A Rational-Choice, Formal-Theoretic Argument Against the Existence of Sophisticated Voting in Legislatures

Tim Groseclose
Department of Political Science
UCLA

Jeff Milyo
Department of Economics
University of Missouri

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Abstract
While Denzau, Riker, and Shepsle (1985) have argued that a significant degree of position-taking sentiment impedes sophisticated voting, we argue that even an infinitesimally small amount of position-taking sentiment completely disallows sophisticated voting. We introduce a model in which legislators have preferences over policy and the positions that they take (i.e. the way they vote even when they are not pivotal). We introduce some assumptions that we argue closely follow the rules of real-world legislatures. Most important is that legislators are free to change their votes after seeing the votes of their colleagues. Under these assumptions we show that the only possible equilibrium is one in which legislators only consider their position-taking preferences—i.e. they disregard their policy preferences, which means they do not vote sophisticatedly. Despite our theoretical result and very little empirical support for sophisticated voting, few, if any, rational-choice scholars seem to have considered the full implications of a world in which sophisticated voting cannot occur. One of the most interesting implications is that it is not appropriate to assume, as many previous models do, that an agenda-setting body (such as a congressional committee with a closed rule) will act as a single individual when the conditions of Black's median voter theorem are satisfied. A related implication is that if sophisticated voting really does not exist, then the gridlock intervals that Krehbiel (1998) derives should instead be double the size that he reports.
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A belief that is almost as gospel among rational-choice scholars is that legislators, if given the opportunity, will vote sophisticatedly. Several scholars—including Calvert and Fenno (1994); Denzau, Riker, and Shepsle (1985); and Volden (1998)—have provided piece-meal evidence of sophisticated voting on a particular roll call vote. However, we are aware of no study that provides systematic evidence that sophisticated voting is prevalent in more than a handful of roll call votes. In contrast, three studies—Ladha (1994), Poole and Rosenthal (1997), and Wilkerson (1999)—do conduct a systematic analysis of many roll calls, and all three conclude that sophisticated voting is rare. E.g. Poole and Rosenthal (1997, 147) note that "our search of the literature on strategic [i.e. sophisticated] voting found very vew bothersome needles in our haystack of the 37,000 roll calls in the first 100 congresses."

Consistent with the latter results, but unlike many previous rational-choice models, we present our own model in which sophisticated voting cannot occur in equilibrium. One of our key assumptions follows a point that Denzau, Riker, and Shepsle make: The constituents of legislators sometimes will fail to understand the strategic implications of a vote. Consequently, at times legislators will have position-taking preferences (a la Mayhew, 1974), that differ from their policy preferences. That is, for example, they may prefer to display a yea vote on a killer amendment to their constituents, while at the same time they may prefer that the killer amendment lose.

Our result requires only a very tiny degree of position-taking preferences. Only two legislators—one of both sides of an issue—need to have position-taking preferences that differ from their policy preferences. Further, even these two legislators can have some policy preferences; we only require that the two legislators place some weight on their position-taking preferences. And this weight can be infinitesimally small compared to the weight they place on their policy preferences. Another key assumption is that voting behavior is consistent with a pure-strategy Nash equilibrium. We argue that this is implied by congressional rules, which allow legislators to change their votes after seeing the votes of their colleagues.

A frequent claim is that legislatures will not allow opportunities for sophisticated vot-
ing. That is, for instance, if a legislator tries to introduce a killer amendment, then party leaders or other legislators will try to block it from the voting agenda. This is not our argument. Our point is that even if an agenda presents an opportunity for sophisticated voting, then legislators will still vote sincerely. In a later section we argue why our claim—that legislators really do not vote sophisticatedly—is the better explanation for why we do not observe sophisticated voting, not that the legislators are disallowed such opportunities.

Despite the results of our model, and despite the scant (if any) evidence of sophisticated voting, few, if any, formal models of politics consider the full implications of a world in which legislators cannot vote sophisticatedly. Most interesting, if legislators cannot vote sophisticatedly, then it is not appropriate to assume, as many models do, that an agenda-setting body, such as a congressional committee, will act like a single actor when the conditions of Black’s Median Voter Theorem are satisfied. If the agenda-setting body cannot vote sophisticatedly, then it cannot propose a bill that differs from the ideal point of its median member. If it tries, some member will want to amend the proposal to the ideal point of the median. Thus, our result is a revisionist one: While Shepsle’s (1979) early work on committee proposals assumed that committees would not act sophisticatedly, later models (e.g. Denzau and Mackay (1983) and Krehbiel (1987)) criticized the assumption; they assumed instead that a committee would act like a Romer-Rosenthal agenda setter. A similar argument applies to veto models (Ingberman and Yao, 1991; Mathews, 1989; Cameron, 2000; and Groseclose and McCarty, 2001). All of these models assume that Congress will behave like a single actor.

The argument also applies to Krehbiel’s (1998) pivotal politics model. In his model the floor is an agenda setting body, and it makes an up-or-down proposal to the pivot player in the legislature (such as the key member for invoking cloture or the key member for overriding a presidential veto). Krehbiel assumes that the floor votes sophisticatedly when choosing a proposal for the pivot. However, the results change if the floor can only vote sincerely. For instance, it causes the gridlock intervals of his model to double in size.

1. An Example

Before presenting our model formally, a simple example helps reveal the intuition of our main result. A legislature is composed of 101 members divided into three groups: (i) 51
Republicans who prefer that a killer amendment be defeated, however each also prefers to vote for the amendment if he or she is not pivotal; (ii) 30 northern Democrats who have the opposite preferences; and (iii) 20 southern Democrats who (like the northern Democrats) prefer the killer amendment to win, but (like the Republicans) prefer to vote for the killer amendment if they are not pivotal. If all legislators voted sophisticatedly, then all Republicans vote against the amendment, and all Democrats vote for it. This means the amendment loses 50-51. However, this is not a Nash equilibrium. A key point of our model is that the legislators on the losing side of roll call are not pivotal. Note that if any of the Democrats switched sides, then this would not change the final outcome—the amendment would still lose; all that would change is that the final tally would become 49-52. Since none of the Northern Democrats are pivotal, all prefer to change their vote so that they vote against the amendment. This makes the tally 20-81. Thus, it is not an equilibrium for every legislator to vote sophisticatedly.

But what about an equilibrium in which only some of the legislators vote sophisticatedly? A natural possibility is to take the latter outcome and switch 30 Republicans to the yea side; this would return the tally 50-51. However, if this happens each of the nay-voting Northern Democrats is pivotal. As a consequence, each of them would prefer to switch to the yea side and thus vote sophisticatedly. But if any one of them switches, this would make the tally 51-50, which would make each of the yea-voting Republicans pivotal. Consequently, each would prefer to switch to the nay side. If we continued this analysis, we could see that if the final tally is a one-vote margin, then at least one legislator will want to switch. The only possible equilibrium occurs when the tally is not decided by one vote. When this happens, no legislator desires to vote sophisticatedly. Consequently, the only equilibrium in this example is where all Republicans and southern Democrats vote for the amendment, and all northern Democrats vote against it, giving a final tally of 71-30.

2. Model and Main Result

2.1. Actors and Preferences

A set of legislators \( N = \{1, 2, ..., n\} \), must choose between two alternatives, \( a \) and \( b \), by
majority rule. Assume that \( n \) is odd, and \( n \geq 3 \).

Let \( U_i(x, y) \) be legislator \( i \)'s payoff when \( x \) is the winning alternative and \( y \) is the alternative for which he votes. We assume that utility is additively separable. That is, there exist two functions, \( o_i() \) and \( p_i() \), and a constant \( \lambda_i \) such that

\[
U_i(x, y) = o_i(x) + \lambda_i p_i(y).
\]

We say that \( o_i() \) represents \( i \)'s outcome preferences and \( \lambda_i p_i() \) represents \( i \)'s position-taking preferences. For simplicity, we assume that no legislator is indifferent over outcome preferences, nor over position-taking preferences. That is, for all \( i \in N \), \( o_i(a) \neq o_i(b) \) and \( \lambda_i p_i(a) \neq \lambda_i p_i(b) \). Define \( x_i^1 \in \{a, b\} \) as the alternative that \( i \) prefers as the outcome and \( x_i^2 \) as the other alternative. Thus, \( o(x_i^1) > o(x_i^2) \). Without loss of generality, we can redefine units of utility for each legislator such that

\[
\begin{align*}
o_i(x_i^1) &= 1, \\
o_i(x_i^2) &= 0, \\
p_i(x_i^1) &= 1, \text{ and} \\
p_i(x_i^2) &= 0,
\end{align*}
\]

(To see why we can set the functions to the above values without loss, let \( \tilde{U}_i(x, y) = \tilde{o}_i(x) + \tilde{\lambda}_i \tilde{p}_i(y) \) be our original utility function, and \( U_i(x, y) = o_i(x) + \lambda_i p_i(x) \) be the utility function after we redefine utility units. It is easily shown that \( U_i(x, y) \) is a linear transformation of \( \tilde{U}_i(x, y) \). For instance, suppose that \( i \)'s outcome preferences favor \( a \). Then, \( U_i(x, y) = \alpha + \beta \tilde{U}_i(x, y) \), where

\[
\begin{align*}
\alpha &= \frac{\tilde{o}_i(b) + \tilde{\lambda}_i \tilde{p}_i(b)}{\tilde{o}_i(b) - \tilde{o}_i(a)}, \\
\beta &= \frac{1}{\tilde{o}_i(a) - \tilde{o}_i(b)}, \text{ and} \\
\tilde{\lambda}_i &= \frac{\tilde{\lambda}_i \tilde{p}_i(a) - \tilde{p}_i(b)}{\tilde{o}_i(a) - \tilde{o}_i(b)}.
\end{align*}
\]

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1 In Appendix I we provide a non-technical summary of the results of this section.

