Lobby cartels and the status quo *

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Abstract

In order to influence EU policy decisions companies and national interest groups both lobby their national political institutions and participate in supranational lobby organizations (Eurogroups) that address EU institutions. It is however far from clear which strategy is more effective. This paper uses a simple model of collective decision-making with agenda-setting to study under which conditions lobbyists choose to form a 'cartel'. Based on the model, a novel factor in the formation and stability of lobby cartels is identified. The key results are the following, (i) a small status-quo bias among legislators will increase the lobbyists' incentives to cooperate; and (ii) lobby cartels might engage more often in lobbying on issues where the 'climate' in the legislature does not promise much lobby success.

1 Introduction

A difficult problem in political theory is to which extent lobbyists can influence the outcomes of the legislative process, and which factors determine lobby success. The large empirical literature concerning these questions has yielded mixed results, both with respect to the legislative institutions of the US and those of the European Union (EU) (see e. g. Wright 1990, Fordham and McKeown 2003, Bernhagen and Bräuninger 2005, Mahoney 2007). For an overview of the literature concerning the EU see also Dür (2005). Formal work on the interaction between lobbying and legislation is still scarce. Denzau and Munger (1986) propose a model of a legislator's decision to serve either the interests of organized groups or the interests of unrepresented constituents, so as to maximize votes. Snyder (1991) analyzes lobby contributions and influence in a spatial voting model where

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legislators have different ideal points. Helpman and Persson (2001) investigate the implications of alternative legislative bargaining processes (US congressional and European parliamentary system) for policy outcomes and lobbying contributions.

This paper studies the conditions under which lobbyists choose to coordinate their efforts, in effect, under which to form a cartel.[1] The formal literature on lobbying has, so far, not addressed the question of when lobbyists perceive it advantageous to join forces to promote their interests, and when they opt to work alone.[2] In this paper, we propose a novel factor – the status quo bias of legislators. It influences the lobbyists' incentive to cooperate and their success in lobbying.

The motivation for this study came essentially from findings in the literature on lobbying at the EU level that cast doubt on the ability of Eurogroups to promote the interests of their members effectively (see, for example, Jordan and McLaughlin 1993; McLaughlin, Jordan, and Maloney 1993). Eurogroups are umbrella associations or 'associations of associations', that are officially recognized by the European Commission. Examples include the European Chemical Industry Council (CEFIC) with a membership of chemical associations from 22 countries, or the European Environmental Bureau (EEB), a federation of more than 140 environmental organizations. The findings indicating the weakness of many Eurogroups are surprising, as one might have expected that the progressive extension of the EU's policy-making competencies at the expense of local and national governments (see van Schendelen 2005, p. 66f) would in fact boost the supranational organization of lobbying activities.

The formation of Eurogroups is also encouraged by a preference on the part of the European institutions to consult via such federations (Mazey and Richardson 1993). In some cases, the EU Commission even helped in the creation of Eurogroups by providing financial assistance. The institutionalized consultation of group interests is seen as related to corporatist ideas prevailing in EU policy-making (see Michalowitz 2004, p. 27). Yet, associations do not sit at the table when decisions are actually made, and inclusion of their suggestions is only rarely obligatory. It is argued that the accommodativeness of EU institutions to Eurogroups and other interest groups is due to the enormous information problems EU legislators face with regard to the consequences and the evaluation of policies in the 27 member states. Eurogroups are supposed to perform the task of reconciling the varied interests of national groups, but their internal heterogeneity and difficulties in forming a common position are among the reasons commonly cited to explain their perceived ineffectiveness (Michalowitz 2004, p. 124; Pijnenburg 1998).

The model that we investigate allows for this heterogeneity, as it includes lobbyists and legislators who both vary in their preferences for policy alternatives. Legislators make decisions by voting. We assume that lobbyists wield some *influence* over legislators. In particular, they are able to persuade the latter to change their policy positions by making

[1] By a lobby cartel, we mean a grand coalition of lobbyists who have undertaken to operate as a single agent.

[2] Coalition formation among organized interests in the US has however been studied empirically by Hojnacki (1997). With respect to the EU, Pijnenburg (1998) presents a case study on the formation of *ad hoc* lobby coalitions of companies.

contributions.[3] The exertion of influence generally comes in various forms, ranging from the provision of information that is biased in favor of a particular interest, to campaign contributions, private gifts and outright bribes. In the context of EU lobbying, it seems appropriate to think of lobby contributions as valuable technical information or proposals on wordings of regulations, but they may also consist of financial resources.

A key assumption is that a single lobbyist can lobby exclusively one legislator, 'his own', i. e. every legislator is paired with one lobbyist. Empirical evidence suggests that contributions to a legislator come in large part from interests within the legislator's own constituency (Wright 1989). This gives some support to a fixed link. The assumption of a one-to-one relationship between legislators and lobbyists is also made in Helpman and Persson (2001).

Lobbyists can also opt to cooperate in making their contributions, effectively forming a cartel. The lobby cartel has access to all legislators, and can thus freely discriminate across them in making contributions. The chances for cooperation among the lobbyists are analyzed in the framework of a cooperative game (N, v) where N is the set of lobbyists and v a characteristic function summarizing what a single player or a coalition of players can get from the game.

Our main finding is that the lobbyists' incentives to cooperate increase when the legislators' inclination to change the status quo is small. But even if the operation of the cartel is not impaired by differences in the lobbyists' preferences over policy outcomes, the cartel's success can be expected to be small in the sense that it is in general unable to achieve outcomes that are far away from those that would have occurred without lobby interference.

The remainder of the paper is organized as follows: The basic model is presented in Section 2.1, lobbyists are introduced in Section 2.2. In Section 2.3, we describe the cooperative game among the lobbyists. Section 3 is devoted to four examples of such games. Section 4 discusses the hypotheses which derive from the examples. In Section 5, we conclude and consider limitations of the analysis.

