Procedural Choice in Majoritarian Organizations*

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Abstract

A puzzling feature of self-governing organizations is continuous majority support for seemingly non-majoritarian procedures, such as chairs, committees, and restrictive rules. This paper provides a theory of self-enforcing commitment to asymmetric procedures. We ask (i) why majorities consent to asymmetric procedures in the first place, (ii) why asymmetric procedures survive challenges thereafter, and (iii) what are the policy consequences of equilibrium procedures. We propose a majoritarian bargaining model with endogenous and revokable recognition probabilities. We find that a risk-averse majority allocates procedural power with the specific goal of increasing procedural efficiency, i.e., reduce the policy uncertainty of egalitarian bargaining. The resulting equilibrium procedures are generally asymmetric and restrictive, generating policy bias. Still, the median may uphold them to avoid amplifying policy uncertainty.

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1 Introduction

Organizations invested with policymaking power such as legislatures, boards, councils, and commissions use well-specified *procedures* to bring policy alternatives to a vote. While the organization's members almost always exercise equal voting power, more often than not they hold unequal procedural power (Cox 2006). Common examples of *restrictive procedures* include chairpersons, committees, gatekeeping, and closed rules.

While some procedures are constitutionally-prescribed, many organizations have discretion to choose, and then change as necessary, their own procedures. In the U.S. Congress "Each House may determine the Rules of its Proceedings." (*U.S. Constitution* Article 1, Section 5, Clause 2) In these self-governing organizations battles over questions of procedure are often more contentious than the substance of policy itself.[1] This should not be surprising since the allocation of procedural rights has been shown to be critical to an organization's policy output (Romer and Rosenthal 1978, Baron and Ferejohn 1989a, McCarty 2000).[2]

Two features of procedures in self-governing organizations *are* surprising when considered jointly: asymmetry and persistence. Chosen procedures seem to exclude a large number of members thereby conferring procedural benefits on a few, not always moderate, members. Moreover they do so on a systematic basis, because once adopted procedures are very rarely challenged.[3] Normative implications aside, these two features raise the following positive theoretical puzzle. On the one hand, procedures are not only endogenous but also revokable at any time through a simple majority vote; therefore they should continuously reflect the policy preferences of a majority. On the other hand, procedures are asymmetric and persistent, suggesting systematic policy deviations away from the majority.

[1]Rep. Robert H. Michel (R-IL), House minority leader from 1981-1995, described the importance of procedures as follows: "Procedure hasn't simply become more important than substance - it has, through a strange alchemy, become the substance of our deliberations. Who rules House procedures rules the House." (Testimony before the GOP Task Force on Congressional Reform, December 16, 1987). In our model below a procedure acquires policy substance by generating an equilibrium policy lottery.

[2]In some organizations the voting rule itself is an object of choice. Since choosing a voting rule is a conceptually different problem, for the purposes of this paper the voting rule is fixed. The choice of voting rules is studied by, e.g., Barbera and Jackson (2004) and Messner and Polborn (2004). Koray (2000) studies the choice of more general social choice functions.

[3]Major reforms to the U.S. House's committee system have been infrequent. The most significant was the Legislative Reorganization Act of 1946. It mandated a significant reduction in the number of standing committees from forty-eight to nineteen. Most of the abolished committees, however, resurfaced as subcommittees of the remaining standing committees.

This paper addresses the following questions. First, the existence of asymmetric procedures: Why does a majority agree to adopt asymmetric procedures in the first place? Second, the persistence of asymmetric procedures: Why doesn't a majority revoke asymmetric procedures more often? Third, the policy consequences of asymmetric procedures: To what extent can we say that policy under procedural endogeneity is majoritarian (i.e., reflects a majority's preferences)?[4]

While these issues arise for any self-governing organization they are prominently reflected in the ongoing debate on the role of standing committees in the U.S. Congress. This extensive literature features three leading theoretical approaches: distributive, informational, and partisan. Distributive approaches argue that the committee system allows policy extremists to take advantage of procedures such as gatekeeping power to exploit gains from vote trading (Shepsle and Weingast 1987) and protect policy trades against defections (Weingast and Marshall 1988). These logrolling agreements, while beneficial for the committees, lead to inefficient outcomes for the legislature as a whole. Why a majoritarian legislature would ex ante approve committees with these incentives is not clear (Baron 1994, p. 287).

The informational approach starts from the observation that there is a potential asymmetry of information between a committee and the legislature, if the committee has had incentives to acquire expertise in its specific jurisdiction. In this theory the legislature is willing to commit to grant the committee a closed rule because this induces the committee to acquire and share information (Gilligan and Krehbiel 1987, 1990, 1997).[5] The majority ends up compromising on its policy preferences in exchange for a more informed policy choice. How the legislature is able to procedurally commit to not renege on the closed rule ex post is not part of this argument (Gilligan and Krehbiel 1989, p. 296).[6]

[4] In his classic study of the U.S. Congress political scientist and 28th U.S. President Woodrow Wilson expressed concern that a committee's legislative output may fail to reflect the broad policy preferences of the legislature, the body that invested that committee with power in the first place. "[The House] legislates in its committee-rooms; not by the determinations of majorities, but by the resolutions of specially-commissioned minorities." (Wilson 1885, p. 69)

[5] Related informational models include Epstein (1997), Baron (2000), Dessein (2002), and Kim and Rothenberg (2008).

[6] In the U.S. House of Representatives a floor majority can at any time extract a bill from a committee by filing and passing a so-called "discharge petition" (Patty 2007). Yet, discharge petitions are rarely filed, and when they are filed they are rarely successful. From 1931-1998 out of 540 discharge petitions filed, only 46 received the required number of signatures, of which 31 were called up for a vote, and only 26 made a majority of votes (Stewart 2001). This is an average of less than one successful committee discharge for each two-year Congress.

The partisan approach argues that majority party moderates allow their party leadership to control the agenda because sacrificing their individual policy goals in favor of the party median helps maintain the party "brand" and with it the party members' reelection prospects (Cox and McCubbins 1993). Deferring to the party leadership may be supported either through disciplined voting on bills (Aldrich and Rohde 2001) or on procedures (Cox and McCubbins 2005). Diermeier and Vlaicu (2011a) show that even in the absence of exogenously-imposed party voting discipline preference affinities among a majority are sufficient to induce partisan voting cohesion over asymmetric procedures.[7]

While providing more or less complete rationales for the *existence* of asymmetric procedures, these theories rely on an assumption of "procedural commitment" (Krehbiel 1991). Indeed commitment to asymmetric procedures is necessary to reconcile a majority's sovereignty over procedure with a minority's power over policy; otherwise the majority retains control over policy.[8] To fully explain majority compromises on policy requires a theory of self-enforcing procedural commitment to asymmetric procedures, i.e., explaining why asymmetric procedures display *persistence* (Krehbiel 2004, p. 122).

The few formalizations advanced so far are built on the informational (principal-agent) model with an asymmetrically informed committee.[9] Instead, we propose a distributive (bargaining) model. Our game begins in a "procedural state of nature" with no pre-existing institutions. Members have equal voting and procedural power; they only differ in preferences. We define a procedure as an allocation of proposal power. Members bargain over procedures under equal recognition. The chosen procedure, potentially unequal, then governs bargaining over policies. We allow procedures to not only be endogenous but also revokable,

[7]Procedural choice has been modeled in a bargaining framework to analyze phenomena like government formation (Merlo 1997, Baron 1998), voting cohesion (Diermeier and Feddersen 1998), and legislative success (Diermeier and Vlaicu 2011b). Non-bargaining approaches to procedural choice focus on checks and balances, e.g., Diermeier and Myerson (1999), Dixit, Gul, and Grossman (2000), Aghion, Alesina, and Trebbi (2004), Ticchi and Vindigni (2010). See Diermeier and Krehbiel (2003) for a methodological discussion of institutional choice theories.

[8]Without procedural commitment a majority grants the committee a restrictive procedure only if it yields a policy outcome similar to that occuring under an open rule. See Gilligan and Krehbiel (1989) for a one-dimensional model, and Banks (1999) for a multidimensional model.

[9]See Diermeier (1995) for an overlapping generations model where commitment is sustained by reputational forces and Callander (2008) for a principal-agent model where commitment is possible because the complexity of the agent's policy expertise cannot be fully conveyed to the principal. In both papers a committee with preferences distinct from the floor's is assumed to exist.

meaning that they must constitute both ex ante and ex post equilibria.[10]

When bargaining, members face opportunity costs, i.e., spending time and resources on one issue limits members' ability to address other issues (Cox 2006). Opportunity costs, even when small, allow recognized proposers to bias policy outcomes away from the median, making proposal power valuable. We find that risk-averse members demand restrictive procedures because they reduce the policy uncertainty of egalitarian bargaining. Equal-recognition bargaining thus does not guarantee median outcomes, since non-median members can exploit their proposal power to bias outcomes away from the median. Uncertainty over the final policy creates incentives for all members, the median included, to restrict proposal power to designated proposers, with the goal of reducing policy variance. However, both symmetric and asymmetric procedures can achieve that. Thus, in agreeing to an asymmetric procedure, the median essentially trades off policy goals for a reduction in policy variance. Our model thus uncovers a new rationale for asymmetric procedures: *procedural efficiency*.

We further show that this logic can also be used to explain ex ante support for a standing procedure, i.e., a procedure that governs multiple policy issues. The standing procedure may be challenged ex post on "major" issues (i.e., issues with low opportunity cost) since the associated ad-hoc procedures may be more moderate. We show that this never happens when (i) organizational costs are small and/or (ii) the frequency of major policy issues is large. Under these conditions the median has more influence over the choice of standing procedure, making it less vulnerable to challenges ex post. The equilibrium then displays *self-enforcing commitment* to the standing procedure.

Our approach does not assume procedural commitment, like distributive theories, is not based on asymmetries of information, like informational theories, and does not rely on partisan incentives, like partisan theories. Moreover, asymmetric procedures in our model are efficiency-enhancing, in contrast to previous distributive models, as they reduce policy uncertainty relative to the "procedural state of nature," benefiting all members.

The rest of the paper is organized as follows. The next section introduces the model. We then present key properties of majoritarian bargaining in our environment. Next we

[10] A technical contribution of our paper is to fully endogenize recognition probabilities in a standard majority-rule bargaining model (see, e.g., Baron and Ferejohn 1989a, Baron 1996, Banks and Duggan 2006). For a "contest success function" approach to modeling recognition probabilities see Yildirim (2007).

characterize ex ante equilibrium incentives to adopt asymmetric procedures issue-by-issue; finally we derive conditions under which standing asymmetric procedures are persistent. The last section concludes.

