Roll call votes in democratic legislatures: the reasons for their use and their effects on legislative behavior

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Roll Call Votes in Democratic Legislatures

The Reasons for Their Use and Their Effects on Legislative Behavior

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Abstract

The goal of this dissertation is to examine the reasons for the selection of roll call votes in democratic legislatures and their effects on the voting behavior of legislators. These two goals are related. Because voting data are observational, understanding the effect of roll call votes on legislative behavior requires that we also understand how such votes are selected in legislatures. Typically, the selection of roll call votes occurs in two steps. In the first step, some actors decide on the rules specifying the requirements for roll call votes. In the second step, a given proposal is put to a roll call vote if the requirements specified in the first step are met. For example, if in the first step the actors decided that a certain quorum of legislators is necessary to request a roll call vote, then in the second step that quorum must be reached for a roll call vote to take place.

I show in Chapter 2 of my dissertation that the roll call requirements for final passage votes vary considerably across legislatures. In a minority of parliamentary chambers final votes are systematically carried out by roll call. Most chambers, however, record and publish only a subset of these votes. While in almost all of the latter chambers it is the legislators who have the power to decide when a vote shall be taken by roll call, the number of legislators that is necessary to do so varies greatly among these chambers.

The existing literature provides two main reasons why legislators have an incentive to rely on roll call votes. First, the "signaling argument" suggests that legislators rely on roll call votes as a means to demonstrate their loyalty to actors outside the legislature. Second, the "disciplining argument" holds that roll call votes are used because they improve the ability of party leaders to monitor and discipline their members, thus helping parties to overcome collective action problems. I argue in Chapter 1 and Chapter 3 that because party leaders are often able to monitor the behavior of their members independently of whether votes are taken by roll call or not, they have little reason to rely on roll call votes to discipline their members. In this dissertation, I therefore focus on the signaling motivation for roll call votes.

In Chapter 4, I draw on voting data and information about roll call requests

from the 47th legislative period of the Swiss lower chamber to evaluate the signaling argument empirically. Based on an extension of the "two-parameter" item-response theory (IRT) model, I show that the increased transparency brought about by roll call votes indeed matters for the voting behavior of reelection-seeking legislators, at least in a subset of votes. Especially moderate and conservative legislators, but also, although to a lesser extent, legislators with liberal ideologies, behave differently when votes are taken by roll call. This suggests that in many roll call votes reelection-seeking legislators expect that outside actors will reward or punish them for their publicly observable voting behavior.

Moreover, I also provide some evidence in Chapter 4 that legislators use their discretion over roll call votes strategically to reveal or not reveal information about their voting behavior to legislative outsiders. The data about the roll call request behavior of Swiss legislators are largely consistent with the idea that legislators tend to request roll call votes when they expect that making their voting behavior transparent to the public will improve their chances of reelection and that they tend not to request roll call votes when they expect that such voting transparency would harm their reelection prospects.

In Chapter 5, I turn to the choice of roll call vote requirements in legislatures. To explore the circumstances under which legislators choose to adopt rules that make roll call votes more or less likely, I develop a game-theoretic model that contains three stages: an organizational stage, a policymaking stage, and an election stage. In the organizational stage, legislators bargain over the probability that in the policymaking stage votes are decided by roll call. In the policymaking stage, legislators then bargain over policy issues, with the probability of a roll call vote depending on the outcome of the organizational stage. Finally, after the bargaining over policy has ended, parliamentary elections take place and voters either reelect their legislators or vote them out of office. Importantly, voters can only reward or punish legislators based on their voting behavior if the votes were taken by roll call in the policymaking stage.

The comparative statics analysis of the model shows that legislators' preference for roll call voting increases in the value that legislators place on being reelected and in the degree of ideological congruence between legislators and their voters. These results have important implications for the empirical analysis of roll call votes. First, analyses of roll call data from legislatures where votes are not systematically taken by roll call may overestimate the degree to which legislators represent the preferences of outside actors. Second, comparisons of legislative representation across different legislatures may be complicated by the fact that roll call voting is more likely to

be constrained in legislatures whose members have preferences that frequently differ from those of outside actors.

Taken together, the findings of this dissertation suggest that we need to exercise caution in making inferences about the general behavior of legislators based on roll call data. The reason is that legislators tend to request roll call votes when they expect that external actors will reward them for their voting behavior and that they tend not to request roll call votes when they expect that external actors would punish them for their behavior in roll call votes. In addition, legislators tend to facilitate the use of roll call votes when they expect that their policy preferences are in line with those of important outside actors, and they especially do so for votes that are relevant to their reelection prospects. As a consequence, analyses that are based on roll call votes may overestimate both the congruence between legislators' revealed preferences and the preferences of relevant actors outside the legislature and the level of polarization between parties in the legislature.

Résumé

L'ambition de cette thèse est double : examiner les raisons qui président à l'utilisation de votes nominatifs au sein des législatures démocratiques et déterminer les effets de ce type de votes sur le comportement de vote des législateurs. Ces deux objectifs sont liés. Considérant que les données sur le vote sont observationnelles, la compréhension de l'effet des votes nominatifs sur le comportement de vote des législateurs ne peut se faire qu'en comprenant comment le recours à ce type de votes est effectué dans les législatures. Ce choix se fait en effet en deux temps. Dans un premier temps, certains acteurs s'accordent sur les règles qui définissent les exigences pour demander un vote nominatif. Dans un second temps, une motion parlementaire donnée peut être soumise à un vote nominatif si ces exigences sont remplies. Par exemple, si les acteurs ont décidé qu'un certain quorum était nécessaire pour demander un vote nominatif, ce quorum devra être atteint pour qu'un vote nominatif ait lieu.

Dans le chapitre 2, je montre que les exigences pour recourir à un vote nominatif lors du vote final sur une motion parlementaire varient considérablement d'une législature à l'autre. Dans une minorité de chambres parlementaires, les votes finaux ont systématiquement lieu sous forme de votes nominatifs. Or, la plupart des chambres parlementaires n'enregistre ou ne publie qu'une partie de ces votes. Bien que presque toutes offrent à leurs membres le pouvoir de décider si un vote nominatif doit avoir lieu, le quorum nécessaire à ce choix varie beaucoup entre celles-ci.

La littérature fait état de deux raisons principales quant aux motivations des législateurs de recourir à un vote nominatif. Premièrement, la "thèse du signal" avance que des législateurs peuvent recourir au vote nominatif pour démontrer leur loyauté envers les acteurs extérieurs à la législature. Deuxièmement, "la thèse de la discipline" estime que les votes nominatifs sont utilisés parce qu'ils augmentent la capacité des leaders des partis politiques à surveiller et discipliner leurs membres, permettant ainsi aux partis de remédier aux problèmes d'action collective. Dans les chapitres 1 et 3, je soutiens l'idée que les leaders des partis politiques sont peu enclins à recourir au vote nominatif car ils sont souvent déjà capables de surveiller le comportement de leurs membres, qu'un vote nominatif ait lieu ou non. Par conséquent,

dans cette étude, je me concentre sur la première raison qui explique le recours au vote nominatif, c'est-à-dire l'idée que les parlementaires utiliseraient celui-ci comme un "signal".

Dans le chapitre 4, j'utilise des données sur les votes nominatifs ayant eu lieu lors de la 47e législature du Conseil national suisse—la chambre basse du Parlement suisse— afin de tester empiriquement la thèse du signal. À partir d'une extension du modèle à deux paramètres de la théorie de la réponse à l'item, je montre que la transparence accrue issue d'un vote nominatif joue un rôle sur le comportement de vote des législateurs cherchant à se faire réélire, du moins pour un sous-ensemble de votes. Plus particulièrement, les législateurs modérés et conservateurs se comportent différemment lorsqu'un vote est nominatif; dans une moindre mesure, il en va de même pour les législateurs d'idéologie libérale. Ceci suggère que, pour un bon nombre de votes nominatifs, les législateurs cherchant leur réélection s'attendent à ce que les acteurs extérieurs à la législature les récompensent ou les punissent en fonction de leur comportement de vote, ce dernier ayant été rendu public.

Ensuite, dans le chapitre 4, je montre que les législateurs utilisent leur pouvoir discrétionnaire de demander un vote nominatif de façon stratégique afin de révéler—ou de cacher—des informations pouvant être induites par leur comportement de vote aux acteurs extérieurs à la législature. Les données portant sur les demandes de votes nominatifs faites par les législateurs suisses correspondent à l'idée que les parlementaires ont tendance à demander un vote nominatif s'ils pensent que la publication de leur comportement de vote peut augmenter leur chance de réélection. Inversément, ils ont tendance à ne pas demander de vote nominatif s'ils estiment que leurs chances de réélection s'en trouveraient diminuées par la publicité de leur comportement de vote.

Dans le chapitre 5, j'examine le choix des exigences requises pour la tenue d'un vote nominatif au sein d'une législature. Afin d'explorer les circonstances dans lesquelles les législatures choisissent d'adopter des règles qui augmentent, respectivement diminuent, la probabilité de recourir à un vote nominatif dans la législature, je développe un modèle issu de la théorie des jeux composé de trois phases: une phase organisationnelle, une phase d'élaboration des politiques et une phase d'élection. Lors de la phase organisationnelle, les législateurs négocient quant aux modalités qui déterminent les possibilités de recours au vote nominatif, tout en tenant compte de la probabilité que des votes aient lieu sous cette forme lors de la phase législative subséquente. Dans cette seconde phase, les législateurs débattent de politiques particulières, lesquelles ont une certaine probabilité d'être adoptées par un vote nominatif en fonction des modalités déterminées lors de la phase organisationnelle. Enfin, après

négociations quant au contenu des politiques, il y a la phase d'élection. Lors de ces élections législatives, les électeurs réélisent ou destituent leurs législateurs. Ce qui importe ici c'est que les électeurs ne peuvent récompenser ou punir les législateurs sur la base de leur comportement de vote que si les votes ayant eu lieu lors de la phase législative ont été des votes nominatifs.

L'analyse de statique comparative de ce modèle démontre que l'inclination des législateurs pour le vote nominatif augmente en fonction de la valeur qu'ils attribuent à leur réélection, de même qu'avec le degré de congruence idéologique entre ceux-ci et leurs électeurs. Ces résultats ont des implications importantes pour l'analyse empirique des votes nominatifs. Premièrement, les analyses de données sur des votes nominatifs dans des législatures qui n'en utilisent pas systématiquement peuvent surestimer la correspondance entre les préférences des parlementaires et des acteurs extérieurs à la législature. Deuxièmement, des comparaisons de la représentation législative entre législatures peuvent devenir plus complexes considérant que le recours aux votes nominatifs est probablement plus restreint dans les législatures où les membres ont fréquemment des préférences divergentes par rapport aux acteurs extérieurs à la législature.

