Partisan and Bipartisan Signaling in Congress

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Gilligan and Krehbiel (1989) analyze bipartisanship in committees through a model in which committee ideal points are exactly symmetric about the floor's ideal point. This article has three objectives: it shows that the Gilligan and Krehbiel equilibrium does not generalize to asymmetric committee members; it proves that a similar equilibrium can be supported when the majority party committee member has gatekeeping power; and it compares this equilibrium to the one-signaler case to show that when partisan differences over policy are small, or when the uncertainty associated with a policy area is large, bipartsianship will be preferred to partisan policy making.

1. Introduction

The informational approach to legislative organization argues that procedural advantages for committees can be rationalized as information-enhancing devices that benefit both the median floor voter and the committee. Restrictive amendment procedures such as closed rules, for instance, can reduce the uncertainty associated with policy outcomes by increasing information transmission. This view of committees and their role in the legislative process contrasts with the previously dominant explanation of committees as vehicles for the distribution of district-specific benefits.[1] However, the informational approach has not yet been extended to incorporate the role of legislative parties in the policy-making process, so that one could predict under which circumstances legislatures will use partisan as opposed to bipartisan modes of constructing legislation.

As a first step toward this goal, the present article reanalyzes Gilligan and Krehbiel (1989), which presents one of the first models of legislative organiza-

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1. The classic expositions of this viewpoint include Mayhew (1974) and Shepsle (1978). The informational and distributive approaches are summarized in Shepsle and Weingast (1995).

tion in which two committee members with diverse preferences both agree to support a bill reported to the floor. This bipartisan support, the authors argue, enhances floor members' perceptions of the bill's merits: "Two informed opinions are better than one, especially when the informants are natural adversaries" (Krehbiel 1991:84). Krehbiel, in his well-known book *Information and Legislative Organization*, employs the insights from this model as the rationale for his "Heterogeneity Principle," which states that specialists from both sides of the policy spectrum are more informative than experts from one side only. The model also serves as the basis for several empirical predictions: committees will be composed of members with diverse preferences rather than homogeneous high-demand outliers; the more heterogeneous a committee, the more likely it is to receive a closed rule; and bills with greater numbers of minority party cosponsors are more likely to receive closed rules as well.

However, Section 2 of this article shows that the equilibrium provided in Gilligan and Krehbiel (1989) does not hold under arbitrary committee preferences—it requires that the two committee members be exactly symmetric about the median floor voter. This dependency on a knife-edge condition weakens the plausibility of the claims made in the article and throws into question the predictions concerning bipartisan committee structure and signaling that follow from it.

Section 3 shows that if committees have effective gatekeeping powers, or equivalently if discharge procedures are sufficiently costly to employ, then a two-signaler equilibrium does hold for general preference configurations. Thus rational legislatures may require bipartisan support for legislation in an environment where the committee has some degree of procedural protection.

Establishing this result is, however, a necessary but not sufficient condition for bipartisanship to emerge. To every costless signaling game with a consensual, bipartisan equilibrium, there also exist equilibria in which the minority party is shut out of the decision-making process and policy is constructed on a purely partisan basis. Technically speaking, this is an "equilibrium selection" problem. In more concrete terms, the question is in which policy areas, if any, the minority party will have a substantive role in shaping legislation due to its ability to provide valuable information. Accordingly, Section 4 extends the Gilligan–Krehbiel model to the informational role of legislative parties and shows that when partisan differences over policy are small, or when the uncertainty associated with policy outcomes is large, bipartisanship will be selected as the preferred mode of policy making. Thus partisan politics and bipartisanship should be seen as alternatives, and any empirical predictions concerning committee composition, procedural advantages, and committee-floor relations must take into account the fact that patterns of policy making in one equilibrium are distinct from the other. In light of these findings, Section 5 concludes by examining their implications for empirical work on legislative organization and public policy.

2. Bipartisanship and Confirmatory Signaling

2.1 The Basic Model

This section establishes the basic results in Gilligan and Krehbiel (1989, hereafter GK), which are founded on the twin concepts of bipartisanship and confirmatory signaling. It recapitulates the GK equilibrium and shows that these results fail to hold if committee preferences are not precisely symmetric about the floor's ideal point.

The game in GK is played between a median floor voter, F, and two committee members, M and m, from the majority and minority party, respectively. Policies and final outcomes lie in the one-dimensional choice space $\mathbf{X} = \Re^1$. Without loss of generality, assume that the floor player has as her ideal point $x_f = 0$. Committee members have ideal points x_M and x_m for the majority and minority parties, respectively, with $|x_i| \leq 1/2$ for $i = M, m$. Assume that $x_m < 0 < x_M$ and that $|x_m| \geq x_M$, so that m is (weakly) more of a preference outlier than M.[2]

All players have quadratic preferences over this space, and each actor i has a most-preferred policy, x_i, called her ideal point. We can then write for any $x \in \mathbf{X}$:

$$u_f(x) = -(x - x_f)^2 = -x^2;$$
$$u_i(x) = -(x - x_i)^2, i = M, m.$$

The legislature produces a policy $p \in \Re^1$, but final outcomes x are separated from policies through the addition of a random variable $\omega \in \Omega = [0, 1]$. Let $\bar{\omega}$ be the mean of ω and $\hat{\omega}$ its variance. Assume also that there is a status quo policy p_0 which is the policy adopted if no further actions are taken.[3] Then final outcomes are related to the policy selected (possibly p_0) by $x = p + \omega$. Given the utility structure above, we can write the induced preferences over the policy space as

$$u_f(p; \omega) = -(p + \omega - x_f)^2 = -(p + \omega)^2; \tag{1}$$
$$u_i(p; \omega) = -(p + \omega - x_i)^2, i = M, m; \tag{2}$$

which for a given value ω^* of ω are maximized, respectively, at $p = -\omega^*$ and $p = -\omega^* + x_i$.

All of the preceding preferences and choice sets are common knowledge, as is the sequence of play which follows. First, the value of ω is revealed to the committee members, making it their private information. Each committee member then sends a message $b_i(\omega) \in \mathbf{B} = [0, 1]$ to the floor player. This

2. By assuming that $x_m < 0 < x_M$, we ignore here the possibility, considered in Austen-Smith (1993) and Epstein and O'Halloran (1995), that both committee members could be on the same side of the floor median.

3. We assume that $0 \geq p_0 \geq -1$, so that some realization of ω can give the floor player her ideal point.

message may be in the form of a bill, a report, or merely a speech. For notational convenience we will write $b_i \in \mathbf{B}_i \subseteq \mathbf{B}$ to indicate that player i randomly chooses her signal from the set $\mathbf{B}_i$. The median floor member, after receiving the committee messages, then selects policy $p(b_M, b_m) \in \Re^1$. Finally, each player receives his payoff in terms of the utility function given in Equations (1) and (2), with no side-payments possible. Refer to this game as Γ_0.[4]

A belief for the floor player is a probability density function g: $\mathbf{B}^2 \rightarrow \Delta(\Omega)$, where for any set Θ, $\Delta(\Theta)$ is the set of probability distributions over Θ. The floor player's beliefs about the value of ω before receiving information from the committee are given by her priors on Ω, which are uniform on the unit interval. Thus $g(\omega|b_m, b_M)$ represents F's updated beliefs about the possible values of ω after having observed the committee messages. With a slight abuse of notation, we will use the expression $g(\omega|b_m, b_M) = S$ to indicate that the floor player's beliefs are uniform within the set S and 0 elsewhere; if S equals a single point s, then the floor player believes that $\omega = s$ with certainty. The equilibrium concept employed is perfect Bayesian, which means that strategies must be subgame perfect, and floor beliefs must be derived from these strategies using Bayes' rule, whenever applicable.

