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Discussion Paper No. 1089

BARGAINING, VETO POWER, AND LEGISLATIVE COMMITTEES

by

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May 1994

Abstract. This paper compares the incentives to create obstructive committee systems under different constitutionally specified requirements for passing legislation. The Shapley value is used to measure the distribution of bargaining power in the legislature. If the legislature is bicameral or the president can veto, then each chamber of the legislature can increase its total bargaining power, at the expense of the other chamber or the president, by giving its committee chairmen the power to block legislation. This incentive to let committees act as gatekeepers with veto power can persist even when such power may cause some opportunities for beneficial legislation to be lost. This incentive is absent, however, in unicameral parliamentary systems.

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Introduction

The Constitution of the United States divides the Congress into two chambers, the House and the Senate, and it gives each chamber the power to determine its own procedural rules. Each chamber has used this procedural control to create a system of committees such that, in each area of legislation, small numbers of individuals are granted the power to prevent a bill from being considered on the floor.

When a chamber of Congress grants a committee chairman the gate-keeping power to prevent this chamber from voting on bills in some area of legislation, this chairman gets the power to bargain for a larger share of the spoils (e.g. contributions from lobbyists, and control of discretionary spending) that are available for politicians from the process of enacting legislation in this area. Of course, such rewards for the committee chairman may come at the expense of other players in the legislative game, both in this chamber and outside of it. However, to the extent that these costs are borne by individuals outside of the chamber, the result of the committee system may be a net increase in the chamber's total share of the return to legislative power.

This argument suggests that each chamber in Congress or other legislative bodies may be expected to design its procedural rules so as to maximize the total bargaining power of its members. The main goal of this paper is to develop a formal model by which we can compare such incentives for legislative chambers to create obstructive committee systems under different constitutionally specified requirements for the passage of legislation.

Models of Legislative Committees

In addition to the rich empirical literature on Congressional committees there has been a growing body of theoretical work starting with Shepsle [1979] who presented a model of legislative politics with committees as the critical institutions. There have been at least two dominant formal approaches in the theory of legislative committees: distributive and informational approaches. Both theories attempt to explain the emergence of committee systems as a solution to a collective action problem that leads to inefficient outcomes.

The first, distributive, approach is due to Shepsle [1979], Shepsle and Weingast [1983], and especially Weingast and Marshall [1988]. Here legislative politics is mainly characterized by distributive issues. A representative's preferences on political outcomes are induced by the needs of the respective district. Constituencies, however, differ in their needs. Thus, there are gains from trades between legislators from different districts. These mutual benefits, however, typically cannot be obtained in the presence of majority rule decision making since deals that would be highly beneficial for the participants can always be picked apart by low-demand chamber majorities. This omnipresent enforcement problem necessitates the creation of a system of stable property rights, which become committee jurisdictions. That is, each member of the chamber (or at least each member of the coalition that has established the procedural rules) may gain more from his (or her) jurisdictional control in one area of legislation than he loses from surrendering the power to demand an unrestricted floor vote on bills in other areas of legislation. Thus, according to distributional theories, the committee system in the United States Congress is the solution to a market failure. Consequently, we should expect a bidding system for committee system, expressed in the "self-selection hypothesis" for committee assignments and norms of seniority and permanent committee assignments (the property rights norm) that facilitate efficient bargains.

A variant of the distributional approach has been proposed by Baron and Ferejohn [1989b]. In contrast to Shepsle and Weingasts' emphasis on committee gate-keeping and germaneness requirements they focus on the proposal power of committees, i.e. committees are given the right to the first proposal in their jurisdiction. Using a non-cooperative majoritarian bargaining model Baron and Ferejohn identify the (independent) benefits from proposal power and gate-keeping and thus provide a rational for serving on a committee in the first place. Baron and Ferejohn, however, do not consider the question why a chamber should set up a committee system that benefits some of its members disproportionally at the expense of other members.

In a series of papers Gilligan and Krehbiel [1987, 1989] and Krehbiel [1991] present a rationale for granting committees special proposal and amendment prerogatives. They focus on the informational role of committees. Legislators are assumed to be risk averse and uncertain about the consequences of their actions. Thus, they would collectively benefit from reducing this uncertainty. According to informational theories committees are to be interpreted as agents of the floor that provide the collective benefit of reducing uncertainty about policy consequences and transmitting the obtained information to the floor. Acquiring such expertise, however, may be very costly. So, if floor and committee preferences do not coincide, majorities have to create incentives for committee members to incur the costs of specialization and to credibly transmit the acquired information. Gilligan and Krehbiel [1987] demonstrate that restrictive amendment procedures are critical in allowing even a committee of like-minded preference outliers to credibly reveal private information to the floor. The key insight is that if a committee can be sure that the floor will not amend its proposal before the final vote, then proposing a bill corresponds to sending a costly signal which allows to transmit more informative signals than would be possible under an open rule. This argument suggests why a floor majority may be willing to grant restrictive proposal and amendment prerogatives to committees, as the only way to extract valuable information from the committee.

While distributional theories suggest how a permanent allocation of policy jurisdictions as property rights can facilitate the efficient allocation of a fixed pie, informational theories indicate how proposal prerogatives can help to capture the collective gains from policy specialization. So, whenever a collective majoritarian body has the property that its members have a diversity of interests and are uncertain about the policy consequences of their actions, then we should see committee systems organized around fixed jurisdictions and characterized by special proposal privileges.