2 Model

An organization (legislature, board, council, commission, etc.) is composed of an odd number $2n+1$ of members, with n a positive integer. Its members make both procedural and policy choices. First, members choose a *procedure* that governs policymaking. A procedure is an allocation of proposal power among the members, modeled as a vector in the $(2n+1)$-dimensional unit simplex. Second, members choose a *policy* using the previously-adopted procedure. A policy is a real number in the interval $[-n, n]$.

Preferences. Let $i \in N = \{-n, -n+1, ..., -1, 0, 1, ..., n-1, n\}$ index the different members. A member's *policy preferences* are represented by the utility function:

$$u_i(x) = v(|x - i|) \tag{1}$$

where the function v is strictly decreasing and strictly concave in the distance between policy and index. These assumptions imply that each member (i) has a single ideal point in the policy space, given by his index, (ii) treats deviations from his ideal point symmetrically, and (iii) is risk averse. We also assume that preferences *over lotteries* on $[-n, n]$ are order-restricted, according to the index order (cf. Rothstein 1990, Austen Smith and Banks 1999). Formally, this means that for any two policy lotteries $\tilde{x}', \tilde{x}''$ and any two members i, j such that i prefers $\tilde{x}'$ and j prefers $\tilde{x}''$: (i) if $i < j$ then all $k < i$ prefer $\tilde{x}'$ and all $k > j$ prefer $\tilde{x}''$, and (ii) if $i > j$ then all $k > i$ prefer $\tilde{x}'$ and all $k < j$ prefer $\tilde{x}''$.

In sum, we assume preferences over policies are single-peaked and preferences over policy lotteries are order-restricted. These two properties ensure that the median member is decisive in a simple majority vote between two policies, as well as between two policy lotteries. That is, the median is always in the coalition voting for the winning alternative.[11]

[11] Cho and Duggan (2003) show that quadratic preferences, the prime functional form in theoretical and empirical studies using the spatial model, are one example of order-restricted preferences. Quadratic

Choices. During the course of the game members can choose three variables: a standing procedure $\boldsymbol{\rho}^S$, an ad-hoc procedure $\boldsymbol{\rho}^{AH}$, and a policy x. Each of these choices is made by up-or-down majority voting on alternatives generated through the following basic random-recognition *bargaining protocol*:[12] (a) A member i is recognized according to the procedure $\boldsymbol{\rho} = (\rho_i)_{i=-n}^n$ in effect, where $\sum_{i=-n}^n \rho_i = 1$. That is, member i is selected with probability ρ_i; (b) The recognized legislator makes a proposal p_i; (c) The proposal goes to an up-or-down majority vote. If the proposal is approved, bargaining stops and the proposal p_i goes into effect. If the proposal is voted down, with probability c bargaining stops and the default option r goes into effect, otherwise bargaining continues according to steps a-c. This bargaining protocol is thus fully characterized by the triple $(\boldsymbol{\rho}, c, r)$ of procedure, bargaining cost, and default option.[13]

Timing. The game starts in a "procedural state of nature" where members have equal proposal power. This is represented by the equal-recognition procedure $\bar{\boldsymbol{\rho}} = \left(\frac{1}{2n+1}\right)_{i=-n}^n$. The game has two major stages: organizational and policy. At the organizational stage members can choose a standing procedure $\boldsymbol{\rho}^S$ that can in principle govern all future policy choices. This choice is made under uncertainty about the policy issues that will arise in the future. At the policy stage, a policy issue arises and members can choose an ad-hoc procedure $\boldsymbol{\rho}^{AH}$ that can be used for this particular policy issue; then they choose a policy using one of the available procedures, as follows (see also Figure 1).

Organizational Stage:

(1) Majority vote on whether to adopt a standing procedure. If approved, majority bargaining over standing procedures, under $\left(\bar{\boldsymbol{\rho}}, c^G, \boldsymbol{\rho}^*\right)$, where $\boldsymbol{\rho}^*$ is the majority-preferred procedure between $\boldsymbol{\rho}^{AH}$ and $\bar{\boldsymbol{\rho}}$. Then go to step 2 followed by step 3. If not approved, go to step 2 followed by step 4.

Policy Stage:

(2) A policy issue arises, i.e., the policymaking cost c^P is drawn from a nondegenerate cdf Γ with support on $(0, 1]$. All members observe c^P.

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preferences also satisfy our assumed properties of single-peakedness, symmetry and concavity.

[12] Baron (1994) calls this protocol a "minimal legislative process."

[13] This protocol is used by Baron and Ferejohn (1989a) for multidimensional choice, Baron (1996) for one-dimensional choice, and Banks and Duggan (2006) in a model that accomodates both one-dimensional and multidimensional choices.

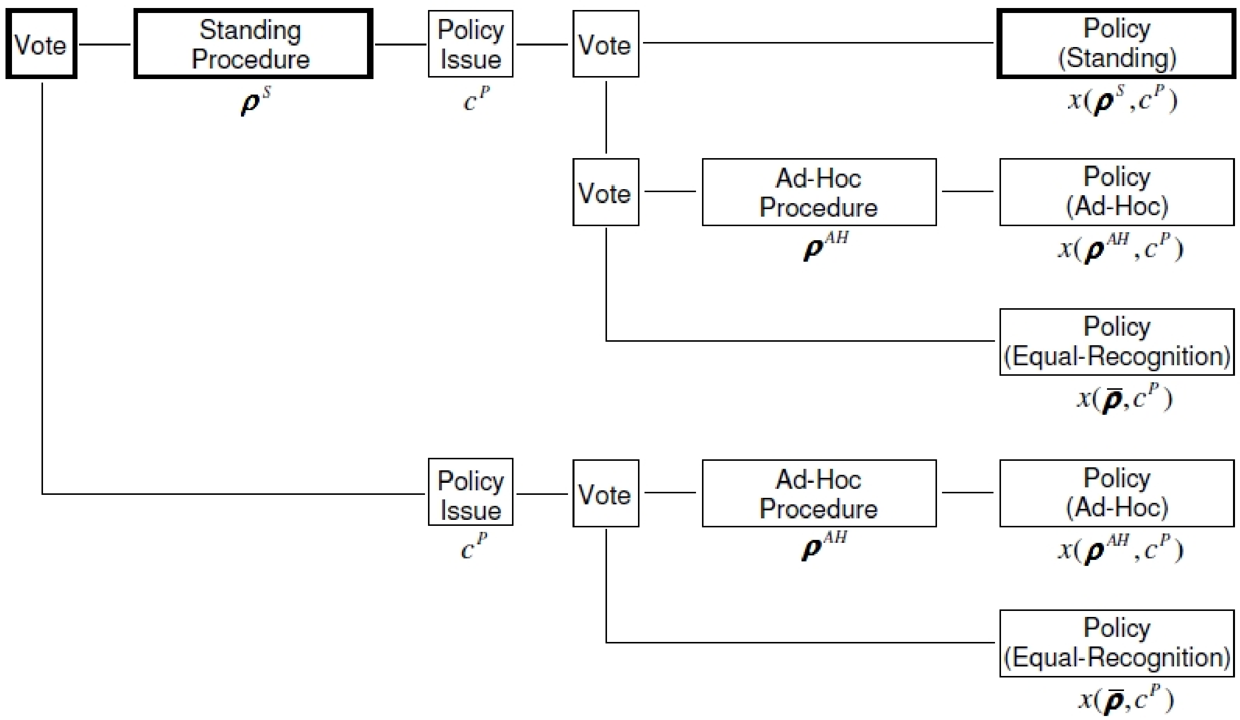

Figure 1: Timing of the Game.

(3) Majority vote on whether to uphold the standing procedure. If approved, majority bargaining over policies, under $\left(\boldsymbol{\rho}^S, c^P, q\right)$, where q is the policy status quo, $q \in [-n, n] \setminus \{0\}$. If not, go to step 4.

(4) Majority vote on whether to adopt an ad-hoc procedure. If approved, majority bargaining over ad-hoc procedures, under $\left(\bar{\boldsymbol{\rho}}, c^P, \bar{\boldsymbol{\rho}}\right)$, and then go to step 5. If not, then bargaining over policies, under $\left(\bar{\boldsymbol{\rho}}, c^P, q\right)$.

(5) Majority bargaining over policies, under $\left(\boldsymbol{\rho}^{AH}, c^P, q\right)$.

Table 1 below summarizes the model's endogenous and exogenous variables, and their domains.[14]

Discussion. We note several features of the model. First, the exogenous probability c that bargaining stops after a failed vote can be interpreted as the opportunity cost of delaying a decision. If this probability is large, failing to make a decision today will very likely prevent legislators from taking a second look at the issue tomorrow.

[14]The timing is similar to Callander (2008) who studies how a principal endogenously commits to delegate policymaking to an agent that has policy expertise. The principal has the option to override the agent, yet in equilibrium he chooses not to.

Table 1: Endogenous and Exogenous Variables.

Bargaining Outcome	Procedure ($\boldsymbol{\rho}$)	Bargaining Cost (c)	Default Option (r)
Standing Procedure $\boldsymbol{\rho}^S$	$\bar{\boldsymbol{\rho}}$	$c^G \in (0,1)$	$\boldsymbol{\rho}^* \in \{\boldsymbol{\rho}^{AH}, \bar{\boldsymbol{\rho}}\}$
Ad-Hoc Procedure $\boldsymbol{\rho}^{AH}$	$\bar{\boldsymbol{\rho}}$	$c^P \sim \Gamma(0,1]$	$\bar{\boldsymbol{\rho}}$
Policy x	$\boldsymbol{\rho}^S/\boldsymbol{\rho}^{AH}/\bar{\boldsymbol{\rho}}$	$c^P \sim \Gamma(0,1]$	$q \in [-n,n] \setminus \{0\}$

In modern organizations the most obvious source of opportunity costs is competing issues on the policy agenda. In the case of legislatures costs could also be due to constituency service and reelection campaigns. High-c^P policy issues can be thought of as "ordinary issues," where delay is very costly. Low-c^P policy issues can be thought of as "major issues" with low opportunity costs of bargaining. Note as well that there are no costs of transitioning between the different bargaining games. For instance, when a standing procedure is in place, it is costless to switch to an ad-hoc procedure.[15]

Second, although we model only a single policy choice x the ex ante uncertainty over the policymaking cost c^P can be interpreted as a sequence of future issues with different policymaking costs. The reason we use a single uncertain issue is that we want to set aside incentives for logrolling across issues, which distributive theories have shown can explain restrictive procedures albeit ones that produce inefficient policy allocations.

Third, members' preferences over procedures are not primitives of the model, but derive from their policy preferences. As we will see below, a given procedure generates a policy lottery, i.e., a probability distribution over policy outcomes. Thus, preferences over procedures are in effect preferences over policy lotteries.

