Discussion Paper, No. 1442, Northwestern University, Kellogg School of Management, Center for Mathematical Studies in Economics and Management Science, Evanston, IL

This Version is available at:

<https://hdl.handle.net/10419/31228>

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STRATEGIC DELEGATION AND VOTING RULES*

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CMS-EMS Discussion Paper 1442
9 February 2007

Abstract

When making collective decisions, principals (voters or districts) typically benefit by strategically delegating their bargaining and voting power to representatives different from themselves. There are conflicting views in the literature, however, of whether such a delegate should be "conservative" (status quo biased) or instead "progressive" relative to his principal. I show how the answer depends on the political system in general, and the majority requirement in particular. A larger majority requirement leads to conservative delegation, but "sincere" delegation is always achieved by the optimal voting rule.

Key words: Strategic delegation, collective decisions, voting rules

JEL Classification: D71, D72, F53, H11

* I have benefited from the help of Philippe Aghion, Patrick Bolton, Oliver Hart, Torsten Persson, my colleagues at MEDS and several seminar audiences. Christina Lönnblad has provided editorial assistance.

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1. Introduction

Political decisions are made by delegates, not the citizens themselves. With multiple electoral districts, each district elects representatives who, on its behalf, negotiate and vote on whether policies should be approved. Each district, or principal, may have an incentive to strategically delegate to an agent that is biased one way or the other. What determines the incentives to delegate strategically? Do they depend on the political system? Can institutions be designed to ensure "sincere" delegation?

Strategic delegation may be costly from a social point of view: If the delegates are "conservative" (status quo biased), they tend not to implement projects even if they are socially optimal. If, instead, the delegates are "progressive" (public-good lovers), they implement projects even if these are too costly. It is thus important to understand when and how voters strategically appoint representatives.

But there is a controversy in the literature on delegation. Starting with Schelling (1956), a large bargaining literature shows how principals delegate to status quo biased agents to gain "bargaining power". Such agents are less desperate in reaching an agreement and, therefore, able to negotiate a better deal.¹

On the other hand, a more recent literature in political economy argues that "voters attempt to increase the probability that their district is included in the winning coalition by choosing a representative who values public spending more" (Chari, Jones and Marimon, 1997, p. 959). The majority coalition will typically consist of the winners, i.e., the representatives who are least costly to please (as in Ferejohn, Fiorina and McKelvey, 1987). And, being a member of the majority coalition is important, since this shares the surplus and expropriates the minority whose votes it does not need. To increase the "political power" (the probability of being a member of the majority coalition), principals should therefore delegate progressively – not conservatively.²

¹Schelling's argument is formalized by Jones (1989) and Segendorff (2003) in two-player games. Milesi-Ferretti, Perotti and Rostagno (2002) compare majoritarian and proportional systems where three districts delegate to gain bargaining power. An n-person bargaining game is studied by Brückner (2003); he finds that the bias may be mitigated by relaxing the unanimity requirement. Besley and Coate (2003) study strategic delegation in a context where two districts maximize joint utility. In a similar model, Dur and Roelfsma (2005) show that the direction of delegation may go either way, depending on the cost-sharing rules.

²Austen-Smith and Banks (1988) and Baron and Diermeier (2001) show how voters consider the

Building on recent work in political economy, I develop a model that includes *both* the incentives to delegate conservatively (to gain bargaining power) and progressively (to gain political power). In equilibrium, the direction of delegation depends on which concern is stronger and this, it turns out, depends on the political system. In particular, if the majority requirement is large, then being a member of the majority coalition is not very beneficial, since it will have to compensate most of the losers. Bargaining power is then more important, and the principals delegate conservatively, just as predicted by Schelling. If the majority rule is small, however, the majority coalition expropriates a large minority, and divides the revenues on just a few majority members. Political power is then very beneficial, and principals delegate progressively, as argued by Chari, Jones and Marimon.

Equilibrium delegation also hinges on other aspects of the political system such as the minority protection, agenda-setting power, coalition-discipline and double majority rules. Moreover, the principals typically delegate differently, depending on local concerns. Nevertheless, sincere delegation by *all* principals is possible if the majority rule is appropriately selected. To achieve this, the majority rule should increase in the union's enforcement capacity but decrease in the agenda-setting power. The majority rule should also reflect other details of the political system and the characteristics of the policy.

The model fits many principal-agent situations. A particularly relevant case may be the European Union, for two reasons. First, the EU is currently debating its future voting rules, although the European Constitution is currently on hold. Second, the EU has several chambers, using different majority rules. While the Commission and the Parliament use the simple majority rule, the Council typically requires unanimity or super-majorities. Based on this, the theory predicts that the delegates in the Commission and the Parliament should be more in favor of further integration than those in the Council, who are predicted to be more status-quo biased. This is, indeed, a commonly held view.³

induced coalition-formation when electing representatives, though bargaining power is not considered. The trade-off between bargaining power and political power is apparent in the seminal contribution of Baron and Ferejohn (1989): In numerical examples, they show that a high probability of being recognized as the next agenda-setter makes the legislator less attractive as a coalition-partner. However, the trade-off is not explicitly discussed and they do not study strategic delegation.

³"For some commentators and practitioners, the Council is the blockage to European political integration, always looking to put obstacles in the way of bright ideas from the Commission or the EP"

The emphasis on majority rules ties the paper to a large literature going back to Rousseau (1762), Condorcet (1785), Wicksell (1896), Buchanan and Tullock (1962).⁴ Roughly, this literature trades off the cost of expropriating the minority and the benefit of approving valuable projects. However, each contribution relies on some kind of transaction cost since, without that, the Coase Theorem applies and all projects increasing total welfare are approved, simply by having the winners compensate the losers. The majority rule is then irrelevant for the selection of projects. This paper, in contrast, explains why the majority rule is crucial even when the transaction costs vanish. By dictating the extent to which winners must compensate losers, the majority rule determines the benefit of delegating to a winner relative to a loser. Using a similar model, Harstad (2005) shows the majority rule to determine the incentives to *invest* to become a winner of anticipated projects. The two models can thus be combined in studying how the voting rules distort delegation as well as the incentives to invest. Remarkably, the majority rule inducing sincere delegation is the very same rule inducing optimal investments.

The next section presents the simplest version of the model. Solving the game by backward induction, Section 3 shows how the principals have incentives to either delegate conservatively or progressively, depending on the policy and the political system. The optimal majority rule balances the strategic concerns, and induces sincere delegation by all principals. While this political game is quite stylized, Section 4 generalizes the game by discussing agenda-setting power, committees or sub-coalitions, coalition-discipline and the stability of coalitions. The connection between this paper and Harstad (2005) is discussed in Section 5, which combines the two models. Section 6 concludes.

