# Intercameral Bargaining and Intracameral Organization in Legislatures

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*We argue that chambers have an incentive to create committees unrepresentative of themselves. In a bicameral setting, a committee within a chamber has two roles: as policy advisor for the parent chamber, and an additional role, less often recognized in the literature, as an agent for bargaining with the other chamber. In the former role, sound advice requires that the committee be representative of the chamber's preferences. In the latter role, a committee can be an effective bargaining agent if it is willing to reject proposals that the chamber cannot commit to reject. But this requires the committee to be unrepresentative of the chamber. Optimal committee design reflects a tension between the chamber's desire for a trustworthy (and therefore representative) advisor and a "tough" (and therefore unrepresentative) bargaining agent. Thus intercameral interactions can affect optimal intracameral arrangements; therefore, unicameral theories of legislative organization may overlook important factors.*

With few exceptions, the vast bulk of analytical and empirical work on legislative organization in the United States looks within a single chamber for explanations of the organizational choices that are empirically observed. This is true, for example, of the three most prominent schools of thought on Congressional organization: the distributive theory (Shepsle 1978; Shepsle and Weingast 1984, 1987; Weingast and Marshall 1988), the informational theory (Gilligan and Krehbiel 1987, 1989, 1990; Krehbiel 1991), and partisan theories (Aldrich 1995; Cox and McCubbins 1993, 2005; and Rohde 1991). While debates among the proponents of these three perspectives have been fruitful, both theoretically and empirically, these perspectives all neglect a key institutional arrangement in the American policy process, and one of the few actually spelled out in the U.S. Constitution: Congress is bicameral, and each chamber of Congress has veto power over proposed legislation.

In this article we explore implications for legislative organization stemming directly from bicameralism. We argue that intercameral interaction may have a crucial influence on intracameral organization. As a result, single-chamber models of legislative organization are underspecified, and empirical evidence on key features of legislative organization, such as committee representativeness, may not be properly interpretable in light of single-chamber models. Committee representativeness, in particular, is one of the most often studied and debated features of within-chamber organization,[1] and so is a good test case for the conceptual value of a multi-institutional perspective.

We argue that, even taking into account the policy advising issues highlighted by the informational theory, bicameralism gives a chamber incentives to create "unrepresentative" committees, with policy preferences biased relative to the chamber itself. This incentive exists even though by design in the model the parent chamber has complete control over committee structure. Under bicameralism, the chamber faces a trade-off in staffing committees because committees play dual roles for the chamber. Specifically, a committee is not only a policy advisor but also a bargaining agent in dealings with the other chamber. Therefore, the chamber (median) may want the committee (median) to have a different ideal

[1] Shepsle (1978), Shepsle and Weingast (1987), Weingast and Marshall (1988), Hall and Groffman (1990), Krehbiel (1990, 1991), Groseclose (1994), Londregan and Snyder (1994), Maltzman (1997), and Poole and Rosenthal (2007) are a few important contributions in this large literature.

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policy from itself, so that the committee is a "tough" veto constraint for the other chamber to satisfy when it makes proposals. This can induce the other chamber to make proposals that are more favorable to the (unrepresentative) committee's parent chamber in the first place. However, biasing a committee also necessarily means that the same committee will make proposals less favorable to its parent chamber. This is the key trade-off explored in our model. In general, the optimal resolution of this trade-off implies that a chamber's incentive is not to create a perfectly representative committee.

Although the literature on legislative organization has, for the most part, not recognized the importance of interchamber bargaining for intrachamber organization, several articles have pointed out the importance of interinstitutional interaction for organization within chambers of a legislature. Cooper (1970) attributed the origins of the standing committee system in the House of Representatives in the 1790s and early 1800s in part to legislators desires to avoid executive domination of the legislative process.[2] Diermeier and Myerson (1999) model legislative organization as a device for rent extraction from lobbyists and show that a multicameral legislative structure, combined with internal committees, may be more effective for this purpose than a streamlined legislature.[3]

The rest of the paper is organized as follows. In the first two sections we formalize our argument in a complete information model; The third section extends the analysis to the case where committees have expertise that the chamber as a whole lacks, and then we Section conclude. The appendix contains formal proofs of propositions.

[2]Bovitz and Hammond (2001) and Monroe and Hammond (2005) have further developed Cooper's point about legislative organization and committee structure as a strategic response by Congress to conflict with the executive branch, a point also analyzed by Epstein and O'Halloran (2001).

[3]Several important contributions have explored other facets of intercameral bargaining more distantly related to the arguments we advance here. For example, Tsebelis and Money (1997) address the relationship between bicameralism and outcomes of legislative bargaining. They argue that intercameral bargaining creates opportunities for delay that push policy outcomes in the favored direction of the more patient chamber. Ansolabehere, Snyder, and Ting (2003) analyze the effect of bicameral bargaining and different forms of representation across chambers (e.g., direct vs. proportional) on the division of public resources across districts. These contributions do not address the effects of bicameralism on within-chamber organization.

# A Model of Bargaining Agents with Agenda-Setting Power

We develop our argument in an extensive form game with three players, $H$, $S$, and $C$. Let $H$ and $S$ represent chambers of the legislature, and let $C$ represent a committee in $H$. These letters will variously denote the player itself, the player's ideal point, or the entire chamber and its subsets as relevant. The space of available policies is the set of all real numbers $\mathbb{R}$, and a policy is denoted by $x \in \mathbb{R}$. Players obtain varying levels of utility from different policies; assume player $j$ has a quadratic utility function $u_j(x) = -(x - j)^2$, and that $H = 0$ and $S > 0$ (without loss of generality).[4] Let $I_j(y)$ denote the (unique) policy in $\mathbb{R}$ not equal to $y$ that a player with ideal point at $j$ considers equally as good as the policy $y$.