2 Model

2.1 The legislative bargaining game

A political decision-making body or legislature with $N \geq 3$ members labeled $i = 1, 2, \ldots, n$ is to make a policy decision by majority-rule. Each member of the body represents one constituency. For the time being, we assume that each member of the legislature has exactly one vote.[4] The set of possible policies is described by a convex one-dimensional Euclidean

[3] Following Dahl (2004), p. 32, we say that A influences B, if B's behavior changes (either in accordance with the wishes of A or in any other direction) due to the behavior of A.

[4] Voting weights could be formally determined by treaty as is the case for the voting schemes of the EU Council of Ministers or the International Monetary Fund. Weighted voting can also be used to model a wider class of problems, e. g. power differentials resulting from hierarchical structures.

space normalized to $X \equiv [0,1]$ with each point corresponding to a different policy. The interval might measure e. g. the amount of money to be spent on a certain public good, a tax rate, or the level of CO_2 emission constraints for cars. The members of the legislative body have single-peaked preferences in the policy space X, and $M = (\mu_1, \ldots, \mu_n) \in \mathbb{R}^n$ is the vector of their ideal points. Throughout this paper we assume ideal points of the legislators to be uniformly distributed over the interval $[0,1]$.

Our point of departure is a simple *legislative bargaining game* under *closed rule* suggested by Widgrén and Napel (2002).[5] It is basically a spatial version of the legislative "ultimatum" game analyzed first by Romer and Rosenthal (1978). A legislative session consists of the following sequence of events:

1. Nature randomly selects one legislator as agenda-setter who is relabeled A.

2. The agenda-setter confronts the other legislators with a take-it-or-leave-it proposal $\chi = \chi(M)$, where χ is adopted if a simple majority of legislators approve of it. The agenda-setter has perfect information about the policy positions of the other committee members.

3. The committee members simultaneously decide on the proposal. The outcome Ω of the game is $\Omega = \chi$ if the proposal is accepted. If the proposal is rejected, the status quo (or a default outcome) denoted by q prevails, i. e. $\Omega = q$. The status quo is known to all players.

A legislator i with ideal point μ_i votes for a proposal χ whenever i prefers it to the status quo q, i. e. whenever his individual rationality constraint

$$(\mu_i - \chi)^2 \leq (\mu_i - q)^2$$

is satisfied. That is: Legislators who are indifferent between passing and rejecting vote in favor of the proposal. Thus, given χ, the coalition $N_{\chi \succeq q} \subseteq N$, $N_{\chi \succeq q} \equiv \{i \mid (\mu_i - \chi)^2 \leq (\mu_i - q)^2\}$, will form.

For any random policy issue, let $\mu_{(k)}$ denote k-th leftmost ideal point of legislators, i. e.

$$\mu_{(1)} \leq \ldots \leq \mu_{(n)}.$$

In other words, $\mu_{(k)}$ is the *k-th order statistic* of $\mu_1, \ldots, \mu_n$. For simplicity let n be an odd number. Then,

$$\mu_{(P)} \equiv \mu_{((n+1)/2)}$$

is the ideal point of the *median* or *pivotal* member of the legislature.

Which proposal will the agenda-setter choose? As a proposal is passed with a majority, the agenda-setter will not forgo any more than inevitable to secure that majority. The agenda-setter's problem then is to choose the most favorable proposal for himself among

[5] Widgrén and Napel (2002) use the model in order to propose a new index of decision power which takes players' spatial preferences into account.

those policies which the median player (marginally) prefers to the status quo. Let μ_A denote the ideal point of the agenda-setting legislator, and assume $\mu_A \geq q$. Then, given the above model of the legislative process, the subgame perfect Nash equilibrium proposal for any particular realization $M = (\mu_1, \ldots, \mu_n)$ of ideal points is

$$\chi^*(\mu_A, M) = \chi^*(\mu_A, \mu_{(P)}) = \begin{cases} \mu_A & \text{if } \mu_{(P)} \geq d \\ 2\mu_{(P)} - q & \text{if } \mu_{(P)} \in (q, d) \\ q & \text{if } \mu_{(P)} \leq q \end{cases} \tag{1}$$

where $d = (\mu_A + q)/2$ is the *dividing point* that separates the area where the agenda-setter gets his own ideal point accepted from the area where he has to compromise with the pivotal player. The equilibrium proposal χ^* is accepted by at least $(n+1)/2$ voters that always include the agenda-setter. Therefore, $\Omega(\mu_A, M) = \chi^*(\mu_A, M) = \chi^*(\mu_A, \mu_{(p)})$. Figure 1 illustrates the equilibria of the game.

Obviously, the model endows the agenda-setter with considerable power over the outcome. However, this power does not go unchecked. It varies considerably with both the position of the status quo and of the median player. For illustration purposes assume that there are 'many' legislators with ideal points distributed uniformly over the interval $X \equiv [0, 1]$. Then the expected median ideal point is $E[\mu_{(p)}] = 0.5$, and the more players there are, the more concentrated around 0.5 is the distribution of the median ideal point.[6] If $q = 0$, the agenda-setter is likely to be effective for virtually all positions he might wish to take. If, by contrast, $q = 0.5$, the status quo will more or less coincide with the median ideal point, making it highly unlikely that the agenda-setter could achieve any position that is not very 'close' to 0.5.