2 Our results still hold when \( n \) is even, as long as one alternative is designated the winner in a tie vote (e.g. the U.S. House and Senate deem the status quo the winner when there is a tie between it and a bill). The results also still hold when \( n \) is even but an additional legislator (like the vice-president for the U.S. Senate) is designated the tie-breaker. Moreover, the results also hold, when the winner is decided by a super-majority voting rule.
If i's outcome preferences favor b, we reverse a and b in the above expressions.)

Thus, if i's outcome preferences favor a, then

\[ U_i(a, a) = 1 + \lambda_i \]
\[ U_i(a, b) = 1 \]
\[ U_i(b, a) = \lambda_i \]
\[ U_i(b, b) = 0, \]

If i's outcome preferences favor b, then we reverse all the a's and b's in the above. Note that if i's outcome preference differs from his position-taking preference, then we must set \( \lambda_i \) to a negative value.

Define a dominant-a legislator as one who prefers to vote for a, regardless of whether she changes the winning alternative with her vote. Formally, i is a dominant-a legislator if

\[ o_i(a) > o_i(b) \quad \& \quad \lambda_i > 0 \]

OR

\[ o_i(b) > o_i(a) \quad \& \quad \lambda_i < -1, \]

and dominant-b legislator is defined in a similar manner.

Define a contingent-a legislator as one who prefers to vote for a if she changes the winning alternative with her vote, otherwise she prefers to vote for b. Formally, i is a contingent-a legislator if and only if \( o_i(a) > o_i(b) \) and \( \lambda_i \in (-1, 0) \). Likewise, we say that i is a contingent-b legislator if and only if \( o_i(b) > o_i(a) \) and \( \lambda_i \in (-1, 0) \). A key assumption of our model is the following.

Assumption (Dual Conflict): There exists at least one contingent-a legislator and at least one contingent-b legislator.

Note that this assumption makes no restriction on the percentage of legislators who are contingent-a or contingent-b, only that there is one of each.

2.2. Actions, Information, and Equilibrium Concept

In the game each legislator has two choices: vote for a or vote for b; abstention is not allowed. All legislators vote simultaneously, and we disallow them to use mixed strategies.
This means that if an equilibrium exists, no legislator wants to change his or her vote after seeing all other votes. We also assume that all actors are completely informed.\footnote{However, this assumption is not crucial; to derive our main result all we need is that each legislator, after learning the total number of yeas and nays (not necessarily who cast them), does not want to change his or her vote.}

These assumptions are appropriate for any voting body—like the U.S. House or Senate—that allows legislators to change their votes and does not allow the presiding officer to invoke a "quick gavel." A quick gavel occurs when the presiding officer ends the voting period when there are still legislators who desire to record or change their vote. Most legislatures, including the U.S. House and Senate, specify a minimum amount of time for voting, and legislators can continue to vote until the presiding officer bangs the gavel.\footnote{Popular accounts often describe these rules inaccurately. For instance, after the recent CAFTA vote in the House, the New York Times wrote "House Republican leaders kept the voting open for almost a full hour, in violation of the normal 15-minute time limit (’Pleas and Promises by G.O.P. As Trade Pact Wins by 2 Votes,’ Edmund L. Andrews, July 18, 2005, Pg. 1.)” Despite the Times account, the Republican leaders did not violate House rules. Nor is it usual for House speakers to end voting after 15 minutes. Rather, as any frequent C-SPAN viewer has observed, a timer, usually set at 15 minutes for major bills, begins to tick down as soon as voting begins. Once the timer reaches 0:00, voting does not stop; rather it continues for several more minutes. The timer represents the minimum amount of time, by House rules, that the speaker must allow legislators to vote, not the maximum amount. The usual practice is for the speaker to allow voting to continue several (5-15) minutes after the 15 minutes has expired. On a number of recent occasions, however, Speaker Dennis Hastert has allowed voting to continue much longer than usual. The CAFTA vote was one occasion. Another was the final-passage vote on the Medicare bill of November, 2003, where the roll call began at 3:00am and Hastert allowed voting to continue for two hours and 51 minutes. This was “believed to be the longest recorded tally since electronic voting began” (’Late Night Medicare Vote Drama Triggers Some Unexpected Alliances,’ Jackie Kosczcuk and Jonathan Allen, CQ Weekly Report, November 29, 2003, p. 2958). If a speaker holds a vote open for a longer than usual amount of time, this alone does not mean it is a case of a quick gavel. To be a quick gavel there must be legislators who desire to record or change their vote at the time the speaker ends voting. We are aware of no such legislators for the CAFTA or Medicare roll calls, nor for any other roll call while Hastert has been speaker. In fact, if the speaker did end voting at the end of the 15-minute minimum time period, this almost surely would be called a quick gavel, since several legislators likely would not have voted, expecting the vote to be held open several more minutes.}
at 205-206. Finally, one Democrat switched. Speaker Rayburn quickly banged the gavel, giving the Republicans no time to find a switcher to their side, and he declared that the motion had passed.

Another quick gavel occurred in 1987 on a budget reconciliation measure. Most Democrats, including Speaker Jim Wright favored it. However, because it included a tax increase, several moderate Democrats opposed it. This included Jim Chapman (D-Tex.), Marty Russo (D-Ill.), and probably a half dozen other Democrats, who told Wright that they planned to vote against the bill unless Wright needed their vote (Barry, 1989, 468-70). The House clock was set at 15 minutes for the roll call. After this time expired, the vote stood at 201-202, one vote short of passage. Wright held the vote open, hoping that some additional members would vote or that some would switch their vote. After a few more minutes the tally changed to 205-206, still one vote short. Wright instructed Democratic Whip Tony Coelho to persuade Chapman to change his vote. In fact, Chapman was waiting in the cloak room in case Wright decided to send such an instruction. However, when Coelho reached him, Chapman refused to switch, perhaps hoping that Coelho would try to persuade someone else, such as Russo. Republicans began to shout at Wright to close the vote. Wright was about to relent when Chapman had a change of heart and burst into the chamber to change his vote. This changed the tally to 206-205 in favor of the bill. Republicans tried to stall—if they could persuade Jim Jeffords (R-Vt.) to switch, or if they could stall long enough to allow Edward Madigan (R-Ill.) to reach the chamber, they could defeat the measure. However, Wright would have none of this. While Mickey Edwards (R-Okla.) tried to raise a parliamentary inquiry, Wright ignored him and announced “The yeas are 206; the nays are 205; the bill is passed.”

These two instances of quick gavels, while dramatic, are very rare. In fact, we are aware of no other instances of quick gavels in Congress. Although the rules of the House and Senate technically allow them—after the minimum time has expired it is strictly the discretion of the presiding officer when to close the vote—there are strong norms against them. In fact, after Wright’s quick gavel, Republicans launched a furious protest. This included Trent Lott (R-Miss.) slamming his fist into the lectern in front of him and shattering it. After the vote, Wright lamented to his biographer, “I don’t feel so good right now, that’s true. ... It didn’t help my reputation. To have people impugn my integrity. To have Republicans
shouting like that.” He shook his head, and he fell silent (Barry, 1998, 474-5).

In contrast, voting models that allow mixed strategies are not consistent with the no-quick-gavel norm. In these models voters draw random variables to decide how to vote. However, depending on the draw of their own and other voters’ random variables, such voters may want to change their vote after seeing the votes of the others. A mixed strategy disallows this. Consequently, such a strategy does not make sense for the U.S. House and Senate when the presiding officer abides by the no-quick-gavels norm.

2.3. Pivotal Legislators

Contingent-\(a\) and contingent-\(b\) legislators will vote for their outcome preferences only if they are pivotal—that is, if their action changes the outcome of the vote. The notion of a pivotal legislator involves some subtle aspects. First, if a legislator is pivotal, the final tally must involve a one-vote margin. Second, a legislator must be on the winning side to be pivotal. For instance, suppose \(a\) receives 50 votes, and \(b\) receives 49. If a \(b\)-voter switches his vote to \(a\), the outcome does not change: \(a\) still wins, only by a larger margin. However, if an \(a\)-voter switches, the outcome does change. Third, if an alternative wins by one vote, all voters who vote for that outcome are pivotal. These aspects are captured in the following formal definition and lemma.

**Definition**: Legislator \(i\) is pivotal if in equilibrium (i) she votes for the winning alternative \(x\), and (ii) \(x\) wins by a one-vote margin (i.e. the final vote is \((n+1)/2\) to \((n-1)/2\)).