Dans l'ensemble, les principaux résultats de cette thèse de doctorat suggèrent qu'il faut être prudent lorsqu'on tire des conclusions générales sur le comportement de vote des législateurs sur la base de données portant sur des votes nominatifs. En effet, les législateurs ont tendance à prôner le recours aux votes nominatifs lorsqu'ils s'attendent à être récompensés pour leur comportement de vote par des acteurs extérieurs alors qu'ils ont tendance à ne pas demander de tels votes lorsqu'ils estiment que ces acteurs risquent de les punir pour un "mauvais" comportement de vote. De plus, les législateurs ont tendance à faciliter le recours aux votes nominatifs s'ils s'attendent à ce que leurs préférences correspondent à celles des acteurs extérieurs, et ce particulièrement pour des votes pouvant jouer un rôle pour leur réélection. Par conséquent, des analyses basées sur des votes nominatifs peuvent surestimer, d'une part, la congruence entre les préférences des législateurs et celles des acteurs extérieurs importants et, d'autre part, le niveau de polarisation entre les partis politiques présents au sein de la législature.

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Chapter 1

Introduction

"[A]ll knowledge is the result of theory—we buy information with assumptions [...]*."*

Clyde H. Coombs, *A Theory of Data*

Even a cursory look at legislatures reveals that there is considerable variation in how legislators cast their votes.[1] For example, in the United States (US) Congress, the default voting mechanism is the voice vote, which produces no record of individual voting positions. To record and publish legislators' voting behavior in either chamber of Congress, a legislator must formally request a recorded vote and that request must be supported by one-fifth of those present (Lynch and Madonna 2013, 531ff.).[2] In contrast, in both chambers of the Swiss parliament, the individual voting decisions of legislators are systematically recorded. However, while the Swiss lower chamber (the National Council) publishes the voting records for all votes, the upper chamber (the Council of States) does so only for total and final votes as well as in the case of votes that require a majority of the total number of its members.[3]

[1] In the following, I will use the terms "legislature" and "parliament," and hence also "legislators" and "members of parliament," interchangeably, although Kreppel (2014, 83ff.) defines legislature as a generic term for a legislative assembly and parliament as the legislature of a country with a parliamentary system of government (moreover, "congress" is defined as the legislature of a separation-of-powers system). For information on the differences between parliamentary and separation-of-powers systems as well as their implications for policymaking and regime and government stability, see, e.g., Horowitz (1990), Linz (1990*a*,*b*), Lipset (1990), Tsebelis (1995), Mainwaring and Shugart (1997), Cheibub, Przeworski and Saiegh (2004), and Lijphart (2012).

[2] The US House of Representative often resolves into the Committee of the Whole (COW) for the consideration of bills (Roberts 2007, 344; see also `http://clerk.house.gov/committee_info/commfaq.aspx`, last accessed on 10/24/2015). In the COW, roll call votes may be requested by at least 25 legislators (Smith 1989; Roberts and Smith 2003).

[3] The Swiss parliament consists of two chambers, the National Council and the Council of States, with equal powers. All bills must pass both chambers, one after the other. In each chamber, a so-called "total vote" takes place on a bill after it has been considered article by article. After the chamber that considers the bill first carried out its total vote, the bill goes to other chamber.

In this dissertation, I define "voting methods," and synonymously "voting procedures," as the rules that specify how and in what form votes are cast.[4] While voting methods differ along several dimensions, one of the most important differences is the degree of transparency they provide about individual voting behavior.[5] Using voting transparency as criterion, I distinguish three groups of voting methods: "roll call voting methods," "signal voting methods," and "secret voting methods" (see also Inter-Parliamentary Union 1986; Saalfeld 1995; Carey 2009; Crisp and Driscoll 2012; Hug, Wegmann and Wüest 2015). Roll call voting methods are voting procedures that record the individual voting decisions of members of parliament (MPs) and then make the record available to the public, such as by publication on the website or in the minutes of proceedings of the parliament.[6] In contrast, if votes are cast by signal voting methods, then the voting behavior of legislators is at best revealed to those who are physically present when the votes are taken on the floor, but not to actors outside the legislature (examples of signal voting are voting by voice, show of hands, rising in places, etc.). Finally, under secret voting, virtually no information about the individual voting decisions of legislators is disclosed. The only information revealed in such votes are the aggregate results.

In almost all parliaments, legislative votes are taken by roll call or signal voting methods. Secret votes, on the other hand, are exceptional and in most cases, their use is restricted to elections and political appointments (Saalfeld 1995, 535). Therefore, in the following, I will focus mainly on roll call and signal voting and only occasionally refer to secret voting procedures.

Do legislators care about whether votes are cast by a roll call or a signal voting method? According to a large number of authors, this should be the case (e.g.,

Then, if the bill passed in the total vote of the second chamber differs from the version passed in the total vote of the first chamber, the bill goes back to the first chamber (Bütikofer 2014, 42f.).

[4]Note that Rasch (1995, 489; 2000, 5) defines "voting procedures" as mechanisms that translate individual votes into collective choices. Such procedures consist of "a balloting method and [...] of more or less complex decision rules," where "balloting method" refers to the rules that specify how and in what form votes are cast and "decision rules" determine how votes are aggregated in order to produce a legislative outcome. In my terminology, voting methods and voting procedures therefore refer to what Rasch (1995, 2000) calls balloting methods.

[5]In addition to the level of individual voting transparency, there are (at least) two other dimensions along which voting procedures differ. First, voting methods vary in terms of how accurately the individual votes cast can be aggregated. This may be important, as the recent vote count errors, and the accompanying surge in support for the introduction of recorded voting, in the Swiss upper chamber illustrate (*Neue Zürcher Zeitung* 2012*a*,*b*, 2013). Second, voting procedures differ with regard to how time-consuming they are. This matters because legislators can use time-intensive procedures as a means to obstruct parliamentary business (Saalfeld 1995). So far, however, most of the literature has focused on the differences in voting transparency, while the accuracy and time consumption of voting methods have received only scant attention (but see Inter-Parliamentary Union 1986; Saalfeld 1995).

[6]I therefore use the term roll call voting in a broad sense. I will indicate in the text when I mean to refer to roll call voting in the narrow sense (i.e., literally calling the roll).

Saalfeld 1995; Carrubba et al. 2006; Carrubba, Gabel and Hug 2008; Carey 2009; Hug 2010; Stecker 2010, 2015; Lynch and Madonna 2013; Finke 2015; Yordanova and Mühlböck 2015). Roll call votes make individual voting decisions transparent to different actors than do signal votes, and this may change the incentive structure legislators face when deciding how to vote. However, there is little evidence in the literature on how legislators' individual voting behavior varies depending on whether roll call or signal voting is used to cast votes. The first goal of this dissertation is therefore to examine how roll call voting affects legislators' voting behavior. Based on data from the Swiss National Council, I will analyze how the voting behavior of legislators varies depending on whether votes are cast by roll call or signal voting. The second goal of the dissertation is to explain when and why legislatures adopt more or less transparent procedures of voting. To do so, I will propose a bargaining model that allows me to explore the circumstances under which legislators prefer to rely on roll call votes rather than signal votes and vice versa.

The remainder of this chapter is organized as follows. Roll call votes matter to legislators because they matter to constituents, parties, and other actors with control over resources that legislators value. In Sections 1.1, 1.2, and 1.3, I will discuss in more detail why roll call votes are relevant to these actors. Next, in Section 1.4, I will describe the research design of the dissertation. I will then explain in Section 1.5 why understanding the reasons for and effects of roll call votes is important for research on legislative behavior and, finally, Section 1.6 concludes the chapter.

1.1 Why Roll Call Votes Are Relevant to Legislators

Roll call votes are relevant to legislators if they affect their ability to achieve their goals. While legislators may have many goals, the literature commonly assumes that reelection, making good policy, and influence in the legislature are the most important (e.g., Mayhew 1974; Fenno 1978; Fiorina 1989; Cox and McCubbins 2005, 2007). Legislators who seek to achieve these goals depend on a variety of resources controlled by other actors, of which some are inside and others are outside the legislature (e.g., Hix 2002; Carey 2007, 2009; Theriault, Hickey and Blass 2011). For example, winning reelection involves garnering sufficient support among constituents, donors, campaign volunteers, and members of the "selectorate."[7] Formulating, pass-

[7]I define as selectorate the body that selects candidates for election. Following Rahat and Hazan (2001), selectorates can be classified on a continuum. At one extreme of the continuum, the selectorate is most inclusive (as, e.g., in an open primary) and on the other extreme, it is most

ing, and successfully implementing policies might not be possible without the help of interest groups and agenda-setters in the legislature. And securing influential positions within the legislature may require the nomination or appointment by party leaders.

Roll call voting and signal voting methods differ in the degree of transparency they provide about the votes of individual legislators. While under roll call voting individual votes are visible to both actors inside and actors outside the legislature, under signal voting they can at best be observed by the former set of actors. If an actor controls valuable resources and if the provision of these resources to legislators depends on the actor's ability to monitor individual votes, then the degree of transparency provided by the method of voting may affect the ability of legislators to attain their goals.

In Sections 1.2 and 1.3 I will discuss why information about individual legislators' votes may be important for the provision of resources that are controlled by actors inside and outside the legislature. Before doing so, however, I present a brief overview of the debates that preceded the adoption of roll call voting procedures in two legislatures, the US Congress and the Swiss Council of States. The debates illustrate that legislators indeed care about whether votes are cast by roll call or not.

1.1.1 Roll Call Voting in the US Congress

In 1787, after years of a weak central government unable to deal with the United States' postwar problems, fifty-five delegates from twelve of the thirteen original states convened in Philadelphia to strengthen the Articles of Confederation, eventually drawing up a wholly new federal constitution (Davidson et al. 2014, 18f.). Although the delegates to the Constitutional Convention devoted relatively little time to the internal procedures of the House and Senate (Binder 1997, 36), "[o]ne of the few congressional rules that the founders did specify and debate was the mechanism allowing members to call for recorded votes" (Lynch and Madonna 2013, 532).

On August 10, 1787, delegates debated a provision allowing one-fifth of the members present in a chamber to call for a recorded vote (Binder 1997, 36; Lynch and Madonna 2013, 532).[8] Gouverneur Morris of Pennsylvania opposed the requirement

exclusive (e.g., when the power to nominate candidates rests with the national party leadership).

