Lobbying and Legislative Bargaining*

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1 Introduction

Economic policymaking in modern democracies generates a great deal of special-interest politics. In policy areas such as public finance, trade policy, and regulation, policy decisions create benefits for well-defined groups with the cost borne by society at large.

Given the difficulties with the aggregation of preferences, social choices are often ill defined. Such difficulties can be resolved, however, by suitable institutional arrangements. As a result, many researchers have examined the institutional details of the policy process in order to predict likely policy outcomes.

Different branches of political economics have taken this route. They have, however, focused on different aspects of the political process and thus suggested different determinants of the outcomes. Electoral models restrict electoral competition to two

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candidates, highlighting the importance of the distribution of voter preferences across groups (Lindbeck and Weibull (1987), Dixit and Londregan (1996)). Lobbying models make specific assumptions about the lobbying process and the role played by contributions, highlighting the importance either of informational asymmetries or of the organizational pattern among interest groups (Austen-Smith and Wright (1992), Grossman and Helpman (1994)). Legislative models suggest specific rules for decision making, highlighting the importance of agenda setting, the allocation of policy jurisdiction across legislators serving as ministers or committee chairs, and the sequential process for proposals and amendments (Romer and Rosenthal (1979), Shepsle (1979), Baron and Ferejohn (1989)).

Attempts to integrate these differing approaches to special interest politics are relatively scarce. Some formal work deals with the interaction between elections and legislative behavior (Austen-Smith and Banks (1988), Baron (1993), McKelvey and Riezman (1992), Chari, Jones and Marimon (1997)), and some work deals with the interaction between elections and lobbying (Austen-Smith (1987), Baron (1994), Grossman and Helpman (1996), Besley and Coate (1996)). But work is lacking on the interdependencies between lobbying and legislation.[1] We propose a step in this direction.

We study a sequence of games in which policy decisions are made by a number of legislators under alternative legislative structures. As in some recent work on comparative politics (Diermeier and Feddersen (1996), Persson, Roland and Tabellini (1997)), we try to contrast some salient features of a US-style congressional system and a European-style parliamentary system, by examining alternative legislative bargaining processes which entail different allocations of agenda-setting and veto powers, implying different degrees of legislative cohesion.

[1] Denzau and Munger (1986) study a reduced-form model where interest groups give contributions to legislators who choose effort on different legislative activities so as to maximize expected votes. Groseclose and Snyder (1996) study a game where two lobbies buy the votes of legislators who will take a decision on a public project.

We assume that all groups in society are organized and that each group makes contributions to individual lawmakers. Our focus is on how contributions may influence the contents of legislation, and not primarily on how they may influence electoral outcomes. Given the specific rules of legislative decision making, contributions are thus made strategically, to influence the design of policy proposals as well as lawmakers' voting behavior in the legislature. In this paper we assume fixed associations between specific groups and specific lawmakers. In every regime we characterize the equilibrium policy outcome and the equilibrium pattern of contributions.

Our results suggest that the interaction between lobbying and legislative bargaining is important. To illustrate, in a symmetric version of our basic congressional regime a standard common-agency model of lobbying would predict equally distributed policy benefits. A standard legislative bargaining model would predict instead a bias towards the group associated with the agenda-setting legislator, giving a default payoff to a minimum winning coalition. Rather than a convex combination of these two, our combined model produces an agenda-setter's-group-takes-all result.

Our results also suggest that equilibrium contributions are very small. But as we just remarked, lobbying nevertheless plays a critical role in shaping the policy outcome. In the equilibrium of the congressional system the proposal of the agenda-setting legislator commands universal support in congress despite the stark redistribution. This provides a possible resolution of a puzzle in the literature on distributive politics in the US congress: distributive policy bills are typically passed with large majorities, even though one might have expected Riker's "size principle" of minimum winning coalitions to apply with particular force to just those decisions.[2] In our setting the desire to form minimum winning coalitions prevails, but it has very different consequences.

Furthermore, our results suggest that the structure of political institutions matters

[2]See Collie (1988) and Inman and Rubinfeld (1997) for surveys of the literature on distributive politics.

a great deal. The concentration of agenda-setting powers in the coalition supporting the executive in parliamentary systems, and the effective veto powers of these coalition members, produce greater legislative cohesion in parliamentary systems, which affects the strategic interaction between lobbies as well as between lawmakers. This, in turn, affects substantially the distribution of policy benefits across groups.

In Section 2 we construct a simple model of local public goods financed out of a given budget. We then characterize equilibrium policies and contributions in congressional and parliamentary settings, assuming that lawmakers care only about contributions. We extend these results in Section 3 to lawmakers who care both about contributions and about the welfare of their constituency. In Section 4 we relax the simplifying assumption that policy just distributes a given budget, by allowing for a set of policy instruments that impose more general costs and benefits on different groups in society. And in Section 5 we relax the assumption of a fixed group structure in order to study group formation. The driving force is intergroup mobility of individuals who seek the highest possible policy benefits from group association. We draw conclusions in Section 6.

2 Congressional and Parliamentary Systems

Consider an economy with a total population of size N. Each citizen belongs to one of three groups, indexed by $i \in \{1, 2, 3\}$, such that $\sum_i N_i = N$, where N_i is the size of group i. We assume that there is no within-group heterogeneity; i.e., all individuals that belong to the same group are identical. In this section we also assume that the size of each group is fixed.

Every group i forms a lobby. We ignore collective-action problems within these lobbies and assume that each interest group tries to influence the allocation of resources. The political system has a budget B that needs to be allocated across the groups. We start out by taking this budget to be fixed. A feasible allocation is a vector $\mathbf{b} = (b_1, b_2, b_3) \geq \mathbf{0}$ such that $\sum_{i=1}^{3} b_i = B$,where b_i is the budget allocation to group i. The effect of the budget allocation on the well-being of a representative individual from group i is given by $H(b_i, N_i)$. This function is increasing and concave in b_i and possibly decreasing in N_i. Moreover, $H(0, N_i) = 0$, independently of group size. This uncomplicated setting – in which the government simply allocates a given budget – is extended in Section 4 to allow for more general policy instruments that impose differential costs and benefits on various group.

The lobby of group i raises money from members in order to influence the policy outcome $\mathbf{b}$. As a result, the net benefits of a representative individual of group i are

$$u_i = I(N_i) + H(b_i, N_i) - c_i, \tag{1}$$

where $I(\cdot)$ is income net of taxes and c_i is the payment for lobbying activities. This income (such as the wage rate net of taxes) is concave and declining in population size.

Three lawmakers, indexed by $l \in \{1, 2, 3\}$, participate in the policy decision. We start out by assuming that these lawmakers are motivated only by money. They are thus assumed to make decisions that maximize the contributions they receive from the lobbies. We therefore ignore the tension between their interest in both social welfare and contributions, emphasized in some models of common agency. But in Section 3 we study the more general case where lawmakers care about a weighted average of contributions and the welfare of the group they are associated with.

Moreover, unlike the standard common-agency model, interest groups in our model do not lobby a single policy-making entity (the government) for policy favors, because no such entity exists. Instead the lawmakers jointly determine the policy. Throughout the paper we assume a fixed association between lawmakers and interest groups: every interest group is associated with exactly one lawmaker to whom it makes contributions in order to affect her legislative behavior. Taking account of these contributions the lawmaker decides how to vote on policy proposals and what policies to propose when a chance arises. We associate lawmaker l with interest group

i so that $l = i \in \{1, 2, 3\}$. For now, lawmaker i acts to maximize her contributions $N_i c_i$.

We can interpret this setting in several ways. It is possible to think about each *group* as residents of a particular district. In this case b_i may represent public investment in the district's roads, schools, police force or water system. In short, b_i can be thought of as district-specific local public goods or government-provided private goods. Alternatively, groups may consist of workers in particular occupations (such as accountants or mechanics), or workers in particular industries (such as steel or printing), who are represented by a labor union. In this case b_i may represent subsidies to group-specific health care or pensions, or sick leaves or safety devices in the workplace. In either case, the function $H(\cdot)$ measures the value of these subsidies.

We can think about every lawmaker as an individual legislator. The assumption of three lawmakers is then motivated by convenience: three is the smallest number that allows us to meaningfully study coalition formation. Our results do not change when there is a larger number of lawmakers and legislators, as long as they are equal in number and every legislator is paired with one lobby and every lobby is paired with one legislator. But the assumption of fixed associations between groups and individual legislators becomes harder to justify when the number of legislators and lobbies becomes large. An alternative interpretation is to think of each lawmaker as a group of legislators, who—like the members of a lobby—have solved their internal collective-action problem. This group of legislators thus acts in unison and interacts with a single interest group. In this interpretation every lawmaker in a US-style congressional system may represent a state (or regional) delegation, or the members of a particular congressional committee. In a parliamentary system with proportional representation and several parties, every lawmaker may instead represent a small political party, whereas in a system with majoritarian elections and few parties, each lawmaker may represent a faction of a large party.[3]

[3]In the US the bulk of campaign contributions by individuals are made by inhabitants of the

2.1 Congressional policy

One distinguishing feature of congressional systems of the US type is that agenda-setting powers over economic legislation are relatively dispersed among individual legislators, according to their positions on the powerful standing congressional committees. Another feature is that legislative cohesion is relatively low. That is, coalitions supporting legislative proposals are not very stable over time, but instead tend to form issue by issue. This characterization is not intended to be absolute, but rather relative to the normal functioning of a parliament in which agenda-setting powers are concentrated.[4] To highlight these two features we assume that policy is set via a simple legislative bargaining game, in the style of Baron and Ferejohn (1989).

Our policy game has four stages. First, Nature randomly selects one of the lawmakers to be the agenda setter, $a \in \{1, 2, 3\}$.[5] Second, the three interest groups, simultaneously and noncooperatively, offer contribution schedules as functions of their budget allocations. Every group offers two schedules to its lawmaker. One schedule applies when the lawmaker supports the agenda setter's proposal. The other schedule applies when the lawmaker votes against the agenda setter's proposal. Third, legislator a makes a policy proposal to congress. Fourth, congress votes on the proposal. It is adopted if it wins a majority and defeated otherwise. In case of defeat congress implements the default policy $\mathbf{b}^d \geq 0$, $\sum_{i=1}^{3} b_i^d \leq B$. We thus only require that total

lawmaker's own district, whereas the bulk of contributions by PACs are made to members of committees that have jurisdiction over decisions of importance for the donors. Less systematic knowledge is available about patterns of lobbying in the parliamentary systems of Europe. In several European countries, however, tight links exist between certain political parties and specific interest groups, such as trade unions or agricultural groups (Liebert (1995)).