In fact, collective bodies that use majority rule frequently are frequently organized along fixed jurisdictions with special proposal powers. Examples include parliamentary committees, cabinet portfolios, party committees and study groups, bureaucracies, or academic search committees.

While these approaches provide important insights into the study of Congressional committees, their use for a comparative study of legislative politics is limited. One of the few "stylized facts" in the comparative study of legislatures is the claim that ceteris paribus presidential political systems encourage strong committees (Lees and Shaw [1979]). Yet, neither distributional, nor informational theories can account for the differences between legislative committee systems in the United States and in parliamentary democracies. A standard answer in this case is to refer to different degrees of party discipline, but party structure is not a given parameter in either theory. Further, the level of party discipline should eventually be derived from the constitutional characteristics of a polity, such as the electoral rules used or the legislative process. In fact, the work of Cox [1987, chapter 6] suggests that the absence of a strong decentralized committee system in the House of Commons may have been a contributing factor in the development of party discipline in the British parliamentary system. Moreover, if we consider the committee structure within parties, we do frequently find different jurisdictions and proposal prerogatives, but none of the veto powers associated with Congressional committees (Ismayr [1992]).

In the next section we develop a formal model that explicitly depends on the requirements for enacting legislation. In particular, this model will allow us to analyze how constitutional features, like the existence of multiple chambers with overlapping jurisdictions or a president with veto powers, may influence the incentives to create internal veto players. The basic idea is that, by creating internal veto players, a chamber may increase its bargaining power with respect to outside agents.

The Basic Model

To develop a formal model of the incentives to create obstructive committee systems, we need a way to measure bargaining power. That is, we need a theory of bargaining that predicts how the distribution of benefits from legislation may depend on the distribution of power to block the passage of legislation. In this paper we use the Shapley [1953] value, which is the most mportant single-valued solution concept in cooperative game theory. The use of the Shapley value as a measure of the distribution of power in committees and legislatures was introduced by Shapley and Shubik [1954]

Given any cooperative game, the Shapley value can be interpreted as a measure of the gains from cooperation that each player can justly demand, based on his ability to help or hinder other players in every possible coalition, under an assumption that each individual player has equal ability to negotiate with any possible combination of players. The Shapley value can be compellingly derived from axioms of linearity and symmetry. The linearity axiom asserts that a player's value in the sum of two games should be the sum of his values in the games when they are considered separately. The symmetry axioms assert that, in a simple game where given set of players can get a fixed total payoff if they can all agree on how to divide it (and otherwise no one gets anything), the value of each player in this set should be his share of this payoff when it is divided equally among the members of the set, and the players who are not in this set should have value zero.

Given the rules of a legislature, let us say that a set of players in the legislative system is a <u>winning coalition</u> if they can pass a law without the support of anyone outside of this coalition; but they are a <u>losing coalition</u> if they cannot pass a law without the support of any outsiders. Thus, legislative rules determine a simple coalitional-form game in which every winning coalition has worth 1 and every losing coalition has worth 0. To interpret this game, we may suppose that the passage of a bill into law can generate total benefits for politicians (in the form of kickbacks from special interest groups and porkbarrel spending) that have a total value of 1 monetary unit (say $1 billion). If the players can pass the bill then they can divide these benefits among themselves in any mutually agreeable way, but a player might refuse to support the bill if he feels that his share of the benefits is too small. We use the Shapley value to estimate the share of these benefits that each player might expect to get in the legislative bargaining game.

The Shapley value of this cooperative game may be characterized using the following well-known random-order story. Imagine a conference room, into which the players in the game are arriving in some random order, and suppose that all possible orders of the players' arrivals are equally likely. When a player arrives, his arrival changes the coalition in the room, increasing its size by one. A player's Shapley value in a game is the expected net increase in the worth of the coalition in the room that will occur when this player arrives in the random order. For simple voting games, a player's contribution in the random-order story is either 1 or 0, and the contribution is 1 if the player's arrival changes the coalition in the room from a losing coalition to a winning coalition. So for simple voting games, the Shapley value of a player is the probability that this player will change the coalition in the room from a losing coalition to a winning coalition when he arrives.

Given any randomly selected arrival order, we may say that the player whose arrival changes the set of players in the room from a losing coalition to a minimal winning coalition is the pivotal player under this order. Thus, the Shapley value of a player is the probability that he will be the pivotal player in the random-order story. Similarly, the total value for all players in some set is the probability that the pivotal player will be in this set.

Case 1: A unicameral legislature with presidential veto

Consider first a large unicameral congress with a president, and suppose that passing legislation requires the approval of both the president and a majority of the congress. In this case, as Shapley and Shubik [1954] have shown, the Shapley value assigns half of the power to the president, and the members of congress divide the other half.

To compute the Shapley value according to the random-order story, we imagine that the the players in the legislative game (that is, the president and the members of congress) are arriving at a conference room in a random order. The arrival of the president changes the coalition in the room from a losing coalition to a winning coalition if and only if a majority of the congress is already in the room. As the size of the congress becomes large, the probability that the president's arrival will change the coalition in the room from a losing coalition to a winning coalition approaches 1/2, because we are assuming that all orders are equally likely. On the other hand, in the event that the president arrives before a majority of the congress has arrived, the pivotal player whose arrival creates the winning coalition will be member of congress, and each member equally likely to be this pivotal player. Thus, assuming that congress is large, the president's value is 1/2, and the members of congress have values that sum to 1/2. In short, the Shapley value assigns half of the power to the congress.

