

UNBUNDLING POLARIZATION

NATHAN CANEN

Department of Economics, University of Houston

CHAD KENDALL

Marshall School of Business, University of Southern California

FRANCESCO TREBBI

Vancouver School of Economics, University of British Columbia, Canadian Institute for Advanced Research,
and National Bureau of Economic Research

This paper investigates the determinants of political polarization, a phenomenon of increasing relevance in Western democracies. How much of polarization is driven by divergence in the ideologies of politicians? How much is instead the result of changes in the capacity of parties to control their members? We use detailed internal information on party discipline in the context of the U.S. Congress—whip count data for 1977–1986—to identify and structurally estimate an economic model of legislative activity in which agenda selection, party discipline, and member votes are endogenous. The model delivers estimates of the ideological preferences of politicians, the extent of party control, and allows us to assess the effects of polarization through agenda setting (i.e., which alternatives to a status quo are strategically pursued). We find that parties account for approximately 40% of the political polarization in legislative voting over this time period, a critical inflection point in U.S. polarization. We also show that, absent party control, historically significant economic policies would have not passed or lost substantial support. Counterfactual exercises establish that party control is highly relevant for the probability of success of a given bill and that polarization in ideological preferences is more consequential for policy selection, resulting in different bills being pursued.

KEYWORDS: Political economy, U.S. Congress, voting, legislatures, political parties.

1. INTRODUCTION

WE FOCUS ON A SET OF OPEN QUESTIONS in the political economy literature on political polarization, a phenomenon that has taken a sharply increasing tack since the mid-1970s in the United States.¹ Other OECD countries have experienced similar trajectories recently, and deeply antagonistic political environments are commonplace across Western Europe today. To many observers, polarization has been linked to heightened policy uncertainty over government spending, regulation, and taxes, with consequences for the pricing of financial assets and sovereign debt market volatility (Baker, Bloom, Canes-Wrone, Davis, and Rodden (2014), Baker, Bloom, and Davis (2016), Pastor and Veronesi (2012), Kelly, Pástor, and Veronesi (2016)). Critically, this segmentation of legislatures

Nathan Canen: ncanen@uh.edu

Chad Kendall: chadkend@marshall.usc.edu

Francesco Trebbi: francesco.trebbi@ubc.ca

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¹For discussions of political polarization in the electorate and U.S. Congress, see for instance Gentzkow (2016), McCarty, Poole, and Rosenthal (2006).

across party lines may be the result of more than just exogenous shifts in the ideologies of elected representatives. The goal of this paper is to present a credibly identified method for unbundling polarization in votes into its constituent determinants: polarization in ideologies and party control. We also quantitatively analyze the differential effects of these underlying mechanisms on expected equilibrium policy outcomes in the U.S. Congress.

A first question is how much of political polarization in votes is the result of more ideologically polarized legislators and how much is due to party leaderships forcing rank-and-file members to toe the party line.² The question of whether or not the current political polarization in Congress can be solely attributed to changes in the ideological composition of the legislative chambers, for example, due to the progressive replacement of moderate representatives with extreme ones,³ remains unsettled (Theriault (2008), Moskowitz, Rogowski, and Snyder (2017)).⁴ Political parties, through changes in institutional rules and in their system of internal leadership, may have contributed to polarization in votes across party lines by allowing parties to more effectively steer members in support of strategically set agendas.⁵

A second question is how polarization in the legislature affects the policies that are pursued. Polarization may affect not only the details of the bills proposed, but also which status quo policies are contested in the first place (and which are instead left unpursued). Policy alternatives, including tax cuts, healthcare reforms, trade policy or tariffs bills, are endogenous and presented strategically based upon the likelihood that a given proposal will pass. The different drivers of polarization may affect the policy alternatives chosen *ex ante* by the agenda setter, who, based on how the equilibrium probability of bill passage varies, may respond differently to changes in the technology of party control relative to shifts in the ideological composition of fellow legislators.

The first contribution of this paper is to provide an economic model of legislative activity for a two-party system. The model is designed to capture strategic considerations on multiple nested dimensions. The first dimension is which issues (and for a given issue,

²See Ban, Moskowitz, and Snyder (2016) for a discussion of whether political polarization is the result of better internal enforcement by party leaders.

³Following a large literature in ideal point estimation, we consider a politician's ideology to be fixed. In this context, polarization in ideologies can only be driven by replacement.

⁴To answer this question, one must first deal with the primitive problem of assessing the ideal points of politicians, a long-standing issue in the political economy and political science scholarship focused on the behavior of national legislatures (Levitt (1996), Poole and Rosenthal (2001), McCarty, Poole, and Rosenthal (2006), Mian, Sufi, and Trebbi (2010)). Showing where politicians' preferences are located, absent any equilibrium disciplining by parties on floor votes, requires recovering the unbiased distribution of within-party individual ideologies, a problem subject to severe identification issues (Krehbiel (2000), Snyder and Groseclose (2000)). Levitt (1996) specifically offered an early decomposition of Congressional voting focused on isolating individual ideology from other determinants of the voting decision.

⁵Seminal work from Cox and McCubbins (1993, 2005), and Aldrich (1995) emphasizes the importance of parties for the functioning of Congress. They focus on how parties use the available institutions to coordinate and set policies to their benefit, as well as how party leaders work toward their goals with their party members. Cox and McCubbins emphasized institutional mechanisms by which majority parties get their policies on the floor, blocking the minority's policies. The incentives to do so include the "brand" value of a party, increasing reelection chances for politicians, the coordination of votes and of policies legislators may be unsure of and setting policy positions. Evidence from attendance rates and transcripts from party caucuses as in Forgette (2004) has shown that these policy positioning and agenda-setting mechanisms are present and affect legislative roll call voting. Aldrich (1995) and his Conditional Party Government theory proposed that parties play an important role in pushing policies of interest to the rank and file. Lawrence, Maltzman, and Smith (2006), instead, focused on implications of agenda selection models. Economists such as Caillaud and Tirole (2002) have also taken a similar stance to party organization, emphasizing internal control issues, but with a focus on electoral success.

which specific policy alternatives) are selected by proposing parties. Policies that are not sufficiently valuable vis-à-vis a specific status quo, or too difficult to pass given the extant chamber composition, may not be pursued at all. The second dimension is whether or not, once a certain alternative to a status quo is proposed, the leadership decides to invest in acquiring extra information about the prospects of that specific policy alternative (i.e., “*to whip count*” a bill). Policies that appear unpromising once more information is acquired may not be pursued further (i.e., not brought to the floor for an official vote). The 2017 repeal attempt of the Affordable Care Act is a salient example. A third dimension for consideration is, if a bill is eventually brought to the floor for a vote, which legislators can be disciplined (i.e., “*whipped*”) in order to maximize the likelihood of passage. As our economic model formalizes, member voting decisions (the observable output of the model) are ultimately endogenous to all of these previous phases of the process. Quantitative approaches based on sincere voting or abstracting from party control, as in the vast majority of the political economy literature, overlook these important dimensions.

The second contribution of the paper is empirically unbundling the multiple elements of this process. We identify and estimate our model structurally. We are able to resolve the identification problems previous researchers have faced thanks to the use of new data that supplements standard floor voting (“*roll call*”) information, thus decoupling true individual ideological positions (before any party control is exerted) from party discipline targeted toward members on the fence of support for a bill.⁶ We make use of a complete corpus of whip count votes compiled from historical sources by Evans (2018) for the U.S. House of Representatives. Whip counts are private records of the voting intentions of party members, used by party leaders to assess the likelihood of success of specific bills under consideration before they are voted.⁷ Our sample period includes the 95th to 99th Congress (years 1977 to 1986). These Congresses occur at the inflection point of contemporary U.S. polarization dynamics (McCarty, Poole, and Rosenthal (2006)), allowing us to observe how ideological differences across parties and party discipline evolve over this critical time period. Section 2 presents background information on the whip system and institutional context useful for the framing of our model.

Members’ responses at the whip count stage are useful for recovering the true ideological positions of politicians *before* party control is exerted. Our argument is three-fold. First, the information revelation value of whip counts resides in the repeated interaction between members and the leadership, limiting the ability of rank-and-file politicians to systematically lie or deceive their own party leaders. These interactions are frequent and

⁶The main difficulty lies in being able to compare outcomes with parties to those without. In a series of works, Keith Krehbiel (Krehbiel (1993, 1999, 2000)) has argued that the previous literature failed to address the confounding issues of whether parties are effective, or whether they are only a grouping of like-minded politicians. This identification problem comes from using outcomes such as roll call votes, party cohesion, or party unity scores that are a combination of politician preferences and of party effects. Moreover, politicians from the same party are likely to share similar ideologies, so could be voting in the same way regardless of party discipline. The paradox, as stated by Krehbiel (1999), is that parties appear strongest when members are most homogeneous ideologically (and hence, when parties are needed the least). That, in turn, leads to an empirically difficult problem: how does one separate individual ideology measurements from party effects? In particular, how does one estimate party effects when ideology measures confound both parties and individual ideologies?

⁷The data structure of whip counts has been explored occasionally in the past, as in the works of Ripley (1964) and Dodd (1979) using limited self-collected data. In the context of parties and party discipline, Burden and Frisby (2004) look at 16 whip counts and their roll calls and find that most of the switching of votes has gone in the direction of party leaders. Evans and Grandy (2009) also use whip counts, and provide an extensive survey of whipping in the U.S. Congress, drawing attention to historical examples.

the stakes are typically high. Second, by a revealed preference argument, the fact that costly whip counts are systematically employed by the party leadership to ascertain the floor prospects of crucial bills bears witness to their usefulness and informational value. It is unclear why leaders would spend valuable time on these counts otherwise. In the model, this information revelation is achieved in equilibrium as legislators are atomistic and cannot individually influence a party's aggregate information or decision. Third, as we model explicitly, certain designated party members (called *whips*), who are responsible for ensuring some subset of members toe the party line, maintain constant relationships with their delegation and know their districts. These relationships make private preferences at least partially observable, reducing the ability of members to misreport their ideological positions (Meinke (2008)).⁸

In addition to providing information about politicians' true ideological positions, the whip count data offers identifying variation for assessing party discipline and agenda setting. Concerning party discipline, switching behavior in Yes/No between the whip count stage and the roll call stage provides the variation necessary to pin down the extent of whipping—how much control the party is able to exert. Concerning agenda setting, we exploit the fact that not all bills that are voted on the floor are whip counted, and that certain bills that are whip counted are subsequently dropped without a subsequent floor vote.⁹ By explicitly modeling this selection process, we theoretically identify thresholds determining which bills are voted on and/or whip counted. Together with flexible assumptions on the distribution of latent status quo policies, these thresholds allow us to recover information on policies that are never proposed and never voted.

This paper establishes several findings. Our results show that standard approaches to the estimation of ideal points based on random utility models that employ roll call votes alone, such as the popular DW-Nominate approach (Poole and Rosenthal (2001)), miss important density in the middle of the support of the ideological distribution. These methods, which conflate party control with the estimation of individual ideologies (Snyder and Groseclose (2000)), show a polarization level of ideal points much larger than the actual one based upon our unbiased estimates. Across the 95th–99th Congresses, we find that the distance between party medians is on average about 60% of that based upon standard DW-Nominate estimates. According to our estimates, the share of traditional DW-Nominate ideological polarization which actually stems from party discipline varies from 34% in the 95th Congress to 44% in the 99th Congress. Importantly, these results do not rely on arbitrary assumptions about which bills may be whipped or not by the party (we operate under the assumption that parties can discipline votes on any bill) or the omission of any floor votes from the analysis, including lopsided or unanimous votes.

In terms of agenda-setting, we show that for every 100 issues that the majority party (Democrats in our sample) could potentially deliberate within a congressional cycle, on average, 7 are never voted because they are not sufficiently valuable for the leadership; 86 are brought directly to the floor where they are whipped and voted; and 7 are whip counted. Of the 7 bills that are whip counted, 2 are subsequently dropped, while 5 are brought to the floor, where they are whipped and voted.

⁸Scholarship discussed in the next section, particularly Evans (2018), support this view. Multiple assistant and regional whips are part of the party leadership hierarchy and are typically appointed or elected within a delegation. As further testimony of the value of whips' activities, the Majority and Minority Whips, who organize these counts, are ranked second or third in importance within the party hierarchy. See Sect. 2.

⁹For a recent important example, consider early 2017 efforts to repeal the Affordable Care Act by the Republican leadership in the House. These attempts were repeatedly whip counted, but not voted.

With our structural estimates in hand, we show that party discipline matters substantially and has proven crucial for the passage of important bills. Eliminating party discipline in the form of whipping is precisely rejected relative to a model with party discipline using standard model selection tests. The extent of party discipline is statistically different from zero, quantitatively sizable, and growing between 1977 and 1986.

Given the specific time period over which the whip count data is available, we are also able to assess, through counterfactuals, the role of parties in steering particularly salient economic bills in the early 1980s, including the two Reagan Tax Reforms of 1981 and 1984, several Social Security Amendments and Debt Limit Increase Acts, the National Energy Act of 1977, and the implementation of the Panama Canal Treaty in 1979. Some of these bills would not have passed or would have substantially lost support absent party discipline. In counterfactual exercises that focus on agenda setting, we also establish that party control is highly relevant for the equilibrium probability of success of a given policy alternative against the status quo. Polarization in the ideological preferences of legislators is instead more consequential for setting the policy alternative for each status quo, resulting in substantially different bills being pursued.

This paper contributes to three strands of literature. First, it is concerned with the polarization of political elites. The empirical literature on political polarization has a rich history (Poole and Rosenthal (1984)), and has experienced a recent resurgence in interest due to glaring increases in partisanship in voting (McCarty (2016–2017)), but also media reports¹⁰). Rising political polarization has been detected not only in legislator ideology assessments based on roll calls, but in candidate survey responses (Moskowitz, Rogowski, and Snyder (2017)), congressional speech scores (Gentzkow, Shapiro, and Taddy (2017)), and campaign contributions measures (Bonica (2014)). Considerations on polarization from an economic perspective, related to the seemingly increasing policy gridlock after the 2008 financial crisis, are offered in Mian, Sufi, and Trebbi (2014). We contribute to this discussion from an empirical perspective by quantitatively unbundling some of the deep determinants of polarization. In this respect, our work complements other recent attempts, such as Moskowitz, Rogowski, and Snyder (2017), and the decomposition exercise of Levitt (1996) earlier on, but it differs in terms of theory, identification strategy, and in the use of a structural approach.