[4] The majority supporting the coalition dominates agenda setting and legislators tend to form a stable legislative majority in such systems.

[5] In this section the results do not depend on the way in which the agenda-setter is chosen. For this reason the first stage can be replaced with other alternatives, such as a deterministic rule based on seniority or election outcomes.

transfers provided by the default policy do not exceed the available budget.[6]

The game is played under complete information. All players thus observe the contribution schedules, the proposal by the agenda setter, and the votes in congress. We restrict the contribution schedules of group i to be conditioned only on payoff-relevant aspects of the policy. In the simple cake-splitting game at hand, this means that $C_i^y(\cdot)$, the contribution by each member of lobby i to lawmaker i when she supports the agenda setter's proposal, depends only on the proposed b_i. $C_i^n(\cdot)$, the per-member contribution of lobby i to lawmaker i when she votes against the agenda setter's proposal, depends only on the budget allocation to i in $\mathbf{b}^d$, which is a constant. Therefore a strategy of lobby i consists of a function $C_i^y(b_i) \geq 0$ and a constant $C_i^n \geq 0$, such that given a proposal $\mathbf{b}^a = (b_1^a, b_2^a, b_3^a)$ by the agenda setter

$$c_i = \begin{cases} C_i^y(b_i^a) & \text{when } l = i \text{ supports the proposal} \\ C_i^n & \text{when } l = i \text{ votes against the proposal} \end{cases}.$$

We require the solution to this game to be subgame perfect, meaning that the agenda setter correctly forecasts the support for her proposal and that lobbies forecast correctly how the policy outcome depends on the structure of their contribution schedules.

It turns out that all equilibria of the congressional system have three common features: (a) the allocation equals the agenda setter's proposal; (b) the entire budget is allocated to the agenda setter's group; and (c) contributions equal zero. Although many equilibria of this type may exist, they differ only in the associated contribution schedules. This is an inessential difference, however, because it affects neither the allocation of the budget nor the transfers from interest groups to politicians.

We start by demonstrating why feature (c) must hold. Suppose that there is an equilibrium with a budget allocation $\hat{\mathbf{b}} = \hat{\mathbf{b}}^a$, such that $0 \leq \hat{b}_a^a \leq B$, and with con-

[6] We could have assumed instead that the default allocation exhausts the entire budget or that the default budget is smaller. The former assumption fits well certain policies, such as entitlement programs, but does not fit others, such as investment in infrastructure. In the latter case the default allocation may well be lack of action; i.e., $b_i^d = 0$ for all i.

tribution schedules $\left[\hat{C}_i^y(b_i), \hat{C}_i^n\right]$ for $i = 1, 2, 3$. Taking account of these contribution schedules, the agenda setter plus at least one other lawmaker have to support the proposed allocation. Thus, it has to be that $\hat{C}_a^y\left(\hat{b}_a^a\right) \geq \hat{C}_a^n$ and $\hat{C}_h^y\left(\hat{b}_h^a\right) \geq \hat{C}_h^n$ for some $h \neq a$. But in this case group h clearly has an incentive to change its contribution schedule whenever $\hat{C}_h^y\left(\hat{b}_h^a\right) > \hat{C}_h^n$. By doing so the interest group can modify its contribution to $\max\left[\hat{C}_h^y(b_h) - \varepsilon, 0\right]$ for some $\varepsilon > 0$, such that $\hat{C}_h^y\left(\hat{b}_h^a\right) - \varepsilon \geq \hat{C}_h^n$. This modification does not affect the agenda setter's behavior and saves money for the interest group. Therefore $\hat{C}_h^y\left(\hat{b}_h^a\right) = \hat{C}_h^n$.[7] But lobby h has not done its best unless $\hat{C}_h^y\left(\hat{b}_h^a\right) = \hat{C}_h^n = 0$. For as long as the equilibrium contributions are positive, the lobby can reduce each one of its schedules by $\varepsilon > 0$, to $\max\left[\hat{C}_h^y(b_h) - \varepsilon, 0\right]$ and $\hat{C}_h^n - \varepsilon$, without affecting the outcome $\hat{\mathbf{b}}^a$ and the support of lawmakers a and h for the proposal. This way, the lobby saves ε in contributions. We therefore conclude that

$$\hat{C}_h^y\left(\hat{b}_h^a\right) = \hat{C}_h^n = 0.$$

A similar argument establishes that

$$\hat{C}_a^y\left(\hat{b}_a^a\right) = \hat{C}_a^n = 0.$$

Finally, the remaining group $j \notin \{a, h\}$ does not make a positive contribution in equilibrium, because if it did, it could reduce its contribution without affecting the outcome. We therefore conclude that equilibrium contributions all equal zero.

Next we show why feature (b) must hold when feature (a) holds. Examine the behavior of lobby a. Suppose that, instead of $\hat{C}_a^y(b_a)$ and $\hat{C}_a^n$, it were to propose, say, the contribution schedules $C_a^n = 0$ and

$$C_a^y(b_a) = \begin{cases} \varepsilon & \text{for } b_a = B \\ 0 & \text{for } b_a < B \end{cases}, \tag{2}$$

[7] Formally, we assume throughout that a lawmaker who is indifferent between a proposal and the default outcome always supports the proposal. The only role of this assumption is to resolve an open-set problem and thus to simplify the presentation of our results.

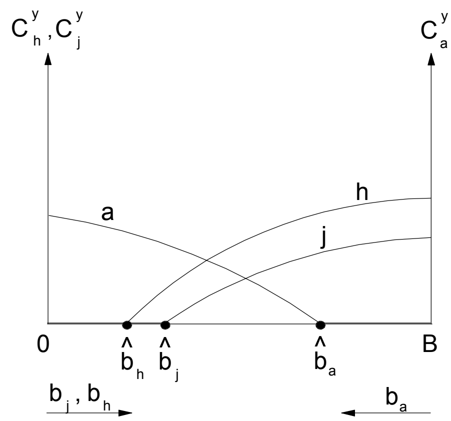

Figure 1:

where $\varepsilon \geq 0$. With these new schedules from lobby a and with $\left[\hat{C}_i^y(b_i), \hat{C}_i^n\right]$ for $i \neq a$, it is easy to see that the agenda setter can do no better than proposing $b_a^a = B$ and $b_i^a = 0$ for $i \neq a$. Whereas all allocations $b_a^a < B$ bring her zero contributions, independently of whether the proposal is supported or not, $b_a^a = B$ and $b_i^a = 0$ for $i \neq a$ bring her ε in contributions and the support of lawmaker h. Therefore for a penny of contributions the agenda setter is happy to propose the allocation that gives all resources to group a, a proposal that wins a majority of votes. It follows that there exists no equilibrium with a majority-supported budget allocation $\mathbf{b}^a$ that does not transfer all resources to the agenda setter.

So far, we have seen that equilibrium contributions must equal zero and that, whenever the agenda setter's proposal is an equilibrium allocation, her interest group receives the entire budget. A simple way to see the intuition behind the latter result is to consider the competition between the non-agenda-setting lawmakers h and j. In Figure 1 allocations to the agenda setter are measured on the horizontal axis from right to left while allocations to h and j are measured from left to right. Contributions by lobbies are measured along the vertical axis. The figure depicts three contribution schedules, one for each interest group. For a proposal that passes, every group offers zero contributions up to a budget allocation $\hat{b}_i$ and rising contributions thereafter.

Faced with these schedules, the agenda setter would like to allocate as much as possible to her own interest group. By proposing $b_a = B$ and $b_i = 0$ for $i \neq a$ she can obtain the support of either h or j, who get zero contributions when the proposal is approved, but also when it is rejected (recall that $C_i^n = 0$ for all i). Moreover, suppose that to induce a vote of support the agenda setter needs to offer legislator i a budget b_i at which i's contributions are positive. Among all the allocations that win a majority, a then prefers to offer h a budget $b_h = \hat{b}_h$ and the remaining part $B - \hat{b}_h$ to her own group. She cannot offer h less and still obtain h's support, while she needs to offer j more for her support. Clearly, under these circumstances lobby j will not offer the schedule in Figure 1, but rather a schedule with $\hat{b}_j$ just to the left of $\hat{b}_h$, knowing that the request of a smaller budget to support the proposal will make her legislator the preferred partner by the agenda setter. This sort of competition between h and j drives both $\hat{b}_h$ and $\hat{b}_j$ down to zero, leaving the entire budget for lobby a.

The only remaining possibility that does not allocate the entire budget to group a is that feature (a) would fail to hold; that is, a majority of legislators support the default policy. To see why this is not an equilibrium for $b_a^d < B$ suppose for the moment that it is; i.e., $\hat{\mathbf{b}} = \mathbf{b}^d$, and that the equilibrium contribution functions are $\left[\hat{C}_i^y(b_i), \hat{C}_i^n\right]$ for $i = 1, 2, 3$. By implication two legislators, $h \neq a$ and $j \neq a$, must vote against a's proposal. Repeating the previous arguments it has therefore to be that

$$\hat{C}_i^y\left(b_i^d\right) = \hat{C}_i^n = 0 \text{ for } i \neq a.$$

In this event, however, lobby a has not offered the best possible contribution schedules. If it were to offer, say, $C_a^n = 0$ and (2), then a could do no better than to propose $b_a^a = B$ and $b_i^a = 0$ for $i \neq a$. All allocations $b_a^a < B$ bring her zero contributions in this case, independently of whether the proposal is supported or not, while $b_a^a = B$ and $b_i^a = 0$ for $i \neq a$ bring her ε in contributions and the support of lawmakers h and j who are indifferent between the agenda setter's proposal and the default policy.