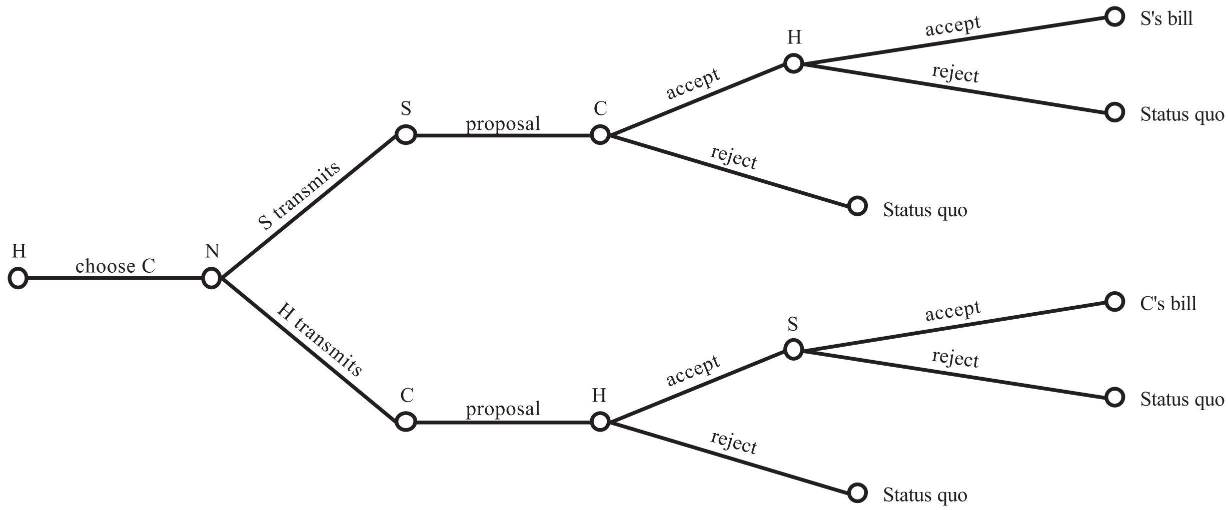
Policymaking follows a modified "agenda setter" structure (Romer and Rosenthal 1978). In particular, $H$ chooses $C$'s ideal policy, and following this, Nature chooses with probability $p$ that $H$ will transmit a proposal to $S$, and with probability $1 - p$ that $H$ will receive a proposal from $S$. In either case all business within $H$ begins in committee: if $S$ makes a proposal, the proposal first goes to $C$ for approval or rejection, and then to $H$ for the same decision. If $H$ transmits a proposal to $S$, $C$ first proposes a bill to $H$, which $H$ accepts or rejects. If $H$ accepts the proposal by $C$, it is sent to $S$, which faces the same choice. Thus either $S$ or $C$ will originate action, and the other two players must accept the proposal for it to pass. If either rejects the proposal, the result is an exogenous status quo $Q$.

The extensive form is depicted in Figure 1 and the equilibrium concept is subgame perfect Nash equilibrium. We assume that players accept an alternative to $Q$ if they are indifferent between the two. Before turning to the analysis we comment on the substantive backing for several features of the model.

The sequence of legislative action in the model corresponds to a simplified version of typical intercameral business in Congress. Note that our interpretation does not emphasize conference committees as the chief vehicle for intercameral bargaining. It is most literally connected to the more common procedure of

[4]We implicitly think of $H$ as selecting a subset of its membership to be on the committee when it chooses $C$. Therefore the overall House ideal point (or that of its median member) will not change when $C$ is selected. This setup has two primary restrictions. First we are assuming that $H$ has enough raw material, in its roster of members, to create any committee ideal point (that is, the committee's median) it might want. Second, we are taking a "partial equilibrium" perspective by focusing on staffing one committee in isolation rather than on all committees at once.

**FIGURE 1 Extensive Form, Complete Information**




sending enrolled legislation to the other chamber, which then follows its own ordinary legislative process as if the bill had been introduced by one of its own members.[5] However, since conference reports often receive more protection from amendments than bills transmitted back and forth across chambers, our argument and basic logic could be straightforwardly extended to the case of conference committees. First, if conference committees treat chamber bills as "anchors" and adjust to a final compromise from them, a chamber can benefit from a relatively extreme committee because it will pass a relatively extreme anchor, leading to a final compromise more favorable to the chamber. Second, if a chamber's bill sincerely reflects its median preference, the chamber can benefit by ensuring that conferees, or indeed any pivotal actors within the chamber, are more inclined to the status quo than the chamber itself. Such conferees can credibly commit to make fewer concessions; too many concessions, and they walk away from the deal.

Perhaps the most obvious simplification in our model is the random draw of $H$ or $S$ to transmit to the other chamber in a Romer-Rosenthal framework. This allows us to abstract from complexities of issue uptake in Congress that are beyond the scope of our argument. One interpretation is that the proposal probability $p$ captures the relative importance of each of a committee's roles to its parent chamber. For instance, if the policy advising and bargaining roles are equally important for the chamber, $p = .5$ reflects this.

Two types of within-chamber institutionalized committee power—gatekeeping (negative agenda) power and (positive) agenda-setting power—appear in the model. First, when $S$ transmits to $H$, $C$ possesses veto power that $H$ cannot revoke. This is gatekeeping power: the committee can prevent consideration of a measure by the parent chamber. Patty (2007) has argued that in the House of Representatives, even the discharge petition (often considered the mechanism to circumvent gatekeeping) confers gatekeeping authority on either the Speaker or the Rules Committee. More directly, Pearson and Schickler (2007) have uncovered evidence on discharge petitions suggesting that Committees do possess important if nonuniversal blocking power. Moreover, even if the House floor retains the *authority* to limit the gatekeeping power of the committee, our results suggest that the floor will have an *incentive* to permit committee gatekeeping. This is in contrast to Crombez, Groseclose, and Krehbiel (2006), where gatekeeping is Pareto dominated by veto power in a unicameral model.[6] Second, in the complete information model (next section), $C$ has positive agenda-setting power. We interpret this as a limiting form of some transaction cost the parent chamber faces for amending $C$'s proposals. As with gatekeeping power, one implication of our results is that the parent

[5]A strict interpretation of this sequential procedure would require the possibility that $C$ can amend legislation enrolled by $S$, and send the amended version to $H$ for consideration, which then returns it to $S$, etc. Our model is a smaller and more tractable version of this sequence. With complete information and no benefit of delay, the difference is irrelevant in equilibrium.

[6]Diermeier and Myerson (1999) and Epstein (1997) have previously identified incentives for a chamber to grant gatekeeping power to a committee, for different reasons than our point about intercameral bargaining: for rent extraction from vote-buying lobbyists, in Diermeier and Myerson; for informational purposes, in Epstein.

chamber has an incentive to endow the committee with this agenda-setting power. This power is not necessary for the logic we identify under asymmetric information (Third section).

We focus on House committee design taking a unitary Senate as given. We comment further on this at the end of the next section. It is useful to defer this discussion until some results and intuition are established.

The model has the same "majoritarian" and policy-oriented (as opposed to, say, position taking and credit claiming) underpinnings as the informational theory (Krehbiel 1991), with the extensive form modified to account for intercameral interaction. In particular the chamber is the sole principal for its committees, and any unrepresentativeness in committees, must be to the chamber's benefit. But our general point applies to any principal (such as a party caucus; cf. Cox and McCubbins 2005) which creates a committee which has a "fiduciary duty" to that principal and which bargains on behalf of that principal with the other chamber.