Now suppose that the congress establishes its procedural rules so that a law cannot be brought to a vote in congress without the approval of V prespecified members of congress. That is, we let V denote the number of members in the congress who have effective veto power over a particular bill. For example, if a bill can be brought to a vote in congress only with the approval of the chairman of the relevant congressional committee, then $V = 1$. If bringing a bill to a vote in congress requires the approval of the relevant committee and the Speaker of the House, then $V = 2$. We could get $V = 3$ if the approval of the rules committee chairman is also required.

In the random-order story, let us compute the probability that the pivotal player will be an ordinary member of congress who does not have veto power. This event happens if the president and all V of the other veto players arrive before there is a majority of congress in the room, and so (again assuming that the congress is large) the probability of this event is 0.5^{V+1}. Thus, the ordinary members of congress have Shapley values that sum to 0.5^{V+1}. The rest of the power $(1 - 0.5^{V+1})$ is allocated by the Shapley value symmetrically to the $V + 1$ veto players, that is, to the V veto players in congress and the president. So the president's share of the power, according to the Shapley value, is $(1 - 0.5^{V+1})/(V + 1)$. The total power of the members of congress is

$$0.5^{V+1} + (1 - 0.5^{V+1}) \times V/(V + 1) = (V + 0.5^{V+1})/(V + 1).$$

So the total value of all members of congress, according to the Shapley value, is 0.5 when $V = 0$, 0.625 when $V = 1$, and 0.708 when $V = 2$. In general, this measure of the congress's share of the legislative power increases and approaches 1 as V increases. In effect, as Shapley and Shubik [1954] remarked, the congress can maximize its share of the legislative power by making every member of congress a veto player.

Of course, this simple model has ignored some of the serious costs of giving veto power to so many independent agents. In real life, if every member of a large congress had the right to veto any piece of legislation (as in Poland before 1791, during the period of the liberum veto), then almost nothing would ever pass and the legislature would be virtually powerless. This observation suggests that we need to augment our simple model in some way to take account of the increased risk of inaction that is caused by the proliferation of veto rights. As a simple way to do so, let us assume that, whenever a bill is introduced, some fraction of the players in the legislative game will be unable to support the bill, for exogenous political reasons, and the bill will be lost if any one of these intransigent players has veto power.

Making this assumption, we let ε denote the expected fraction of the players who cannot support the bill. We may refer to this fraction as the <u>intransigence parameter</u>. Throughout this paper, we assume that this parameter ε is less than 1/2, and so a majority of congress will (almost surely) be able to support the bill. We also assume that each veto player in the congress has an independent probability ε of being among those who cannot support the bill. Thus, when the president and V members of congress are veto players, the probability that the bill can be passed into law is $(1 - \varepsilon)^{V+1}$.

For this model, the Shapley value of each agent can still be defined as the probability, in the random-order story, that this player's arrival would change the coalition in the room from a losing coalition to a winning coalition, except that we now must also consider players' abilities to support the bill as a random factor (as well as the arrival order of the players). At any point in time, the set of players in the room is a winning coalition if the subset of those in the room who are able to support the bill is a set which, according to the legislative rules, can pass a law without the support of anyone else.

In the event that one or more veto players cannot support the bill, all coalitions would be losing coalitions, and so no player can be pivotal in this event. So the probability that the grand coalition of all players is a winning coalition is

$$(1 - \varepsilon)^{V+1},$$

and the sum of the Shapley values of all players in the legislative game must equal this probability.

The existence of the ε fraction of the congress which cannot support the bill means that a winning coalition must include all veto players and more than a $0.5/(1 - \varepsilon)$ fraction of the congress. Thus, in the random-order story, the coalition in the room will be changed from a losing coalition to a winning coalition by the arrival of an ordinary member of congress (without veto power) only if all veto players can support the bill and all veto players arrive before a $0.5/(1 - \varepsilon)$ fraction of the congress arrives. This event has probability

$$(1 - \varepsilon)^{V+1} \times (0.5/(1 - \varepsilon))^{V+1}$$

when the president and V members of congress have veto powers. Because the sum of all players' values must be $(1 - \varepsilon)^{V+1}$, and because the Shapley value will treat all veto players symmetrically (at least in the limit as the size of congress gets large, holding the number of veto players fixed), the Shapley value of each of the V + 1 veto players must be

$$((1 - \varepsilon)^{V+1} - (1 - \varepsilon)^{V+1} \times (0.5/(1 - \varepsilon))^{V+1})/(V + 1).$$

Thus, the total value of all members of congress, which is the total of all players' values minus the power of the president, is

$$(1 - \varepsilon)^{V+1} - ((1 - \varepsilon)^{V+1} - (1 - \varepsilon)^{V+1} \times (0.5/(1 - \varepsilon))^{V+1})/(V + 1)$$
$$= (1 - \varepsilon)^{V+1} \times (V + (0.5/(1 - \varepsilon))^{V+1})/(V + 1).$$

This total is the probability that all veto players can support the bill but the president is not the pivotal player in the random order.