Therefore for a penny of contributions the agenda setter is happy to propose the allocation that gives all the resources to group a, a proposal that wins a majority of votes. This completes the proof that features (a)-(c) hold in every equilibrium.

To see a specific example of this sort of equilibrium, consider the truthful contribution functions[8]

$$C_i^y(b_i) = \begin{cases} \max\left[H(b_a, N_a) - H(B, N_a), 0\right] & \text{for} \quad i = a \\ H(b_i, N_i) & \text{for} \quad i \neq a \end{cases}$$

and

$$C_i^n = 0 \quad \text{for all } i = 1, 2, 3.$$

Given these contribution schedules, we have to show that: (i) the agenda setter can do no better than to propose $b_a^a = B$ and $b_i^a = 0$ for $i \neq a$; (ii) this proposal is supported by a majority of legislators; and (iii) no lobby by changing its contribution functions can induce an outcome that it prefers. First, the agenda setter can do no better than to propose $b_a^a = B$ and $b_i^a = 0$ for $i \neq a$: even though the agenda setter's proposal brings her zero contributions when supported by a majority, no other feasible proposal raises more money. Second, each one of the other lawmakers is happy to support this proposal: despite the fact that each one gets no contributions when the proposal wins a majority, she also receives no contributions when it is defeated. Thus, the agenda setter can do no better than to offer $b_a^a = B$ and $b_i^a = 0$ for $i \neq a$, and this proposal wins a majority.

Finally, no lobby has an incentive to redesign its contribution schedules. Lobby $i = a$ gets the entire budget B and makes no contributions (in equilibrium). Evidently, this outcome cannot be improved upon. Each one of the other groups, $i \neq a$, already offers its lawmaker contributions equal to its entire benefit of the budgetary allocation, $C_i^y(b_i) = H(b_i, N_i)$. If it were to offer a higher contribution at some $b_i > 0$ and a

[8] They are truthful in the sense that whenever contributions are positive the marginal contribution truthfully reflects the marginal benefit of the budgetary allocation b_i (see Bernheim and Whinston (1986) and Dixit, Grossman and Helpman (1997)).

proposal with this b_i were adopted, this would make the group worse off than in the proposed equilibrium. The only remaining option to the lobby is to offer a positive value of C_i^n to induce its lawmaker to vote against the equilibrium proposal, hoping that it will be defeated and the default policy implemented. For $0 < C_i^n < H\left(b_i^d, N_i\right)$ the lobby indeed prefers the default policy. But there is no hope of defeat. Given the contribution schedules of group j, $j \neq i, a$, the agenda setter obtains support from j for her proposal and does not need i's vote. It follows that, given the contribution schedules of a and j, lobby i stands to gain nothing from redesigning its own schedules. The proposed allocation and contribution functions therefore describe an equilibrium.

The results in this section can be summarized in

Proposition 1 *In every equilibrium of the congressional system: (a) the budget allocation equals the agenda setter's proposal; (b) for every $a \in \{1, 2, 3\}$ the budget allocation is $b_a = B$ and $b_i = 0$ for $i \neq a$; and (c) contributions equal zero.*

The equilibrium allocation of the budget is extreme in this model: the group that is associated with the agenda setter is able to appropriate the entire budget. The reason is that the agenda setter has a lot of power in the congressional system.[9] Because of the competition between the remaining legislators, she is able to extract the entire surplus available to the legislative body. Anticipating this outcome the agenda setter's lobby can in turn design contribution schedules that extract the entire surplus from its bilateral relationship with the lawmaker. As a result lobby a gets the entire surplus from the political process.[10] Despite the extreme distributive outcome

[9] More accurately, the agenda-setter has such extreme powers not only because this is a congressional system, but also because decisions are made under a closed rule; i.e., without amendments. As in the literature on legislative bargaining, amendments may dilute her power. We do not deal, however, with open-rule decisions in this paper. Allowing amendments would considerably complicate the analysis of the contribution decision.

[10] Ferejohn (1986) makes a related argument in a setting with retrospective voting. He finds that a single policymaker captures all the surplus in the relationship with his constituency when the latter

the equilibrium policy has universal support, in the sense that no lawmaker has an incentive to vote against the agenda setter's proposal.

Note also that equilibrium contributions are very small (zero) in this system. Some observers have taken the small size of contributions to American congressmen (relative to the benefits of special-interest legislation) to imply that lobbying by means of campaign contributions is not an important phenomenon. Our model illustrates, however, that lobbying can be very important even when equilibrium contributions are small. To see this, consider an alternative institutional framework in which there are no lobbies and the budget allocation $\mathbf{b}$ is determined instead via legislative bargaining in the style of Baron and Ferejohn (1989), with every legislator serving as a perfect delegate of her constituency (group). Legislator i thus seeks maximum utility for her constituency, which amounts to maximizing b_i. In analogy with our setting, consider only one round in which the agenda setter makes a take-it-or-leave-it proposal. If her proposal wins a majority of votes it is adopted. Otherwise the default policy is implemented. Under these circumstances the agenda setter's best course of action is to seek support from the legislator whose group has the smallest default budget, $m = \arg\min_i \left\{ b_i^d \text{ for } i \neq a \right\}$, offer b_m^d to group m, $B - b_m^d$ to group a and zero to the third group. This allocation is supported by m and therefore wins a majority. Evidently, the result is quite different from Proposition 1 in which the agenda setter gives her own group the entire budget.

Compared to the Baron-Ferejohn benchmark with direct representation, adding interest groups thus leads to a more skewed budget allocation. In this comparison we are clearly changing the objective function of politicians: they care only about the welfare of their constituency under direct representation, while they care only about contributions under lobbying. In Section 3 we consider a setting with lobbies, in which every lawmaker cares about a weighted average of contributions and the

consists of different groups of voters that compete with each other for policy favors given by the policymaker in exchange for their vote.

welfare of her group. The Baron-Ferejohn specification is then one extreme, in which the weight on contributions is zero, and the specification in this section is the other extreme, in which the weight on welfare is zero.

Our policy outcome also differs starkly from the predictions of a common-agency style game in which the government is a single decision maker. For example, when all default budgets are the same and all groups are of equal size, a simple common-agency framework predicts equal budget allocations to all while in our congressional system the agenda-setter wins all.[11]

2.2 Parliamentary policy

In parliamentary systems of the European type cabinet ministers control the legislative agenda and the survival of the government plays a key role in the formation of stable parliamentary majorities. As Diermeier and Feddersen (1996) have shown, legislative cohesion emerges as the endogenous outcome of a legislative bargaining game in European-type parliamentary systems and lack of cohesion emerges in US-type congressional systems. As our focus is quite different, we take a shortcut and simply assume that in a parliamentary system two of the three lawmakers, say k and l, form a government and decide on policies via intragovernmental bargaining, with veto rights for the nonproposing member of the coalition.[12]

Thus let $G = \{k, l\}$ be the set of lawmakers in the coalition. Each legislator $i \in G$ is interested in her own contributions. The two of them reach a policy compromise using noncooperative bargaining. We use a simple single-round legislative bargaining

[11] Persson (1998) studies a policy problem close to the one in this paper and shows how various models of special interest politics produce different predictions about the way in which preferences get aggregated into policy outcomes.

[12] This formulation ignores the government formation phase and implicitly assumes that each member of government has the ability to trigger a breakup of government with prohibitive costs for the other member. A richer model would make explicit such assumptions about government formation and the causes and consequences of government breakup.

procedure. One member of the coalition, say $g \in G$, is chosen to make a proposal $\mathbf{b}^g$. If the other member of the coalition, say $q \in G$, $q \neq g$, supports $\mathbf{b}^g$, it is implemented. If not, the default policy $\mathbf{b}^d$ is implemented.

The parliamentary policy game evolves in four stages. First, nature picks randomly two legislators that form a government (a coalition). Second, nature picks randomly a member of the coalition who will propose an allocation. Third, the interest groups offer contribution schedules, as in the congressional system. Fourth, members of the coalition engage in single-round noncooperative bargaining and implement the resulting policy compromise.[13]

As the coalition forms a majority and the nonproposing coalition member has veto rights, the vote of the nonmember, $i = t$, is immaterial for passing legislation. Groups associated with coalition members are thus able to jointly appropriate the entire budget, B and $b_t^g = 0$. We therefore focus on allocations between coalition members, who effectively bargain over how to split between themselves the available surplus, which consists of the outside group's default allocation plus the difference between the available budget and the default budget.[14]

Consider an equilibrium with an allocation $\hat{\mathbf{b}} = \hat{\mathbf{b}}^g \geq 0$, where $\sum_{i \in G} \hat{b}_i^g = B$, and with contribution functions $\left[\hat{C}_i^y(b_i), \hat{C}_i^n\right]$ for $i \in G$. Then

$$\hat{b}_g^g = \arg \max_{0 \leq b \leq B} \hat{C}_g^y(b) \quad \text{subject to } \hat{C}_q^y(B - b) \geq \hat{C}_q^n. \tag{3}$$

Moreover, $\hat{C}_g^y\left(\hat{b}_g^g\right) \geq \hat{C}_g^n$. In other words, the coalition member who makes the proposal chooses to allocate the budget between the coalition partners in a way that

[13] The resulting equilibrium allocations do not depend on whether k or l makes the proposal, as we shall see below. For this reason it does not matter whether g is chosen randomly or according to some parliamentary procedure. Second, the set of equilibrium allocations is the same whether the lobbies design the contribution schedules before or after the identity of g is revealed.

[14] As stated above, a richer model would replace the veto power of the coalition members with the possibility of the non-agenda-setting member triggering a government breakup (via, say, outright dissolution of parliament or via a vote of no-confidence). The spirit of our results would persist if the costs of such a breakup to the agenda-setting member of the coalition were large enough.

maximizes her own contributions subject to the constraint that her partner gets at least as much as she would get at the default allocation. Of course, g's equilibrium contributions also have to be at least as large as her contributions at the default allocation.