A second, closely related, literature considers the problem of separating politician's ideological preferences from party discipline. At the heart of the problem is the observation by Krehbiel (1999, 1993) that party unity in floor voting may not necessarily be conclusive evidence of discipline. This observation is, at its core, an identification critique. Politicians from the same party are likely to share a similar ideology, and hence may vote similarly even absent party control. Exemplifying one of the most popular existing procedures used to estimate legislator ideology,¹¹ McCarty, Poole, and Rosenthal (2006) offers a broad discussion of this research area and links it to parallel relevant phenomena, such as the codetermined evolution of U.S. income inequality (Piketty and Saez (2003)).

Decomposition efforts in problems of political agency are rooted in an older literature that seeks ways to separate a politician's true policy preferences from that of the party, by focusing on situations in which one or the other factor would not be present. Snyder and Groseclose (2000) proposed one such method of separating party effects from politician

¹⁰See, for instance, Philip Bump, December 21, 2016, "Farewell to the most polarized Congress in more than 100 years!" *Washington Post*.

¹¹Among the standard approaches to estimation are Poole and Rosenthal (1997), Clinton, Jackman, and Rivers (2004), Heckman and Snyder (1997).

ideology, which has been widely used and adapted (e.g., [McCarty, Poole, and Rosenthal \(2001\)](#), [Minozzi and Volden \(2013\)](#)). Their argument is that parties concentrate their efforts on results that they can influence, such as close legislative votes. Seemingly, expected lopsided votes would not attract nor need party intervention. Absent party effects on lopsided votes, [Snyder and Groseclose \(2000\)](#) argued in favor of estimating individual ideologies from a first stage on lopsided roll calls alone. After recovering estimates of individual preferences, in a second stage they study close votes to recover party effects, given the previously estimated legislator true preferences. There are two main methodological obstacles to this approach. First, which vote is lopsided and which is contested is endogenous to the choice of policy alternative by the agenda setter (see the discussion in [Bateman, Clinton, and Lapinski \(2017\)](#)). This selection mechanism is explicit in our framework. Secondly, [McCarty, Poole, and Rosenthal \(2001\)](#) noted that this method provides poor identifying variation due to minimal differences in vote choices within a party for lopsided votes. In contrast, our paper does not rely on an arbitrary selection of votes where parties are assumed to be inactive.¹² [Ansolabehere, Snyder, and Stewart \(2001a\)](#) used a survey directly targeted at candidate ideology (NPAT, also used in [Moskowitz, Rogowski, and Snyder \(2017\)](#)) to estimate ideal points, hence moving away from roll calls. Also, [Ansolabehere, Snyder, and Stewart \(2001b\)](#) found a decline in the responsiveness of Congress members to constituents in 1970s and 1980s, consistent with our findings.¹³ Previous work has also discussed how polarization and agenda setting may interact ([Clinton, Katznelson, and Lapinski \(2014\)](#), [Bateman, Clinton, and Lapinski \(2017\)](#)), a point that our model clarifies.

[Evans \(2018\)](#) is a closely related, but less formal foray into the study of internal party organization as a tool for identifying party discipline. The central contribution of his volume remains its compendious treatment of the whip system, historical and contemporary. In this work, [Evans \(2018\)](#) also concludes that an increase in party discipline (measured through qualitative whipping evidence) could also explain the increasing polarization of voting—a conclusion that we also draw.

A final literature to which we contribute deals with the consequences of polarization for the behavior of legislatures. [Mian, Sufi, and Trebbi \(2014\)](#) offered a discussion of the effects of political polarization on government gridlock and lack of reform. They also discuss how gridlock may be particularly damaging in the contexts of the aftermath of deep economic crises, where political stalemate may trigger secondary adverse events (e.g., sovereign debt crises following banking crises). The relationship between slowdowns in

¹²In Online Appendix D, we explore a specification inspired by [Snyder and Groseclose \(2000\)](#) in which parties do not discipline lopsided votes in order to allow for different strategies in party discipline. However, in contrast to their work, in our robustness check all bills are informative about ideologies, guaranteeing stronger identification. Our main quantitative messages continue to hold in this case.

¹³Other closely related papers such as [Clinton, Jackman, and Rivers \(2004\)](#), who use Bayesian methods to estimate ideal points, also employ lopsided bills to recover party discipline. Another approach looks at politicians who change party to see how their voting behavior changes. As [Nokken \(2000\)](#) found, congressmembers who switch party do change voting patterns, suggesting that ideology is not their sole decision factor. Our model microfounds this change in behavior. An interesting historical approach is presented by [Jenkins \(2000\)](#). By studying congressmembers who initially served in the U.S. House and then served in the Confederate House during the American Civil War, he finds striking differences in the estimated ideologies for the same politician from voting behavior in the different Houses. Since the legislators were the same, and in very similar institutional settings, he concludes (with further evidence) that differences were due to agenda setting and party discipline rather than mere ideology. [Lee \(2008\)](#) argued that changes in the agenda explain some of the increase in roll call polarization in the Senate. Finally, [Lee \(2009\)](#) argued that party competition may be a key driver of polarization in Congress.

legislative productivity and polarization is also a topic frequently discussed in political science (e.g., Binder (2003) and references therein). None of these works, however, offers a theory for the analysis of the role of polarization in the context of strategic party control efforts and endogenous agenda setting decisions. Appendix A is found in the Online Supplemental Material (Canen, Kendall, and Trebbi (2020)). Appendices B–H are located within the replication file.

2. INSTITUTIONAL BACKGROUND: PARTY LEADERSHIP AND WHIPS

This section provides a brief primer on the leadership structure and whip organization of the Democratic and Republican Parties in the United States. It does not attempt an exhaustive review, but rather a sufficiently accurate synthesis of the main institutional features necessary to guide the reader in the following sections, which rely on such features. Evans (2018) offers a comprehensive discussion of the whip system.¹⁴

The internal organization of modern party apparatuses requires both the transmission of information within the hierarchy and the allocation of both rewards and punishments across rank-and-file members. Historically, British and American legislative bodies developed the whip system¹⁵ to serve such purposes. Although different in terms of their form of government, Westminster systems and the U.S. Congress are characterized by parties where the role of “Whip” is a recognized tier of their formal leadership structure.¹⁶ The United States Congress glossary defines whips as “*Assistants to the floor leaders who are also elected by their party conferences. The majority and minority whips (and their assistants) are responsible for mobilizing votes within their parties on major issues. In the absence of a party floor leader, the whip often serves as acting floor leader.*”¹⁷

The Majority or Minority Whip is aided by a set of assistant, deputy or regional whips, either appointed or elected. Table F.1 in the Online Appendix reports their number by Congress and party in our sample. The number of Democratic whips trends upward from 35 in the 95th Congress to 64 in the 99th, and, for Republicans, from 16 in the 95th Congress to 25 in the 99th. Assistant whips play the role of the eyes and ears of the leadership across congressional delegations, and steer members in the direction of the party leadership. The latter activity may involve the provision of incentives, which may take the form of valuable committee appointments, floor time, or leadership political action committee campaign funds.¹⁸ Assistant whips may also play a role in communicating more forcefully the importance of certain issues to selected members, affecting their stance on a vote. We refer to the activity of selectively providing incentives to toe the party line as “whipping” (Meinke (2008)).

¹⁴The internal organization of parties in the modern U.S. Congress is the subject of a large literature; see, for instance, Cox and McCubbins (1993, 2005), Poole and Rosenthal (2011).

¹⁵The term originates from the “whipper-in” who keeps the pack of hounds tight during the hunting of foxes on behalf of the huntsman.

¹⁶For instance in the contemporary Congress, Majority or Minority Whip are third and second, respectively, in the official party ranking. In the United Kingdom, the chief Whip not only officiates in the legislative chamber, but is customarily appointed to a cabinet position and participates to the executive. The official role is Parliamentary Secretary to the Treasury, a junior ministerial position in the British Government, with only nominal association to the Treasury.

¹⁷https://www.senate.gov/reference/glossary_term/whips.htm.

¹⁸Parties also sanction their whipped members. The House Democratic leadership did not allow Representative Phil Gramm (D-TX) to retain his seat on the Budget Committee after he was unresponsive to whip pressure against President Reagan’s economic program in 1983. See Baker (1985).

The chief Whip, in conjunction with the party leadership, also conducts straw polls to elicit the extent of support among the rank-and-file on certain bills.¹⁹ Such head counts are costly and strategically employed in about 6% of all bills in our sample. Typically, support for the party position on a legislative issues is elicited, requiring an indication of yes, no, undecided or other. In practice, any position that does not provide firm support of the leadership's stance can be interpreted as not supportive.²⁰ This straw poll activity is what we refer to as "whip counting."

The issue of truthfulness of the information elicited at the whip count stage is worthy of attention. Evans (2011) notes: "*One common question about whip counts is whether the responses of members can be trusted. Are there any incentives for them to overstate their opposition to the party program, potentially securing favors in exchange for their support? Four points are worth mentioning in response. First, the whip process is a "repeated game" and members develop reputations. There are incentives for them to be truthful. Second, congressional leaders generally know a lot about the constituencies of rank-and-file members and can be very difficult to fool. Third, in a sense it does not matter. If a member claims that she will oppose a bill or amendment unless she receives some concession, then that essentially becomes her position and the polled question and the concession are for all practical purposes inseparable. Fourth, and most important, participants in the whip process believe that whip poll responses are accurate, which is precisely why they base strategic decisions on the results.*" (p. 13).

This perspective is not merely academic, but finds support in statements offered by practitioners.²¹ It is common to find evidence of the importance and reliance on the internal whip system by party leaders. For example, current House Speaker Nancy Pelosi, also a former Minority Whip, is known to have often asserted reliance on accurate internal counts and focused effort on them.²² For the remainder of this article, it is important to assert that we will not be assuming that whip counts are perfectly truthful about the position of each party member on each vote. Based on the discussion above, we will assume, however, that whip count responses are truthful on average. This is tantamount to ruling out systematic deception and gaming of the leadership by rank-and-file members.

¹⁹In the words of current Senate Majority Leader Mitch McConnell, a former Majority Whip, such counts play a crucial role: "*Producing an accurate vote count is the most important function of the Whip. Accordingly, the question posed to members on the whip card must be phrased with precision, so as not to distort the accuracy of the tabulation. Moreover, the question has to be presented in as fair and accurate a way as possible; otherwise leadership could wind up repelling wavering senators by seeming to be heavy-handed. After the whip cards are distributed, the whip collects the data, and based on that information, the party leader determines how to proceed on a matter. For me, as party leader, it is crucial that the whip count be accurate. If it is not, our leadership team might be embarrassed, and precious floor time could be wasted on a failed measure.*" McConnell and Brownell (2019, p. 190). For a discussion on the Democratic side, specifically about Tip O'Neill's role as a leader and his efforts in improving whip count accuracy, see Meinke (2016, p. 90).

²⁰"*Member decisions not to respond with one of the standard [yes/no] categories were far from random, in other words, and there are obvious signs of strategic behavior. Often, members who were disinclined to support the party simply refused to respond to leadership entreaties about their views, or otherwise were unwilling to take a clear position.*" Evans (2018, p. 112).

²¹"*[About lying to leadership], a Republican aide surmised: 'some of that happens' but 'it doesn't happen as much as people think it would.'*" Green and Harris (2019, p. 19).

"*[...] members of Congress have strong reasons to refrain from lying about their vote choice. [...] there is strong norm in Congress about violating one's commitments and deceiving fellow representatives (Barber (1965), Weingast (1979)),*" Green and Harris (2019, p. 19).

²²See Kathryn L. Pearson "Nancy Pelosi victorious—why the California Democrat was reelected speaker of the House," The Conversation, January 3, 2019.

3. MODEL

With the institutional context of Section 2 in mind, we present a model with two main features: (i) party discipline and (ii) agenda-setting. Two parties compete for votes on a series of issues that make up a congressional term. Each party employs a subset of their legislators (the whips) to discipline their members (including other whips). For a given status quo policy, a randomly-selected proposing party chooses the alternative policy (if any) to be voted upon, accounting for both parties' abilities to discipline their members, and on the value and likelihood of passage of the alternative policy. Because floor votes are costly, not all status quo policies will be pursued. If an alternative is pursued, the proposing party can employ a formal whip count, which allows it to obtain additional information about a bill's probability of success before a floor vote, and to drop bills that are unlikely to pass conditional on the count.²³ Whether the proposing party chooses to conduct a formal whip count depends upon its option value relative to the fixed cost of undertaking this process.

3.1. Preliminaries

Party members vote on a series of policies at times $t = 1, 2, \dots, T$ with the majority vote determining the winning policy. Each party, $p \in \{D, R\}$, has a mass of N_p members whose underlying ideologies, θ , are continuously distributed with cumulative distribution functions (CDFs), $F_p(\theta)$, in a single-dimensional space. We assume that the corresponding probability distribution functions (PDFs), $f_p(\theta)$, have unbounded support. The median member(s) of a party are identified by θ_p^m and represent the preference of the party overall. We assume without loss that $\theta_D^m < \theta_R^m$.

In each period, party D is randomly recognized with probability γ , allowing it to set the policy alternative, x_t , to be put to a vote. With the remaining probability, $1 - \gamma$, party R is recognized. The recognized party draws a status quo policy, q_t , from a continuous CDF, $W(q)$, with corresponding PDF, $w(q)$, which is also assumed to have unbounded support.²⁴

3.2. Preferences

There are three sets of actors for each party: nonwhip members, whip members, and the party itself.

Whips are a "technology" that a party uses to discipline its members. We take the mass and ideologies of whips as given and assume an exogenous matching of whips to members for which they are responsible, such that each member is controlled by exactly one whip. Whips acquire information from members and are rewarded for obtaining votes that the party desires.

All party members (whips and nonwhips) derive expressive utility from the policy, $k_t \in \{q_t, x_t\}$, that they vote for. This utility is given by $u(k_t, \omega_t^i)$, where $\omega_t^i = \theta^i + \delta_{1,t}^i + \delta_{2,t}^i + \eta_{1,t} + \eta_{2,t}$ determines their position on a particular bill. We assume a symmetric, strictly concave utility function: $u(k_t, \omega_t^i) = u(|k_t - \omega_t^i|)$ with $u(\omega_t^i, \omega_t^i) = u_k(\omega_t^i, \omega_t^i) = 0$, $u_{kk}(k_t, \omega_t^i) < 0$.

²³The party not setting the agenda may also conduct a whip count, but this occurs less frequently in our data so we do not model its reason for doing so.

²⁴In our application, D is the majority party. We do not model how the frequency of recognition is determined by the leadership of both parties.

θ^i is a member's fundamental ideology, a constant trait of i .²⁵ A member's position on a particular bill is determined by this ideology, two idiosyncratic shocks, $\delta_{1,t}^i$ and $\delta_{2,t}^i$, and two aggregate shocks, $\eta_{1,t}$ and $\eta_{2,t}$. Multiple shocks are required to model the information acquisition problem of the proposing party, as will become clear below. The aggregate shocks are common across all members of both parties and are independent draws from a Normal distribution with mean zero and standard deviation, σ_η . The idiosyncratic shocks $\delta_{1,t}^i$ and $\delta_{2,t}^i$ are identically and independently distributed across i and t according to the continuous, unbounded, and mean zero CDF, $G(\delta)$ with corresponding PDF, $g(\delta)$.