This measure of total congressional power is maximized by setting V = 0 if

$\varepsilon \geq 0.134$. It is maximized by $V = 1$ if $0.133 \geq \varepsilon \geq 0.097$, and it is maximized by $V = 2$ if $0.096 \geq \varepsilon \geq 0.069$. Thus, the congress can increase its total bargaining power at the expense of the president by giving veto power to some of its members if the intransigence parameter ε is less than 0.133.

Case 2: A unicameral legislature, with no presidential veto

Consider what happens in a legislature in which there is no presidential veto. If there are V veto players in congress, when ε is the expected fraction who cannot support the bill, then the total Shapley value of all members of congress is $(1 - \varepsilon)^V$, which is the probability that all veto players can support the bill. Thus, for any ε, the total value of congress is maximized by letting $V = 0$. That is, we find no incentive for the congress to give anyone a veto over legislation, in a unicameral legislature that faces no presidential veto.

In general, if there are any costs associated with obstructive committees that may come at the expense of members of the chamber, then a chamber will be willing to bear those costs only if this will lead to a net increase in the chamber's share of the returns to legislation. Thus, if a chamber effectively controls the legislative process, we should not find an obstructive committee system. This suggests an answer to Cox' [1987] puzzle of why the nineteenth century British House of Commons did not develop a strong committee system. Our model implies that there are no incentives to create such internal veto players, given that the monarch and the House of Lords had essentially lost the power to effectively block legislation.

This conclusion might be modified in a situation where the legislature cannot realize the benefits of legislating without the agreement of some other outside agent, such as a leader of business or an entrenched manager of a government agency. Any such outsiders, who have power to block legislative initiatives in some domains, could create an incentive for a unicameral congress to create its own internal veto players, to bargain with them in their respective domains.

Case 3: A bicameral legislature, with no presidential veto

So let us now suppose that the legislature is bicameral, consisting of a Senate and a House, but there is no presidential veto. Assume that the constitution requires majority approval in each of these two chambers, to pass a bill into law, and the constitution allows each chamber to establish its own procedural rules. So each chamber can establish procedures that give veto power (by preventing the bill from coming to a vote) to any number of its members. Suppose that each member of congress expects to remain in his current chamber with high probability for the forseeable future, and the two chambers choose their respective procedural rules separately and autonomously. Then the members of each chamber may have the goal of establishing procedures that maximize the total power of their chamber, as measured by the Shapley value. As before, we assume a given intransigence parameter ε, which represents the fraction of legislators who will be unable to support the bill for exogenous reasons.

Let V denote the number of veto players in the House, and let W denote the number of veto players in the Senate. We assume V and W are small nonnegative integers, but the House and Senate are both large. At any point in the random-order story, if more than a $0.5/(1 - \varepsilon)$ fraction of the legislative players has already arrived, then the conference room almost surely already contains majorities which are able to support the bill in both chambers. On the other hand, if less than a $0.5/(1 - \varepsilon)$ fraction has arrived, then the conference room almost surely does not yet contain majorities that can support the bill in either chamber. So

$$(0.5/(1 - \varepsilon))^{W+V}$$

is the probability that all veto players will arrive in the conference room before it contains a majorities that can support the bill in both chambers. A nonveto player can be pivotal only if all veto players are able to support the bill and all veto players arrive before a working majority in both chambers; and the probability of this event is

$$(1 - \varepsilon)^{W+V} \times (0.5/(1 - \varepsilon))^{W+V}.$$

The probability that a winning coalition is first created by the arrival of a nonveto player from the House is half this number, because either chamber is equally likely to be the second chamber to get a majority for the bill in the conference room. Thus, the probability that the pivotal player will be a member of the House who does not have veto power is

$$0.5 \times (1 - \varepsilon)^{W+V} \times (0.5/(1 - \varepsilon))^{W+V}.$$

On the other hand, the probability that a minimal winning coalition will be created by the arrival of a veto player is

$$(1 - \varepsilon)^{W+V} \times (1 - (0.5/(1 - \varepsilon))^{W+V}),$$

and each veto player is equally likely to be the pivotal player who creates this minimal winning coalition. So the probability that one of the V veto players in the House will be pivotal is

$$(1 - \varepsilon)^{W+V} \times (1 - (0.5/(1 - \varepsilon))^{W+V}) \times V/(W + V).$$

Thus, the total Shapley value of all members of the House is

$$0.5 \times (1 - \varepsilon)^{W+V} \times (0.5/(1 - \varepsilon))^{W+V}$$
$$+ (1 - \varepsilon)^{W+V} \times [1 - (0.5/(1 - \varepsilon))^{W+V}] \times V/(W + V)$$
$$= (1 - \varepsilon)^{W+V} \times [V + (0.5/(1 - \varepsilon))^{W+V} \times 0.5 \times (W - V)]/(W + V).$$

When $W = V = 0$, this formula becomes 0/0 and thus cannot be evaluated, but in this case the total Shapley value of all members of the House is 1/2.