(Hayes-Renshaw and Wallace, 1997, p. 2). Also for environmental policies, Weale (2002, p. 210) observes that "the Parliament has the general reputation of having a policy position that is more pro-environmental than the Council of Ministers".

⁴Recent contributors include Aghion and Bolton (2003), Barbera and Jackson (2006) and Maggi and Morelli (2006).

2. The Model

2.1. Preferences and Delegation

The model is applicable to several principal-agent situations. A particularly relevant example is the European Union, currently debating its future voting rules. To pin down ideas, I will therefore refer to the principals as "countries", and the agents as their representatives or delegates in the EU. A typical project is then whether to liberalize trade or public utilities. Such a proposal may be accompanied by a set of side transfers, and it is implemented if approved by the required majority m .

Let I represent the union of countries. Each country $i \in I$ (or its median voter,⁵ "she") selects a delegate i_d ("he"), characterized by his observable type $d_i \in \mathfrak{R}$. If $d_i > 0$, i 's delegate is "progressive" and generally has a higher value of liberalization than i herself. If $d_i < 0$, i 's delegate is a status quo biased "conservative" who is less in favor of liberalization than i herself. Formally, i_d 's value of the project is given by⁶

$$v_i^d = v_i + d_i,$$

where v_i is i 's own value of the project. Since the delegates may represent their countries for many projects and for a long time, they are appointed before the particular project, and thus its local value, are realized:

$$v_i = \epsilon_i + \theta.$$

ϵ_i and θ represent some random local and global preference shocks, respectively. Combined, $v_i^d = d_i + \epsilon_i + \theta$, and it is actually not important whether i and her delegate are affected by the very same shocks.⁷

⁵I am treating a country and its median voter as being the same, thus ignoring heterogeneity within countries. Such heterogeneity would in any case not be important when side payments are available, as I assume. Without side payments, however, Barbera and Jackson (2006) explain that heterogeneity within countries determines their optimal voting weights.

⁶This is in line with citizen-candidate models, and I thus do not allow the voters to specify an arbitrary payoff function for the delegate. If such contracts were possible, the number of equilibria would be much larger if the contracts were observable (Fershtman, Judd and Kalai, 1991), while the contracts may have little effect if they were unobservable (Katz, 1991).

⁷The analysis below only uses the combined equation $v_i^d = d_i + \epsilon_i + \theta$, so ϵ_i can be interpreted as the

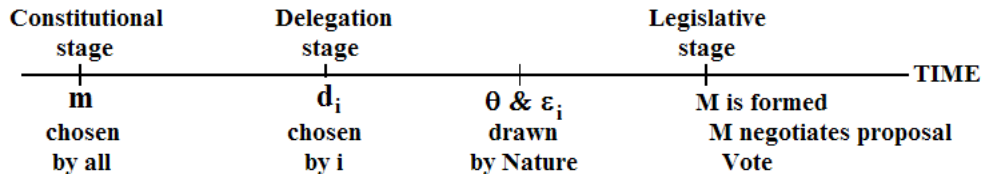


Figure 2.1: *Timing of the game*

The results hold for general distributions of the preference shocks. But to arrive at explicit solutions, let the ϵ_i s be independently drawn from a uniform distribution with mean zero and density $1/h$:

$$\epsilon_i \text{ iid } \sim U \left[-\frac{h}{2}, \frac{h}{2} \right].$$

If I is finite, the distribution of the ϵ_i s can take many forms, thus making the analysis quite complex. To simplify, let I be a continuum, $I \equiv [0, 1]$, such that the distribution of the ϵ_i s is deterministic and uniform on $[-h/2, h/2]$. Thus, if d_i is the same for all i s, h measures the heterogeneity in preferences between the delegates.

The state parameter θ measures the average (and aggregate) value of the project. θ can be negative, of course, since it includes the cost of the project. Let also θ be uniformly distributed:

$$\theta \sim U \left[a - \frac{\sigma}{2}, a + \frac{\sigma}{2} \right].$$

a is the expected average value of the project, and σ measures the variance in the aggregate shock (the variance of θ is $\sigma^3/12$).

2.2. The Legislative Stage

While Section 4 discusses generalizations, I start out by adopting the political game from Harstad (2005).

First, the majority coalition is formed. In line with Riker (1962), an initiator (for-mateur or president), randomly drawn among the delegates, selects a *minimum winning coalition* $M \subset I_d$ of mass m to form the majority, where I_d is the set of delegates.

individual shock to i_d 's value, or the uncertainty regarding i_d 's preference. What is crucial is that the principals cannot costlessly re-delegate at a later stage, e.g., after the shocks are observed. If that were possible, delegation would have less effect (McCallum, 1995, and Jensen, 1997).

Second, the representatives in M negotiate a political proposal. A proposal specifies whether the project should be implemented and, in either case, a set of regional transfers or taxes t_i . All representatives in the majority coalition must agree before the proposal is submitted for a vote, and I let the outcome be characterized by the Nash Bargaining Solution. Many scholars presume there to be some transaction costs related to transfers. As in Aghion and Bolton (2003), let a fraction λ of the taxes imposed on the minority $N \equiv I_d \setminus M$ be deadweight loss. The budget constraint is then $\int_{i_d \in M} t_i = - \int_{i_d \in N} (1 - \lambda)t_i$.⁸ Since I let $\lambda \rightarrow 0$, the results do not hinge on this particular kind of transaction cost.

Third, the vote takes place. For the proposal to be implemented, it must be *approved* by a fraction m of the delegates, where $m \in (0, 1]$ is the majority rule. Otherwise, all receive the status quo payoff of zero. In addition, the proposal must be *accepted* by *all* delegates: No delegate should prefer to cheat or "break out" to avoid implementing the project. If that were to happen, the status quo may remain but deviators would receive their reservation utility $-r$. Thus, r might be interpreted as the penalty for refusing to implement the public project. In some cases, r might be determined by the club's enforcement capacity (as in Maggi and Morelli, 2006). In other cases, r might be limited to protect minorities. For any of these interpretations, the project is implemented if and only if a representative's utility,

$$u_i^d = v_i^d - t_i,$$

is positive for a fraction m and larger than $-r$ for all. The principals' utilities are given by $u_i = v_i - t_i$.

2.3. The Cost of Strategic Delegation

As shown below, the sum of the principals' expected welfare is given by a constant minus $d^2/2\sigma$, where d is the average d_i . Thus, $d = 0$ is required for the optimal outcome. However, i herself generally prefers to strategically choose $d_i \neq 0$. To get interior solutions, let there also be some individual cost of delegation, given by $c_i d_i^2/2$. Such a cost may be reasonable, for several reasons.

⁸For these and similar integrals to be defined, the integrands are assumed to be piecewise continuous in i .