Whip members, in addition to their utility from voting, receive a payment of r_p (which may differ across parties) for each member i for whom the whip is responsible and that votes with the party. r_p may represent, for example, improved future career opportunities within the party hierarchy.²⁶ We model whip influence over the members for whom she is responsible as an ability to persuade a member to change his position on a particular bill. To influence a member's position by an amount, y_t^i (i.e., to move his ideal point to $\omega_t^i + y_t^i$), a whip bears an increasing cost, $c(y_t^i)$ ($c' > 0$), which can be thought of, most simply, as an effort cost.²⁷ We assume $c(0) < r_p$ so that a whip optimally exerts a nonzero amount of influence. The contribution to a whip's utility from whipping is therefore given by $\sum_i (r_p I(i \text{ votes with party}) - c(y_t^i))$, where $I(\cdot)$ is the indicator function and the summation is over all members for whom she is responsible. Whips are allowed to whip any bill, independently of the party promoting the bill, this way also capturing active obstruction by the minority of majority-proposed bills. Whips are not allowed, however, to cross-discipline or entice members of the other party. Such behavior is not completely infrequent, but dominated by whipping within one's own party, so we omit it.

Each party derives utility from that of its median member, $u(k_t, \theta_p^m)$ where $k_t \in \{q_t, x_t\}$ is the winning policy. For simplicity, we assume that the party's position, represented by their median member, is not subject to idiosyncratic or aggregate shocks.²⁸ Because the party does not directly bear the cost of whipping its members, whipping is costless to the party (and thus both parties' whips are engaged on every vote).

3.3. Information and Timing

At each time t (see Figure 9 in the Online Appendix):

- (1) The proposing party is randomly recognized and a status quo policy, q_t , is drawn.
- (2) Whip count stage:

²⁵In this regard, we follow the discussion and evidence from Lee, Moretti, and Butler (2004) and Moskowitz, Rogowski, and Snyder (2017). The latter use surveys to identify ideological positions and find that measured polarization occurs through the replacement of politicians. As a result of constant ideology in our model, polarization due to changing ideologies within a chamber can only arise from the replacement of moderate politicians over time.

²⁶Rewarding the whip only if she switches a member's vote does not change the results.

²⁷Having the shocks and influence operate on the ideological bliss point rather than as changes in utility (i.e., $u(k_t, \theta^i) + \delta_{1,t}^i + \delta_{2,t}^i + \eta_{1,t} + \eta_{2,t} + y_t^i$) simplifies the model in two ways. First, it ensures that the maximum influence exerted by a whip (see Section 4.2) is a constant, independent of the locations of the policies and the distance between them. Second, it ensures the expected number of votes monotonically decreases in the extremeness of the alternative policy, x_t (see the proof of Proposition 1), which need not be the case for utility shocks.

²⁸This assumption rules out the possibility that an aggregate shock causes the proposing party to prefer the status quo over the alternative they themselves proposed.

(a) The proposing party chooses the policy x_t as an alternative to the status quo q_t and decides whether or not to conduct a whip count at a cost, $C_w > 0$.²⁹

(b) The first aggregate and idiosyncratic shocks, $\eta_{1,t}$ and $\delta_{1,t}^i$, are realized and observed noisily: each member observes his idiosyncratic shock, $\delta_{1,t}^i$, and the policy he prefers, $u(x_t, \theta^i + \delta_{1,t}^i + \eta_{1,t}) \leq u(q_t, \theta^i + \delta_{1,t}^i + \eta_{1,t})$, but not the realization of $\eta_{1,t}$.³⁰

(c) If a whip count is undertaken, each member makes a report, $m_t^i \in \{\text{Yes}, \text{No}\}$, to his whip, answering the question of whether or not they intend to support the alternative policy, x_t . The outcome of the whip count is common knowledge.

(d) The proposing party (conditional on the whip count, if taken) decides whether or not to proceed with the bill, taking it to a roll call vote at a cost, $C_b > 0$.³¹

(3) Roll call stage:

(a) The second aggregate and idiosyncratic utility shocks, $\eta_{2,t}$ and $\delta_{2,t}^i$, are realized and observed as in the case of the first shocks: each member observes his idiosyncratic shock, $\delta_{2,t}^i$, and the policy he prefers $u(x_t, \omega_t^i) \geq u(q_t, \omega_t^i)$, but not the realization of $\eta_{2,t}$.

(b) Similar to a whip count, whips communicate with their members to learn the sum of the aggregate shocks, $\eta_{1,t} + \eta_{2,t}$. They then communicate this sum back to each member.³²

(c) Whips learn the sum of the idiosyncratic shocks, $\delta_{1,t}^i + \delta_{2,t}^i$, of the members for whom they are responsible and choose the amount of influence to exert, y_t^i , over each member.

(d) The roll call vote occurs.

The information structure (who knows what and when) is a formalization of the role that whips play in obtaining and aggregating information by keeping close relationships with the rank-and-file members for which they are responsible. Information about individual member positions is important for determining (i) which members will be most easily persuaded to toe the party line, and (ii) the aggregate position on a bill, which is important for determining the likelihood that a particular bill is going to pass the roll call.

4. ANALYSIS

We solve the model via backward induction. In Sections 4.1 and 4.2, we determine the decisions of members and whips. These decisions are the same for each party, so we drop the party label for convenience. In Sections 4.3 through 4.5, we turn to the decisions unique to the proposing party: which alternative policy to pursue, if any, and whether or not to conduct a whip count and a floor vote.

²⁹We assume a closed agenda setting rule: x_t cannot be modified after observing the outcome of the whip count. Empirically, minor changes are captured by the aggregate shocks, η . Changes that target individual legislators, such as certain earmarks, can be captured in our set-up by the transfers, y_t^i . When changes to x_t become truly substantial, the issue typically translates into a new vote, which we then examine as a distinct t . Substantial changes to the alternative policy are treated as different votes by the House of Representatives itself, which registers different roll call votes not just for final passage votes, but also for amendments, motions, etc.

³⁰The particular information structure is not critical, for example, in addition to observing his preferred policy, a member could observe an additional noisy signal about the aggregate shock. However, it is important that no single member observes the aggregate shock perfectly because, were it the case, a whip count would not be necessary. In the absence of aggregate shocks, due to the fact that we have a continuum of members, the outcome of a vote would be known ex ante with probability one.

³¹ C_b could capture either an organizational cost or an opportunity cost of floor time.

³²We assume whips communicate truthfully without modeling it explicitly. In reality, party leadership also communicates with members so that if the whip count were not reported truthfully, the whip would likely suffer severe consequences (i.e., lose their position).

4.1. Roll Call Votes

Prior to the roll call vote, whips communicate with the members for whom they are responsible in order to learn the value of $\eta_{1,t} + \eta_{2,t}$, which is necessary for deciding how much influence to exert (see Section 4.2). To do so, each whip asks each member whether or not they intend to vote for the alternative policy, x_t . Integrating across politicians, this process reveals the aggregate shocks as in the case of a whip count (see Section 4.3). Whips then communicate the values of the aggregate shocks to all members, so that they have full information at the time of their vote.

A member votes for x_t if and only if $u(x_t, \omega_t^i + y_t^i) \geq u(q_t, \omega_t^i + y_t^i)$, where $\omega_t^i + y_t^i$ is the member's ideological bliss point after whip influence.³³ It is convenient to define the marginal voter as the ideological position of the voter who is indifferent between the two policies. Given symmetric utility functions, this voter is located at $MV_t = \frac{x_t + q_t}{2}$, absent party discipline and aggregate shocks. At roll call time, after both aggregate shocks, we define the *realized* marginal voter, $\tilde{MV}_{2,t} \equiv MV_t - \eta_{1,t} - \eta_{2,t}$ (similarly, we define the realized marginal voter at whip count time, $\tilde{MV}_{1,t} \equiv MV_t - \eta_{1,t}$).

4.2. Whipping Decisions

Just prior to roll call, each whip has full information about the ideological position of his members. He therefore knows whether or not a given (conditional) transfer induces a vote for a party's preferred policy or not, and so either exerts the minimal influence necessary to make the member indifferent between policies, or exerts no influence at all. The maximum influence he is willing to exert, y_p^{\max} , is such that the cost of exerting this influence is equal to its benefit, $r_p = c(y_p^{\max})$. y_p^{\max} is strictly greater than zero because we assume that the cost of exerting no influence is less than the reward of successfully whipping a member ($c(0) < r_p$).

Given y_p^{\max} , Lemma 1 establishes that only members who would not otherwise vote for the party's preferred policy, and are within a fixed distance of the marginal voter are whipped (see Figure 1 for an illustration).

LEMMA 1: *Assume a party strictly prefers policy k_t over policy k'_t . Then, only members, i , whose realized ideologies are on the opposite side of MV_t from k_t and such that $|\omega_t^i - MV_t| \leq y_p^{\max}$ are whipped.*

4.3. The Whip Count

If a whip count is conducted, whips receive reports, $m_t^i \in \{\text{Yes}, \text{No}\}$, from each member for whom they are responsible and subsequently make these reports public. If each member reports truthfully, he reports $m_t^i = \text{Yes}$ if $u(x_t, \theta^i + \delta_{1,t}^i + \eta_{1,t}) \geq u(q_t, \theta^i + \delta_{1,t}^i + \eta_{1,t})$ and $m_t^i = \text{No}$ otherwise. Given the continuum of reports, $\{m_t^i\}$, and knowing θ^i , q_t , and x_t , a whip is able to infer $\hat{\eta}_{1,t}$, the realized value of $\eta_{1,t}$, with probability one by application of the law of large numbers.

All members reporting truthfully forms part of an equilibrium strategy of the overall game because no single member can influence beliefs about $\hat{\eta}_{1,t}$, and hence cannot influence the eventual policy outcome by misreporting.³⁴ We therefore assume in what follows

³³Ties have measure zero due to the continuous nature of the shocks and, therefore, the vote tie-breaking rule is immaterial.

³⁴In addition, misreporting does not change the amount of influence a member's whip exerts because the whip learns the member's true position before exerting influence.

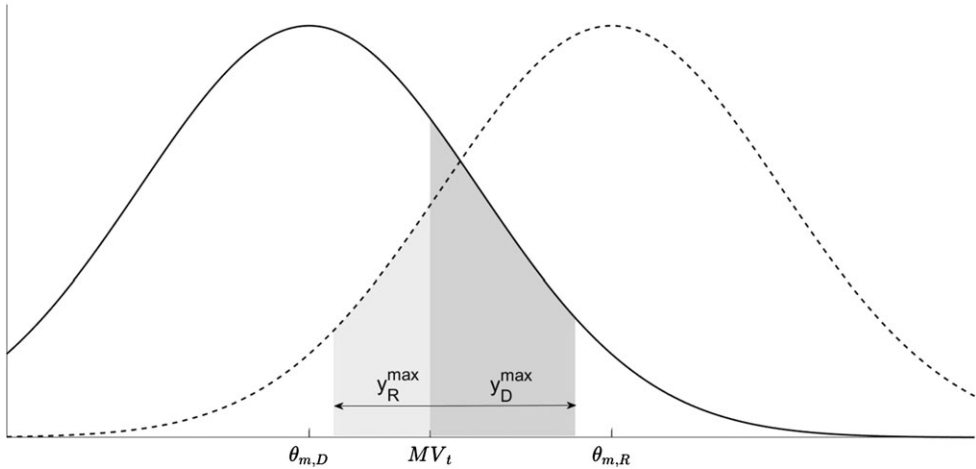


FIGURE 1.—Whipping. Notes: All Democrats whose realized ideal points, ω_t^i , are within a distance of y_D^{\max} , and to the right of the marginal voter, MV_t , are whipped. Similarly, all Republicans within a distance of y_R^{\max} , and to the left of the realized marginal voter, $MV_{2,t}$, are whipped.

that members play a truth-telling strategy.³⁵ This is isomorphic to a model that allows a form of unsystematic misreporting, by interpreting the idiosyncratic shocks as idiosyncratic determinants of misreporting.

We formalize these claims in Lemma 2.

LEMMA 2: *Truth-telling at the whip count stage forms part of an equilibrium strategy. Under truth-telling, the realization of the first aggregate shock, $\hat{\eta}_{1,t}$, is known with probability one.*

4.4. Optimal Policy Choices

After observing q_t , the proposing party can choose to do one of three things. One, it can decide not to pursue any alternative policy. Two, it can choose an alternative policy to pursue, x_t , without conducting a whip count. In this case, the party pays the cost, C_b , of pursuing the bill to the roll call stage. Three, the party can choose an alternative policy to pursue and conduct a whip count at a cost, C_w . In this case, after observing the results of the whip count, the party can decide whether or not to continue with the bill at a cost of C_b . Choosing to undertake the whip count is analogous to purchasing an option: the option to save the cost of pursuing the bill should the initial aggregate shock $\eta_{1,t}$ turn out unfavorably.

For status quo policies to the left of the proposing party's ideal point, θ_p^m , the alternative policy pursued (if any) must lie to the right of the status quo: any policy to the left of q_t is less preferred than q_t and q_t can be obtained at no cost. Similarly, for status quo policies to the right of θ_p^m , the proposed alternative policy must lie to the left of the status quo. In choosing how far from the status quo to set the alternative policy, the proposing party

³⁵As usual, there also exists an equilibrium of the whip count subgame in which each member babbles, so that nothing is learned about $\hat{\eta}_{1,t}$. This equilibrium is not empirically plausible because in this case no costly whip count would ever be conducted.

faces an intuitive trade-off: policies closer to its ideal point are more valuable, should they be successfully voted in, but are less likely to obtain the necessary votes to pass.

To formalize this intuition, define the number of votes that x_t obtains as $Y(\tilde{M}V_{2,t})$, which is stochastic only because of the random aggregate shocks—the idiosyncratic shocks average out because of a continuum of members. Using these definitions, the proof of Lemma 3 shows that more preferred policies obtain less votes on average.

LEMMA 3: *The number of votes that the alternative policy, x_t , obtains, $Y(\tilde{M}V_{2,t})$, strictly decreases with the closeness between x_t and the proposing party's ideal point.*

The result of Lemma 3 guarantees that the alternative policy proposed must lie between the party's ideal point and the status quo policy. An alternative policy on the opposite side of the ideal point from the status quo is dominated by $x_t = \theta_p^m$, which is both more preferred and obtains more votes in expectation.