2.2 Equilibrium With Symmetric Committees

Before introducing the equilibrium given in GK, we formally define the notion of confirmatory signaling, which lies at the heart of the equilibrium analysis. In simplest terms, committee members who send confirmatory signals send the same message to the floor—they "come out united" behind a bill. The fact that committee players with opposing preferences agree on a single proposal is then taken as strong evidence in favor of the proposal, thereby reducing the uncertainty surrounding its policy consequences. Formally,

Definition 1. A set of strategies $\hat{b}_M$ and $\hat{b}_m$ and beliefs $\hat{g}(\omega|b_M, b_m)$ display confirmatory signaling in range $[\omega^-, \omega^+]$ if, for all $\omega \in [\omega^-, \omega^+]$,

(i) $\hat{g}(\omega|\hat{b}_M(\omega), \hat{b}_m(\omega)) = \omega$; and
(ii) For $i = M, m$ there exists $b_i \in \mathbf{B}$ such that $\hat{g}(\omega|b_i, \hat{b}_{-i}(\omega)) \neq \omega$.

We make three observations about this definition. First, under confirmatory signaling the floor player can combine the committee members' reports to exactly determine the value of the hidden information ω. This perfect information transmission is impossible in equilibrium with only one signaler, as was shown in Crawford and Sobel (1982). Thus confirmatory signaling, if and when it arises, has considerable informational advantages over noisy

4. GK analyze three institutional settings, of which two—open rule and modified rule—have identical confirmatory signaling equilibrium outcomes. The open rule corresponds to the procedure described here; the modified rule is similar, except that the floor must set p to one of the two committee bills or the status quo. The same weaknesses in the open rule equilibrium also apply to the modified rule.

one-player signaling [hence Krehbiel's (1991) emphasis on bipartisanship as a key to legislative organization]. Second, both committee players must cooperate in conveying this information; either one can destroy the floor player's inferences by changing her report to some nonconfirmatory signal $b_i \neq \hat{b}_i$. This in turn suggests that confirmatory signaling can be sustained only when both parties prefer it to the next best alternative. Third, the mechanism for sending confirmatory signals is generally not unique. Since the floor player is free to set policy after observing the committee reports, the signals serve only to convey the value of ω.[5] Thus confirmatory signaling schedules can be represented generally as pairs $(\hat{b}_M(\omega), \hat{b}_m(\omega))$; the simplest such mechanism is to set $\hat{b}_M(\omega) = \hat{b}_m(\omega) = \omega$.

Confirmatory signaling is not an equilibrium in itself, but it might arise in certain ranges as part of an equilibrium. This equilibrium could contain other types of behaviors as well; here, we limit ourselves to the case, examined in GK, which contains two confirmatory signaling regions and one nonconfirmatory, or noisy, signaling region:

Definition 2. An equilibrium is classified as a simple confirmatory signaling equilibrium with parameter $\omega^\dagger \in (2|x_m|, 1 - 2x_M)$ if:

(i) The equilibrium displays confirmatory signaling in the ranges $[0, \omega^\dagger - 2|x_m|]$ and $[\omega^\dagger + 2x_M, 1]$; and
(ii) The floor player has equilibrium beliefs such that if there exists no ω for which $b_M = \hat{b}_M(\omega)$ and $b_m = \hat{b}_m(\omega)$, then $g(\omega|b_M, b_m) = [\omega^\dagger - 2|x_m|, \omega^\dagger + 2x_M]$.

In simple confirmatory signaling equilibria, then, extreme values of ω elicit confirmatory signals from the committee members, while intermediate values do not. Upon receiving non-confirmatory signals, the floor believes that the true value of ω falls somewhere in the middle region, $[\omega^\dagger - 2|x_m|, \omega^\dagger + 2x_M]$. The length of this middle region is dictated by indifference conditions for both the majority and minority party committee members at the boundaries, as discussed below.

Proposition 1 (Gilligan and Krehbiel 1989). A simple confirmatory signaling equilibrium to Γ_0 exists when $x_M = -x_m \equiv x_c$. One such equilibrium is characterized by:

$$b^*_M(\omega) = \begin{cases} x_c - \omega & \text{if } \omega < \bar{\omega} - 2x_c \text{ or } \omega > \bar{\omega} + 2x_c, \\ [x_c - 1, x_c] & \text{otherwise;} \end{cases}$$

$$b^*_m(\omega) = \begin{cases} -x_c - \omega & \text{if } \omega < \bar{\omega} - 2x_c \text{ or } \omega > \bar{\omega} + 2x_c, \\ [-x_c - 1, -x_c] & \text{otherwise;} \end{cases}$$

5. More complicated issues arise in the modified rule case, where reports both convey information and offer the floor player a possible policy outcome that could not be implemented otherwise.

$$p^*(b_m, b_M) = \begin{cases} b_M - x_c & \text{if } b_M - b_m = 2x_c, \\ -\bar{\omega} & \text{otherwise;} \end{cases}$$

$$g^*(\omega | b_m, b_M) = \begin{cases} x_c - b_M & \text{if } b_M - b_m = 2x_c, \\ [\bar{\omega} - 2x_c, \bar{\omega} + 2x_c] & \text{otherwise.} \end{cases}$$

Proof. See Gilligan and Krehbiel (1989). ■

Proposition 1 is illustrated for a sample value of x_c in Figure 1. The logic of the equilibrium is explained well in GK; its salient characteristics are as follows. In the GK formulation, the value of $\omega^\dagger$ is set to $\bar{\omega}$, the mean value of ω. For any observed value of ω, then, either committee player can induce the floor to set policy to $-\bar{\omega}$ by sending a nonconfirmatory signal. Therefore confirmatory signaling can be sustained only in those ranges where both committee members prefer the floor to set policy equal to $-\omega$ and receive the floor's ideal policy of 0, rather than set policy equal to $-\bar{\omega}$ and receive the policy outcome $-\bar{\omega}+\omega$. Thus at each boundary between confirmatory signaling and noisy signaling regions, one committee member must be just indifferent between these two options. This is the reasoning behind the fact that the noisy signaling region extends $2x_i$ to either side of $\bar{\omega}$; these are the values of ω that make one committee member or the other indifferent between a policy outcome of 0 and a policy outcome of $-\bar{\omega} + (\bar{\omega} + 2x_i) = 2x_i$.