Now consider lobby q. Knowing that the allocation is determined by (3), it does not choose a schedule such that $\hat{C}_q^y\left(\hat{b}_q^g\right) > \hat{C}_q^n$. By choosing a schedule $\max\left[\hat{C}_q^y\left(b_q\right) - \varepsilon, 0\right]$, for $\varepsilon > 0$ small enough, it does not affect the choice of $\mathbf{b}^g$ and saves money in equilibrium. Therefore $\hat{C}_q^y\left(\hat{b}_q^g\right) = \hat{C}_q^n$. Next note that $\hat{C}_q^n > 0$ is also not possible. For whenever $\hat{C}_q^n > 0$ lobby q can replace the schedules $\left[\hat{C}_q^y\left(b_q\right), \hat{C}_q^n\right]$ with $\max\left[\hat{C}_q^y\left(b_q\right) - \varepsilon, 0\right]$ and $\hat{C}_q^n - \varepsilon$, respectively, for $\varepsilon > 0$ small enough, and save money in equilibrium; because with the new schedules in place the solution to (3) remains the same and therefore q gets the same allocation for less contributions. We therefore conclude that $\hat{C}_q^y\left(\hat{b}_q^g\right) = \hat{C}_q^n = 0$. It follows that legislator q gets no contributions in equilibrium. A similar argument establishes that g too receives no contributions.

We next show that every $\hat{\mathbf{b}} = \hat{\mathbf{b}}^g \in \mathcal{B}$ where

$$\mathcal{B} = \left\{\mathbf{b} \mid b_t = 0,\ b_k \geq b_k^d,\ b_l \geq b_l^d,\ \sum_i b_i = B\right\}$$

is an equilibrium allocation. It is enough to construct equilibrium contribution functions that support every point in $\mathcal{B}$. To this end take a point $\mathbf{b}^\circ \in \mathcal{B}$ and the contribution functions $C_i^n = \varepsilon_i$ and

$$C_i^y\left(b_i\right) = \begin{cases} \varepsilon_i & \text{for } b_i \geq b_i^\circ \\ 0 & \text{for } b_i < b_i^\circ \end{cases} \quad \text{for } i \in G,$$

where $\varepsilon_i > 0$. It is easy to see that given these contribution functions, $b_g^g = b_g^\circ$ solves (3) for all positive ε_i's. A key feature of these schedules is that g has to offer group q at least b_q° in order to gain the support of legislator q for its proposal. In this way, group q secures a minimal budgetary allocation. Consequently, lobby g can do no better than to design schedules that give it the budgetary allocation $B - b_q^\circ$ at zero costs. This is achieved with the proposed contribution functions by choosing ε_g

as small as possible. And conversely, given the schedules of lobby g, lobby q's best response is to offer the above functions with ε_q as small as possible. As ε_g and ε_q both approach zero, the solution of the bargaining game therefore remains constant at $\mathbf{b}^{\circ}$. Evidently, every point in $\mathcal{B}$ is an equilibrium allocation.[15]

These findings are summarized in

Proposition 2 *In every equilibrium of the parliamentary system: (a) the budget allocation equals the coalition's proposal; (b) for every $G = \{k, l\}$ there is a continuum of budget allocations characterized by $b_t = 0$ and $(b_k, b_l) = (b, B - b)$ for some $b_k^d \leq b \leq B - b_l^d$; and (c) contributions equal zero.*

How does this outcome depend on the presence of lobbies offering contributions? As in the previous section on the congressional system it is natural to consider direct bargaining by delegates of groups k and l as a benchmark. With direct representation, bargainer $i \in G$ seeks to maximize $H(b_i, N_i)$. When legislator g makes a proposal that she wants q to accept, she therefore offers q the default budget b_q^d and gives the residual to her own group. As a result group g extracts the entire surplus. Evidently, the group whose representative is in the coalition, but does not make the proposal in the bargaining stage, prefers lobbying to direct representation. This group gets its default budget under direct representation, while it gets at least as much under lobbying.[16] On the other hand, the group whose representative makes the proposal prefers direct representation, because its bargaining position is stronger in this regime. Finally, group t, whose representative is not a member of the government, is indifferent; it gets no budgetary allocation in either case.

[15] A related multiple equlibrium result is found in the electoral framework of Persson, Roland and Tabellini (1997).

[16] Recall that equilibrium contributions equal zero.

2.3 Discussion

Propositions 1 and 2 show that—in congressional and parliamentary systems alike—interest groups associated with agenda-setting legislators succeed in biasing the policy outcome in their favor, at little cost in terms of contributions. The benefits appear more evenly distributed in a parliamentary system, however, in which each coalition member obtains a budget allocation at least as large as the default policy. Compared to a setting with bargaining based on direct representation, lobbying introduces multiple equilibria into parliamentary systems. And the group associated with the non-agenda-setting coalition member is better off (at least never worse off). In a congressional system, by contrast, competition between lobbies and lawmakers who are not agenda setters enhances the bargaining power of the agenda setter and allows her group to appropriate the entire surplus, no matter what default options are available. In this system, lobbying unambiguously strengthens politicians that are powerful to begin with, and helps the groups associated with these powerful politicians.[17]

This characterization is true for a single policy decision. When it comes to the overall distribution of policy benefits, however, the contrast between the two systems is not as stark. Consider, for example, an entire election cycle, in which a number of separate decisions on various policy issues have to be taken. Whenever Congress confers agenda-setting power on every legislator in some decisions, our model predicts a distribution of policy benefits to all groups, despite the fact that every decision in isolation produces an extreme outcome. This result appears to be in line with the distributive politics described in the literature on universalism in the US Congress. In the parliamentary system, on the other hand, agenda-setting powers would be split only within the government coalition, largely through the allocation of ministerial

[17] The different implications for distributive politics in congressional and parliamentary systems are emphasized (in a context with legislative bargaining, but without lobbying) by Diermeier and Feddersen (1996), and (in a context with legislative bargaining and elections) by Persson, Roland and Tabellini (1997).

portfolios. The ruling coalition will not only stick together for the entire election period, but may also split policy benefits between members in each decision separately, assuming that the costs of breaking up a government are large enough. The ruling coalition's effective monopoly on the policy agenda implies a larger concentration of policy benefits; the minority group, whose lawmakers are outside the governing coalition, is systematically exploited.[18]

As emphasized by Baron and Ferejohn (1989), the decisions that control the distribution of policy benefits vary across political systems. In congressional systems these decisions are made in legislative bargaining, whereas in parliamentary systems they are effectively made in the bargaining over the government's formation. Have we thus not biased the outcome by not studying government formation? We may have, but it is not clear in which direction. True, lobbies compete for the inclusion of their lawmakers in government. But policy-contingent contributions designed to make their lawmakers cheap to include in government may not be time-consistent. Once a government has formed, the lobbies have strong incentives to redesign their contributions, taking account of the interests of other members of the government and the powers of their own representatives. It is therefore not apparent which way the interaction of lobbying with government formation biases the outcome.

3 Benevolent Lawmakers

Lawmakers that care only about contributions are a rare breed. Most of them also care about the well-being of the voters they represent. Moreover, caring about the well-being of voters can be motivated by electoral considerations as much as caring about contributions is motivated by electoral considerations. The better off the voters, the more likely they are to reelect their representative. And the more contributions a legislator has for campaign spending, the more likely her reelection. Even

[18]This point is also made by Diermeier and Feddersen (1998).

purely election-motivated lawmakers should therefore care about both welfare and contributions.[19] We do not provide in this section a unified theory that takes account of all these considerations. Instead we explore whether our results extend to lawmakers whose objective functions include the welfare of their constituency in addition to contributions.

We now suppose that lawmaker i places weight $\beta_i \geq 0$ on the aggregate welfare of her constituency and weight $1 - \beta_i$ on aggregate contributions.[20] In view of (1) her objective function is

$$\beta_i \left[I(N_i) + H(b_i, N_i) - c_i \right] N_i + (1 - \beta_i) c_i N_i.$$

It follows that for lawmakers to value contributions β_i has to be smaller than 1/2, which we assume to be the case.

To express this objective function in monetary units we now divide it by $1 - 2\beta_i$. The result is

$$L_i = \left[\omega_i I(N_i) + \omega_i H(b_i, N_i) + c_i \right] N_i, \tag{4}$$

where $\omega_i = \beta_i / (1 - 2\beta_i)$ is the relative weight on welfare.[21] In Section 2 we thus discussed the special case $\omega_i = \beta_i = 0$, for all i.

[19] See Grossman and Helpman (1996) for a model of electoral competition with special interest groups that has this feature.

[20] We are thus identifying each lawmaker's constituency with the lobby group that she is associated with. This fits well only certain types of associations, such as those that lobby for regional support in a majoritarian electoral system with single-member voting districts.

[21] An alternative formulation (with similar consequences) would assume that a legislator cares about the welfare of the representative voter in her district in addition to aggregate contributions. Her objective has the form

$$\beta_i \left[I(N_i) + H(b_i, N_i) - c_i \right] + (1 - \beta_i) c_i N_i.$$

In this case the implied weight on welfare is $\omega_i = \frac{\beta_i}{N_i(1-2\beta_i)}$, which is smaller than the weight given in the text.

3.1 Congressional system

Suppose that the equilibrium allocation in a congressional system is a proposal $\mathbf{b}^a$ by the agenda setter. It is straightforward to show that it has to be of the form $b_a^a = B - b_h^a$, $B \geq b_h^a \geq 0$, $b_j^a = 0$, where h is the lawmaker that supports the proposal and j is the remaining lawmaker. Namely, no resources are allocated to j's group, because the agenda-setter does not seek her support. However, since h supports the proposal,

$$\omega_h H(b_h^a, N_h) + C_h^y(b_h^a) \geq \omega_h H(b_h^d, N_h) + C_h^n. \tag{5}$$

The optimal design of the contribution schedules by group h then implies

$$C_h^n = 0,$$

$$C_h^y(b_h^a) = \omega_h \left[H(b_h^d, N_h) - H(b_h^a, N_h) \right]. \tag{6}$$

The first equation results from the fact that as long as $C_h^n > 0$ group h can reduce its contribution C_h^n and the schedule $C_h^y(\cdot)$ without affecting the inequality in (5). In response, its lawmaker will continue to support the proposal in exchange for lower contributions. Therefore $C_h^n = 0$. The second equation follows, because whenever the inequality in (5) is strict, group h can reduce the schedule $C_h^y(\cdot)$ and still maintain the inequality in (5). The lower contributions do not affect the voting behavior of lawmaker h whereas group h saves on contributions. Therefore (5) must hold with equality, which implies (6).