**Lemma 1**: If a legislator is not pivotal, he or she votes for the alternative that his or her position-taking preferences favor.

**Proof**: Suppose legislator \(i\) is not pivotal. Let \(x\) be the winning alternative. Then \(i\)'s utility for voting for \(x\) is

\[
o_i(x) + \lambda_i p_i(x),
\]

and her utility for voting for \(y\) is

\[
o_i(x) + \lambda_i p_i(y),
\]

Comparing (1) and (2) shows that \(i\) votes for \(x\) if and only if \(\lambda_i p_i(x) > \lambda_i p_i(y)\). That is, \(i\) votes for the alternative that his or her position-taking preferences favor.

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2.4. Main Results

As the following proposition shows, under these assumptions a very strong result follows: in equilibrium each legislator votes for the alternative that favors his or her position-taking preferences.

**Proposition 1**: If an equilibrium exists, then all legislators vote for the alternative that their position-taking preferences favor.

**Proof**: Suppose an equilibrium exists, and suppose, contrary to the result, that at least one legislator voted against her position-taking preferences. Then, by the Lemma, she must have been pivotal. In turn, this implies that the winning alternative won by a one-vote margin. Without loss of generality, assume that \( a \) was the winning alternative. Next, let \( i_0 \) be a contingent-\( b \) legislator. (By the Dual Conflict Assumption, such a legislator must exist.) Either he voted for \( a \) or for \( b \). We show that either case leads to a contradiction. First, suppose \( i_0 \) voted for \( b \). Since \( b \) lost, \( i_0 \) was not a pivotal legislator. Therefore, he must have voted for the alternative that favors his position-taking preferences, which is \( a \), which is a contradiction. In contrast, suppose that \( i_0 \) voted for \( a \). Since \( a \) won by one vote, \( i_0 \) was a pivotal legislator. But since he is a contingent-\( b \) legislator, he prefers to vote for \( b \) when he is pivotal, which, again, is a contradiction. It follows that there does not exist a legislator who voted against his or her position-taking preferences.

Many models assume that voters only have outcome preferences. The above result shows that such models may be knife-edge. If voters also have position-taking preferences, but place only an infinitesimally small weight on these preferences (that is, as all the \( \lambda \)'s approach zero), then outcome preferences become irrelevant. Further, this is true if voters have lexicographic preferences, and they use their position taking preferences only to break ties in their outcome preferences.

Proposition 1 depends significantly on the process for voting. For instance, an alternative process is for legislators to follow a particular order (say, alphabetically by or seniority), and the legislators are not allowed to pass nor change their vote.\(^5\) In Appendix II we characterize the equilibrium of such a process. In stark contrast to Proposition 1, the winning alternative depends only on the outcome preferences of the contingent legislators. That is, to calculate the winning outcome in equilibrium, one ignores the position-taking preferences of these legislators. Thus, while Proposition 1 implies that sophisticated voting

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\(^5\) Some roll calls in the House and Senate adopt a similar process, where the members vote in alphabetical order. However, the members are allowed to pass, and they are allowed to change their vote. As a consequence, the equilibrium concept of Proposition 1 is relevant for this type of vote, since voting does not end until no member wants to change his or her vote.
should be rare in Congress, the latter result implies that if Congress changed its rules, then sophisticated voting should be common.

The equilibrium of Proposition 1 is not necessarily a Strong Nash equilibrium. For instance, consider the earlier-mentioned example, where the equilibrium is for 51 Republicans and 20 southern Democrats to vote yea (in favor of a killer amendment) and for 30 northern Democrats to vote nay. To see that this does not survive the Strong Nash refinement, note that if 21 Republicans changed their vote to nay, then all 21 would improve their utility. But recall that this is not a Nash equilibrium (and therefore not a Strong Nash equilibrium). Namely, this new specification of strategies would cause one of the northern Democrats to want to switch to the yea side.\(^6\) If one insists that Strong Nash is the proper equilibrium concept, then this does not give a different prediction from the (Weak) Nash concept; it gives no prediction.

Proposition 1 is silent on the existence of an Nash equilibrium. It only gives properties of an equilibrium when it exists. However, as the following propositions states, only rarely will a (pure-strategy) equilibrium fail to exist.

**Proposition 2:** Define \(n_a\) as the total number of legislators whose position-taking preferences favor \(a\). A (pure-strategy) equilibrium exists if and only if \(n_a \neq (n + 1)/2\) and \(n_a \neq (n - 1)/2\).

**Proof:** If \(n_a \neq (n + 1)/2\) and \(n_a \neq (n - 1)/2\), then there exists an equilibrium in which every legislator votes for the alternative that his position- taking preferences favor. In such an equilibrium, the assumptions about \(n_a\) imply that no legislator (neither those voting for \(a\) nor those voting for \(b\)) is pivotal. Therefore, no legislator wants to change his vote. To prove the "only if" part, suppose that an equilibrium exists. Proposition 1 implies that each legislator votes for the alternative that his position-taking preferences favor. Now suppose, contrary to the hypothesis, that the final tally produces a one-vote margin (i.e. \(n_a = (n + 1)/2\) or \(n_a = (n - 1)/2\)). Without loss of generality, suppose that \(a\) is the winning alternative. Let \(i_0\) be a contingent-\(b\) legislator. (By the Dual Conflict assumption, such a legislator exists.) Proposition 1 implies that \(i_0\) votes for \(a\) (his position-taking preference). This implies that he is a pivotal legislator, which implies that he prefers to vote

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\(^6\) In the famous Medicare roll call vote of 2003, two hours after voting began, the tally stood at 216-218—two votes short of victory for the Republicans. Speaker Hastert and fellow Republican leaders eventually persuaded C.L. "Butch" Otter (R.-Id.) and Trent Franks (R.-Ariz.) to switch from nay to yea. This put the tally at 218-216, making all those on the nay side non-pivotal legislators. Consistent with the above analysis, shortly after the switch by Otter and Franks, two more legislators decided to vote yea, making the final tally 220-215. ('Late Night Medicare Vote Drama Triggers Some Unexpected Alliances,' Jackie Kosczuk and Jonathan Allen, *CQ Weekly Report*, November 29, 2003, p. 2958).
for $b$, which is a contradiction. It follows that the final tally cannot be a one-vote margin.

Propositions 1 and 2 allow us to compute equilibria by the following algorithm. Suppose each legislator voted according to his or her position-taking preferences. If such behavior does not produce a one-vote margin in the final tally, then the unique equilibrium is for every legislator to vote according to his or her position-taking preferences. On the other hand, if such behavior does produce a one-vote margin in the final tally, then no equilibrium exists.

To see the latter result, consider the following example of a three-member legislature. Legislator 1 is dominant-$a$, Legislator 2 is contingent-$a$, and Legislator 3 is contingent-$b$. Let us first examine 3’s optimal strategy. If 2 has voted for $b$, then 3 is pivotal; since she is a contingent-$b$ legislator, she prefers to vote for $b$. On the other hand, if 2 has voted for $a$, then 3 does as well. Note that 3 prefers to match the action of 2. In contrast, however, it can be shown that Legislator 2 wants not to match the action of legislator 3. Thus, their incentives are identical to those in a classic matching pennies game. And it is well known that this game has no pure-strategy equilibrium.

3. Implications of Our Result to Three Case Studies

Given the results of the previous section, if a legislator does vote sophisticatedly, then at least one of the assumptions of our model must have been violated. This presents a challenge for empirical researchers who claim that sophisticated voting occurred on a particular roll call. They should be able to point to an assumption in our model that was violated. More specific, they must be able to answer “no” to at least one of the following questions:

1. Did any legislator have position-taking preferences that conflicted with his or her outcome preferences?

2. If so, did the Dual Conflict assumption hold? That is, was there at least one legislator on both sides of the issue with conflicting preferences?

3. Were all legislators non-pivotal? That is, was the final tally not a one-vote margin?

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7 More specific, if an odd number of legislators voted, was the final tally not a one-vote margin? If an even number of legislators voted and the yea alternative won, was the final tally not a two-vote margin? If an even number of legislators voted and the nay alternative won, was the final tally not an exact tie?
4. Did legislators have an opportunity to switch their vote? That is, did the speaker or presiding officer abide by the no-quick-gavel norm?

5. Did each legislator act rationally?

We are aware of only three roll-call votes in Congress in which a researcher claims that sophisticated voting occurred. These are (1) the Powell amendment to the 1956 Education Act (Denzau, Riker, and Shepsle, 1985); (2) the Armstrong amendment to the 1986 resolution in the U.S. Senate to allow the Senate to be televised (Calvert and Fenno, 1994); and (3) the override vote in the House on the 1989 attempt to increase the minimum wage (Volden, 1998). How do these roll calls stack up to the above five questions?

First, none of these roll calls produced a one-vote margin (question 3). Second, there is no evidence of a quick gavel on any of the roll calls (question 4). Consequently, on these roll calls either (i) position-taking and outcome preferences did not conflict (question 1 and 2) or (ii) legislators did not act rationally (question 5).