The only other player apart from the agenda-setter who may have an impact on the outcome is the pivotal player, who has exactly half of the votes to his left and the other half to his right. Given the assumption of equal voting weights, the legislator holding the median position is always pivotal, i. e. $P \equiv (n+1)/2$. Under weighted voting, however, this is generally not the case. 'A priori', i. e. without taking preferences into account, the pivotal position would be a random variable. Under the condition that the ideal points $\mu_1, \ldots, \mu_n$ are independently and identically distributed, the a priori probability that a legislator is pivotal is given by the respective Shapley-Shubik index (Shapley and Shubik (1954)). The pivotal player is potentially powerful in the sense that a change in his preferences might alter the outcome of the collective decision-making.[7] But his 'power' is conditional on his preferences, it vanishes when his preferences change such that his ideal point is not in the interval (q, d) any more or ceases to be the pivotal ideal point.[8]

[6] In fact, the median of n uniformly $[0, 1]$-distributed random variables is normally distributed with mean 0.5 and standard deviation $\sigma = 1/2\sqrt{n}$ (see e. g. Arnold et al. 1992).

[7] The notion of power as marginal impact or 'power as sensitivity' of outcomes to individual players' preferences is introduced in Napel and Widgrén (2004).

[8] For a debate on the possibility to include preferences in the concept of power see Napel and Widgrén (2004), Braham and Holler (2005a), (2005b). Following Morriss (1987) we use 'power' as referring to a person's ability to *effect* outcomes whereas 'influence' refers to the ability to *affect* outcomes.

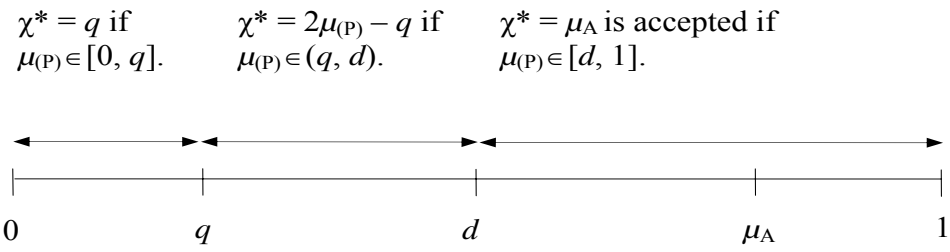

Figure 1: The Nash equilibrium proposal χ^* of the legislative bargaining game

2.2 The legislative bargaining game with lobbying

In this section, lobbyists are introduced into the legislative bargaining game.

There are $N \geq 3$ lobbyists labeled $j = 1, 2, \ldots, n$ who seek *narrow* influence on the decision-making on one particular issue represented by the policy space $X \equiv [0, 1]$. The lobbyists are all identical except for their ideal points. The vector of lobbyists' ideal points is given by $\Lambda = (\lambda_1, \ldots, \lambda_n) \in \mathbb{R}^n$. It is assumed that each lobbyist is associated with exactly one legislator, "his own", as lobbyist and legislator either come from the same geographical location, or because they are linked to each other by ideological ties. Each lobbyist knows the position of 'his' constituency's delegate on the issue at stake. Concerning lobbyists' information of other legislators' ideal points, we discuss both the case that ideal points are common knowledge, and the case that lobbyists are unable to detect the positions of legislators other than their own.

Whereas in the basic legislative bargaining game the agenda-setter is randomly selected, we now assume that the lobbyists compete with one another to bring their legislator into this position. The probability of lobbyist j that 'his' legislator turns out agenda-setter on the issue is π_j, and differences in these probabilities may reflect that lobbyists vary in their skills. Another way to motivate differences is to suppose that some legislators are in a systematically better position to make proposals, e. g. due to differences in voting weight or seniority.

Each lobbyist is restricted to make contributions exclusively to the legislator from his 'own' constituency, thereby changing the preferences, i. e. the ideal point, of the latter. He is unable to influence the positions of the other legislators. This assumption is important because the situation of N lobbyists allocating their resources non-cooperatively to N legislators would constitute a Colonel Blotto game which is exceedingly difficult to analyze.

Legislators care about their own vote. Specifically, they do not wish to depart too much from their ideal point which could be interpreted as the prevailing opinion of their constituency on the issue at stake, but could also reflect the legislator's own preferences. Though, in reality, the extent to which legislators are susceptible to lobbyists certainly differs, it is natural to start on the assumption that they can be influenced equally. The exertion of influence is costly for the lobbyists: The minimum contribution necessary to induce legislator i with ideal point μ_i to adopt a position $\hat{\mu}_i$ is given by

$$c_i = (\hat{\mu}_i - \mu_i)^2 \tag{2}$$

The cost of lobbying in this model is the cost of persuading the legislator. These costs might take several forms. One could imagine that the lobbyists incur costs in compiling (possibly biased) information about policy consequences, or that they have expenditures for surveys, research or commissioned studies. But contributions might also be outright bribes.

Lobbyists evaluate outcomes according to the following utility function:

$$u_j(\Omega, c_i) = 1 - (\Omega - \lambda_j)^2 - c_i, \qquad i = j \tag{3}$$

where Ω is the outcome of the agenda setting game, λ_j is lobbyist j's ideal point in the policy space, and c_i is the contribution j makes.[9]

We now consider the modified *legislative bargaining game*:

1. Lobbyists compete with one another to 'establish' their legislator as agenda-setter. Lobbyist j succeeds with probability π_j.

2. The lobbyists make contributions to 'their' legislators.

3. The agenda-setter makes a take-it-or-leave-it proposal $\chi = \chi(M)$, and a simple majority is needed to pass a proposal. The agenda-setter has perfect information about the ideal points of the other committee members.

4. The committee members simultaneously accept or reject the proposal. The outcome of the game is $\Omega = \chi$ or $\Omega = q$, respectively.

With steps 1 and 2 interchanged, i. e. with contributions made first, lobbies would have to make their contributions contingent on 'their' legislator's status (agenda-setter, or not). This would leave the results unchanged.