Fourth, the procedural choices ($\boldsymbol{\rho}^S$ and $\boldsymbol{\rho}^{AH}$) are made using the equal-recognition procedure $\bar{\boldsymbol{\rho}}$. We refer to bargaining under equal recognition as "egalitarian bargaining." Actual organizations, however, almost never use the equal-recognition procedure to choose policy. On the contrary, observed policymaking procedures are typically restrictive. In this model of

[15] A bargaining game ends in a finite number of rounds with probability one. One can think of each bargaining game as lasting one period, with the uncertainty being about the number of rounds that can be "squeezed in" during that period. If opportunity costs are prohibitive, then only one round is feasible. If they are smaller, several rounds are possible.

endogenous procedures, will equilibrium procedures feature this observed restrictiveness?[16]

Fifth, even if members agree to adopt a standing procedure $\boldsymbol{\rho}^S$ there is no external commitment device to force them to later use it on a policy issue (i.e., no procedural commitment). Once a policy issue arises members have a choice of procedures under which to consider it: standing, ad-hoc, and equal-recognition. Yet commitment may arise endogenously, de facto, if the majority chooses to uphold the standing procedure ex post. In this model of revokable procedures, when will the standing procedure chosen ex ante also be preferred by a majority ex post?

Equilibrium Concept. The game consists of a finite sequence of bargaining games. A full strategy for member i consists of a voting strategy that chooses among bargaining games and a bargaining strategy for each bargaining game. A bargaining game is a sequence of proposals and votes. A bargaining strategy is a mapping from the set of histories to the set of available actions. A history of length t is a collection of variables describing the identity of the recognized proposers, the policy each one proposed, and how each legislator voted.

As is standard in multilateral bargaining models we focus on stationary bargaining strategies, i.e., strategies that are independent of the history of play up to the current period. Formally, a bargaining strategy for member i is a pair $s_i = (p_i, A_i)$ where p_i is member i's proposal in any bargaining period when he is recognized, and A_i is the set of proposals member i votes for in each period. The *majority acceptance set* is defined as the set of proposals for which a majority coalition L votes in favor: $A = \bigcup_{L \subseteq N} \bigcap_{i \in L} A_i$, where $|L| \geq n+1$.

We use the standard equilibrium concept for legislative bargaining games, namely stationary subgame perfect equilibrium. We also impose the requirement of symmetry. The equilibrium is a profile of symmetric stationary strategies $\mathbf{s}^* = (s_i^*)_{i=-n}^{n}$ that satisfy two conditions:

(i) Proposals $(p_i^*)_{i=-n}^{n}$ are sequentially rational: $p_i^* \in \arg\max \{\mathbb{E}[u_i(p)] \mid p \in A^*\}$, whenever $\sup \{\mathbb{E}[u_i(p)] \mid p \in A^*\} \geq c\mathbb{E}[u_i(r)] + (1-c)U_i(\mathbf{s}^*)$; and $p_i^* \notin A^*$, otherwise (i.e., member i prefers to delay). Here $U_i(\mathbf{s}^*)$ is member i's stationary equilibrium value in equilibrium $\mathbf{s}^*$.

[16] Baron and Ferejohn's (1989a) multilateral bargaining model uses an exogenous equal-recognition procedure. Baron and Ferejohn (1989b) comment: "We acknowledge that random recognition rules are not generally observed in real legislatures." (p. 349). Cox (2006) makes a similar remark: "[...] while legislators are everywhere equal in voting power, they are unequal in agenda-setting power." (p. 142). He refers to an environment with egalitarian agenda-setting as the "legislative state of nature."

(ii) Individual acceptance sets $(A_i^*)_{i=-n}^n$ satisfy weak dominance: $A_i^* = \{p \mid \mathbb{E}[u_i(p)] \geq c\mathbb{E}[u_i(r)] + (1-c)U_i(\mathbf{s}^*)\}$, namely a member's vote is a best response and is weakly undominated in a majority vote.[17]

3 Equilibrium

This section characterizes the equilibrium of the game. First, we present general properties of bargaining in our majoritarian environment. Second, we characterize equilibrium ad-hoc procedures for a given level of policymaking cost, and then discuss their policy consequences. Third, we characterize equilibrium standing procedures and identify conditions under which they display persistence. Proofs of all formal results are presented in the Appendix.

3.1 Majoritarian Bargaining

Our game features two types of bargaining: bargaining over procedures, followed by bargaining over policies. Despite being played over different choice spaces, i.e., simplex vs. one-dimensional interval, the two games have two key features in common. In both the median has to be in the winning coalition, and in both the equilibrium is no-delay.

The fact that the median is decisive in equilibrium is based on two observations. First, voting is by simple majority rule. And second, any vote is in essence a binary choice between two "policy lotteries." A policy proposal is voted on against the wait option, which is a lottery between the status quo and future policy proposals. A procedural proposal, which itself is a policy lottery, is voted on against the wait option, which is a composite policy lottery by being a lottery of alternative procedural proposals. Single-peakedness over policies and order-restrictedness over policy lotteries then ensure that given two policy lotteries, the ideal points of the first lottery's supporters lie on one side from the ideal points of the second lottery's supporters. Therefore, the winning coalition has to include the median.[18]

[17] For a general treatment of legislative bargaining games see Austen-Smith and Banks (2006). Undominated voting strategies are appropriate in multilateral bargaining games because they serve to eliminate voting outcomes divorced from preferences.

[18] Cho and Duggan (2003) use a similar argument to show uniqueness of stationary equilibrium in a one-dimensional bargaining model with quadratic preferences.

Proposition 1 *In majoritarian bargaining over procedures, as well as over policies, any proposal that passes has the vote of the median (i.e., $A^* = A_0^*$).*

The proposition says that at both procedural and policy votes the median member is decisive. The median may or may not be pivotal. A proposal may pass with the support of a supermajority, for example when the bargaining cost is large and the default option is extreme.

This result is critical for our argument because it implies that an equilibrium procedure in our game always has the consent of a majority, i.e., is "majoritarian." In the case of a standing procedure this consent is expressed under uncertainty about future policy issues, therefore at that point it only has an ex-ante meaning. However, in our model the procedure chosen ex ante is revokable after the uncertainty has been resolved. If this procedure is upheld ex post, then we can say it has a majority's ex post consent as well. Our goal will be to explore if such continuously majority-supported procedures can be asymmetric.

In the Appendix we show that for both policies (Lemma 1) and procedures (Lemma 2) a bargaining equilibrium exists and has to be no-delay. A majority accepts the proposal made in the first round of bargaining. The no-delay property follows from complete information about preferences and risk aversion. Intuitively, a proposer knows what proposals can pass. Moreover delaying is unappealing to risk-averse members because it creates uncertainty about the final outcome, since it is not known which member is recognized next. Lemma 1 further shows that policy bargaining has a unique equilibrium and it is in pure strategies.[19]

The median's ability to shape policy and procedure depends on his bargaining power. In our model bargaining power is a function of the bargaining cost c and the default option r. As the bargaining cost increases, the median's willingness to wait for his turn to propose is lower, allowing the proposer to extract more benefits from the median. As the value of the median's default option increases, the median is, in contrast, less willing to make policy concessions, reducing the proposer's ability to move policy or procedure away from the median's preferred alternative. We summarize these observations in the following proposition.

[19]Because procedural bargaining is multidimensional, in general its equilibrium cannot be guaranteed to be unique or in pure strategies. Below we present an example with quadratic preferences where the procedural bargaining equilibrium is both unique and in pure strategies.

Proposition 2 *The median's influence over bargaining outcomes increases when (i) the bargaining cost c decreases, and (ii) the median's default option value* $\mathbb{E}[u_0(r)]$ *increases.*

The median's influence over bargaining outcomes can be seen most easily in the case of policy bargaining. Here, the median's influence can be captured by the *policy deviation*, denoted x^*, that the median is willing to tolerate. The median's equilibrium acceptance set is $A_0^* = [-x^*, x^*]$, which by Proposition 1 is also the majority acceptance set. Let $M(x^*) = \{i \in N \mid |i| \leq x^*\}$ and $E(x^*) = \{i \in N \mid |i| > x^*\}$ denote the set of moderate, respectively extreme, members relative to policy deviation x^*, i.e., members inside, respectively outside, the median's acceptance set. Moderate members can propose and pass their ideal points. Extreme members are constrained to propose the bound of the majority acceptance set closest to their ideal point.

By strict monotonicity of the members' utility functions, the equilibrium policy deviation $x^*(\boldsymbol{\rho}, c^P)$ under procedure $\boldsymbol{\rho}$ and bargaining cost c^P is the unique solution of the median's indifference condition:

$$v(x^*) = c^P v(|q|) + (1 - c^P)V(\boldsymbol{\rho}, x^*) \tag{2}$$

where $V(\boldsymbol{\rho}, x^*) = \sum_{i \in M(x^*)} \rho_i v(|i|) + v(x^*) \sum_{i \in E(x^*)} \rho_i$ is the median's stationary equilibrium value from bargaining under procedure $\boldsymbol{\rho}$ with a policy deviation x^*.

Equation (2) reveals that the equilibrium policy deviation $x^*(\boldsymbol{\rho}, c^P)$ is increasing in the bargaining cost c^P and decreasing in the median's default option value $v(|q|)$. Note that $x^*(\boldsymbol{\rho}, c^P) = |q|$ if the policymaking cost is prohibitive ($c^P = 1$) or there are no moderate proposers, but $x^*(\boldsymbol{\rho}, c^P) = 0$ if the median has monopoly proposal power. Otherwise the equilibrium deviation lies in between the median's ideal point and the default option's absolute value. In the Appendix we show that the claims of Proposition 2 cover procedural bargaining as well.

3.2 Procedural Choice

Before fully characterizing procedural choice we present a special case of the model to build intuition for the model's mechanisms. Afterward we show that this intuition carries over to the general environment of our model.

Example. Consider a five-member organization $i \in \{-2,-1,0,1,2\}$ where policy preferences are quadratic $u_i(x) = -(x-i)^2$. The policy default option has $|q| = 2$. The organizational cost is $c^G = c \in (0,1)$. The policymaking cost has a binary distribution: $c^P = c$, with probability m, and $c^P = 1$, with probability $1-m$. Here $m \in (0,1)$ can be thought of as the (exogenous) frequency of major policy issues.[20]

For some values of the parameters c and m the unique equilibrium of this game has the following form. If a non-median member $i \neq 0$ is recognized to propose a standing procedure, he allocates monopoly proposal power to the moderate member $i=-1$ or $i=1$ closest to himself. The chosen member's monopoly proposal power, despite generating policy bias, is not later challenged on a major and much less on an ordinary policy issue. In this equilibrium the median de facto "commits" to this non-median procedure. In doing so he accepts a policy bias of 1 on all future policy issues.