3.1. The Armstrong Amendment to Televised Senate Proceedings

It appears that (i) is the case on the Armstrong amendment—that legislators’ position-taking and outcome preferences did not conflict. As Calvert and Fenno note, “The Senate TV example provides an extreme case in which constituent relations were irrelevant to the issue at hand (1994, 373).” We agree with this statement, however, we disagree with one of the conclusions that Calvert and Fenno draw from it: “[T]here is much room for sophisticated voting on issues that lie somewhere between this inside-baseball extreme and the opposite extreme of highly public votes such as the Powell amendment.” In contrast, our results suggest that as long as legislators place some priority on constituency pressures—that is, they are not at the complete inside-baseball extreme—then there is no room for sophisticated voting.

3.2. The Powell Amendment

The Powell amendment presents a different story. On this roll call position-taking preferences clearly were important. Further, for some members these preferences conflicted their outcome preferences.

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8 The Powell amendment won 229-197. The Armstrong amendment passed 60-37. And the 1989 override attempt on the minimum wage failed 247-178, 37 votes short of the necessary two-thirds.
The vehicle for the Powell amendment was a bill, proposed in 1956 by the House Democratic leadership, that would extend federal funding to build schools. Adam Clayton Powell proposed an amendment that would disallow any of these funds to be spent on segregated schools. According to Denzau, Riker, and Shepsle (1985), the common wisdom of House members at the time was that the Powell amendment was a killer amendment; that is, the education-funding bill would pass if the Powell amendment was unsuccessful and fail if the Powell amendment was successful.

Let us label the amended bill as $a$, the unamended bill as $b$, and the status quo as $q$. Denzau, Riker, and Shepsle estimate that 132 House members ordered the alternatives $abq$. That is, they preferred $a$ over $b$ and $b$ over $q$. They call these legislators *Powellians*. In the roll call on the Powell amendment, the position-taking preferences of these legislators favored $a$, while their outcome preferences favored $b$. Denzau, Riker, and Shepsle estimate that 48 House members had the opposite preferences, ordering the three alternatives $qba$. Let us call this group the *Anti-Powellians*. Their position-taking preferences favored $b$ on the Powell-amendment roll call, while their outcome preferences favored $a$. Thus, the Dual Conflict assumption holds on this roll call. This means that we answer “no” to the first four questions above. If sophisticated voting really occurred, we must answer “yes” to question 5—that some legislators did not act rationally.

Denzau, Riker, and Shepsle discuss this possibility. Specifically, they note that the Anti-Powellians may have acted cooperatively, rather than each maximizing his or her individual utility function. For instance, they might have all agreed to vote the same way. Given this, they are better off if all of them vote (sophisticatedly) for the Powell amendment than if all of them vote (sincerely) against it. However, even if they adopt this strategy, some members of the group are not optimizing, and the group is not maximizing its collective payoff. To see this, note that the final vote on the Powell amendment was 229-197. Denzau, Riker, and Shepsle claim that all 48 of the Anti-Powellians voted in favor of the amendment. Note that 15 of them could change their vote and the measure would still pass. Each of

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9 We are assuming that the constituents (or other relevant observers) of these legislators also preferred $b$ over $a$, although Denzau, Riker, and Shepsle do not explicitly claim this. However, Denzau, Riker, and Shepsle claim that these legislators voted sophisticatedly, in favor of the amendment. If, instead, their constituents favored $a$ over $b$, then it does not make sense to call this sophisticated voting. Instead one could just say that this group of legislators were voting sincerely for their constituents’ wishes.
these members would improve their utility with such a switch. Further it would come at no cost to the other Anti-Powellians. Therefore it would improve the collective benefits of the group.

Although it is possible, and perhaps reasonable, to believe that the Anti-Powellians acted in such a cooperative, but non-optimizing, fashion, we think researchers should seriously consider the possibility that no legislator really voted sophisticatedly on this roll call. This conclusion is echoed by Krehbiel and Rivers (1990), who also question whether sophisticated voting occurred on this roll call, although for a different reason.\footnote{The main reason that Krehbiel and Rivers question sophisticated voting on the roll call is because they believe that the House rarely, if ever, allows agendas to arise that present an opportunity for sophisticated voting. They cite Austen-Smith's (1987) model of sophisticated sincerity as theoretical support for their conclusion. However, as we discuss later, this model cannot explain the Powell amendment. One implication of the Austen-Smith model is that each proposer only proposes alternatives that will defeat all existing proposals on the agenda. However, the Powell amendment could not defeat the status quo—indeed it lost to the status quo in the vote on final passage. Therefore, if the House members were really behaving according to the Austen-Smith model, none of them should have proposed the Powell amendment. Related, the agenda did not exhibit sophisticated sincerity. Because the Powell amendment was a killer amendment, legislators realized that "a vote for the amendment is really a vote for the status quo." If instead the agenda exhibited sophisticated, then instead "a vote for the amendment would indeed be a vote for the amendment as the final policy."}

A final thought about the Powell amendment involves the manner that the opportunity for sophisticated voting arose. Theories of sophisticated voting often portray such opportunities as being purposeful—that is, for instance, that the legislators who prefer to kill a bill are the ones who propose the killer amendment. However, if this were true, one of the Anti-Powellians would have proposed the amendment, not Powell himself. That the opportunity for sophisticated voting on this roll call was not purposeful is one more reason to question whether sophisticated voting really occurred on the Powell amendment.

The latter point serves as an additional challenge to researchers who believe that legislators frequently vote sophisticatedly. The classic example of sophisticated voting involves a killer amendment. However, as far as we are aware, no researcher has ever offered a case where the proposer of the amendment was one of the sophisticated voters—that is, someone who opposed the substance of the amendment, yet voted for it in order to kill the bill. If this has never happened, should we really believe that sophisticated voting is frequent?
3.3. The 1989 Increase to the Minimum Wage

Another roll call on which a researcher claims that sophisticated voting occurred is the override attempt to the minimum wage bill of 1989 (Volden, 1998). That year, Congress passed a bill to increase the minimum wage to $4.55 an hour. President Bush vetoed the bill, and the House attempted to override the veto. The vote on this attempt was 247-178, which was 37 votes short of the necessary two-thirds. Earlier, President Bush had vowed that $4.25 was the maximum bill that he would accept. After the veto override failed, Democratic leaders acquiesced to Bush’s demands, and they introduced a bill for $4.25 an hour. This passed the House and Senate, and Bush signed it into law.

Volden (1998) claims that sophisticated voting occurred on the override vote. Ostensibly, the vote was between the bill ($4.55) and the status quo ($3.35). However, sophisticated legislators would be able to see down the agenda tree and realize that a vote for the status quo would really be a vote for a $4.25 minimum wage, the eventual outcome. Consequently, if House members voted sincerely on the override attempt, then the cut point would be \$3.95 (\( \approx \frac{4.55 + 3.35}{2} \)). But if they voted sophisticatedly, then the cut point would be \$4.40 (\( \approx \frac{4.55 + 4.25}{2} \)). Volden collects a number of independent variables, and using revealed preferences from prior roll calls, he estimates the cut point on the override vote. His estimate allows one to reject the hypothesis that the true cut point equaled the sincere cut point.

On the override roll call at least two assumptions of our model seem to have been violated. One was the Dual Conflict assumption. To see this, note that only legislators who had ideal points between \$3.95 and \$4.40 had position-taking and outcome preferences that conflicted. Let us call these legislators moderates. These legislators preferred to vote for the bill; however, they preferred that the status quo win. However, no legislator has the opposite preferences. Thus, the “Dual” in the Dual Conflict assumption was violated. In fact, no legislators besides the moderates had conflicting preferences. For instance, if a legislator’s ideal point was greater than \$4.40, then he or she preferred the bill, \$4.55, whether the opposing alternative was \$3.35 or \$4.25. Consequently, both her outcome preferences and position-taking preferences favored the bill.

Since the Dual Conflict assumption was violated, our model does not apply. Therefore it is possible for sophisticated voting to take place on this roll call. However, even so, if
some legislators voted sophisticatedly, it is not clear that they were acting rationally on this roll call. Thus, the assumption related to question 5 may also have been violated. To see this, note that the override vote failed by 37 votes. Thus, no legislator was pivotal. Accordingly, any of the legislators who voted sophisticatedly could have changed his vote and strictly improved his utility. Such a change would have allowed him to vote for his preferred alternative (the bill) while still achieving his preferred outcome (that the bill lose). In fact, when preferences are aligned so that contingent legislators exist on only one side of the roll call (as in this roll call), then there are two equilibria: one where each legislator votes sincerely, and another where enough legislators vote sophisticatedly so that their side wins by a one-vote margin. The latter condition clearly did not occur on this roll call.\footnote{To explain the roll call Volden offers a model in which legislators have imperfect information, and therefore there exists a probability, strictly between zero and one, that the legislator will be pivotal. However, this ignores the fact that members of Congress are allowed to change their vote after seeing the votes of their fellow legislators. Therefore, as long as the no-quick-gavel norm is followed, all of these probability terms will be zero or one. Volden does not recognize this. Denzau, Riker, and Shepsle make a similar oversight in the theory section of their article.}

Consequently, although we do not question Volden’s result that the actual cut point for the roll call differed from the sincere cut point, we think it is possible that the reason for this discrepancy could be something besides sophisticated voting. For instance, one possibility is vote buying. That is, a coalition leader, such as President Bush, may have persuaded some legislators on this roll call to vote against the way that they would vote if they considered only the merits of the bill. As Groseclose and Snyder (1996) show, such a situation can cause the final tally not to be a one-vote margin.