We would like to answer the question what the optimal contribution of a lobbyist associated with the agenda-setter is, given his own and the agenda-setter's ideal point, and the status quo. The proposal of the agenda-setter is subject to the same strategic considerations as in the basic game. It is also known to the lobbyist that legislators' ideal points are uniformly distributed on $[0, 1]$.[10] In principle, the lobbyists whose legislators do not have agenda-setting power might also do better with non-zero contributions. But recall that the basic model showed that only the pivotal member potentially has some influence on the agenda-setter's optimal proposal, and that even in this case the outcome would not be the pivotal member's ideal point, but rather $\Omega = 2\mu_{(P)} - q$.[11] This and the low

[9] One might also consider a more general utility function $u_j(\Omega, c_i) = -\alpha(\Omega - \lambda_j)^2 - c_i$, where the parameter $\alpha_j > 0$ for $j = 1, \ldots, n$ indicates the significance of the issue at stake to the lobby. It might be interesting to vary α across lobbyists.

[10] In the case that legislators' ideal points are not uniformly distributed, the assumption could still be justified by the *principle of insufficient reason*. As lobbyists are not able to investigate the positions of other lobbyists and legislators except their own equal probability of all legislators' ideal points might be considered most plausible.

[11] Obviously, this outcome could be close to the ideal point of a lobbyist that is not linked with the agenda-setter. Even though he is not powerful, he might simply be lucky.

probability of being the pivotal member in any sizeable decision-making body justify the assumption that the contributions of all lobbyists other than the agenda-setter's-lobbyist are zero.

In the case that the lobbyists only know the position of their own legislator, but are unable to detect the positions of legislators from other constituencies, the lobbyist j who is associated with the agenda-setting legislator faces the problem of selecting contributions such as to maximize his *expected utility* $E[u_j(\Omega, c_i)]$:

$$\max_{c_i} E\left[u_j(\Omega, c_i)\right] = 1 - E\left[(\Omega(c_i) - \lambda_j)^2\right] - c_i \qquad j = i = A. \tag{4}$$

To calculate (4) we first introduce some notation. Let $X_1, \ldots, X_n$ be i. i. d. random variables with density $f(x)$ and cumulative distribution function $F(x)$. The density of the kth order statistic $X_{(k)}$ is given by

$$f_{(k)}(x) = nf(x)\binom{n-1}{k-1}(F(x))^{k-1}(1 - F(x))^{n-k}.$$

In the case of uniformly distributed variables X, we get

$$f_{(k)}(x) = \begin{cases} n\binom{n-1}{k-1}x^{k-1}(1-x)^{n-k} & 0 \leq x \leq 1 \\ \\ 0 & \text{elsewhere} \end{cases}$$

and the cumulative distribution function

$$F_{(k)}(x) = P(X_{(k)} \leq x) = \begin{cases} 0 & x < 0 \\ \\ \int_0^x n\binom{n-1}{k-1}s^{k-1}(1-s)^{n-k}ds & 0 \leq x \leq 1 \\ \\ 1 & 1 < x. \end{cases}$$

Assume that $\mu_A \geq q$. The probability that one of the $n-1$ players other than the agenda-setter is the median and located in the interval $[0, q]$ is

$$\begin{aligned} P(\mu_i = \mu_{(P)} \wedge 0 < \mu_{(P)} < q) \quad &= \quad \int_0^q (n-1)\binom{n-2}{\frac{n-1}{2}}x^{\frac{n-1}{2}}(1-x)^{\frac{n-3}{2}}dx \\ &\underset{n \text{ ``large''}}{\approx} \quad F_{(P)}(q), \end{aligned}$$

$i \neq A$. If one of the other $n-1$ players is both positioned in the crucial interval (q, d) and the median player, then his ideal point affects the agenda-setter's optimal proposal. In this case this player is said to have a *strict spatial swing* for the combination (μ_A, M) (Widgrén and Napel (2002)). The probability for this event is

$$\begin{aligned} P(\mu_i = \mu_{(P)} \wedge q < \mu_{(P)} < d) \quad &= \quad \int_q^d (n-1)\binom{n-2}{\frac{n-1}{2}}x^{\frac{n-1}{2}}(1-x)^{\frac{n-3}{2}}dx \\ &\underset{n \text{ ``large''}}{\approx} \quad F_{(P)}(d) - F_{(P)}(q), \end{aligned}$$

$i \neq A$. Taking into account the subgame perfect Nash equilibrium (1) the expected utility of the lobbyist is

$$E\left[u_j(\Omega, c_A)\right] \approx \tag{5}$$
$$1 - \Big[F_{(P)}(q)(q-\lambda_A)^2 + \textstyle\int_q^d f_{(P)}(x)(2x-q-\lambda_A)^2 dx + (1-F_{(P)}(d))(\hat{\mu}_A - \lambda_A)^2\Big] - \underbrace{(\hat{\mu}_A - \mu_A)^2}_{=c_A}$$

It is obvious from the brief discussion of the basic model (see p. 5) that the position of the agenda-setter, and hence of the agenda-setter's-lobbyist, is the better the greater the distance between q and $\mu_{(P)}$. In the case $N = 3$, the first-order condition for a maximum of $E\left[u_j(\Omega, c_A)\right]$ is

$$d^3 - \frac{1}{2}(\lambda_A + q)d^2 - 2d + \frac{1}{2}(\lambda_A + 2q + \mu_A) = 0 \tag{6}$$

where $d = 2\hat{\mu}_A - q$. The optimal contributions c_A to the agenda-setting legislator can be inferred from (6). A lobbyist makes also a contribution to 'his' legislator if the voting predisposition of the latter is opposed to his preferences.[12] That is, the lobbyist puts particularly great effort to the avoidance of highly unfavorable outcomes. If one thinks of the legislator's ideal point as derived from the preferences of his constituency, then the price the lobby has to pay will be high if the legislator's constituency expresses a significant aversion to the lobby's aims. This is similar to Denzau and Munger (1986).