Now let us apply the assumption that the members of each chamber want to maximize their chamber's power. Then the House should choose V so as to maximize the above expression, given the Senate's choice of W. At the same time, the Senate wants to choose W so as to maximize the total value of all members of the Senate, which is analogously

$$(1 - \varepsilon)^{W+V} \times (W + (0.5/(1 - \varepsilon))^{W+V} \times 0.5 \times (V - W))/(W + V)).$$

The Nash equilibria of this symmetric game depend on ε. There exists an equilibrium with $W = V = 0$ only if $\varepsilon \geq 0.250$. That is, at least one chamber in the legislature must find that giving veto power to some of its members can increase its relative power at the expense of the other chamber, unless the intransigence parameter ε is more than 0.250.

There exists an equilibrium with $W = V = 1$ if $0.292 \geq \varepsilon \geq 0.202$. Notice that, if $0.292 \geq \varepsilon \geq 0.250$ then there are multiple equilibria, with $W = V = 0$ or $W = V = 1$. That is, when $0.292 \geq \varepsilon \geq 0.250$, the House could maximize its value by creating one veto player (making $V = 1$) if the Senate has a veto player ($W = 1$), but the House would not increase its total value with a veto player (making $V = 0$) if the Senate does not have one ($W = 0$). This multiplicity of equilibria can occur because the optimal number of veto players for a chamber tends to increase as the number of veto players in the other chamber increases. There exists an equilibrium with $W = V = 2$ if $0.238 \geq \varepsilon \geq 0.157$.

In the interpretation of these results, it is important to notice that these veto players are gatekeepers who can prevent legislation from coming to a vote in their chamber. That is, their chamber gives them the power to kill a bill, but they do not have the power to approve a bill on behalf of the chamber. Delegating approval power to an individual would not be in the best interests of a chamber in this model. For example, suppose that the Senate created one gate-keeping veto player (so $W = 1$), but the House delegated full power to both kill and approve legislation (at least in some areas) to one person, whom we may call the leader of the House. Then passing legislation would require the approval of the leader of the House, the gatekeeper in the Senate, and a majority of the Senate; but there is no need to also get separate approval from a majority of the House. In this situation, the leader of the House would look exactly like the president in our previous model, and the Senate would look like a unicameral legislature in which one member is a veto player. According to the results from our previous analysis (of Case 1), the value of the leader of the House in this situation would be

$$((1 - \varepsilon)^2 \times (1 - (0.5/(1 - \varepsilon))^2)/2,$$

which approaches 3/8 as ε goes to zero. This quantity would also be the total value of the House, because members of the House other than the leader would have value 0 once the House's legislative authority has been delegated to its leader.

In contrast, when the House creates a veto player who does not have such approval power, then we are back in our standard (Case 3) model with $W = V = 1$, and so the total value of all members of the House becomes

$$(1 - \varepsilon)^2 \times 1/2.$$

This value is approaches 1/2 as ε goes to zero, and it is always strictly higher than $((1 - \varepsilon)^2(1 - (0.5/(1 - \varepsilon))^2)/2$. Thus, when the House gives veto power to a committee chairman, the overall bargaining power of the House versus the Senate would be strictly decreased if the House also delegated to this chairman an authority to approve legislation for the House. This result suggests that the British House of Commons might not have delegated so much legislative authority to its leaders in the Cabinet, through the institution of party discipline, if the House of Lords and the King had retained an effective separate power to block legislation. (See Cox [1987].)

It has been often suggested that the function of bicameralism is to slow down the legislative process by increasing the number of hurdles that a bill must pass to become law. Our analysis in this section reinforces this idea from a new perspective. In our model, even without a presidential veto, a bicameral structure encourages each of the rival chambers to increase its bargaining power (against the other chamber) by creating and sustaining a system of gate-keeping veto players, which would not be in the overall best interests of a unified legislature. So we find that, in equilibrium, each chamber of a bicameral legislature may maintain more hurdles in its legislative procedures than there would be in the whole of a unicameral parliament.

This equilibrium analysis is based on a crucial assumption that, at the first stage when procedural rules are being established, the members of each chamber will act so as to maximize the power of their own chamber (as measured by the Shapley value), acting cooperatively with each other but noncooperatively from the other chamber. This assumption may be reasonable if members of congress can anticipate a high probability of serving for long terms in their current chamber, because each legislator then has a vested interest in maximizing the power of his own chamber. On the other hand, if members of both chambers are very dependent on their party leadership for renomination (as may happen in closed-list proportional-representation systems), then legislators may feel constrained to follow the directives of party leaders, and these party leaders would presumably have interests that are not limited to either chamber of congress. In that case, it would be less likely that legislators would act so as to maximize their own chamber's power.