First, if there were $N < \infty$ countries, i would internalize $1/N$ of the social loss when delegating. If the other countries delegated "sincerely", i.e. $d_j = 0 \forall j \neq i$, i 's cost of disagreeing with her delegate would be $d_i^2/2\sigma N$, similar to the cost function above. This cost would vanish when $N \rightarrow \infty$, however.

Second, i 's delegate may, as a powerful politician, be able to influence a number n_i of purely *domestic* decisions regarding liberalization. For example, ministers in the European Council are, first of all, ministers in their home government, thus influencing several domestic as well as European decisions. Country i 's value of a typical domestic liberalization project may be given by some parameter θ_i ,

$$\theta_i \sim U \left[a_i - \frac{\sigma_i}{2}, a_i + \frac{\sigma_i}{2} \right].$$

But the delegate's value is $\theta_i + d_i$, recognizing that i and i_d quite generally have different views of liberalization. Since the delegate is deciding, a domestic project will be undertaken if $\theta_i + d_i \geq 0$. Country i 's expected utility of the domestic policies becomes:

$$n_i \int_{-d_i}^{a_i + \sigma_i/2} \theta_i \frac{d\theta_i}{\sigma_i} = \kappa - \frac{c_i}{2} d_i^2, \text{ where}$$

$$c_i \equiv \frac{n_i}{\sigma_i}$$

and $\kappa \equiv n_i (a_i + \sigma_i/2)^2 / 2\sigma_i$ is a constant. Thus, national decisions make strategic delegation costly, exactly as assumed above. Delegating to a very progressive representative ($d_i > 0$) is costly since he will liberalize too much nationally. Delegating to a conservative ($d_i < 0$) is costly because he will liberalize too little. These costs are higher the more domestic decisions (n_i) the delegate is making.

3. The Solution

3.1. The Benefits of Strategic Delegation

This section solves the game by backward induction. After the representatives are appointed, the legislative game begins. Since this stage of the game is similar to that in Harstad (2005), so is the outcome (and the proof, which is thus omitted):

Proposition 1. *Suppose the transaction cost $\lambda \rightarrow 0$.*

(i) *The project is undertaken if and only if it increases the delegates' average utility, i.e., if $\theta + d \geq 0$. Then:*

(ii) *All delegates $i_d \in N$ receive their reservation utility,*

$$u_i^d = u_N \equiv -r \forall i_d \in N.$$

(iii) *All delegates $i_d \in M$ receive the utility*

$$u_i^d = u_M \equiv \frac{\theta + d + r(1 - m)}{m} \forall i_d \in M.$$

(iv) *The majority coalition consists of the delegates with the highest value of the project, $M = \{i_d | v_i^d \geq v_m\}$, where v_m is the $(1-m)$ -fractile of the v_i^d s.⁹*

Part (i) says that the project is implemented if and only if the delegates' aggregate surplus is positive. Since the delegates make the actual decision, they implement it whenever it is in *their* interest. Thus, if the delegates are on average conservative ($d < 0$), they implement too few projects, leading to a status-quo bias. If the delegates are on average progressive ($d > 0$), they implement too many projects. These welfare losses are given by $d^2/2\sigma$.¹⁰

Note that the distribution of the benefits across the delegates plays no role for whether the project is implemented, since side transfers can be made between the countries. Thus, the majority rule does not affect whether the project will be approved either. This result resembles the Coase Theorem, and it holds because the transaction costs approach zero.¹¹

Part (ii) states that all minority representatives are kept at their reservation utility. This is not surprising, since the majority does not need their approval. If the project is proposed, keeping i_d at his reservation utility implies

$$t_i = v_i^d + r \forall i_d \in N.$$

⁹If all countries choose the same d_i , $d = d_i$ and

$$v_m = \theta + d + h \left(\frac{1}{2} - m \right).$$

¹⁰The sum of the principals' welfare is $\int_{-d}^{a+\sigma/2} \theta d\theta / \sigma = (a + \sigma/2)^2 / 2\sigma - d^2/2\sigma$.

¹¹This contrasts the earlier literature by Wicksell (1896), Buchanan and Tullock (1962) and Aghion and Bolton (2003), emphasizing a relationship between the majority rule and the selection of projects. As pointed out in Harstad (2005), the traditional literature does not fully take side payments into account.

These tax revenues, plus the entire surplus of the project, are shared by the majority coalition. Part (iii) states that all majority members receive the same payoff after the negotiations, which implies that delegates favoring the project a great deal, must compensate those favoring it less. Intuitively, a delegate's eagerness reduces his bargaining power, and he is hold up by the other delegates unless he gives in by transferring some of his benefits to the other coalition members. Using the Nash Bargaining Solution, the transfers are

$$t_i = v_i^d - u_M \forall i_d \in M.$$

In sum, i is taxed more if her delegate is progressive than if he is conservative, whether he is in the minority or in the majority.

Part (iv) states that the majority coalition consists of the delegates most in favor of the project. If the project is good ($\theta + d \geq 0$), *any* initiator prefers to form the majority coalition with the delegates having the highest possible values v_i^d s.¹² These progressive delegates do not need to receive (much) compensation to approve the project, and they are instead willing to compensate the losers.¹³ However, if the project is bad ($\theta + d < 0$), it will not be implemented and the majority's surplus ($r(1 - m)$) is independent of the composition of the majority coalition. Suppose then that the initiator randomly selects coalition members, giving everyone zero expected utility.

3.2. Strategic Delegation and the Voting Rule

At the delegation stage, country i delegates by selecting d_i . There are two reasons why i may delegate strategically by choosing $d_i \neq 0$.

On the one hand, a low d_i reduces the transfers to be paid by country i . Notwithstanding whether the country becomes a majority or minority member, a conservative delegate

¹²The randomly drawn initiator may have a low value of the project, but his size is negligible.

¹³To some extent, a winner's surplus v_i^d could be expropriated (by taxes) even if he were excluded from the coalition, but a fraction λ of these tax revenues would disappear as transaction costs. Thus, arbitrarily small transaction costs induce the initiator to select the losers (with low λv_i^d) as minority members. That the majority coalition will consist of the winners is simply assumed by Aghion and Bolton (2003), conjectured by Axelrod (1970), and derived by Ferejohn, Fiorina and McKelvey (1987) in a slightly different model.