[8] Article VI, Sect. 7 of the draft of the constitution stated that "[t]he House of Representatives, and the Senate, when it shall be acting in a legislative capacity, shall keep a Journal of their proceedings, and shall, from time to time, publish them: and the yeas and nays of the members of each House, on any question, shall at the desire of one-fifth part of the members present, be entered on the journal" (Farrand 1911, 254).

that the support of one-fifth of members be necessary to record a vote and proposed instead that any single member should be allowed to call the yeas and nays.[9] Morris' motion was countered by Roger Sherman of Rhode Island, who argued that recorded votes "are not proper as the reasons governing the voter never appear along with them." He therefore proposed eliminating the yeas and nays clause altogether (Farrand 1911, 255). A similar argument was made by Nathaniel Ghorum of Massachusetts, who expressed concern that allowing a single member to demand a recorded vote would lead to a practice of "stuffing the journals with them [recorded votes] on frivolous occasions" and "misleading the people who never know the reasons determining the votes" (Farrand 1911, 255). In the end, both proposals were defeated and the one-fifth requirement for recording a vote was left unaltered (Lynch and Madonna 2013, 532).

1.1.2 Roll Call Voting in the Swiss Council of States

More than two centuries later, similar objections against roll call voting were raised in the Swiss Council of States. In 2002, in the context of the revision of the Parliament Act, the Council of States had to decide on a parliamentary initiative of the Political Institutions Committee of the National Council that required both chambers to record and publish individual voting decisions for all votes, thus abandoning the Council of States' practice of voting by show of hands and recording and publishing individual votes only at the request of ten members (von Wyss 2003, 36f.; Bütikofer 2014, 32).[10] The Council of States rejected the initiative, partly based on the argument that publishing legislators' voting behavior for all votes would distort the public perception of the chamber.[11]

However, the question of recording votes remained on the agenda of the Council of States. In 2005, Simonetta Sommaruga (SPS – BE) introduced a motion calling for the use of an electronic voting system to record and publish the voting behavior of individual legislators for all total and final votes as well as votes requiring a qualified majority.[12] In the subsequent debate on the motion, Peter Bieri (CVP – ZG), then

[9] According to Farrand (1911, 255), Morris argued that "[t]he small States may otherwise be under a disadvantage, and find it difficult to get a concurrence of one-fifth."

[10] For more information on the parliamentary initiative of the Political Institutions Committee of the National Council, see `https://www.parlament.ch/de/ratsbetrieb/suche-curia-vista/geschaeft?AffairId=20010401` (last accessed on 05/16/2016).

[11] See the minutes of proceedings of the Council of States, available at `https://www.parlament.ch/de/ratsbetrieb/amtliches-bulletin/amtliches-bulletin-die-verhandlungen?SubjectId=5312` (last accessed on 05/10/2016).

[12] For more information on Simonetta Sommaruga's motion, see `https://www.parlament.ch/de/ratsbetrieb/suche-curia-vista/geschaeft?AffairId=20053698` (last accessed on 05/16/2016).

vice president of the Office of the Council of States, justified the Office's opposition to the motion by arguing that it would enable political scientists and the media to analyze the voting behavior of the members of the Council of States.[13] Referring to the National Council, which has been publishing individual voting decisions since 1994 (until 2007, however, only for a subset of votes), he warned:

> At the end of November, the rating of the members of the National Council was published once again. This rating puts the members of the Council on parade like a cattle show or a beauty pageant would. One ends up somewhere between minus 10 and plus 10 and is closer to or farther from the median value; in our case, considering that the president does not vote, this would be number 23. Then, 22 of us would have to deal with being praised or blamed as being left and, respectively, right on the political spectrum, whatever that may mean, and it would be the role of some political scientists acting as self-declared judges to decide what is politically left and right.
>
> Such a lineup of parliament would entirely ignore that we represent not only our own interests or those of our parties, but also have to take into account the concerns of our cantons in our decisions, independently of whether such a cantonal concern lies more on the left or more on the right on the spectrum of political parties.

Similar concerns were raised by Carlo Schmid (CVP – AI), another opponent of recorded voting: "The problem is not that we would not bear ratings or would pay attention to ratings, but that scientists would start to make ratings and draw inferences from them. Our voters would take note of these ratings and not realize what is different in this Council from the National Council."[14] After the debate, the Council of States clearly rejected Sommaruga's motion.

A new attempt to mandate the recording and publication of individual votes occurred in 2011. A parliamentary initiative by This Jenny (SVP – GL) demanded the introduction of an electronic voting system and the publication of individual voting decisions for all total and final votes as well as votes that require a majority

[13] The Office of the Council of States is responsible for the organization and procedures of the chamber. It consists of the president of the chamber, the first and second vice presidents, a teller, a deputy teller, and a member from each parliamentary party that has at least five members in the upper chamber and that would otherwise not be represented in the Office (see `https://www.parlament.ch/en/%C3%BCber-das-parlament/parlamentsw%C3%B6rterbuch/parlamentsw%C3%B6rterbuch-detail?WordId=37`, last accessed on 05/15/2016).

[14] See the minutes of proceedings, available at `https://www.parlament.ch/de/ratsbetrieb/amtliches-bulletin/amtliches-bulletin-die-verhandlungen?SubjectId=10195` (last accessed on 05/15/2016). My own translations from the German original.

of the total number of members of the chamber.[15] Although the Council of States passed the initiative in the first reading, a few months later, in the second reading, a majority of the chamber voted to reject it. The objections to increased voting transparency ran along familiar lines. Paul Niederberger (CVP – NW), for example, contended that the members of the chamber would be reduced to a yes or a no if votes were electronically recorded and published. However,

> [w]hen communicating, you always ask so-called open-ended questions, and journalists do so in particular, which is to say questions that you cannot answer by a simple yes or no. And when someone asks me an open-ended question, I have the opportunity to respond with arguments. I do not want us to be reduced to a yes or a no. This would then mean that the politically interested go on the Internet and check how Paul Niederberger has voted on this or that proposal, whether it was a yes or a no. The communication with the people would suffer in this case.[16]

In a later debate on the initiative, Urs Schwaller (CVP – FR) lamented that "the question is once more whether we want here an electronic voting system or not." And he went on arguing that "[i]n the end, this also means whether we want to have rating tables and a left-right classification once, twice, or three times a year. If you do not want such tables to be created once, twice, or three times a year, then you will have to say no to the introduction of an electronic voting system [...]."[17]

The decision to reject This Jenny's initiative would normally have meant its end. However, as over the next few weeks the practice of voting by show of hands lead to a number of incorrect vote counts, This Jenny chose to raise a point of order to reconsider his parliamentary initiative.[18] A majority of the chamber decided to accept

[15]For more information on the parliamentary initiative of This Jenny, see `https://www.parlament.ch/de/ratsbetrieb/suche-curia-vista/geschaeft?AffairId=20110490` (last accessed on 05/16/2016). Moreover, in 2011, Lukas Reimann (SVP – SG) and the Swiss People's Party each introduced a parliamentary initiative that required the Council of States to publicize the voting behavior of legislators for all votes. The Council of States decided in the first reading not to consider these initiatives. The decision was justified on the grounds that, first, the initiatives became obsolete in the light of the one introduced by This Jenny and, second, internal procedures should be the concern of the Council of States and not of the National Council (see `https://www.parlament.ch/de/ratsbetrieb/amtliches-bulletin/amtliches-bulletin-die-verhandlungen?SubjectId=22518`, last accessed on 05/16/2016).

[16]See the minutes of proceedings, available at `https://www.parlament.ch/de/ratsbetrieb/amtliches-bulletin/amtliches-bulletin-die-verhandlungen?SubjectId=22527` (last accessed on 05/16/2016). My own translation from the German original.

[17]See the minutes of proceedings, available at `https://www.parlament.ch/de/ratsbetrieb/amtliches-bulletin/amtliches-bulletin-die-verhandlungen?SubjectId=22533` (last accessed on 05/16/2016). My own translation from the German original.

[18]The fact that votes were counted incorrectly on a number of occasions was re-

Jenny's point of order and the initiative was referred back to the committee.[19] Finally, the Council of States passed the committee's proposal to electronically record all voting decisions and to publish them in the case of total and final votes as well as votes that require a majority of the total number of members of the chamber.[20]

The discussions about voting transparency in the US Constitutional Convention and, more recently, the Swiss Council of States illustrate that legislators care a great deal about whether and when their votes are recorded and published. In particular, the debates show that legislators are concerned about how roll call voting will affect their perception in the eyes of the public. This is one example of how roll call votes can influence the way an actor (here citizens) allocates resources (here the citizens' votes) that are valuable to legislators. In following two sections, I will describe in more detail why roll call votes are relevant to constituents, parties, and other actors whose resources legislators value.

1.2 Why Roll Call Votes Are Relevant to Constituents and Other Actors Outside the Legislature

In all modern democracies, citizens delegate policymaking authority to a set of representatives, thus establishing a principal-agent relationship (e.g., Lupia and Mc-

ported widely in the Swiss media. For example, see the *Tagesanzeiger* (http://www.tagesanzeiger.ch/schweiz/standard/Abstimmung-im-Staenderat-falsch-ausgezaehlt/story/17333595, http://www.tagesanzeiger.ch/schweiz/standard/Die-StaenderatsPosse-des-Jahres/story/31317162, and http://www.tagesanzeiger.ch/schweiz/standard/Eine-Wiederholung-ist-keine-Korrektur/story/28104539), the *Neue Zürcher Zeitung* (http://www.nzz.ch/schweiz/neuer-auszaehlfehler-im-staenderat-1.17871135 and http://www.nzz.ch/schweiz/schon-wieder-zaehlfehler-im-staenderat-1.17873695), the *Aargauer Zeitung* (http://www.aargauerzeitung.ch/schweiz/falsch-gezaehlt-staenderat-haette-fuer-ein-importverbot-gestimmt-125734853 and http://www.aargauerzeitung.ch/schweiz/gleiches-resultat-bei-wiederholter-abstimmung-im-staenderat-125740921), and the *Solothurner Zeitung* (http://www.solothurnerzeitung.ch/schweiz/schon-wieder-falsch-staenderat-verzaehlt-sich-auch-bei-wiederholung-125740921 and http://www.solothurnerzeitung.ch/solothurn/kanton-solothurn/roberto-zanetti-als-partysprenger-der-staenderatsabstimmung-125741570) (last accessed on 05/21/2016).

[19]For more information, see https://www.parlament.ch/de/ratsbetrieb/amtliches-bulletin/amtliches-bulletin-die-verhandlungen?SubjectId=32793 (last accessed on 05/17/2016).