Since contributions are nonnegative, it follows from (6) that

$$b_h^a \leq b_h^d. \tag{7}$$

Next note that group h can always design schedules that induce lawmaker h to vote against the proposal. The worst that can happen to group h in this case is that it will obtain a zero allocation. Therefore in equilibrium

$$H(b_h^a, N_h) - C_h^y(b_h^a) \geq H(0, N_h) = 0.$$

Taking account of (6) this implies

$$H\left(b_h^a, N_h\right) \geq \frac{\omega_h}{1+\omega_h} H\left(b_h^d, N_h\right). \tag{8}$$

This is a participation constraint; with optimally designed contribution schedules the agenda-setter has to offer group h a budget that satisfies this inequality. Evidently, whenever lawmakers place positive weight on welfare, the budget allocation to h has to be strictly positive, although it can be smaller than h's default budget. In the special case $\omega_h = 0$ (no weight on welfare) this budget allocation can be zero, as in the previous section.

Next consider group $j \notin \{a, h\}$. In order to save space, assume that the agenda-setter always prefers larger allocations to group a.[22] Then group j is willing and able to compete with group h for budgetary support. For it can induce its lawmaker to support a proposal that gives j a budget allocation b_h^a minus a penny. And if it designed its schedules in this way, the agenda setter would prefer to offer group j the allocation b_h^a minus a penny rather than to offer group h the budget b_h^a. It therefore has to be the case that in equilibrium it does not profit group j to induce the agenda-setter to propose this alternative allocation. To induce the alternative allocation group j has to offer contributions that satisfy

$$\omega_j H(b_h^a, N_j) + C_j^y\left(b_h^a\right) \geq \omega_j H(b_j^d, N_j) + C_j^n.$$

The most efficient way to do it is by offering $C_j^n = 0$ and

$$C_j^y\left(b_h^a\right) = \omega_j\left[H(b_j^d, N_j) - H(b_h^a, N_j)\right].$$

For this strategy not to pay off it has to be the case that $H(b_h^a, N_j) - C_j^y\left(b_h^a\right) \leq 0$, or

$$H\left(b_h^a, N_j\right) \leq \frac{\omega_j}{1+\omega_j} H\left(b_j^d, N_j\right).$$

[22] Namely, $\omega_a H(b_a^a, N_a) + C_a^y\left(b_a^a\right)$ is increasing in b_a^a. This is necessarily the case when $\omega_a > 0$ and the contribution function $C_a^y\left(\cdot\right)$ is nondecreasing

Moreover, when group h designs its contribution schedules it can induce the largest b_h^a that satisfies this inequality in addition to (7), and, in view of (6), it is in its interest to do so. Therefore define b_j^c as the budget that satisfies

$$H\left(b_j^c, N_j\right) = \frac{\omega_j}{1+\omega_j} H\left(b_j^d, N_j\right). \tag{9}$$

This equation determines b^c uniquely. It implies

$$b_j^c \leq b_j^d,$$

and therefore

$$b_h^a = \min\left\{b_j^c, b_h^d\right\} \tag{10}$$

as long as (8) is also satisfied. It follows that group h's equilibrium allocation exceeds neither group h's nor group j's default allocation.

Conditions (8)-(10) determine which lawmaker supports the agenda-setter's proposal (namely, who h is) and what budget is allocated to her group. A simple way to identify the role of each group is to define budgets b_i^c for $i \neq a$ that satisfy the analog of (9), namely

$$H\left(b_i^c, N_i\right) = \frac{\omega_i}{1+\omega_i} H\left(b_i^d, N_i\right) \quad \text{for } i \neq a. \tag{11}$$

The budget b_i^c provides a measure of how cheap it is for the agenda-setter to elicit the support of lawmaker i, because according to (8) the agenda-setter has to offer group i at least b_i^c for this purpose. In equilibrium the agenda-setter seeks the support of the group that is cheapest in this sense. Therefore [23]

$$h = \arg\min_i \left\{b_i^c\right\}_{i \neq a};$$

and the budget allocation to group h equals b_j^c, unless $b_j^c \geq b_h^d$, in which case h is given its default allocation. With this we have fully characterized the equilibrium allocation of the budget. What remains is to complete the characterization of contributions.

[23] It is easy to see that if h is the group with the larger value of b_i^c, then conditions (8)-(10) cannot be satisfied simultaneously.

We have seen that group j, whose lawmaker's support the agenda-setter does not seek, gets zero. Because of this, group j makes no contributions; if it did, it could cut them to zero without worsening its allocation, which is already as bad as it can get. We have also seen that group h, whose lawmaker supports the agenda-setter, makes contributions according to (6). It remains to characterize the contributions of group a. For those we can use the argument from Section 2 to show that the agenda-setter gets no contributions. For example, group a can offer its lawmaker zero in case she defeats the equilibrium allocation and $C_a^y(b_a) = \min[0, H(b_a, N_a) - H(B - b_h^a, N_a)]$ in case she supports it, where b_h^a is given by (10). Under these circumstances lawmaker a can do no better than to propose the equilibrium allocation and vote in its favor. Therefore the agenda-setter gets no contributions.

These results are summarized in

Proposition 3 *In every equilibrium of the congressional system: (a) the budget allocation equals the agenda setter's proposal; (b) the agenda-setter seeks the support of lawmaker h that is cheapest to elicit; namely, $h = \arg\min_i \{b_i^c\}_{i \neq a}$, where b_i^c is defined in (11); and does not seek the support of lawmaker j, $j = \arg\max_i \{b_i^c\}_{i \neq a}$; (c) the budget allocation is $b_j = 0$, $b_h = \min\left\{b_j^c, b_h^d\right\}$ and $b_a = B - b_h$; and (d) the agenda setter and lawmaker j get zero contributions, while lawmaker h gets $c_h = \omega_h\left[H\left(b_h^d, N_h\right) - H(b_h, N_h)\right]$.*

To see what contribution functions could support such an equilibrium, we provide an example. Let $\mathbf{b}^\circ$ be the equilibrium allocation. Then

$$C_i^n = 0 \quad \text{for } i = 1, 2, 3;$$

$$C_j^y(b_j) = H(b_j, N_j);$$

$$C_h^y(b_h) = \max\left[0, H(b_h, N_h) + \omega_h H\left(b_h^d, N_h\right) - (1 + \omega_h) H(b_h^\circ, N_h)\right];$$

$$C_a^y(b_a) = \max[0, H(b_a, N_a) - H(B - b_h^\circ, N_a)].$$

It is easy to verify that these are (truthful) equilibrium contribution functions.

A final formal point to note is that Proposition 1 is a special case of Proposition 2: when the relative weight on welfare approaches zero (i.e., $\omega_h \to 0$), both propositions describe the same equilibrium properties. In particular, $b_h^a \to 0$ and $c_h \to 0$. On the other hand, for ω_h large enough, we obtain the legislative bargaining solution: $b_h^a \to b_h^d$ and $c_h \to 0$. Interestingly, contributions are zero when either the relative weight on welfare is negligibly small or very high. For intermediate values, group h makes positive contributions.

A simple way to see the intuition behind the results in this section is to consider the special case in which the two competing groups are of equal size. Suppose further that both have the same default allocations; i.e. b_i^d is the same for $i \neq a$. In this event Proposition 3 states that the lawmaker of group h, who forms a majority with the agenda-setter, is also the lawmaker that puts the lowest weight on welfare relative to contributions ($\omega_h < \omega_j$). The reason may be that lawmaker h anticipates a tighter electoral race, or she is more popular relative to her opponent.[24] Suppose, alternatively, that ω_i is the same for $i \neq a$. Then h is the group with the lowest value of b_i^d; i.e., the group with the less attractive outside option. Evidently, the composition of the majority depends on characteristics of the lawmakers and the default policies. Be that as it may, the agenda-setter elicits the support of the lawmaker whose vote is cheapest to get.[25]

Interestingly, only lawmaker h, who supports the agenda-setter, obtains contributions. Due to the competition with group j, group h needs to give its representative a positive contribution in order to induce her to prefer the equilibrium proposal to the

[24] See Grossman and Helpman (1996) for an analysis of the determinants of the relative weights ω_i and the role of popularity in their determination.

[25] When groups differ in size, the interaction between size and budget allocations can break the simple association between the default option and how cheap it is to elicit the support of a lawmaker. But when the benefit function has the separable form $H(b, N) = H^1(b)\, H^2(N)$, we find again that it is cheapest to elicit the support of the lawmaker who either puts a lower relative weight on welfare or whose group has the lower default allocation.

default allocation. On the other hand, the agenda-setting lawmaker a does not need monetary incentives, as she is better off with the equilibrium than with the default allocation. Finally, group j, the least attractive coalition partner, does not give its lawmaker any contributions, because this would be a waste of resources.

3.2 Parliamentary system

Now turn to the parliamentary system with the coalition consisting of lawmakers k and l, namely, $G = \{k, l\}$, while t is not a member of the coalition. As in the previous section, there are multiple equilibria. Moreover, every point in the previous set of equilibrium allocations,

$$\mathcal{B} = \left\{ \mathbf{b} \mid b_t = 0,\ b_k \geq b_k^d,\ b_l \geq b_l^d,\ \sum_i b_i = B \right\},$$

is still an equilibrium allocation.

To see why, let $b^{\circ} \in \mathcal{B}$, and consider the following contribution functions for k and l (t gets no allocation because this group is not in the coalition, and therefore its contribution functions are of no interest):

$$C_i^y \left(b_i\right) = 0 \text{ for } i \in G,$$

$$C_i^n = \omega_i \left[H\left(b_i^{\circ}, N_i\right) - H\left(b_i^d, N_i\right) \right] \text{ for } i \in G.$$

Evidently, with these contribution functions in place, lawmaker $g \in G$ who makes the proposal cannot offer q, her coalition partner, less than b_q°. Because if she were to make such an offer, lawmaker q would rejected it in favor of the default allocation.[26] On the other hand, lawmaker g would like to offer q as little as possible, because her utility is increasing with the allocation to group g. Therefore g offers b_q^d to q and takes the residual, and this is supported by the coalition.