Case 4: A bicameral legislature with presidential veto

When we combine both presidential veto and a bicameral legislature in our model, we find that each chamber has an even greater incentive to give some of its members obstructive veto power. Suppose that a bill needs to be passed by majorities in both the House and the Senate and it must be signed by the President. Consider the situation when the House and Senate, by their procedural rules, have also created an additional W veto players in the Senate and V veto players in the House. The pivotal player who converts a losing coalition to a minimal winning coalition, in the random-order story, can be a member of the House who does not have any veto power only if the following three conditions are met: (1) all veto players (including the President) are able to support the bill; (2) all veto players arrive in the first $.5/(1 - \varepsilon)$ fraction of the population; and (3) a working majority (able to support the bill) arrives in the House after the Senate. The probability of this event is

$$(1 - \varepsilon)^{V+W+1} \times (0.5/(1 - \varepsilon))^{V+W+1} \times 0.5.$$

This number is thus the total Shapley value of the nonveto players in the House, and (by symmetry) it is also the total Shapley value of the nonveto players in the Senate. The total value of all players is the probability that a bill can be passed, which is

$$(1 - \varepsilon)^{V+W+1}.$$

The remaining value is divided equally among the V + W + 1 veto players, who each get

$$(1 - \varepsilon)^{V+W+1} \times [1 - (0.5/(1 - \varepsilon))^{V+W+1}]/(V + W + 1).$$

Thus, the total power of the House, as measured by the Shapley value is

$$(1 - \varepsilon)^{V+W+1} \times [1 - (0.5/(1 - \varepsilon))^{V+W+1}] \times V/(V + W + 1)$$
$$+ (1 - \varepsilon)^{V+W+1} \times (0.5/(1 - \varepsilon))^{V+W+1} \times 0.5$$
$$= (1 - \varepsilon)^{V+W+1} \times [V + (0.5/(1 - \varepsilon))^{V+W+1} \times 0.5 \times (W + 1 - V)]/(V + W + 1).$$

We assume that, in the design of the House rules, the number V will be chosen so as to maximize this total power measure, given the Senate's choice of W. Similarly, the total power of the Senate is

$$(1 - \varepsilon)^{V+W+1} \times [W + (0.5/(1 - \varepsilon))^{V+W+1} \times 0.5 \times (V + 1 - W)]/(V + W + 1),$$

and we assume that the Senate chooses W so as to maximize this number, given the House's choice of V. This game has an equilibrium with W = V = 0 only if $\varepsilon \geq 0.293$. That is, a chamber in the legislature should find that giving veto power to some of its members can increase its relative power at the expense of the other chamber, unless the intransigence parameter ε is more than 0.293.

There exists an equilibrium with W = V = 1 if $0.321 \geq \varepsilon \geq 0.239$ (and so there are multiple equilibria when $0.321 \geq \varepsilon \geq 0.293$). There exists an equilibrium with W = V = 2 if $0.266 \geq \varepsilon \geq 0.183$, and there exists an equilibrium with W = V = 3 if $0.203 \geq \varepsilon \geq 0.140$.

[Insert Table 1 about here]

Table 1 compares the results for the various legislative structures that we have considered so far. The strongest incentives to create internal veto players are present in presidential democracies with a bicameral legislature.

If there is no president with veto power, it is still valuable to have obstructive committees as long as the legislature is bicameral. In this case the incentives are even stronger than in a presidential democracy with a unicameral legislature. Unicameral parliamentary systems provide no incentives to create internal veto powers.

Case 5: Parallel legislative systems

The above results may suggest the following generalization: a chamber of congress gets more incentive to create obstructive committees as the power outside the chamber increases. Such obstructive committees serve to increase the bargaining power of the chamber, and we may expect that this bargaining power will become more worth acquiring (even at the possible cost of losing some profitable opportunities to legislate) when there are more outside power centers against which the members of this chamber must bargain.

However, this generalization needs to be qualified in at least one important way. So far, we have only considered rival legislative bodies that function in series, in the sense that all chambers must approve a bill to make it a law. When we consider legislative bodies that can function in parallel, in the sense that one body's approval can make another body's approval unnecessary, then we find that weakening a body does not necessarily give it an incentive to create obstructive gatekeepers within itself.

For a specific example, consider a legislature that is divided into three large chambers, called Chambers A, B, and C. Suppose that the constitution specifies that a bill becomes a law when it is approved by majorities in at least two of these three chambers. Each chamber controls its own procedural rules, and it can use this internal control to give obstructive gate-keeping power to some of its members; but any such individual has an independent probability ε of being unable to support any proposed bill that may arise. As usual in this paper, we assume that each chamber will try to design its procedural rules so as to maximize its total power as measured by the Shapley value.

In the random-order story for the Shapley value, we may imagine that the members of the legislature arrive at random in a conference room at a uniform rate during a time interval from time 0 to time 1. So for any time t between 0 and 1, a random subset that contains (approximately) a fraction t of all legislators will have arrived in the room. If there are no veto players, then a working majority of each chamber (counting only individuals who are able to support the bill) is likely to become available in the conference room at some time very close to $t = 0.5/(1 - \varepsilon)$. (We are using here the assumption that all three chambers are large.) The pivotal player whose arrival converts the coalition in the room from a losing coalition to a winning coalition will be the player who completes a working majority in the <u>second</u> chamber that gets such a working majority in the room. With no veto players, the three chambers are equally likely to complete their working majorities in any order, so the pivotal player is equally likely to be in any of the three chambers. Thus, the total Shapley value of each chamber is 1/3.