For the remainder of the analysis, we present the case in which party D is the proposer—the case of party R is symmetric. Given the whipping technologies available to each party (defined by the maximum influence their whips are willing to exert, y_R^{\max} and y_D^{\max}), we can define the position of the marginal voter when the alternative policy is such that it obtains exactly half of the votes. Denote this position, $\hat{M}V_{i,j}$, where the subscripts $i, j \in \{L, R\}$ indicate the directions of the policy that parties D and R whip for, respectively.³⁶ Each $\hat{M}V_{i,j}$ is then given by $Y(\hat{M}V_{i,j}) = \frac{N_R + N_D}{2}$.

In the absence of a whip count, if party D pursues an alternative policy, the alternative policy x_t must maximize

$$EU_D^{\text{no count}}(q_t, x_t) = \Pr(x_t \text{ wins})u(x_t, \theta_D^m) + \Pr(x_t \text{ loses})u(q_t, \theta_D^m) - C_b,$$

where the cost of proceeding with the bill, C_b , is paid with certainty.

For status quo policies to the left of θ_D^m , since $x_t \in (q_t, \theta_D^m]$, both parties prefer and whip for x_t , the rightmost policy. Because $Y(\tilde{M}V_{2,t})$ is monotonically decreasing in x_t and, therefore, in $\tilde{M}V_{2,t}$, x_t wins if and only if $\tilde{M}V_{2,t} < \hat{M}V_{R,R}$ so that $\Pr(x_t \text{ wins}) = \Pr(\tilde{M}V_{2,t} < \hat{M}V_{R,R})$. The sum of the aggregate shocks, $\eta_{1,t} + \eta_{2,t}$, is normally distributed with a variance of $\sigma^2 = 2\sigma_\eta^2$, so that we can write $\Pr(x_t \text{ wins} | x_t > q_t) = 1 - \Phi(\frac{\tilde{M}V_{2,t} - \hat{M}V_{R,R}}{\sigma})$, where Φ denotes the CDF of the standard Normal distribution.

For status quo policies to the right of θ_D^m , we have $x_t \in [\theta_D^m, q_t)$. Party D therefore whips for the leftmost policy, x_t , but party R may whip for either policy depending on where q_t and x_t lie with respect to θ_R^m . As a simplification, we assume party R always whips for q_t in this case.³⁷ Under this assumption, x_t wins if and only if $\tilde{M}V_{2,t} > \hat{M}V_{L,R}$, so that $\Pr(x_t \text{ wins} | x_t < q_t) = \Phi(\frac{\tilde{M}V_{2,t} - \hat{M}V_{L,R}}{\sigma})$. Figure 10 in the Online Appendix illustrates this case, showing how moving the alternative policy closer to party D 's ideal point lowers the probability that it passes.

Conducting a whip count provides the option value of dropping the bill and avoiding the cost, C_b , if the first aggregate shock makes it unlikely the bill will pass. After conducting

³⁶Each $\hat{M}V_{i,j}$ is a function of many parameters of the model, so we suppress their dependencies for convenience. Note, however, that each is independent of q_t and x_t .

³⁷Similarly, if party R proposes an alternative to a status quo policy, $q_t < \theta_R^m$, we assume party D always whips for the status quo. We can solve the model without these assumptions, and the results are qualitatively similar.

the whip count, party D continues to pursue the bill if and only if

$$\Pr(x_t \text{ wins} | \eta_{1,t} = \hat{\eta}_{1,t})(u(x_t, \theta_D^m) - u(q_t, \theta_D^m)) + u(q_t, \theta_D^m) - C_b \geq u(q_t, \theta_D^m),$$

where $\hat{\eta}_{1,t}$ is the realized value of $\eta_{1,t}$ and $u(q_t, \theta_D^m)$ is the party's utility from the outside option of dropping the bill. $\Pr(x_t \text{ wins} | \eta_{1,t} = \hat{\eta}_{1,t})$ is easily shown to be strictly monotonic in $\hat{\eta}_{1,t}$, so that we can define cutoff values of $\eta_{1,t}$, $\underline{\eta}_{1,t}$ and $\bar{\eta}_{1,t}$, such that party D continues to pursue the bill if and only if $\eta_{1,t} > \underline{\eta}_{1,t}$ (for status quo policies to the left of θ_D^m) or $\eta_{1,t} < \bar{\eta}_{1,t}$ (for status quo policies to the right).

Given these continuation policies, prior to the whip count, party D chooses x_t to maximize

$$\begin{aligned} EU_D^{\text{count}}(q_t, x_t) = & \Pr(\eta_{1,t} > \underline{\eta}_{1,t}) [\Pr(x_t \text{ wins} | \eta_{1,t} > \underline{\eta}_{1,t})(u(x_t, \theta_D^m) - C_b) \\ & + (1 - \Pr(x_t \text{ wins} | \eta_{1,t} > \underline{\eta}_{1,t}))(u(q_t, \theta_D^m) - C_b)] + \Pr(\eta_{1,t} < \underline{\eta}_{1,t})u(q_t) \end{aligned}$$

for status quo policies to the left of θ_D^m and

$$\begin{aligned} EU_D^{\text{count}}(q_t, x_t) = & \Pr(\eta_{1,t} < \bar{\eta}_{1,t}) [\Pr(x_t \text{ wins} | \eta_{1,t} < \bar{\eta}_{1,t})(u(x_t, \theta_D^m) - C_b) \\ & + (1 - \Pr(x_t \text{ wins} | \eta_{1,t} < \bar{\eta}_{1,t}))(u(q_t, \theta_D^m) - C_b)] + \Pr(\eta_{1,t} > \bar{\eta}_{1,t})u(q_t) \end{aligned}$$

for status quo policies to the right of θ_D^m .

We define x_t^{count} and $x_t^{\text{no count}}$ to be the optimal alternative policies pursued (if any alternative is pursued) when a whip count is conducted and when it is not, respectively. Proposition 1 shows that, provided that the cost of pursuing a bill, C_b , is not too large, these optimal policies are unique and bounded away from the party's ideal point. Furthermore, alternative policies pursued with whip counts are closer to the party's ideal policy. Intuitively, the fact that a whip count allows the party to drop bills that are unlikely to pass after observing the first aggregate shock allows it to pursue policies that are more difficult to pass.

PROPOSITION 1: *There exists a strictly positive cutoff cost of pursuing a bill, $\hat{C}_b > 0$, such that for all $C_b < \hat{C}_b$, the optimal alternative policies, x_t^{count} and $x_t^{\text{no count}}$, are unique and contained in (q_t, θ_D^m) for $q_t < \theta_D^m$, contained in (θ_D^m, q_t) for $q_t > \theta_D^m$, and equal to θ_D^m for $q_t = \theta_D^m$.*

The requirement in Proposition 1 that C_b be sufficiently small is for analytical purposes only. Numerically, we have been unable to find a counterexample for which the conclusion of the proposition does not hold.

4.5. The Whip Count and Bill Pursuit Decisions

To complete the analysis, we determine for which status quo policies alternative policies are pursued and, when they are pursued, whether or not a whip count is conducted. Define the value functions, $V_D^{\text{count}}(q_t) = EU_D^{\text{count}}(q_t, x_t^{\text{count}}) - u(q_t, \theta_D^m)$ and $V_D^{\text{no count}}(q_t) = EU_D^{\text{no count}}(q_t, x_t^{\text{no count}}) - u(q_t, \theta_D^m)$, as the gains from pursuing an alternative policy with and without conducting a whip count, respectively (note that these definitions account for the cost of pursuing a bill, C_b , but ignore the cost of the whip count, C_w). Lemma 4 characterizes the value functions as a function of the status quo policy.

LEMMA 4: Fix $C_b < \hat{C}_b$ such that the optimal alternative policies, x_t^{count} and $x_t^{\text{no count}}$, are unique. Then, for all $q_t \neq \theta_D^m$, the value of pursuing an alternative policy with a whip count, $V_D^{\text{count}}(q_t)$, strictly exceeds that without, $V_D^{\text{no count}}(q_t)$. Furthermore, both value functions strictly decrease with $|q_t - \theta_D^m|$, but the difference between them, $V_D^{\text{count}}(q_t) - V_D^{\text{no count}}(q_t)$ strictly increases.

Intuitively, both value functions decrease as the status quo approaches the proposing party's ideal point because there is less to gain from an alternative policy. More interestingly, the difference between the value functions increases as the status quo approaches the party's ideal point because the whip count is an option that allows the proposing party to initially pursue a bill, but drop it if the initial aggregate shock turns out to be unfavorable (thus avoiding the cost, C_b). This option value is always positive because the party could always ignore the result of the whip count. It increases as the status quo nears the party's ideal point because passing an alternative policy becomes more difficult (fixing x_t , as q_t approaches θ_D^m , the marginal voter approaches θ_D^m , resulting in a lower probability of passing). Therefore, exercising the option becomes more likely, and hence more valuable.

Using the nature of the value functions, Proposition 2 shows which bills are pursued with and without a whip count, accounting for the fact that whipping is costly.

PROPOSITION 2: Fix $C_b < \hat{C}_b$ such that the optimal alternative policies, x_t^{count} and $x_t^{\text{no count}}$, are unique and fix the cost of a whip count, $C_w > 0$. Then we can define a set of cutoff status quo policies, $\underline{q}_l, \bar{q}_l, \underline{q}_r$, and \bar{q}_r , with $\underline{q}_l \leq \bar{q}_l < \theta_D^m < \underline{q}_r \leq \bar{q}_r$ such that:

- (1) for $q_t \in [-\infty, \underline{q}_l] \cup [\bar{q}_r, \infty]$, the optimal alternative policy, $x_t^{\text{no count}}$, is pursued without conducting a whip count.
- (2) for $q_t \in (\underline{q}_l, \bar{q}_l] \cup [\underline{q}_r, \bar{q}_r)$, the optimal alternative policy, x_t^{count} , is pursued and a whip count is conducted.
- (3) for $q_t \in (\bar{q}_l, \underline{q}_r)$, no alternative policy is pursued.

We illustrate Proposition 2 via an example in Figure 2. For status quo policies nearest to party D 's ideal policy, alternative policies are never pursued because the value of such an alternative over the existing status quo is small. For status quo policies farther away, alternative policies may be pursued with or without a whip count, but when both are possible (as in the empirically relevant case illustrated), it is always policies farthest from the party's ideal policy that are pursued without a whip count, because they have a higher probability of passing ex ante (lower option value).

5. DATA

We use data from two main sources. The whip count data was compiled from historical sources by Evans (Evans (2012, 2018)), and the roll call voting data come from VoteView.org (Poole and Rosenthal (1997, 2001)).

The whip count data collected by Evans is a comprehensive set of whip counts retrieved from a variety of historical sources, mostly from archives that hold former whip and party leaders' papers. Evans (2012) described the data collection procedure in depth. We use data from 1977–1986, as whip count data for other Congresses are not as comprehensive and complete as those for the 95th–99th Congresses, mainly due to idiosyncratic differences in the diligence of record-keeping by the Majority and Minority Whips. Importantly, however, the period under analysis is interesting because, according to most narratives, it

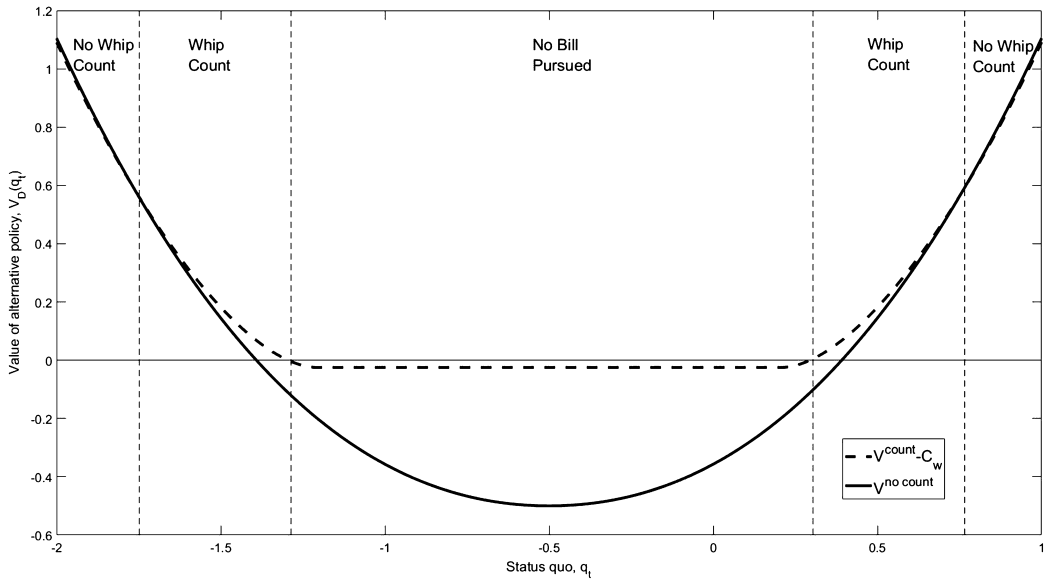


FIGURE 2.—Example of Value Functions. Notes: Value functions of pursuing an alternative policy with and without a whip count. Party D is the proposing party. The value functions are simulated using $\theta_D^m = -0.5$, $\theta_R^m = 0.5$, $M\hat{V}_{R,R} = M\hat{V}_{L,R} = -0.5$, $\sigma_\eta = 1$, $C_b = 0.5$, $C_w = 0.025$, and quadratic utility.

sits at the inflection point of modern political polarization in U.S. politics (e.g., [McCarty, Poole, and Rosenthal \(2006\)](#)).

For the Republican Party, we have data from 1977–1980, originating from the Robert H. Michel Collection, in the Dirksen Congressional Center, Pekin, Illinois, Leadership Files, 1963–1996. This part of the data “*appears to be nearly comprehensive about whip activities on that side of the partisan aisle, 1975–1980*” ([Evans \(2012\)](#)). Data for the Democratic Party covers 1977 to 1986, and originates from the Congressional Papers of Thomas S. Foley, Manuscripts, Archives and Special Collections Department, Holland Library, Washington State University, Boxes 197–203. Although John Brademas was the Majority whip from 1977 to 1980, his papers are collected within the Thomas Foley Collection (his successor).³⁸

We rely on the matching of [Evans \(2012\)](#) to associate each whip count with a bill voted on the floor (if the latter was sufficiently close to the one that had a whip count). In total, we have 340 bills with whip counts covering the period of 1977 to 1986, of which 238 can be directly associated with a subsequent floor vote in the House. Seventy of the whip counts are Republican and the remaining 270 are Democratic. For each whip count, we have data on the Yes or No responses of each member to the party’s particular question. Several bills include further whip counts (i.e., a second, third whip count), in which case we use the first whip count, as it is most representative of a member’s position prewhipping.