2.3 Cooperation among lobbyists

Suppose now that the lobbyists can form *coalitions*, i. e. nonempty subsets S of N, to coordinate their lobbying efforts. The grand coalition $\{N\}$ consisting of all lobbyists is occasionally referred to as a *lobby cartel*. Generally, the formation of a coalition entails side-payments among the coalition members, otherwise some coalition members would prefer to defect from the coalition. If the lobbyists' positions are scattered on both sides of the status quo, it might be most natural to assume that two cartels opposing each other would form, a situation we do not consider.[13]

Coalition members cooperate in choosing the agenda-setter, rather than try to bring their own legislator into that position. The probability of a coalition S to make the legislator of its choice agenda-setter is $\pi_S \geq \sum_{j \in S} \pi_j$. In the context of a small legislature or decision-making committee, it seems natural to assume that the lobby coalition can discriminate among the legislators "within their reach" when making contributions.

The lobbyists in S make contributions such as to maximize their joint payoff

$$u_S(\Omega, C) = \sum_{j \in S} 1 - \sum_{j \in S} (\Omega - \lambda_j)^2 - C \tag{7}$$

[12]The result is contrary to the view that lobbyists make contributions to and act as a "service bureau" (Bauer, Pool, and Dexter 1963) for legislators who already agree with them.

[13]The situation of two competing lobbyists is studied by Groseclose and Snyder (1996).

where C is the total amount of contributions given to legislators by the lobby coalition S. Since the utility functions of the lobbyists are additively separable, it does not matter how contributions are divided among the lobbyists. Contributions could e. g. be financed through membership fees uniformly levied on members, or could be split in line with some efficient cooperative bargaining solution as the result of a bargaining process among the lobbyists.

Provided that all lobbyists in the coalition have the same preference intensity over policy outcomes (see Footnote 9), the sum of squares $\sum_{j\in S}(\Omega-\lambda_j)^2$ is minimal for $\Omega = \bar{\lambda} = 1/n\sum_{j\in S}\lambda_j$, i. e. if the outcome of the legislative bargaining is the mean of the lobbyists' ideal points. Therefore, $\bar{\lambda}$ is the ideal point of the lobby coalition. When the issue at stake has a different importance to lobbyists from different constituencies, $\bar{\lambda}$ has to be replaced with a weighted mean.

In the case that lobbyists only know the ideal points of their own legislators, the members of coalition S pool their knowledge on the ideal points of the corresponding committee members. Then, only the grand coalition $\{N\}$ consisting of all lobbyists has complete information on all legislators' ideal points. The members of S maximize their joint expected utility:

$$E\left[u_S(\Omega,C)\right] = \sum_{j\in S} 1 - E\left[\sum_{j\in S}(\Omega-\lambda_j)^2\right] - C \tag{8}$$

Accounting for the Nash equilibrium (1), (8) leads to a $|S|$-person variant of (4).

How do the coalition members allocate contributions to maximize (7) or (8)? Consider first the situation of the grand coalition which is very similar to that of a single lobbyist in Snyder's (1991) model of pure bribery in a majoritarian legislature. The differences are that in Snyder's model the set of legislators forms a continuum, and that the lobbyists themselves can set the proposal to be voted upon. This could happen through a legislator sympathetic with the lobbyists' position (who always exists as there are uncountable many legislators).

Assume that the cartel's ideal point is greater than the median of the legislators' ideal points, i. e. $\bar{\lambda} > \mu_{(P)}$. Then, Snyder (1991) proves:[14]

Proposition (Snyder 1991). (i) If $\mu_{(P)} < (q+\bar{\lambda})/2 \leq \mu_{(n)}$, then the lobby cartel makes the highest contributions to legislators with ideal points close to $\mu_{(P)}$, but on the same side as $\bar{\lambda}$. (ii) In the case $(2\mu_{(P)}-\bar{\lambda}) < q < \bar{\lambda}$ there exists a $q_D \in (\mu_{(P)},\bar{\lambda})$ such that if $(2\mu_{(P)}-\bar{\lambda}) < q < q_D$ then the lobby cartel's optimal proposal x_D^* is unique, and satisfies $\max\left[(2\mu_{(P)}-q), q, q_D\right] < x_D^* < \bar{\lambda}$.

If $q \leq (2\mu_{(P)}-\bar{\lambda})$ or $q \geq \bar{\lambda}$, the lobby cartel optimally proposes $x_D^* = \bar{\lambda}$, and does not make any contributions since $\bar{\lambda}$ defeats the status quo anyway.

The proposition states the intuition that a status quo q that is far away from $\mu_{(P)}$ and

[14] We cite Snyder's results with some adaptations to the case of the lobby cartel. In addition to the situation at hand where the lobbyist can discriminate bribes across legislators, Snyder (1991) considers in his paper also the situation that the lobbyist is not able to discriminate.

$\bar{\lambda}$ can be defeated at low or no costs to the lobbyist with a proposal close to or even equal to $\bar{\lambda}$. The closer q is to the legislators' median ideal point, $\mu_{(P)}$, the more expensive it is to beat q with some divergent proposal. The cartel makes contributions to its marginal opponents, and the highest contributions go to the legislators whose ideal points are closest to the pivotal member of the legislature.