To see how the equilibrium works, consider the equilibrium strategies for parameters $c = 0.75$ and $m = 0.82$. Let $\mathbf{e}_i$ denote the unit vector in dimension i, that is $e_i = 1$ and $e_j = 0$ for all $j \neq i$. In the language of our model this represents a "monopoly procedure." Equilibrium procedural proposals are as follows.

$$\left(\boldsymbol{\rho}_i^S\right)_{i=-2}^{2} = (\mathbf{e}_{-1}, \mathbf{e}_{-1}, \mathbf{e}_0, \mathbf{e}_1, \mathbf{e}_1) \quad (3)$$

$$\left[\boldsymbol{\rho}_i^{AH}(c)\right]_{i=-2}^{2} = [(0.25, 0.75, 0, 0, 0), \mathbf{e}_{-1}, \mathbf{e}_0, \mathbf{e}_1, (0, 0, 0, 0.75, 0.25)] \quad (4)$$

$$\left[\boldsymbol{\rho}_i^{AH}(1)\right]_{i=-2}^{2} = [(0.33, 0.67, 0, 0, 0), \mathbf{e}_{-1}, \mathbf{e}_0, \mathbf{e}_1, (0, 0, 0, 0.67, 0.33)] \quad (5)$$

Notice that the ad-hoc procedures attached to a major policy issue are more moderate than those attached to an ordinary policy issue; the median has to compromise more on ad-hoc procedures for ordinary policy issues (0.67 vs. 0.75). Equilibrium policy proposals are as follows. Under the standing procedure, the sole proposer proposes his ideal point. Under ad-hoc procedures with power-sharing on a major issue the most extreme proposers propose $\pm x^* \left[\boldsymbol{\rho}^{AH}(c), c\right] = \pm 1.84$, otherwise proposers get their ideal points. Under the equal-recognition procedure for a major issue the most extreme proposers propose $\pm x^*(\bar{\boldsymbol{\rho}}, c)$

[20] One could argue that the organizational cost is smaller than policymaking costs since the standing procedure can potentially affect multiple policy issues, and so members should display more patience when bargaining over it.

$=\pm 1.85$, otherwise proposers get their ideal points.

In this example an asymmetric ad-hoc procedure, even if biased and excluding a majority, is more favorable to the median, and therefore to a majority, than the unbiased equal-recognition procedure. The reason is that an ad-hoc procedure, even the most extreme, reduces policy volatility. For instance, even though the most extreme ad-hoc procedure in equation (5) has higher policy bias $\mathbb{E}[\tilde{x}(\boldsymbol{\rho})]$ than the equal-recognition procedure (1.21 vs. 1.14) it actually reduces the standard deviation of the the associated policy lottery $sd[\tilde{x}(\boldsymbol{\rho})]$ by a factor of almost four (0.36 vs. 1.33).

Since every ad-hoc procedure improves over the equal-recognition procedure, the median strictly prefers adopting ad-hoc procedures even before knowing which ad-hoc procedure will be picked. By order-restrictedness of preferences, all members on one side of the median agree. By ex ante symmetry, all members must agree. Because this procedural improvement results from a reduction in policy variance, we call it "procedural efficiency."

At the organizational stage the standing procedure proposed by a given member is at least as moderate as the ad-hoc procedure proposed by the *same* member, because the default option for standing procedures (an ad-hoc procedure) is more favorable to the median than the one for ad-hoc procedures (the equal-recognition procedure). The median may however contemplate revoking the standing procedure ex post in the hope that the replacement ad-hoc procedure is picked by a more moderate member (in this case the median himself $i = 0$). Revoking an asymmetric standing procedure, say $\mathbf{e}_{-1}$, nevertheless has a downside. It is possible that an even more extreme member ($i = \pm 2$) will get to propose an ad-hoc procedure, pulling policy even further away (1.21 vs. 1) from the center.

For the assumed parameter values this tradeoff is always resolved in favor of upholding the standing procedure.[21] The median never has an incentive to revoke the standing procedure, not even for a major policy issue ($c^P = c$) when the median would have the most influence over ad-hoc procedures. What are the general conditions under which the median is thus endogenously committed to an asymmetric standing procedure? We characterize these conditions below in Proposition 6.

[21] Each of the asymmetric standing procedures $\mathbf{e}_{-1}$ and $\mathbf{e}_1$ yields an expected utility for the median of -1. The expected utility from switching to ad-hoc procedures is -1.04 for a major policy issue ($c^P = c$) and -1.2 for an ordinary policy issue ($c^P = 1$).

Ad-Hoc Procedures. Before adopting any procedures, members are in a "procedural state of nature" where they share proposal power equally. This equal-recognition procedure $\bar{\boldsymbol{\rho}}$ is unrestricted, since it does not exclude any member from making proposals, and symmetric, since proposal power is uniformly distributed around the median. Due to these features, the equal-recognition procedure generates a policy lottery $\tilde{x}(\bar{\boldsymbol{\rho}})$ that is unbiased, although volatile, with variance increasing in the policymaking cost.

Do members have an incentive to alter the "procedural state of nature"? If so, how does the chosen procedure compare to the equal-recognition procedure? We find that the endogenous procedures are different from the equal-recognition procedure.

Proposition 3 *An equilibrium ad-hoc procedure is (i) asymmetric, except when proposed by the median, and (ii) restrictive, i.e., gives proposal power to a minority, except for the polar case of three members.*

To understand these properties consider the proposer's problem. Let $\left[\boldsymbol{\rho}_i^{AH}(c^P)\right]_{i=-n}^{n}$ denote the ad-hoc procedures proposed in equilibrium for a given policymaking cost c^P. Each of these proposals maximize the proposing member's, say member i's, expected payoff subject to the constraint, by Proposition 1, that the median prefers the proposal to waiting:

$$\begin{aligned} &\boldsymbol{\rho}_i^{AH}(c^P) = \arg\max\nolimits_{\boldsymbol{\rho}_i} \mathbb{E}\left\{u_i([\tilde{x}(\boldsymbol{\rho}_i)]\right\} \\ &\text{s.t. } V_i^{AH}(c^P) \geq c^P \bar{V}\left(c^P\right) + \frac{1-c^P}{2n+1} \sum_{j=-n}^{n} V_j^{AH}(c^P). \end{aligned} \tag{6}$$

In this equation $\bar{V}\left(c^P\right) = V\left[\bar{\boldsymbol{\rho}}, x^*(\bar{\boldsymbol{\rho}}, c^P)\right]$ and $V_j^{AH}(c^P) = V\left\{\boldsymbol{\rho}_j^{AH}(c^P), x^*[\boldsymbol{\rho}_j^{AH}(c^P), c^P]\right\}$ are the median's values from bargaining under the ad-hoc procedure proposed by member j, and the equal-recognition procedure, respectively. As before $V(\boldsymbol{\rho}, x^*)$ denotes the median's expected bargaining value under procedure $\boldsymbol{\rho}$ and policy deviation x^*.

Note that if the proposer is the median himself, he can afford to retain full proposal probability since rejecting this proposal is worse for the median and therefore, by order-restrictedness, for a majority of members as well. Thus $\boldsymbol{\rho}_0^{AH} = \mathbf{e}_0$. If the proposer is a non-median member, however, he can retain full proposal probability only when the policymaking cost c^P is sufficiently high. Otherwise, he has to share proposal probability with other members. Because the median treats deviations from his ideal point symmetrically, a non-median proposer will not have an incentive to allocate proposal probability on the opposite side of the median. Therefore, unless proposed by the median, the equilibrium ad-hoc procedure is asymmetric.

Since for an asymmetric procedure all proposal probability is allocated on the proposer's side of the median, the proposer and the median being risk-averse have a common interest in reducing policy variance. The way to achieve this so that both are better off is to shift proposal power toward members located in between the proposer and the median.[22]

These variance-reducing incentives imply that the median has to gain under an ad-hoc procedure relative to the equal-recognition procedure, if not procedurally, certainly in terms of policy distribution. Indeed this interpretation becomes apparent when we consider the policy implications of asymmetric ad-hoc procedures. They can be summarized as follows.

Corollary 1 *Policy outcomes under an asymmetric ad-hoc procedure* $\boldsymbol{\rho}^{AH}(c^P)$ *are (i) biased, but (ii) less volatile relative to the equal-recognition procedure* $\bar{\boldsymbol{\rho}}$*. The median (A majority) benefits more from an asymmetric procedure when the policymaking cost is smaller:* $\frac{d}{dc^P}V^{AH}(c^P) \leq 0$, *with strict inequality for the most extreme ad-hoc procedure.*

An *asymmetric ad-hoc procedure* induces bias in policy outcomes because policy proposals come systematically from one side of the preference spectrum. Policy is less volatile than under the *equal-recognition procedure* because the median and the proposer both gain from restricting proposal power to members situated in between the proposer and the median. Thus, although the median is hurt by the policy bias, in equilibrium an ad-hoc procedure compensates the median through variance reduction.

The equilibrium ad-hoc procedure depends on the policymaking cost c^P. As this cost declines the median tolerates a smaller and smaller policy deviation $x^*\left[\boldsymbol{\rho}^{AH}(c^P), c^P\right]$. The policy deviation shrinks for two reasons. First, the reduced policymaking cost directly increases the median's influence in policy bargaining. And second, the change in the policymaking cost affects the policy deviation indirectly through affecting the equilibrium procedure

[22]The equilibrium procedure displays a "limited power sharing" property: at most two members are allocated positive recognition probability, and, if two, they are adjacent to each other. Thus a proposed equilibrium procedure can be fully characterized by a one-dimensional endogenous variable, defined as the most extreme proposer's power.

$\boldsymbol{\rho}^{AH}(c^P)$. Globally the indirect effect reinforces the direct effect, although locally the indirect effect could be partially offsetting the direct effect. In the next section we focus on the case of a globally and locally reinforcing effect, since that is what happens under quadratic utilities, as the above example has illustrated.That is, we study policy and procedural choices that are strategic complements: policy moderation is achieved through procedural moderation.[23]

The variance-reducing incentives inherent in choosing ad-hoc procedures help answer the first question raised in this paper, namely the rationale for asymmetric procedures: If ad-hoc procedures are almost always asymmetric and restrictive, creating policy bias, why does the median consent to them in the first place? The reason is a reduction in uncertainty about the final policy outcome. Before a proposer is recognized both the ad-hoc procedure and the equal-recognition procedure are unbiased. The median's ex ante preference for ad-hoc procedures is then due to their restrictiveness, which reduces their variance relative to the default equal-recognition procedure. By order-restrictedness of preferences, all members on one side of the median agree. By ex ante symmetry, all members must agree.