[20]The proposal to record and publish individual votes was, however, again met with opposition. For example, Roland Eberle (SVP – TG) warned that if individual voting decisions are electronically recorded and published, they are available immediately. This would create additional media pressure that may lead to oversimplified interpretations, while those concerned have no opportunity to adequately explain their published opinions (see the minutes of proceedings, available at https://www.parlament.ch/de/ratsbetrieb/amtliches-bulletin/amtliches-bulletin-die-verhandlungen?SubjectId=22515, last accessed on 05/17/2016).

Cubbins 2000; Mitchell 2000; Strøm 2000, 2003; Besley 2006).[21] As in any agency relationship, the delegation of authority from citizens (the principals) to legislators (the agents) can create two main problems (see, e.g., Hart and Holmström 1987; Laffont and Martimort 2002). First, hidden information—i.e., agents have private information about their types—may lead principals to delegate authority to the "wrong types" of agents (adverse selection). For example, if voters lack sufficient information about the quality of candidates, it might be difficult for them to select "good" representatives, who share similar policy preferences and have the skills and willingness to realize these preferences efficiently.[22] Second, the possibility of hidden action—i.e., agents can take actions that are unobserved by principals—may create incentives for agents with different preferences than their principals to act contrary to the principals' wishes (moral hazard). This means, for instance, that when representatives have different policy preferences than their constituents, be they personal or induced, and when constituents cannot monitor individual voting decisions, representatives may have an incentive to shirk their constituents by voting their own personal or induced preferences.

While there are several potential ways to deal with these information problems, the principals' choice of measures typically depends on the nature of the agency relationship (e.g., Kiewiet and McCubbins 1991; Strøm 2000). In representative democracies, competitive elections are generally seen as the primary mechanism to solve the agency problems between voters and representatives (e.g., Lott 1987; Fearon 1999; Mansbridge 2009; Ashworth 2012). Rational voters, when presented with a choice of candidates, decide whom to vote for based on the utility they expect to derive from each candidate in office.[23] Competitive elections therefore allow forward-

[21] Jensen and Meckling (1976, 308) define a principal-agent relationship as a "contract under which one or more persons (the principal(s)) engage another person (the agent) to perform some service on their behalf which involves delegating some decision making authority to the agent." Similarly, according to Eggertsson (1990, 40f.), an agency relationship is established "when a principal delegates some rights—for example, user rights over a resource—to an agent who is bound by a (formal or informal) contract to represent the principal's interests in return for payment of some kind." For alternative definitions of agency relationship, see, e.g., Fearon (1999, 55) and Carey (2009, 3).

[22] Note that my characterization of a good type of representative is similar to that of Fearon (1999, 59), who defines a good representative as a "politician who (1) shares [his or her] voter's issue preferences, (2) has integrity, in that he or she is hard to bribe or otherwise induce to work against [his or her] voter's interests, and (3) is competent or skilled in discerning and implementing optimal policies for the voter." In a similar way, Caselli and Morelli (2004, 759) define a good politician as competent and honest, where competence is "the skill to identify the appropriate policy objectives and achieving them at minimum social cost" and honesty "leads an official to perform his duties without harassing private citizens for bribes or other kickbacks."

[23] In this dissertation, I define a rational actor as an actor that tends to choose the correct way to achieve his or her objectives (Friedman 1990, 2). For alternative conceptions of rationality, see, e.g., Binmore (2009, 1f.) and Gilboa (2010, 5f.).

looking, rational voters to sort out good politicians. However, because the types of politicians cannot be easily discerned, "rationally ignorant" voters often have an incentive to rely on information cues to assess the quality of their candidates (e.g., Downs 1957; Sniderman, Brody and Tetlock 1991; Zaller 1992; Lupia 1994).

What cues do voters use to form beliefs about their candidates' types? Following Fearon (1999, 59), there are four classes of cues that may help voters to assess candidates. First, voters might use outcome measures like GDP growth, inflation, and crime rates in order to draw inferences about the types of incumbent politicians. Second, voters might derive information from representatives' legislative behavior, such as votes cast, bill (co-)sponsorship, and legislative speeches. Third, candidates' party affiliations, personal characteristics, and life histories may provide information to voters. And fourth, voters can learn about the types of their candidates through campaign speeches and electoral promises.

Therefore, in principle, both retrospective and prospective information may be relevant to the beliefs voters form about candidates.[24] While the cues in the first three of the above classes convey retrospective information, those in the fourth class provide prospective information to voters. Not all cues, however, are equally informative about the types of candidates. First, as Fearon (1999, 60) argues, selecting good types based on prospective information (e.g., campaign speeches and electoral promises) can be difficult because such information is often noisy and misleading. Provided that retrospective information is more informative than prospective information (and not much more costly to obtain), voters will therefore rely mostly on the former kind of information to learn about the quality of candidates.

Second, with regard to cues that provide retrospective information, making inferences about the quality of incumbents based on outcome measures can be problematic if it is not clear who bears responsibility for the outcomes. According to Besley (2006, 105), unclear responsibilities for outcomes may thus be expected "to weaken the mapping from outcomes to reelection decisions [...]." Voters are then likely to base their reelection decisions primarily on information about legislators' party affiliations and descriptive characteristics as well as their past behavior in office. Indeed, research on descriptive representation in the US has shown that constituents favor and are more likely to vote for representatives who are similar to them (Graves and Lee 2000; Gay 2002; Box-Steffensmeier et al. 2003; Jones 2016). The representatives, in turn, try to present themselves to constituents in ways that emphasize their

[24]Note that rational voters use retrospective information to make prospective evaluations of the candidates in the election. As Besley (2006, 106) notes, this implies that "there really is no meaningful distinction between prospective and retrospective voting. It is precisely because there is information content in past actions about future behavior that retrospective voting is rational" (see also Ashworth 2012).

shared characteristics, thus stressing that "I am one of you" (Fenno 1978; Bianco 1994).

Among the potential cues that provide information about legislators' past behavior, the votes they cast are of particular importance. This is due to the fact that votes are one of the most important and consequential actions legislators take in parliament (e.g., Aydelotte 1977; Saalfeld 1995; Carey 2007, 2009). In addition, voting behavior is very standardized, making it easy to compare legislators to one another. The extent to which constituents are able to monitor legislators' voting behavior hinges crucially on the degree of voting transparency. Constituents can easily access information about the behavior of legislators in roll call votes, yet the costs of obtaining such information become prohibitive when individual votes are not recorded and made public (e.g., Carey 2009; Hug, Wegmann and Wüest 2015).

Consequently, roll call votes are relevant to constituents because they provide readily accessible information about legislators' behavior in office. Constituents can use this information to form beliefs about representatives' types and reelect those whom they consider to be good. Anticipating this, reelection-minded legislators then have an incentive to use roll call votes to signal to voters that they are good types voting in line with constituent preferences and, respectively, that their opponents are bad types that act against the interests of voters (e.g., Mayhew 1974; Smith 1989; Saalfeld 1995; Kreppel 2004; Carrubba et al. 2006; Thiem 2006; Carey 2009; Stecker 2010; Finke 2015).[25] In the literature, this incentive for legislators to rely on roll call votes has been called the "signaling motivation" (e.g., Cohen and Noll 1991; Carrubba et al. 2006; Thiem 2006; Carey 2009; Stecker 2010, 2015; Finke 2015; Thierse 2016). Roll call votes therefore are an important signaling device that allows legislators to develop and maintain reputations, or ideological "brand names," which can serve as low-cost heuristics for voters (e.g., Downs 1957; Fiorina 1981; Dougan and Munger 1989; Hinich and Munger 1994; Jenkins and Munger 2003; Poole and Rosenthal 2007).

Similarly, legislators may also wish to signal their loyalty (or the disloyalty of political opponents) to other actors outside the legislature that control valuable resources. Important examples of such actors are lobbying groups with policy expertise, selectorates that nominate candidates, and potential campaign donors and other activists for the next election campaign (with the latter likely coming from what Fenno 1978 calls the "primary constituency"). Like voters, these actors may

[25] Canes-Wrone, Brady and Cogan (2002), Bovitz and Carson (2006), and Carson et al. (2010) show that the positions legislators take on roll call votes affect their chances of reelection. Bartels (1991), Hiscox (2002), and Broz (2005) provide evidence that legislators' roll call voting behavior is indeed often in line with their constituents' policy preferences.

well prefer politicians who are in line with their policy preferences. If this is the case, roll call votes provide a powerful tool for legislators to demonstrate their ideological proximity to such actors (e.g, Poole and Romer 1985; Wawro 2001; Claassen 2007; Ansolabehere, de Figueiredo and Snyder 2003).

1.3 Why Roll Call Votes Are Relevant to Parties

The reelection probabilities of legislators depend not only on their personal reputations with voters and campaign donors, but also on their party affiliations. What matters here are the parties' collective reputations or brand names (Downs 1957; Kiewiet and McCubbins 1991; Carey and Shugart 1995; Aldrich and Rohde 2001; Snyder and Ting 2002, 2003; Cox and McCubbins 2005, 2007; Woon and Pope 2008; Aldrich 2011). Kiewiet and McCubbins (1991, 40) argue that a "party label conveys a simple, low-cost signal to 'rationally ignorant' voters as to the policies a candidate would pursue in office and the constituencies he or she would seek to benefit." Thus, like individual reputations, party labels are cues that provide voters with information about the types of legislators.[26]

Personal reputations are private goods. Provided that the prospects of reelection depend not solely on party reputations, reelection-seeking legislators thus have a strong incentive to undertake activities that enhance their personal standing with voters. Clearly, one such activity is the production of particularistic-benefits legislation, such as pork-barrel projects, for legislators' home districts (Cox and McCubbins 2007, 113). Party reputations, in contrast, are public goods. And because the provision of public goods is plagued by free-riding problems (Olson 1965), legislators tend to underproduce legislation that benefits their parties collectively.

The overproduction of particularistic-benefits legislation and the underproduction of collective-benefits legislation is electorally inefficient for all members of a party. To overcome these electoral inefficiencies, party members delegate to their leaders the authority to discipline the rank and file (e.g., Kiewiet and McCubbins 1991; Carey and Shugart 1995).[27] However, party leaders can only hold their mem-

[26]The relative importance of personal reputation and party reputation as information cues depends on a variety of factors. According to Carey and Shugart (1995), the relative value of party reputation increases when party leaders exercise strong control over ballots, votes for candidates are pooled to determine how many seats are to be allocated to each party list, voters can cast only a single vote for one party, and district magnitude is large (provided that there is no intraparty competition among candidates).