These results can be applied to the case of a finite number of legislators in which the lobby cartel will pick the legislator i as the agenda-setter, whose ideal point μ_i is closest to $\bar{\lambda}$. If $\bar{\lambda}$ is preferred by the median legislator to the status quo, then the best strategy of the lobby cartel – maximizing $u_{\{N\}}(\Omega, C)$ – is to make contributions to the agenda-setter only such that the ideal point of the latter approaches $\bar{\lambda}$. If, by contrast, the median legislator originally prefers the status quo to $\bar{\lambda}$, then the cartel's optimal strategy is still to choose the 'closest' (possibly more extreme) legislator, and then make contributions to the set of legislators whose original ideal points are in the interval $[\mu(P), (\bar{\lambda}+q)/2)$ such that their new ideal points are all equal to $(\bar{\lambda}+q)/2$. If the agenda-setting legislator is more extreme than the cartel, $\mu_A > \bar{\lambda}$, his optimal proposal, given the changed profile M' of legislators' ideal points is $\chi^*(\mu_A, M') = 2\mu_{(P)} - q$, and the outcome is exactly $\Omega = 2\mu_{(P)} - q = \bar{\lambda}$. In the case that no legislator is more extreme than the lobby cartel's position, maximization generally requires to make also contributions to the 'closest' legislator.

A lobby coalition $S \subset N$ that maximizes (7) or (8) behaves qualitatively in the same way as the grand coalition. In the case of uncertainty about the ideal points of legislators associated with non-members of the coalition, it additionally has to account for the possibility that the pivotal legislator's ideal point could lie in the interval $[0, q]$ or (q, d).

The situation of the N lobbyists contemplating the formation of a grand coalition or Eurogroup can now be modeled as a *N-person cooperative game* with *transferable utility*. The game is described by a *characteristic function* v which maps each coalition $S \subseteq N$ to a real number $v(S)$.

Under complete information $v(S)$ measures the expected utility S gets from playing against the rational counter-coalition, viz.

$$v(S) = \pi_S u_S(\Omega^*_S, c_S) + \pi_{N\setminus S}\, u_S(\Omega^*_{N\setminus S}, 0)$$

where Ω^*_S and $\Omega^*_{N\setminus S}$ denote the outcomes of the legislative bargaining game with optimal contributions by coalitions S and $N\setminus S$, respectively.

Under incomplete information the value $v(S)$ of the game to coalition S is defined in the standard fashion as the expected utility that the members of S can obtain, whatever the complementary coalition $N\setminus S$ may do. Since it is unknown to S what the outcome of the game will be in the case that $N\setminus S$ chooses the agenda-setter, it seems prudent to visualize the worst case. The value of S is given by

$$v(S) = \pi_s\, E\left[u_S(\Omega^*_S, c_S)\right] + \pi_{N\setminus S}\, \min\left[u_S(\Omega^*_{N\setminus S}, 0)\right]$$

where $\min[u_S(\Omega^*_{N\setminus S}, 0)]$ is the minimum utility received by the members of S if the counter-coalition chooses the agenda-setter among its legislators. As the ideal points of the latter are unknown to S, S anticipates the most unfavorable scenario.

A game in characteristic function form is *superadditive* if

$$v(S) + v(T) \leq v(S \cup T) \qquad \forall\ S,\ T \subseteq N : S \cap T = \emptyset, \tag{9}$$

i. e. if two disjoint coalitions S and T can achieve as much by joining their forces as by remaining separate.

The value $v(S)$ is shared among the members of S via a pay-off vector $\mathbf{u} = (u_1, \ldots, u_n)$. Since our main interest is in the question under which conditions a stable grand coalition (the Euro group) is likely to form, a natural choice of solution concept is the *core*.[15] A pay-off vector $\mathbf{u}$ that is an element of the core is stable in the sense that no single player or coalition of players can deviate profitably. In the next section, several games among 3 lobbyists are analyzed with regard to the stability of cartel formation.

3 Examples

In this section we consider four games that help to formulate hypotheses about the conditions for cartel formation among lobbyists.

Example 1: Let $n = 3$, $q = 0$, $\Lambda = (0.55,\ 0.6,\ 0.85)$, and $M = (0.5,\ 0.45,\ 0.9)$. Each lobbyist has a chance of $1/3$ that his legislator turns out agenda-setter, and coalitions of two lobbyists have a chance of $2/3$ to determine the agenda-setter. All ideal points are known to the lobbyists. The game among the lobbyists is defined by the characteristic function v where

$$\begin{aligned} v(\{1\}) &= 0.963 \\ v(\{2\}) &= 0.996 \\ v(\{3\}) &= 0.940 \\ v(\{12\}) &= 1.936 \\ v(\{13\}) &= 1.917 \\ v(\{23\}) &= 1.928 \\ v(\{123\}) &= 2.908 \end{aligned}$$

This characteristic function does not satisfy the superadditive property (9), in particular $v(\{13\}) + v(\{2\}) \geq v(\{123\})$. The most likely outcome of the game is that lobbyist 2 pursues a solitary or national lobbying strategy, whereas lobbyists 1 and 3, though not "ideologically" close to each other, form a coalition which makes them in expectation better off than playing alone. The outcome of the game is $\Omega = 0.525$ if lobbyist 2 picks the agenda-setter, and $\Omega = 0.633$ in the case that $\{13\}$ can choose the agenda-setter.

[15] The core of the game v consists of all N-vectors $\mathbf{u}$ satisfying (a) $\sum_{i \in S} u_i \geq v(S)$ for all $S \subset N$ and (b) $\sum_{i \in N} u_i = v(N)$.

Example 2: Consider Example 1 again with the status quo changed to $q = 0.5$. The characteristic function is given by

$$\begin{aligned} v(\{1\}) &= 0.987 \\ v(\{2\}) &= 0.992 \\ v(\{3\}) &= 0.899 \\ v(\{12\}) &= 1.993 \\ v(\{13\}) &= 1.929 \\ v(\{23\}) &= 1.926 \\ v(\{123\}) &= 2.942. \end{aligned}$$

When $\{123\}$ forms, the outcome is $\Omega = 0.654$ which is achieved by choosing legislator 3 as agenda-setter and persuading legislator 1 to take the position $\hat{\mu}_1 = 0.577$. Then, the Nash equilibrium proposal of legislator 3 is $\chi^* = 0.654$.