[26]By supporting an allocation with b_q lawmaker q attains the utility level $\omega_q H\left(b_q, N_q\right)$, because she gets no contributions. By voting against the proposal, however, she attains the utility level $\omega_q H\left(b_q^d, N_q\right) + C_q^n = \omega_q H\left(b_q^{\circ}, N_q\right)$. It follows that she will not support a proposal that gives her less than b_q°.

Finally, note that group h cannot improve its lot by designing different contribution functions, given the contribution functions of g, because lawmaker g prefers the default allocation to any other allocation that gives her group less than b_g°. By the same token group g cannot design different contribution functions that improve its budget allocation in view of the contribution functions of h. Therefore this is an equilibrium, and equilibrium contributions equal zero. The same line of reasoning as in the previous section can be used again to establish that equilibrium contributions equal zero, even if other contribution functions are used to support the equilibrium allocation.

4 More General Policies

What happens when the total budget B is not fixed and the agenda setter or coalition government can propose budget size in addition to its allocation? To answer this question we need to specify how changes in the budget are financed. Take, for example, the case in which an equal lump-sum tax is imposed on all members of society in order to finance an allocation $\mathbf{b} \geq 0$. In this event the tax per person equals $\sum_{j=1}^{3} b_j/N$ and the utility of an individual belonging to group i is

$$u_i = J(N_i) + H(b_i, N_i) - \frac{1}{N}\sum_{j=1}^{3} b_j - c_i. \tag{12}$$

Compared to (1) we now distinguish the explicit tax that finances $\mathbf{b}$ and the income net of other taxes, $J(\cdot)$. In this formulation, the policy vector can be chosen without further constraints on its components and the contribution schedules $C_i^y(\cdot)$ can be designed as functions of $\mathbf{b}$. A vector $\mathbf{b}^d \geq \mathbf{0}$ continues to represent the default option.

This suggests a way to treat more general policy instruments. Let $Z_i(\mathbf{b}, N_i)$ be the net benefit function of group i when the government implements a policy vector $\mathbf{b}$. Now $\mathbf{b}$ can describe budget allocations to groups, as above, or other instruments such as tariffs, employment subsidies or environmental standards. In every case the net benefit functions have to be suitably specified.[27] Under these circumstances the utility of an individual from group i is

$$u_i = J(N_i) + Z_i(\mathbf{b}, N_i) - c_i, \tag{13}$$

where $J(\cdot)$ and c_i have the same interpretation as before.

In this section, as well as in the rest of the paper, we return to our original assumption that lawmakers care only about contributions.

4.1 Congressional policy

The policy game is the same as in Section 2, except that now the agenda-setter can propose an allocation $\mathbf{b}^a \in \mathcal{B}_F$, where $\mathcal{B}_F$ represents a feasible set of the policy instruments that takes account of such limits as how much various people can be taxed.[28] Repeating the arguments from Section 2 we can now reaffirm, in spirit, the results in Proposition 1. Namely, in equilibrium there are no contributions, the agenda setter's proposal wins a majority, and the agenda setter chooses a policy that suits her group best; i.e.

$$\mathbf{b}^a = \arg\max_{\mathbf{b}\in\mathcal{B}_F} Z_a(\mathbf{b}, N_a).$$

The reasons are the same as in Section 2. The agenda setter extracts the entire surplus, because the other lobbies compete for her favors through their legislators. This state of affairs is fully exploited by the interest group affiliated with the agenda setter, because it is able to design its contribution schedules to appropriate the entire surplus from its relationship with the agenda setter. For example, a contribution

[27] For example, when b_i represents a budget allocation to group i the net benefit functions are $Z_i(\mathbf{b}, N_i) = H(b_i, N_i) - \sum_{j=1}^{3} b_j/N$ for all i.

[28] An interesting extension would be to study a multistage legislative process with separation of power between different legislators, such as one proposing a tax rate and another proposing how to spend the revenue. The results in Persson, Roland and Tabellini (1997) suggest that this will have a marked effect on the outcomes.

schedule

$$C_a^y(\mathbf{b}) = \max\left[Z_a(\mathbf{b}, N_a) - Z_a(\mathbf{b}^\circ, N_a), 0\right]$$

ensures that the agenda setter proposes $\mathbf{b}^a = \mathbf{b}^\circ$ if she can secure a majority for the proposal. And a majority is indeed secured for such a proposal, by an argument along the lines of Section 2. In this event, lobby a is best off when $\mathbf{b}^\circ$ maximizes its net benefit $Z_a(\mathbf{b}, N_a)$.

4.2 Parliamentary policy

Consider a coalition $G = \{k, l\}$. Legislator $g \in G$ makes a proposal $\mathbf{b}^g$ that $q \in G$, $q \neq g$, can accept or reject. If accepted, the government implements $\mathbf{b}^g$. If rejected the government implements the default allocation $\mathbf{b}^d$. Under these circumstances g's proposal maximizes g's contributions subject to the constraint that q's contributions are at least as large as C_q^n. Namely,

$$\mathbf{b}^g = \arg\max_{\mathbf{b}\in\mathcal{B}_F} C_g^y(\mathbf{b}) \quad \text{subject to } C_q^y(\mathbf{b}) \geq C_q^n.$$

Repeating the arguments from Section 2 establishes that equilibrium contributions equal zero. What about the equilibrium allocations $\mathbf{b}$?

As in the case of a fixed budget, there are many equilibrium allocations and many contribution functions that support such equilibria. In fact, more equilibria are now possible, some of which are inefficient for lobbies k and l that are represented in the coalition. All the equilibrium allocations have, however, to provide each of these groups with a net benefit at least as large as its net benefit in the default position. Therefore, the set of equilibrium allocations is contained in the intersection of the set of allocations that group l prefers to its default option and the set of allocations that group k prefers to its default option. Let $\mathcal{B}_i\left(\hat{\mathbf{b}}\right) = \left\{\mathbf{b} \in \mathcal{B}_F \mid Z_i(\mathbf{b}, N_i) \geq Z_i\left(\hat{\mathbf{b}}, N_i\right)\right\}$ be the set of feasible allocations that lobby i weakly prefers to $\hat{\mathbf{b}}$. Then the set of equilibrium allocations is contained in $P\left(\mathbf{b}^d, G\right) = \mathcal{B}_k\left(\mathbf{b}_k^d\right) \cap \mathcal{B}_l\left(\mathbf{b}_l^d\right)$. Amongst these there is a subset that is efficient from the point of view of the coalition members, defined by

$$\mathcal{E}\left(\mathbf{b}^d, G\right) =$$

$$\left\{\mathbf{b}' \mid \mathbf{b}' = \arg\max_{\mathbf{b}\in P\left(\mathbf{b}^d, G\right)} \left[\alpha_l Z_l\left(\mathbf{b}, N_l\right) N_l + \left(1-\alpha_h\right) Z_k\left(\mathbf{b}, N_k\right) N_k\right] \text{ for some } 0 \leq \alpha_h \leq 1\right\}.$$

This subset belongs to the equilibrium set. For example, an allocation $\mathbf{b}^\circ \in \mathcal{E}\left(\mathbf{b}^d, G\right)$ and the truthful contribution functions

$$C_j^n = 0 \text{ and } C_j^y\left(\mathbf{b}\right) = \max\left[Z_j\left(\mathbf{b}, N_j\right) - Z_j\left(\mathbf{b}^\circ, N_j\right), 0\right] \text{ for } j = k, l$$

describe an equilibrium.

4.3 Example

To see how this general treatment works in a specific application, consider the budget allocation problem with taxation that was discussed at the beginning of this section. An individual's utility is given by (12), where a district gets a budget of b_i and an equal lump-sum tax is imposed on every individual in all districts. In this case, the net benefit functions are $Z_i\left(\mathbf{b}, N_i\right) = H\left(b_i, N_i\right) - \frac{1}{N}\sum_{j=1}^{3} b_j$. We note, as a benchmark, that it is efficient to choose b_i so as to maximize the difference between social benefits and social costs, namely $N_i H\left(b, N_i\right) - b_i$. But this allocation is not attained in our polities, independent of whether they have a congressional or a parliamentary system. Under these circumstances a congressional system leads to a budget allocation

$$b_a = \arg\max_{b\geq 0}\left[N_a H\left(b, N_a\right) - \frac{N_a}{N} b\right] \text{ and } b_i = 0 \text{ for } i \neq a.$$

Evidently, the budget spent on the groups $i \neq a$ is too small. On the other hand, the budget spent on group a is too large. Group a sees its cost of spending as only a fraction N_a/N of the true cost, because taxes are payed by all. As a result of this "common pool problem" it chooses to overspend. Finally note that the budget depends on the size of group a. If the marginal benefit of b_a is increasing in group size, then the budget is larger the larger group a. And if the marginal benefit of b_a

declines with group size, then the budget is larger the smaller the group.[29] Whether aggregate spending is too high depends on relative group sizes and the concavity of $H(\cdot)$.