For values of ω outside of the middle region, confirmatory signaling can be sustained because both committee players prefer 0 to $-\bar{\omega} + \omega$; inside the region at least one player prefers $-\bar{\omega} + \omega$, which destroys the possibility of confirmatory signals. Given nonconfirmatory signals, the floor player believes that $\omega \in [\bar{\omega} - 2x_c, \bar{\omega} + 2x_c]$, and given these beliefs, she will rationally set policy so that, in expectation, the policy outcome is $x_f = 0$, which means setting policy at $-\bar{\omega}$. Thus the proposed set of strategies is an equilibrium.

This equilibrium has a few degrees of latitude. First, as explained above, the confirmatory signaling mechanism can take on a variety of functional forms. The equilibrium given in Proposition 1 uses the device that each committee member suggests a bill that will yield their ideal point if adopted, and the floor takes this as a confirmatory signal if $b_M - b_m = 2x_c$ exactly. Second, the point $\omega^\dagger$ can take on a range of values; GK uses $\omega^\dagger = \bar{\omega}$, but the noisy signaling range in Figure 1 can be shifted to the left or right, so long as it remains within the [0,1] interval.

2.3 Asymmetric Committees

Thus the equilibrium presented in GK is correct as stated; a simple confirmatory signaling equilibrium to the game Γ_0 does exist when the ideal points of the committee players are symmetrically distributed around the floor player's ideal point. It might seem natural that this equilibrium would extend to cases of asymmetric committees as well, but the following proposition shows that this is not the case.

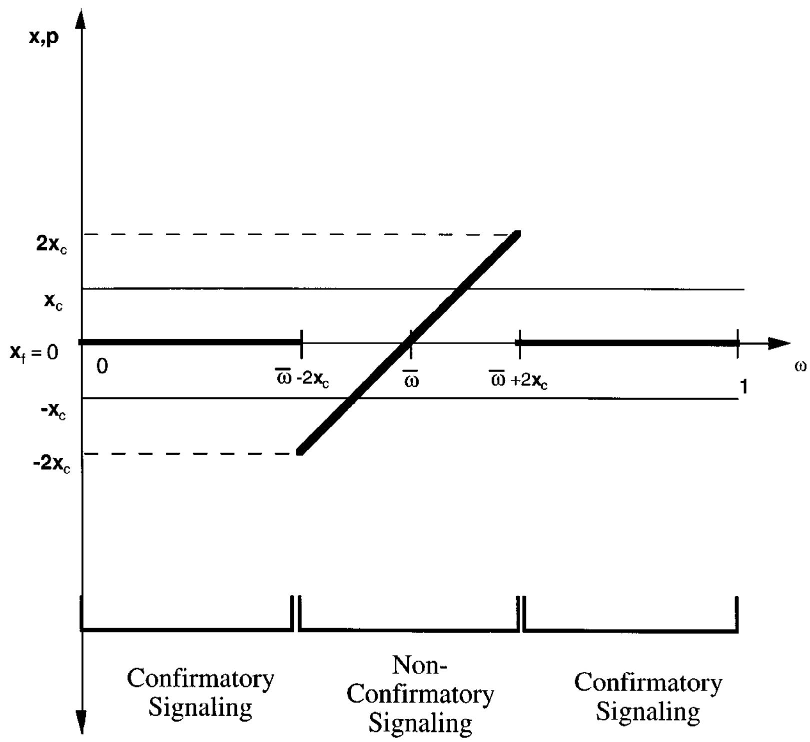

Figure 1. Simple confirmatory signaling equilibrium with a symmetric, bipartisan committee.

Proposition 2. A simple confirmatory signaling equilibrium to Γ_0 exists iff $x_M = -x_m$.

Proof. We know that the desired equilibrium exists when $x_M = -x_m$. We will now show that the conditions of a simple confirmatory signaling equilibrium imply $x_M = -x_m$. By definition, any simple confirmatory signaling equilibrium displays confirmatory signaling in the ranges $[0, \omega^\dagger - 2|x_m|]$ and $[\omega^\dagger + 2x_M, 1]$. Thus if ω falls in either of these ranges, the committee signals will allow the floor player to infer the exact value of ω, which will lead a rational floor player to set $p = -\omega$, resulting in a policy outcome of $x = -\omega + \omega = 0$.

Upon receiving nonconfirmatory signals, the floor player believes that ω falls in the range $[\omega^\dagger - 2|x_m|, \omega^\dagger + 2x_M]$, by the definition of a simple confirmatory signaling equilibrium. Given these beliefs, the floor will set policy so as to receive a policy outcome of 0 in expectation, which means that (substituting $\omega^\dagger + 2x_m$ for $\omega^\dagger - 2|x_m|$ since $x_m < 0$),

$$\begin{aligned} p &= -E(\omega|\omega \in [\omega^\dagger + 2x_m, \omega^\dagger + 2x_M]) \\ &= -\frac{\omega^\dagger + 2x_m + \omega^\dagger + 2x_M}{2} \end{aligned}$$

$$
\begin{aligned}
&= -(\omega^\dagger + x_M + x_m) \\
&\equiv p^\dagger.
\end{aligned}
$$

Either committee player can thus induce a policy of $p^\dagger$ by sending a nonconfirmatory signal. Therefore at the boundaries between the confirmatory signaling and noisy signaling ranges—$\omega^\dagger + 2x_m$ and $\omega d + 2x_M$—each player must weakly prefer to send a confirmatory signal. This implies that

$$
\begin{aligned}
p^\dagger + (\omega^\dagger + 2x_m) &\leq 2x_m \\
-(\omega^\dagger + x_M + x_m) + (\omega^\dagger + 2x_m) &\leq 2x_m \\
-x_m &\leq x_M;
\end{aligned}
\tag{3}
$$

and that

$$
\begin{aligned}
p^\dagger + (\omega^\dagger + 2x_M) &\geq 2x_M \\
-(\omega^\dagger + x_M + x_m) + (\omega^\dagger + 2x_M) &\geq 2x_M \\
-x_m &\geq x_M;
\end{aligned}
\tag{4}
$$

Combining Equations (3) and (4) implies that $x_m = -x_M$. ■

The difficulty of constructing an equilibrium with asymmetric committee members is shown in Figure 2. The natural extension to Proposition 1 would expand the range of nonconfirmatory signaling to $\omega^\dagger + 2x_m$ on the left-hand side, as shown in Figure 2, which would allow the indifference properties of the previous equilibrium to hold. But notice that now nonconfirmatory signals are being sent for all $\omega \in [\omega^\dagger + 2x_m, \omega^\dagger + 2x_M]$, whose midpoint (labeled ω' for convenience) is no longer equal to $\omega^\dagger$. A rational floor player, upon seeing a nonconfirmatory signal, will then set $p = -\omega'$, changing the equilibrium outcomes, as shown by the dotted line in the figure. The key indifference properties are now violated at the boundaries of the middle range; in particular, the minority committee member will wish to send a nonconfirmatory signal for values of ω just less than $\omega^\dagger + 2x_m$, thus bringing down the proposed equilibrium. In essence, under an open rule the floor player cannot commit to setting any particular policy in advance, and so she will take advantage of the information contained in a set of nonconfirmatory signals to obtain her ideal point in expectation. The committee members realize this and adjust their behavior accordingly, making the proposed level of information sharing unsustainable.