4. Systematic Tests of Sophisticated Voting

The above three articles are the only studies of which we are aware that claim evidence of sophisticated voting in Congress. Each examines only one particular roll call; none of the articles is a systematic study of many roll calls.

Meanwhile, we three other studies do systematically examine a set of roll calls to determine the frequency of sophisticated voting. All three find little, if any, evidence of sophisticated voting.
The first systematic study is chapter 7 of Poole and Rosenthal’s (1997) book. They claim that one piece of evidence for sophisticated voting is a two-ends-against-the-middle coalition—that is, for example, a case where extreme conservatives and extreme liberals oppose moderates on a roll call. The notion follows a case such as the Powell amendment, where the legislators who voted for the amendment were (i) Powellites, who voted sincerely for the amendment, and (ii) Anti-Powellites, who voted sophisticatedly for the amendment, despite opposing the substance of the amendment.\footnote{Although it seems reasonable that sophisticated voting could produce a two-ends-against-the-middle coalition, as far as we are aware, no one has ever published a formal, rational-choice model where sophisticated voting causes such a coalition.} Poole and Rosenthal test this by altering their Nominate framework to estimate two cut points on each roll call instead of one cut point, as their original framework does. However, they conclude “that a two-point model cannot improve vote classifications beyond the amount expected from the random-error process assumed by D-NOMINATE (1997, 147).” Indeed, their study disclosed only one case, the Mathias amendment, that produced a two-ends-against-the-middle coalition. Accordingly, they conclude that “sophisticated voting is not pervasive in Congress (1997, 164).”

In the second study Wilkerson (1999) searches through speeches of members of Congress and records all cases where a member mentioned “killer amendment” or a similar phrase. Such instances occurred in a total of 76 proposals. He examines each for evidence of sophisticated voting. This included searching for anecdotal evidence in the Congressional Record and a systematic search to determine if any of the roll calls on these proposals produced a two-ends-against-the-middle coalition. He concludes that “successful killer amendments and identifiable strategic voting are extremely rare. In none of the cases examined could the defeat of a bill be attributed to adoption of an alleged killer amendment.”

In our view one of the most under-appreciated political-science papers of all time is Krishna Ladha’s (1994) “Coalitions in Congressional Voting.” In this article, Ladha examines eight years of roll call votes that are described in the annual CQ Almanac. He searches for cases where more than one amendment is proposed to a bill. He reads the text of the amendments, trying to discern if they can be ordered in terms of how conservative or liberal they are. He finds several cases where the ordering is unambiguous. For instance, suppose one amendment proposes to decrease taxes by $100 billion, while another proposes to de-
crease taxes by $200 billion. Or suppose that one amendment proposes to increase defense expenditures by $1 billion, while another increases defense expenditures by $3 billion. In both cases, the latter amendment is clearly more conservative than the former.

By reading the substance of the amendments, Ladha can specify the ordering of cutpoints on the roll calls for each amendment if legislators vote according to a sincere spatial model. Next, he uses Nominate scores and a probit-like procedure to estimate cut points for each roll call. He then observes if the estimated cutpoints of the amendments fit the order that is predicted by reading the text of the amendments.

Of the 140 roll calls that he examines, he finds that 137 fit the hypothesized order. Of the three cases that do not fit, two seemed to be caused by heavy lobbying by the White House. In the third case the two cutpoints of the roll calls in question were almost identical, and if only two senators had voted differently, the cutpoints would have fit the hypothesized order. Thus, in this fairly exhaustive study of many roll calls Ladha finds no clear evidence of sophisticated voting; the results are in “near perfect harmony” with the sincere spatial model.

One reason, we believe, that Ladha’s paper has not received the recognition it deserves is because Ladha does not explain how remarkable his results are. Namely, if killer amendments occur in more than in a trivial number of instances, and if legislators really vote sophisticatedly when given the opportunity, then we should have seen many violations of the hypothesized order of cutpoints.

To see this, consider the following example, where we have constructed an agenda that contains one amendment \( a_2 \) that kills a bill and another amendment \( a_1 \) that does not. To make the example more concrete, suppose the policy is a tax cut, expressed in billions of dollars per year, where the status quo is \( q = 0 \); the ideal point of the median legislator is \( m = 100 \); the proposed bill is \( b = 120 \); and the killer and non-killer amendments are \( a_2 = 250 \) and \( a_1 = 150 \). See Figure 1 for an illustration of these policies.

Assume that all legislators have Euclidean preferences. Thus, majority rule is transitive, and it gives the following relationships: \( b \succ a_1 \succ q \succ a_2 \), where “\( \succ \)” is defined as “is preferred by a majority to”.

Voting proceeds according to the usual rules in the U.S. House and Senate. First, the legislature considers \( a_1 \). At the time to vote, the presiding officer says “the question is on
the amendment.” This means that a yea vote is a vote for $a_1$, while a nay means that the legislator does not want to amend the bill—i.e. it is a vote in favor of $b$. If “the question” (i.e. $a_1$) is approved, then the next roll call pairs $a_2$ against $a_1$, whereas, if the question is defeated, then the next roll call pairs $a_2$ against $b$. Finally, in the third round the alternative that wins the second round is paired against $q$. Figure 2 illustrates the voting tree for this agenda. Note that it is not an amendment agenda in the sense that Austen-Smith (1987) uses the term. This is because both amendments are first-degree amendments. If instead, $a_2$ had been offered as a second-degree amendment (i.e. an amendment to amendment $a_1$ instead of as an amendment to the bill $b$), then the agenda would be called an amendment agenda.

In fact, none of the amendments in Ladha’s data set are second-degree amendments. Consequently, all the sets of roll calls that contain more than one amendment are not cases of an amendment agenda. Thus, Ladha’s lack of support for sophisticated voting cannot be explained by Austen-Smith’s model, since the latter model only applies to cases where alternatives are considered under an amendment agenda.13

In Figure 2 each node represents the ostensive alternative for each round of voting. Below the ostensive alternatives in parentheses are sophisticated equivalents. For instance, consider the four penultimate nodes of the tree, which have ostensive alternatives $a_2$, $a_1$, $a_2$, and $b$. At the two nodes where $a_2$ is the ostensive alternative, the sophisticated equivalent is $q$. This reflects the fact that $a_2$ is a killer amendment. Legislators realize that “a vote for $a_2$ is really a vote for $q$.” Since the ostensive alternative at these two nodes ($a_2$) differs from the sophisticated equivalent ($q$), legislators’ sincere and sophisticated strategies may differ. In terms of Austen-Smith’s (1987) model, the agenda does not exhibit sophisticated sincerity.

Now consider the roll call on the first round of voting, $a_1$ versus $b$. As Figure 2 illustrates, on this roll call the ostensive alternatives are identical to the sophisticated equivalents. Thus, each legislator votes for $a_1$ if and only if it is closer to his or her ideal point than $b$ is, and this is true regardless if he or she adopts a sophisticated or sincere strategy.

13 Another reason that Austen-Smith’s model cannot explain Ladha’s results is that in Austen-Smith’s model proposers only propose amendments that can defeat the bill that is on the agenda. However, in Ladha’s data set most of the the amendments lose to the bill that they are paired against.
Since $b$ is closer to the median's ideal point, it defeats $a_1$ in the first round. In Figure 3 we list the cutpoint for this roll call, $c_1$. It is the midpoint of $a_1$ and $b$. The next round of voting pairs $a_2$ against $b$. If legislators vote sincerely, then the cutpoint is $c_2$, the midpoint of $a_2$ and $b$. However, if legislators vote sophisticatedly, then the cutpoint is $c_2'$, the midpoint of $q$ and $b$. Thus, if legislators vote sophisticatedly, the cutpoint moves left compared to the cutpoint on the first roll call, even though the substance of the yea alternatives ($a_2$ versus $a_1$) moves right. It is very easy to derive theoretical examples such as this. Yet, Ladha finds no corresponding empirical cases such as this in his data. We find this very remarkable, and we think it is perhaps the most compelling evidence of all political-science research that sophisticated voting is very rare in Congress.

Next, if sophisticated voting really is common, not only should opposite-moving cutpoints appear in Ladha's data, there should also be instances of flipped coalitions. Here's what we mean by a flipped coalition: Consider the second roll call vote of the above example, and suppose that legislators vote sophisticatedly. Then all legislators who vote yea should be left-wing—specifically, all those to the left of $c_2'$ should vote yea. Meanwhile, the legislators who vote yea on the first roll call (regardless if they vote sophisticatedly or sincerely) are to the right of $c_1$. That is, between the first and second roll call, even though the yea alternative shifts right (from $a_1$ to $a_2$), and the nay alternative stays the same ($b$), the ideal point of the average yea voter shifts left.\(^{14}\) Yet, Ladha does not report a single instance of this phenomena. Such phenomena should be common if sophisticated voting occurs frequently. In our view this is extremely compelling evidence that sophisticated voting in Congress is rare and perhaps non-existent.