Proposition 4 [*Procedural Efficiency*] *When deciding under what procedure to consider a given policy issue, all members gain ex ante by replacing the equal-recognition procedure* $\bar{\boldsymbol{\rho}}$ *with ad-hoc procedures* $\left[\boldsymbol{\rho}_i^{AH}(c^P)\right]_{i=-n}^{n}$.

This proposition formalizes a novel rationale for asymmetric procedures that does not arise in the well-established distributive, informational, and partisan approaches mentioned in the Introduction. We refer to this rationale as "procedural efficiency," for two reasons. First, endogenous procedures have a statistical efficiency property since they reduce policy variance relative to the "procedural state of nature" of the equal-recognition procedure. Second, endogenous procedures have a distributive efficiency property since ad-hoc procedures ex ante Pareto-dominate the equal-recognition procedure.[24]

The efficiency rationale formalized in Proposition 4 bears similarities to Cox's (2006) informal theoretical conjecture regarding the source of legislative institutions. He envisions restrictive procedures as arising in response to a congestion problem affecting developing legislatures. As the legislature becomes more "busy" the competing claims on plenary time

[23] Local strategic complementarity hinges on the curvature properties of the underlying payoff function v.

[24] Ex post, though, only a majority may support the adopted ad-hoc procedure.

start to create pressure to regulate access to the plenary, especially on major policy issues. In this scenario procedures serve to increase legislative efficiency by reducing congestion and improving the flow of legislation through the plenary.[25] In our model, in contrast, ad-hoc procedures increase policymaking efficiency by reducing members' uncertainty over the final policy outcome.

Standing Procedures. Finally we turn to the first stage of the game, namely the organizational stage, indicated by the box labeled "Standing Procedure" in Figure 1 above. Behavior at this stage should yield insights into two questions. First, will members have incentives to adopt a standing procedure, given that they do not yet know the policy issues that will arise in the future? Second, if a standing procedure is adopted, under what conditions is it persistent, i.e., when will a majority of members want to use it ex post?

The structure of bargaining over standing procedures is similar to bargaining over ad-hoc procedures. There are, however, two key differences. First, members are uncertain about the type of policy issues that will arise in the future, which could be low cost or high cost. Second, the default option is not the equal-recognition procedure anymore, but a (yet unknown) ad-hoc procedure, by Proposition 4. Despite these differences, an equilibrium standing procedure shares the basic qualitative features of an equilibrium ad-hoc procedure, namely asymmetry and restrictiveness.

Proposition 5 *An equilibrium standing procedure is (i) asymmetric, except when proposed by the median, and (ii) restrictive, i.e., gives proposal power to a minority, except for the polar case of three members.*

The logic of these properties is analogous to the logic of ad-hoc procedures, being based in the necessity to pass muster with the median, which creates incentives for proposers to keep proposal power on their side, and in members' risk aversion, which creates incentives to restrict proposal power to a few members in between the proposer and the median. The policy consequences are again bias and variance-reduction.

[25] "At some point, the plenary time constraint binds when important and controversial issues are at stake. Motivated by the desire to enact legislation on these pressing issues, a majority of members are willing to reduce ordinary members' powers of delay and enhance officeholders' special powers to expedite business." (Cox 2006, p. 146)

Self-governing organizations almost always adopt a set of standing procedures to govern their deliberations. These are typically published in a procedures manual. In the U.S. Congress a set of standing procedures began to take shape within the first twenty years after the Constitution established the Congress. The most consequential of these were the standing committees, with power to bring bills to the floor. By 1825 both the House and the Senate had developed a system of standing committees that has dominated lawmaking up to the present time (Gamm and Shepsle 1989).[26]

We say that a standing procedure is "persistent" when it is upheld by a majority on all policy issues. When a procedure is persistent the median de facto "commits" to use the procedure in the future. What factors determine whether a standing procedure is persistent? This question is particularly interesting if the persistent procedure is asymmetric, since it implies that one-dimensional policy bias could be consistent with majority preferences.

To understand this issue consider a proposer's problem. Let $\left(\boldsymbol{\rho}_i^S\right)_{i=-n}^n$ denote the persistent standing procedures proposed in equilibrium. Each of these proposals maximize the proposing member's, say member i's, expected payoff subject to the constraint, by Proposition 1, that the median prefers the proposal to waiting. By the procedural efficiency argument of Proposition 4, if organizational bargaining breaks down, at the policy stage members will choose to engage in bargaining over ad-hoc procedures. Thus,

$$\begin{aligned}
&\boldsymbol{\rho}_i^S = \arg\max\nolimits_{\boldsymbol{\rho}_i} \mathbb{E}\left\{u_i([\tilde{x}(\boldsymbol{\rho}_i)]\right\} \qquad (7)\\
&\text{s.t.} \quad \int V_i^S(c^P)d\Gamma(c^P) \geq \frac{c^G}{2n+1}\sum_{j=-n}^{n}\int V_j^{AH}(c^P)d\Gamma(c^P) + \frac{1-c^G}{2n+1}\sum_{j=-n}^{n}\int V_j^S(c^P)d\Gamma(c^P)
\end{aligned}$$

where the second constraint set says that the median upholds the standing procedure for every realization of the policymaking cost:

$$V_i^S(c^P) \geq \frac{1}{2n+1}\sum_{j=-n}^{n} V_j^{AH}(c^P) \quad \text{for all } c^P. \qquad (8)$$

[26] In the U.S. House only the office of the Speaker is constitutionally-mandated. Each Congress, upon convening, votes on its own rules of procedure. Historically, the current Congress adopts the rules of the previous Congress with any necessary amendments. For a detailed account of congressional procedures see Oleszek (2007).

In this equation the value functions $V_j^{AH}(c^P) = V\left\{\boldsymbol{\rho}_j^{AH}(c^P), x^*[\boldsymbol{\rho}_j^{AH}(c^P), c^P]\right\}$ and $V_i^S(c^P) = V\left[\boldsymbol{\rho}_i^S, x^*(\boldsymbol{\rho}_i^S, c^P)\right]$ are the median's values from bargaining under a standing procedure, and an ad-hoc procedure proposed by members i and j, respectively. As before $V(\boldsymbol{\rho}, x^*)$ denotes the median's expected bargaining value under procedure $\boldsymbol{\rho}$ and policy deviation x^*.

The key intuition for persistence is that a standing procedure is upheld later on if it is sufficiently favorable to the median to start with. Otherwise, there will exist a (major) policy issue where the median prefers to switch to ad-hoc procedures. By Proposition 2 the median's influence over the standing procedure is larger when the bargaining cost is lower and when the median's default option value is larger.

Proposition 6 [*Self-Enforcing Commitment*] *Suppose policy and procedural choices are strategic complements. An asymmetric standing procedure is persistent when: (i) the organizational cost c^G is small, and (ii) the frequency of major policy issues is large.*

If the organizational cost c^G is small then at the organizational stage the median will have to compromise little on standing procedures, so later, even if facing a major policy issue, the median still prefers the standing procedure over a (yet unknown) ad-hoc procedure. If the frequency of major policy issues is large, then the median's effective default option is more likely to be a relatively moderate ad-hoc procedure, since the median has more influence over ad-hoc procedures attached to major policy issues. Thus, even if the policy issue ends up being major, the median would still prefer to uphold the standing procedure he agreed to earlier.

The second condition in Proposition 6 may appear counterintuitive at first. One may expect that a standing procedure should be more resilient when future policy issues are ordinary, i.e., have high opportunity costs, since these have associated ad-hoc procedures that are relatively more extreme, and thus unappealing to the median. However, a default option of more extreme ad-hoc procedures also reduces the median's influence over the standing procedure; thus, if a major policy issue does happen to come up, the median would certainly prefer to circumvent the standing procedure.[27]

[27] We model an increase in the frequency of major policy issues as a shift from a policymaking cost cdf Γ' to another cdf Γ'' that strictly first-order stochastically dominates it. Formally, this requires $\Gamma''(c^P) > \Gamma'(c^P)$ for all c^P.

Proposition 6 answers the second question we raised in this paper, namely the persistence of asymmetric procedures in an environment of majoritarian procedural endogeneity. It shows that persistence is rooted in the median's interest to uphold asymmetric procedures in order to avoid amplifying the policy uncertainty associated with unfavorable ad-hoc procedures or egalitarian bargaining. We thus find that the median's commitment to the standing procedure can be self-enforcing.[28]

Integrating the inequalities in (8) over all c^P and averaging over all members $i = -n, ..., n$ implies that the median gains by agreeing to bargain over standing procedures that are going to be persistent. In expectation this is then majority-preferred to bargaining over procedures issue by issue.

Corollary 2 *When asymmetric standing procedures are expected to be persistent they are adopted in equilibrium and generate policy bias.*

While serving as vice-president of the United States Thomas Jefferson drafted a *Manual of Parliamentary Practice* for the U.S. Senate, published in 1801. It was the first such document for Congress and is still in use today as part of congressional procedures, together with the House Rules, the Senate Rules, and the Constitution. In it he wrote:

> "It is much more material that there should be a rule to go by, than what that rule is; that there may be a uniformity of proceeding in business, not subject to the caprice of the Speaker, or captiousness of the members. It is very material that order, decency, and regularity be preserved in a dignified public body."

The incentives for procedural persistence that our model identifies resonate with the call for "uniformity" and "regularity" of proceedings that Jefferson wanted to see as President of the U.S. Senate. While ad-hoc procedures perform a procedural efficiency role, the persistence of standing procedures reduces policymaking uncertainty even further, benefiting all risk-averse members. Our model demonstrates that persistence can be a feature of procedures that are at the same time majoritarian, asymmetric and restrictive.[29]

[28] Proposition 6 also suggests, consistent with the historical record, that persistent standing procedures are a feature of developed organizations whose agenda is dominated by major policy issues.

[29] As Gamm and Shepsle (1989) document, Jefferson's call was answered within a generation, first in the House, a more majoritarian body, and then in the Senate.

The policy consequences of equilibrium procedures help us interpret the nature of policymaking in a self-governing organization. In particular we learn that systematic policy bias is not necessarily a non-majoritarian phenomenon (cf. Patty 2007). On the contrary, it can be supported both ex ante and ex post in a majoritarian environment where the median is part of every winning coalition.

4 Conclusion

This paper proposes a model of procedural choice in a majoritarian organization lacking external means of procedural commitment. A procedure is a vector of recognition probabilities that governs policy bargaining. Our dynamic model allows for procedures that are both endogenous and revokable, as is the case in self-governing organizations. We solve for equilibrium procedures in this environment and study their properties. The model provides a new way of thinking about the nature of policymaking procedures, as it sheds light on basic efficiency-driven incentives to adopt procedures that are asymmetric and persistent, some of the most evident features of procedures in self-governing organizations.