[27]More precisely, to overcome the collective action problem of establishing and maintaining party reputations, party members delegate to their party leaders both disciplining and agenda-setting powers (Kiewiet and McCubbins 1991; Carey and Shugart 1995; Cox and McCubbins 2005, 2007). Cox and McCubbins (2005, 9) point out that enforcing party discipline and establishing agenda

bers accountable if they are able to monitor individual voting behavior. Solving the collective action problems faced by parties thus requires that leaders have information about how their members vote. A number of authors have argued that roll call votes are an important means for obtaining such information (e.g., Saalfeld 1995; Carrubba et al. 2006; Carrubba, Gabel and Hug 2008; Stecker 2010).[28] If this is the case, then reelection-seeking legislators will not only delegate to their party leaders the power to mete out rewards and punishments, but also adopt roll call voting procedures so that leaders are better able to determine whom to reward and punish, respectively. Therefore, a second reason for legislators to rely on roll call votes is to enable party leaders to enforce voting discipline among the members of their parties. This reason has been dubbed the "disciplining motivation" in the literature (e.g., Carrubba et al. 2006; Thiem 2006; Carrubba, Gabel and Hug 2008; Stecker 2010, 2015; Finke 2015; Thierse 2016).

So far, the focus has been on legislators who attempt to prevent electoral inefficiencies by endowing their leaders with disciplining power. Yet the authority of party leaders to discipline their members is not only a consequence of the members' wish to be reelected. Cox (2006, 142) states that "important bills can only pass pursuant to motions formally stated and voted upon in the plenary session." This implies that in the legislative "state of nature," in which the ability of legislators to propose and delay legislation is unconstrained, a plenary bottleneck emerges (see also Cox 1987; Cox and McCubbins 2005; McCubbins 2008). Motivated by the desire to pass legislation on pressing issues, members of the majority party are willing to delegate to their leaders the authority to set the agenda and the power to pressure backbenchers on procedural votes (Cox and Poole 2002; Sinclair 2002; Cox and McCubbins 2005, 2007). Yet, again, as proponents of the disciplining motivation argue, party leaders' ability to impose discipline is a function of their ability to monitor individual votes. Hence, if members of the majority party are motivated by the desire to make good policy, they have an incentive to both create agenda-setting offices for their leaders and use roll call voting (at least for procedural votes) so that leaders are able to pressure the rank and file to support their agenda-setting decisions.

The disciplining argument rests on the assumption that roll call votes greatly facilitate the ability of party leaders to monitor the voting behavior of their members. However, party leaders are usually present in the chamber when voting takes place. Unlike actors outside the legislature, they are thus often able to observe their

control are both costly and, depending on their circumstances, different legislatures choose different combinations of these mechanisms.

[28] This becomes particularly clear in the model of Carrubba, Gabel and Hug (2008), where party leaders can only discipline backbenchers in roll call votes but not in signal votes.

members' behavior in both signal votes and roll call votes (Carey 2009; Stecker 2013; Hug, Wegmann and Wüest 2015).

Figure 1.1 distinguishes the groups of voting procedures defined above by the ability of actors inside the legislature (in particular party leaders) and actors outside the legislature (e.g., constituents, interest groups, and the media) to monitor legislators' voting behavior (Carey 2009, 49). While monitoring individual votes is strictly not possible under secret voting, all actors can observe the behavior of legislators when votes are taken by roll call. In contrast, under signal voting, legislators' votes are usually visible to those who are physically present when voting takes place, but not to actors outside the legislature.

Figure 1.1: The Ability of Internal and External Actors to Monitor the Votes of Individual Legislators

		Internal Actors	
		Can monitor	Cannot monitor
External Actors	Can monitor	Roll call voting	-
	Cannot monitor	Signal voting	Secret voting

Source: Adapted from Carey (2009, 49).

If party leaders can monitor their members' behavior under both signal voting and roll call voting, then they have little reason to press for roll call votes. Some evidence supporting this line of reasoning comes from Carey (2009), who conducted interviews with legislators and party leaders in a number of Latin American countries. He notes that "[m]ost legislators interviewed suggested that formally recording individual votes is not necessary for leaders to monitor their troops, and all the party leaders interviewed found informal methods of monitoring votes to be sufficient for their needs" (Carey 2009, 75). What is more, the interviewed party leaders even "were consistently dismissive of the need to record and publish legislative votes" (Carey 2009, 76).

Not only do roll call votes little to enhance the disciplining power of party leaders, but they might even reduce it. Under signal voting, leaders have an informational advantage vis-à-vis external actors. This relative advantage disappears under roll call voting, where legislators' behavior is transparent also to actors outside the legislature. As discussed above, legislators may use roll call votes to demonstrate their loyalty to outside actors. If these actors have different preferences than party lead-

ers and votes are cast by roll call, then the wish of legislators to vote in line with the preferences of actors outside the legislature poses a strain on party discipline. Carey (2009, 73f.) thus argues that "[f]or leaders who bear primary responsibility for maintaining their party's collective reputation, responsiveness to outside actors whose demands might conflict with the party line is a liability." Consequently, roll call voting presents "a potential liability to party leaders" (see also Jenkins and Stewart 2003; Stecker 2013).[29]

For these reasons, the focus of this dissertation is on the signaling motivation. The theoretical and empirical models I will use to examine when legislatures vote by roll call and what effect this has on legislative behavior are based on the idea that such votes encourage legislators to vote in line with the preferences of external actors. However, while there are good reasons to assume that in many legislatures roll call votes are primarily used for signaling purposes, there are circumstances under which the disciplining motivation becomes more important. In particular, there are three conditions under which roll call voting is likely to increase the ability of party leaders to discipline their members. First, party leaders may have a hard time observing their members' signal votes if these votes are cast by voice. Second, leaders might also find it difficult to effectively monitor their members' behavior in signal votes if the party groups are large (Carey 2009, 75f.; Hug, Wegmann and Wüest 2015, 946). Third, the monitoring task of leaders may become more complicated when votes are carried out by a signal voting method and party members do not sit together in a group. For example, the members of the Icelandic Althingi sit in no particular order, while in the parliaments of Sweden and Norway, legislators are seated by constituencies and not by party affiliations (Wheare 1968; Patterson 1972; Andeweg and Nijzink 1995).

In all of these cases, party leaders are in a better position to monitor individual votes under roll call voting than under signal voting. Hence, it is important to keep in mind that the models I will propose are not equally well suited for all legislatures. In legislatures with large party groups, nonpartisan seating arrangements, or where signal votes are carried out by voice, the disciplining motivation may be an important reason for roll call votes, which decreases the relevance of my models. The models I will develop are most relevant to legislatures in which party leaders can easily observe their members' behavior in signal votes.

[29] Jenkins and Stewart (2003) argue that party line voting in US House speakership elections was undermined—and not, as intended, enhanced—by the increased voting transparency brought about by a change from secret to signal voting in 1839. Although signal votes are generally not visible to legislative outsiders, the extensive coverage of House speakership elections by the regional press made such votes effectively public.

1.4 Research Design

The first goal of this dissertation is to analyze the effect of roll call votes on the voting behavior of legislators. As noted above, legislative votes are taken either by roll call voting or by signal voting in almost all parliaments. Hence, from the perspective of the "potential outcome model," for each legislative proposal reaching a floor vote there are two causal states to which legislators could be exposed (for more information on the potential outcome framework, see, e.g., Rubin 1974, 1977, 1978; Holland 1986; Gelman and Hill 2007; Morgan and Winship 2007; Angrist and Pischke 2009): in the "treatment state," the members of the legislature are informed that a proposal will be voted on by roll call, meaning that their votes on the proposal will be recorded and then published; on the other hand, in the "control state," the members of the legislature receive the information that some method of signal voting will be used to vote on the proposal.[30]

In the following, I follow the (slightly more general) discussions of Heckman (2005) and Heckman and Vytlacil (2007) on causal and structural models to describe the approaches that can (theoretically) be used to examine the effect of roll call votes on legislator behavior. Let $Y(i, p, v)$ be the potential outcome variable of interest—here legislative voting behavior—for legislator $i \in N$, policy proposal $p \in M$, and voting procedure $v \in V$. I define $V = \{0, 1\}$ as the set of possible causal states, with one denoting the treatment state (i.e., proposal p is voted on by roll call vote) and zero denoting the control state (i.e., proposal p is voted on by signal vote).[31] For each pair (i, p), there are two potential outcome variables given by $\{Y(i, p, v)\}_{v \in V}$. Thus, $Y(i, p, 1)$ is the potential outcome variable for legislator i exposed to the treatment state for proposal p and $Y(i, p, 0)$ is the potential outcome variable for i exposed to the control state for p.

Let $g \in G$ be the roll call constraint assignment rule that maps proposals $p \in M$ to roll call vote constraints $c \in C$, i.e., $g : M \to C$. For instance, one possible

[30] Note that the treatment is not simply the occurrence of a roll call vote, i.e., the recording and subsequent publication of individual legislators' voting decisions, but the prior *knowledge* that the vote is going to be roll called. Therefore, hereafter, when I refer to a roll call vote as treatment, I mean the treatment to be the (credible) information that the vote will be taken by roll call.

[31] Note that the assumption that $V = \{0, 1\}$, with one denoting roll call voting and zero denoting signal voting, involves three simplifications. First, secret voting is not an option for proposals $p \in M$. Second, V_p is the same for all $p \in M$, implying that $V_p = V$. Finally, in practice, each treatment $\boldsymbol{v} \in V$ is a collection of "finer" treatments, i.e., $\boldsymbol{v} = (v_1, v_2, \ldots, v_K)$. For example, besides the recording and publishing of individual voting decisions (v_1), having a roll call vote might also imply that the process of conducting a vote consumes more plenary time than what would be necessary for taking a signal vote (v_2) and that the aggregate result is more likely to be calculated correctly than in a signal vote (v_3). The third simplification is that I abstract from the latter two and, possibly, other characteristics and simply focus on the degree of transparency of a voting method.

constraint assignment rule $g \in G$ is to require roll call voting for all proposals $p \in M$, in which case there are no constraints on roll call votes whatsoever (this rule is used, e.g., in the Swiss National Council). Another possible rule $g' \in G$ is to make roll call voting mandatory only for final votes, and permit it for all other legislative votes at the request of at least 20% of MPs. This definition thus allows treatment assignment to be either a fixed rule or a choice made by legislators (or other actors). In the latter case, a legislative proposal $p \in M$ is assigned a roll call constraint $c \in C$ that makes it more or less difficult for actors to choose a roll call vote for that proposal p.

