## MODELS OF VETOES AND VETO BARGAINING

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■ Abstract Models of veto bargaining have become an important tool for formal institutional analysis. This chapter reviews the core model of veto bargaining and some of its more interesting and useful extensions, focusing on one of the best developed applications, the presidential veto over legislation. One of the primary attractions of these models is that they often produce crisp, testable empirical predictions. Our review focuses on 18 such predictions. We conclude with a brief review of the empirical evidence related to these hypotheses.

## 1. INTRODUCTION

Consider the following situations:

- A legislature passes a bill and sends it to the executive, who may veto the bill.
- A legislature passes a bill and a constitutional court reviews it, possibly striking it down as unconstitutional.
- A legislative committee brings a bill to the floor of the legislature under a closed rule (no amendments allowed).
- An executive presents a legislative body with a treaty, which it may reject or accept but not modify.
- An executive promulgates an executive order, which the legislature may tacitly accept or explicitly reject.
- An executive or a board presents voters (or a legislature) with a proposed budget, which they may accept or reject.
- An interest group places an initiative on the ballot for a decision by the voters.
- An executive agency writes a regulation, which an administrative law court may review and strike down as incompatible with the agency's statutory authority or direction.

A subordinate presents a bureaucratic superior with an alternative to current policy, which the superior may accept or reject.

All these examples and many more involve veto bargaining, one of the most ubiquitous of all forms of political bargaining.

A defining feature of veto bargaining is that a proposer makes a take-it-or-leaveit offer to a receiver. But often this simple procedure is embedded in more complex procedures that reflect different institutional structures. For example, rejections of offers (vetoes) may themselves be overridden. The proposer may follow a rejected offer with a subsequent offer. The receiver may issue a veto threat before the proposer makes her offer. Third parties may monitor the bargaining and reward or punish the bargainers. Behavior in one episode of bargaining may offer hints about likely behavior in subsequent episodes that involve somewhat different issues. And so on. In order to study the implications of any of these situations, a political analyst can modify and extend the simple models of veto bargaining to capture the critical strategic features in question. This flexibility has made models of veto bargaining an essential component in the toolkit of rational choice institutionalists.

In addition, models of veto bargaining often yield crisp empirical predictions, for example, about the circumstances under which rejections are likely or unlikely, the character (e.g., ideological make-up) of offers as reversion points shift, and so on. Many of these comparative static predictions have received systematic empirical support across a variety of institutional settings (briefly reviewed below). Thus, models of veto bargaining have also been at the forefront of work on the empirical implications of formal, game theoretic models of politics.

In this chapter, we review the core model of veto bargaining and some of its most interesting and useful extensions. Although the substantive applications of veto bargaining are numerous, we focus on one of the more developed applications, the presidential veto over legislation. Throughout, we keep technical considerations to a minimum, expositing the models by using very simple set-ups. More complex modifications—some hitherto restricted to advanced research articles—then develop naturally from the simpler ones. All employ a common framework and notation, which is listed in Table 1. Students who have received as little as a single semester of instruction in game theory ought to be able to follow most of the exposition, and advanced researchers who have been curious about the new developments should be able to see the essential ideas quickly and easily.

The chapter is organized as follows. In Sections 2 and 3, we present the basic model of veto bargaining derived from the seminal work of Romer & Rosenthal (1978) and present the results derived from the complete-information version of that model. Noting the inability of the complete-information model to produce vetoes, we explore a simple incomplete-information model in Section 4. This model indicates that uncertainty about the president's position can produce vetoes if legislative and presidential preferences are sufficiently divergent. In Section 5, we proceed to application of the incomplete-information model focusing on veto threats, sequential bargaining, presidential reputations, and the role of electoral politics. In Section 6, we conclude with a brief discussion of empirical research and current research opportunities.

Variable	Definition
x	Policy outcome
q	Status quo
С	Congress
Р	President
0	Override pivotal voter
V	Voter
С	Congress's ideal point
р	President's ideal point (complete information)
0	Override pivot's ideal point
m	Moderate presidential type
е	Extreme presidential type
r	Recalcitrant presidential type
a	Accommodating presidential type
v	Voter's ideal point
b	Legislative proposal
π	Probability that president is extreme type
ρ	Probability bargaining breaks down following a veto
u(x;c)	Congress's utility function
v(x; p)	President's utility function
$u_o(x;o)$	Override pivot's utility function
$w(e, m, \pi; v)$	Voter's utility function

TABLE 1 Notation used in this review

## 2. PRELIMINARIES

To keep the models relatively simple, we abstract from bicameralism and other features of the internal institutional process to model the proposer—typically a legislature, such as the U.S. Congress—as a unitary actor whom we denote as C ("Congress").<sup>1</sup> Similarly, we treat the receiver—typically an executive, such as the U.S. president—as a unitary actor whom we denote as P ("President"). These assumptions allow us to model veto bargaining as bilateral between the proposer and the receiver. For ease of exposition, we often refer to the proposer as "Congress" or "she," and the receiver as the "president" or "he."

All the models presented in this chapter focus on political bargaining over a onedimensional policy space. The assumption of unidimensionality is not particularly

<sup>&</sup>lt;sup>1</sup>We prefer to think of C as the median member of the chamber. Adherents of other theories of legislative decision making can interpret C according to their preferred conception (party leader, majority party median, etc.). Such ecclesiastical disputes need not detain us here.

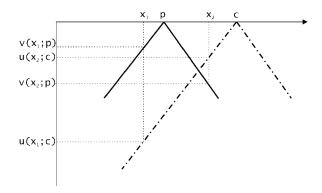


Figure 1 Linear spatial preferences.

consequential except in the more advanced models that incorporate signaling. Most of the predictions in the simpler models would hold for a multidimensional model, so long as the players are treated as unitary actors.

For simplicity of exposition, we assume *C* and *P* evaluate policy alternatives solely on their proximity to their most preferred policies, which we denote *c* and *p*, respectively. Thus, the policy utility functions for *C* and *P* are u(x; c) = -|x - c| and v(x; p) = -|x - p| given any alternative *x*. These functions are plotted in Figure 1.

In some of the models discussed in this chapter, an additional player is relevant for determining whether the president's veto will be overridden. The override pivot, denoted O, has an ideal point o. This pivot is defined as the legislator closest to the president for whom exactly one third of the legislature has ideal points either lower or higher than hers.<sup>2</sup> We assume O's utility function has the same form as Cand P, or  $u_o(x; o)$ . For clarity of exposition, we refer to the override pivot as "it."

#### **3. THE BASIC MODEL: COMPLETE INFORMATION**

In the core model, the sequence of play is as follows:

- 1. C makes a proposal b (a "bill") to change the status quo or reversion policy q.
- 2. *P* accepts or vetoes the offer. If *P* accepts the offer, the final policy outcome *x* is the bill *b*, and the game ends.
- 3. If *P* vetoes the offer, a vote on a motion to override occurs. If *O* supports the motion, the bill is successful and again x = b is the new policy. If *O* does not support the motion, the bill fails and x = q, so the status quo remains the policy in effect.