The model generates two main insights. First, we find that procedures are chosen so as to increase the procedural efficiency of policy bargaining. This is in contrast to existing distributive theories of legislative institutions, where procedures generate inefficiency. Second, the reason equilibrium procedures in our model are persistent suggests they may be based on a self-enforcing commitment. Under characterized conditions the median upholds asymmetric procedures in order to avoid amplifying policy uncertainty. The model thus provides microfoundations for the common assumption of procedural commitment present in the endogenous institutions literature.

Our results suggest that distributive, informational, and partisan approaches to procedural choice can only partly explain the existence of asymmetric procedures. Members' common incentives to reduce procedural, and with it policymaking, uncertainty may also play a role. The results also point to a more nuanced understanding of the notion of majoritarianism. In our model both procedures and policy are majoritarian in the sense that the median is part of every procedural and policy coalition (Krehbiel 1991, p. 16). However, systematic policy bias can still exist in equilibrium. Thus, policy bias is not necessarily inconsistent with majoritarianism. Empirical work is necessary to determine the pervasiveness of this effect, as well as the magnitude of the policy bias.

One potentially useful extension of the model would be to introduce incentives for specialization into policy jurisdictions. This could provide a new theoretical perspective and testable implications in the long-standing debate over whether congressional committees are composed of preference outliers. Also, in organizations where members are elected through political parties, such as state or national legislatures, procedural choice typically has a partisan nature (see, e.g., Diermeier and Vlaicu 2011a). A majority party may harness the procedural efficiency incentives of members to augment its own power. Another fruitful direction for future research thus seems to be how procedural efficiency interacts with partisan motivations in shaping procedural choices. More broadly the model's insights could be applied to the study of institutional choice in self-governing majoritarian societies (see, e.g., Acemoglu and Robinson 2008, Lagunoff 2009) where issues of democratic stability are of paramount importance.

Appendix

Proof of Proposition 1. Consider any stationary equilibrium $\mathbf{s}^*$. Take a proposal $p \in A_0^*$. That means $\mathbb{E}[u_0(p)] \geq c\mathbb{E}[u_0(r)] + (1-c)U_0(\mathbf{s}^*)$. In words, the median prefers the lottery induced by p to the (composite) continuation lottery that follows an unsuccesful vote. By order restriction, at least all members on one side of the median have to prefer the lottery induced by p. This establishes $A_0^* \subseteq A^*$. Now take a proposal $p \in A^*$ and assume that $p \notin A_0^*$. Since the median prefers the continuation lottery to the proposal itself, by order restriction, at least all members on one side of the median also prefer to wait. However, this contradicts that $p \in A^*$. This contradiciton establishes that $A^* \subseteq A_0^*$. ■

Lemma 1 *Policy bargaining has a unique equilibrium and it is no-delay.*

Proof. We first show the existence of a no-delay equilibrium. Then we show that a no-delay equilibrium must be unique. Last, we show that there can be no equilibria with delay.

Step 1) In a no-delay equilibrium a member with positive recognition probability $\rho_i > 0$ makes a proposal from the majority acceptance set $x_i \in A^*(= A_0^*$, by Proposition 1). This implies that the median's acceptance set is a symmetric interval $A_0^* = [-x^*, x^*]$ centered at zero, whose bounds are defined recursively by the median's indifference condition:

$$v(x^*) = c^P v(|q|) + (1-c^P)\left[\sum_{j \in M(x^*)} \rho_j v(|j|) + v(x^*) \sum_{j \in E(x^*)} \rho_j\right] \tag{9}$$

by the symmetry and strict monotonicity of the payoff function $v()$.

Suppose, to the contrary, that $\rho_i > 0$ and $|x_i| > x^*$. That must be because proposer i prefers waiting to any policy from $[-x^*, x^*]$. That cannot be the case for a moderate proposer $i \in M(x^*) \subseteq A_0^*$ since proposing his ideal point, which passes, cannot be beaten by any alternative. Consider, then, an extreme proposer $i \in E(x^*) \supseteq A_0^*$ whose proposal is not in the majority acceptance set. Let $\tilde{w}$ denote the continuation lottery, and let $\bar{w} = \mathbb{E}(\tilde{w})$ denote its expected value. Then, from (9), $v(x^*) = \mathbb{E}[u_0(\tilde{w})] < u_0(\bar{w}) = v(|\bar{w}|)$, by the strict concavity of $u_0()$. Because $v()$ is strictly decreasing this implies $|\bar{w}| < x^*$. Then,

$$\begin{cases} u_i(-x^*) > u_i(\bar{w}) > \mathbb{E}\left[u_i\left(\tilde{w}\right)\right] & \text{for } i < -x^* \\ u_i(x^*) > u_i(\bar{w}) > \mathbb{E}\left[u_i\left(\tilde{w}\right)\right] & \text{for } i > x^* \end{cases} \tag{10}$$

by the strict concavity and strict monotonicity of $u_i()$. This contradicts the premise that an extreme proposer prefers waiting to making a proposal from $[-x^*, x^*]$.

Step 2) Let $\mathbf{s}'$ and $\mathbf{s}''$ be two no-delay equilibria and $\mathbf{s}' \neq \mathbf{s}''$. Let $A' = [-x', x']$ and $A'' = [-x'', x'']$ be their corresponding majority acceptance sets, where $A = A_0 = \{x \in [-n, n] \mid u_0(x) \geq c^P u_0(q) + (1 - c^P)U_0(\mathbf{s})\}$, by Proposition 1. Suppose that $x' < x''$. Then since $c^P > 0$:

$$\begin{aligned} u_0(x') - u_0(x'') &= \left(1 - c^P\right)\left[U_0(\mathbf{s}') - U_0(\mathbf{s}'')\right] && (11) \\ &< U_0(\mathbf{s}') - U_0(\mathbf{s}''). && (12) \end{aligned}$$

Because the equilibria are no-delay $U_0(\mathbf{s}) = \sum_{i \in M(x)} \rho_i u_0(i) + u_0(x) \sum_{i \in E(x)} \rho_i$ and:

$$\begin{aligned} U_0(\mathbf{s}') - U_0(\mathbf{s}'') &= \left[u_0(x') - u_0(x'')\right] \sum_{i \in E(x'')} \rho_i + u_0(x') \sum_{j \in A'' \setminus A'} \rho_j - \sum_{j \in A'' \setminus A'} \rho_j u_0(j) && (13) \\ &\leq u_0(x') - u_0(x'') && (14) \end{aligned}$$

since $u_0(j) > u_0(x'')$, when $j \in A'' \setminus A'$. This contradicts inequality (12). Thus $\mathbf{s}' = \mathbf{s}''$.

Step 3) A proposal with delay occurs because a recognized member is strictly better off with the continuation value than with any policy in the majority acceptance set:

$$\exists\, i \in N \text{ such that } \rho_i > 0 \text{ and } c^P u_i(q) + (1 - c^P)U_i(\mathbf{s}^*) > \max\left\{u_i(x) \mid x \in A_0^*\right\}. \tag{15}$$

There are two cases to consider. First, suppose the delay equilibrium is static (i.e., the equilibrium outcome is the default option q). Then $q \in A_0^*$ and the inequality in (15) becomes $u_i(q) > \max\left\{u_i(x) \mid x \in A_0^*\right\}$, which together form a contradiction. Second, suppose the delay equilibrium is not static. That means at least one proposal is in A_0^*. Let $\bar{w}$ be the expected value of the continuation lottery. By strict concavity of each $u_i()$ we have $u_i(\bar{w}) >$

$c^P u_i(q)+(1-c^P)U_i(\mathbf{s}^*)$ for all i. But this implies that $\bar{w} \in A_0^*$ and so $\max\{u_i(x) \mid x \in A_0^*\} \geq u_i(\bar{w})$. It now follows from the inequality in (15) that $c^P u_i(q) + (1-c^P)U_i(\mathbf{s}^*) > u_i(\bar{w})$, a contradiction. ■

Lemma 2 *Procedural bargaining has a unique equilibrium and it is no-delay.*

Proof. We first show the existence of a no-delay equilibrium. Then we show that a no-delay equilibrium must be unique. Last, we show that there can be no equilibria with delay.

Step 1). The vector of recognition probabilities in the procedural game is egalitarian. By Proposition 1, we know that the median is decisive. As a consequence, to be approved, a policy proposal needs to be in the median's acceptance set. Suppose that there exists a no-delay equilibrium $\mathbf{s}^*$. The median's acceptance set associated with this equilibrium, denoted by $\mathbf{A}_0$, is given by the set of procedures that yield the median a payoff higher than a certain threshold $\underline{V}_0$ (also an equilibrium quantity). As a consequence,

$$\mathbf{A}_0 = \{\boldsymbol{\rho} \in \Delta^{2n} | V_0(\boldsymbol{\rho}) \geq \underline{V}_0\} \tag{16}$$

Denote by ρ_i i's proposal power under procedure $\boldsymbol{\rho}$. Given that the median's payoff function is symmetric around zero, and given the equilibrium of the policy game, we can establish the following:

$$\boldsymbol{\rho}' \in \mathbf{A}_0 \Rightarrow \boldsymbol{\rho}'' \in \mathbf{A}_0 \;\forall\; \boldsymbol{\rho}'' \in \{\boldsymbol{\rho} : \rho_i = \rho_i' + \varepsilon,\, \varepsilon \in [-\rho_i', \rho_{-i}'],\;\, \rho_{-i} = \rho_{-i}' - \varepsilon\}. \tag{17}$$

In other words, what matters for the median's payoff is the distribution of proposal power across each possible position away from his bliss point. We call this property *centrality.*

Consider a generic proposer in the procedural game. In equilibrium:

$$\boldsymbol{\rho}_i \in \arg\max_{\boldsymbol{\rho} \in \mathbf{A}_0} V_i(\boldsymbol{\rho}) \tag{18}$$

Due to the centrality property of $\mathbf{A}_0$, it must then be that equilibrium procedures are asymmetric: proposers to the right of the median will never allocate any positive proposal power on the other side of the median (otherwise, shifting any proposal power from k to $-k$ would not change the median's expected payoff but strictly i's payoff). More formally

$$\forall\ i > (<)\ 0, \rho_{ik} = 0 \forall k < (>) 0. \tag{19}$$

Using Proposition 1 (which, by order restrictedness, guarantees that the median is decisive in accepting a proposal), to show existence we can invoke the one stage deviation principle and show that no legislator i has an incentive to deviate from his equilibrium proposal strategy. The strategy consist of proposing $\mathbf{e}_i$ (i.e., keep all proposal power to himself) if $v(i) \geq \underline{V}_0$, or some other $\boldsymbol{\rho}^i : V_0(\boldsymbol{\rho}^i) = \underline{V}_0$. Assume wlog, that $i > 0$, and that $\boldsymbol{\rho}^i \neq \mathbf{e}_i$ (otherwise, not delaying gives i is highest possible payoff, and no-delaying follows automatically). Suppose that i prefers delaying. Then it must be that

$$V_i(\boldsymbol{\rho}_i) < c^P V_i(\overline{\boldsymbol{\rho}}) + (1 - c^P) \frac{1}{2n+1} \sum_{k=-n}^{n} V_i(\boldsymbol{\rho}^k) =: V_i^{CV} \tag{20}$$