I can now define the treatment assignment rule as a function $r : M \times C \to V$ that maps each proposal $p \in M$ with its corresponding constraint $c \in C$ assigned by rule $g \in G$ to a treatment $v \in V$.[32] Rule r thus says that if some actors have discretion over how to vote on proposal $p \in M$, and given roll call constraint $c \in C$ allocated by rule $g \in G$, they choose $v \in V$ as the voting method for p.[33]

There are two problems that complicate estimation of the effect of roll call votes on legislators' voting behavior. First, by definition, the voting behavior of individual legislators is recorded and published only for roll call votes but not for signal votes. Let $y(i, p, 1)$ denote the realized outcome if legislator i casts a roll call vote on proposal p and let $y(i, p, 0)$ be the realized outcome if i casts a signal vote on p. Because signal votes are not public, information on $y(i, p, 0)$ is generally not available for all i and p. This makes it difficult—and without relying on rather strong assumptions even impossible—to draw inferences about the effect of roll call voting on the behavior of legislators.

While this problem exists in almost all legislatures, the Swiss National Council provides an exception in this respect. Since 1994, the Swiss National Council is equipped with an electronic voting system that records the voting decisions of individual legislators for all votes taken on the floor (Hug 2010; Bütikofer 2014). Until 2007, these voting decisions were published automatically in the minutes of the parliament for total votes, final passage votes, votes on emergency measures, and, since 2003, votes that dealt with the "Schuldenbremse" (i.e., a break on increases in public debt). For all other votes that were not automatically roll called, at least 30 legislators could submit a roll call vote request in order to make individual voting decisions

[32] As Heckman and Vytlacil (2007, 4795) note, in the potential outcome model (e.g., Rubin 1974, 1977; Holland 1986; Gelman and Hill 2007; Morgan and Winship 2007; Angrist and Pischke 2009), an "assignment" is an assignment to a treatment (implying that $g = r$), not an assignment to a constraint that may affect the behavior of actors making treatment choices.

[33] Note that r can also include random assignment mechanisms that assign a pair (p, c) to an element v. In this case, additional elements of randomness must be added to the environment (see Heckman and Vytlacil 2007, 4795, fn. 17).

public. If votes were neither automatically roll called nor made public at the request of 30 or more legislators, then individual voting decisions were only recorded but not published. While since 2007 the National Council makes public the individual voting decisions for all votes, the recorded but not published votes from the previous period were made available only for scientific research.

Relying on these data allows me to compare legislators' behavior in roll call votes and signal votes. However, even with these data at hand, a second problem persists. For each legislator i and proposal p at most one potential outcome can be observed. Let $D(i,p,1) = 1$ if we observe legislator i casting a roll call vote on proposal p and $D(i,p,1) = 0$ otherwise. Because all legislators in a parliament vote either by roll call or by signal vote, the voting procedure is constant for all i. Therefore, it is $D(i,p,1) = D(p,1)\ \forall i,p$. The observable outcome variable $Y(i,p)$ is then given by

$$Y(i,p) = \begin{cases} Y(i,p,1) & \text{if } D(p,1) = 1 \\ Y(i,p,0) & \text{if } D(p,1) = 0, \end{cases}$$

or, more compactly, by

$$Y(i,p) = Y(i,p,0) + [Y(i,p,1) - Y(i,p,0)]D(p,1).$$

The effect of having a roll call vote for proposal p on the voting behavior of legislator i (relative to having a signal vote) is

$$Y(i,p,1) - Y(i,p,0).$$

However, because only one component of $\{Y(i,p,v)\}_{v \in V}$ can be observed, direct calculation of the proposal-specific effect of roll call voting for i, i.e., $\delta(i,p) = y(i,p,1) - y(i,p,0)$, is impossible (this is what Holland 1986 has dubbed the "fundamental problem of causal inference").

As noted by Heckman (2005) and Heckman and Vytlacil (2007), there are two main approaches to deal with this problem. The first approach—labeled by Holland (1986) as the "statistical solution"—redirects attention away from calculating the "individual-level" effect $\delta(i,p)$ toward estimating aggregated treatment effects in the population (here the population of proposals, $p \in M$). On the other hand, the second approach—Holland (1986) called it the "scientific solution"—attempts to explicitly model the selection to treatment and how this selection process affects the outcomes.

1.4.1 The Statistical Solution

The statistical solution requires that a number of units—here a sample of proposals, $p \in M \subset M'$, where M' is the population—are randomly assigned to alternative treatment states.[34] This can be achieved either through a randomized experiment, where the researcher is able to directly manipulate the treatment assignment mechanism r, or through a "natural experiment," where treatment assignment is out of the control of the researcher, but "some external force intervenes and creates comparable treatment groups in a seemingly random fashion" (Robinson, McNulty and Krasno 2009, 346; see also Dunning 2008; Morton and Williams 2010). Random treatment assignment (respectively, "as if" random treatment assignment) ensures that the treatment status variable $D(p, 1)$ is independent of the potential outcome variables $\{Y(i, p, v)\}_{v \in V}$. If this is the case, we can estimate aggregated effects of roll call voting in the population without modeling how units end up in alternative treatment states (see, e.g., Holland 1986; Gelman and Hill 2007; Morgan and Winship 2007; Angrist and Pischke 2009).

Unfortunately, as researchers, we cannot control the voting procedures used in parliaments and it is difficult to imagine a natural experiment that would generate exogenous variation in the allocation of roll call votes. Hence, the statistical solution is hardly feasible and we are, therefore, compelled to rely on observational data to study the effect of roll call votes on legislators' voting behavior.

1.4.2 The Scientific Solution

In observational studies, treatments are not randomly assigned to units.[35] For the analysis of roll call votes, this implies that there can be systematic differences between proposals that end up in different treatment states—and, of course, such differences in proposals can affect the voting behavior of legislators. Hence, to infer causal effects from roll call data (or, more generally, observational data), it is important to carefully investigate the treatment selection mechanism (e.g., Morgan and Winship 2007, 41).

[34] More precisely, treatment assignment must either be entirely random or depend only on observed covariates for which there is sufficient overlap across treatment groups (see, e.g., Gelman and Hill 2007, 184f.).

[35] Cochran (1965, 234) defines an observational study as an empirical investigation in which "[t]he objective is to elucidate cause-and-effect relationships [...] [and in which] [i]t is not feasible to use controlled experimentation, in the sense of being able to impose the procedures or treatments whose effects it is desired to discover, or to assign subjects at random to different procedures." Similarly, according to Rosenbaum (2002, vii, emphasis in original) an "*observational study* is an empiric investigation of treatments, policies, or exposures and the effects they cause, but it differs from an experiment in that the investigator cannot control the assignment of treatments to subjects."

Relying on observational data, the scientific approach thus attempts to explicitly model the potential outcomes $\{Y(i,p,v)\}_{v \in V}$, the choice of treatment status $D(p,1)$, and the relationship between treatment selection and potential outcome variables (see, e.g., Heckman and Vytlacil 2007, 4833-4838). Compared to the statistical solution, the scientific approach clearly requires more data than just treatments and outcomes and more complicated analysis strategies that make stronger assumptions, typically based on some kind of theory (Angrist and Krueger 1999; Gelman and Hill 2007, 181). Although this may be considered a disadvantage of the latter approach (see the discussion in Keane 2010; for a defense of the scientific approach, see also Heckman 2005; Heckman and Vytlacil 2007), it is, at this point, important to remember Coombs' (1964, 5) adage quoted in the beginning of this chapter that "all knowledge is the result of theory—we buy information with assumptions."

Because voting data are observational, this dissertation employs the scientific approach. Understanding the effect of roll call votes on legislators' voting behavior therefore requires that we also understand how these votes are selected in parliament. Typically, the selection of roll call votes involves two steps. In a first step, some actors decide on the requirements for roll call votes. In the notation defined above, these actors choose constraints $c \in C$ that make it more or less likely that roll call votes occur. The second step is the actual choice of a voting procedure $v \in V$ for some proposal $p \in M$. A roll call vote occurs whenever the requirements specified in the first step are met. For example, if in the first step actors choose constraint c such that at least 20% of MPs are necessary to request a roll call vote for proposal p, then in the second step 20% of the legislature or more must decide to demand a roll call for such a vote to occur for p.

The Choice of Roll Call Constraints

In most legislatures, the requirements for roll call votes are laid down in the rules of procedure (e.g., Saalfeld 1995), which are typically chosen and can be modified by the legislators themselves (e.g., Martin 2011; Sieberer, Müller and Heller 2011).[36] If roll call voting affects legislators' ability to achieve their goals, then rational legislators have an incentive to choose roll call vote constraints so as to maximize the probability of attaining their goals. Roll call vote constraints are thus endogenous institutions.[37]

[36] An exception is the US, where the requirements for roll call voting in Congress are laid down in the constitution. Art. 1, Sec. 5 of the constitution specifies that "the Yeas and Nays of the Members of either House on any question shall, at the Desire of one fifth of those Present, be entered on the Journal." For a description of the amendment process of the US constitution, see, e.g., `https://www.archives.gov/federal-register/constitution/` (last accessed on 10/12/2015).

[37] Krehbiel (2004, 113) makes this point more generally when he argues that "democratic legislatures are self-organizing and, as such, nearly all legislative procedures are endogenous."

In the words of Diermeier and Krehbiel (2003), they are "first-order institutions," whose choice is constrained by "second-order institutions" that are exogenous to the choice process.[38] Important second-order institutions are the distribution of power to propose amendments to the rules of procedure and the majority needed for the adoption of such amendments (e.g., a simple majority of legislators).

To learn about the roll call constraint assignment mechanism $g \in G$ that maps proposals $p \in M$ to constraints $c \in C$, I will develop a game-theoretic model in which legislators decide on the rules governing the use of roll call votes in parliament. The model is based on the idea that parliamentary rules are chosen under incomplete information at the beginning of a legislative session. Although the model is flexible enough to accommodate different arrangements of second-order institutions, in solving it I will focus on a neutral environment where all legislators have equal power to propose amendments to the rules of procedure and a simple majority requirement for adopting such amendments.[39]

The model will allow me to examine the circumstances under which legislators choose rules that make roll call voting more or less likely. In particular, I will conduct a comparative statics analysis to show how legislators' preferences for roll call voting depend on two important factors: the signaling value of roll call votes and the degree of ideological alignment between legislators and constituents.[40] Therefore, according to Clarke and Primo's (2012) classification of theoretical models, my model is an "exploratory model," whose purpose is to "investigate the putative (causal) mechanisms or motivations underlying phenomena of interest" (Clarke and Primo 2012, 90).[41]

[38]Following Diermeier and Krehbiel (2003, 125), I define an institution as a "set of contextual features in a collective choice setting that defines constraints on, and opportunities for, individual behavior in the setting." Note that this definition allows institutions to be exogenous or endogenous. It is thus different from earlier rational choice definitions that viewed institutions as exogenous constraints on behavior (e.g., Shepsle 1979; North 1990). For a discussion of the endogeneity of institutions, see, e.g., Riker (1980), Schotter (1981), Shepsle (1986), Calvert (1995), Weingast (2002), and Shepsle (2006*b*). For other, non-rational choice definitions of institutions, see, e.g., Hall and Taylor (1996) and March and Olsen (1989, 1995, 2006).