Now consider a situation where Chamber A has given V of its members the power to prevent a bill from coming to a vote in Chamber A, but the other two chambers have not granted such obstructive gate-keeping powers to any of their members. In the random-order story, if any of the gate-keeping players in Chamber A arrive after time $0.5/(1 - \varepsilon)$, then the first winning coalition will be formed by the arrival of a player who completes the process of forming working majorities in Chambers B and C, and so the pivotal player will not be in Chamber A. On the other hand, if all V gatekeepers in Chamber A arrive before time $0.5/(1 - \varepsilon)$, an event which has probability $(0.5/(1 - \varepsilon))^V$, then each of the three chambers is equally likely to be the second chamber to complete its working majority for the bill; and so there is then a 1/3 probability that the minimal winning coalition will be completed by a pivotal player who is in Chamber A. Thus, the total Shapley value of all members of Chamber A is

$$(0.5/(1 - \varepsilon))^V \times 1/3.$$

This value is monotone decreasing in V. That is, Chamber A as a whole loses power when it gives some of its members the power to individually obstruct the consideration of bills in Chamber A, even when the intransigence parameter ε is zero, because of the parallel structure of this two-out-of-three-chambers legislative system. When Chamber A adopts a more cumbersome procedure for passing bills, it becomes more likely that bills will be passed by the other two chambers without the participation of Chamber A. So for any $\varepsilon \geq 0$, we have an equilibrium in which none of the three chambers gives internal veto power to any members.

This result provides some implications for the incentives to form internal veto players in legislative parties. Consider, for example, a unicameral legislature in which the seats are divided among three major parties, such that any two parties can form a majority to pass a bill. Further suppose that each party can determine its own procedural rules, such as the creation of party committees with veto powers. In this case, reinterpreting Chambers A, B, and C in the above discussion as Parties A, B, and C, our results suggest that we should not expect party committees to have effective veto powers. In accordance with distributional and informational theories of committees, we might expect party committees to have assigned jurisdictions and proposal prerogatives (e.g. the right to the first proposal), but we should not expect these committees to have effective veto powers.

In their comparison of presidential systems, Shugart and Carey [1992] distinguish several forms of legislative powers that the constitution may assign to a president. The president may be assigned exclusive power to propose some types of legislation, power to veto bills, power to issue decrees in some situations, and power to propose referenda. From the perspective of our model, we see a striking difference between the first two of these powers and the latter two powers. Exclusive proposal power and the power to veto are presidential powers that are applied in series with the congress's legislative power, and so they may be expected to increase the congress's incentive to create an obstructive committee system that gives gate-keeping power to individual members of congress. Decree power and referendum power are presidential powers to legislate in parallel to the congress, without requiring the congress's approval, and so these powers should not increase the congress's incentives to create an obstructive committee system. These distinctions may be of particular importance in comparing different forms of presidential and semi-presidential systems.

Other solution concepts

Bargaining is a complex phenomenon, and there is no general consensus among game theorists as to how it should be modelled. In cooperative game theory, the core is another commonly used solution concept (for example, see Myerson [1991]). In noncooperative game theory, sequential-offer models of bargaining have been much studied since the work of Rubinstein [1982], and Baron and Ferejohn [1989ab] applied such sequential-offer models to the study of legislatures. These solution concepts offer different but closely related perspectives on the questions that we have examined above using the Shapley value.

To offer here a brief comparison of these perspectives, let us now consider how each of these solution concepts might be applied to a legislative game in which there is a unicameral congress and a president who has veto power. So consider a simple coalitional game in which any coalition that contains the president and a majority of the congress is a winning coalition (worth 1), and any other coalition is a losing coalition (worth 0). The core of this game consists of the single allocation in which the president gets 1 and everyone else gets 0. If the congress changes the game by giving veto power to V members of congress (so that a winning coalition must now contain a majority of congress, the president, and all V veto players in congress), then the core expands and includes all allocations in which a total payoff of 1 is divided in any way among the president and the other V veto players. Thus, like the Shapley value, the core attributes more power to congress when it gives veto power to some of its individual members. Our ability to draw comparative conclusions from analysis of the core is somewhat reduced, however, by the fact that the core has multiple solutions for some games. Also, the core is empty for the simple majority game when the president and all other veto players are removed.

To study legislative bargaining by the noncooperative approach, we must make specific assumptions about the sequence of feasible moves in the bargaining game. Following Baron and Ferejohn [1989ab], let us consider the following infinite-stage bargaining procedure, to analyze a legislature that consists of a unicameral congress with N members and a president who has veto power. The legislature has the opportunity to pass one bill. Passing this bill will make available one unit of benefits, which can be divided in any way among the legislative players, except that each player's share must be nonnegative and the sum of their shares must equal one. At the first stage of the game, one player is selected at random to propose the division of the benefits. Then every player votes either to approve or reject this bill, and the bill passes if the president and a majority of the congress approve it. If the bill is passed at this stage, then the game ends and each player gets the share that was proposed for him at this stage. If the bill is rejected, then this process is repeated at the next stage, with a new proposer being independently drawn at random again, using the same probability distribution as the first stage. Let δ be the discount factor per unit time, where $0 < \delta < 1$. Thus, if the bill is passed as stage k, then each player's ultimate payoff in the game is δ^{k-1} times the share of the benefits that were allocated to him by the proposer at stage k. (If the bill is never passed, then each player gets payoff 0.) Let p denote the probability that the president gets to make the proposal at any stage, and suppose that each member of congress is equally likely to be selected to make the proposal if the president does not.