(small v_i^d) raises i 's *bargaining power* (bp), and the tax t_i decreases correspondingly:

$$t_i = \left\{ \begin{array}{l} v_i + d_i + r \text{ if } i_d \in N \\ v_i + d_i - u_M \text{ if } i_d \in M \end{array} \right\}. \quad (\text{bp})$$

On the other hand, a high d_i makes it more likely that i_d becomes a member of the majority coalition, since this coalition consists of the most enthusiastic representatives. There will be some threshold v_m (the $(1-m)$ -fractile of the v_i^d 's) such that all representatives valuing the project more than v_m become coalition-members, while all those valuing the project less become minority members. Thus, a large d_i may increase country i 's *political power* (pp). Since v_i^d is uniformly distributed with mean $d_i + \theta$, the probability of becoming a majority-member is:¹⁴

$$p(d_i) \equiv \Pr(v_i^d \geq v_M) = \frac{d_i + h/2 + \theta - v_m}{h}. \quad (\text{pp})$$

These two effects work in opposite directions. To increase the bargaining power, it is tempting to delegate conservatively, since such a delegate would be better able to receive compensation from the others. To increase the political power, however, it is tempting to delegate progressively. The choice of delegate depends on what is most important. Formally, i 's problem is:

$$\text{Max}_{d_i} E \int_{-d}^{a+\frac{\sigma}{2}} (v_i - t_i) \frac{d\theta}{\sigma} - \frac{c_i}{2} d_i^2 \quad \text{s.t. (bp) and (pp)}. \quad (3.1)$$

The first-order conditions can be derived straightforwardly (the second-order conditions are trivially fulfilled):

$$\begin{aligned} c_i d_i &= \left([Eu_M - u_N] \frac{1}{h} - 1 \right) q, \text{ where} & (\text{FOC}) \\ Eu_M - u_N &= \frac{r + a/2 + \sigma/4 + d/2}{m} \text{ and} \\ q &\equiv \Pr(\theta \geq -d) = \frac{1}{2} + \frac{a + d}{\sigma}. \end{aligned}$$

¹⁴To be accurate, the probability should be written as:

$$\Pr(v_i^d \geq v_M) = \left\{ \begin{array}{ll} 0 & \text{if } (d_i + \sigma/2 + \theta - v_m)/h < 0 \\ (d_i + h/2 + \theta - v_m)/h & \text{if } (d_i + \sigma/2 + \theta - v_m)/h \in [0, 1] \\ 1 & \text{if } (d_i + \sigma/2 + \theta - v_m)/h > 1 \end{array} \right\}.$$

The Appendix derives the condition for when p will be interior (basically, the requirements are that m should not be too far away from its optimum, and heterogeneity in the c_i 's should not be too large).

q is the probability that the project will be approved.

The brackets in (FOC) capture the benefit of political power. This benefit is smaller if m is large, for two reasons: the minority $(1 - m)$ which the majority can expropriate is then small and the total surplus is shared between more majority members. Thus, the gains from political power decrease in m , as does the incentive to delegate progressively. The larger is the majority rule, the less progressively, or the more conservatively, does i delegate. Note that this leads to a status quo bias when the majority rule is large, since countries then delegate conservatively and conservative delegates are less likely to approve projects. If the majority rule is instead small, countries delegate progressively and too many projects are approved.

The benefits of political power increase in the enforcement capacity r , since the minority is then expropriated more and the revenues shared by the majority are larger. Thus, the more the majority can expropriate the minority, the more progressively the countries delegate, and the more projects will be approved.

Notice that d_i also depends on the nature of the policy. If the project is likely to be valuable (a large), the surplus shared by the majority coalition is larger and, to become a member of this coalition, the countries delegate progressively.¹⁵ If the heterogeneity in preferences, h , is large, the delegates' values are so widely distributed that country i 's chances of gaining political power, $\Pr(v_i^d \geq v_M)$, increase just a little by increasing d_i . Delegation is not very effective in gaining political power, and the countries delegate conservatively to gain bargaining power instead.¹⁶

The left-hand side of (FOC) is the marginal *cost* of delegation. The larger is the cost c_i , the less is the country willing to deviate from sincere delegation (implying a smaller $|d_i|$). As explained in Section 2.3, the cost of delegation may be due to a large n_i , the number of domestic decisions made by the delegate. The greater is the number of domestic decisions, the less a country deviates from sincere delegation.

¹⁵To be precise, what motivates progressive delegation is the delegates' value of the project *conditional on the project being approved*. This conditional value is $(a + \sigma/2 + d)/2$, explaining why σ appears in the equations.

¹⁶The second term in (FOC), -1 , reflects the loss of bargaining power when d_i increases. Both the effects on bargaining power and political power are multiplied by q , the probability that the project will actually be approved (if it is not, political power and bargaining power are both useless).

Finally, d_i is also a function of d , the average level of delegation. If d is large, the delegates value the project a lot and it becomes more important to become a majority-member, sharing this surplus. Multiple or unstable equilibria therefore seem possible. But the Appendix proves (under certain conditions¹⁷) that the equilibrium exists, is unique, stable and possesses the comparative static just discussed.

Proposition 2.

(i) *All countries delegate conservatively ($d_i < 0 \forall i$) if m and h are large while r and a are small, while they delegate progressively ($d_i > 0 \forall i$) otherwise:*

$$\text{sign } d_i = \text{sign} \left(\frac{r + a/2 + \sigma/4}{mh} - 1 \right). \quad (3.2)$$

(ii) *Countries with small c_i choose larger $|d_i|$:*

$$\frac{\partial |d_i|}{\partial c_i} < 0 \text{ if } \left(\frac{r + a/2 + \sigma/4}{mh} - 1 \right) \neq 0. \quad (3.3)$$

3.3. The Optimal Majority Rule

The above section showed that each country’s choice of delegate d_i is (inversely) proportional to c_i . Generally, therefore, the d_i s will differ across countries.

However, the *signs* of the d_i s are the same for all countries. For every country, the sign of d_i depends on the comparison between bargaining power (which makes a negative d_i tempting) and political power (which makes a positive d_i tempting). By equalizing the effects on political power and bargaining power, the two forces cancel and all countries delegate sincerely.

Proposition 3. *All countries delegate sincerely if and only if $m = m^*$. m^* increases in the enforcement capacity r and the project’s value a , but decreases in ex post heterogeneity h .¹⁸*

$$m^* = \frac{r + a/2 + \sigma/4}{h} \quad (3.4)$$

¹⁷Basically, the conditions are that m should not be too far away from its optimal level and the c_i s should be sufficiently large and similar.

¹⁸If (3.4) implies that $m^* > 1$, then $d > 0$ for any $m < 1$ and sincere delegation is not attainable by any fixed majority rule. However, if the local shocks ϵ_i had bell-shaped probability density functions, d would decrease a great deal when m approached 1, and m^* would always be less than 1. Therefore, from now on I simply presume m^* to be interior.