The obvious extension of the GK equilibrium does not hold, then. Can it be fixed by a redefinition of the signaling ranges? The only possible solutions along these lines, as detailed in the appendix, involve expanding the noisy signaling range to accommodate the minority party's indifference conditions, or moving this range to the extreme boundary of the values of ω. Both of these solutions, however, have the property that the extent of the bipartisan signaling region depends only on the ideal point of one player, rather than both players as in the GK equilibrium, thus making invalid any comparative statics based on the ideal points of all committee members.

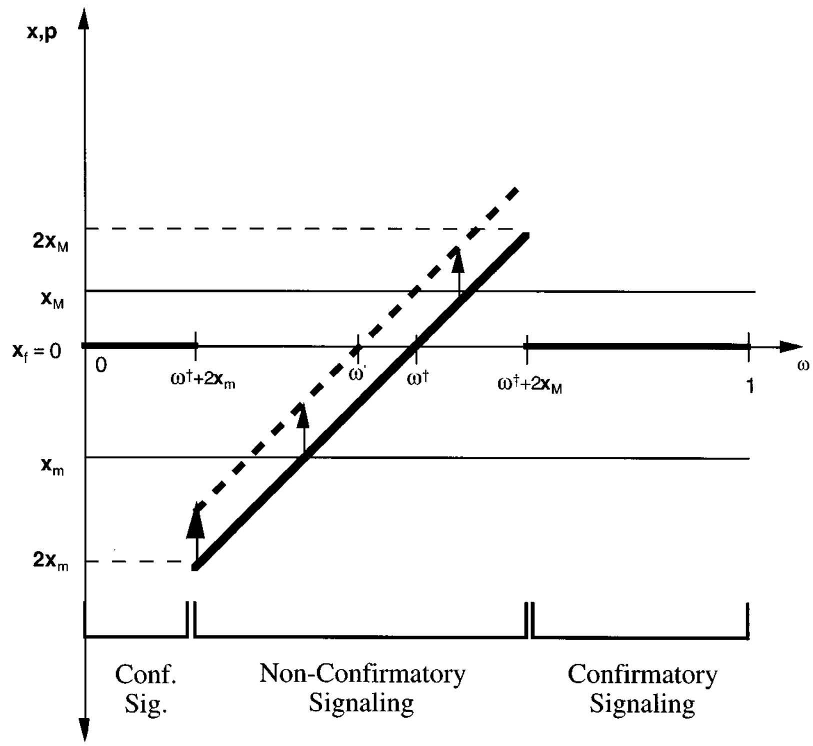

Figure 2. Lack of simple confirmatory signaling equilibrium with an asymmetric, bipartisan committee.

Other than these possibilities, modeling heterogeneous committees presents a problem. The assumption that $x_M = -x_m$ exactly is unlikely to be the case outside of the modeler's world. But no other continuous signaling range meets the test of rationality for all players. Thus, to date, the question remains open of what an attractive equilibrium would look like in this general setting. For our present purposes, the lesson is that to implement the GK equilibrium, some amount of institutional structure must be added to the game.

3. Bipartisan Signaling With Gatekeeping

The institutional structure proposed here is that the committee have gatekeeping powers over legislation in its policy domain. That is, bills must be reported out for floor consideration, otherwise they will die in committee. This need not imply that committees possess absolute gatekeeping powers; rather it implies that the costs of discharge are high enough that floor voters will find it against their interests to discharge committees. Furthermore, as Epstein (1997) shows, there are informational reasons as to why floor voters would rationally choose to set a positive cost of discharge, similar to the rationale for closed rules given in Gilligan and Krehbiel (1987).

Consider then the following variant on the game described in the previous section; this variant will be referred to as Γ_1. The only aspect of the policy-making process that changes is that after observing the value of ω, the majority party committee member chooses the value of a gatekeeping variable $\psi \in \Psi \equiv \{0, 1\}$, where $\psi = 1$ means that the measure is killed in committee. In that case, the game ends immediately, the policy chosen is the status quo p_0 and the outcome is $x_0 = p_0 + \omega$. If the gatekeeping option is not exercised, then, as before, each committee member sends a message b_i to the floor player, who can then choose any policy p that she wishes. For convenience, define $\omega_0 = -p_0$.

With committee gatekeeping power, the GK result does generalize to asymmetric committees. Formally:

Proposition 3. A simple confirmatory signaling equilibrium to Γ_1 exists for all values of x_M and x_m. One such equilibrium is characterized by:

$$\psi^*(\omega) = \begin{cases} 1 & \text{if } \omega \in [\omega_0 - 2|x_m|,\ \omega_0 + 2x_M], \\ 0 & \text{otherwise;} \end{cases}$$

$$b_i^*(\omega) = \begin{cases} \omega & \text{if } \omega < \omega_0 - 2|x_m| \text{ or } \omega > \omega_0 + 2x_M, \\ [\omega_0 - 2|x_m|,\ \omega_0 + 2x_M] & \text{otherwise, } \ i = m, M; \end{cases}$$

$$p^*(b_m, b_M) = \begin{cases} -b_M & \text{if } b_M = b_m, \\ p_0 & \text{otherwise;} \end{cases}$$

given messages b_m, b_M,

$$g^*(\omega | b_m, b_M) = \begin{cases} \omega = b_m & \text{if } b_m = b_M, \\ \omega = \omega_0 & \text{otherwise.} \end{cases}$$

The players' utilities are given by:

$$Eu_f = -\hat{\omega}(2x_M + 2|x_m|)^3 - \left(\frac{x_M + x_m}{2}\right)^2 \tag{5}$$

$$Eu_M = -\hat{\omega}(2x_M + 2|x_m|)^3 - \left(x_M - \frac{x_M + x_m}{2}\right)^2 \tag{6}$$

$$Eu_m = -\hat{\omega}(2x_M + 2|x_m|)^3 - \left(x_m - \frac{x_M + x_m}{2}\right)^2. \tag{7}$$

Proof. We show that all actions are optimal given the other players' strategies. The majority party player prefers the status quo to the floor's ideal point whenever

$$\begin{aligned} |p_0 + \omega - x_M| &\le |0 - x_M| \\ \omega_0 &\le \omega \le \omega_0 + 2x_M. \end{aligned}$$

Therefore his decision to send confirmatory signals and receive the outcome $x = 0$ rather than $x = p_0 + \omega$ is optimal in the specified ranges. Furthermore, by keeping the gates closed when $\omega \in [\omega_0 - 2|x_m|,\ \omega_0 + 2x_M]$, the policy outcome is $p_0 + \omega$. If he were to open the gates, the floor player would receive nonconfirmatory signals given player m's strategy, leading the floor player to set $p = p_0$ and yielding the same policy outcome of $p_0 + \omega$.[6] Thus the majority party committee member is indifferent to opening or closing the gates, and the decision to keep the gates closed is in the set of optimal strategies.

The minority party committee member prefers the status quo to the floor's ideal point whenever

$$
\begin{aligned}
&|p_0 + \omega - x_m| \leq |0 - x_m| \\
&\quad \omega_0 - 2|x_m| \leq \omega \leq \omega_0.
\end{aligned}
$$

Therefore his decision to send confirmatory signals and receive the outcome $x = 0$ rather than $x = p_0 + \omega$ is optimal in the specified ranges. In equilibrium, player m will never be called on to act in cases where $\omega \in [\omega_0 - 2|x_m|,\ \omega_0 + 2x_M]$, making his decision to randomly select a value of ω from that range rational.