## Optimal Committees with Symmetric Information

In our model the House is selecting a committee (its agent) in the context of policy bargaining with the Senate. As in many proposal and bargaining situations (e.g., Baron and Ferejohn 1989; Romer and Rosenthal 1978), the responder would benefit from committing to reject specific types of offers from the proposer, in order to extract different proposals more to its own liking. Using a bargaining agent creates some scope for institutionalizing this commitment and adding credibility to it (cf. Schelling 1960). The cost of this is that the committee will try to get the floor to adopt a policy that is at the committee median and not at the floor median. Therefore, choosing an unrepresentative committee presents a trade-off to the chamber.

The location of $Q$ is critical for determining $H$'s optimal resolution of this trade off, and we can distinguish three cases and three corresponding sets of results.[7]

[7]This presentation assumes that $C$ can be conditioned on $Q$. This assumption produces straightforward results, but similar results obtain by assuming that the committee must be chosen before $Q$ is revealed by Nature (i.e., chosen from some fixed distribution). We take this approach when considering asymmetric information because it simplifies the analysis in that case. In the symmetric information case, however, conditioning on $Q$ is formally straightforward and prevents any need to introduce uncertainty and expectations.

**CASE 1:** $0 = H < S < Q$. (*i*) **If** $S$ **proposes** and $C$ and $H$ have ideal points left of $S$, $S$ will propose and obtain its ideal point as the final policy: $S$ can present a choice between its own ideal policy, and the less attractive status quo. Of course, $H$ can force $S$ to a different proposal by choosing $C > S$, but obviously this is not to $H$'s benefit. Thus, $H$ cannot do better than to choose $C = H$ and have the final policy at $S$. (*ii*) **If** $H$ **proposes** and chooses $C = H$, the final policy is max $\{0, I_S(Q)\}$—exactly the policy that $H$ itself would choose to propose to $S$. If $H$ instead chooses $C \neq H$ but $C < I_S(Q)$, final policy is max $\{C, I_S(Q)\}$ and choosing $C \geq I_S(Q)$ is clearly dominated by $C < I_S(Q)$. Thus as both proposer and receiver, the optimal choice for $H$ is $C^* = 0$.

**CASE 2:** $0 = H < Q < S$. In this case no movement from $Q$ is possible, regardless of whether $H$ or $S$ proposes. Any movement to the right of $Q$ is vetoed by $H$, and any movement to the left is vetoed by $S$. So $H$'s choice of $C$ is irrelevant, and $H$ certainly cannot gain by choosing $C \neq H$.

**CASE 3:** $Q < 0 = H < S$. (*i*) **If** $S$ **proposes,** then $H$ can gain with an unrepresentative committee. Suppose first that $H$ chooses a representative committee ($C = 0 = H$). Then $S$ chooses its favorite policy above $H$ (and $Q$) that $H$ considers at least as good as $Q$, and since $C = H$ in this scenario, $C$ is willing to accept it as well. Final policy is $x_f \equiv$ min $\{S, I_H(Q)\} > 0$. This is standard Romer-Rosenthal rent extraction as in a two-player game: $H$ would prefer a proposal closer to 0, but $S$ uses its agenda-setting power to pull policy as close to its ideal as possible while still inducing both $H$ and $C$ to accept. However, $H$ could improve its utility by selecting $C' < H$ as defined by $I_{C'}(Q) = 0$, so the committee is indifferent between the status quo and $0 = H$. Then $S$ does the best it can given this committee $C'$: it proposes $x = 0$, which both $C'$ and $H$ accept. Whereas $H$ can only commit to reject proposals outside of $[Q, I_H(Q)]$, $C'$ will reject any proposal outside of $[Q, I_{C'}(Q)]$, and here $I_{C'}(Q) = 0$. Since $C'$ values the status quo more highly than $H$, $S$ must lower its proposal relative to the scenario with $C = H$ to induce $C'$ to accept. (*ii*) **If** $H$ **proposes,** $H$ does not want an unrepresentative committee. The cost of choosing $C' < 0$ is that the committee has agenda-setting power and policy advising functions within the chamber. Given $Q < 0 < S$, the committee $C' < H$ such that $I_{C'}(Q) = 0$ proposes its own ideal point, which is approved by both chambers since $Q < C' < H < S$. $H$ receives a more favorable proposal (indeed, its ideal point) when $C = H$.

In short, in cases 1 and 2, $H$ cannot improve on a representative committee $C = H$. But in case 3, when

$Q < H < S$, $H$ faces a trade-off. If $H$ chooses $C < H$, then when $S$ proposes, it must account for $C$'s relatively demanding, status quo friendly preferences to have its proposals accepted. This forces $S$ to lower its proposals, closer to $H$'s ideal than it makes in case $C = H$, and this is to $H$'s benefit. On the other hand, when $H$ proposes, the final policy will be $C < H$ because $C$'s own ideal point is preferred to $Q$ by $H$ and $S$; $C$ knows it can simply propose its ideal policy and have it passed. This is further from $H$'s ideal policy than obtains for $C = H$, and this is to $H$'s detriment. In short, $C < H$ forces $S$ to lower its proposal below $S$ when it transmits, but by the same token pushes policy below $H$ when $H$ transmits.

Note that in general $I_C(Q) = 2C - Q$ when $Q < C \leq 0$. Then $H$'s optimal committee $C$ follows from maximization of

$$\max_C EU_H(C) = -pC^2 - (1-p)(2C-Q)^2.$$

This is $H$'s weighted average policy utility from any choice of $C$. The weights are given by the probabilities that $H$ is chosen to propose ($p$) or chosen to receive ($1 - p$). The utilities come from the policy that results when $H$ proposes and when $H$ receives, for a given committee choice $C$. This utility function clearly expresses the trade off that $H$ faces in choosing the value of $C$: it can obtain concessions from $S$ by creating a tough bargaining agent to screen $S$'s proposals, but only at the cost of rent extraction by $C$ when it reports bills to $H$ which then proposes to $S$.

This expected utility is maximized at $C_M = \frac{2Q(p-1)}{3p-4} < H$. Since this accounts for optimal behavior by all parties further down the game tree, and since choosing $C < Q$ or $C > 0$ is dominated for $H$, this is $H$'s most preferred value of $C$ that actually affects $S$'s proposal when $S$ transmits.