 $<sup>^{2}</sup>$ If the president has a low ideal point, O is the thirty-third-percentile legislator. Alternatively, if the president has a relatively high ideal point, O is the sixty-seventh-percentile legislator.

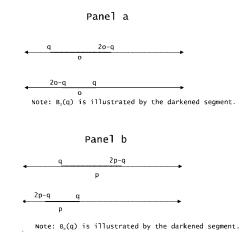


Figure 2 Outcomes of complete-information model.

A typical point of departure for analyzing veto power is the assumption that all actors are perfectly informed about the preferences and actions of all other players. Under these assumptions, there is no uncertainty about how the receiver or override pivots will respond to a proposal. Therefore, C can choose b optimally given her correct expectations about the future.

Given that there is no uncertainty, the game can be solved via backward induction. First consider the decision of the override pivots on an override motion. Clearly, a pivot will vote to override if it prefers *b* to *q*. Thus, we can define a set of bills  $B_o(q)$ , shown in Figure 2*a*, that *O* prefers to *q* so that an override motion would always be successful if *b* is an element of this set. Given the assumptions about the symmetry of the utility functions, this set is simply [q, 2o - q] or [2o - q, q]depending on whether or not o > q. As long as *C* makes a proposal in  $B_o(q)$ , the veto will be overridden and the proposal will become the new policy.

Having determined which proposals survive a veto, we can now compute which proposals will be accepted by the receiver. First, it is reasonable to assume that the president will accept any bill that would have been overridden.<sup>3</sup> Thus, the bills in  $B_o(q)$  will not be vetoed. Nor will the president veto any bills that he prefers to the status quo. Formally, let  $B_P(q)$  be the set of bills for which  $v(b; p) \ge v(q; p)$ , that is,  $-|b-p| \ge -|q-p|$ . Under the specified assumptions,  $B_P(q)$  is given by either [q, 2p-q] or [2p-q, q] depending on whether or not p > q (Figure 2b).

Since *C* is perfectly informed about *P*'s preferences, she knows for certain that any bill in either  $B_o(q)$  or  $B_P(q)$  will be successful. She need only offer her most-preferred bill from these sets. If *q* is her favorite bill in these sets, she shouldn't

<sup>&</sup>lt;sup>3</sup>Rationales for this assumption range from the practical to the very technical. The easiest is that with any cost of being overridden, no matter how small, the president would prefer to sign any bill destined to pass over his veto.

legislate at all; any cost of legislating, no matter how small, will lead her to prefer not to pass a bill destined to be vetoed. Thus, it is straightforward to compute C's optimal behavior.

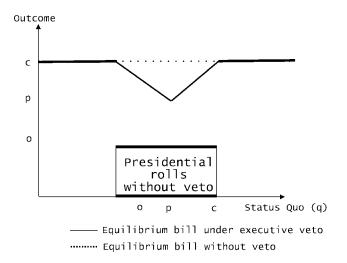
In the Appendix of this chapter, we formally present Proposition 1, which fully describes the proposal, veto, and override behavior in the subgame perfect Nash equilibrium to the basic veto game. This proposition generates three specific predictions that are useful in understanding the power of the veto.

The first prediction deals with the usage of the veto. In the basic model, the president never vetoes any bill whose veto can be overridden, and the legislature never makes any proposal that will be vetoed, so the only bills we observe in equilibrium are passed bills.

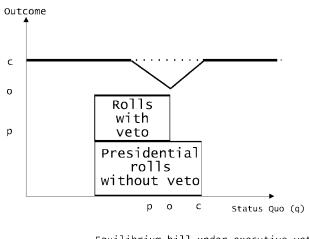
*Prediction 1 (complete information: veto frequency).* If all actors are perfectly informed about the preferences of all other actors, vetoes should not occur.

Though seemingly simple (or even absurd), Prediction 1 has a very powerful implication. Most importantly, it demonstrates that it is impossible to infer anything about the extent of veto power from the frequency of vetoes. In this very simple model, P's veto power moves policy away from that preferred by C—yet we never see vetoes actually employed. Thus, it would be incorrect to infer that the veto is impotent based solely on the infrequency of its use.

The second prediction, which we present graphically, is that the executive veto has policy consequences even if it not used. Figures 3 and 4 present the equilibrium policy outcomes  $x^*$  for all status quo points and for two illustrative preference configurations. These policy outcomes with the veto can be compared with the policy outcome that would prevail without an executive veto, namely,  $x^* = c$ . Note that for status quo points around p and o, the veto moves policy away from c toward the positions favored by P and O.



**Figure 3** Equilibrium proposals when c > p > o.



----- Equilibrium bill under executive veto ------ Equilibrium bill without veto

**Figure 4** Equilibrium proposals when c > o > p.

*Prediction 2 (complete information: policy outcomes).* Policy may be responsive to the preferences of the receiver or the override pivot.

In the case of executive-legislative relations in separation-of-powers systems, Proposition 1 also leads to some important predictions about presidential support for legislation. Suppose for the moment that the president does not have veto power. Then policy is determined solely by Congress's preferences, and often legislation passes that the president opposes. In other words, he would veto these bills if he could. Of course, whether the president will get "rolled" in this way depends on the position of the status quo. Figure 3 indicates the set of status quos in which policy will move contrary to the president's preferences. Now suppose instead the president can utilize the veto. Not surprisingly, the circumstances under which he gets rolled are much rarer. In fact, if the president's ideal point lies between c and o (as in Figure 3), he never gets rolled. If the president's preferences are more extreme than the override pivot's (as in Figure 4), he may get rolled when veto-proof legislation is passed. Critically, however, rolls will occur far less often when the president possesses the veto power than when he lacks it.

*Prediction 3 (complete information: roll rates).* The probability of passage of offers opposed by the president is lower when he has a veto.<sup>4</sup>

<sup>&</sup>lt;sup>4</sup>By stating the prediction in terms of the probability that the president will be rolled rather than the set of status quos under which a roll occurs, we are implicitly assuming that the distribution of status quo points does not vary across the models. As Krehbiel (1998) points out, this assumption can be problematic because different models of collective choice predict different dynamic evolution of status quos.

This is an obvious prediction, but it can be useful when considering the history of the veto in different institutional structures. For example, some have argued that during the eighteenth and nineteenth centuries, a norm of legislative deference prevented the U.S. president from using the veto except to protect the Constitution (see McCarty 2002). If this is true, we should observe higher presidential roll rates prior to the breakdown of this norm than afterward. We would also expect to see roll rates responding to variations in the override pivot only after the establishment of the veto as policy tool. Thus, this simple prediction can provide leverage in understanding institutional history.

## 3.1. Extension: Sequential Veto Bargaining Under Complete Information

In many cases, the proposer can make repeated offers if the receiver uses the veto, and the receiver can veto and reveto offers. Cameron (2000) calls such situations "sequential veto bargaining." Maintaining the assumption of complete and perfect information, what happens to the proposer *C*'s offers under sequential veto bargaining? One might expect that the receiver can implicitly threaten to veto early offers and extract concessions from the proposer. However, Primo (2002) finds that the proposer makes exactly the same offers in finitely and infinitely repeated versions of the basic model—and this holds for (almost) any discount rates for the proposer and receiver.