[39]In many parliaments, amending the rules of procedure requires a simple majority. For example, Döring (1994, 343) shows in an analysis of 16 West European parliaments that in ten parliaments the standing orders may be amended by a simple majority, while in the remaining six parliaments a supermajority is necessary to do so.

[40]For more information on comparative statics analysis, see Mas-Colell, Whinston and Green (1995, 616-620).

[41]Scholars disagree as to whether the results of theoretical models should be evaluated empirically. The currently dominant approach in positive political science is the "three-step method" (which Clarke and Primo 2012 also call "hypothetico-deductivism"), according to which empirical implications are derived from theoretical models and then tested against data (e.g., King, Keohane and Verba 1994; Morton 1999; Granato and Scioli 2004). This approach has not been unchallenged. While some authors simply argue that not all theoretical models need empirical testing (Binmore 1990; Tetlock and Belkin 1996; Doron and Sened 2001) or that evaluations of predictions should be

The Choice of Roll Call Votes and Their Influence on Voting Behavior

Provided that parliamentary rules neither mandate nor prohibit the use of roll call votes, the next step is to analyze when roll call votes are actually chosen in parliament. I will show in Chapter 2 that in almost all chambers that do not mandate a particular voting method, roll call votes may be invoked by legislators—either by a single member of parliament or by a number of members. Legislators have an incentive to vote by roll call if they are more likely to achieve their goals in roll call votes than in signal votes. I therefore examine, first, whether legislators' decision calculus differs in roll call votes and signal votes. Building on the spatial model of voting (e.g., Hotelling 1929; Downs 1957; Davis, Hinich and Ordeshook 1970; Poole 2005; McCarty 2011; Carroll and Poole 2014) and, in particular, the model proposed by Clinton, Jackman and Rivers (2004), I will develop an extension of the "two-parameter" item-response theory (IRT) model. More specifically, the model is the reduced form of a structural model that includes a spatial utility component for all votes and an additional utility component that exists only in roll call votes. This model then allows me to estimate, based on data on signal votes and roll call votes from the Swiss National Council, how the use of roll call votes affects legislators' voting behavior.

If roll call voting affects the behavior of legislators, the second problem to consider is when roll call votes are requested and when not. Based on the IRT model mentioned above, I will estimate for each legislator and requested roll call vote the probability that the legislator prefers roll call voting over signal voting for that vote. Comparing these estimates with information about who actually requested a roll call vote then allows me to learn about the treatment assignment rule r.

1.5 The Relevance of Roll Call Votes for Research on Legislative Behavior

In a review article on legislative voting, Hug (2013) identifies three areas of research that rely heavily on the analysis of roll call records (see also Collie 1984). First, determining the extent to which different actors influence legislators' voting behavior is an important thread in the literature (e.g., Levitt 1996; Snyder and Groseclose 2000, 2001; McCarty, Poole and Rosenthal 2001; Nokken 2000; Ansolabehere, Snyder

complemented with evaluations of model assumptions and evaluations of alternative models (Bates et al. 1998; Morton 1999), others assert that the three-step method is inherently flawed (Clarke and Primo 2012). Note, however, that this discussion is not of direct relevance to my analysis, as I do not attempt to empirically evaluate the results of the comparative statics analysis.

and Stewart 2001; Nokken and Poole 2004; Clinton 2006; Coman 2009; Høyland 2010). Second, researchers rely on roll call data to examine why different parties (and other groups) have different levels of voting unity (e.g., Lowell 1902; Rice 1925, 1928; Hertig 1978; Bowler, Farrell and Katz 1999; Skjæveland 2001; Depauw 2003; Faas 2003; Morgenstern 2004; Hix, Noury and Roland 2005; Sieberer 2006; Carey 2007; Depauw and Martin 2009; Coman 2015). And third, roll call votes are used to recover the dimensions that structure political competition in various systems (e.g., Wilcox and Clausen 1991; Poole and Rosenthal 1991, 2007; Hix, Noury and Roland 2006; Hansen 2008; Hix and Noury 2014).

A number of authors have argued that such analyses of legislative behavior are fraught with difficulties if in a legislature votes are not systematically taken by roll call. For example, with regard to the European Parliament (EP), Carrubba et al. (2006, 692) argue that "the quality of our inferences about voting behavior depends crucially on the sampling properties of [roll call votes]" and that if "roll calls are not a random sample of legislative votes, we would need to account explicitly for the selection process before drawing accurate inferences about legislative behavior."[42] Referring to earlier studies of roll call voting that did not account for the selection process, Carrubba et al. (2006, 694) then note that if roll call votes "are a random sample of the universe of legislative votes cast in the EP, these studies and their conclusions are unproblematic" (for a similar statement, see also Clinton and Lapinski 2008, 514f.).

Carrubba et al. (2006) are right that nonrandom roll call data can complicate inferences about legislative behavior. If treatment assignment is nonrandom, then proposals that are voted on by roll call vote are likely to be different from proposals that are voted on by signal vote. Consequently, it is important to understand the selection process of roll call votes when drawing inferences about legislative behavior in general.

However, as the signaling argument suggests, a second problem is that legislators may behave differently in roll call votes than in signal votes. Because actors outside the legislature can monitor the behavior of legislators in roll call votes but not in signal votes, legislators' voting behavior might vary depending on whether a vote is decided by roll call or signal voting.[43] Unfortunately, determining the extent to

[42]The possibility of selection bias in roll call data has been discussed rather widely in the literature, such as by Greenstein and Jackson (1963), Koford (1990), VanDoren (1990), Snyder (1992), Thiem (2006), Roberts (2007), Carrubba, Gabel and Hug (2008), Clinton and Lapinski (2008), Høyland (2010), Hug (2010), Cantú, Desposato and Magar (2013), Lynch and Madonna (2013), Stecker (2015), Hix, Noury and Roland (2014), and Yordanova and Mühlböck (2015).

[43]A similar argument can be made for the disciplining motivation if roll call votes increase the disciplining capacity of party leaders.

which legislators' roll call behavior is different from their behavior in signal votes is often not possible. The reason for this is twofold: first, data on individual voting decisions are generally not available for signal votes; and second, based on roll call vote data alone, it is difficult to estimate the influence of constituents (and other outside actors) on legislators' voting behavior.[44] It is important to note that this problem remains even if roll call votes are a random sample of legislative votes. Without also having data on legislators' behavior in signal votes, and without being able to estimate the effect of constituents monitoring legislators' behavior in roll call votes, we cannot draw accurate inferences about legislative voting behavior in general.

The following toy model illustrates the problems that may arise in the analysis of legislative voting data. Suppose a legislature consists of 15 members who are organized in two parties, A and B. The legislators' commonly known ideal points are the integers $\{-7, -6, \ldots, -1, 0, 1, \ldots, 6, 7\}$. Party A is to the left of party B and has a simple majority in the legislature. The legislators with ideal points $\{-7, -6, \ldots, -1, 0\}$ are thus members of party A, whereas the legislators with ideal points $\{1, 2, \ldots, 6, 7\}$ are members of party B. The legislature votes on a series of issues, either by a roll call or a signal voting method. When an issue is taken up, an agenda setter is randomly selected to make a proposal $p \in [-7, 7]$. I assume that every legislator has an equal probability of being recognized as agenda setter. For expositional convenience, I also assume that for each issue voted on the status quo, denoted sq, is located at -4 (e.g., because the previous government was more left-wing than the current majority). All decisions are made by simple majority rule. Figure 1.2 shows the legislator ideal points and the location of the status quo for all votes that occur in the legislature.

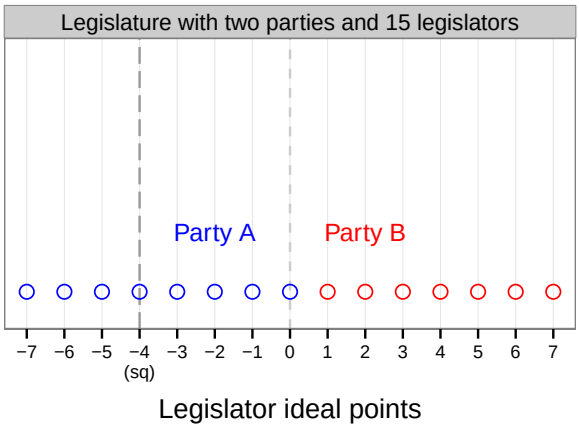
Suppose that legislators care about both policy and reelection. Let $U(i, p, 1)$ be legislator i's utility if proposal p is adopted in a roll call vote and let $U(i, p, 0)$ be i's utility if p is adopted in a signal vote. Assuming additive separability, $U(i, p, 1)$ and $U(i, p, 0)$ are given by

$$U(i, p, 1) = U_p(i, p) + U_e(y(i, p, 1))$$
$$U(i, p, 0) = U_p(i, p).$$

$U_p(i, p)$ is the policy utility legislator i receives from the implementation of proposal p

[44] For attempts to estimate the relative influence of constituent preferences on legislators' roll call votes, see, e.g., Kau and Rubin (1979), Peltzman (1984), Kalt and Zupan (1984, 1990), and Levitt (1996). For a critique of these approaches, see, e.g., VanDoren (1990) and Jackson and Kingdon (1992).

Figure 1.2: Legislator Ideal Points and Status Quo Location



Note: The figure shows the ideal points of 15 legislators who are organized in two parties, A and B. The ideal points of party A's members are shown in blue and the ideal points of party B's members are shown in red color. The legislature votes on a series of issues. For all issues, the status quo, denoted sq, is located at -4.

and $U_e(y(i,p,1))$ describes the utility that i attaches to the change in the probability of reelection caused by her roll call vote on p, i.e., $y(i,p,1) \in \{0,1\}$, where one denotes a vote for p and zero denotes a vote against p (which is a vote in favor of the status quo sq).