The game is superadditive, and it can be checked that the core is non-empty. One possible allocation of pay-offs among the members of the grand coalition is defined by the *Shapley value* (Shapley 1953). Applying the Shapley value to the game above yields the pay-off vector $\mathbf{u} = (1.006, 1.007, 0.929)$ which is also an element of the core.

Example 3: Let $n = 3$, $q = 0$, $\Lambda = (0.5, 0.7, 1.0)$, and $M = (0.5, 0.3, 0.9)$. The lobbyists are only aware of the positions of the legislator with whom they are associated, a lobby coalition or cartel thus serves as an information pool for its members. The probabilities to determine the agenda-setter are $\pi_S = 0.15$ if $|S| = 1$, and $\pi_S = 0.85$ if $|S| = 2$. The game is defined by the characteristic function v where

$$\begin{aligned} v(\{1\}) &= 0.862 \\ v(\{2\}) &= 0.894 \\ v(\{3\}) &= 0.573 \\ v(\{12\}) &= 1.962 \\ v(\{13\}) &= 1.849 \\ v(\{23\}) &= 1.908 \\ v(\{123\}) &= 2.853. \end{aligned}$$

The game is superadditive, yet its core is empty: A core allocation $\mathbf{u} = (u_1, u_2, u_3)$ would have to fulfill the conditions

$$\begin{aligned} u_1 + u_2 &\geq 1.962 \\ u_1 + u_3 &\geq 1.849 \\ u_2 + u_3 &\geq 1.908 \end{aligned}$$

which by summation calls for

$$2(u_1 + u_2 + u_3) \geq 5.719 \quad \text{or} \quad u_1 + u_2 + u_3 \geq 2.860.$$

This is not feasible since $v(\{123\}) = 2.853$. The problem resulting from the empty core in this game is cyclical coalitional deviations. It can be expected that two of the three lobbyists coordinate their efforts, but which coalition eventually forms, and hence the outcome of the game, depends on the sequence of negotiations between the lobbyists.

Example 4: Consider now again Example 3 with $q = 0.5$. The game is represented by the characteristic function v where

$$\begin{aligned} v(\{1\}) &= 0.786 \\ v(\{2\}) &= 0.911 \\ v(\{3\}) &= 0.750 \\ v(\{12\}) &= 1.960 \\ v(\{13\}) &= 1.754 \\ v(\{23\}) &= 1.792 \\ v(\{123\}) &= 2.853. \end{aligned}$$

In this game, the core is non-empty so that cooperation among all 3 lobbyists can be established. The lobby cartel $\{123\}$ brings about the outcome $\Omega = 0.715$ by choosing legislator 3 as the agenda-setter and contributing to legislator 1 such that he changes his position to $\hat{\mu}_1 = 0.608$. The pay-off allocation defined by the Shapley value is $\mathbf{u} = (0.958, 1.040, 0.855)$.

4 Discussion

In Example 1, the conflict among the lobbyists' positions induces a *non-superadditive* game structure. The coalition $\{N\}$ is inefficient, and a primary reason for its formation is lacking. Therefore, coalition structures other than $\{N\}$ arise very naturally in non-superadditive games (see Aumann and Drèze 1974).

The superadditivity of the game in Example 3 ensures that there are incentives to cooperate, but it is not sufficient to guarantee the formation of a stable grand coalition. The game can rather be expected to give rise to ad-hoc coalitions among some of the lobbyists. The grand coalition would not be stable as some coalitions always have an incentive to split.

In both Examples 1 and 3 the disadvantage of the structure $\{123\}$ is due to the variance in the lobbyists' ideal points. It is intuitively plausible that a cartel might not be effective if the preferences of its members differ very much.[16] Whilst it seems e. g. safe to assume that all cigarette producers would prefer a lax anti-smoking regulation to a stricter one, and could thus form an effectual cartel, one could easily conceive of situations where different

[16]To the extent that a positive relationship exists between the degree of collusion in an industry and the similarity of firms' preferences over policy outcomes, this result is in line with Damania and Fredriksson (2000) who show formally that more collusive industries with higher profits from collusion have a greater incentive to form industry lobby groups, and more easily overcome the free-rider problems involved.

national lobby associations have antagonistic preferences. For example, the car industry of one country could be greatly advanced in producing cars with low CO_2 emission levels whilst the car makers of another country lag behind. In the extreme case that the mean of the lobbyists' ideal points coincides with the median legislator ideal point, the optimal policy choice of the cartel would be this median position.

Examples 2 and 4 demonstrate that incentives to cooperate significantly improve when the status quo is changed. $q = 0$, as in Examples 1 and 3, implies that legislators are highly biased against the status quo. This enables lobbyists to be successful under a solitary strategy as is the case with lobbyist 2 in Example 1. The solitary lobbyist generally has an interest to make the policy issue salient on a 'national' basis, since this tends to convince 'his' legislator to adopt a position favorable to his own. A lobby cartel, by contrast, may be more likely to base its lobbying efforts on 'ideology' in order to effect a multi-national change in public opinion and the opinion of legislators.