We merely sketch Primo's results. First, assume both players receive  $x_t = q$ in period *t* if *P* vetoes the bill or *C* makes no offer. However, if a bill is ever accepted, then both players receive  $x_t = b_t$  for that and all succeeding periods in the game (which may be infinite in length). Hence, the payoff function for *C* becomes  $\sum_{t=1}^{T} \delta_C^{t-1} u(x_t)$ , and similarly for  $P \sum_{t=1}^{T} \delta_P^{t-1} v(x_t)$ , where  $\delta_C \in (0, 1]$ is the discount factor for *C* and  $\delta_P$  that for *P*. (We abstract for the moment from veto overrides).

First, Primo (2002) proves the following result: For any game with total number of finite periods *T*, for any allowable discount factors, the equilibrium offers, vetoes, acceptances, and policy outcomes specified in Proposition 1 remain the unique subgame perfect equilibrium. The intuition for the result is that if the game reaches the last period, the outcome will be identical to that of Proposition 1. Consider first the case of Proposition 1 where the president is indifferent to accepting or rejecting the equilibrium proposal, so that  $-|p - q| = -|b_T - q|$ . Thus, his payoff in the last period is -|p - q|. Backing up one more period, his utility of vetoing is therefore  $-|p - q| - \delta_P |p - q| = -(1 + \delta_P) |p - q|$  and the utility of accepting any  $b_{T-1}$  is  $-(1 + \delta_P) |p - b_{T-1}|$ . Because the  $(1 + \delta_P)$  simply scales up both utilities, the president's calculus is the same as it is in the final period. Thus,  $b_{T-1} = b_T = b^*$ . This logic will continue for any finite number of periods. The case where  $b^* = c$  is very similar.

Next, Primo extends his result to the infinitely repeated case. Again, the same offers, vetoes, acceptances, and policy outcomes are the unique subgame perfect

equilibrium for all discount rates in (0,1).<sup>5</sup> This result may seem surprising to those familiar with the many Folk Theorems for repeated games, which typically generate a plethora of equilibria. However, as Primo (2002, p. 419) notes,

We should not expect a Folk theorem to be operative. Intuitively, Folk theorem results emerge when there are credible punishment or reward strategies that can be invoked. This is not possible in this game, because each player (implicitly) has veto authority over the policy outcome, either by not proposing a particular policy, in the case of the proposer, or by rejecting a proposal, in the case of the receiver.

Absent these punishment strategies, only the unique equilibrium from Proposition 1 can exist.

What happens if we add veto overrides to this game? Cameron (2000) considers a two-period model that is almost identical to Primo's except that a veto override player is randomly selected in each period (Cameron 2000, pp. 99–106, 117–20).<sup>6</sup> Again, the one-shot offers, acceptances, and vetoes remain the unique equilibrium. This result surely extends to any finite number of periods, and Primo's results strongly suggest the same for infinitely repeated offers with vetoes. This leads us to Prediction 4.

*Prediction 4 (complete information: sequential veto bargaining).* In completeinformation settings, sequential veto bargaining yields the same behavior and outcomes as one-shot veto bargaining. This holds for any period game, even if one player is more patient than the other.

An important implication of Prediction 4 for modelers is that the results from one-shot versions of veto bargaining will be robust to repetition—unless incomplete information is a critical feature of the environment. Primo (2002) suggests a number of empirical implications; for example, term limits may not affect presidential veto power very significantly, since the time horizon of the executive does not affect the equilibrium outcome.

## 4. SIMPLE INCOMPLETE INFORMATION

The complete-information model provides an excellent tool for studying veto power, but it cannot provide a basis for studying vetoes themselves, for the obvious reason that it predicts vetoes will not occur. We now turn to a simple model for studying vetoes. In this model, vetoes do occur. This simple incompleteinformation model provides the foundation for building more complex models of veto bargaining that incorporate reputation, learning, and dynamics.

<sup>&</sup>lt;sup>5</sup>If  $\delta_P = 1$ , so that the president is infinitely patient, there may be additional equilibria. But this is simply a technical curiosity (see Primo 2002, Proposition 4).

<sup>&</sup>lt;sup>6</sup>Technically, this is a game with incomplete information. In addition, Cameron assumes an exogenous probability that bargaining breaks down in each period, rather than discount factors. The latter is a very minor difference from the game considered above.

In order to explain the fact that vetoes occur, one must dispense with at least one of the assumptions underlying the basic model. Although the model presented in Section 3 has some very restrictive assumptions, few of them are actually consequential in the prediction of no vetoes. One important exception is the assumption that C has complete information about the preferences of P and O. When C has incomplete information, vetoes may occur because the legislature overestimates its ability to extract concessions from the president or the override pivot.

Relaxing the assumption of complete information has been the starting point for most of the recent work on veto bargaining (Cameron 2000, Matthews 1989, McCarty 1997). To present the flavor of these models, we consider a model without an override possibility, so that q remains the policy in the event of a veto. To capture the uncertainty that the proposer C faces about the receiver P's preferences, we assume she believes P is one of two preference types: a moderate with ideal point m or an extremist with ideal point e. We assume throughout that e < m < c. Following the usual practice in applied game theory, we assume C's beliefs are common knowledge (P knows these beliefs, C knows that P knows, etc.). Let  $\pi$ be the probability that P is the extreme type.

The main implication of the uncertainty about preferences is that Congress no longer knows for sure which bills the president will accept and which he will veto. To see this, consider Figure 5, where we assume that q < e. Here the set of bills the extremist type of receiver is willing to accept over the status quo is only a subset of those the moderate type is willing to accept. Thus, the proposer can force a more attractive bill (from her perspective) on the moderate receiver than she can on the extremist one. *C*'s dilemma is whether to propose a bill she finds relatively less attractive but that both types will accept—a bill like  $b_e$ —or be more aggressive and propose a bill like  $b_m$ , which she finds more attractive but only the moderate receiver will accept. Clearly, the attractiveness of the gamble depends on *C*'s beliefs about *P*'s type. If  $\pi$  is high (so *C* believes *P* is probably an extremist), *C* will likely be deterred from making the aggressive proposal. On the other hand, if  $\pi$  is low (so *C* believes *P* is probably a moderate), *C* may well find  $b_m$  an attractive gamble. If she offers it, it will sometimes prove a poor choice: The receiver will turn out to be the extreme type and will veto it.

In the Appendix to this chapter, we calculate the necessary conditions for a veto to occur. For the preference configuration in Figure 5a, we show that *C* will make the risky proposal (possibly generating a veto) if and only if

$$\pi < \frac{m-e}{m-q}$$
 1.