In these whip counts, votes from party members are predominantly recorded as: “Yes, Leaning Yes, Yes if Needed, Undecided, Leaning No, No, Expected to be Absent for Vote” (94% of the sample). We categorize these answers into the coarser groups of “Yes”

³⁸ According to [Evans \(2012\)](#), “the Brademas records are extensive and very well organized, and I am confident that they are nearly comprehensive. For that matter, I also have a similar sense of the archival file from Foley’s time in the position.”

or “No,” which we can then compare to the leadership’s position. The coded “Yes” votes (44.2% of the sample) and “No” votes (9.8%) are immediate to be classified. Among the other groups, first we deem that “Leaning Yes” and “Yes if Needed” (together, 7.2% of the sample) are “Yes” votes. Similarly, we treat “Leaning No” and “No” (together, 12.5% of the sample) as “No” votes. Finally, we take the position that “Undecided” (16.7% of the sample), “No Response” (13.0% of the sample), and “Expected to be Absent” (0.8% of the sample) are “No” votes, for two reasons. First, questions in the whip counts are generally phrased in support of the party (i.e., “Will you vote with the leadership for/against...”), so these responses suggest the member does not yet support the party’s position. Second, as discussed in footnote 20, Congressional scholars have taken the position that such answers are strategically ambiguous and reflect a negative stance.³⁹

Next, we construct variables that indicate whether or not a member voted with the party leadership, as well as make Yes or No votes comparable between whip counts and roll calls (whip count questions may be framed opposite to that of the roll call).⁴⁰ To do so, we use party leadership votes to assign the party’s preferred direction on a particular whip count/roll call. In order of priority, we use the (majority/minority) party leader’s vote, the (majority/minority) party Whip’s vote, and, for the small set of votes for which neither are available, the direction in which the majority of the party voted.

For each roll call vote, we also need a proxy for the party that proposed the bill, in order to both determine in which region the status quo must lie and the directions each party whips. We again rely on the direction in which party leadership votes. For the majority of bills, this revealed preference, together with guidance from the theory, pins down the whipping directions. In particular, if the two party leaderships vote differently, we know from the theory that the status quo must have originated between the party’s preferred positions. In this case, each party whips in the direction its party leadership prefers. If the leadership of both parties votes Yes, then the status quo could either be left of both medians with the Democrats proposing, or right of both medians with the Republicans proposing. In the former case, we expect a greater fraction of Republicans to support the bill, and vice versa in the latter case. Therefore, when the party leaderships both vote Yes, we assign the proposing party to the party that has the *least* support for the bill. Finally, a small minority of bills are supported by neither party, which cannot be reconciled with our theory. In order to avoid any selection issues, we include them by treating them as a tremble by one of the party leaderships, assigning the proposing party to be that with greater support of the bill and assuming the parties whip in opposite directions.

To demonstrate the differences between whip counts and roll calls in the raw data, Figure 3 plots the distribution of individual vote choices aligned with the party leadership at each phase (for bills proposed by the majority party that have both whip count and roll call votes). The number of members voting with the leadership dramatically increases at roll call time—a shift from approximately 160 votes with leadership at whip count time to 218 at roll call time. Notice that 218 is the simple majority threshold for the chamber—what is needed to pass a bill at roll call. Around 58 members are persuaded to toe the party

³⁹There are other categories in the data, although they make up only a small sample of the data. One group of categories include “No Comment” and “Other Response” (0.06% of the sample). For these observations, we maintain our previous definition that they are a “No” vote. Another group of responses, which we pool together as “Missing,” are dropped from the analysis. These include “Missing sheets,” “Ill or out of Town at the time of the poll,” and “Unclear or Ambiguous.” They constitute only 3.30% of the data, and could not be coded from archival records. We also drop records for the Speaker (coded separately in the raw data; 2.08% of the sample) when he does not take a position, as he rarely votes.

⁴⁰For example, often for the minority party, but not always, a whip count is framed in the negative, “Will you vote against...?”

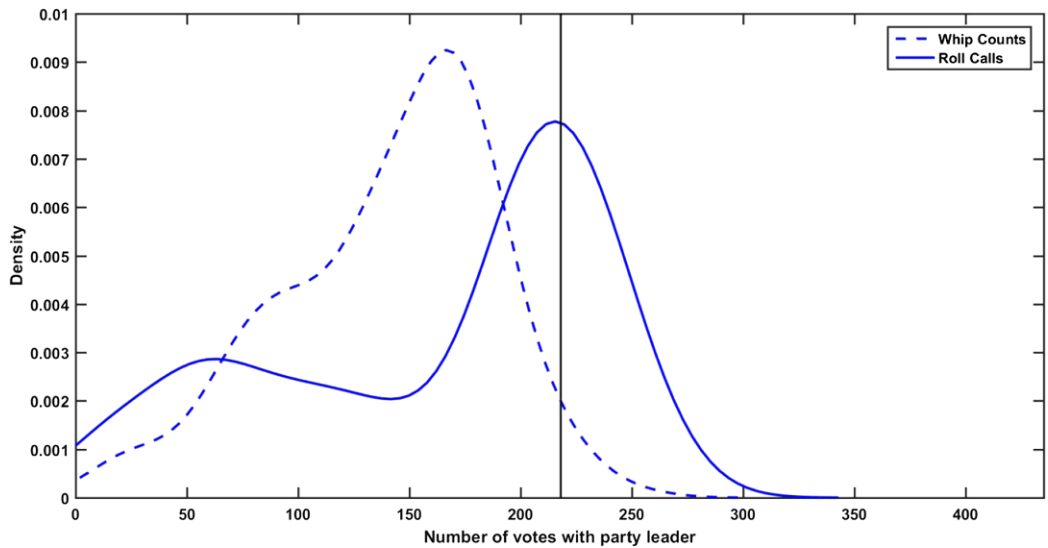


FIGURE 3.—Majority Party Votes with Leadership. Notes: Kernel densities of the number of Democratic votes with their party leadership at the whip count and roll call stages. Includes only bills with both whip counts and roll calls. The vertical line at 218 indicates the majority needed to pass a bill in the House of Representatives.

line on average, moving in the direction supported by the party leaders, in accordance with our theory.

Table F.2 in the Online Appendix provides aggregate statistics on the number of bills for which we have: (i) whip counts only (subsequently dropped), (ii) whip counts and roll calls, and (iii) roll calls only. Key bills in our time-frame address a variety of questions about economic policy, foreign aid, and domestic policy, among others. Examples include the Reagan Tax Reforms of 1981 and of 1984, the National Energy Act of 1977, the Healthcare for the Unemployed Act of 1983, the Contra affair in Nicaragua of 1984, the implementation of the Panama Canal Treaty in 1979, and multiple votes for increasing the debt limit. We revisit such key bills in our counterfactuals.

6. IDENTIFICATION AND ESTIMATION

6.1. Identification

We provide a formal proof of identification in Online Appendix B. Here, we state the necessary assumptions and provide intuition about the identifying variation.

The first assumption provides a normalization of the location of ideal points:

ASSUMPTION 1—Ideal Point Locations: *We normalize the ideal point of one member (without loss of generality, member ‘0’), $\theta^0 = 0$.*

As with a discrete choice model, we must choose the distribution, G , for the idiosyncratic shocks, δ_i . The “scale” of the ideal points is pinned down by a normalization of the variance of this distribution. We assume G is standard Normal so that the convolution of

the two shocks, $\delta_1 + \delta_2$, which we denote G_{1+2} , is a Normal distribution with a variance of two.⁴¹

ASSUMPTION 2—Ideal Point Scale: G is standard Normal, with CDF denoted by $\Phi(\cdot)$.

The following two assumptions (Assumptions 3 and 4) are needed solely for the analysis of agenda setting and are not required for our theory or for the estimation of ideal points and party discipline.

In order to be able to determine the mass of status quo policies that are never pursued (which we do not observe), we must make a parametric assumption about the distribution of status quo policies, $W(q)$. We assume a Normal distribution, $\mathcal{N}(\mu_q, \sigma_q^2)$ for the status quo policies themselves, but note that the resulting distribution of marginal voters (as determined by the proposing party) is generally different from Normal. For the purpose of allowing the status quo distribution to change over time, we allow $W(q)$ to vary by Congress.

ASSUMPTION 3—Status Quo Distributions: *The distribution of status quo policies is $W(q) \sim \mathcal{N}(\mu_q, \sigma_q^2)$. μ_q and σ_q^2 may vary by Congress.*

Lastly, in order to determine the optimal alternative policy and hence marginal voter, we assume each party has a quadratic loss utility function around its ideal point.

ASSUMPTION 4—Utility: *The utility a party derives from a policy, k_t , is given by a quadratic loss function around the ideal point of its median member, $u(k_t, \theta_p^m) = -(k_t - \theta_p^m)^2$.*

Under Assumption 2, the probability that a member of party D votes Yes at the whip count is given by

$$\begin{aligned} P(\text{Yes}_t^i = 1 \mid X_{i,t}) &= P(\delta_{1,t}^i + \theta^i \leq MV_t - \eta_{1,t} \mid X_{i,t}) \\ &= \Phi(\tilde{M}V_{1,t} - \theta^i), \end{aligned} \quad (6.1)$$

where $X_{i,t}$ denotes a matrix of dummy variables (for each individual i and each vote t , at both the whip count and roll call stages). The covariates, $X_{i,t}$, are common across whip counts and roll calls, because they are at the politician and bill level only.

The probability of voting Yes at roll call time it is given by

$$\begin{aligned} P(\text{Yes}_t^i = 1 \mid X_{i,t}) &= P(\delta_{1,t}^i + \delta_{2,t}^i \leq MV_t - \eta_{1,t} - \eta_{2,t} - \theta^i \pm y_D^{\max} \mid X_{i,t}) \\ &= \Phi\left(\frac{\tilde{M}V_{2,t} - \theta^i \pm y_D^{\max}}{\sqrt{2}}\right). \end{aligned} \quad (6.2)$$

In (6.2), the sign with which y_D^{\max} enters depends upon the direction that party D whips (see Section 6.2). We seek to identify the parameter vector:

$$\Theta = \left\{ \left\{ \left\{ \theta_p^i \right\}, y_p^{\max}, \underline{q}_{l,p}, \bar{q}_{l,p}, \underline{q}_{r,p}, \bar{q}_{r,p} \right\}_{p \in \{D,R\}}, \gamma, \mu_q, \sigma_q, \{\tilde{M}V_{1,t}\}, \{\tilde{M}V_{2,t}\}, \sigma_\eta \right\}.$$

⁴¹A Normal distribution, while not essential, is convenient because it has a simple closed form for the convolution G_{1+2} .

As is standard in ideal point estimation, the member ideal points, $\{\theta_p^i\}$, are identified relative to each other by the frequencies at which the members vote Yes and No over a series of whip count votes. Namely, they are proportional to their probabilities of voting Yes over the same set of bills. Their absolute positions are then pinned down by the normalization assumptions (Assumptions 1 and 2). Given the ideal points, the realized marginal voter at each whip count, $\{\tilde{M}V_{1,t}\}$, is then identified as the “cutpoint” that divides the Yes and No votes.

At roll call time, each party has a different cutpoint (because of different party discipline parameters) given by $\{\tilde{M}V_{2,t}\} \pm y_p^{\max}$. The two cutpoints are identified by the locations that best divide Yes and No votes within a party. We determine the sign of the party discipline parameter using a proxy for the whipping direction, as described in Section 5. With whip count data, we can separately identify each party discipline parameter by the average change in votes between the whip count and roll call.⁴² In Congresses for which we have whip count data for only one of the parties, identification is guided by the fact that some members are present in Congresses for which we have whip counts for both parties. Next, because the estimated cutpoint at roll call time within a party is given by $\{\tilde{M}V_{2,t}\} \pm y_p^{\max}$, we can recover the realized marginal voters, $\{\tilde{M}V_{2,t}\}$. The variance in the second aggregate shock, η_2 , is given by the variance of the differences between realized marginal voters at whip count and at roll call.

Identification of the parameters governing agenda-setting, $\{\gamma, \mu_q, \sigma_q, \{\underline{q}_{l,p}, \bar{q}_{l,p}, \underline{q}_{r,p}, \bar{q}_{r,p}\}_{p \in \{D,R\}}\}$, requires the distributional assumption, Assumption 3. Under this assumption, the status quo distribution that the parties draw from is Normal, which, from the theory, means that the bills with only roll calls are drawn from a truncated Normal.⁴³ The resulting distribution of marginal voters is pinned down by the relationship between status quo policies and optimal alternative policies (Lemma A1 in the Appendix shows that the relationship between status quo and marginal voter is one-to-one), assuming each party has a quadratic loss utility function around its ideal point (Assumption 4). Convolving the distribution of marginal voters with those of the first and second aggregate shocks (whose variances have already been identified) provides a distribution over the realized marginal voters, $\{\tilde{M}V_{2,t}\}$, which we then match to the data.

Intuitively, the mean, variance, and cutoffs of the truncated Normal distribution all provide independent effects on the distribution of realized marginal voters for bills with roll calls only. Once the status quo distribution is identified, the cutoffs, $\bar{q}_{l,p}$ and $\underline{q}_{r,p}$, that determine the range of status quo policies for which whip counts are conducted, are pinned down by the number of whip counted bills. Finally, the probability that D

⁴²To identify the individual party discipline parameters from the change between whip count and roll call requires that the aggregate shock between these stages to be mean zero or at least of known mean. Knowledge of the mean of $\eta_{1,t}$, $\eta_{2,t}$ allows us to separate whether systematic changes in votes from whip counts to roll calls originate from the aggregate shocks or from party discipline. In addition, we have a second source of identification for the party discipline parameters. This comes from the two parties agreeing on some proposals (whipping in the same direction), but disagreeing on others (whipping in opposite directions). The difference between their cutpoints for any bill may be either the difference or the sum of the individual discipline parameters.

⁴³For computational reasons, we estimate the status quo cutoffs directly rather than the cost parameters, C_b and C_w , that determine them. The cutoffs are complex, implicit functions of the cost parameters making it infeasible to calculate them within the optimization loop. By allowing the cutoffs to be different on either side of each party’s median, we are implicitly allowing the costs to be potentially different in each case. This assumption therefore allows the cost of pursuing a bill to depend upon whether or not parties agree or disagree over the alternatives.

proposes a bill, γ , is determined by our proxy for the party proposing the bill augmented by information on the extent of selection of status quos, as discussed in the following subsection. We verify this intuition with extensive Monte Carlo simulations, reported in Online Appendix E.

The probabilities and likelihoods shown in the next section are also conditional on $X_{i,t}$, but to keep notation light we omit this dependency from the main equations.

6.2. Two Step Estimation

We observe votes for both parties, $p \in \{D, R\}$, at both the whip count stage (denoted $\text{Yes}_{t,p}^{i,\text{wc}}$) and at the roll call stage (denoted $\text{Yes}_{t,p}^{i,\text{rc}}$), for each politician $i \in \{1, \dots, N\}$ and period $t \in \{1, \dots, T\}$. We estimate the model in two steps.