A large bias against the status quo potentially allows lobbyists to exercise more influence in the sense that they can achieve outcomes that differ to a great extent from the outcome which would have occurred without their interference. Under the assumptions of a uniform distribution of legislators' ideal points and a continuum of legislators, 0.5 is the median ideal point and constitutes the unique element of the *core* of the voting game in the absence of any payments. With status quo $q = 0.5$, it is therefore highly unlikely that, in any sizeable decision-making committee, the agenda-setter could put through any proposal which is not close to 0.5. The agenda-setter and the lobbyist linked to him are essentially powerless. A single lobbyist is able to influence the outcome when the status quo is close to the median legislator's ideal point, and the incentive to cooperate is therefore higher for the lobbyists. It would, however, be rather costly to move the policy outcome far away from 0.5, and the cartel may be unwilling to do so. The outcome of the legislative process with lobbying tends to stay quite close to 0.5 and rather far from $\bar{\lambda}$, making the cartel look little influential. This result could thus motivate why Eurogroups often appear as rather ineffective. They might be engaged more often than 'national' associations or companies in lobbying on issues where the 'climate' in the legislature does not leave much scope for lobby success.

If a lobbyist has for some reason a higher probability that 'his' legislator will be the agenda-setter (perhaps due to differences in voting weight), playing alone becomes *ceteris paribus* more attractive for him. With regard to EU decision-making, it is for example conceivable that lobbyists from 'bigger' member states have better chances to influence policy proposals and hence less incentive to participate in Eurogroups compared to lobbyists from smaller member states. On the other hand, the number of interests that are active in EU lobbying has multiplied with the enlargement of the Union, reducing the chances that a national association or business lobbyist can get hold of agenda-setting power. Therefore, Euro-level groups could be expected to gain strength in a larger Union.

We can summarize the discussion above as follows: A lobby cartel is more likely to form when lobbyists' preferences over policy outcomes are similar, when they have a priori equal chances of influencing the policy proposal, and when the bias among legislators against the status quo is small.

5 Concluding remarks

It is well established that companies and national interest groups attempt to influence EU policy decisions by lobbying their national political institutions as well as by lobbying the EU institutions, which is done to considerable extent by Eurogroups. It is however far from clear which strategy is more effective (Dür 2005). This paper identifies a new factor in the formation of lobby cartels that, to our knowledge, has so far not been mentioned in the literature. It argues that the status-quo bias among legislators may have a critical effect on the lobbyists' incentive to cooperate.

In our model, a large bias against the status quo exists when $q = 0$. With regard to EU decision-making this case is particularly interesting, because the direction of new legislation is often not open to negotiation, and only the extent of change is subject to the process of legislative bargaining. Given our assumption of a uniform distribution of legislators' ideal points on $[0, 1]$, the outcome of the decision-making is a priori sure to differ from the status quo. For example, when the EU Commission recently deliberated upon a new regulation of CO_2 emissions of new cars, emission rates could indeed only be lowered, but the extent of the reduction was highly controversial. Our analysis suggests that such a situation enhances the chances of noncooperative lobbyists to be successful. On the other hand, a small or zero status-quo bias, as implied by $q = 0.5$, means that the lobbyists can alter the policy outcome *only* by cooperation. For example, opinions on which role atomic energy should play in the future not only greatly vary among European decision-makers, but there is also no consensus as whether to expand or reduce reliance on this energy source.

The analysis presented here is intended to suggest that further theoretical work could produce interesting hypotheses on the formation of lobby cartels. It has been confined to an overly simple model of legislative bargaining. Whereas the specific assumptions concerning the form of the utility functions and the contribution function should not be essential to the qualitative results, it is well known from bargaining theory that modest variations in the institutional details can indeed result in very different outcomes. It would, for example, probably be a more realistic approach to EU decision-making to assume multi-round bargaining, with lobbyists making contributions in each bargaining round. It might also be interesting to consider super-majority requirements which reduce the power of the agenda-setter and make lobby cartels more desirable.

The analysis suffers from several other important drawbacks: First, we have not modeled the costs of the competition among lobbyists to bring their legislator into the agenda-setter position. While in some cases this competition may essentially be costless ("The early bird catches the worm."), it seems worthwhile to explicitly incorporate the agenda-setter competition. If competition is costly, lobbyists might only engage in it to the extent that their legislator takes a position congenial to their own preferences on the issue. Then their expected gain from 'their' legislator being the agenda-setter is greater. Second, the one-dimensionality of the policy space is obviously a strong assumption. It might be justified, however, for the application to Eurogroups whose domains of concern are mostly 'low politics' issues such as e.g., technical standards. Third, the problem of two or more

lobbyists with conflicting interests competing for public policy is left out. While, for some matters, there may only be one dominant 'type' of lobbyists that has a particularly high stake in the issue, other issues provoke activity in different 'types' of lobbyists opposing each other, e. g. the bio engineering industry and consumer food associations. The effect of countervailing interests on the incentive to form lobby cartels clearly deserves attention.

This paper takes up the simple notion that lobbyists endeavor to influence the positions of decision-makers, and it "blackboxes" the mechanisms through which lobbyists exercise their influence. One key resource, interest groups 'exchange' for influence, is information. An influential branch of the lobbying literature (see e. g. Potters and van Winden 1992, Austen-Smith and Wright 1992, Lohmann 1995) has emphasized the role of interest groups as providers of information which is relevant to policy-decisions.

The informational view could also be relevant when trying to understand the weakness of Eurogroups. Especially in the case of the EU Commission, it has been argued that the Commission heavily depends on groups for information on technical details, market conditions or policy implementation and acceptance in the member states. Austen-Smith and Wright (1992) portray lobbying as a game of strategic information transmission and argue that lobbying by countervailing groups enhances the reliability of the information public actors receive and hence the quality of their decisions. In the light of this insight, it seems well conceivable that the (aggregate) information provided by Eurogroups could lead to 'impoverished' and less informed decisions of the EU bureaucracy. Inasmuch as this is acknowledged by EU decision-makers, the information loss occurring inside Eurogroups might reduce their influence.

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