If the minority can be considerably expropriated (r large) and the project is very valuable (a large), it is very beneficial to be a member of the majority coalition, sharing all these revenues. The countries are then tempted to delegate progressively, particularly if the heterogeneity h is small, since gaining political power is then heavily influenced by d_i . To discourage progressive delegation, m should increase. A larger m makes political power less attractive, and the incentives to delegate progressively fade away. Thus, a larger majority requirement (m) can substitute for poor minority protection (r large); more important issues (where a is large) should require larger majorities; while a smaller majority should suffice if preferences are very heterogeneous.¹⁹

4. Political Institutions and Strategic Delegation

The legislative game above is simple and it can easily be extended. This section generalizes the political game in four directions. Each extension is discussed in isolation, although it is straightforward to combine them.

4.1. Agenda-Setting Power

Above, the sole role of the "initiator" was to form a majority coalition. Once done, the coalition-members negotiate an outcome giving them all the very same payoff. In reality, the initiator, as a president or agenda-setter, may have additional bargaining power, perhaps simply because he can make the first offer (after which there may be some delay before a second offer can be made). In such cases, the initiator will be able to capture a larger share of the total surplus than the other coalition members.

Suppose, as an example, that if the initiator's offer is rejected, there is some delay before another proposer is randomly drawn from M to make a final take-it-or-leave-it offer. Letting $\delta < 1$ represent the discount factor, each coalition-member's expected payoff is δu_M by rejecting the initiator's offer, where u_M is exactly the same as before.

¹⁹In line with footnote 15, what is important is the project's value conditional on being accepted ($a/2 + \sigma/4$), which explains why σ enters the equation.

Note that m^* does *not* depend on the cost of delegation c_i . When $m = m^*$, the marginal benefit of delegation is zero. Then, there are no incentives to delegate strategically, no matter what the costs should be.

Thus, the initiator captures a fraction $(1 - \delta)$ of the surplus, just because he makes the first offer.

Anticipating the payoff $\delta E u_M$ as coalition-members, the incentives to delegate are now given by:

$$c_i d_i = q \left(\frac{\delta E u_M - u_N}{h} - 1 \right), \quad (\text{FOC}_\delta)$$

where q , u_M and u_N are defined as before. It follows that d_i increases in δ : If the agenda-setter is powerful (δ small), the countries delegate conservatively ($d_i < 0$) since the value of gaining political power is small, and bargaining power is relatively more important.²⁰

Just as before, sincere delegation is achieved if the effects on bargaining and political power cancel. Since a more powerful initiator leads to conservative delegation, the majority rule should decrease to encourage sincere delegation.

$$m_\delta^* = \frac{\delta(r + a/2 + \sigma/4)}{h - r(1 - \delta)}.$$

Proposition 4. (i) *The d_i s increase in δ , and (ii) so does the optimal majority rule m_δ^* .*

4.2. Committees and Sub-Coalitions

So far, I have simply assumed the majority coalition M to be of size m , the required majority for proposals to be approved. This is in line with Riker's (1962) prediction of a "minimum winning coalition". In some cases, however, the size of M may be smaller than m (or larger, as in the next subsection).

One reason for this is committees or sub-coalitions. In many political systems, the political proposal is negotiated in small coalitions (or minority governments), although the proposal eventually needs to be approved by a larger majority. To reflect this possibility, suppose that the initiator first selects a minimum-winning coalition $\underline{M} \subset I_d$ of mass \underline{m} , which negotiates a proposal. All members of \underline{M} must agree before the proposal is submitted as a take-it-or-leave-it offer to the rest. Just as before, the proposal is implemented if approved by a fraction \underline{m} ($u_i^d \geq 0 \forall i_d \in \underline{M}$) and accepted by all ($u_i^d \geq -r \forall i_d$).

²⁰The probability of gaining $(1 - \delta)u_M$ as the initiator is independent of d_i .

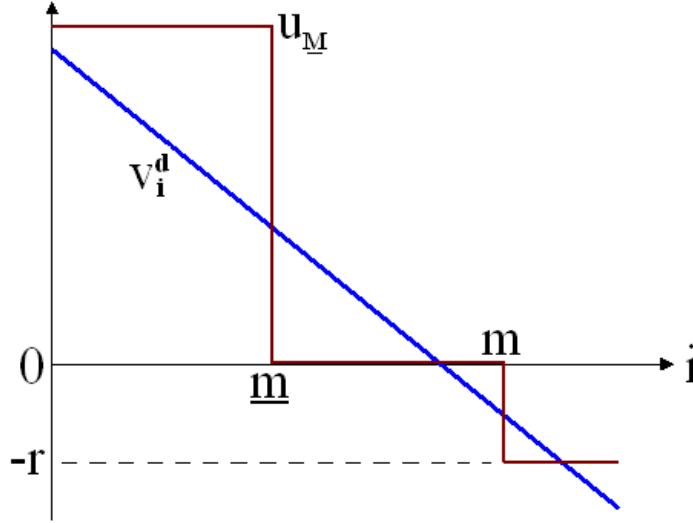


Figure 4.1: If $d_i = d_j \forall i, j \in I$, the delegates' values of the project are represented by the straight, downward-sloping, line, while their utilities of the proposal are represented by the step-function. The \underline{M} -coalition shares all the surplus, while the minority-members receive their reservation utility only. Transfers make up for the difference between the two lines.

Just as before, the minority $N = I_d \setminus M$ is expropriated and receives payoff $-r$. To minimize the transfers, any initiator will form the \underline{M} -coalition with the \underline{m} representatives who have the largest v_i^d s, while the representatives with smallest v_i^d s will be in the minority N .²¹ The other representatives ($M \setminus \underline{M}$) receive zero payoff, just enough to make them approve the proposal. Maximizing the expected payoff, the first-order condition becomes

$$c_i d_i = q \left(\frac{Eu_{\underline{M}} - u_N}{h} - 1 \right), \quad (\text{FOC}_{\underline{m}})$$

similar to before. However, since the total surplus is divided by only $\underline{m} < m$ winners, each of them receives the expected utility

$$Eu_{\underline{M}} = \frac{r(1 - m) + a/2 + \sigma/4 + d/2}{\underline{m}}.$$

The \underline{M} -members' payoff $u_{\underline{M}}$ decreases in m , since a larger m reduces the size of the minority which can be expropriated, as well as in \underline{m} , since a larger \underline{m} implies that the surplus must be shared by more \underline{M} -members. Hence, d_i decreases in both m and \underline{m} .

²¹This minimizes the transfers and thus, the transaction costs. Formally, the argument justifying this coalition formation requires some marginal transaction costs, cfr. footnote 13.

Sincere delegation, $d = 0$, is achieved by setting the right-hand side of (FOC $_{\underline{m}}$) equal to zero, which requires:

$$mr + \underline{m}(h - r) = r + a/2 + \sigma/4.$$

Proposition 5. (i) d_i decreases in \underline{m} as well as in m . (ii) The optimal m decreases in \underline{m} .