In the first step, we take the distribution of status quo policies as given, which is possible because we estimate the realized marginal voters as fixed effects. We estimate the set of parameters, $\Theta_1 = \{\{\theta_p^i\}, y_p^{\max}\}_{p \in \{D,R\}}, \{\tilde{M}V_{1,t}\}, \{\tilde{M}V_{2,t}\}, \sigma_\eta\}$, by maximum likelihood, allowing the party discipline parameters, y_p^{\max} , to vary by Congress.

Replacing the conditional probability of observing a Yes vote at roll call given a Yes vote at whip count by its unconditional probability, we can define the pseudo-likelihood for the first step:

$$\begin{aligned} \mathcal{L}(\Theta_1; \text{Yes}_{t,p}^{i,\text{wc}}, \text{Yes}_{t,p}^{i,\text{rc}}) &= \prod_{p \in \{D,R\}} \prod_{t=1}^T \prod_{n=1}^{N_p} P(\text{Yes}_{t,p}^{i,\text{wc}} = 1)^{\text{Yes}_{t,p}^{i,\text{wc}}} P(\text{Yes}_{t,p}^{i,\text{wc}} = 0)^{1 - \text{Yes}_{t,p}^{i,\text{wc}}} \\ &\quad \times P(\text{Yes}_{t,p}^{i,\text{rc}} = 1)^{\text{Yes}_{t,p}^{i,\text{rc}}} P(\text{Yes}_{t,p}^{i,\text{rc}} = 0)^{1 - \text{Yes}_{t,p}^{i,\text{rc}}}. \end{aligned} \quad (6.3)$$

Using the pseudo-likelihood as opposed to the more cumbersome original likelihood has no effect on consistency of the estimation (Gourieroux, Monfort, and Trognon (1984), Wooldridge (2010)), because our model is identified despite the nuisance of the dependence between the roll call and the whip count stages.

For the Democratic Party, we can use equations (6.1) and (6.2), together with our parametrization to reexpress the likelihood of a series of votes by member of party D in (6.3) as

$$\begin{aligned} \mathcal{L}_D(\Theta_1; \text{Yes}_{t,p}^{i,\text{wc}}, \text{Yes}_{t,p}^{i,\text{rc}}) &= \prod_{t=1}^T \prod_{n=1}^{N_D} \Phi(\tilde{M}V_{1,t} - \theta^i)^{\text{Yes}_{t,p}^{i,\text{wc}}} (1 - \Phi(\tilde{M}V_{1,t} - \theta^i))^{1 - \text{Yes}_{t,p}^{i,\text{wc}}} \\ &\quad \times \Phi\left(\frac{\tilde{M}V_{2,t} - \theta^i \pm y_D^{\max}}{\sqrt{2}}\right)^{\text{Yes}_{t,p}^{i,\text{rc}}} \left(1 - \Phi\left(\frac{\tilde{M}V_{2,t} - \theta^i \pm y_D^{\max}}{\sqrt{2}}\right)\right)^{1 - \text{Yes}_{t,p}^{i,\text{rc}}} \end{aligned} \quad (6.4)$$

using $P(\text{Yes}_{t,p}^{i,\text{stage}} = 1) = 1 - P(\text{Yes}_{t,p}^{i,\text{stage}} = 0)$, for $\text{stage} \in \{\text{wc}, \text{rc}\}$. An analogous expression for the likelihood of votes by member of party R holds (see Online Appendix B).

We estimate (6.3), subject to $\theta^0 = 0$ (Assumption 1), then obtain an estimate of σ_η^2 from the variance of the difference between the realized marginal voters at whip count and roll call (for those bills which have both).

In the second step, we estimate the remaining parameters, $\Theta_2 = \{\gamma, \mu_q, \sigma_q, \{q_{l,p}, \bar{q}_{l,p}, q_{r,p}, \bar{q}_{r,p}\}_{p \in \{D,R\}}\}$, using both the realized marginal voters, $\{\tilde{M}V_{2,t}\}$, for bills with only roll

calls and the number of whip counts (whether pursued to roll call or not).⁴⁴ In each period, we observe either a whip count ($WC_t = 1$) or the realized marginal voter for a roll call without whip count ($RC_t = 1$) so that the likelihood can be written

$$\mathcal{L}^{\text{second step}}(\Theta_1; \tilde{WC}_t, \tilde{MV}_{2,t}) = \prod_{t=1}^T P(WC_t)^{WC_t} P(\tilde{MV}_{2,t})^{RC_t}.$$

The probability of observing a whip count is simply the probability that a status quo is drawn from the appropriate interval of the q support. Because for some status quo policies (those between $\bar{q}_{l,p}$ and $\underline{q}_{r,p}$) we observe neither a whip count nor a roll call, we must condition on the probability that we observe either. For example, for a whip count for a status quo to the right of a party's median, we have, using Proposition 2:

$$P(WC_t) = \frac{\Phi\left(\frac{\bar{q}_{r,p} - \mu_q}{\sigma_q}\right) - \Phi\left(\frac{\underline{q}_{r,p} - \mu_q}{\sigma_q}\right)}{P(WC_t \cup RC_t)},$$

where

$$\begin{aligned} P(WC_t \cup RC_t) &= \gamma \left(\Phi\left(\frac{\bar{q}_{l,D} - \mu_q}{\sigma_q}\right) + 1 - \Phi\left(\frac{\underline{q}_{r,D} - \mu_q}{\sigma_q}\right) \right) \\ &\quad + (1 - \gamma) \left(\Phi\left(\frac{\bar{q}_{l,R} - \mu_q}{\sigma_q}\right) + 1 - \Phi\left(\frac{\underline{q}_{r,R} - \mu_q}{\sigma_q}\right) \right). \end{aligned}$$

A realized marginal voter can come from a range of status quo policies. For example, the probability of observing a particular realized marginal voter for a status quo drawn from the right of the Democrats median (conditional on observing either a whip count or roll call) is

$$P(\tilde{MV}_{2,t}) = \int_{\bar{q}_{r,D}}^{\infty} \phi\left(\frac{\tilde{MV}_{2,t} - MV(q_t)}{\sigma}\right) \frac{\phi\left(\frac{q_t - \mu_q}{\sigma_q}\right)}{P(WC_t \cup RC_t)} dq_t.$$

The term, $\frac{\phi\left(\frac{q_t - \mu_q}{\sigma_q}\right)}{P(WC_t \cup RC_t)}$, is the conditional probability of drawing a particular q_t . A given q_t determines the marginal voter, $MV_t = MV(q_t)$, through the first-order condition.⁴⁵ The term, $\phi\left(\frac{\tilde{MV}_{2,t} - MV(q_t)}{\sigma}\right)$ is then the probability of observing a particular realized marginal

⁴⁴ Although the first step also recovers the realized marginal voters at the time of the whip count, $\{\tilde{MV}_{1,t}\}$, they are a function of the unobserved cost parameter, C_b , and so are not easily incorporated into the likelihood function. They are not necessary, however, as the number of whip counts themselves are sufficient to recover the associated cutoffs.

⁴⁵ Importantly, the first-order condition in case of no whip count does not depend on the unobserved cost parameters. For each Congress, we calculate the optimal policy alternatives for each party using estimates of the party medians, the standard deviation of the sum of the aggregate shocks, and the $\hat{MV}_{i,j}$ calculated from first step estimates.

voter, $\tilde{M}V_{2,t}$, for the given MV_i . Integrating over all possible q_i 's that could generate the observed realized marginal voter gives the probability.⁴⁶

In estimating the second step likelihood, we allow the cutoff status quo policies, $\{q_{l,p}, \bar{q}_{l,p}, q_{r,p}, \bar{q}_{r,p}\}_{p \in \{D,R\}}$ and the distribution (μ_q and σ_q) to vary by Congress, but hold the probability that the Democrats propose the bill, γ , constant.⁴⁷ As such, we are implicitly allowing the costs, C_b and C_w , to vary by Congress.

Online Appendix E presents the results of extensive Monte Carlo simulations of both the first and second steps, demonstrating good finite sample performance in each step. It also discusses the validity of our asymptotic inference in this context.

7. RESULTS

7.1. First Step Estimates: Ideologies and Party Discipline

Table I presents our first step, maximum likelihood estimates. In this step, we recover the estimated ideologies, θ^i , for 711 members of Congress from 315 whip counts and 5424 roll call votes. We report the party medians for each congressional cycle. We also recover the party discipline parameters, y_D^{\max} and y_R^{\max} , for each Congress, and the standard deviation of the aggregate shocks, σ_η . All parameters are precisely estimated.

In our first main result, Table I shows that both party discipline parameters, y_D^{\max} and y_R^{\max} , are positive and statistically different from zero in each Congress, rejecting the null of a model without party discipline (i.e., with no whipping). This party discipline results in additional polarization in votes, above and beyond that due to ideological polarization itself. Under standard methods that use roll calls only and assume sincere voting by politicians, this additional polarization in votes incorrectly loads on the ideologies, producing *perceived* ideological polarization that is too large. In fact, party discipline results in the party medians being exactly $y_D^{\max} + y_R^{\max}$ too far apart when party discipline is ignored.⁴⁸ To illustrate this fact, Figure 4 plots kernel densities of the estimated legislator ideologies, θ^i , by party and over time from our full model (solid lines). For comparison purposes, it also plots the corresponding ideological distributions (dashed lines) which result from estimates of a misspecified model in which we impose no party discipline, $y_D^{\max} = 0$ and $y_R^{\max} = 0$.

Differences in our methodology from standard methods (i.e., DW-Nominate random utility, optimal classification scores, Heckman–Snyder linear probability model scores, or

⁴⁶To estimate the second step likelihood, we need to identify for each whip count and realized marginal voter, the associated range of status quo policies. For roll call votes, we do so based on our proxy for which party proposed the bill as described in Section 5. For whip counts with subsequent roll calls, we identify the associated range of status quo policies for the whip counts based upon the corresponding range of status quo policies associated with the roll call. For whip counts without roll calls, we have no way to determine the leadership stance of the party that did not conduct a whip count. The natural assumption is that a party is more likely to conduct a whip count when it expects opposition from the other party, so we assume that the party conducting the whip count is the proposer and that the status quo is right of the party median for Democratic proposals and left of the party median for Republican proposals.

⁴⁷We estimated a specification that allowed γ to vary by Congress, but rejected this specification through a likelihood ratio test. The values of γ in each Congress were very similar.

⁴⁸One may hypothesize that party discipline results in a “hollowing out” of the middle of the distribution. However, party discipline simply shifts the cutpoint between Yes and No (see equation (6.2)), which, under the assumption of unbounded idiosyncratic shocks, affects the estimates of all ideologies in the same way.

TABLE I
FIRST STEP ESTIMATES^a

Parameter	Congress				
	95	96	97	98	99
Party Discipline y^{\max} , Democrats	0.383 (0.003)	0.526 (0.005)	0.366 (0.004)	0.658 (0.007)	0.865 (0.010)
Party Discipline y^{\max} , Republicans	0.342 (0.003)	0.373 (0.003)	0.482 (0.005)	0.600 (0.006)	0.440 (0.005)
Standard Deviation of Aggregate Shock σ_{η}			0.859 (0.953)		
Party Median—Democrats, θ_D^m	-1.431 (0.069)	-1.431 (0.052)	-1.420 (0.055)	-1.435 (0.053)	-1.462 (0.102)
Party Median—Republicans, θ_R^m	-0.036 (0.060)	0.042 (0.142)	0.134 (0.144)	0.181 (0.049)	0.236 (0.061)

N : 711
 T : 315 Whip Counted bills, 5424 Roll Called bills

^aEstimates of the first step parameters. Asymptotic standard errors are in parentheses. Nontime-varying parameters are centered in the table and apply to all five Congresses.

Markov Chain Monte Carlo approaches) are not driving our results.⁴⁹ As evidence, Figure 5 compares the estimated ideologies from our full model (right panel) and misspecified model with no party discipline (left panel) to the standard DW-Nominate estimates.

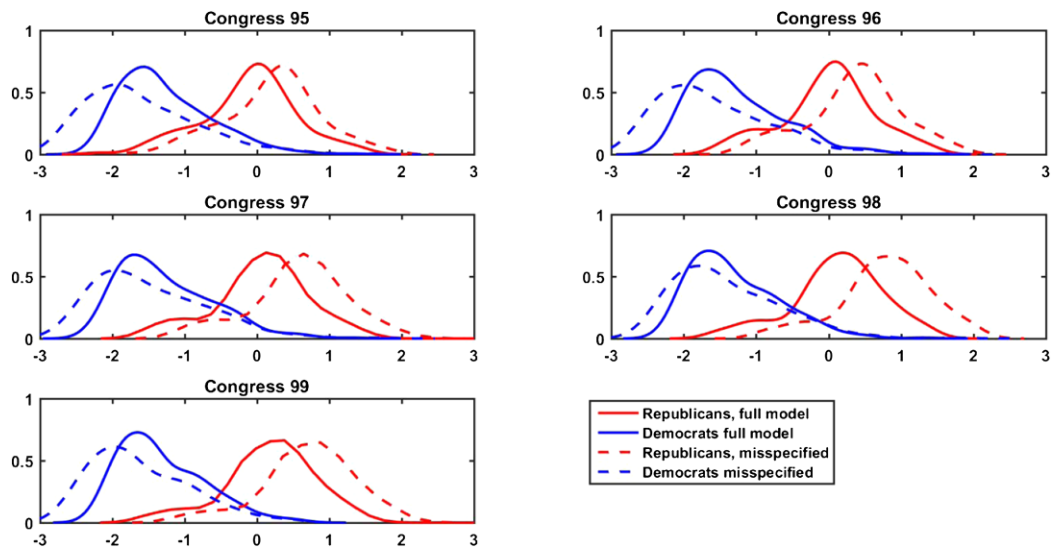


FIGURE 4.—Estimates of Ideological Points. Notes: Each graph (one per Congress) provides the kernel density of the estimated ideological points for each party (solid lines). For comparison (dashed lines), the graphs show the kernel density estimates under a misspecified model that assumes no party discipline.

⁴⁹For a discussion of optimal classification and maximum score estimators and their properties, see Online Appendix G. Combining the discussion in this section with that in Appendix G should make clear that using a nonparametric estimator does not, by itself, solve identification issues related to party discipline.