Notice that under egalitarian policy bargaining, the distribution of expected policy outcome is symmetric and centered in zero. Since procedural bargaining takes place under egalitarian procedures, the same is true for the policy lottery induced by $\mathbf{s}^*$. As a consequence, having the median reject a proposal leads to a lottery over policy outcome which is symmetrically distributed around zero. As a consequence, we must have

$$V_i^{CV} = V_{-i}^{CV}. \tag{21}$$

By definition of $\underline{V}_0$, it must be that the median weakly prefers $\boldsymbol{\rho}^i$ to another round of bargaining:

$$V_0(\boldsymbol{\rho}_i) \geq c^P V_0(\overline{\boldsymbol{\rho}}) + (1 - c^P) \frac{1}{2n+1} \sum_{k=-n}^{n} V_0(\boldsymbol{\rho}_k) \tag{22}$$

By order restrictedness on policy lotteries, it must be that every legislator to the left of the median also weakly prefers $\boldsymbol{\rho}^i$ to another round of bargaining, including $-i$. Therefore, we must have

$$V_{-i}(\boldsymbol{\rho}_i) \geq V_{-i}^{CV} \tag{23}$$

But we know that $\boldsymbol{\rho}^i$ is asymmetric, and can only give proposal power to the median or to legislators to his right. As a consequence, we must have

$$V_{-i}(\boldsymbol{\rho}_i) < V_{-i}(\mathbf{e}_0) = v(i) \tag{24}$$

$$V_i(\boldsymbol{\rho}_i) > V_i(\mathbf{e}_0) = v(i) \tag{25}$$

Combining equations (20)-(25) yields

$$V_i(\boldsymbol{\rho}_i) < V_i^{CV} = V_{-i}^{CV} \leq V_i(\boldsymbol{\rho}_i) < v(i) < V_i(\boldsymbol{\rho}_i), \tag{26}$$

a contradiction.

Step 2) Suppose there are two equilibria in the procedural game, $\mathbf{s}'$ and $\mathbf{s}''$, and that $\mathbf{s}' \neq \mathbf{s}''$. Let $\underline{V}_0'$ and $\underline{V}_0''$ the associated lower bounds on median's payoff for acceptance. Suppose that $\underline{V}_0' > \underline{V}_0''$. Since $c^P > 0$

$$\underline{V}_0' - \underline{V}_0'' = (1 - c^P)[V_0(\mathbf{s}') - V_0(\mathbf{s}'')] < V_0(\mathbf{s}') - V_0(\mathbf{s}'') \tag{27}$$

Because equilibria are no delay,

$$V_0(\mathbf{s}') = \frac{1}{2n+1} \left\{ \sum_{i \in M(\underline{V}_0')} u_0(i) + \sum_{i \notin M(\underline{V}_0')} \underline{V}_0' \right\}. \tag{28}$$

Moreover, since we must have $M(\underline{V}_0') \subseteq M(\underline{V}_0'')$,

$$V_0(\mathbf{s}') - V_0(\mathbf{s}'') = \frac{1}{2n+1} \left\{ \sum_{i \notin M(\underline{V}_0'')} (\underline{V}_0' - \underline{V}_0'') + \sum_{i \in M(\underline{V}_0'')/M(\underline{V}_0')} (\underline{V}_0' - u_0(i)) \right\} < \underline{V}_0' - \underline{V}_0'' \tag{29}$$

where the last inequality follows from the fact that $\forall i \in M(\underline{V}_0'')$, $u_0(i) > \underline{V}_0''$. As a consequence, it must be that every NDSE generates the same median's acceptance set.

Step 3) Suppose that there is an equilibrium $\mathbf{s}^*$ with acceptance set $\underline{V}_0^*$ that displays delay. Then

$$\exists i : c^P V_i(\overline{\boldsymbol{\rho}}) + (1 - c^P) V_i(\mathbf{s}^*) > \max_{\boldsymbol{\rho}: V_0(\boldsymbol{\rho}) \geq \underline{V}_0^*} V_i(\boldsymbol{\rho}) \tag{30}$$

If the equilibrium is static, then we have $V_0(\overline{\boldsymbol{\rho}}) \geq \underline{V}_0^*$ and (30) cannot hold. If the equilibrium is not static, then at least one proposal gives the median at least $\underline{V}_0^*$. There are two cases to consider:

a) The strategy of legislators k and $-k$ are *coherent*: if k delays, so does $-k$. By symmetry k's no-delay proposal is center-symmetric to $-k$'s no-delay proposal. By stationarity, this must also be true in all future periods (proposes $\boldsymbol{\rho}^k : V_0(\boldsymbol{\rho}^k) = \underline{V}_0^*$, $-k$ proposes the same distribution of proposal power on the other side of the median). Therefore, the policy lottery induced by $\mathbf{s}^*$ is symmetrically distributed around zero. Hence, the continuation lottery is also symmetrically distributed around zero. As a consequence

$$V_i(\mathbf{e}_0) > c^P V_i(\overline{\boldsymbol{\rho}}) + (1 - c^P) V_i(\mathbf{s}^*) \tag{31}$$

and, by definition, $V_0(\mathbf{e}_0) = v(0) \geq \underline{V}_0^*$. A contradiction.

b) Suppose that the strategy is of some legislators k and $-k$ is not coherent. Then there must be some legislator k that delays, while $-k$'s proposal is immediately accepted. If all legislators k violating coherence are (wlog) to the right of the median, then it must be that the lottery induced by $\mathbf{s}^*$ is centered to the left of the median. But that implies that the whole continuation lottery has expected value $w < 0$. As a consequence

$$c^P V_k(\overline{\boldsymbol{\rho}}) + (1 - c^P) V_k(\mathbf{s}^*) < u_k(w) < V_k(\mathbf{e}_0) \tag{32}$$

which, since $V_0(\mathbf{e}_0) \geq \underline{V}_0^*$, leads to a contradiction. Therefore, is must be that there exists k, k' such that k and $-k'$ delay, while $-k$ and k' have their proposal immediately accepted. Denote by w the mean of the lottery induced by $\mathbf{s}^*$. If $w < 0$, we incur in the same contradiction as above. If $w \geq 0$, then we have

$$c^P V_{-k'}(\overline{\boldsymbol{\rho}}) + (1 - c^P) V_{-k'}(\mathbf{s}^*) < u_{-k'}(w) < V_k(\mathbf{e}_0) \tag{33}$$

which is, for the same reason, a contradiction. ■

Proof of Proposition 2. Let $\tilde{x}_i$ denote the policy lottery implied by member i's equilibrium proposal p_i^* and $\tilde{y}$ the policy lottery implied by the default option r. By the median's decisiveness (Proposition 1) and the no-delay property of bargaining equilibrium (Lemmas 1 and 2), member i will propose p_i^* that maximizes his expected utility subject to the constraint that the median prefers the proposal to waiting for the next round of bargaining:

$$\mathbb{E}\left[u_0(\tilde{x}_i)\right] \geq c\mathbb{E}\left[u_0(\tilde{y})\right] + (1-c)\sum_{j=-n}^{n} \rho_j \mathbb{E}\left[u_0(\tilde{x}_j)\right]. \tag{34}$$

Since this inequality has to hold in equilibrium for any member i with positive recognition probability $\rho_i > 0$, averaging over all members $i = -n, ..., n$ implies that $\sum_{i=-n}^{n} \rho_i \mathbb{E}\left[u_0(\tilde{x}_i)\right] \geq \mathbb{E}\left[u_0(\tilde{y})\right]$. Thus, by equation (34), the median can extract a larger benefit $\mathbb{E}\left[u_0(\tilde{x}_i)\right]$ from member i's proposal p_i^* when either the bargaining cost c is smaller or the median's default option value $\mathbb{E}\left[u_0(\tilde{y})\right]$ is larger. ■

Proof of Propostion 3. (i) Because the median treats deviations symmetrically, a non-median proposer has no incentive to allocate proposal power on the other side of the median.

(ii) This claim is immediate if either the proposer is anyone but the two most extreme members, since there is no incentive to allocate proposal power to a more extreme member, or, the majority acceptance set A leaves out at least the four most extreme members. Suppose, then, that neither of these situations obtains. That is, the proposer is one of the two most extreme members and the majority acceptance set leaves out only the two most extreme proposers. Without loss of generality, suppose the proposer is on the right: $i = n$. Suppose that in his proposal $\boldsymbol{\rho}$ every member in the majority located on the proposer's side receives some proposal power: $\rho_i > 0$ for all $i \geq 0$ and $\rho_i = 0$ for all $i < 0$. We show that this cannot be an equilibrium proposal.

Consider the alternative procedure $\boldsymbol{\rho}'$ where proposal power is shifted from members $i = 0$ and $i = n$ to $i = 1$. Thus $\rho_0' = \rho_0 - \epsilon_0$, $\rho_1' = \rho_1 + \epsilon_0 + \epsilon_n$, $\rho_n' = \rho_n - \epsilon_n$ and $\rho_i' = \rho_i$ for all i with $2 \leq i \leq n-1$. Pick $\epsilon_0, \epsilon_n > 0$ such that the median is indifferent to the change:

$$\sum_{i=0}^{n-1} \rho_i v(i) + \rho_n v(x) = (\rho_0 - \epsilon_0)\, v(0) + (\rho_1 + \epsilon_0 + \epsilon_n)\, v(1) + \sum_{i=2}^{n-1} \rho_i v(i) + (\rho_n - \epsilon_n)\, v(x) \tag{35}$$

which implies that $\epsilon_n = \frac{v(0)-v(1)}{v(1)-v(x)}\epsilon_0$. Note that however small ρ_0,ρ_n are, ϵ_0, ϵ_n can be chosen smaller still. The median is indifferent between procedures $\boldsymbol{\rho}'$ and $\boldsymbol{\rho}$. However, member $i = 1$ strictly prefers procedure $\boldsymbol{\rho}'$ to $\boldsymbol{\rho}$. By order-restrictedness of preferences, every member on the right of the median, including $i = n$, strictly prefers $\boldsymbol{\rho}'$. Thus, procedure $\boldsymbol{\rho}$ cannot be an equilibrium proposal of member $i = n$. ■

Proof of Corollary 1. (i) Policy bias follows directly from asymmetry.