The two majority thresholds m and \underline{m} are therefore substitutes when it comes to delegation. One can increase if the other decreases. As long as $mr + \underline{m}(h - r)$ remains the same, delegation is sincere.²²

4.3. Imperfect Coalition Discipline

Side payments are crucial for the argument in this paper. Using that, the "winners" can bribe "losers" to approve the project. Only the majority members propose such bribes in the model, however. This is justified if the majority coalition "controls the chair" and makes all proposals itself; if it has "coalition discipline" and can ignore any proposals by the minority; or if the majority coalition can always make the final offer.

However, if the majority coalition does not control the chair, or if it does not have coalition discipline, then Baron (1989) shows that the majority coalition will be larger than m , curbing some of the minority's power. A super-majority coalition is also predicted if the losing party can make a final proposal, as explained by Groseclose and Snyder (1996), and they argue that this timing is indeed more reasonable in many situations.

To capture these ideas, suppose that the minority coalition N can bribe M -members to reject the proposal after it has been negotiated. Then, if there exist *any* blocking coalition (of a size marginally larger than $1 - m$) with a negative aggregate surplus of the proposal, the losers will be able to distribute bribes in such a way that they will all benefit from blocking the proposal. To prevent this from happening, M must ensure that

²²By comparing this and the previous subsections, concentrating majority power (small \underline{m}) and agenda-setting power (small δ) have *opposite* effects on the optimal m . The explanation is that while the initiator is randomly drawn, \underline{M} consists of the most progressive delegates. Thus, higher agenda-setting power *reduces* the incentives to delegate progressively, while concentrated majority-power *increases* this incentive.

no blocking coalition receives a negative total surplus:

$$\int_{i \in C} u_i^d di \geq 0 \forall C \subset I \text{ s.t. } \|C\| > 1 - m. \quad (4.1)$$

One way of doing this is to give every minority-member a payoff of zero. This is actually the cheapest way of satisfying (4.1) if $\underline{m} < m$,²³ and I thus assume this to be the case. By giving all minority members zero utility ($u_N = 0$), there can be no attempt of bribing majority members to reject the proposal. This is equivalent to setting $r = 0$, which clearly reduces the value of being in the majority coalition, making the countries tempted to delegate conservatively. To prevent this, the majority rule should be accordingly smaller.

Proposition 6. *Without coalition discipline, the countries delegate conservatively unless the majority rule is smaller and given by:*

$$m_{nd}^* = \frac{a/2 + \sigma/4}{h}.$$

4.4. Coalition Stability and Strategic Delegation

Crucial for the argument above is that the majority coalition consists of the representatives with the highest valuation of the project. This arises as an equilibrium phenomenon and it is often simply assumed elsewhere in the literature (see footnote 13). In reality, however, there may be other reasons for selecting coalition members, not only their valuation of the project.

Suppose that, with probability s , the coalition is formed independently of the v_i^d s. This may be the case if, for example, the issue is perceived to be less important and not worthwhile the formation of a new coalition. Alternatively, some earlier coalition may already exist and this may be stable with probability s . If s is large, then a progressive delegate is not that much more likely to become a member of the majority coalition, and the countries may instead delegate conservatively since this, at least, increases their bargaining power. The first-order condition becomes:

$$c_i d_i = q \left((1 - s) \left[\frac{Eu_M - u_N}{h} \right] - 1 \right), \quad (\text{FOC}_s)$$

²³Since then, (4.1) must hold for all sub-coalitions of $I_d \setminus \underline{M}$ of size m .

where u_M , u_N and q are just as before. Sincere delegation is ensured by making the parenthesis zero. This requires:

$$m_s^* = (1 - s) \frac{r + a/2 + \sigma/4}{h}.$$

Proposition 7. (i) d_i decreases in s . (ii) The optimal majority rule m_s^* decreases in s .

Thus, less important issues, where coalitions are likely to be formed independently of the v_i^d s, should be taken by smaller majority rules. This complements the conclusion in Section 3.3 that less valuable projects (lower a) should be taken by smaller majority rules.

5. Strategic Investments, Delegation and Voting Rules

While Section 2 borrowed the political game from Harstad (2005), the *focus* is very different in the two papers. While this paper analyzes strategic delegation, Harstad (2005) studies countries' *investments* to increase their private value of the project. Achieving one goal (optimal investment *or* delegation) by one instrument (m) seems fair enough, but how can we best address both problems simultaneously?

To answer this question, suppose each country makes multiple choices at the delegation stage: In addition to appointing a delegate, i makes an investment x_i in the project, at cost $c_x(x_i)$. Such an investment may be to liberalize domestically or in another way increase i 's value (or reduce her cost) of international liberalization. In addition, suppose that i can also invest y_i , at cost $c_y(y_i)$, to increase her value of the *status quo* (by, for example, investing in industries where i has a comparative disadvantage). Thus, if the project is *not* implemented, i 's expected payoff is y_i . Relative to the status quo, therefore, i 's value of the public project is:

$$v_i = x_i - y_i + \theta + \epsilon_i. \quad (\text{de})$$

The delegate's value is $v_i^d = v_i + d_i$, just as before. With these modifications, i 's problem becomes:

$$\text{Max}_{d_i, x_i, y_i} E \int_{-d-x+y}^{a+\frac{\sigma}{2}} (v_i - t_i) \frac{d\theta}{\sigma} - \frac{c_i}{2} d_i^2 - c_x(x_i) - c_y(y_i) \quad \text{s.t. (de), (bp), (pp)} \Rightarrow$$

$$c_i d_i = q \left(\frac{Eu_M - u_N}{h} - 1 \right) \quad (\text{FOC}_d)$$

$$c'_x(x_i) = q \left(\frac{Eu_M - u_N}{h} \right) \quad (\text{FOC}_x)$$

$$c'_y(y_i) = 1 - q \left(\frac{Eu_M - u_N}{h} \right), \text{ where} \quad (\text{FOC}_y)$$

$$q \equiv \Pr(\theta + x - y \geq -d) = \frac{1}{2} + \frac{a + (d + x - y)}{\sigma} \text{ and,}$$

$$Eu_M - u_N = \frac{r + (a + d + x - y)/2 + \sigma/4}{m}$$

x and y are the average of x_i and y_i .

Thus, for large m , i delegates conservatively, just as before (FOC_d). In addition, she invests little in the project, since large investments would reduce her bargaining power (FOC_x). Instead, i invests a great deal in the status quo, since this increases her bargaining power (FOC_y). If m is small, on the other hand, it is very beneficial to be a member of the majority coalition, and the countries will act accordingly. To increase the chance of becoming majority-members, i will delegate progressively, invest a great deal in the project and little in the status quo.

The socially optimal choices, however, can be shown to be:

$$c_i d^* = 0$$

$$c_x(x^*) = q$$

$$c_y(y^*) = 1 - q.$$

By comparison, setting $Eu_M - u_N = h$ aligns the equilibrium with the first-best.