Of course, $H$ also has the option to choose $C = 0$ and let $S$ extract gains when it transmits, and it may prefer this when $C_M$ is too far below 0. This gives rise to a threshold, a function of $Q$ and $p$, that $S$ must exceed for $C < H$ to be in $H$'s interest. The optimal committee choice is summarized in the following proposition, proved in the appendix.

**Proposition 1** *(a) If $Q \geq 0$, $H$'s optimal choice of $C$ is a representative committee, $C^*(Q) = H$. (b) If $Q < 0$, $H$'s optimal choice of $C$ is*

$$C^*(Q) = \begin{cases} \frac{2Q(p-1)}{3p-4} & \text{if } S > -Qf(p) \\ 0 & \text{if } S \leq -Qf(p) \end{cases}$$

*where* $f(p) \equiv \left[4\left(\frac{4(p-1)^2}{(3p-4)^2} + \frac{p(p-1)^2}{(1-p)(3p-4)^2}\right) - 8\frac{(p-1)}{(3p-4)} + 1\right]^{\frac{1}{2}}$ *is a differentiable function for $p \in (0, 1)$ such that $\frac{df(p)}{dp} > 0$, $f(0) = 0$, and $\lim_{p\to 1} f(1) = 1$.*

$H$'s decision to bias its committees when $Q < H < S$ requires $S$ to exceed the threshold $-Qf(p) \geq 0$. Note that since $f(p) \leq 1$ for all $p$, the required threshold to induce bias in $C$ never exceeds $-Q$. Further, this threshold is increasing in $p$, which indexes the cost to $H$ of an unrepresentative committee: as $H$ is more likely to propose, $S$ must be relatively larger to make it worthwhile for $H$ to incur the relatively more important cost of a biased proposal from $C$ when $H$ transmits. The threshold also grows as $Q$ falls further below 0: a decline in $Q$ means that $C_M$ declines, so the cost of bias that $H$ incurs when it transmits is greater; accordingly, it must face a more distant $S$ in order to make this increased bias worthwhile. Thus, equilibrium committee bias is weakly increasing in ideological conflict between $S$ and $H$ (measured by $|S - H|$, equivalent to $S$ given our assumptions that $H = 0 < S$).[8,9]

Whether committees are actually representative of the parent chamber or are ‘‘outliers’’ has been a major impasse in the literature and the proposition sheds light on this. Empirical results on this point are sensitive to the specific measures, techniques, and sample periods used for analysis (see Groseclose 1994 and Poole and Rosenthal 2007 for elaboration and reviews of the literature). Most recently Poole and Rosenthal (2007, 252) have argued that unrepresentativeness is common for the House of Representatives in general and the Democratic contingent. This impasse has been interpreted as an indeterminacy as far as theory is concerned, because the prevailing theories informing this work make clear and

[8]Empirically, chamber differences in median first-dimension DW-NOMINATE scores (Poole and Rosenthal 2007) exceed 0.1 in 9 Congresses from the 80th to 110th. This is roughly one-third of the typical within-chamber standard deviation in first-dimension DW-NOMINATE scores. Moreover, as the recently passed House and Senate health care bills illustrate, substantial differences between chambers can exist on specific issues even when the same party holds a majority in each.

[9]However, $|S - H|$ has no effect on $C^*$ other than determining whether the threshold to induce bias is met. This is because the choice of $C^*$ is, in essence, a device for $H$ to control the proposal transmitted by $S$. But proposals by $S$ do not depend on its own utility under the status quo; they depend only on the utility that its veto players $H$ and $C$ experience under the status quo. This is a general feature of models in which a proposer offers a settlement to a group of voters (e.g., the Romer-Rosenthal and Baron-Ferejohn models); the continuation value of the pivotal voter(s) drives the proposals.

unconditional, but different, predictions about committee representativeness (but see Hall and Grofman 1990 and Epstein and O'Halloran 2001, whose predictions are conditional). Our argument suggests that conclusive empirical results—demonstrations that committees either generally are or generally are not representative of the chamber (or more generally any given principal)—should not necessarily be expected. Whether chambers themselves even want representative committees is conditional on wider political circumstances both inside and outside the chamber. In particular, findings of unrepresentativeness are not necessarily inconsistent with the informational theory or its majoritarian premise; they can be rationalized in that framework by intercameral interaction.

An exception to this is when H proposes with probability 1; in this case C should be representative of H. An approximation of this is revenue bills, which as stipulated in Article I, Section 7 of the Constitution, generally originate in the House (the Senate must work through amendments). Consistent with this point, Table 4.6 of Krehbiel (1991) shows that the Ways and Means committee is one of the most representative in the House.

We close this section with two points about the Senate in this model. First, we have Senate structure as given. One interpretation of this is as a best response of the House to the Senate in a larger game in which both chambers design committees. Our results then imply that for any given committee design in the Senate, the House has an incentive to create outlier committees (e.g., it cannot be an equilibrium for both chambers to have representative committees simultaneously). Therefore, in this sense our argument is robust to simultaneous consideration of the other chamber's committee design problem.

Second, the conditions for our results are more consistent with received wisdom for procedures in the House than the Senate. The model requires that committees have some degree of agenda setting power power with respect to their parent chamber. Arguably this power is easier to envision in the House than the Senate, since the latter has no general requirement that amendments offered to a measure must be germane to it. If this process of extraction from committee is truly easier in the Senate, the bargaining-advantage rationale for creating outlier committees is weakened, their policy-advising role is more important, and Senate committees should not be as biased, relative to the floor (and in the relevant ideal point-status quo configurations), as House committees.

## Policy Advice, Bargaining, and Asymmetric Information

Most within-chamber studies of committees as advisors for the chamber assume asymmetric information about the relationship between policy choices and policy outcomes (Gilligan and Krehbiel 1987, 1989, 1990; Krehbiel 1991); this relationship may be cheaply discoverable by the committee because of specialization and expertise, but not by the chamber as a whole. In this section we discuss several results on these information asymmetries and their effects on the chamber's incentives to create a biased committee. We address only cases in which the committee is perfectly informed about the value of the random shock. Our focus is not on how a committee with a given preference can be induced to invest in expertise, but instead on the choice of (median) preference for a given committee.[10]

The primary effect of adding asymmetric information is that we can relax the proposal power the committee was assumed to have with respect to the parent chamber *H*. For the rest of the article we assume that *C*'s proposals can be freely amended by *H*, though *C* still must possess some ability to prevent proposals from reaching floor consideration.