The floor player will receive her ideal point with certainty if, given the committee players' strategies, she sets $p = -b_M$ after observing $b_M = b_m$, for in that case $x = p + \omega = -b_m + \omega = -\omega + \omega = 0$ given that the committee bills are both equal to ω. And her decision to set $p = p_0$ after receiving signals $b_m \neq b_M$ is similarly rational given her equilibrium beliefs that such signals indicate $\omega = \omega_0 = -p_0$ with certainty. Finally, these beliefs are consistent with the committee players' strategies since nonconfirmatory signals are never sent in equilibrium. ■

Note first that, in equilibrium, no bill held up in committee is ever discharged, and all legislation reported out by the committee will command bipartisan support and be passed by the floor unaltered.[7] On the other hand, the committee only reports those bills that can gain the support of both M and m; all others are subject to majority party gatekeeping. Note also that in this context, the decision of the majority party to gatekeep is itself a signal to the floor player, conveying information about the value of ω. In fact, the gatekeeping decision carries the same information that nonconfirmatory signals convey in the GK equilibrium; namely, that ω falls in the range $[\omega_0 - 2|x_m|,\ \omega_0 + 2x_M]$.

Why does the GK equilibrium survive in a world with committee gatekeeping and fail otherwise? The key difference is that with gatekeeping, conflicting messages from the committee are never sent to the floor. As discussed above, the

6. Note that whenever $\omega \in [\omega_0 - 2|x_m|,\ \omega_0 + 2x_M]$, the minority party committee member will send a random bill $b_m \in [\omega_0 - 2|x_m|,\ \omega_0 + 2x_M]$, which means that the majority party committee member will send a confirmatory signal with probability zero.

7. As the game Γ_1 is defined, of course, the floor has no opportunity to discharge the committee. If instead the floor had the option of discharge, but the cost to do so was $c > (\omega' - \omega^\dagger)^2$ (the expected utility that the floor would gain by switching policy from $\omega^\dagger$ to ω'), then the same equilibrium actions would result.

GK equilibrium falls apart under an open rule due to the lack of commitment of the floor player not to adjust policy after receiving nonconfirmatory signals. Here, though, the floor player has effectively committed herself through a nonzero cost of discharge, which allows a greater degree of information sharing to occur in equilibrium.

4. Choosing Bipartisanship

The analysis in the previous section established that when committees have gatekeeping powers, bipartisan signaling can be sustained in equilibrium in the natural way. However, other equilibria also exist to these two-signaler games. In these equilibria, the floor player uses the information from one committee member to make policy, but ignores entirely the other committee member's input. These patterns of behavior can therefore be classified as partisan equilibria, as opposed to the bipartisan equilibria examined above. In fact, one fundamental feature of costless signalling games is that such "babbling" equilibria will always exist.[8] So two modes of constructing legislation will be available; it remains to be shown in which types of policy area, if any, bipartisanship will dominate partisan policy making. Will the majority party actively solicit the minority party's support for informational reasons, and if so, what impact will this have on the type of legislation reported out of committee and passed on the floor?

To answer these questions, let us consider two equilibria to the game with two committee members and gatekeeping. The first equilibrium is the one identified in the previous section, with confirmatory signaling for extreme values of ω and gatekeeping in the middle. The second is a variant of the single-committee member equilibrium defined in Epstein (1997), with the addition of a second, babbling committee member.[9] A typical equilibrium configuration in this game is shown in Figure 3. The heavy diagonal line indicates the outcomes resulting from gatekeeping; outside of this region are a number of noisy signaling ranges, as in the Crawford and Sobel (1982) equilibrium. The gatekeeping region becomes smaller and the total number of signaling ranges increases as x_M approaches x_f, until in the limit where $x_M = x_f$ perfect information sharing results. Notice that the ideal point of the minority party, x_m, plays no role in this analysis.

The overall sequence of events in the expanded game, including the choice of partisanship or bipartisanship, is shown in Figure 4. One difference between the problem explored here and those addressed by Gilligan and Krehbiel (1987, 1989) is that the first stage is not an institutional choice made by the median floor voter to maximize her utility. Rather it is an equilibrium selection problem, where all three players agree, tacitly or otherwise, on which of the possible equilibria to play. Note that the choice of equilibrium will affect every action taken in the game: it influences the procedural choice of the majority party

8. See Banks (1991:24); this feature of cheap talk games makes them uniquely suited to explore issues concerning the informational role of bipartisanship.

9. This equilibrium is formally defined and proved in the appendix.

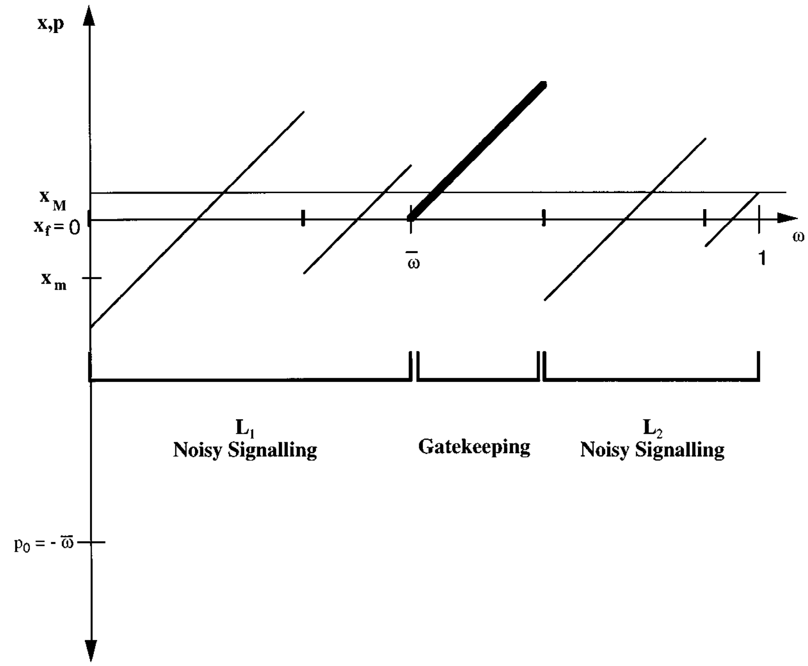

Figure 3. Partisan signaling equilibium with gatekeeping.

committee member as to whether or not to obstruct legislation; the choice of both committee members as to which messages to send; the manner in which the floor player interprets these messages; and the final bill passed, along with policy outcomes. Of course, this is just another way of saying that partisan and bipartisan politics operate very differently. But it also emphasizes the point that political actions and rhetoric do not necessarily speak for themselves; they must be interpreted within the relevant political context. Consequently, predictions made on the basis of one equilibrium would not be expected to hold in situations where the other equilibrium was being played.