Proposition 8. *All d_i , x_i , and y_i are socially optimal if and only if the majority rule is*

$$m^* = \frac{r + \tilde{a}/2 + \sigma/4}{h}, \text{ where}$$

$$\tilde{a} \equiv a + x^* - y^*$$

is the project's average value under optimal investment levels.

Intuitively, whether i delegates, invests in the project or in the status quo, her action can affect her utility in three ways: First, there may be a direct effect (de), taking the transfers as given. Second, there is an effect on her bargaining power (bp), taking her

political power as given. Third, i 's choices may affect whether i_d will be a member of the majority coalition (pp). From a social point of view, only the first, direct, effect is of any value. Thus, to prevent distorted choices, the values of less bargaining power and better chances of obtaining political power should nullify each other. This can be done by adjusting the majority rule, and this condition is the same no matter how i tries to affect her (and her delegate's) value.

The principle of equalizing the effects on bargaining power and political power naturally holds also for the legislative extensions studied in the previous section. Whether (1) the agenda-setter becomes more powerful (δ decreases); (2) the coalition less powerful (\underline{m} increases); (3) the coalition-discipline lower; or (4) the coalitions more stable (s increases), the value of being in the majority coalition decreases, and so do d_i and x_i , while y_i increases. Reducing the majority rule restores optimality for all these choices.²⁴

With this insight, it is tempting to conclude that the same majority rule can always induce optimal investments as well as delegation. Let me, instead, mention some limitations of this result. The rule for m^* above assumes there to be no externalities related to the investments. If such externalities were positive, the countries would invest too little under m^* , since they would not be motivated to take these into account. If the externalities were negative, they would invest too little. As shown in Harstad (2005), such externalities can be internalized by adjusting m . If the externality is positive (negative), a smaller (larger) majority rule increases (decreases) investments, inducing first-best investment levels. To internalize externalities, the sum of the bargaining power and political power effects should *not* be zero, but equal to the externality. Obviously, this is not possible

²⁴We can also draw lessons from the previous study of majority rules and incentives. In particular, Harstad (2005) studied asymmetry in size and initial conditions. Then, countries which initially have large values of the project may anticipate becoming majority members, almost with certainty. The incentives to increase this likelihood are then small, as are their investments in the project. Allowing for delegation, such countries would delegate conservatively since bargaining power would be more important. The same would be the case for countries initially having very *low* values of the project, since these would expect their chances of obtaining political power to be negligible in any case. How can optimality be restored in such a situation? As shown in Harstad (2005), the effects on bargaining power and political power can still be equalized, for all countries, by appropriately weighting the votes. In particular, countries who are initially ill-prepared should have more voting power, while countries with high initial values should have less voting power. This would make all countries uncertain concerning their future political power, they would all have first-best incentives to invest, and would therefore delegate sincerely. The same can be achieved if the countries are of different sizes, by giving more voting power to large countries (the vote shares should be less than proportional to size, however).

if the externalities for x_i and y_i are different and, in any case, such adjustments would lead to strategic delegation. With externalities there are no majority rule which induces optimal investments as well as sincere delegation.

6. Concluding Remarks

There is a large literature on strategic delegation, in bargaining as well as politics. But there are conflicting views on the direction of such delegation, and few studies on how it can be mitigated. This paper shows that principals may either delegate conservatively or progressively, depending on the political system in general, and the majority rule in particular. If the majority requirement is large, the principals appoint more status quo biased representatives. The direction and magnitude of strategic delegation also depend on the characteristics of the relevant policy and the political system, but "sincere" delegation can always be achieved by carefully selecting the majority rule. If the agenda-setter becomes more powerful, for example, the majority rule should decrease.

The European Union is a particularly relevant example since its rules are subject to change, and since the rules vary across its chambers and policies. While the Commission and the Parliament apply simple majority rules, the Council typically requires qualified majorities or unanimity. Based on this, Proposition 2 predicts that the representatives in the Council should be more protectionistic (status quo biased) than the Commission and the Parliament. This indeed seems to be the case, as discussed in the Introduction.

The voting rules applied by the EU are probably influenced by many factors, and it is unlikely that they equal the normative recommendations above. Nevertheless, it is interesting to notice that more important issues (e.g. trade agreements with third parties) require unanimity or qualified majorities, while for less important issues (regarding implementation or "procedural" issues), a simple majority suffice.²⁵ This is consistent with Proposition 3. Moreover, the heterogeneity increases when the EU expands, and the proposed Constitution gives the president more power. Both changes should lead to a smaller majority rule, according to Propositions 3 and 4. And smaller majority requirements are, indeed, a part of the suggested Constitution.

²⁵For details on the current rules, see Hix (2005).

Widely interpreted, the results make predictions beyond the relationship between delegation and voting rules. Delegation is often implemented by institutional rules, not necessarily by selecting representatives. For example, Haller and Holden (1997) show how groups (such as districts or countries) may require a local super-majority for the proposal to be ratified in order to gain bargaining power. This, in effect, delegates the ratification decision from the median voter to a more reluctant citizen. Such delegation is, in this paper, argued to be desirable when the federal majority rule is large. Combined, the prediction is a positive correlation between the majority requirements at the federal (or international) and the local level. If e.g. the EU applies large super-majority rules, political power is not very important and to gain bargaining power, each country may require a domestic super-majority for proposals to be ratified.

Instead of strategic delegation, Fershtman, Judd and Kalai (1991, p. 551) noticed that "sending an agent can be equivalent to *credibly* reporting a distorted utility function". If values are privately known, therefore, one may expect that the same incentives arise when announcing these values, as when appointing delegates, studied in this paper. When the majority rule is large, a principal may want to report a low value to gain bargaining power. If the majority rule is instead small, she may want to report a large value to gain political power. Truthful revelation may be possible at the appropriate rule. However, reporting privately known types may not be that "credible", breaking its equivalence with strategic delegation. The results of this paper are thus not directly applicable to a situation with private information, which therefore needs a separate analysis.

7. Appendix

PROOF OF PROPOSITION 2: Deriving (FOC) from (3.1) is straightforward. This appendix (i) derives the explicit function for d , (ii) derives Proposition 2 from (FOC) under specified conditions, (iii) explains why and when the constraints on $p(d_i) \in [0, 1]$ do not bind under (FOC), and (iv) explains why and when FOC is sufficient (by comparing with the corner solution $p = 0$).