5. **Endogenous Agendas and Opportunities for Sophisticated Voting**

A frequent claim is that sophisticated voting rarely occurs in practice because party leaders and back-bench legislators have incentives to construct agendas that disallow opportunities for sophisticated voting. While compelling, this argument is orthogonal to our argument. That is, the two arguments are logically independent—it is possible that both are true, or both are false. Our main argument is that even if legislators are given the opportunity to

\(^{14}\) Rather than computing average ideal points of yea voters, another way that Ladha's results could reveal such occurrences is if the coefficient on the Nominate scores changes signs from the first roll call to the second.
vote sophisticatedly, they will not.

That said, however, a brief word should be mentioned about the poverty of this claim as an explanation for the lack of sophisticated voting in Congress. First, as far as we are aware, there has been only one attempt to model such a claim formally. This is Austen-Smith's (1987) famous article on "sophisticated sincerity." Although it is filled with brilliant theoretical insights, we question its relevance for explaining the lack of sophisticated voting in Congress. The problem is that the model contains implications that are clearly counterfactual, at least in the U.S. Congress. Namely, if proposers behave in the fashion that Austen-Smith assumes, then the agenda will have the following special property: All later-proposed alternatives will defeat all earlier-proposed alternatives. This means that the legislator who is recognized to introduce a bill will propose an alternative that can defeat the status quo; the legislator who is recognized to introduce the first amendment will propose an alternative that can defeat the bill and the status quo; if a legislator is recognized to propose a second-degree amendment, then he or she will choose an alternative that can defeat the first-degree amendment, the bill, and the status quo; and so on. Clearly, this is not an accurate description of the U.S. House or Senate. Almost daily, bills and amendments are defeated in Congress.¹⁵

Second, the classic opportunity for sophisticated voting is when the legislature considers a killer amendment. As we discussed earlier, Wilkerson (1999) identifies a sample of 76 proposals that were called a "killer amendment" by at least one legislator. In contrast to the above claims, only rarely did the legislature disallow a roll call vote on such proposals. Of the 76 alleged killer amendments, 47 were allowed an up-or-down vote. Only 22 were defeated by a procedural motion, as the above claim would predict. (Three were withdrawn, and four were modified after being called a killer amendment.) And even some of the procedural

¹⁵ There are other ways in which Austen-Smith's model is orthogonal to our model. First, unlike our model, Austen-Smith's model constructs an endogenous agenda. Our model's agenda is formed exogenously. Further, since there is only one roll call vote in our model, it is not clear if one should even say that an agenda exists in our model at all. Another way that the two models are orthogonal is that Austen-Smith's model assumes that if a legislator's sophisticated strategy differs from his or her sincere strategy, then he or she will choose the sophisticated strategy. The main result of our model implies the opposite. Consequently, if the proposers in Austen-Smith's model assumed that legislators would vote as they do in our model, then these proposers would not necessarily construct an agenda that exhibits sophisticated sincerity.
motions really should be interpreted as an opportunities for sophisticated voting. Namely, if the amendment was “tabled,” Wilkerson called this a “procedural motion.” But a vote on tabling a motion is identical to a vote on the motion itself—except the meanings of a “yea” and “nay” vote are reversed. Thus, in this systematic study of opportunities for sophisticated voting, in the overwhelming majority of the cases the legislature did not block such opportunities.

Third, it is not clear that rational party leaders—or a rational median legislator—would really want to squash all opportunities for sophisticated voting. To see this, consider the following example, which we illustrate in Figure 4. The status quo is slightly to the left of the median legislator, and the median legislator proposes his own ideal point as a bill. Now consider a far-right legislator who writes an amendment equal to his own ideal point. Although this legislator understands that his proposal will lose, there are many reasons why he might still want to propose the amendment. One is position-taking. Another is blame-game politics (Groscolas, 1995; Groscolas and McCarty, 2001)—that is, he may want to show that his legislative opponents voted against a proposal that voters desire. Now, before considering whether the legislature would want to allow a vote on the amendment, let us consider the outcome that would occur if the legislature did allow a vote. First, note that if legislators vote sincerely, then the amendment loses to the bill. Second, let us suppose that the legislators instead vote sophisticatedly. If so, they realize that if the amendment defeats the bill, then the amendment will lose in the second round to the status quo. Thus, the legislators realize that “a vote for the amendment is really a vote for the status quo.” Hence, this is a bona fide case where legislators’ sincere strategies can differ from their sophisticated strategies. Now, if legislators vote sophisticatedly, then in the first round of voting, the legislators vote for the amendment if and only if they prefer the status quo to the bill. But note that a majority prefer the bill to the status quo. Thus, regardless if the legislators vote sincerely or sophisticatedly, the amendment loses in the first round, and the bill is the final policy. From a policy standpoint, no one in the legislature will care if the amendment is introduced or not. Thus, none of the legislators should oppose this opportunity for sophisticated voting.
6. Implications for Agenda-Setting Bodies and Pivotal Politics

The preceding sections, in our view, gives strong reasons—both empirical and theoretical—to cause one to question whether sophisticated voting really exists in Congress and other legislatures. But even if this is true, does it really matter? To address this question we consider the implications of a world where legislators cannot vote sophisticatedly. We think that scholars have not considered the full ramifications of such a world.

One of the most important, and perhaps surprising, ramifications involves the behavior of an agenda-setting body, such as a committee that proposes a bill under a closed rule to the floor. A host of theoretical studies assume that if the conditions of Black’s median voter theorem are satisfied, then such a body will behave as if it is a single person. However, this is not true if the members of the body cannot vote sophisticatedly. Instead, the body can only propose the ideal point of its median member. In contrast, dozens of political models make the opposite assumption, that the body can behave strategically, like a single person. This includes not only models of congressional committees; it also includes models of the presidential veto (where Congress is the agenda-setting body and the president votes on its proposal), judicial politics (where, say, the Supreme Court chooses a policy—not equal to its median’s ideal point—so that Congress and the president cannot overturn it) and the co-decision procedure in EU politics (where the European Council proposes a policy that the European parliament must vote up or down). Also, it includes Krebbs’s Pivotal Politics model (where the floor acts as an agenda setting body, proposing a bill to a pivot legislator (such as the filibuster pivot or the veto override pivot).

To demonstrate this principle, we consider an example of Krebbs’s Pivotal Politics model. Suppose Congress is considering a minimum-wage bill, and suppose the status quo is $5.35 an hour. Next, suppose that the most conservative senator has an ideal point of $5.01 an hour, the next-most conservative senator has an ideal point of $5.02 an hour, and so on, where the most liberal senator has an ideal point of $5.99 an hour. (For simplicity, suppose there are only 99 senators.) Thus, the median ideal point of the Senate is $5.50 an hour. Suppose the president and the median of the House have ideal points greater than the median senator’s.

If the amended bill of the Senate raises the minimum wage, then any senator with an ideal point below $5.35 has an incentive to filibuster. To break the filibuster, the Senate must
invoke cloture, which requires a vote of 60 senators. Thus, an increase in the minimum wage will pass if and only if the senators with ideal points in \([5.40, 5.99]\) prefer it. Therefore, an increase will pass if and only if the senator with ideal point 5.40 prefers it to the status quo. This senator is called the pivot player in the Senate. (See Figure 5.) In Krehbiel's model, the median of the Senate acts as a Romer-Rosenthal agenda setter, proposing a bill of $5.45 an hour. This bill is optimal since it makes the pivot indifferent between it and the status quo. In equilibrium, the pivot agrees to the bill, and this is the final policy outcome.

However, if senators cannot vote sophisticatedly, then $5.45 will not be the bill that the senate proposes to the pivot, and therefore it will not be the policy outcome. To see this, suppose that the senate did propose this to the pivot. Then at the amendment stage—before the pivot considers the proposal—one of the conservative senators could propose that it be amended to $5.46. \(^\text{16}\) (See Figure 6.) This amendment would kill the bill, since the pivot prefers the status quo to the amended bill of $5.46. Thus, liberal senators, recognizing that the $5.46 amendment would kill the bill, have an incentive to vote sophisticatedly for $5.45. All senators with ideal points in \([5.40, 5.99]\) would have outcome preferences for $5.45, and all senators with ideal points in \([5.01, 5.39]\) have outcome preferences for $5.46. Meanwhile, all senators with ideal points in \([5.01, 5.45]\) have position-taking preferences for $5.45, and all those with ideal points in \([5.46, 5.99]\) have position-taking preferences for $5.46. Not only is there one contingent-a legislator, there are 39: all senators in \([5.01, 5.39]\) have outcome preferences for $5.46 but have position-taking preferences for $5.45. Also, there is not just one contingent-b legislator, but 54—all senators with ideal points in \([5.46, 5.99]\) are this type of voter. Therefore, as Proposition 1 implies, the only equilibrium is for all senators to vote their position-taking preferences. This implies that $5.46 defeats $5.45. However, when it is paired against the status quo, the senators with ideal points in \([5.01, 5.40]\) can execute a cloture-proof filibuster.