The question of whether legislation will be constructed in a partisan or bipartisan mode thus boils down to an equilibrium selection problem. These problems are familiar in economics, especially in the context of costly signaling games. Their solution usually involves a hierarchy of refinements, such as subgame Nash perfection, the intuitive criterion (Cho and Kreps, 1987), and universal divinity (Banks and Sobel, 1987), in which equilibria are sequentially eliminated from consideration until (hopefully) only one remains. Currently the most commonly used equilibrium refinement for costless signaling, or cheap talk, games is the Pareto criterion, which states that if from an ex ante perspective all players unanimously prefer one equilibrium to another, then we should

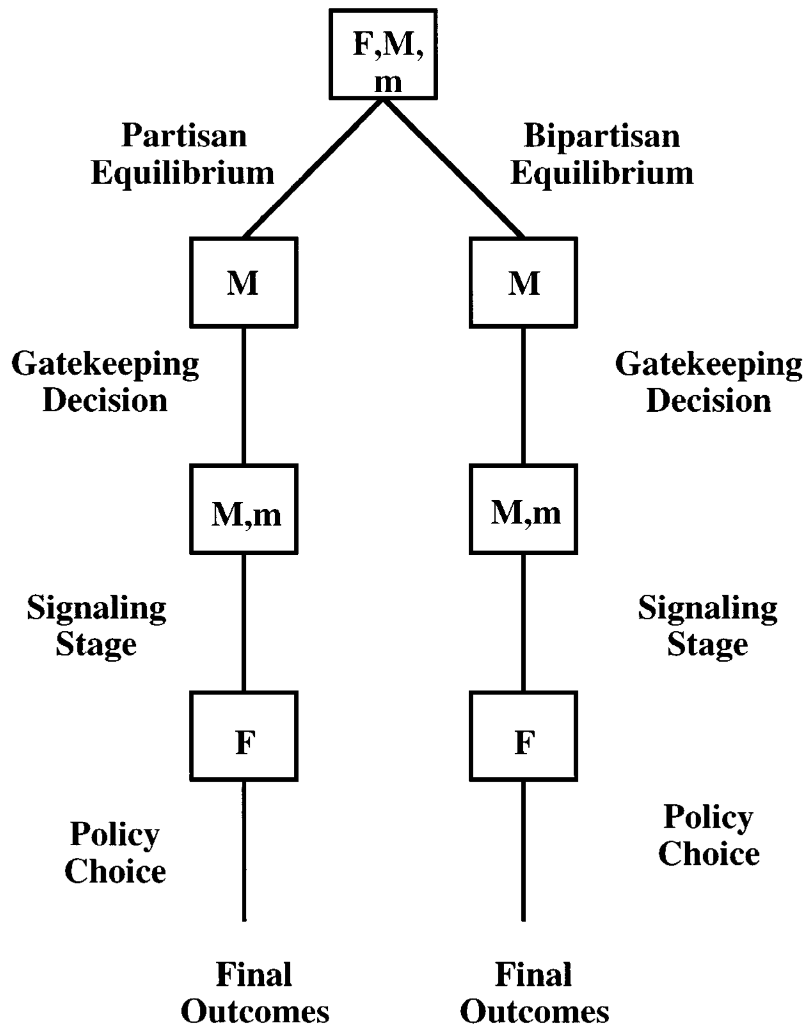

Figure 4. Order of play in the expanded game.

expect that equilibrium to be played.[10] Using the Pareto criterion, then, we wish to determine whether for any combination of preferences the bipartisan equilibrium yields higher utilities for all players when compared to the partisan equilibrium.

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10. This rule, for example, allows Crawford and Sobel (1982) and Gilligan and Krehbiel (1987) to choose the most informative equilibrium from among all possibilities. The utilities for each player under the alternative equilibria are given by Equations (5)–(7) above and Equations (8)–(10) in the appendix.

The relative merits of the partisan and bipartisan equilibria under varying values of x_M and x_m are illustrated in Figure 5. The light area beginning in the bottom left corner represents configurations in which all three actors prefer the bipartisan equilibrium. In the upper left corner and along the top of the graph, the floor and majority party prefer the partisan equilibrium, while the minority party actor prefers bipartisanship. The bottom right corner represents the symmetric situation where the minority party has an ideal point closer to the floor's than the majority party.[11] The figure shows that when one committee member's ideal point is significantly closer to the floor's, partisanship emerges in equilibrium. When both committee members are roughly equidistant from the floor player, then bipartisanship is selected. Thus bipartisan signaling can emerge as a Pareto superior alternative to purely partisan policy making.

There are two lessons to be drawn from the figure. First, partisanship is most attractive when committee preferences are polarized. If the minority party is relatively extreme in its preferences, or if both parties are unrepresentative of the floor, then partisan construction of legislation should be expected. To put it another way, one precondition for bipartisanship is that the minority party has preferences not too different from the majority party. Otherwise, the chances of obtaining bipartisan support are too small to offset the large number of bills that would be held up in committee.

The second point hinges on the interpretation of committee ideal points. What does it mean for a committee to be an outlier in this model? Differences in ideal points are measured relative to the magnitude of ω, so preferences are relevant only when compared to the degree of uncertainty in the political environment. This has important substantive implications for the testing of information theories of legislative organization. Namely, policy differences between the minority and majority party members should be scaled by the electoral consequences of ill-formed policy. Thus the correct interpretation of the bipartisan region in the figure is that when uncertainty in outcomes is large, bipartisanship becomes more attractive. In informationally intense policy areas, where politicians want to avoid making mistakes or when they are most risk averse, bipartisanship is the preferred mode.

5. Conclusion

This article reviewed the Gilligan and Krehbiel (1989) equilibrium with a heterogeneous committee and showed that it failed to hold under arbitrary committee preferences. It then demonstrated that the equilibrium could be resurrected if committees are assumed to have gatekeeping authority. Finally, it derived conditions under which a bipartisan legislative strategy was rational for all players.

11. It should be noted that in the latter two regions, one committee member may still prefer that the bipartisan equilibrium be played. Thus under a strict application of the Pareto criterion, no prediction could be made for these areas, even though the outlying committee member babbles in equilibrium and therefore cannot upset the communication strategies of the floor and the other committee member. All that matters for the present discussion is that there are parameter values for which bipartisanship is universally preferred to either partisan equilibrium.