In a parliamentary system all allocations in $\mathcal{E}\left(\mathbf{b}^d, G\right)$ have the feature that the group whose lawmaker is outside the coalition gets no budget; namely, $b_t = 0$ for $t \notin G$. In addition, allocations in $\mathcal{E}\left(\mathbf{b}^d, G\right)$ that are interior for coalition members satisfy

$$\alpha_l N_l \frac{\partial H\left(b_l, N_l\right)}{\partial b_l} = \frac{N_l}{N} \text{ and } \left(1-\alpha_l\right) N_k \frac{\partial H\left(b_k, N_k\right)}{\partial b_k} = \frac{N_k}{N} \text{ for some } 0 \leq \alpha_l \leq 1.$$

For every pair of weights $(\alpha_l, 1-\alpha_l)$ the resulting spending level is too high, because these conditions imply

$$\alpha_l N_l \frac{\partial H\left(b_l, N_l\right)}{\partial b_l} + \left(1-\alpha_l\right) N_k \frac{\partial H\left(b_k, N_k\right)}{\partial b_k} = \frac{N_l + N_k}{N},$$

due to the fact that the coalition internalizes only the share of taxes it pays. The optimal spending levels satisfy $N_i \frac{\partial H(b_i, N_i)}{\partial b_i} = 1,\ i \in G$, and therefore

$$\alpha_l \frac{\partial H\left(b_l, N_l\right)}{\partial b_l} N_l + \left(1-\alpha_l\right) \frac{\partial H\left(b_k, N_k\right)}{\partial b_k} N_k = 1.$$

We may also compare the parliamentary outcome to the outcome in a congressional system. In the latter, the agenda setter equates the marginal benefit of the budget for her group, $N_a \partial H(b_a, N_a)/\partial b_a$, with the perceived marginal cost, N_a/N. It follows from the concavity of $H(\cdot)$ that spending on the powerful groups is larger in the congressional system, if, as is likely, $N_a < N_k + N_l$. Since the governing coalition represents a larger group, it internalizes a larger share of the taxes.

Finally, note that in the budget allocation problem the net benefit function of group j, $Z_j\left(\mathbf{b}, N_j\right) = H\left(b_j, N_j\right) - \sum_{i=1}^{3} b_i/N$, is increasing in b_j and decreasing in b_i, $i \neq j$. Due to this "gross substitution" property the set $\mathcal{E}\left(\mathbf{b}^d, G\right)$ is larger when $\mathbf{b}^d = \mathbf{0}$ than when $\mathbf{b}^d > \mathbf{0}$. This suggests that the range of policy uncertainty in a

[29] The equilibrium budget is related to group size via $\partial H\left(b_a, N_a\right)/\partial b_a = 1/N$ (recall that $H(\cdot)$ is concave in b). Therefore b_a rises with N_a if and only if the left-hand side rises in N_a.

parliamentary system may be larger for infrastructure projects, for which $\mathbf{b}^d = \mathbf{0}$, than for entitlement programs, for which $\mathbf{b}^d > \mathbf{0}$.

5 Mobility Across Groups

In the previous sections we considered polities with groups of fixed size. We found that political systems do not treat all groups equally. Groups associated with legislators who are devoid of agenda-setting power are not able to secure budgetary support, and congressional systems have more such groups. Interestingly, in congressional systems group size has no effect on the allocation of the budget, while parliamentary systems exhibit multiple equilibria with a wide range of possible outcomes. The set of equilibrium allocations does not depend directly on group size, however, but may depend on it indirectly to the extent that the default allocation depends on group size.

Our analysis suggests that individuals have clear motives in joining groups associated with lawmakers possessing agenda-setting power, or lawmakers more likely to acquire such power. The search for higher utility can produce shifts in membership driven by expectations of political power. As we associate group membership with a particular location, occupation or sectorial affiliation, we do not expect group membership to be entirely fluid; membership displays some inertia even when citizens can switch groups. We therefore explore in this section the effects of intergroup mobility, using alternative assumptions about the stage in which an individual can choose his affiliation. In all cases, however, the resulting composition of groups and the allocation of agenda-setting power produce an equilibrium of the sort discussed in the previous section.

For simplicity we return to the model of Section 2, in which a fixed budget is to be allocated across groups in society.

5.1 Congressional policy

For current purposes a key question in congressional systems is whether people can move across groups after the identity of the agenda setter has been revealed. Recall that in the congressional case the entire budget is allocated to the agenda setter's group (and there are no contributions in equilibrium). Therefore (1) implies the following utility levels of individuals, by group affiliation:

$$\begin{aligned} u_a &= I(N_a) + H(B, N_a); \\ u_i &= I(N_i) + H(0, N_i) \quad \text{for } i \neq a. \end{aligned}$$

First suppose that people can choose their group affiliation after the identity of a has been revealed. Then mobility across groups ensures that every person has the same equilibrium utility u_i. If in addition $I(0) - I(N) \geq H(B, N)$, there is an equilibrium with positive membership in all groups.[30] Some people join group a and the rest split equally between the remaining two groups, with[31]

$$\begin{aligned} I(N_a) + H(B, N_a) &= I\left[\frac{1}{2}(N - N_a)\right] + H\left[0, \frac{1}{2}(N - N_a)\right] \\ &= I\left[\frac{1}{2}(N - N_a)\right]. \end{aligned} \tag{14}$$

Thus three groups are formed: a large group associated with the agenda setter and two smaller equally-sized groups.[32] People who join the smaller groups do not expect to obtain a budget allocation, but they are compensated by higher income net of

[30] When the inequality is reversed, the equilibrium has a corner solution: everyone joins group a and $I(N) + H(B, N) > I(0) + H(0, 0) = I(0)$. Here, people congregate in one group that is associated with the agenda-setter in order to benefit from B. Their income net of taxes is lower than it would be if they formed a small group $i \neq a$, but the availability of B more than compensates them for the net income loss.

[31] It is not possible to have an equilibrium in which one of the groups that is not associated with the agenda-setter has members while the other does not. The reason is that $H(0, N) = 0$, and $I(\cdot)$ is a declining function. Therefore $I(0) + H(0, 0) > I(N) + H(0, N)$ for $N > 0$.

[32] Since $H(B, N_a) > 0$, we have $I(N_a) < I\left[\frac{1}{2}(N - N_a)\right]$ from (14). Therefore $N_a > \frac{1}{3}N$.

taxes. Whenever intergroup mobility is possible after the agenda setter has been recognized, group a is larger than the others.

What if groups are formed before the identification of the agenda setter?[33] In this event the decision to join a group depends on expectations about who will be the agenda setter. Let p_i be the probability that lawmaker i will be the agenda setter. This is a common prior shared by all individuals. In congressional systems of the US type the agenda-setting power of an individual legislator is related to her seniority and the results of past elections. We take the vector of probabilities $\mathbf{p} = (p_1, p_2, p_3)$ to accurately reflect these considerations, as well as other characteristics of the political system that have a bearing on the choice of an agenda setter.[34] Once groups have formed and the agenda setter has been identified, the equilibrium is described by Proposition 1. Namely, the entire budget B is allocated to the agenda setter's group and contributions equal zero.

Under these circumstances the expected utility of an individual who joins group i is[35]

$$E(u_i) = I(N_i) + p_i H(B, N_i).$$

In equilibrium all individuals have the same *expected* utility $\bar{u}$, such that

$$I(N_i) + p_i H(B, N_i) = \bar{u} \quad \text{for all } i. \tag{15}$$

These conditions together with $\sum_{i=1}^{3} N_i = N$ uniquely determine group size and expected utility. Evidently, lawmakers with a higher probability to become agenda setters represent larger groups. Namely, $N_i > N_j$ if and only if $p_i > p_j$.[36] A group

[33] As we shall see shortly, however, the preceding analysis is a special case of what follows.

[34] As discussed in Section 2, a richer model would allow for a number of consecutive policy decisions in an election cycle with more powerful legislators having agenda-setting privileges in a larger fraction of these decisions.

[35] Such an individual obtains utility $I(N_i) + H(B, N_i)$ with probability p_i, and utility $I(N_i)$ with probability $1 - p_i$.

[36] Although this specification uses probabilities, the result applies as well to situations in which the agenda-setter is chosen deterministically. If, for example, a seniority rule applies, according to

represented by a legislator with higher prospects of agenda-setting power has a higher expected budget allocation. These expectations attract membership, which reduces the group's net income and the per-individual benefits of the budget allocation. Expansion of membership continues until the additional crowding eliminates the higher policy benefits, so that on the margin an individual is just indifferent between joining a group represented by a powerful politician and a group represented by a weaker politician. The case in which intergroup mobility is possible after the revelation of the agenda setter is a special case in which $p_a = 1$ and $p_i = 0$ for $i \neq a$. We have thus established the following

Proposition 4 *In the congressional system a legislator represents a larger group the higher her probability of agenda-setting power.*

This result emphasizes the causality from agenda-setting power to group size. But a reverse causality is also possible: representatives of larger groups tend to carry more political clout. It is therefore conceivable that probability p_i rises with group size. If this were the case a positive feedback would occur: as the size of a group increases joining it becomes more attractive because the prospects of getting benefits B increase as a result. Under these circumstances multiple equilibria could arise, even when the ex-ante conditions are symmetric (such as when $p_i = \pi(N_i)$). One equilibrium would be symmetric, with $N_i = N/3$ for all i, while in another equilibrium a disproportionately large group would be affiliated with one of the legislators.

We assumed free entry into groups. But it is clearly in the interest of members of groups with powerful politicians to protect their prospective rents. This can be done in a number of ways. One example is lobbying for regulation of entry. Lawyers and medical doctors are cases in point. Alternatively, a group can lobby for the administrative control of a subsidized program, such as training, or for the distribution of goods and services (e.g., fertilizers). A treatment of these issues is, however, outside the scope of this paper.

which legislator a is the agenda-setter, then $p_a = 1$ and $p_i = 0$ for $i \neq a$.

5.2 Parliamentary policy

In parliamentary systems the identity of the government is closely related to election outcomes. Let p_i be the probability that legislator i will be a member of some coalition, and let $q_{i,j}$ be the probability that i and j, $i \neq j$, form a coalition, conditional on i being a member of some coalition. Then $q_{i,j}p_i$ is the unconditional probability that i and j form a coalition. If they do then $G = \{i, j\}$ and the equilibrium is characterized in Proposition 2. Namely, $b_i = b$ and $b_j = B - b$ for some $b_i^d \leq b \leq B - b_j^d$ and there are no contributions.