However, the necessary conditions change as c moves closer to m, as in Figure 5b. Here C's best risky proposal is her ideal point c. This fact alters the necessary condition somewhat:

$$\pi < \frac{c+q-2e}{c-q} \tag{2}$$

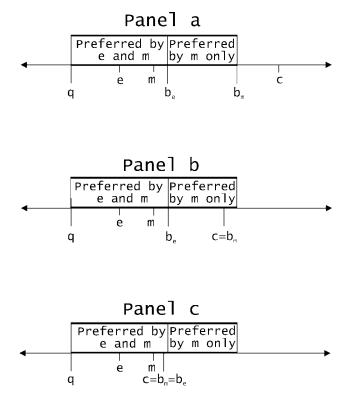


Figure 5 Outcomes of incomplete-information model.

It can easily be shown that the right-hand side of Equation 2 is lower than that of Equation 1, implying that a veto is less likely to occur. This is because in the preferences illustrated by Figure 5*b*, the policy concession required to avoid a veto (i.e.,  $b_m - b_e$ ) is much smaller. Finally, note that in the extreme case shown in Figure 5*c*, where *C*'s ideal point is acceptable to both types, no veto will occur. These results lead to Prediction 5:

*Prediction 5 (incomplete information: veto frequency).* Vetoes are more likely the larger the expected difference between the ideal points of *P* and *C*.

In the interest of brevity, we omit an analysis of this model with a veto override. But such an analysis produces a parallel result:<sup>7</sup>

*Prediction 6 (incomplete information: veto frequency).* Vetoes are more likely the larger the expected difference between the ideal points of *O* and *C*.

<sup>&</sup>lt;sup>7</sup>This prediction is also generated by Magar's (2003b) Stunt model, which we discuss briefly below.

# 5. MODELS WITH REPUTATION, LEARNING, AND DYNAMICS

An interesting feature of the incomplete-information model is that a moderate receiver P does better if the proposer C believes P is the extreme type. This raises the possibility that P might attempt to manipulate C's beliefs about his type—his reputation. In this section, we examine three models in which the actors try to manipulate P's reputation. All are signaling models, because an informed player takes an action that conveys information about P's type. In the first two models, the veto-threat and sequential veto bargaining (SVB) models, the informed player is P himself. In the third model, the blame-game veto model, both C and P take actions to convey information to uninformed voters.

## 5.1. Veto Threats

Ranging from the dramatic "read my lips" variety to the much more mundane "statements of administration policy" routinely produced by the Office of Management and Budget, the veto threat is an important feature of legislative politics in the United States. However, none of the models reviewed thus far provides any leverage on understanding this phenomenon. Matthews (1989), however, offers an influential model of veto threats in which the president may use a costless signal, or "cheap talk," to reveal information about preferences and veto intentions.

To illustrate this model, it is helpful to increase the number of presidential types from two to four. Therefore, in addition to *m* and *e*, we add the two following types: *r*, the recalcitrant type, and *a*, the accommodating type. We assume that r < q < e < m < c < a as in Figure 6. President *r* is called recalcitrant because he will veto any bill that *C* prefers to the status quo; *a* is accommodating because he prefers *c* to the status quo. We also assume that the probabilities of these types are  $\pi_r$ ,  $\pi_e$ ,  $\pi_m$ , and  $\pi_a$ . In this game, the president first makes a speech, which is simply a costless signal to the legislature. Each of these messages has no literal meaning, only a contextual one derived from the equilibrium that is being played. Following the speech, *C* updates her beliefs about *P*'s preferences and then makes a proposal, which *P* can either accept or reject.

As a baseline, first consider an equilibrium where the president's speeches contain no information because each type makes the same speech. In this babbling equilibrium, C will simply choose the bill from  $b_r = q$ ,  $b_e$ ,  $b_m$ , or  $b_a = c$  that maximizes her utility. For any such choice, those with lower types will veto. For example, if C chooses  $b_m$ , e and r will veto so that the veto probability is  $\pi_r + \pi_e$ .

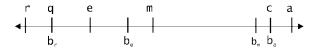
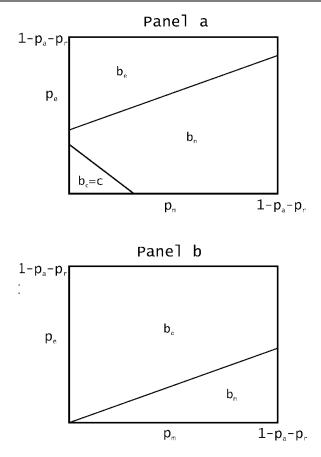


Figure 6 Complete-information proposals.



**Figure 7** Veto threats. (*a*) Proposals in "babbling equilibrium"; (*b*) proposals in "two-message equilibrium" following compromising message.

Rather than present the formulae for the conditions for each proposal, we illustrate them in Figure 7. Figure 7*a* shows which proposal will be made in the babbling equilibrium for different values of  $\pi_m$  and  $\pi_e$  for given values on  $\pi_a$  and  $\pi_r$ . Note that the proposal  $b_r = q$  is never made because *C* always does at least as well with a vetoed proposal. Note that this equilibrium is somewhat bad from the president's perspective. If the president is type *a*, there is a utility loss associated with the fact that *C* may propose the less desirable policies  $b_m$  and  $b_e$ . For president *m*, there are losses associated with the fact that *C* might propose *c* (which he then vetoes) rather than his preferred  $b_e$ . Because *r* and *e* only get their status quo utility from all proposals, they are not affected. *C* is also affected by the lack of information, as it may force her either to accommodate more than necessary or to risk a veto.

Given the bad outcomes from the babbling equilibrium, it is reasonable to ask whether there are other equilibria where more information is transmitted. Matthews (1989) shows that some information can be revealed in presidential speeches, but not all of it. First, consider why a separating equilibrium in which every presidential type gives a distinct speech cannot exist. If C could learn the president's type from the speech, she would optimally propose  $b_r$  to r,  $b_e$  to e, etc. However, since m prefers  $b_e$  to  $b_m$ , m would prefer to defect and give e's speech. Thus, a separating equilibrium cannot exist. Matthews shows that the most informative equilibrium is one in which type a reveals his type with an "accommodating" speech and the other types all make the same "threatening" speech. Following an accommodating speech, C correctly infers that P will accept her ideal point, and thus proposes c. Type *a* is willing to make the accommodating speech, since he clearly prefers *c* to  $b_m$  or  $b_e$ . Following the threatening speech, C learns that the president is not a and updates her beliefs accordingly. Given these beliefs, C chooses between  $b_m$ and  $b_e$ . Figure 7b illustrates the optimal proposal as a function of  $\pi_m$  and  $\pi_e$  for given values of  $\pi_a$  and  $\pi_r$ . Note that C is more likely to propose  $b_e$  because the knowledge that the president is not type a greatly increases the probability that  $b_m$ will be vetoed.

*Prediction 7 (concessions to veto threats).* Congress makes a larger concession to the president's preferences following a veto threat.

It is important to note that an informative equilibrium is not guaranteed to exist. If type *a* prefers  $b_m$  to *c* to  $b_e$ , an informative equilibrium would exists only if *C*'s best response to the threatening message was  $b_e$ . Otherwise, type *a* would defect to the threat. Similarly, if type *a* prefers  $b_e$  to *c*, no informative equilibrium can exist.