Following Baron and Ferejohn [1989a], let us consider stationary Nash equilibria such that, as long as the game continues, the players' expected behavior in the game from any stage onwards is independent of the history of the game before this stage. It can be shown that, in any such equilibrium, the first proposal made will be accepted with probability 1. Let x denote the expected payoff to the president in this game. Each member of congress will get expected payoff $(1 - x)/N$, because the sum of all players' expected payoffs in equilibrium equals 1. Assume that N, the number of members of congress, is odd. If the president gets to make a proposal, he will offer $\delta(1 - x)/N$ to each of $(N + 1)/2$ randomly selected members of congress, and he will keep the rest

$$1 - (\delta(1 - x)/N)(N + 1)/2 = 1 - 0.5\delta(1 - x)(1 + 1/N)$$

for himself. On the other hand, if a member of congress gets to make a proposal, then he will get the president's approval by offering him δx (so that the president will be just indifferent between approving the bill and continuing the game for another round). Thus, the president's expected payoff must satisfy the equation

$$x = p[1 - 0.5\delta(1 - x)(1 + 1/N)] + (1 - p)\delta x$$

The solution to this equation is

$$x = p[1 - 0.5\delta(1 + 1/N)]/[1 + 0.5p\delta(1 - 1/N) - \delta].$$

The total expected share for all members of congress is then

$$1 - x = [1 + p\delta - p - \delta]/[1 - (1 - p)\delta - 0.5p\delta(1 + 1/N)].$$

If we assume that only members of congress can propose bills, then we have $p = 0$, and so these formulas imply $x = 0$. That is, this noncooperative analysis leads us to the conclusion that the president's veto power is worth nothing if the president has no power to directly propose legislation to congress. The result that the president gets nothing when $p = 0$ differs greatly from our cooperative analysis, but this difference is straightforward to interpret. The noncooperative approach requires us to precisely specify the order of moves in the bargaining game, and it then takes this specification very seriously. But even if the constitution does not give the president any formal power to introduce legislation in congress, we may expect that the president would enter into informal negotiations with members of congress, to get them to introduce a bill that he prefers. The president may try to maintain a reputation for vetoing any bill that he has not approved in such informal negotiations before the congressional vote. If he can do so, then the actual bargaining game for any bill may have a dynamic structure that is very different from the formal procedures that are described in the constitution. We may interpret the Shapley value as an attempt to predict the expected payoffs that would result when such informal negotiation processes are taken into account.

Now consider the sequential-offer bargaining game when the president has some positive probability p of being able to make a proposal. When p is positive, the president's expected payoff x is an increasing function of δ. Given any annual rate of time preference, the discount factor δ in our game model increases as the time required for congress to consider a newly proposed bill decreases, and δ approaches 1 as the fraction of a year required to bring a new proposal to a vote in congress goes to zero. When δ goes to 1, the president's power increases to

$$\lim_{\delta \to 1} x = p[1 - 0.5(1 + 1/N)]/[1 + 0.5p(1 - 1/N) - 1] = 1,$$

Thus, if the president has any power of proposal at all, then he can get almost all the benefits of legislation if congress considers new proposals quickly. On the other hand, if the time to bring a new proposal to a vote becomes very long, then δ decreases towards zero, and the president's expected share decreases to

$$\lim_{\delta \to 0} x = p.$$

Thus, when $p > 0$, we find that the president's veto power gives the congress a strong incentive to decrease δ by slowing down the process of bringing proposals to a vote. This result is an interesting complement to our finding, from Shapley-value analysis, that the president's veto power gives the congress an incentive to create a system of committees that can obstruct new legislation.

Conclusion

In this paper we have proposed a formal model to study the incentives to create obstructive committee systems, as a consequence of other features of the legislative process. We find that chambers or bodies that are part of sequential legislative processes may increase their payoffs by devising obstructive committee systems which have internal veto power. Moreover, these incentives will vary in a predictable way as the powers of legislative actors (such as other chambers or presidents) are changed.

Throughout the paper, we have emphasized the importance of studying effective constitutional features. Party discipline induced by a particular electoral system, for instance, may limit the importance of second chambers, if party leaders control legislative careers and have interests that are not limited to one chamber. Presidents may be involved in legislative bargaining, although they may lack formal proposal powers.

When a chamber has an incentive to create internal veto players, even if the chamber's rules formally allow procedures for circumventing obstructive committees, the members of the chamber should recognize that they share a common interest in maintaining a reputation for respecting the gate-keeping power of committees. That is, deference to committees may be an equilibrium of an underlying repeated game, in which a majority of legislators understand that their future ability to use committee power in bargaining with outsiders would be diminished if they permitted a precedent-breaking circumvention of a committee's jurisdiction.

We should point out that the insights provided in this paper are logically independent from the results of Weingast and Marshall [1988], or Gilligan and Krehbiel [1987]. A jurisdictional committee system may be preferable even when there are no incentives to create obstructive committees, as in unicameral parliamentary democracies. On the other hand, even if legislators are fully informed and do not differ in their needs or constituency interests, there is an incentive to create internal veto players in a chamber that has to bargain over legislation with external actors. We also see an distinction between different forms of committee power, such as veto power and proposal power, which may respond differently to changes in the constitutional features of a democracy. These distinctions can be important in a comparative study of committees that transcends United States legislatures.

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	Unicameral	Bicameral
No president	0	0.250
President with veto	0.133	0.293

TABLE 1. Lowest value of the intransigence parameter ε such that there is a procedural equilibrium without veto players in any chamber of congress.