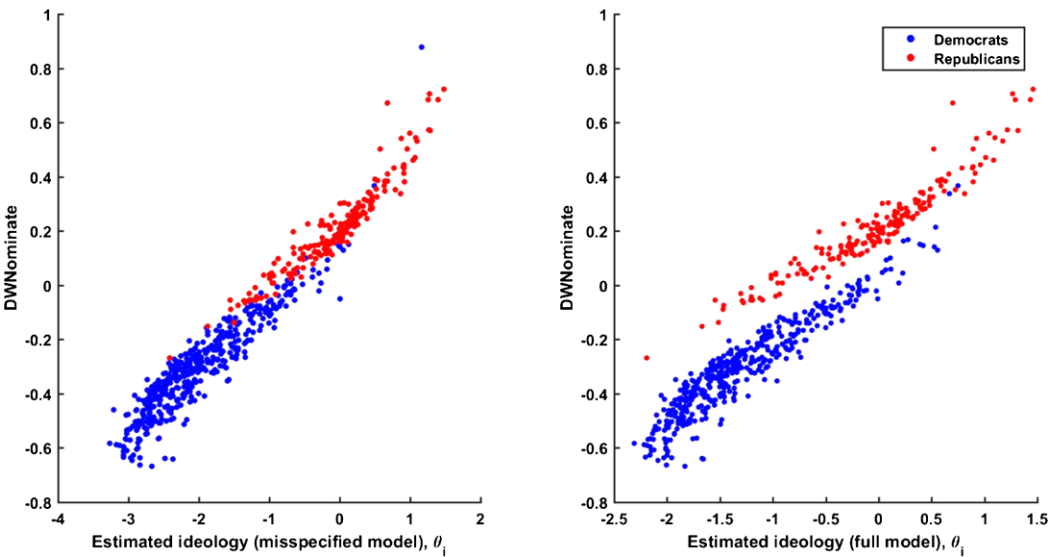


FIGURE 5.—Estimated Ideologies Compared to DW-Nominate Estimates. Notes: Correlations between our estimates of ideologies to those of DW-Nominate. In the left panel, the estimates are for a misspecified model with no party discipline (correlation = 0.976). In the right panel, the estimates are for the full model (correlation = 0.957).

The misspecified model and DW-Nominate estimates are very close, demonstrating that the two methods produce comparable results. Our full model, however, reveals a gap in density over the ideological middle ground, driven by DW-Nominate’s loading of party discipline on legislator ideology. This misspecification results in a sizable bias in DW-Nominate estimates, amounting to around 0.20 DW-Nominate units.

In the Online Appendix, Figure F.1 combines all three models (our main estimates, the misspecified model without party discipline, and DW-Nominate) to show graphically the impact of ignoring party discipline. Tracing across Congresses, party polarization, defined in terms of the distance between party medians $\theta_R^m - \theta_D^m$, widens over time, as can also be seen in Table I. Thus, even controlling for party discipline, we confirm the established view that ideologies appear to be diverging across party lines.

However, Figure 6 illustrates that party discipline is also becoming more important over time for both parties: the trend in y_p^{\max} for each party is clearly positive, tracing an increase in the reach of party leaders over rank-and-file members. The null hypothesis of a constant y_p^{\max} across Congresses is rejected via a likelihood ratio test after obtaining estimates from the constrained model (see Table F.3 in Online Appendix F for details).⁵⁰

Table II shows that party discipline accounts for 34 to 44% of perceived ideological polarization, and is increasing in importance over time. This measure is well-defined as both y^{\max} and ideologies are defined and measured in the same ideological space.

This rise in party discipline in the mid 1970s coincides with large reforms conducted in the House of Representatives, in particular among the majority Democratic party.

⁵⁰As specified in Section 6.1, given the rest of the data available, our estimates of y_p^{\max} do not depend on whether whip count data is available for the Republican party in the 97th–99th Congresses or not. y_R^{\max} , in particular, is identified. In Figure 6, while a jump in polarization happens in Congress 98 when whip count data for Republicans is absent, we do not observe a break in the trend of y_R^{\max} between the 96th and 97th Congresses.

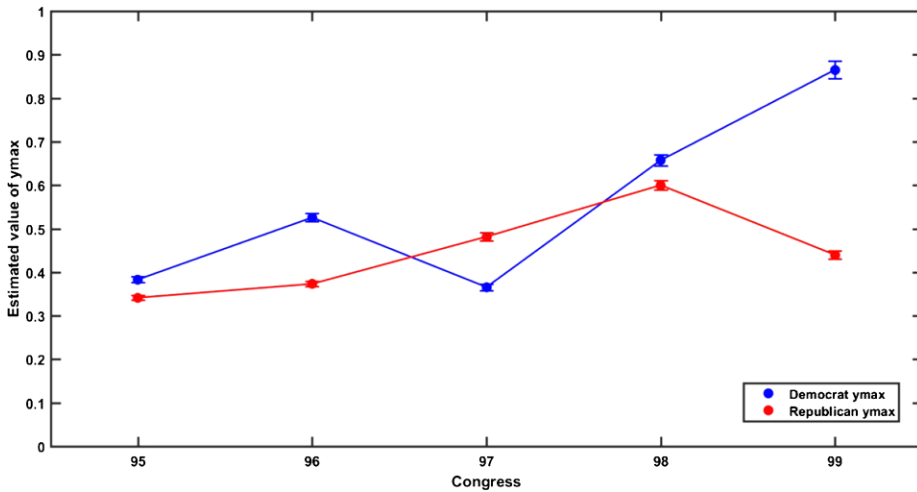


FIGURE 6.—Estimates of Party Discipline. Notes: Time series of the estimates of the party discipline (whipping) parameters for each party. Each parameter is in units of the single-dimension ideology.

During this period, power was heavily concentrated in the party leadership’s hands. Among the changes, leaders became responsible for committee assignments (including the Rules Committee), the Speaker gained larger control of the agenda progress, new tactics emerged (such as packaging legislation into ‘megabills’), and the Democratic Steering and Policy Committee was formed which met regularly to gather information and determine tactics and policies, with the leadership controlling half of the votes. A strong motivation for these reforms appears to be policy-based, aimed at preventing more liberal policies from being held back by Committee chairmen. See Rohde (1991) for a thorough description.⁵¹

TABLE II
DECOMPOSITION OF POLARIZATION^a

	Congress				
	95	96	97	98	99
Implications of Table I for Polarization					
A: Polarization due to ideology ($\theta_R^m - \theta_D^m$)	1.395	1.473	1.554	1.615	1.698
B: Polarization due to whipping ($y_R^{\max} + y_D^{\max}$)	0.725	0.899	0.848	1.258	1.305
C: Share of Perceived Ideological Polarization due to whipping (B/(A + B))	0.342	0.379	0.353	0.438	0.435
D: Share of Change in Perceived Ideological Polarization Explained by Change in Party Discipline		0.198	−0.058	0.464	0.054

^aDecomposition of perceived polarization (polarization in ideologies from a misspecified model that ignores party discipline) into that due to ideological polarization and that due to party discipline, by Congress. The last row reports the changes in perceived polarization from Congress to Congress that are explained by changes in party discipline.

⁵¹One can also observe polarization in votes in the Senate, starting in the mid to late 1970s. Although the Senate did not face institutional changes as extensive as those in the House of Representatives, their leaders also adopted “technological innovations” such as megabills, omnibus legislation, and time-limitation agreements, allowing more control over their party members and the agenda. See Deering and Smith (1997)

In Online Appendix Table F.4, we report in-sample model fit: individual vote choices correctly predicted by the model. The overall fit for roll call votes (with and without whip counts) is 85.5%. For whip count votes, the fit is lower, at 63%, due to the fact that whip count votes are much fewer in number and maximum likelihood weighs whip count votes and roll call votes equally. Overall, the fit of the model is very good, especially considering that we do not drop any roll call (we include both lopsided and close votes). This approach differs from extant approaches that condition on (occasionally hard to justify) selected subsamples of votes. For comparison, over our sample, the DW-Nominate prediction rate is 85.9%, but for reasons that were not immediate to us the procedure drops 892 roll calls, that we instead include.

Lastly, our first step produces an estimate of the size of the aggregate shock between whip count and roll call, $\eta_{2,t}$. In the theory, we assume that $\eta_{2,t}$ follows a mean-zero Normal distribution. In practice, we recover the distribution of $\eta_{2,t}$ semiparametrically. In the Online Appendix, Figures F.2a and F.2b show, via a histogram and a QQ-plot, that a Normal distribution with mean 0 and variance $\hat{\sigma}_\eta^2 = 0.859$ fits the recovered distribution of these aggregate shocks very well, providing empirical support for our assumption.⁵²

7.2. Second Step Estimates: Agenda Setting

Table III presents the results of maximum likelihood Estimation of the second step. We find that the means of status quo policy distributions, $W(q)$, lie between the party medians, with a standard deviation similar to the estimated distance between the party medians.⁵³

TABLE III
SECOND STEP ESTIMATES^a

	Congress				
	95	96	97	98	99
Probability Democrat is Proposer, γ			0.427 (0.020)		
Status Quo Distribution (Mean), μ_q	-0.188 (0.243)	-0.227 (0.298)	-0.237 (0.250)	0.045 (0.218)	-0.125 (0.189)
Status Quo Distribution (Standard Deviation), σ_q	2.222 (0.456)	1.816 (0.532)	1.937 (0.322)	1.354 (0.217)	1.252 (0.151)

^aEstimates of the second step parameters. Asymptotic standard errors, accounting for estimation error from the first step, in parentheses. Standard errors are computed by drawing 100 samples from the asymptotic distribution of first step estimates, recomputing the second step estimates, and using the law of total variance.

for a discussion. Nevertheless, institutional explanations might not be the sole driver of increasing discipline. Organizational change might have played a role and increasing polarization is also observed in U.S. state legislatures (Shor and McCarty (2011)).

⁵²The estimated shocks have slightly larger tails than a Normal, which is expected given that the shocks are convoluted with estimation error (Grinstead and Snell (2012, p. 294)).

⁵³We do not model explicitly intertemporal linkages across Congresses in terms of policy alternatives today that become tomorrow’s status quo policies, or any dynamic considerations in this respect on the part of party leaders. These extensions appear completely intractable. However, our parametric time-varying distribution of status quo policies allows the model to capture these dynamic considerations across Congresses, to a reasonable extent.

Our theoretical framework makes clear predictions about which status quo policies, q_i , are: (i) never brought to the floor; (ii) whip counted and then brought to the floor with a corresponding alternative, x_i , and (iii) brought directly to the floor with a corresponding alternative. In particular, as illustrated in Figure 2, the model predicts that status quo policies closest to a party's median are not pursued at all, the next closest are pursued with a whip count, and those furthest away proceed directly to roll call. We partially test this implication of the model in Table F.5 in the Online Appendix, by comparing the average absolute distance of the realized marginal voters among policies that were whip counted (whether they proceeded to roll call or not) to those brought directly to roll call. Because status quo policies closer to the party median result in realized marginal voters closer to the party median (on average), we expect realized marginal voters to be closer for policies with whip counts than for those that proceed directly to roll call. The results of Table F.5 strongly confirm this prediction of our theory with either the Democrats or the Republicans as the proposing party.

We illustrate the unobservable “missing mass,” those status quo policies that are never pursued, in Figures 7(a) and 7(b). Status quo policies brought directly to the floor are

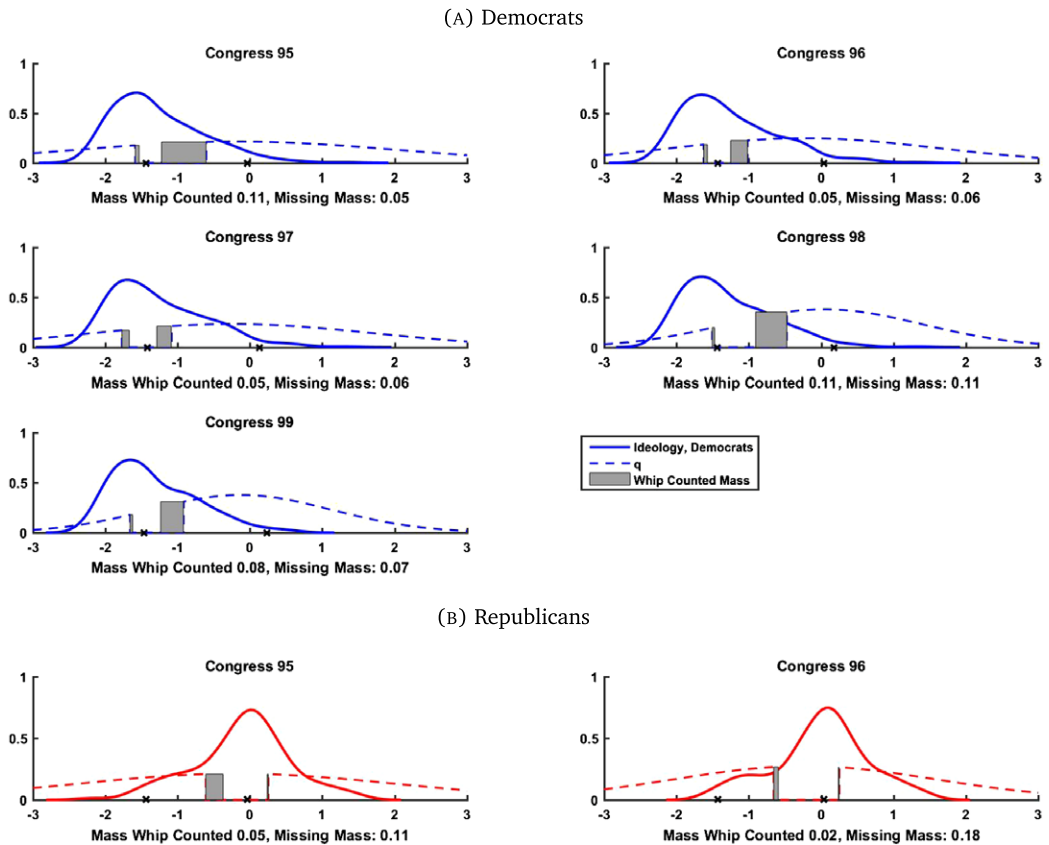


FIGURE 7.—Pursued Status Quo Policies. Notes: Estimated status quo distributions by Congress (dashed lines). Democrats are shown in the first set of graphs, Republicans in the second. Status quo policies that are pursued by the party with whip counts are shown in gray. The remaining gap in the distribution is the “missing mass” of status quo policies that are not pursued by the party at all. For reference, the party's ideologies are shown as solid lines.