In fact, if the status quo is in \((5.30, 5.50)\), then no bill can defeat it in equilibrium. If the bill is such that the filibuster-pivot prefers it to the status quo, then a senator can

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\(^{16}\) This story requires a senator to propose sophisticatedly. One might ask: if senators cannot vote sophisticatedly, why can they propose sophisticatedly? However, there is an asymmetry between voting and proposing. To have sophisticated proposing, all one needs is one senator who places zero weight on position-taking preferences. To have sophisticated voting one needs all senators to place zero weight on their position-taking preferences.
propose that it be amended to the median's ideal point. When the senators vote their position-taking preferences, the amendment must win. Therefore, the only time the senate can change the status quo is when the filibuster pivot prefers the median ideal point ($5.50) to the status quo. This is only true if the status quo is to the left of $5.30.

Krehbiel defines the *gridlock interval* as the set of status quo points that cannot be overturned in equilibrium. For the above example, ($5.30, $5.50] forms the left-side gridlock interval. Of course this is computed by assuming (as Proposition 1 implies) that legislators do not vote sophisticatedly. In Krehbiel's original model, he assumed that legislators can vote sophisticatedly. This would imply a left-side gridlock interval of [$5.40, $5.50]. In fact, this example generalizes to any case where legislators have single-peaked and symmetric preferences in one dimension: If legislators cannot vote sophisticatedly, Krehbiel's gridlock intervals double in size.

7. Discussion

Our theory has many testable implications. First, since it implies that sophisticated voting should be rare, any of the existing tests for sophisticated voting—such as those by Ladha (1994), Poole and Rosenthal (1997), and Wilkerson (1999)—also apply to our theory. Further, because we build a formal model to generate our result, our theory contains additional testable implications. One such implication comes from a careful read of our proof of Proposition 1. It implies not only that all legislators should vote their position-taking preferences, it also implies that no roll call votes, in equilibrium, should produce a one-vote margin. Of course, the assumptions of our model will not always be satisfied—for instance, legislators' preferences doubtless will not always satisfy the Dual Conflict assumption. However, the assumptions should be satisfied some of the time, perhaps usually. Further, they are more likely to be satisfied on amendments than the final passage of a bill, since these roll calls provide greater opportunities for sophisticated voting. As a consequence, it is reasonable to infer from our theory that (i) on roll call votes on amendments, one-vote margins should occur less frequently than, say, three- or five- or seven- vote margins, and (ii) one-vote margins should occur less frequently on amendment roll calls than final-passage roll calls.

Yet another set of implications come from the rules that we assume that the legislature adopts. As we show in Appendix II, if instead the legislature voted in a pre-specified
order, and legislators were not allowed to change their votes, then our model predicts that sophisticated voting should be more frequent. Likewise, roll calls in such legislatures should produce more one-vote margins. Similarly, we conjecture that when a legislature uses a secret ballot, as the Italian Parliament sometimes does, then sophisticated voting and one-vote margins should be more frequent.

Finally, our theory has some policy implications. In general it implies that the status quo in a separation-of-powers system is more privileged than nearly all previous formal models imply. For instance, our theory implies that the gridlock intervals of Krehbiel’s Pivotal Politics model should be double the size that Krehbiel reports. Perhaps even more interesting, our model also implies that if the U.S. House and Senate would change their rules—specifically, to disallow legislators to change their votes—then this would cause the status quo to be less privileged.
8. Appendix I: Non-technical presentation of Proposition 1

Suppose a legislature is considering a bill, similar to the Freedom of Choice Act of 1993, that basically codifies *Roe v. Wade.*\(^{17}\) Suppose a legislator introduces an amendment that would legalized what opponents of the procedure call "partial-birth" abortions—that is, the amendment would make the bill more strongly pro-choice. Suppose, however, that this is a killer amendment; if it passes, it will cause the bill to be defeated by the status quo.

Let us consider the possible strategies of an extreme pro-choice legislator, Patricia Schroeder, and an extreme pro-life legislator, Henry Hyde. Assume that Henry Hyde, if he is pivotal, prefers to vote (sophistically) for the amendment, so he can kill the bill. However, if he is not pivotal, he prefers to vote (sincerely) against the amendment, to demonstrate his pro-life ideology to his constituents. Assume that Patricia Schroeder has the opposite preferences. That is, if she is pivotal, she prefers to vote (sophistically) against the amendment. However, if she is not pivotal, she prefers to vote (sincerely) for the amendment, to demonstrate her pro-life preferences to her constituents.

The technical assumptions that we make have the following substantive implications.

A. All legislators, after seeing the votes of their fellow legislators, do not want to switch votes. That is, all legislators are free to change their vote indefinitely, and the speaker cannot bang the gavel until everyone is satisfied with how they vote.

B. If any legislator is pivotal, the final tally must be a one-vote margin.

C. Only legislators on the winning side are pivotal. (If a legislator is on the losing side, he or she can switch votes without changing the outcome.)

D. Therefore a legislator is pivotal if and only if he or she is on the winning side of a one-vote margin.

E. If Patricia Schroeder is pivotal, she wants to vote against the amendment. If she is not, she wants to vote for the amendment.

F. If Henry Hyde is pivotal, he wants to vote for the amendment. If he is not, he wants to vote against the amendment.

The following is an informal proof of why there cannot be an equilibrium where any legislator votes sophisticatedly. To prove the result, assume the opposite, that at least one legislator votes sophisticatedly.

\(^{17}\) Some opponents, however, claimed that the bill would provide more liberal abortion rights than *Roe,* such as disallowing states to impose parental notification (1993 CQ Almanac, p. 349).
1. Since a legislator votes sophisticatedly, the roll call on the amendment must be decided by a one-vote margin.

2. Suppose the amendment wins. (A similar proof can be made if we suppose the amendment loses. But we replace all the following occurrences of Schroeder with Hyde.)

3. Suppose Schroeder votes for the pro-choice amendment. This means that she is on the winning side, and hence she is pivotal. But if she is pivotal she prefers to vote against the amendment. Therefore there cannot be an equilibrium in which she votes for the amendment.

4. Suppose Schroeder votes against the amendment. This means she is voting on the losing side; hence she is not pivotal. But if she is not pivotal she prefers to vote for the amendment. Therefore there cannot be an equilibrium in which she votes against the amendment.

5. This shows that if the pro-choice amendment wins by one vote, then Patricia Schroeder cannot be voting optimally (nor can any other legislator with similar preferences). Therefore there cannot be an equilibrium where the pro-choice amendment wins by one vote.

6. A similar argument shows that there also cannot be an equilibrium where the pro-choice amendment loses by one vote.

7. Therefore there cannot be an equilibrium where the roll call results in a one-vote margin. Therefore, no legislator can be pivotal. Hence, no legislator can vote sophisticatedly.

9. **Appendix II: Equilibria When the Legislators Vote Sequentially**

As a comparison to our main result, we examine an alternative model where the legislators vote sequentially. In this model an exogenous order for voting is common knowledge to all the legislators. Legislators are not allowed to pass nor allowed to change their vote.\(^{18}\) We seek to characterize subgame-perfect equilibria when some legislators have position-taking preferences that differ from their outcome preferences. It turns out that there is a unique equilibrium to the game.

Let legislator \(n\) be the first voter, \(n - 1\) the second voter, and so on. Define \(s(j)\) as the *strength* of alternative \(a\) when it is legislator \(j\)’s turn to vote. It equals the margin by

\(^{18}\) As we mention in the text, Congress sometimes adopts a procedure where members vote in alphabetical order. However, they are allowed to pass, and they are allowed indefinite opportunities to change their vote. As a consequence, the simultaneous model, examined in the text, is the appropriate model for that process, not the model we examine here.
which \( a \) wins if every remaining legislator votes as if he or she is pivotal. Formally,

\[
s(j) = \text{Total votes for } a \text{ after legislator } j + 1 \text{ votes} \\
- \text{Total votes for } b \text{ after legislator } j + 1 \text{ votes} \\
+ \text{Remaining dominant--} a \text{ legislators after legislator } j + 1 \text{ votes} \\
- \text{Remaining dominant--} b \text{ legislators after legislator } j + 1 \text{ votes} \\
+ \text{Remaining contingent--} a \text{ legislators after legislator } j + 1 \text{ votes} \\
- \text{Remaining contingent--} b \text{ legislators after legislator } j + 1 \text{ votes}
\]

It is worthwhile to note some properties of \( s(j) \). First, \( s(0) \) equals \( a \)'s margin of victory after the final round of voting. Second, since \( n \) is odd, \( s(j) \) is odd, for all \( j \). Finally, if a contingent--\( a \) or dominant--\( a \) legislator votes for \( a \), the strength of \( a \) does not change—that is \( s(j - 1) \) has the same value as \( s(j) \). The strength of \( a \) changes only if one of these legislators votes for \( b \) (in which case it decreases) or if a contingent--\( b \) or dominant--\( b \) legislator votes for \( a \) (in which case it increases).