It is possible for some configurations of preferences that the veto threat is merely a bluff. Consider what would happen if m were moved in Figure 6 sufficiently to the right that he preferred c to q (and thus became an accommodator) but still preferred  $b_e$  to c. In the informative equilibrium, m would still give the threatening speech, but it is a bluff in the sense that he would have signed a bill at C's ideal point.

*Prediction 8 (veto threats: bluffing).* The president may issue a veto threat even though he would accept Congress's ideal point.

The informative equilibrium makes *C* better off; if it didn't, she could just turn off the TV and ignore the speech. However, it is possible that some presidential types will be worse off. Suppose that type *a* were repositioned so that his preference ordering were such that  $b_m$  was preferred to *c*, which was preferred to  $b_e$ . Further, suppose that the babbling equilibrium produced  $b_m$  and a threat in the more informative equilibrium produced  $b_e$ . Then type *a* would clearly prefer the outcome of the babbling equilibrium to the *c* he gets from making his accommodating speech in the informative equilibrium.

## 5.2. Sequential Veto Bargaining with Incomplete Information

Often, the proposer can make multiple offers, learning about the receiver as she does so. For example, if the receiver rejects a tough offer early, the proposer may believe the receiver is genuinely tough. If so, the proposer's next offer is apt to be more accommodating. This "haggling" dynamic is very common in many types of bargaining, and one might well expect to see it in veto bargaining as well. But a complicating factor is misdirection: The proposer often has an incentive to reject early offers in order to build a reputation that leads to better later offers. Knowing this, why should the proposer actually make the compromises? The sequential veto bargaining (SVB) model explores these questions about learning and credibility.

A simple example conveys many of the basic ideas. First, consider a situation in which q = 0,  $e = \frac{1}{4}$ , m = 0.6, and c = 1. By now it should be clear that in a one-shot game (without a veto threat),  $b_e = \frac{1}{2}$  and  $b_m = c$ . The techniques discussed in Section 4 and Equation 2 make it clear that C will offer  $b_m = c$ if  $\pi \le \frac{1}{2}$ , and  $b_e = \frac{1}{2}$  otherwise. But suppose this is not a one-shot game, so that C may make a second offer if the first is rejected. More specifically, suppose bargaining breaks down with probability  $\rho$ , but otherwise a second offer can be made. (The probability of a bargaining breakdown reflects the inherent uncertainty of the legislative and other political processes.) Is a haggling equilibrium possible, that is, one in which C first makes a tough offer and then, following a veto and no bargaining breakdown, makes a more accommodating offer?

In such a haggling equilibrium, the moderate president must accept the tough offer in the first round (if both types rejected the tough offer, then C should make the accommodating offer lest a breakdown saddle her with the unappealing status quo). Therefore, the following "incentive compatibility constraint" must hold:

$$-(c-m) \ge (1-\rho)(m-2e+q) - \rho(m-q)$$
 or  
 $\rho \ge \frac{c-q-2(m-e)}{2(e-q)}.$  3.

(The incentive compatibility constraint indicates that accepting the tough offer in the first round is better for the moderate type than rejecting the offer and holding out for the more proximate accommodating offer, taking into account the probability of a bargaining breakdown.) In the example, the critical value for the breakdown probability is 0.6. Let  $\mu(e)$  be *C*'s belief, following a veto, that the president is the extreme type. Note that in a haggling equilibrium, it must be the case that  $\mu(e) \ge 1/2$ ; otherwise, following a veto, *C* will make the tough offer again in the final period (this was proven above). But if the probability of a breakdown is greater than 0.6, then the moderate type accepts the initial offer, so that by Bayes's Rule,  $\mu(e) = 1$  following a veto and *C* will indeed make the accommodating offer in the second round.

There remains an additional incentive compatibility constraint to examine, however. Congress must find it more appealing to make a tough offer followed by an accommodating offer (conditional on a veto and no breakdown) than to make an initial accommodating offer that would be surely accepted. This requires that

$$(1-\pi)(-0) + \pi[(1-\rho)(-(c-2e+q)) + \rho(-(c-q))] \ge -(c-2e+q)$$

$$\pi \le \frac{c - 2e + q}{c - 2e(1 - \rho) + q(1 - 2p)}$$
 4.

and in the example  $\pi \leq \frac{1}{1+\rho}$ .

We can now indicate a haggling equilibrium in the two-period, two-type SVB model with the ideal points indicated earlier. If  $0.6 \le \rho \le 1$  and  $\pi \le \frac{1}{1+\rho}$ , then *C* offers  $b_1 = b_m = c$  and  $b_2 = b_e = \frac{1}{2}$ , presidential type *m* accepts both  $b_e$  and  $b_m$  in both periods, presidential type *e* accepts offer  $b_e$  and vetoes offer  $b_m$  in both periods, and *C*'s belief that the president is the extreme type following a veto is  $\mu(e) = 1$ .

This example indicates how haggling, vetoes, and sequences of bills arise during veto bargaining. However, a somewhat more general model allowing a continuum of presidential ideal points, rather than only two, yields richer and more interesting results.

*Prediction 9 (SVB: basic dynamics)*. In sequential veto bargaining, Congress makes concessions in repassed bills; there is a positive probability the president accepts each bill; and there is a positive probability no offer is accepted even if bargaining does not break down. Moreover, in the first period, some types of presidents are willing to strategically veto.

The possibility of strategic vetoes is particularly interesting. Here, a president vetoes a bill that he actually prefers to the status quo in order to build a policy reputation that will extract an even more favorable bill in the next period.

Cameron (2000) explores the comparative statics of this version of the SVB model in detail. Not surprisingly, many of the model's empirical predictions are identical to the simple one-shot model; for example, increased differences between proposer and receiver lead to increased veto rates. However, a novel set of predictions involves the probability of a breakdown in bargaining [denoted q in Cameron (2000) rather than  $\rho$ ]. Cameron argues for a link between legislative significance and breakdown probabilities. In this view, less important bills are "brittle" whereas important ones are more robust. The idea is that, because enactment of an unimportant bill is unlikely, such a bill is unlikely to return to the legislative agenda if it is vetoed. Conversely, more important bills, propelled by powerful advocates, are quite likely to retain their place on the agenda even if they receive an initial check. Cameron shows that this differential fragility affects the dynamics of veto bargaining. In particular, bargaining is much tougher for more important bills. Hence, in the model with a continuum of types, we get Prediction 10.

*Prediction 10 (SVB: effects of legislative significance).* Given disagreement between the president and Congress, more important bills are more likely to be vetoed than less important ones; are more likely to be repassed if vetoed; are likely to incorporate smaller legislative concessions; and are more likely to be vetoed a second time.

Cameron (2000) also considers veto overrides in conjunction with a SVB model. For the most part, the dynamics of bargaining remain the same. *Prediction 11 (SVB: overrides and repassed bills).* Congress is more likely to attempt an override on repassed bills than on initially passed ones.