(i) Integrating (FOC) over all the d_i s gives:

$$\begin{aligned} d &= \frac{1}{c} \left(\frac{1}{2} + \frac{a+d}{\sigma} \right) \left(\frac{r + a/2 + \sigma/4 + d/2}{mh} - 1 \right) \\ &= \frac{1}{2c\sigma mh} \left(d^2 + d(2r + 2a + \sigma - 2mh) + \left(a + \frac{\sigma}{2} \right) \left(2r + a + \frac{\sigma}{2} - 2mh \right) \right) \end{aligned} \quad (7.1)$$

where $1/c \equiv \int_I 1/c_i di$. The right-hand side of (7.1) is a U-shaped function of d which *may* cross the 45-degree line. Such a crossing is clearly necessary for there to be an equilibrium for d . Moreover, the right-hand side must cross from above for this equilibrium to be stable (and then it is uniquely so). Thus, of the two values for d which may fulfill (7.1), we should look for the smallest. Deriving this d from (7.1) gives:

$$\begin{aligned} d &= K - \sqrt{K^2 - \left(a + \frac{\sigma}{2} \right) (a + \sigma/2 + 2r - 2mh)}, \\ &= K - \sqrt{K^2 - 2h \left(a + \frac{\sigma}{2} \right) (m^* - m)} \text{ where} \\ K &\equiv mh\sigma c + mh - a - \sigma/2 - r = mh\sigma c + mh - 2m^*h + r \\ &= mh(\sigma c - 1) + 2h(m - m^*) + r \text{ and} \\ m^* &= (r + a/2 + \sigma/4) / h. \end{aligned} \quad (7.2)$$

Thus, d is a real number if the root of (7.2) is positive, requiring that

$$m^* - m \leq \frac{K^2}{2h(a + \sigma/2)},$$

i.e., that m is not too much smaller than the optimal rule. If this condition does *not* hold, then the right-hand side of (7.1) is always larger than d , making d increase until some countries give up the prospects of political power (selecting d_i such that $p(d_i) = 0$), which is discussed in point (iv) below.

(ii) Note that $K > 0$ if m and c are not too small. Then, $d = 0$ if $m = m^*$, $d < (>)0$ if $m > (<)m^*$. And, since d_i increases in d , $d_i < (>)0$ if $m > (<)m^*$ as well (this follows from (FOC)). This proves (3.2). (FOC) also implies (3.3), whatever the sign of d_i .

(iii) Above, I simply assumed p to be interior between 0 and 1. When is this the case under (FOC)? Since, in equilibrium, m representatives become coalition-members, we may label $A \in I$ the "average" principal if her chance of becoming a coalition member

is m at the delegation stage. This means:

$$\begin{aligned}\Pr(v_A^d > v_m) &= (d_A + h/2 + \theta - v_m) / h = m \Rightarrow \\ v_m &= d_A + h/2 - hm + \theta.\end{aligned}$$

Then, i 's chance of being a coalition member is (using (FOC)):

$$\begin{aligned}\Pr(v_i^d > v_m) &= (d_i + h/2 + \theta - v_m) / h \\ &= m + d_A (c_A/c_i - 1) / h,\end{aligned}\tag{7.3}$$

if (7.3) is no more than 1. If this is at least 1, then i becomes a coalition-member for sure.

This requires:

$$\begin{aligned}d_A (c_A/c_i - 1) &\geq h(1 - m) \Rightarrow \\ (1/c_i - 1/c_A) \left(\frac{r + a/2 + \sigma/4 + d/2}{mh} - 1 \right) q &\geq h(1 - m) \Rightarrow \\ (1/c_i - 1/c_A) \left(\frac{(m^* - m) + d/2h}{m} \right) q &\geq h(1 - m),\end{aligned}$$

i.e., that c_i and c_A are very different, and that m and m^* are very different (as noted, also d increases in $(m^* - m)$). If $m < m^*$, $d > 0$ and countries with *small* c_i appoint the most progressive representatives. These may anticipate M -membership with certainty and they can reduce d_i until $p(d_i) = 1$ binds. If instead $m > m^*$, $d < 0$ and countries with *large* c_i appoint the most progressive representatives. These may anticipate M -membership with certainty and they can reduce d_i until $p(d_i) = 1$ binds. However, for m close to m^* , or with small variation in the c_i s, no country is certain of being a coalition-member. The reason is that for $m \approx m^*$, the d_i s are small as are the differences in the d_i s.

If (7.3) is less than zero, then i is a minority member for sure. This requires:

$$\begin{aligned}d_A (c_A/c_i - 1) &\leq -mh \Rightarrow \\ (1/c_i - 1/c_A) \left(\frac{r + a/2 + \sigma/4 + d/2}{mh} - 1 \right) q &\leq -mh \Rightarrow \\ (1/c_A - 1/c_i) \left(\frac{(m^* - m) + d/2h}{m} \right) q &\geq mh,\end{aligned}\tag{7.4}$$

i.e., that c_i and c_A are very different, and that m and m^* are very different. For m close to m^* , for example, no country is certain of being a minority-member. The reason is that

for $m \approx m^*$, the d_i s are small as are the differences in the d_i s. If (7.4) holds, however, i gives up on political power and selects d_i only to maximize bargaining power. This is studied next.

(iv) Suppose that i gives up on political power. Her maximization problem then becomes:

$$\text{Max}_{d_i} E \int_{-d}^{a+\frac{\sigma}{2}} (v_i - t_i) \frac{d\theta}{\sigma} - \frac{c_i}{2} d_i^2 \quad \text{s.t. (bp) and } (i \in N) \Rightarrow c_i d_i = -q.$$

Her expected payoff (including the cost of delegation) becomes:

$$q(-r - d_i) - \frac{c_i}{2} d_i^2 = \frac{q^2}{2c_i} - qr. \quad (7.5)$$

This payoff should be compared to the payoff when i chooses d_i according to (FOC) (this check is necessary since $p(d_i)$ is non-concave). Of particular importance is i 's payoff when $m = m^*$ and everyone else chooses $d_i = 0$. If i does the same, her payoff is simply the average value of the policy:

$$q(a/2 + \sigma/4).$$

This is indeed better than (7.5) when:

$$\begin{aligned} q(a/2 + \sigma/4) &\geq \frac{q^2}{2c_i} - qr \Leftrightarrow a/2 + \sigma/4 \geq \frac{1}{2c_i} \left(\frac{a + \sigma/2}{\sigma} \right) - r \Leftrightarrow \\ r &\geq \left(\frac{a}{2} + \frac{\sigma}{4} \right) \left(\frac{1}{\sigma c_i} - 1 \right). \end{aligned} \quad (7.6)$$

Thus, if r is large, or if $c_i \geq 1/\sigma$, then no i will only maximize bargaining power when $m = m^*$. Note that $c_i \geq 1/\sigma$ if, for example, $n_i \geq 1$ and $\sigma_i = \sigma$. If (7.6) does not hold, then countries with small c_i s will choose $d_i = -q/c_i$ instead of $d_i = 0$, even when $m = m^*$. There is then no m which makes all countries delegate sincerely. *QED*

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