Suppose in particular that given a policy choice $x \in \mathbb{R}$, the policy outcome is $y = x + \varepsilon$. Suppose also that *C* knows the value of $\varepsilon$ but *H* only knows that $\varepsilon$ is uniformly distributed on some interval $[-L_\varepsilon, L_\varepsilon]$, where *L* simply represents the arbitrary boundary of the support of $\varepsilon$. Now the players' ideal points refer to their ideal outcomes; their ideal policies are contingent on the "state of nature" $\varepsilon$.

Suppose further that *S* is fully informed about $\varepsilon$ when it is chosen to transmit, but only knows $\varepsilon \sim U[-L_\varepsilon, L_\varepsilon]$ (and so is no more informed than *H*) when *H* is chosen to transmit. This captures the idea that when a chamber originates a bill, information about the issue in question is created and disseminated in the chamber. But when the same chamber receives another actor's policy proposal it may not have gone through the same process of informing itself.

Finally, assume for simplicity that after *H* chooses *C*'s ideal point, *Q* is randomly drawn from a uniform distribution on the interval $[-L_Q, L_Q]$. For reasons

[10] Endogenous committee information will not reverse the argument we identify below. Our results cover the branch of an endogenous information game on which the committee does in fact specialize.

explained in the appendix,[11] we further assume that $L_Q > L_\varepsilon$, i.e., the support of $Q$ is strictly wider than the support of $\varepsilon$. The draw of $Q$ then immediately becomes common knowledge. Qualitatively similar results would hold with $Q$ fixed at the beginning of the game, as it was in in the previous section. We make this assumption to suppress the dependence of optimal choices on uninteresting locations of $Q$. Proposals and accept/reject decisions can still depend on $Q$, but $H$'s choice of $C$ cannot.

All considered, the new sequence of the game is as follows: $H$ chooses $C$'s ideal point; Nature chooses $H$ or $S$ to transmit; Nature draws $\varepsilon$ and informs $C$, and $S$ as well if $S$ is chosen to transmit; Nature draws the status quo $Q$ and informs all players. From this point the game proceeds as in Figure 1. A natural equilibrium concept for this game is perfect Bayesian equilibrium; it preserves the credibility requirement in subgame perfection and allows for incomplete information.

The analysis first addresses $H$'s incentives conditional on transmission by $S$, and then conditional on transmission by $H$. Breaking the analysis up in this way clearly demonstrates the countervailing pressures facing $H$ when choosing committees.

## S Transmits

When $S$ transmits, both $S$ and $C$ are fully informed about $\varepsilon$. For $C \leq H$, a perfect Bayesian equilibrium involves the proposals that $S$ would make to $C$ (conditional on $\varepsilon$) in a standard Romer-Rosenthal model, and acceptance of all proposals in equilibrium by both $C$ and $H$. Moreover, $C \leq H$ is the only relevant case because given $S > H$, choosing $C > H$ is obviously a dominated choice for $H$. For any $\varepsilon$, such a choice would create ranges of $Q < C - \varepsilon$ that cause $C$ and $S$ to collude against $H$.[12]

**Proposition 2** *Suppose $S$ transmits with probability 1 and $C \leq H$. A perfect Bayesian equilibrium of the continuation game beginning with $S$'s policy choice exists with the following strategies on the equilibrium path: (a) $S$ proposes $S - \varepsilon$ if $S - \varepsilon \leq Q$, proposes $Q$ if $C - \varepsilon < Q < S - \varepsilon$, and proposes* $2C - Q - 2\varepsilon$ if $Q \leq C - \varepsilon$; (b) *$C$ accepts all proposals, and $H$ accepts all proposals $C$ accepts.*

[11]In brief, this assumption ensures that a second order condition is satisfied.

[12]Of course, it is possible and potentially interesting that a committee and the other chamber may collude against the committee's parent chamber in specific cases. Our point is not that this is empirically impossible, only that the parent chamber would never cause it to happen on purpose.

Because $C \leq H < S$, any proposal that $S$ would actually make, and that is preferred to $Q$ by $C$, must also be preferred to $Q$ by $H$. There are proposals that $C$ would like to accept that $H$ would not, but $S$ never makes them. Therefore, acceptance of a proposal by $C$ provides a strong and useful signal to $H$. In order to secure $C$'s approval, $S$ must make the policy proposal sufficiently responsive to the state $\varepsilon$ and cannot make it too extreme.

$H$'s incentive to create a biased committee is now very much as in the complete information case.

**Proposition 3** *Suppose $H = 0 < S$, $S$ transmits with probability* 1, *and the equilibrium policy proposals and responses are as identified in Proposition 2. Then $H$'s optimal choice of $C$ is $C^* = -\frac{2L_Q + (L_Q^2 - L_\varepsilon^2)^{\frac{1}{2}}}{3} < H$.*

In short, for the boundary case in which $S$ transmits with probability 1, $H$ has an incentive to make its committee unrepresentative. The basic logic of the complete information model carries through: an unrepresentative committee is a veto constraint for the other chamber, and can prevent it from making proposals that the committee's parent $H$ would rather not face but cannot commit to reject.

## H Transmits

All of $H$'s incentive to form an unrepresentative committee comes from the possibility that $S$ might transmit. If $H$ transmits with certainty, the committee is strictly a policy advisor and the logic of committee selection collapses to the unicameral case. Thus $H$ prefers a representative committee $C = H$. The most important effect of asymmetric information is that this conclusion holds even if $C$ lacks positive agenda power. With an open rule $C \neq H$ implies that $C$ "holds back" on reporting some of its information, leaving $H$ only partially informed about the implications of its policy choices.[13]

To see this point consider a (within-chamber) open rule, when $H$ is selected to transmit a proposal. Then $C$ plays a "cheap talk" sender-receiver game with $H$ (Crawford and Sobel 1982). In the most informative perfect Bayesian equilibrium,[14] $C$ plays a

[13]As Gilligan and Krehbiel (1987) show, $C$ holds back less under a closed rule, but still does not communicate its information perfectly if chamber and committee preferences are not perfectly aligned.

[14]This is a standard equilibrium refinement in sender-receiver games, since they generally have many equilibria and are focused on the possibilities for informative communication; moreover, both sender and receiver prefer this equilibrium to any other equilibrium before the sender learns the state.

semi-separating strategy in reporting a bill to $H$ as a function of $\varepsilon$; specifically, it divides the support of $\varepsilon$ into mutually exclusive and exhaustive intervals, and communicates to $H$ only the interval in which $\varepsilon$ falls. The information conveyed (or the number of intervals in the partition) is decreasing in $|C - H|$. Therefore, $H$'s preference for good advice imposes a cost for choosing an unrepresentative committee—as in the complete information, closed-rule case.