The following proposition shows that \( a \) wins if and only if the strength of \( a \) is positive before the first round of voting. That is, \( a \) wins if and only if the dominant--\( a \) and contingent--\( a \) legislators outnumber the dominant--\( b \) and contingent--\( b \) legislators. This contrasts starkly with the simultaneous game, where \( a \) wins if and only if the dominant--\( a \) and contingent--\( b \) legislators outnumber the dominant--\( b \) and contingent--\( a \) legislators.

**Proposition 3:** Alternative \( a \) wins if and only if \( s(n) > 0 \).

To prove the proposition it is useful to construct the following definitions.

Let \( P_j \) be the statement “If legislator \( j \) is a contingent--\( a \) legislator, then he or she votes for \( a \) if and only if \( s(j) = 1 \); and if legislator \( j \) is a contingent--\( b \) legislator, then he or she votes for \( b \) if and only if \( s(j) = -1 \).”

Let \( Q_j \) be the statement “\( P_i \) is true for all \( i \leq j \).”

**Lemma 2:** \( Q_n \) is true.

**Proof:** We use induction to prove the lemma. First, note that \( Q_1 \) follows trivially: If legislator 1 is a contingent--\( a \) legislator, then he or she votes for \( a \) if and only if he or she is pivotal. But he or she is pivotal if and only if \( s(1) = 1 \). For the same reason, if legislator 1 is a contingent--\( b \) legislator, then he or she votes for \( b \) if and only if \( s(1) = -1 \).
Next, assume that \( Q_j \) is true. We show that this implies that \( Q_{j+1} \) is true. First, note that after legislator \( j+1 \) votes, if \( s(j) \geq 1 \), then \( s(k) \geq 1 \), for all \( k \leq j \). That is, if the strength of \( a \) is positive when there are \( j \) more voters, then the strength will remain positive throughout the remaining rounds of voting. To see this, suppose not. Then at some round, \( s(k) \) decreases from 1 to \(-1\). (That is, \( s(k) = 1 \) and \( s(k-1) = -1 \).) By definition, \( s(k) \) cannot decrease in value if legislator \( k \) is contingent-\( b \) or dominant-\( b \). Next, since a dominant-\( a \) legislator necessarily votes for \( a \), voter \( k \) cannot be a dominant-\( a \) type. This implies that voter \( k \) is contingent-\( a \). But, since \( s(k) = 1 \), \( Q_j \) implies that \( k \) must vote for \( a \), which means \( s(k-1) \) remains at 1, a contradiction. A similar argument shows that after \( j+1 \) votes, if \( s(j) \leq -1 \), then \( s(k) \leq -1 \), for all \( k \leq j \). Next, suppose that legislator \( j+1 \) is a contingent-\( a \) legislator. The preceding argument implies that he or she can affect the outcome if and only if \( s(j+1) = 1 \). (If \( s(j+1) \geq 3 \), then \( s(j) \geq 1 \), no matter how \( j+1 \) votes. And if \( s(j+1) \leq -1 \), then \( s(j) \leq -1 \), no matter how \( j+1 \) votes.) Therefore, \( j+1 \) votes for \( a \) if and only if \( s(j+1) = 1 \).

A similar argument shows that if \( j+1 \) is continent-\( b \), then he or she votes for \( b \) if and only if \( s(j+1) = -1 \). This establishes \( Q_{j+1} \). By law of induction, \( Q_n \) is true.

Proof of Proposition 3: By the lemma, if the strength of \( a \) is positive in any round of voting, then it remains positive for all remaining rounds. Likewise, if the strength is negative in any round of voting, then it remains negative. Thus, \( s(0) > 0 \) if and only if \( s(n) > 0 \). That is, \( a \) wins if and only if \( s(n) > 0 \).

Lemma 2 characterizes the voting strategies of contingent legislators. Contingent-\( a \) types vote for \( a \) if and only if the strength of \( a \) is 1 when it is their turn to vote. Contingent-\( b \) types vote for \( b \) if and only if the strength of \( a \) is \(-1 \). Further, these are the unique subgame-perfect strategies of these legislators.

Proposition 3 provides a simple method to determine which alternative is the winning outcome: One simply counts how each legislator would vote if he or she were pivotal. This gives a stark contrast to the simultaneous game, where instead the winner is determined by counting how each legislator would vote if they were not pivotal. Thus, loosely speaking, in the simultaneous game position-taking preferences are all important, while in the sequential game position-taking preferences are inconsequential.\(^{19}\)

We should note that, although the winning alternative is determined by treating all contingent-\( a \) legislators as if they were certain to vote for \( a \), they do not all necessarily vote this way. When it is their turn to vote, if they can vote for \( b \) and still be assured

\(^{19}\) The statement is literally true (and does not need the "loosely speaking" caveat, if all legislators place greater weight on their outcome preferences than their position-taking preferences—that is, if \( |\lambda_i| < 1 \) for all \( i \). In contrast, if \( \lambda_j < -1 \), for some \( j \), then this legislator prefers to vote her position-taking preferences, even if she is pivotal. Here position-taking preferences are consequential in determining the winner of the sequential game.
that \( a \) will win, they vote for \( b \). As the following two examples show, the order of voting crucially affects how these legislators vote. In both examples there are nine legislators and their preferences are the same in each example. All that differs is the order of voting. While alternative \( a \) wins in both examples, the final tally differs in the two examples. The reason is that in Example 2 some of the contingent-\( a \) legislators can afford to vote their position-taking preferences, since they realize that \( a \) still wins, even without their help.

**Example 1.** Suppose that there are nine legislators. Legislators 1-4 are contingent- \( b \) types, and legislators 5-9 are contingent-\( a \) types. (Recall that legislator 9 votes first, then legislator 8, and so on.) The equilibrium is for all five contingent-\( a \) legislators to vote for \( a \). Then all four contingent-\( b \) legislators vote for \( a \) as well. Note that \( s(j) = 1 \) in each of the first five rounds of voting (when legislators 9, 8, 7, 6, and 5 vote). Therefore, they each vote (sophistically) for \( a \). Once it is time for a contingent-\( b \) legislator to vote, \( a \) has already won. Therefore, all of these legislators can vote their position-taking preferences. The final tally is 9-0 in favor of \( a \).

**Example 2.** Now reverse the order. Suppose that legislators 6-9 are contingent- \( b \) types, and legislators 1-5 are contingent-\( a \) types. In the first round of voting, \( s(9) = 1 \). Since \( s(9) \neq -1 \), legislator 9 votes (sincerely) for \( a \). This makes \( s(8) = 3 \). Again, this is not equal to \(-1\), so legislator 8 votes (sincerely) for \( a \). Legislators 7 and 6 vote the same way, so the tally is 4-0 in favor of \( a \) when it is legislator 5's turn to vote. At this point \( s(5) = 9 \), so legislator 5 votes (sincerely) for \( b \). This makes \( s(4) = 7 \), which allows legislator 4 to vote (sincerely) for \( b \). Legislators 3 and 2 vote the same way. Consequently, when it is legislator 1's turn to vote, the tally is 4-4, and \( s(1) = 1 \). At this point legislator 1 votes (sophistically) for \( a \). Thus, like Example 1, \( a \) wins. But unlike Example 1, the final tally is 5-4.
References


Figure 1. Illustration of Ladha's Study

Figure 2. Voting Tree for the Alternatives in Figure 1

Figure 3. Cutpoints Under Sincere and Sophisticated Voting

Note: $c_1$ is the cutpoint on the first roll call, regardless if legislators adopt a sincere or sophisticated strategy. $c_2$ is the cutpoint on the second roll call if legislators adopt a sincere strategy. $c'_2$ is the cutpoint on the second roll call if they adopt a sophisticated strategy.
Note. The median legislator proposes a bill, $b$, equal to his own ideal point. The status quo, $g$, is to the left of the bill, which is to the left of the amendment, $a$. The legislators have symmetric preferences and $a$ is further from the median's ideal point than $g$. Thus $a$ is a "killer amendment." If it defeating $b$ in the first round of voting, then it would lose to $g$ in the next round.
Figure 5. Krebs'el's Pivotal Politics Model (When Legislators Vote Sophisticatedly)

5.35  5.40  5.45  5.50
status quo  filibuster pivot  equilibrium bill  median
Figure 6. Krebsiel’s Pivotal- Politics Model when Legislators Cannot Vote Sophisticatedly.

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Legislators whose outcome preferences favor the amendment (since it kills the bill).

Legislators whose outcome preferences oppose the amendment (since it kills the bill).

Legislators whose position-taking preferences oppose the amendment.

Legislators whose position-taking preferences favor the amendment.

Contingent-a legislators

Dominant-b legislators

Contingent-b legislators

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Note. The figure illustrates legislators’ position-taking and outcome preferences when the amendment (§ 5.46) is paired against the bill (§ 5.45). Note that there are several contingent-a legislators and several contingent-b legislators. Hence, the Dual Conflict assumption is satisfied. Accordingly, Proposition 1 implies that the only possible equilibrium is where all legislators vote sincerely, which implies that the amendment defeats the bill in the first round of voting.