(ii) In equilibrium the ad hoc procedure $\boldsymbol{\rho}_i^{AH}(c^P)$ proposed by member i has to be approved by the median:

$$V_i^{AH}(c^P) \geq c^P \bar{V}\left(c^P\right) + \frac{1 - c^P}{2n+1} \sum_{j=-n}^{n} V_j^{AH}(c^P) \tag{36}$$

with strict inequality for at least $i = 0$. Averaging over all proposers $i = -n, ..., n$ implies that $\frac{1}{2n+1} \sum_{i=-n}^{n} V_i^{AH}(c^P) > \bar{V}\left(c^P\right)$, and by inequality (36), $V_i^{AH}(c^P) > \bar{V}\left(c^P\right)$ for all $i = -n, ..., n$. Thus the median is at least as well off under $\boldsymbol{\rho}_i^{AH}(c^P)$ as under $\bar{\boldsymbol{\rho}}$. Since the equal-recognition procedure $\bar{\boldsymbol{\rho}}$ is unbiased and an asymmetric ad-hoc procedure biased, the reason the median prefers the asymmetric procedure has to be lower policy variance.

By repeated application of Proposition 3 an equilibrium procedure has a limited power sharing property: at most two members get proposal power, and, if two, they are adjacent to each other. Only the most extreme ad-hoc procedure has power sharing and so depends on c^P. For this procedure the inequality in (36) holds with equality. Then:

$$\frac{d}{dc^P} V_i^{AH}(c^P) = \frac{\bar{V}\left(c^P\right) - \frac{1}{2n+1} \sum_{i=-n}^{n} V_i^{AH}(c^P) + c^P \frac{d}{dc^P} \bar{V}\left(c^P\right)}{1 - \frac{2(n-i^*)}{2n+1}\left(1 - c^P\right)} \tag{37}$$

where i^* is the moderate member furthest from the median. Now $\bar{V}\left(c^P\right)$ is decreasing in c^P because $\bar{V}\left(c^P\right) = \frac{1}{2n+1} \sum_{i=-\bar{\imath}}^{\bar{\imath}} v(|i|) + \frac{2(n-\bar{\imath})}{2n+1} v\left[x^*(\bar{\boldsymbol{\rho}}, c^P)\right]$ and v is decreasing in x while $x^*(\bar{\boldsymbol{\rho}}, c^P)$ is increasing in c^P. ■

Proof of Proposition 4. In the proof of Corollary 1 we showed that $\frac{1}{2n+1} \sum_{i=-n}^{n} V_i^{AH}(c^P) > \bar{V}\left(c^P\right)$ for any c^P. Since ex ante both the ad-hoc procedure and the equal-recognition procedure are unbiased, the increase in median expected utility has to come from a reduction in policy variance. This is the "statistical efficiency" property of endogenous procedures. By order-restrictedness of preferences at least half of the members agree with the median. By the ex ante symmetry of the two induced policy lotteries, all members must agree with the median. This is the "distributive efficiency" property of endogenous procedures. ■

Proof of Proposition 5. The argument is analogous to the proof of Proposition 3. ■

Proof of Proposition 6. A standing procedure $\boldsymbol{\rho}_i^S$ is upheld ex post (after c^P is realized) if the median prefers to bargain under it than to bargain under a (yet unknown) ad-hoc procedure, since by Proposition 4 revoking the standing procedure leads to bargaining over ad-hoc procedures. Thus $\boldsymbol{\rho}_i^S$ is persistent if:

$$V_i^S(c^P) \geq \frac{1}{2n+1}\sum_{j=-n}^{n} V_j^{AH}(c^P) \quad \text{for all } c^P. \tag{38}$$

Intuitively the standing procedure is upheld on all future issues if sufficiently favorable to the median in the first place. This means that at the organizational stage the median needs to have a lot of influence. Note that a standing procedure $\boldsymbol{\rho}_i^S$ does not vary with c^P, whereas an ad-hoc procedure $\boldsymbol{\rho}_j^{AH}(c^P)$ generally does. In particular, according to Corollary 1 the smaller c^P the more the median benefits: $\frac{d}{dc^P}V_j^{AH}(c^P) \leq 0$.

Consider the most extreme standing procedure, denoted $\boldsymbol{\rho}^S$. By repeated application of Proposition 3(ii) it has the limited power sharing property, and thus can be fully characterized by a one-dimensional variable ρ^S defined as the most extreme proposer's power under $\boldsymbol{\rho}^S$. The median's value $V^S(\rho^S)(c^P) = \left(1-\rho^S\right)v(|i|) + \rho v\left[x^*(\boldsymbol{\rho}^S, c^P)\right]$ is strictly decreasing in c^P and ρ^S :

$$\frac{d}{dc^P}V^S(\rho^S)(c^P) = \rho\frac{\partial}{\partial c^P}v\left[x^*(\boldsymbol{\rho}^S, c^P)\right] = \frac{\left(1-\rho^S\right)\left[v(|q|)-v(|i|)\right]}{\left[1-(1-c^P)\rho^S\right]^2} < 0 \tag{39}$$

$$\frac{d}{d\rho^S}V^S(\rho^S)(c^P) = v\left[x^*(\boldsymbol{\rho}^S, c^P)\right] - v(|i|) + \rho^S\frac{\partial}{\partial\rho^S}v\left[x^*(\boldsymbol{\rho}^S, c^P)\right] \tag{40}$$

$$= \frac{c^P\left(1-c^P\right)\left[v(|q|)-v(|i|)\right]}{\left[1-(1-c^P)\rho^S\right]^2} < 0 \tag{41}$$

since in policymaking equilibrium $v\left[x^*(\boldsymbol{\rho}^S, c^P)\right] = \frac{c^P v(|q|)+(1-c^P)(1-\rho^S)v(|i|)}{1-(1-c^P)\rho^S}$.

For the most extreme standing procedure $\boldsymbol{\rho}^S$ the proposer's constraint holds with equality:

$$\int V^S(c^P)d\Gamma(c^P) = \frac{c^G}{2n+1}\sum_{j=-n}^{n}\int V_j^{AH}(c^P)d\Gamma(c^P) + \frac{1-c^G}{2n+1}\sum_{j=-n}^{n}\int V_j^S(c^P)d\Gamma(c^P) \tag{42}$$

and moreover $V^S(c^P) \leq V_j^S(c^P)$ for all c^P and all j.

(i) Suppose the organizational cost c^G goes down. Then the left side of equation (42) remains unchanged, while the right side goes up because $V^S(c^P) \leq V_j^S(c^P)$ for all j and equation (42) imply $\sum_{j=-n}^{n} \int V_j^S(c^P)d\Gamma(c^P) > \sum_{j=-n}^{n} \int V_j^{AH}(c^P)d\Gamma(c^P)$. Thus the equilibrium adjusts through $\boldsymbol{\rho}^S$ such that $\int V^S(c^P)d\Gamma(c^P)$ goes up. Since $V^S(c^P)$ is strictly decreasing in ρ^S for all c^P it means that every $V^S(c^P)$ in the integral goes up. This makes the inequalities in (38) more likely.

(ii) Suppose there is a first-order stochastic increase in Γ. This increases the frequency of low-c^P policy issues. Since both $V^S(c^P)$ and $V_j^{AH}(c^P)$ are strictly decreasing in c^P both the right side and the left side of equation (42) go up. We show that the left side goes up more slowly, thus requiring the equilibrium to adjust through $\boldsymbol{\rho}^S$ increasing $V^S(c^P)$ for all c^P, as in part (i).

Let $\boldsymbol{\rho}^{AHE}(c^P)$ be an equilibrium ad-hoc procedure that generates $\frac{1}{2n+1} \sum_{j=-n}^{n} V_j^{AH}(c^P)$ for the median.

$$\boldsymbol{\rho}^{AHE}(c^P) = \arg\max_{\boldsymbol{\rho}} \left\{ \mathbb{E}\left\{u_n([\tilde{x}(\boldsymbol{\rho})]\right\} \mid V(\boldsymbol{\rho}, c^P) \geq \frac{1}{2n+1} \sum_{j=-n}^{n} V_j^{AH}(c^P) \right\} \tag{43}$$

By Proposition 3(ii) the procedure $\boldsymbol{\rho}^{AHE}(c^P)$ has the limited power sharing property, and thus can be fully characterized by a one-dimensional variable $\rho^{AHE}(c^P)$ defined as the most extreme proposer's power under $\boldsymbol{\rho}^{AHE}(c^P)$. By a regularity condition on v, $\rho^{AHE}(c^P)$ and $x^*\left[\boldsymbol{\rho}^{AHE}(c^P), c^P\right]$ are strategic complements, thus $\rho^{AHE}(c^P)$ is increasing in c^P. Since $\boldsymbol{\rho}^S$ also has the limited power sharing property, it can be characterized by the one-dimensional ρ^S.

Suppose, in contradiction to (38), that there is a c^P where $V^S(c^P) < V^{AHE}(c^P)$, thus $\rho^S > \rho^{AHE}(c^P)$. Since $\rho^{AHE}(c^P)$ is strictly increasing in c^P, there is a $\hat{c}^P$ such that $V^S(c^P) < V^{AHE}(c^P)$ iff $c^P < \hat{c}^P$. This implies the following inequality.

$$\int_{(0,\hat{c}^P]} V^S(c^P)d\Gamma(c^P) < c^G \int_{(0,\hat{c}^P]} V^{AHE}(c^P)d\Gamma(c^P) + \frac{1-c^G}{2n+1} \sum_{j=-n}^{n} \int_{(0,\hat{c}^P]} V_j^S(c^P)d\Gamma(c^P) \tag{44}$$

Now starting from an equilibrium standing procedure that satisfies equation (42) and increasing probability mass on $(0, \hat{c}^P]$ makes the left side of the equation smaller than the right size. By part (i) the equilibrium adjusts through $\boldsymbol{\rho}^S$ such that every $V^S(c^P)$ goes up making the inequalities in (38) more likely. ■

Proof of Corollary 2. Averaging the equilibrium constraint for proposing a standing procedure in equation (7) over all proposers $i = -n, ..., n$ we find that ex ante the median's equilibrium expected value from standing procedures is larger than from ad-procedures:

$$\frac{1}{2n+1}\sum_{j=-n}^{n}\int V_j^S(c^P)d\Gamma(c^P) > \frac{1}{2n+1}\sum_{j=-n}^{n}\int V_j^{AH}(c^P)d\Gamma(c^P). \tag{45}$$

By order-restrictedness of preferences, at least half of the remaining members agree with the median. By ex ante symmetry, all members agree with the median. The existence of policy bias then follows directly from asymmetry. ■

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