Driving Prediction 11 are the concessions that follow a veto. Repassed bills are more likely to be geared for an override attempt.

Finally, Cameron uses the model with a continuum of types to uncover a deadline effect in bargaining.

*Prediction 12 (SVB and deadlines).* The probability of vetoes for important legislation should fall at the end of a legislative session.

The rationale for Prediction 12 turns on the strategic vetoes, discussed above. In the last period, the president has no incentive to build a reputation through strategic vetoes. Although Congress understands this and accordingly makes a tougher offer, its offers are not so much tougher as to offset the president's weaker incentive to veto.

## 5.3. Bargaining Over Multiple Bills

Whereas the previous section shows that incomplete information can affect the dynamics of bargaining on a single issue, McCarty (1997) considers how informational and reputational incentives alter the bargaining across multiple issues over time. He considers a model of veto bargaining with incomplete information where P and C bargain over a series of policies with status quo points  $q_1$  and  $q_2$ . In each of the two periods, C proposes  $b_t$  and P accepts or rejects it. Thus, bargaining over each policy is modeled as one-shot, such that if P vetoes  $b_t$  the status quo  $q_t$  is the policy outcome. Since P's ideal point is assumed to be constant across policies, the outcome on policy 1 may provide information to C prior to her making an offer on policy 2.8 Because in the last period the game is identical to the one-shot incomplete-information game described above, type m does better on the second policy by having C believe that he is the extreme type if preferences are such as those given in Figures 5a or b. Thus, given those preference configurations, type *m* may be willing to use his first-period veto to build a reputation as the extreme type in order get a better outcome on policy 2. This involves rejecting bills that he, but not type e, prefers to  $q_1$ . Thus, reputational incentives increase the likelihood of a veto on policy 1.

Given that *C* understands these incentives, she may be willing to be sufficiently accommodating on policy 1 to discourage type *m* from vetoing on reputational grounds. Thus, McCarty's model predicts a "honeymoon" pattern of accommodating policies early in the president's term followed by less accommodating policies toward the end when reputational incentives are diminished. However, he notes that because the existence of reputational incentives depends on preference configurations such as those in Figures 5a and 5b, this honeymoon effect is unlikely when the expected difference in ideal points between *P* and *C* is small, such as in unified governments.

<sup>&</sup>lt;sup>8</sup>McCarty shows that many of the model's predictions hold so long as the president's preferences are highly correlated across policy areas.

*Prediction 13 (multiple bills: the honeymoon effect).* When the expected difference between the ideal points of *P* and *C* is sufficiently large, policy enactments should show a declining accommodation to the president's preferences over the course of his administration.

### 5.4. Blame-Game Vetoes

A recent model argues that vetoes are less a product of legislative uncertainty than of electoral politics. Groseclose & McCarty (2000) examine a model in which the legislative agenda setter uses its proposal power to signal that the president's policy views are out of step with the voters' (see Gilmour 1995 for a less formal version of similar arguments). In this "blame game" model, vetoes occur when the agenda setter receives a larger payoff from signaling that the president has extreme preferences than she does from enacting new policy. Thus, in this model, the electorate's uncertainty about the president is critical, not the uncertainty of legislators.

To understand a simple version of this model, consider a new actor V, the voter. We assume V, like P and C, has linear preferences and an ideal point (v). V believes P is type e with probability  $\pi$  and type m otherwise. We focus on the case where e < m < v. We assume the voter evaluates the president based on the expected distance between the president's ideal point and her own ideal point. Therefore, the voter's evaluation is simply

$$w(e, m, \pi; v) = -\pi |v - e| - (1 - \pi)|v - m| = \pi e + (1 - \pi)m - v.$$
 5.

An important feature of this model is that *P* and *C* care how much expected utility *V* gets from *P*'s position. The most interesting case is one of conflict, in which the president gets greater utility when the voter believes he is a moderate and Congress gets greater utility when the voter believes the president is an extremist. Such a case would plausibly arise when Congress and the presidency are controlled by different political parties or factions, especially when those parties are highly polarized ideologically, and voters are generally more moderate. In such a case, *C* and *P* trade off policy gains with those from political posturing. More specifically, the president would like to take actions that lead the public to lower  $\pi$ , whereas the legislature would like to take actions that lead the public to increase  $\pi$ . We allow *C* and *P* to value these trade-offs differently by letting  $\lambda_C$  and  $\lambda_P$  denote the respective weights each actor places on policy. Therefore, the utility functions for *C* and *P* become

$$-\lambda_{c}|x-c| + (1-\lambda_{c})[v-\pi e - (1-\pi)m]$$
 6.

$$-\lambda_{p}|x-p| - (1-\lambda_{p})[v-\pi e - (1-\pi)m]$$
7.

An important assumption of this model is that although V is relatively uninformed about P's preferences (p), C is fully informed. Therefore, C may be able to credibly communicate her information about p through her choice of bill. Similarly, the president's decision whether to veto particular proposals may also provide information to voters about his preferences.

A particularly interesting equilibrium is one in which C proposes an acceptable bill when P is moderate and proposes a bill that will be rejected when the president is extreme. McCarty (2002) shows that such an equilibrium is the only one in which vetoes occur, and it exists if and only if the following two conditions hold:

$$\left[\frac{\lambda_p - \lambda_c}{\lambda_p \lambda_c}\right] (1 - \pi)(m - e) > (2e - 2q)$$
8.

These conditions produce a number of predictions about the occurrence of vetoes.<sup>9</sup> First, note that Equation 8 cannot be satisfied if m = e or  $\pi = 1$ . Thus, voter uncertainty about the president's preferences is crucial. Without this uncertainty, orchestrating a veto has no signaling value to *C*, so she might as well make acceptable proposals to both types.

*Prediction 14 (blame game: voter uncertainty).* Voter uncertainty about the president's preferences is necessary for equilibrium vetoes.

Note that both Equations 8 and 9 are easier to satisfy when  $\pi$  is lower. Because the ex ante evaluation of the president is decreasing in  $\pi$  (the probability he is extreme), the model suggests that more vetoes will occur when the public believes the president is moderate (that is, believes the president is ideologically proximate). Intuitively, Congress finds the blame game most attractive when it knows that the president's policy preferences are inconsistent with voters' beliefs.

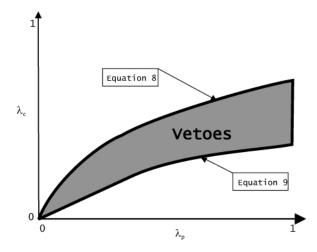
*Prediction 15 (blame game: voter beliefs).* Blame-game vetoes are more likely when the public believes the president's policy preferences are similar to its own.

The next three predictions are based on *C* and *P*'s willingness to trade policy gains for electoral gains. Figure 8 illustrates how each of the conditions is affected by the policy weights  $\lambda_P$  and  $\lambda_C$ . The area under the higher solid line represents the combinations of  $\lambda_P$  and  $\lambda_C$  that satisfy Equation 8. The area above the lower dashed line shows those satisfying Equation 9. The blame-game equilibrium described above exists in the intersection of these regions.