The difference introduced by bicameralism is that when $H$ transmits and uses an open rule internally, $C$ is not just signaling to one party. Instead it is signaling to $H$ under an open rule (as in Crawford-Sobel) but also to $S$ under a closed rule (as in Gilligan-Krehbiel). $H$ maps $C$'s bill or "message" into any proposal it desires, while $S$ can either accept $H$'s proposal or veto it in preference of the status quo $Q$. In fact this change significantly complicates the analysis of equilibrium strategic behavior, the properties of which are explored by Board and Dragu (2007). When $C < H$, the veto constraint imposed by $S$ can induce policy preferences in $H$ that are further from $C$ than $|H - C|$ implies. This in turn reduces the incentive for $C$ to inform $H$; the sender is in effect facing a more distant receiver than the policy preferences alone would suggest.

The key point for our argument is that conditional on transmitting to $S$, $H$ has no incentive to choose $H \neq C$. The result that $C$ perfectly informs $H$ of $\varepsilon$ (i.e., signals its value perfectly) if and only if $C = H$ continues to hold when $S$ can veto $H$'s policy choice (Board and Dragu 2007).[15] In fact this is a natural result even when $S$ can veto $H$'s actions, because when their interests exactly coincide, $C$ and $H$ have common interests in the game with $S$. No strategic conflicts within the chamber would create incentives for $C$ to conceal information from $H$ in this case. Then the only question is whether $H$ would rather be perfectly informed of $\varepsilon$ or not, conditional on being selected to transmit to $S$. But this is not really in doubt because if $H$ wants $S$ to receive a garbled signal of $\varepsilon$, a perfectly informed $H$ can garble as it sees fit; it need not rely on $C$ to garble the message sent to $H$ in the first place.

In short, the result follows because only when $C = H$ does $C$ perfectly communicate the state $\varepsilon$ to $H$, and $H$ cannot benefit from incomplete knowledge of the state. When the committee's only role is policy advisor, it is intuitive that the chamber most prefers a representative one. This gives the following result the proof of which is omitted for brevity.[16]

**Proposition 4** *Suppose $H < S$, $H$ transmits with probability 1, and $C$ plays according to the most informative perfect Bayesian equilibrium. Then $C^* = H$ is an optimal choice of $C$ for $H$.*

### Optimally Biased Committees

Summarizing the results in the previous subsections, $H$ prefers $C$ to be biased relative to itself when $S$ transmits with certainty, while it prefers $C$ to be representative of the chamber when $H$ transmits with certainty. For general transmission probabilities $p \in (0, 1)$, in choosing a committee ideal point, $H$ again faces the tradeoff between creating a tough agent and a faithful advisor.

**Proposition 5** *Suppose $H < S$ and $H$ transmits with probability $p \in (0, 1)$. Suppose that when $H$ transmits, $C$ plays according to the most informative perfect Bayesian equilibrium, and that when $S$ transmits, the equilibrium policy proposals and responses are as identified in Proposition 2. Then for some $\overline{p} > 0$, $p < \overline{p}$ implies that $H$'s optimal choice of $C$ is $C^*(p) < H$.*

This result establishes that even with a significant relaxation of the proposal power $C$ was assumed to have with respect to $H$ in the complete information model, the basic point we identify continues to hold; the countervailing incentives to choose a biased or a representative committee continue to exist.

The result is normatively interesting for the case of congressional committees but also more generally, because it highlights the subtlety of what it means to be "representative" in a strategic context. In particular it cannot be confined to a descriptive notion that the representative resembles the represented in some outward or visible trait—in this case, of course, policy preferences. Rather, whether the representative is performing adequately in its task for the represented must account for the effect it has on the strategic behavior of third parties that, at first sight, are not implicated in the relationship between represented and representative.

## Conclusion

Though much has been learned conceptually and empirically about legislative organization and its effects on policy outcomes, most of this literature

[15]Specifically, Board and Dragu (2007) show that Lemma 1 in Crawford and Sobel (1982) continues to hold when a veto player is added after the receiver acts in a sender-receiver game, *i.e.*, finitely many actions can occur in equilibrium if $C \neq H$.

[16]An alternative way to see this result is to consider the limiting case $L_\varepsilon \rightarrow 0$, so $\varepsilon$ is distributed over an arbitrarily small interval and information is nearly complete. Since $H$ transmits with certainty in this subsection, this limiting case is similar to the $p = 1$ case under complete information in the second section. As noted in proposition 1, $H$ prefers $C = H$ under these conditions.

has focused on within-chamber conflicts in accounting for within-chamber organization. We argue that it is also important to locate the rationale for intracameral organization in a wider institutional context; in the case of the United States, this context means bicameralism and the separation of powers.

This perspective raises a wide range of questions. In this article we analyze a small part of one of them: the effects of intercameral bargaining on key aspects of intracameral organization in a bicameral legislature. Bicameralism gives chambers a strategic rationale to create unrepresentative committees. Committees function not only as policy advisors for the parent chamber, but also as bargaining agents in interactions with the other chamber. Therefore, the parent chamber faces a trade-off between creating a sympathetic advisor with preferences aligned with its own, and a tough bargaining agent that will reliably take actions the chamber itself would find sequentially irrational. The good advisor gives reliable policy advice, but the tough agent causes the other chamber to moderate its proposals.

The model highlights that intercameral considerations affect several important conclusions from unicameral theories. Even when committees are entirely designed by and answerable to the chamber they may be "outliers" and have "high demand" for the status quo. Evidence on committee outliers must be interpreted in this context, particularly as the informational model can naturally accommodate unrepresentative committees when intercameral interaction is considered. Finally, with intercameral interaction, at least a limited degree of committee gatekeeping power is clearly beneficial for the chamber.

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## Appendix: Proofs

***Proof of Proposition 1:*** Part ($a$) follows from the discussion in the text. For part ($b$) $H$ has three regions of $C$ to choose from: ($i$) $C < 0$ such that $I_C(Q) > S$, ($ii$) $C < 0$ such that $I_C(Q) \leq S$, and ($iii$) $C = 0$. Any $C$ in region ($i$) has no effect on policy when $S$ transmits, and lowers policy below 0 when $H$ transmits. Such a $C$ is strictly dominated for $H$ by $C = 0$: this still has no effect when $S$ transmits but leads to policy choice of 0 when $H$ transmits. Any $C$ in region ($ii$) leads to expected utility for $H$ of $EU_H(C) = -pC^2 - (1-p)(2C-Q)^2$. Each term is the equilibrium utility to $H$ conditional on being chosen to transmit to or receive from $S$, weighted by the probability of these events. It is strictly concave in $C$, so the first order condition $C_M = \frac{2Q(p-1)}{3p-4}$ is sufficient. This is increasing in $p$ (given $Q < 0$), and has a maximum value of 0 and a minimum of $\frac{Q}{2}$. Note that $I_{C_M}(Q) < S$ is equivalent to $C_M < \frac{S+Q}{2}$. For region ($iii$) with $C = 0$, $H$ obtains 0 utility when $H$ proposes, and $-S^2$ utility when $S$ proposes, yielding an expected utility of $EU_H(C=0) = -(1-p)S^2$.