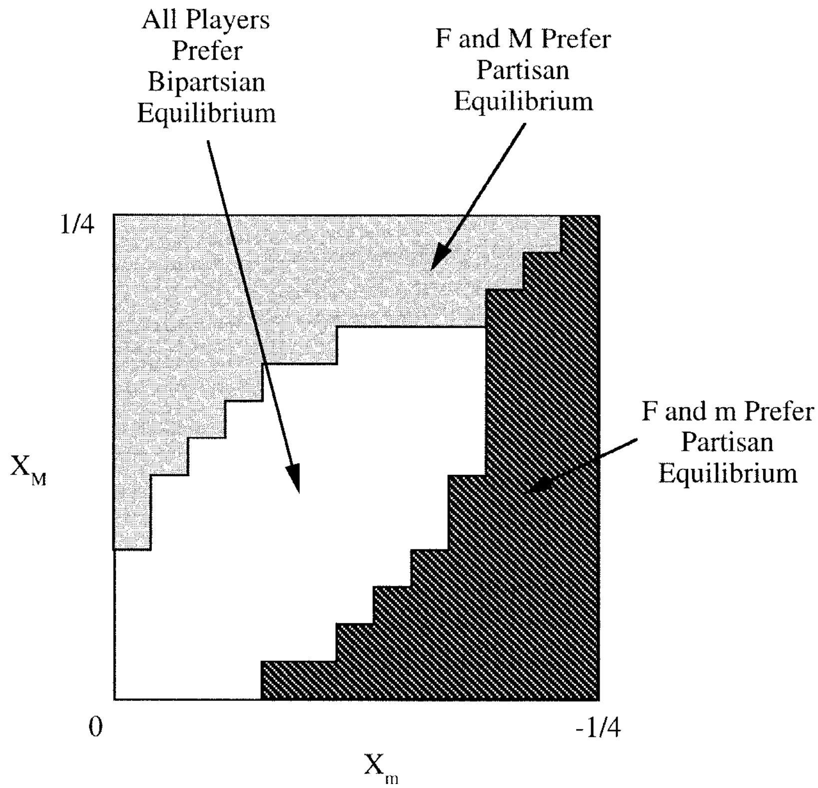

Figure 5. Equilibrium utility comparison.

The equilibrium selection analysis above clearly delineates the advantages and disadvantages of bipartisan fashioning of legislation. Partisanship is more attractive when the preferences of the parties are polarized and the electoral consequences from ill-considered legislation are relatively low. Under partisan policy making, more legislative activity will be observed, fewer bills will be obstructed in committee, and minority party members will have little substantive input into the legislative process. This set of characteristics describes well the first session of the 104th Congress, with Republicans passing items from the Contract with America and a clearly partisan budget, all over the ineffective protests of Democrats. In this environment, policy differences will be sorted out within the majority party and then passed on the floor.

Bipartisanship is more attractive when policy uncertainty is high and inter-party preferences are not so polarized. Here, legislative activity is lower and policy movement is less likely. To all appearances, committees will play a dominant role, as all legislation reported to the floor will pass with bipartisan support. On the other hand, more proposals die in committee, unable to garner the necessary support from both sides of the aisle. Policy compromises will be worked out between parties, and less uncertainty is associated with policies that pass through Congress. In this case, minority parties remain influential not because they can enact their own agenda or obstruct the majority party, but because they can lend their approval to policies that transcend the usual political and social divisions.

Of these findings, some agree well with the previous literature on legislative parties. Many such accounts, such as Cooper and Brady (1981), Rohde (1991), and Cox and McCubbins (1993), argue that party strength will wax and wane in proportion to the homogeneity of preferences within the majority party. The logic developed above reinforces this view, adding the additional requirement that minority party preferences matter as well; when all actors share similar policy goals, then bipartisan policy making will again be preferred. To these findings, the present work adds an informational dimension: complex policy areas will tend to develop bipartisan modes of operation, where less complex areas give rise to more partisan forms of constructing policy.

These conclusions also have implications for the testing of theories of legislative organization. If partisanship and bipartisanship are alternatives, and different policy areas give rise to one mode of policy making or the other, then empirical predictions that arise from these theoretical models should not be expected to hold across all issue areas. Rather the predictions from bipartisan models should hold in certain cases, and predictions from partisan models in others—this is the essence of the equilibrium selection argument advanced above. Specifically the heterogeneity of committees and the number of minority party cosponsors should have the greatest impact in informationally intense and less polarized policy domains. Ideological closeness to the floor should matter most when information is less important or partisan polarization is high. To distinguish between these two alternatives econometrically, a switching regimes model is the most appropriate, so that one set of variables are significant in the partisan regime and another in the bipartisan regime.

Appendix

A.1 Equilibria With Confirmatory Signaling

The confirmatory signaling equilibria described here can be summarized by the region in which nonconfirmatory signaling occurs, $[\omega^-, \omega^+]$, with confirmatory signaling for all other values of ω. Thus the equilibria are of the form

$$b_i^*(\omega) = \begin{cases} \omega & \text{if} \omega < \omega^- \text{or} \omega > \omega^+, \\ [\omega^-, \omega^+] & \text{otherwise}, i = m, M; \end{cases}$$

$$p^*(b_m, b_M) = \begin{cases} -b_M & \text{if} b_M = b_m, \\ -\frac{\omega^- + \omega^+}{2} & \text{otherwise}; \end{cases}$$

given messages b_m, b_M,

$$g^*(\omega | b_m, b_M) = \begin{cases} b_m & \text{if} b_m = b_M, \\ [\omega^-, \ \omega^+] & \text{otherwise}. \end{cases}$$

Note that the floor sets policy to receive her ideal point in expectation whenever nonconfirmatory signals are sent. Also, the value of ω^- may be 0, and/or the value of ω^+ may be 1, in which case one of the two indifference conditions in a simple confirmatory signaling equilibrium need not be met. We know from the exposition above that the requirement for confirmatory signaling to exist in equilibrium is that both committee members prefer the floor's ideal point to the policy that would result from a nonconfirmatory signal. Then we state:

Proposition 4. The following nonconfirmatory signaling ranges characterize equilibria to Γ_0:

(i) $\omega^- = 0$and $4x_M \leq \omega^+ \leq 1$;
(ii) $0 < \omega^- \leq 1 - 4x_m$ and $\omega^- + 4x_m \leq \omega^+ \leq 1$.

Proof. Define $\omega^\dagger = \frac{\omega^- + \omega^+}{2}$. Then upon receiving nonconfirmatory signals, the floor will set policy equal to $-\omega^\dagger$. The majority party player prefers $-\omega^\dagger$ to the floor's ideal point whenever

$$|-\omega^\dagger + \omega - x_M| \leq |0 - x_M|$$
$$\omega^\dagger \leq \omega \leq \omega^\dagger + 2x_M.$$

Therefore his decision to send confirmatory signals and receive the outcome $x = 0$ rather than $x = \omega^\dagger + \omega$ is optimal whenever the nonconfirmatory signaling range is of length $\omega^+ - \omega^- \geq 4x_M$, which is true for the ranges described in Proposition 4. Furthermore, in all cases where the minority party player sends a nonconfirmatory signal, the majority party player will send a confirmatory signal with probability zero, so his decision to randomize as well is rational.

The minority party committee member prefers $-\omega^\dagger$ to the floor's ideal point whenever

$$|-\omega^\dagger + \omega - x_m| \leq |0 - x_m|$$
$$\omega^\dagger - 2|x_m| \leq \omega \leq \omega^\dagger.$$

Therefore his decision to send confirmatory signals and receive the outcome $x = 0$ rather than $x = \omega^\dagger + \omega$ is optimal whenever the nonconfirmatory signaling range is of length $\omega^+ - \omega^- \geq 4x_m$, which is true for the ranges described in part (ii) of Proposition 4. For the ranges described in part (i) of Proposition 4, confirmatory signals are being sent for values of $\omega \geq \omega^\dagger + 2x_M > \omega^\dagger$, so the minority party's actions are optimal here as well. In all cases where the majority party player sends a nonconfirmatory signal, the minority party player will send a confirmatory signal with probability zero, so his decision to randomize as well is rational.