First, note that the condition in Equation 8 can be met only when  $\lambda_p > \lambda_c$ . This suggests that the president must put more weight on the policy outcome than does Congress. If this were not the case, Congress would prefer to achieve policy gains by passing mutually attractive bills rather than to seek purely electoral advantage by passing bills the president will reject. However, the condition in Equation 9 puts an upper bound on the difference in policy weights. If  $\lambda_P$  is too much larger than  $\lambda_c$ , *C* loses the ability to signal credibly through its proposals.

*Prediction 16 (blame game: policy salience)*. Blame-game vetoes will occur on issues that the president cares more about than does Congress.

<sup>&</sup>lt;sup>9</sup>These conditions are necessary for  $c > 2m - q + \frac{1-\lambda_P}{\lambda_P}(m-e)$ . Different positions of *c* result in slightly modified but qualitatively similar conditions.



**Figure 8** Conditions for equilibrium vetoes in the blame-game model.

Assuming that the policy weights are uniformly lower during election years, the model generates Prediction 17.

*Prediction 17 (blame game: electoral politics)*. Blame-game vetoes will be more likely during election years.

Only extreme types ever veto in the blame-game model. Therefore, every veto is followed by a reduction on support from  $-[v - \pi e - (1 - \pi)m]$  to -(v - e).

*Prediction 18 (blame game: vetoes and public approval).* Vetoes lead to lower public support for the president.

Groseclose & McCarty (2000) find support for this prediction. Magar (2001) develops similar models, in which both executives and legislators care about position taking in that they derive utility not only from the outcome but from the actions that they take in the process. This modification generates equilibria with non-outcome-consequential "publicity stunts," such as vetoing a bill when the veto is certain to be overridden or passing a bill that is certain to fail. Thus, otherwise anomalous behavior such as successful veto overrides can be sustained in equilibrium. An important distinction is that Magar's action contingent preferences are exogenous whereas Groseclose & McCarty's are endogenous. In particular, it is not clear why the voter in the Magar model would reward purely symbolic actions.

## 6. EMPIRICAL APPLICATIONS

Although this chapter is primarily theoretical in orientation, we would be remiss not to review, if only cursorily, the substantial body of empirical work that has used or tested the models reviewed here. In some cases, we note obvious gaps in the literature.

## 6.1. Methodological Issues

A central issue concerns the dependent variable—in particular, whether the analyst studies process measures related to bargaining (e.g., vetoes, override attempts, threats, enactments, presidential popularity) or policy directly. Policy is often the measure of greatest interest, but process indicators are far easier to observe and quantify. As indicated above, models with incomplete information often generate crisp propositions about process measures, and these can be used to test the models.

Regardless of the dependent variable, an important methodological issue arises from the three distinctive regimes that occur in many veto models, depending on the relative positions of the players' ideal points and the status quo. As discussed above, in the accommodating regime, the proposer offers her ideal point. In the compromising regime, she offers a proposal that responds to the receiver's ideal point, with a unit move in the latter forcing a unit move in the former. In the third regime, the recalcitrant regime, a successful proposal is not possible, so no offer is made. Thus, the comparative statics of both policy and process measures (e.g., vetoes) depend on which regime generated which observation. But associating observations with regimes can be problematic because of the difficulty of measuring ideal points and status quos. Analysts have tackled this problem in two ways.

The first method relies on research design, using a priori grounds to associate observations with regimes. For example, increasing the distance between the ideal points of the proposer and receiver makes the accommodating regime less likely and the compromising or recalcitrant regime more likely (*ceteris paribus*). Hence, increased distances should increase the probability of a veto, given an offer and a degree of incomplete information. Most of the empirical predictions in this chapter take this form, and most of the empirical work has this flavor.

The second approach employs endogenous regime-switching models to estimate simultaneously the probability that a given observation belongs to a regime (using appropriate indicators) and the policy outcomes associated with each regime.

Though conceptually appealing, this approach has been little used because of the difficulties of measurement and estimation [see, however, Spiller & Gely (1992) and McCarty & Poole (1995); Moraski & Shipan (1999) has this flavor but stops short of endogenous switching].

Not surprisingly, in light of the importance of regime switching, measurement issues often become central in empirical studies of veto bargaining. Typical problems include determining the location of the status quo, and placing proposers and receivers on common preference scales. There are no general solutions here; the analyst must tailor her response to each situation and sometimes display considerable ingenuity (see, e.g., Bailey & Chang 2001).

## 6.2. Experimental Studies

Laboratory experiments often afford the cleanest setting for testing game theoretic models of social interactions. For example, one can definitively address regime and

measurement issues. Thus, one might expect to find a well-developed experimental literature on veto models. Unfortunately, this is not the case.

Within economics, there is a vast literature on the ultimatum game, which strongly resembles the compromising regime in veto games. In the ultimatum game, a proposer offers a receiver a division x of a pie, retaining 1 - x for herself; if the receiver rejects the proposal, both receive zero. Camerer (2003) and Roth (1995) elegantly review findings from this literature. Typical result are (*a*) proposers do not make as tough an offer as theory predicts, and (*b*) receivers sometimes reject stingy offers that theory predicts they ought to accept. The explanation for these departures from the theoretical predictions remains a subject of controversy.

Unfortunately, the ultimatum game is not isomorphic even to the one-shot veto game, since the ultimatum game lacks two of the relevant regimes as well as comparative statics on the location of the status quo in the compromise regime. Veto games with repeated play, reputation, threats, and third-party audiences are even farther removed from the ultimatum game. To the best of our knowledge, political scientists have conducted little or no experimental work on veto games, especially those with repeat play, reputation, and third-party audiences. This is an obvious area for research.

## 6.3. Studies on Observational Data

Purely empirical studies of the veto abound, many of which are reviewed in Cameron (2000). More recent examples not referenced there include additional studies of veto probabilities for individual bills (Gilmour 2002, Sinclair 2002), veto threats (Conley 2002, Deen & Arnold 2002, Jarvis 2002, Marshal 2003), and override politics (Conley 2000, 2003; Manning 2003; Whittaker 2003; Wilkins & Young 2002). Comparative politics scholars increasingly draw on veto models to interpret case study materials from a variety of countries (see, e.g., Lehoucq & Molina 2002, Remington 2001). Rarer, however, are studies in which systematic observational data confront formally derived hypotheses from game theoretic models of the veto. We focus on these studies below.

6.3.1. COMPLETE-INFORMATION MODEL The complete-information model examines the consequences of veto power rather than vetoes. Tests of the model relate changes in preferences to changes in policy. For example, Kiewiet & McCubbins (1988) examine appropriations politics. Taking into account the normal reversion points in the appropriations process, they argue that the veto gives the president strong power when he wants to cut budgets but much less power when he wants to increase them. Their statistical analysis of appropriations data supports their argument. Krehbiel (1998) and Brady & Volden (1998) embed completeinformation veto models in larger models of law making under the separation of powers. Both find a variety of systematic evidence supporting these "gridlock" models. Cameron (2000, pp. 169–76) and Howell et al. (2000) argue that patterns in the legislative productivity of Congress are compatible with predictions of a complete-information veto model.