Due to the multiplicity of equilibria, a person who chooses to join a group has to forecast not only the chances of the lawmaker representing it becoming a coalition member, but also how the coalition will reach a compromise over the budget allocation. For this purpose assume that the default allocation exhausts the available budget, $\sum_i b_i^d = B$. Assume further that, conditional on i and j forming a coalition, the vector (b_i, b_j) is uniformly distributed on $\left\{(b_i, b_j) \mid b_i \geq b_i^d, b_j \geq b_j^d, b_i + b_j = B\right\}$. With these simplifying assumptions, the expected utility of an individual in group i, conditioned on the formation of a coalition between legislators i and j, is

$$E[u_i \mid G = \{i, j\}] = I(N_i) + \frac{1}{B - b_j^d - b_i^d} \int_{b_i^d}^{B - b_j^d} H(b, N_i)\, db. \tag{16}$$

Using this representation the unconditional expected utility of such an individual is

$$E(u_i) = I(N_i) + p_i \sum_{j=1, j\neq i}^{3} \frac{q_{i,j}}{B - b_j^d - b_i^d} \int_{b_i^d}^{B - b_j^d} H(b, N_i)\, db.$$

In equilibrium there is a common expected utility level $\bar{u}$ such that

$$I(N_i) + p_i \sum_{j=1, j\neq i}^{3} \frac{q_{i,j}}{B - b_j^d - b_i^d} \int_{b_i^d}^{B - b_j^d} H(b, N_i)\, db = \bar{u} \quad \text{for all } i. \tag{17}$$

Unlike the congressional system, now group size depends not only on the probability of setting the agenda, but also on the default options. Moreover, there is an interaction between probabilities of joining different coalitions and the default allocations.

A number of implications are evident from (17); they are summarized in[37]

Proposition 5 *In the parliamentary system a legislator represents a larger group (a) the larger her probability p_i of being a member of a coalition; (b) the larger her conditional probability $q_{i,j}$ of forming a coalition with a legislator who has the smaller default allocation b_j^d among the potential coalition partners; and (c) the larger her default allocation b_i^d.*

A group represented by a legislator with a larger probability of being a member of a coalition secures a larger expected budget allocation. For this reason this group is more attractive and therefore grows to the point at which the negative effect of the larger population eliminates the utility advantage of a larger expected budget. This is very similar to congressional systems in which lawmakers with a larger probability of agenda-setting power attract more members. The difference is that in parliamentary systems agenda-setting power is more limited, because a lawmaker has to reach a compromise with other coalition members. Nevertheless, a coalition member has an advantage over a nonmember, and this advantage drives the result in part (a) of the proposition.

Parts (b) and (c) describe features that are special to parliamentary systems, both deriving from the structure of bargaining power within prospective coalitions. The larger a group's default budget, the stronger its legislator's bargaining power, because equilibrium contributions induce her to support only those policy bargains in which her group obtains a budget at least as large as the group's default option.

[37] The proof is as follows. As the left-hand side of (17) is decreasing in N_i, group size is increasing with any variable in which the left-hand side is increasing. Evidently, the left-hand side is increasing in p_i, which proves part (i). Also, since $q_{i,j} + q_{i,k} = 1$ for $k \neq j$, an increase in $q_{i,j}$ implies an equal decrease in $q_{i,k}$. But then the left-hand side increases if and only if $b_j^d < b_k^d$, proving (ii). Finally, as $\sum_{i=1}^{3} b_j^d = B$, an increase in b_i^d has to be compensated by a decrease in the default budget of either one of the other two groups. Note, however, that the left-hand side is increasing in b_i^d and decreasing in b_j^d for $j \neq i$. Therefore when b_i^d rises either one or the other b_j^d declines by the same amount and the left-hand side rises, which proves part (iii).

Moreover, the expected value of her group's budget allocation is midway between this minimum and the largest concession that a coalition partner is willing to make (which is to accept a budget equal to her own group's default option). For this reason individuals find groups with larger default budgets more attractive and every group prefers its representative to form a coalition with the partner whose group has the lowest default option. Analogously, groups represented by lawmakers with high conditional probabilities to form coalitions with weak partners are more attractive.[38]

This completes our discussion of the case in which individuals must choose group affiliation before the formation of a coalition. If mobility is easy and they can switch groups after coalitions form, the expected utility of an individual belonging to group k or group l whose representatives belong to the government is given by (16), whereas it equals $u_t = I(N - N_k - N_l)$ for members of group t not represented in government. These utility levels have to be equal for all groups, namely

$$E[u_k \mid G = \{k, l\}] = E[u_l \mid G = \{k, l\}] = u_t = I(N - N_k - N_l). \tag{18}$$

Using the expression in (16), it follows that, among the groups represented in government, the lawmaker securing a larger default budget attracts more members. In addition, the lawmaker outside the government has the smallest group.

5.3 Group structure and the political system

We can now compare the equilibrium structure of interest groups across political systems. Let us start by the high-mobility case where groups can re-form after the political power has been allocated across lawmakers; i.e., a has been appointed in the congressional system and a government consisting of k and l has been formed in the parliamentary system. Congressional group structure is then given by (14) and

[38] This discussion suggests an interesting question for further work: how would the behavior of interest groups modify the outcome of the government formation process if our model were extended along the lines of Baron (1991) or of Laver and Shepsle (1996)?

parliamentary group structure by (18). In a parliamentary system, when the default budget is the same for both coalition members, groups k and l are of equal size. It is easy to show that in this case $N_a^C > N_k^P = N_l^P$ (where superscript C stands for "congressional" and P for "parliamentary").[39] It implies that whenever b_k^d does not differ too much from b_l^d the agenda setter in a congressional system attracts a larger group than either one of the coalition members in a parliamentary system; i.e., $N_a^C > \max\left[N_k^P, N_l^P\right]$. This is a natural consequence of political power over individual policy decisions being more concentrated in the congressional system.

It is not realistic to assume that mobility is high enough so that group membership adapts to every single policy decision. In our model group membership is associated with a particular region, sector or occupation. Thus, switching groups requires moving or taking a new job, decisions that are not easily reversed. Let us therefore compare the two systems under more restrictive assumptions about mobility. First consider groups that form only once after "an election" based on a *sequence* of anticipated policy decisions—the setting discussed informally in section 2.3. Group size in the parliamentary case will then still be given by (18). We can approximate equilibrium group size in the congressional system by (15), if we think of p_i as the *share* of the policy decisions to be made in the election period for which lawmaker i sets the agenda. Now groups tend to be more concentrated in the parliamentary system, particularly if congressional power is distributed relatively equally (i.e., the p_i's are close to each other). To see this most clearly, assume that $p_i = 1/3$ for all i in the congressional system, implying equal groups $N_i^C = N/3$. Assume also that the two government partners in the parliamentary system are equally powerful: $b_k^d = b_l^d$, implying $N_k^P = N_l^P$. As (18) clearly implies that $N_k^P = N_l^P > N_t^P$, we thus have that

[39]Proof: Condition (18) implies that $N_k^P = N_l^P$ when $b_k^d = b_l^d$. Now suppose that $N_a^C < N_k^P$. Then $I\left(N_a^C\right) + H\left(B, N_a^C\right) > I\left(N_k^P\right) + H\left(B, N_k^P\right)$. Together with (14) and (18) this inequality implies $I\left[\frac{1}{2}\left(N - N_a^C\right)\right] > I\left(N - 2N_k^P\right)$, or $\frac{1}{2}\left(N - N_a^C\right) < N - 2N_k^P$. In view of $N_a^C < N_k^P$ the previous inequality implies $N_a^C < \frac{1}{3}N$. But we have seen that $N_a^C > \frac{1}{3}N$ in a congressional system (see footnote 16). Thus we have a contradiction implying that $N_a^C > N_k^P$.

groups are more concentrated in the parliamentary system: $N_k^P = N_l^P > N_i^C > N_t^P$.

Assume finally that mobility is even lower, such that groups form only once and for all, according to the expected power of different lawmakers, but do not re-form in response to realizations of power. Then group size in the two systems is given by (15) and (17), respectively. The probabilities of setting the agenda, or of belonging to the government, shape the incentives for group formation in a straightforward way. Suppose these probabilities were all equal, namely p_i and q_{ij} were equal for all i and j. This again implies symmetric groups in the congressional system. But as emphasized in the previous section, different default budgets would still give incentives to mobility in the parliamentary system. Groups with larger default budgets attract more members due to the better bargaining position in government of their lawmakers. If we interpret the default budgets as reflecting the pattern of redistribution implied by existing entitlement programs, we would thus observe the beneficiaries of those programs forming large pressure groups.

The discussion in this section also suggests a testable positive association between political instability and mobility across groups associated with policy-sensitive regions or sectors, so as to take advantage of perceived rents. Specifically, countries that experience large and frequent shifts of political power should, *ceteris paribus,* have more mobility than countries with political systems characterized by a stable power structure.

6 Concluding Comments

Policy formation in representative democracies entails legislative bargaining as well as influence peddling by special interest groups. Whereas each of these activities in the policy process has received much attention, the interaction between them has not. We have argued, however, that this interaction is important and deserves close examination.

Our analysis has been confined to very simple structures of congressional and parliamentary systems. It is therefore difficult to assess, at this point, the robustness of the main results. As is well known from other models of special interest politics, institutional details—such as the procedures for legislative bargaining and for government formation and dissolution—can have a marked effect on outcomes. But this does not detract from the main argument, namely that the interaction between legislative bargaining and lobbying is of prime importance for an understanding of policy formation.

We have seen that, in each decision, a congressional system allocates policy benefits more unevenly than a parliamentary system. Moreover, lobbying by special interest groups amplifies this skewness in a congressional system and moderates it in a parliamentary system. These results are likely to survive procedural modifications, because they derive from the greater separation of proposal powers and the lesser legislative cohesion in congressional systems, and these seem to be inherent differences between the two systems. But the distribution of policy benefits over an electoral cycle may be, nevertheless, more concentrated in parliamentary systems, due to the concentration of proposal-making powers in the hands of the coalition and the incentives for this coalition to stick together.

Our result that special interest groups tend to appropriate the entire surplus in both systems is more questionable. It stems from the assumption that every legislator is associated with a particular interest group. As suggested by the literature on common agency, policymakers have a stronger position vis-a-vis lobbies whenever several interest groups compete for the favors of a single policymaker. In our context this means that allowing interest groups to choose which legislator to lobby will enhance the power of legislators. A reasonable conjecture is that a more even distribution of surplus between lobbies and legislators should result. To derive general results in a setting where every interest group can lobby every legislator appears to be a difficult task, however, as it requires the handling of multi-principal, multi-agent interactions.

Nevertheless, this would be a worthwhile extension.

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