The floor player will receive her ideal point with certainty if, given the committee players' strategies, she sets $p = -b_M$ after observing $b_M = b_m$, for in that case $x = p + \omega = -b_m + \omega = -\omega + \omega = 0$ given that the committee bills are both equal to ω. And her decision to set $p = -\omega^\dagger$ after receiving signals $b_m \neq b_M$ is similarly rational as it maximizes her expected utility given her beliefs about ω. Finally, all floor beliefs are consistent with the equilibrium strategies of the committee players. ■

A.2 Partisan Signaling Equilibrium With Gatekeeping

Proposition 5. (i) An equilibrium to Γ_1 is characterized by

$$\psi^*(\omega) = \begin{cases} 1 & \text{if } \omega \in [L_1, 1 - L_2], \\ 0 & \text{otherwise;} \end{cases}$$

$$\begin{aligned} b^*_M(\omega) &\in [a_i, a_{i+1}], \ \text{if } \omega \in [a_i, a_{i+1}]; \\ b^*_m(\omega) &\in [0, 1]; \end{aligned}$$

given a message $b_M \in [a_i, a_{i+1}],\ i \neq N_1$,

$$p^*(b_M) = -(a_i + a_{i+1})/2 \text{ if } b_M \in [a_i, a_{i+1}];$$

$$g^*(\omega|b_M) = \begin{cases} 1/(a_{i+1} - a_i) & \text{for } \omega \in [a_i, a_{i+1}], \\ 0 & \text{otherwise;} \end{cases}$$

given a message $b_M \in [a_{N_1}, a_{N_1+1}]$ (the gatekeeping region),

$$p^*(b_M) = -(a_{N_1-1} + a_{N_1})/2;$$

$$g^*(\omega|b_M) = \begin{cases} 1/(a_{N_1-1} - a_{N_1}) & \text{for } \omega \in [a_{N_1-1}, a_{N_1}], \\ 0 & \text{otherwise.} \end{cases}$$

(ii) The expected utilities for the players are

$$\begin{aligned} Eu_f &= L_1\left[-\frac{L_1^2\hat{\omega}}{N_1^2} - \frac{x_M^2(N_1^2-1)}{3}\right] + L_2\left[-\frac{L_2^2\hat{\omega}}{N_2^2} - \frac{x_M^2(N_2^2-1)}{3}\right] \\ &\quad + 4\{-\hat{\omega}[(1 - L_2 + d - 1/2)^2 - (L_1 + d - 1/2)^2]\} \end{aligned} \tag{8}$$

$$\begin{aligned} Eu_M &= L_1\left[-\frac{L_1^2\hat{\omega}}{N_1^2} - \frac{x_M^2(N_1^2-1)}{3} - x_M^2\right] \\ &\quad + L_2\left[-\frac{L_2^2\hat{\omega}}{N_2^2} - \frac{x_M^2(N_2^2-1)}{3} - x_M^2\right] \\ &\quad + 4\{-\hat{\omega}[(1 - L_2 + d - 1/2 - x_M)^2 \\ &\qquad - (L_1 + d - 1/2 - x_M)^2]\} \end{aligned} \tag{9}$$

$$\begin{aligned} Eu_m &= L_1\left[-\frac{L_1^2\hat{\omega}}{N_1^2} - \frac{x_M^2(N_1^2-1)}{3} - x_m^2\right] \\ &\quad + L_2\left[-\frac{L_2^2\hat{\omega}}{N_2^2} - \frac{x_M^2(N_2^2-1)}{3} - x_m^2\right] \\ &\quad + 4\{-\hat{\omega}[(1 - L_2 + d - 1/2 - x_m)^2 \\ &\qquad - (L_1 + d - 1/2 - x_m)^2]\}, \end{aligned} \tag{10}$$

where $d = p_0 + 1/2$ (the distance between the actual status quo and $-\bar{\omega}$),

$$L_1 = \frac{N_1 + 2N_1(N_1+1)x_M - 2N_1 d}{2N_1+1},$$

$$L_2 = \frac{N_2 - 2N_2(N_2+1)x_M + 2N_2 d}{2N_2+1},$$

N_2 is the greatest integer such that

$$x_M \le \frac{1+2d}{4N_2^2},$$

and N_1 is the greatest integer such that

$$x_M \le \frac{1-2d}{4N_1^2-2}.$$

Proof. The preferences of the floor and majority party committee players in this game are special cases of those in the original Crawford and Sobel (1982) article. Crawford and Sobel prove that, as long as there is no ω for which $u_f(p,\omega)$ and $u_M(p,\omega)$ are maximized by the same p, there are a finite number of noisy signaling ranges in equilibrium. Further, there is a unique equilibrium in which the maximum number of signaling ranges occur.

As long as the majority party committee player does not employ a weakly dominated strategy, he will set $\psi = 1$ upon observing $\omega = \omega_M^* \equiv x_M - p_0$. This implies two signaling regions, each of which must conform to the Crawford–Sobel model for noisy signaling.

In deriving the number of signaling ranges above and below the gatekeeping region, it is convenient to note that each noisy signaling region must be $4x_M$ larger than the region immediately to its right.[12] Thus if there are n signaling regions of total length L, and the smallest one has size a, then

$$\begin{aligned} L &= a + (a+4x_M) + (a+8x_M) + \cdots + (a+(n-1)x_M) \\ &= n\,a + 2n(n-1)x_M. \end{aligned} \tag{11}$$

For signaling above the gatekeeping region, at the boundary with the gatekeeping region, the committee is just indifferent between signaling and gatekeeping. This means

$$\begin{aligned} \frac{a+(n-1)4x_M}{2} + x_M &= (d-1/2) + (1 - na - 2n(n-1)x_M) - x_M; \\ (n+1/2)a + 2n^2 x_M &= d + 1/2. \end{aligned} \tag{12}$$

12. See Gibbons (1992:217–18) for a useful discussion of this property.

Coupled with the requirement that $a > 0$, this implies that N_2 is the greatest integer such that

$$x_M \leq \frac{1+2d}{4N_2^2}. \tag{13}$$

Finally, substituting from Equation (12) into Equation (11), we get

$$L_2 = \frac{N_2 - 2N_2(N_2+1)x_M + 2N_2 d}{2N_2+1}. \tag{14}$$

For signaling below the gatekeeping region, the indifference condition at the gatekeeping boundary translates to

$$\begin{aligned} a/2 - x_M &= x_M - (d - 1/2 + na + 2n(n-1)x_M); \\ (n+1/2)a + d - 1/2 &= 2x_M + 2nx_M - 2n^2 x_M. \end{aligned} \tag{15}$$

The smallest signaling region, the one on the boundary, must be at least $2x_M$ in length, so that at the boundary the outcome is greater than x_M. Then Equation (15) gives N_1 as the greatest integer such that

$$x_M \leq \frac{1-2d}{4N_1^2 - 2}. \tag{16}$$

Substituting Equation (15) into Equation (11) gives

$$L_1 = \frac{N_1 + 2N_1(N_1+1)x_M - 2N_1 d}{2N_1+1}. \tag{17}$$

■

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