6.3.2. VETO THREATS Cameron (2000, pp. 178–202) tests many predictions from the Matthews model of veto threats, as do Cameron et al. (2000), using data on threats from Truman to Clinton. The evidence they muster strongly supports the model. Evans & Ng (2003) use more extensive systematic evidence from the Clinton and George W. Bush administrations to test the Matthews model. They too find strong support, but they also find evidence of a blame-game dynamic in veto threats (see also Conley 2001).

6.3.3. SEQUENTIAL VETO BARGAINING AND BARGAINING OVER MULTIPLE BILLS Cameron (2000) uses the SVB model to explain many patterns in the use of the veto in the postwar era. In addition, he tests hypotheses on concessions and the deadline effect. He finds very substantial empirical support for the model. The distinction this model makes between more important and less important legislation has not been exploited as fully in empirical work as one could imagine.

McCarty (1997) examines the "honeymoon" prediction generated by the multiple-bills model. Rather than using data on actual bill locations, he uses data on average presidential support scores, which would tend to decline as legislative proposals move away from the president's expected ideal point. Consistent with his prediction, he finds that presidential support scores decline during periods of divided, but not unified, government. McCarty & Poole (1995) also find evidence for a honeymoon effect using data on bill locations and status quos estimated by D-NOMINATE (Poole & Rosenthal 1997).

One of the principal predictions of the blame-game 6.3.4. BLAME-GAME VETOES model is that presidential popularity should fall after a blame-game veto. Groseclose & McCarty (2000) test this prediction and find support in presidential job approval ratings. McCarty (2002) marshals a variety of evidence from the early Republic, testing the blame-game model and in some instances contrasting it with predictions of the simple incomplete-information model. He finds support for the blame-game model, especially relative to the simple incomplete-information model. Magar (2001, 2003a) applies his closely related model of "stunt" vetoes to data from several Latin American countries, especially Argentina and Uruguay, and also finds support for the model. Finally, Gilmour (2001) uses newspaper coverage of vetoes to test the informational assumptions underlying sequential veto bargaining and the blame-game model. He argues that under the SVB model, vetoes should surprise members of Congress (and journalists for that matter), whereas the blame-game model is consistent with vetoes that even the voters can predict in equilibrium. His study finds that most, but not all, vetoes were predicted by the news coverage, which he interprets as evidence in favor of the blame-game model.

#### 6.4. Summary

A substantial empirical literature examines the presidential veto. Much of this literature investigates ad hoc hypotheses unsupported by theory, or repeatedly replicates simple and well-known patterns predicted by almost every model. A smaller number of studies attempt to test formal models of veto bargaining in a methodologically sophisticated way against appropriate data. The studies that have attempted this task have found repeated and substantial support for the models.

## 7. CONCLUSION

The study of veto bargaining has developed into a successful social scientific endeavor. This literature contains a rich set of explicit models with generally clear empirical predictions. Its large set of claims, sometimes complementary and sometimes competing, have proven a rich source of hypotheses for empirical research, and this research has undoubtedly increased our knowledge of the veto power and its role in executive-legislative relations.

Despite this success, there remains much to be gained from pushing forward on the theoretical and empirical fronts. On the theoretical side, current models are somewhat limited by their simple informational and preference structures. The extent to which equilibrium veto bargaining is substantially different in a world with multidimensional preferences and signaling is still an open question. The incorporation of electoral politics and public opinion is also rudimentary. For example, the Groseclose-McCarty model allows voters to learn about presidential preferences, but not congressional ones, and is also limited to preferences along a single dimension.

Open empirical questions abound as well. Much of the empirical literature has naturally centered on data from the post–World War II U.S. national government. But with dozens of presidential democracies and 50 U.S. states providing variation both in the rules for veto bargaining and in electoral systems, there is much more to be learned from the data (see Magar 2001, 2003b). New opportunities for analyzing political history are also apparent.

## 8. APPENDIX

#### 8.1. Proposition 1

The subgame perfect equilibrium to the complete information veto game is as follows.

President: Accept any bill such that either  $v(b, p) \ge v(q, p)$  or  $u_o(x; o) > u_o(b; o)$ .

Override pivot: Override any veto such that  $u_o(x; o) > u_o(b; o)$ .

Congress: Make the following proposals:

 $\begin{array}{l} Case \ 1: \ c > \max\{o, \ p\}.\\ \text{If } c > \max\{o, \ p\} > q, \ b^* = \min\{c, \max\{2o-q, 2p-q\}\}.\\ \text{If } c > q > \max\{o, \ p\}, \text{make no proposal.}\\ \text{If } q > c, \ b^* = c.\\ \hline Case \ 2: \ c < \min\{o, \ p\}.\\ \text{If } c < q \ \min\{o, \ p\} < q, \ b^* = \max\{c, \min\{2o-q, 2p-q\}\}.\\ \text{If } c < q \ \min\{o, \ p\}, \text{make no proposal.}\\ \text{If } q < c, \ b^* = c.\\ \hline Case \ 3: \ p < c < o, \ b^* = c.\\ \hline Case \ 4: \ o < c < p, \ b^* = c.\\ \end{array}$ 

## 8.2. Incomplete Information Models

We wish to establish the critical values of  $\pi$  given in Equations 1 and 2. Thus, we consider only the preference configurations in Figure 5, i.e., q < e < m < c. Other configurations are quite simple to analyze and are left to the reader.

Let  $B_t(q)$  be the set of bills that each type  $t \in \{m, e\}$  is willing to accept over the status quo. As above, these sets are [q, 2t - q] if t > q and [2t - q, q] otherwise. Notice that for any q, a president of type m is willing to accept a higher bill that is e. For simplicity, let e > q, so that  $b_e(q) = [q, 2e - q] \subset b_m(q) = [q, 2m - q]$ —any bill that e accepts is also acceptable to m, but the converse is not true. Therefore, C faces a tradeoff. She can propose 2e - q, which both types accept, or can propose 2m - q, which e will veto. Given C's beliefs, the latter strategy results in a veto with probability  $\pi$ .

**CASE 1**: c > 2m - q Given C's linear utility function, her payoffs from b = 2e - q are 2e - q - c and her payoffs from b = 2m - q are  $\pi q + (1 - \pi)(2m - q) - c$ . If  $\pi < \frac{m - e}{m - q}$ , C will propose b = 2m - q and a veto may occur.

**CASE 2**: 2e - q < c < 2m - q *C*'s payoff from b = 2e - q is 2e - q - c. Her payoffs from b = c are  $\pi(q - c)$ . Therefore, *C* will adopt the risky strategy when  $\pi < \frac{c+q-2e}{c-q}$ . Note that the critical value of  $\pi$  is lower than in Case 1, which makes a veto less likely for any given set of beliefs.

**CASE 3**: c < 2e - q In this case, neither president will veto b = c. So C maximizes her utility by proposing her ideal point, and no vetoes occur.

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## Errata

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