$H$ weakly prefers $C = 0$ to $C = C_M$ whenever $EU_H(0) \geq EU_H(C_M)$, or $(1-p)S^2 \leq -pC_M^2 - (1-p)(2C_M - Q)^2$, or $S \leq [(4 + \frac{p}{1-p})C_M^2 - 4QC_M + Q^2]^{\frac{1}{2}}$. Using $C_M = \frac{2Q(p-1)}{3p-4}$, this inequality is equivalent to

$$S \leq -Q\left[4\left(\frac{4(p-1)^2}{(3p-4)^2} + \frac{p(p-1)^2}{(1-p)(3p-4)^2}\right) - 8\frac{(p-1)}{(3p-4)} + 1\right]^{\frac{1}{2}}.$$

Writing the multiplier of $-Q$ as $f(p)$, this inequality is $S \leq -Qf(p)$ as stated in the text. Therefore, when $S > -Qf(p)$, $H$ strictly prefers $C = C_M$ to $C = 0$.

For the properties of $f(p)$, $f(0) = 0$ follows from simple substitution; $\lim_{p\to 1} f(p) = 1$ follows from L'Hôpital's rule; and $f(p)$ increasing in $p$ is demonstrated by differentiating $f(p)$ and simplifying.

***Proof of Proposition 2:*** ($i$) $H$'s decision. $H$ can condition its decision on $Q$, $S$'s proposal $x^S$, and $C$'s approval of $x^S$. Assume $x^S$ is as conjectured in the proposition. If $Q \geq S - \varepsilon = x^S$, $H$ infers $\varepsilon \geq S - Q$ and thus $E(\varepsilon | \varepsilon \geq S - Q) \geq E(\varepsilon) = 0$ because the prior is symmetric around 0 (so left-censoring can only increase the expectation). Therefore if $H$ approves $x^S$ the outcome is $S$, while if $H$ rejects the outcome is $Q + \varepsilon$, which is greater than $S$ in expectation and has positive variance. If $x^S = Q \in (C - \varepsilon, S - \varepsilon)$, the outcome is insensitive to $H$'s decision. If $Q \leq C - \varepsilon$, it follows that $Q \leq 2C - Q - 2\varepsilon = x^S$ as well. For $2C - \varepsilon \leq Q$, $2C - Q - \varepsilon \leq 0$, so $Q \leq 2C - Q - 2\varepsilon \leq -\varepsilon$, where $-\varepsilon$ is $H$'s ideal policy. Thus $H$ prefers $x^S$ to $Q$. For $Q < 2C - \varepsilon$, and given $Q + \varepsilon \leq C \leq 0$, it follows that $-Q - \varepsilon > 2C - Q - \varepsilon$, which implies $|Q + \varepsilon - 0| > |2C - Q - \varepsilon - 0|$. Thus $H$ prefers $x^S$ to $Q$. Therefore for all values of $Q$, $H$ maximizes expected utility by approving $x^S$, given approval by $C$; and the beliefs used for the expectation are rational given priors and other players' strategies.

($ii$) $C$'s decision. If $Q \geq S - \varepsilon$, $C \leq 0$ strictly prefers a policy $S - \varepsilon$ and outcome $S$ to policy $Q$ and outcome $Q + \varepsilon > S$. If $Q \in (C - \varepsilon, S - \varepsilon)$ and therefore $x^S = Q$, the outcome is insensitive to $C$'s decision. If $Q \leq C - \varepsilon$, the policy $x \geq Q$ which $C \leq 0$ considers equally as good as $Q$ is $x = (2C - Q - 2\varepsilon)$ because $|x - (C - \varepsilon)| = |Q - (C - \varepsilon)|$. In all three cases, $C$ maximizes utility by approving $x^S$, given that $H$ approves whenever $C$ approves.

(*iii*) $S$'s DECISION. The specified proposals for $S$ are as close as possible to $S$'s ideal policy, given $\varepsilon$, subject to the constraint of approval by $C$ and $H$. Either $S$ obtains its ideal point, or $C$ is indifferent between accepting and rejecting, so that a proposal to move the outcome closer to $S$ would give $C$ strict preference for $Q$ and would be rejected.

***Proof of Proposition 3:*** Denote $H$'s expected utility as a function of $C$, conditional on transmission by $S$, as $EU^S(C)$. The maximization problem for $H$ is

$$\max_C EU^S(C) = \int_{-L_\varepsilon}^{L_\varepsilon} \left[ \int_{-L_Q}^{C-\varepsilon} -(2C - Q - \varepsilon)^2 dG(Q) + \int_{C-\varepsilon}^{S-\varepsilon} -(Q+\varepsilon)^2 dG(Q) + \int_{S-\varepsilon}^{L_Q} -S^2 dG(Q) \right] dF(\varepsilon)$$

where $F(\varepsilon)$ is the uniform cumulative distribution function (CDF) of $\varepsilon$ and $G(Q)$ is the uniform CDF of $Q$. This is the utility in each case from proposition 2 weighted by the probability it occurs, in expectation with respect to $\varepsilon$.