TABLE IV
MISSING MASS^a

	Congress				
	95	96	97	98	99
Democrats					
<i>Main Model</i>	0.048	0.057	0.064	0.110	0.071
<i>Counterfactual: No Whipping</i>	0.049	0.058	0.064	0.115	0.076
<i>Counterfactual: Polarized Ideologies</i>	0.046	0.052	0.061	0.088	0.048
Republicans					
<i>Main Model</i>	0.109	0.180	–	–	–
<i>Counterfactual: No Whipping</i>	0.106	0.170	–	–	–
<i>Counterfactual: Polarized Ideologies</i>	0.113	0.195	–	–	–

^aMass of status quo policies (‘missing mass’) that are not pursued by the party at all. For the counterfactuals, C_b and C_w are determined from the second step estimates and held fixed, allowing new thresholds to be calculated.

indicated by dashed lines and those shaded in gray are preceded by whip counts. The gaps in the distributions around the party medians represent estimates of the missing mass. As reported in Table IV, the fraction of missing mass hovers around 15% across Congresses for the minority party and ranges from 5 to 11% for the majority party.⁵⁴ Bills that are first whip counted may also never see a floor vote, a form of agenda setting made explicit in our model. In the data, across all Congresses, on average 2 out of 7 whip counted bills are abandoned before reaching the floor (Table F.2 in the Online Appendix). Overall, our results suggest substantial censoring of the status quo policies pursued, indicating selection is an important role of parties in legislative activity.

Lastly, agenda setting works not only through selection, but also through the choice of policy alternatives to pursue in the first place. In the Online Appendix Figures F.3 and F.4, we report the implied distributions of marginal voters based upon the estimated status quo distribution and the optimal policy alternatives, x_t^* , from theory.⁵⁵ Each graph illustrates both parties’ efforts to move policy closer to their ideal points across the entire distribution of status quo policies. The reduction in the variance of the marginal voter distribution relative to that of the status quo policies is substantial, indicating sizable changes in policy. In addition, the variance in the marginal voter distribution narrows over time, consistent with the finding that parties are increasingly able to discipline members, and can thus pursue policy alternatives closer to their ideal points.

7.3. Robustness

Online Appendix D presents three additional estimates of the first stage of our model. First, we reestimate our model on the subsample of final passage votes alone (as opposed to amendments or motions), showing that our results are unchanged in a subset of salient votes. Second, we implement a procedure akin to Snyder and Groseclose (2000) in which we assume lopsided votes are not whipped (relaxing the assumption that all roll calls are

⁵⁴Note that our estimates of the missing mass do not directly relate to counts of the number of proposed bills that never make it to the whip count stage (e.g., dropped in committee). These counts would include bill proposals that neither party ever intended to pursue.

⁵⁵This is preferable than plotting the distribution of alternative policies, x_t^* , because the latter is a nonmonotone function of q_t which is difficult to depict graphically.

subject to whipping). Although the average party discipline decreases by about 7 percentage points in this specification (as the focus on divisive bills magnifies defection from the party line), this modification of our approach does not substantially alter our main quantitative conclusions. Third, we explore the possibility that our results are overly dependent on imposing a single dimensional policy space. We re-estimate our model dropping bills that split Northern and Southern Democrats using data from David Rohde's PIPC-University of Oklahoma repository. We do not find significant changes on the ideological distributions. This suggests that while a second dimension may not be unimportant, precluding it does not radically distort our findings.

In Appendix D, we also address an aspect not accounted for in the model—the salience of a bill might provide a reason for it to be whip counted. There, we note that only a small fraction of whip counted votes are included among the Congressional Quarterly's "Key Votes" series, a standard reference for highly visible votes. Only 32.5% of these Key Votes are whip counted, suggesting that a vote being salient is neither necessary nor sufficient for it to be whip counted.

Finally, our estimate of γ in Table III suggests that the majority party does not appear to have a majority of proposal opportunities, counter to what one might expect. The main reason for this result is that our sample of roll call votes is highly heterogeneous and includes both important final passage votes and a vast number of smaller amendments and motions typically originating from the minority party, as we discuss in detail in Online Appendix C. Among final passage bills in which the two parties oppose each other, the Democrats propose more than 94%. Thus, among these highly significant votes, the majority does in fact propose most of them. But, as pointed out by [Jenkins, Monroe, and Provins \(2014\)](#), among the far greater number of amendment and motion votes, the minority party is actively involved, negotiating with the majority party, using as bargaining chip threats of obstruction. Relatedly, [Jenkins, Monroe, and Provins \(2014\)](#) used bill sponsorship data to identify the proposing party. In Online Appendix D, we limit our sample to those votes in which our proposal proxy matches that of [Jenkins, Monroe, and Provins \(2014\)](#) based on the identity of the bill sponsor. In this subsample (where there is little doubt about the identity of the proposing party) we find $\hat{\gamma} = 0.56$.

8. COUNTERFACTUALS

8.1. *Salient Bills*

In our first counterfactual exercise, we analyze the role of party discipline for the approval of historically salient legislation, focusing on a series of economically consequential bills from our sample. To do so, we maintain the policy alternatives to be voted on as they were proposed in Congress (including realized aggregate shocks), but assume that parties cannot discipline members' votes: legislators vote solely according to their ideologies. Specifically, we calculate the predicted votes for a bill setting $y_D^{\max} = y_R^{\max} = 0$.

Among the bills, we consider are the lifting of the arms embargo to Turkey, the Panama Canal Treaty, several increases to the Debt Limit, the Social Security Amendments of 1983, and the Reagan Tax Reforms of 1981 and 1984. The first and second columns of Table V show that our baseline model fits these votes well. The third column presents the results of the counterfactual exercise, showing that party discipline is quantitatively important for the outcomes of these bills as, in some cases, their passage would have been reverted. In particular, a lack of party discipline would have reversed the approval

TABLE V
COUNTERFACTUAL: VOTING OUTCOMES ON SALIENT BILLS^a

Bill	Yes Votes (Data)	Yes Votes (Model Predicted)	Yes Votes (Counterfactual, No Whipping)
Security, International Relations and Other Policies			
Aid to Turkey/Lifting of Arms Embargo (H.R. 12514, Congress 95)	212	193	147
Foreign Intelligence Surveillance Act of 1978 (H.R. 7308, Congress 95)	261	283	280
National Energy Act, 1978 (H.R. 8444, Congress 95)	247	271	258
Panama Canal Treaty, 1979 (H.R. 111, Congress 96)	224	243	180
Contra Aid, 1984 (H.R. 5399, Congress 98)	294	279	343
Economic Policies			
Increase of Temporary Debt Limit (H.R. 9290, Congress 95)	221	242	185
Increase of Temporary Debt Limit (H.R. 13385, Congress 95)	210	235	201
Increase of Temporary Debt Limit (H.R. 2534, Congress 96)	220	239	208
Depository Institutions Deregulation and Monetary Control Act of 1980 (H.R. 4986, Congress 96)	369	404	391
Increase of Public Debt Limit, Make it part of Budget Process (H.R. 5369, Congress 96)	225	244	217
Economic Recovery Tax Act of 1981 (H.R. 4242, Congress 97)	284	329	276
Garn-St. Germain Depository Institutions Act of 1982 (H.R. 6267, Congress 97)	263	279	327
Social Security Amendments of 1983 (H.R. 1900, Congress 98)	282	299	230
Tax Reform Act of 1984 (H.R. 4170, Congress 98)	319	370	292

^aCounterfactual vote outcomes on certain key bills absent party discipline (whipping). The policies are assumed fixed.

of increases to the Debt Limit and significantly decreased support for the Social Security Amendments of 1983 and the 1984 Reagan Tax bill.⁵⁶

Although many bills lose support, Table V shows that others actually gain votes, a subtle consequence of differences in the location of the marginal voter and the directions each party whips their members. Consider H.R. 5399 banning aid to the Contras. For this bill, the Democrats whipped in favor and the Republicans against. The estimated marginal voter at roll call time is 0.288, right of both party medians.⁵⁷ Shutting down the ability of Democrats to whip for support of this bill changes a limited number of votes, as very few Democrats lie to the right of the marginal voter. On the other hand, shutting down the ability of the Republicans to whip against the bill increases its support substantially, because many Republican ideal points lie near the marginal voter. Thus, absent party discipline by either party, the number of Yes votes actually increases. An analogous argument, with opposite signs, leads to a decrease in support for the National Energy Act and for the 1984 Tax Reform. As a final example, H.R. 9290 which increased the temporary debt limit in the 95th Congress, loses about 35 Yes votes absent whipping, changing the outcome of the vote. The estimated marginal voter is -1.20 , a point sufficiently to the left that only a small minority of politicians would have voted Yes without both parties whipping for its support.

⁵⁶Selecting such bills as the 1984 Tax Reform is motivated by their use in economics to study consumer decisions, labor supply and labor, and income elasticities Auerbach and Slemrod (1997), Hausman and Poterba (1987), Souleles (2002). We provide further historical details about other bills in Online Appendix H.

⁵⁷This number rationalizes the large number of both Democrats and Republicans voting Yes, even if the Republican leadership voted against it.

The results in this section point to the quantitative importance of party discipline in determining policy outcomes. Our exercise here is, however, only a partial equilibrium one: absent the ability to discipline members, the equilibrium policy alternatives would have also changed. We consider the full equilibrium effects of a lack of ability to discipline in the following section.

8.2. Agenda Setting

8.2.1. No Party Discipline

We consider now a counterfactual exercise with no whipping ($y_D^{\max} = y_R^{\max} = 0$), but unlike in the previous section, we allow the proposing party to reoptimize. This entails choosing which status quo policies to pursue, whether to perform a whip count or not, and selecting the optimal alternative policy, x_t . Because we cannot identify the status quo associated with a particular bill (due to aggregate shocks), in this section we focus on averages across simulated bills. In particular, we calculate the average probability that a bill will pass and the average distance between the status quo and the proposed alternative, focusing on status quo policies that lie between the party medians (as estimated with our main model).

Table VI reports these two measures for the estimates from our model, as well as under the counterfactual of no whipping. From these results, we see that party discipline impacts the probability of approval of a bill by over 10%, while the magnitude of its effects on the policy alternative is very close to 0. For bills proposed by the Democrats, we observe a decrease in the passage rate of approximately 5 percentage points on average, relative to a baseline probability of 43%. For Republicans, however, when neither party whips

TABLE VI
COUNTERFACTUAL: AGENDA SETTING^a

	Congress				
	95	96	97	98	99
<i>Panel A: Average Change in the Probability of Bill Approval</i>					
Democrats					
Baseline Probability (Main Model)	0.357	0.467	0.421	0.431	0.544
Main Model—No Whipping	0.032	0.060	0.009	0.054	0.011
Main Model—Polarized Ideology	−0.005	−0.011	0.010	−0.013	−0.024
Republicans					
Baseline Probability (Main Model)	0.240	0.220	—	—	—
Main Model—No Whipping	−0.034	−0.042	—	—	—
Main Model—Polarized Ideology	0.028	0.032	—	—	—
<i>Panel B: Average Change in Pursued Policies, x_t</i>					
Democrats					
Main Model—No Whipping	−0.011	−0.018	−0.003	−0.024	−0.042
Main Model—Polarized Ideology	0.085	0.161	0.107	0.163	0.285
Republicans					
Main Model—No Whipping	−0.011	−0.016	—	—	—
Main Model—Polarized Ideology	−0.057	−0.048	—	—	—

^aNotes: Estimated and counterfactual probabilities of bill approval and average distance between the proposed policy alternative and the status quo, for status quo policies that lie between the party medians.

there is an increase in bill approval of approximately 4 percentage points on a baseline of 22%. The Republicans benefit from a lack of whipping by both parties, but the Democrats suffer, because the Democrats exert more discipline (see first step estimates in Table I) and are the majority party. For both reasons, when discipline is shut down for *both* parties, the Democrats lose more votes than Republicans, making proposals by Republicans more likely to pass and proposals by Democrats less so.

The lack of ability to discipline also impacts the size of the mass of bills that are never pursued (see Table IV). For the Democrats, we observe small increases in the missing mass, consistent with it being more difficult for them to pass legislation, lowering the value of pursuing a policy alternative. For the Republicans, the opposite occurs. The value of pursuing a bill increases because bills are passed more easily, enlarging the set of status quo policies that Republicans pursue and reducing their missing mass.

8.2.2. Increased Ideological Polarization

Our final counterfactual considers the effects of an increase in ideological polarization. In particular, holding everything else constant, we shift the Democratic party median to the left and the Republican party median to the right, increasing the distance between medians by $\frac{y_D^{\max} + y_R^{\max}}{2}$. We consider the same measures as in the previous section: probability of bill approval, distance between alternative and status quo policies, and the extent of the missing mass. Table VI presents the results for the first two measures and Table IV reports the missing mass results.

We find that an increase in ideological polarization has very different effects from changes in party discipline. The probability that a bill passes is relatively unchanged, but alternative policies are now set further left by Democrats and further right by Republicans.⁵⁸ Hence, the polarization in ideologies translates directly to polarization in the bills pursued. The magnitudes of these changes are quantitatively significant, ranging from 6 to 15% of the distance between the party medians relative to where they would have been, an order of magnitude larger than the changes resulting from a lack of party discipline. Interestingly, the missing mass changes go in the opposite direction to those under the counterfactual of no party discipline. The missing mass decreases for the Democrats and increases for the Republicans, suggesting that the value of pursuing a policy alternative increases for the majority party, but decreases for the minority party as ideological polarization increases.

Taken together, our counterfactual results suggest that an increase in polarization, either through an increase in party discipline or through ideological polarization, increases the value of pursuing an alternative policy for the majority party (lowers the missing mass for the Democrats), but decreases the value for the minority party (increases the missing mass for the Republicans). The results therefore suggest that increases in polarization via either channel benefit the majority party at the expense of the minority party. However, the channel matters—ideological polarization produces more polarized policies, while party discipline affects mainly the probability of bill approval. The benefit of explicitly modeling party discipline, optimal policy selection, and bill pursuit decisions simultaneously is that it demonstrates the subtle interactions between these factors. Omitting any single factor could lead to different and potentially biased conclusions.

⁵⁸These average effects mask heterogeneity with respect to the status quo as shown in Online Appendix Figures F.5–F.6. The counterfactual effects depend upon whether or not the status quo is between the party medians. For example, no party discipline is beneficial for the minority for bills within the medians (as the majority no longer whips against it), but it is harmful outside of it (where party discipline by the majority goes in the direction of the minority).

9. CONCLUSION

Polarization of political elites is an empirical phenomenon that has recently reached historical highs. It has consequential implications, ranging from heightened policy uncertainty (with consequences for investment and trade) to gridlock and inability of political elites to respond to shocks and crises. Extant literature has suggested competing views of the drivers of polarization and what can be done to counter this phenomenon. Some researchers point squarely at the ideological polarization of legislators, arguing that it is a result of more polarized electorates electing extremists. Other researchers caution about the role of individual ideology and instead emphasize changes in the rules of controlling the legislative agenda, tightening of the leadership's grip over policy, and the capacity of parties to more precisely reward and punish their rank-and-file.

Our empirical analysis provides an identification strategy useful for the quantitative assessment of the role of preferences and parties over the initial phase of modern congressional polarization and our theoretical setting rationalizes these issues within an internally coherent structure.

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