By repeated application of Leibniz's rule for differentiating under an integral, and neglecting the constant uniform densities $f(\varepsilon) = \frac{1}{2L_\varepsilon}$ and $g(Q) = \frac{1}{2L_Q}$ because they do not affect the optimum $C$, we have

$$\begin{aligned}
\frac{dEU^S(C)}{dC} &= \frac{\partial}{\partial C} \int_{-L_\varepsilon}^{L_\varepsilon} \left[ \int_{-L_Q}^{C-\varepsilon} -(2C - Q - \varepsilon)^2 dQ + \int_{C-\varepsilon}^{S-\varepsilon} -(Q+\varepsilon)^2 dQ + \int_{S-\varepsilon}^{L_Q} -S^2 dQ \right] d\varepsilon \\
&= \int_{-L_\varepsilon}^{L_\varepsilon} \left[ \frac{\partial}{\partial C} \int_{-L_Q}^{C-\varepsilon} -(2C - Q - \varepsilon)^2 dQ + \frac{\partial}{\partial C} \int_{C-\varepsilon}^{S-\varepsilon} -(Q+\varepsilon)^2 dQ + \frac{\partial}{\partial C} \int_{S-\varepsilon}^{L_Q} -S^2 dQ \right] d\varepsilon \\
&= \int_{-L_\varepsilon}^{L_\varepsilon} \left[ -6C^2 + 8\varepsilon - 2\varepsilon^2 - 8CL_Q - 2L_Q^2 - 4\varepsilon L_Q \right] d\varepsilon \\
&= -12C^2 L_\varepsilon - 16CL_\varepsilon L_Q - \frac{4}{3}L_\varepsilon^3 - 4L_\varepsilon L_Q^2.
\end{aligned}$$

Applying the quadratic formula to the last line gives the solutions to the first order necessary condition $\frac{dEU^S(C)}{dC} = 0$ as $C = \frac{2L_Q \pm (L_Q^2 - L_\varepsilon^2)^{\frac{1}{2}}}{-3}$. The assumptions $L_Q > L_\varepsilon > 0$ imply that (*i*) this equation has two real-valued solutions, because then the square root is of a positive number, and (*ii*) both solutions have $C < 0$, because $(L_Q^2 - L_\varepsilon^2)^{\frac{1}{2}}$ cannot exceed $L_Q$, so the numerator of all solutions for $C$ is positive.

Provided $C < 0$, the second order sufficient condition $\frac{d^2EU^S(C)}{dC^2} < 0$ is equivalent to $-24CL_\varepsilon - 16L_QL_\varepsilon < 0$ or $C > -\frac{2}{3}L_Q$. Given $L_Q > L_\varepsilon$, the solution to the first order condition that satisfies the second order condition, and therefore is the optimal choice of $C$ for $H$ given transmission by $S$, is

$$C^* = -\frac{2L_Q + (L_Q^2 - L_\varepsilon^2)^{\frac{1}{2}}}{3} < 0.$$

***Proof of Proposition 5:*** We first note that $H$'s equilibrium expected utility is jointly continuous in $C$ and $p$, and then note that, given continuity, the set of $C$'s that maximize utility for $H$ must vary smoothly with the transmission probability $p$. Given Proposition 3 the result then follows.

In case $S$ transmits, $H$'s expected utility is $EU^S(C) = \int_{-L_\varepsilon}^{L_\varepsilon} [-\int_{-L_Q}^{C-\varepsilon}(2C - Q - \varepsilon)^2 dG(Q) - \int_{C-\varepsilon}^{S-\varepsilon}(Q+\varepsilon)^2 dG(Q) - \int_{S-\varepsilon}^{L_Q} S^2 dG(Q)] dF(\varepsilon)$ (*cf.* proof of Proposition 3). Note that each individual integrand is continuous in $C$, $Q$, and $\varepsilon$. Since continuity is preserved under addition, each integral with respect to $Q$ is a continuous function of $C$ and $\varepsilon$, and the integral with respect to $\varepsilon$ is a continuous function of $C$.

In case $H$ transmits, denote $H$'s equilibrium expected utility by $EU^H(C)$. The arguments for continuity of $EU^H(C)$ in the standard sender-receiver model continue to hold when a veto player observes the sender's signal and acts following the receiver. Specifically, fixing the number of intervals in $C$'s partition of $[-L_\varepsilon, L_\varepsilon]$ at $N$, $EU_N^H(C)$ is the negative of the sum of the variances of $\varepsilon$ conditional on each interval in the partition. Given that $F(\varepsilon)$ is uniform the variance is simply $\frac{l_i^3}{12}$ for interval $i$ where $l_i$ is the width of the interval. For each interval of the partition this width is, as in Crawford and Sobel (1982), defined by a second-order linear difference equation in which $C$'s ideal point enters linearly (Board and Dragu 2007). Therefore, the sum of the variances is a smooth function of $C$ provided $C < H$ (so $N$ is bounded), so $EU_N^H(C)$ is continuous for a given $N$. Moreover, if $N^*(C)$ is the number of partitions of the state space in the most informative PBE given $C$, $N^*(C)$ is weakly increasing given $C < H$ but can increase only by 1 at a point of discontinuity; this follows (as in Crawford and Sobel's proof of Theorem 1) from the fact that equilibrium involves finitely many policy choices (Board and Dragu 2007), and that the difference equations specifying the intervals of $C$'s signaling strategy vary smoothly with $C$. Furthermore, at any such point, $EU^H_{N^*(C)}(C) = EU^H_{N^*(C)-1}(C)$; both sender and receiver are indifferent about the most informative and second-most informative PBE's at points where $N^*(C)$ is discontinuous (and only at such points). Thus, conditional on the number of intervals in equilibrium, $EU^H(C)$ is continuous in $C$, and at $C$ values for which the number of intervals in the most informative PBE grows discontinuously, $EU^H(C)$ is not affected by this growth when $C$ is held fixed. It follows that $EU^H(C)$ is continuous in $C$.

Averaging over transmission probabilities for $H$ and $S$, $H$'s overall expected utility is $EU(C) = pEU^H(C) + (1 - p)EU^S(C)$. It is a sum of functions that individually are continuous in both $p$ and $C$, so $EU(C)$ is a continuous function of $p$ and $C$.

Let $\mathfrak{C}^*(p)$ denote the set of optimal values of $C$ (*i.e.*, maximizers of $EU(C)$) when the probability $H$ transmits is $p$, with arbitrary member $C^*(p)$. It then follows from Berge's maximum theorem (*cf.* Border 1985) that $\mathfrak{C}^*(p)$ is upper hemicontinuous and compact-valued. This in turn implies that the graph of $\mathfrak{C}^*(p)$, *i.e.* the set of points $(p, \mathfrak{C}^*(p))$, is closed in $\mathbb{R}^2$ for $p \in [0, 1]$. Furthermore, by Proposition 3, $H \notin \mathfrak{C}^*(0)$. Because the graph of $\mathfrak{C}^*(p)$ is closed, its complement is therefore open, so there is some open set $\mathfrak{S}$ in $\mathbb{R}^2$ that contains the point $(0, H)$, as well as $(p', H)$ for some $p' > 0$, but that is not in $\mathfrak{C}^*(p')$. Therefore, $C^*(p') < H$ for all $C^*(p') \in \mathfrak{C}^*(p')$, *i.e.*, all possible optimal committees at this $p' > 0$ are unrepresentative.

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