Assuming that legislator i's personal preferences over policy alternatives $p \in [-7,7]$ are characterized by a quadratic utility function, it is

$$U_p(i,p) = -(p-\xi_i)^2,$$

where ξ_i denotes the ideal point of legislator i. Suppose that party A's voters prefer to maintain the status quo (or any policy to the left of the status quo) over a policy change to the right. For simplicity, suppose further that the voters of party B are indifferent to any policy change. I thus assume that

$$U_e(y(i,p,1)) = \begin{cases} 5 & \text{if } i \in A \text{ and } i\text{'s vote is in line with voter preferences} \\ -5 & \text{if } i \in A \text{ and } i\text{'s vote is not in line with voter preferences} \\ 0 & \text{if } i \in B. \end{cases}$$

This means that if a vote is taken by roll call, the members of party A are rewarded by their voters if they vote for a policy proposal that is equal to or to the left of the status quo and punished if they vote for a policy that is to the right of the status quo. The members of party B, on the other hand, are neither rewarded nor punished

for their roll call voting behavior.

A researcher who wishes to analyze data from this toy legislature to make inferences about the ideal points and voting unity of legislators could (theoretically) encounter any of three different cases. Depending on the data-generating process and the availability of the voting data, the researcher may have (i) random samples of both roll call votes and signal votes, (ii) data on roll call votes but not on signal votes, or (iii) nonrandom samples of roll call votes and signal votes. I briefly discuss each of these cases in the following subsections.

1.5.1 Random Samples of Roll Call Votes and Signal Votes

Suppose that the treatment assignment rule r is a random process. After an issue has been taken up and the agenda setter made a proposal, legislators are either informed that the vote on that proposal will be a roll call vote or they are told that the vote will be a signal vote. I assume that roll call votes and signal votes occur with equal probability. The timing of the toy model is as follows.

1. An issue is taken up. An agenda setter is randomly selected from the set of legislators to make a policy proposal $p \in [-7, 7]$.

2. Nature decides with probability 0.5 whether proposal p will be voted on by roll call vote or signal vote.

3. All legislators simultaneously vote on proposal p.

    a. If a majority votes for proposal p, then p is adopted.

    b. If a majority votes against proposal p, then the status quo sq prevails.

4. If proposal p was voted on by roll call, then voters either reward or punish the members of party A.

    a. A member of party A is rewarded if she voted in line with her voters' preferences.

    b. A member of party A is punished if she voted against the preferences of her voters.

Figure 1.3 shows the data that the researcher encounters if the above steps are repeated an infinite number of times. The data consist of two equally sized sets: a set of signal votes (the top panel of the figure) and a set of roll call votes (the bottom panel of the figure). Each row in a panel shows a policy proposal p introduced by

an agenda setter. The columns are the legislators and the cell entries indicate their voting behavior ("y" stands for a yes vote on p and "n" stands for a no vote on p).[45] Finally, the percentages in parentheses show the distribution of proposals in the data.

Figure 1.3: Voting Data if Treatment Assignment is Random

Signal Vote Data

	−7	−6	−5	−4	−3	−2	−1	0	1	2	3	4	5	6	7	
$p=-4$	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	(13.33%)
$p=-3$	n	n	n	n	y	y	y	y	y	y	y	y	y	y	y	(3.33%)
$p=-2$	n	n	n	n	y	y	y	y	y	y	y	y	y	y	y	(3.33%)
$p=-1$	n	n	n	n	n	y	y	y	y	y	y	y	y	y	y	(3.33%)
$p=0$	n	n	n	n	n	y	y	y	y	y	y	y	y	y	y	(3.33%)
$p=1$	n	n	n	n	n	n	y	y	y	y	y	y	y	y	y	(3.33%)
$p=2$	n	n	n	n	n	n	y	y	y	y	y	y	y	y	y	(20.00%)

Roll Call Vote Data

	−7	−6	−5	−4	−3	−2	−1	0	1	2	3	4	5	6	7	
$p=-4$	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	(13.33%)
$p=-3$	n	n	n	n	n	n	n	n	y	y	y	y	y	y	y	(3.33%)
$p=-2$	n	n	n	n	n	n	n	y	y	y	y	y	y	y	y	(3.33%)
$p=-1$	n	n	n	n	n	n	n	y	y	y	y	y	y	y	y	(3.33%)
$p=0$	n	n	n	n	n	n	n	y	y	y	y	y	y	y	y	(3.33%)
$p=1$	n	n	n	n	n	n	n	y	y	y	y	y	y	y	y	(3.33%)
$p=2$	n	n	n	n	n	n	n	y	y	y	y	y	y	y	y	(20.00%)

Note: The figure shows the voting data a researcher encounters if treatment assignment is random and if both roll call votes and signal votes are accessible. The data consist of two sets: a set of signal votes (the top panel of the figure) and a set of roll call votes (the bottom panel of the figure). Each row in a panel shows a policy alternative proposed by an agenda setter and each column represents a legislator. The cell entries show the voting behavior of legislators, with "y" indicating a vote for the proposal and "n" indicating a vote against the proposal. The percentages in parentheses show the distribution of proposals in the data.

Based on the data depicted in Figure 1.3, the researcher is able to accurately describe the effect of roll call votes on legislator behavior.[46] First, the data reveal that while roll call votes matter for members of party A, they do not affect the voting behavior of party B's members. Second, with regard to party A, the data show that the effect of voters monitoring legislators is strong enough so as to shift

[45] I assume that a legislator votes for proposal p if $U(i,p,1) \geq U(i,sq,1)$ and $U(i,p,0) \geq U(i,sq,0)$, respectively, and for the status quo sq otherwise.

[46] Note, however, that it is not possible based on these data to recover the ideal points of all legislators because only a subset of proposals, $p \in [-4,2]$, reach a floor vote (see, e.g., Londregan 2000 for an analysis of what proposals reach the floor in Chile).

the cutpoints considerably to the right, making the voting behavior of party A's members more unified. Based on random samples of roll call votes and signal votes, the researcher would therefore conclude that the two parties are more polarized in roll call votes.

1.5.2 Data Are Available for Roll Call Votes But Not for Signal Votes

Now suppose that the treatment assignment rule r and the timing of the model are the same as in the previous case, but that data on individual voting behavior are available only for roll call votes. This means that the researcher only has access to the data shown in the bottom panel of Figure 1.3. Based on roll call data alone, the level of polarization in the legislature appears to be rather high. Both parties exhibit high levels of voting unity, yet it is unclear whether this is due to strong party cohesion and discipline or a consequence of roll call voting.[47] Note that there is no selection bias. The inferential problems the researcher encounters simply stem from the fact that data on signal votes are missing.

Authors who analyze voting data from legislatures that do not systematically vote by roll call generally acknowledge the problem of selection bias (e.g., Depauw and Martin 2009; Sauger 2009; Rasmussen 2011; Klüver and Spoon 2015). However, as this example illustrates, having a random sample of roll call votes does not ensure that inferences drawn from the data are accurate. Additional information on individual behavior in signal votes, and possibly theory, are necessary to understand how roll call votes affect the behavior of legislators.

1.5.3 Nonrandom Samples of Roll Call Votes and Signal Votes

Suppose, finally, that roll call votes are not random but chosen by legislators. More specifically, suppose that the roll call constraint assignment rule g is such that any proposal p is voted on by roll call if requested by at least q members of the legislature.[48] The timing of the toy model is therefore as follows.

1. An issue is taken up. An agenda setter is randomly selected from the set of legislators to make a policy proposal $p \in [-7, 7]$.

[47] See Hazan (2003) for the distinction between party unity, party cohesion, and party discipline.

[48] I assume that a legislator i only requests a roll call vote on proposal p if $U(i, p, 1) > U(i, p, 0)$. Otherwise, if roll call voting does not increase i's utility, she has not reason to demand a roll call vote.

2. If q or more legislators decide to request a roll call vote for proposal p, then p will be voted on by roll call. Otherwise, proposal p will be voted on by signal vote.

3. All legislators simultaneously vote on proposal p.

   a. If a majority votes for proposal p, then p is adopted.

   b. If a majority votes against proposal p, then the status quo sq prevails.

4. If proposal p was voted on by roll call, then voters either reward or punish the members of party A.

   a. A member of party A is rewarded if she voted in line with her voters' preferences.

   b. A member of party A is punished if she voted against the preferences of her voters.

Again, suppose that the above steps are repeated an infinite number of times. The resulting data depend on the roll call vote threshold q.[49] First, if q is equal to or greater than nine, then all votes are decided by signal voting. Figure 1.4 shows the signal votes that occur in this case. While these data allow the researcher to make rather accurate inferences about the ideological positions of legislators and the voting cohesion of parties, estimation of the effect of roll call votes on legislators' behavior is not possible.

Second, if q is equal to eight, then the data shown in Figure 1.5 are generated. On the basis of these data the researcher finds that party A is more unified in roll call votes than in signal votes. Moreover, when analyzing the data in conjunction with information about the identity of the roll call requesters, it becomes clear that party A members derive utility from publicizing their support for liberal policies.[50]

Finally, if q is less than or equal to seven, then all votes are taken by roll call and the researcher encounters the data depicted in Figure 1.6. In this case, describing the effect of roll call votes on legislator behavior is difficult because no votes are decided by signal voting. However, taking into account the information about the identity of the roll call requesters again shows that the members of party A who cast liberal votes receive utility from making their voting behavior public.

[49] If legislators can decide on the requirements for roll call votes, then they will choose q so as to maximize their utility. In this example, the members of party B are indifferent over q, while a majority of party A's members prefers to set $q \leq 7$.

[50] Theory is needed to further interpret this result. A model based on the signaling motivation would suggest that roll call voting makes individual votes transparent to outside actors and these actors reward members of party A for casting liberal votes.

Figure 1.4: Voting Data if Nine or More Legislators Are Necessary to Request a Roll Call Vote

Signal Vote Data

	−7	−6	−5	−4	−3	−2	−1	0	1	2	3	4	5	6	7	
$p = -4$	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	(26.67%)
$p = -3$	n	n	n	n	y	y	y	y	y	y	y	y	y	y	y	(6.67%)
$p = -2$	n	n	n	n	y	y	y	y	y	y	y	y	y	y	y	(6.67%)
$p = -1$	n	n	n	n	n	y	y	y	y	y	y	y	y	y	y	(6.67%)
$p = 0$	n	n	n	n	n	y	y	y	y	y	y	y	y	y	y	(6.67%)
$p = 1$	n	n	n	n	n	n	y	y	y	y	y	y	y	y	y	(6.67%)
$p = 2$	n	n	n	n	n	n	y	y	y	y	y	y	y	y	y	(6.67%)
$p = 3$	n	n	n	n	n	n	n	y	y	y	y	y	y	y	y	(6.67%)
$p = 4$	n	n	n	n	n	n	n	y	y	y	y	y	y	y	y	(26.67%)

Note: The figure shows the voting data a researcher encounters if nine ore more legislators are necessary to request roll call votes. In these cases, all votes are decided by signal voting. Each row in the figure shows a policy alternative proposed by an agenda setter and each column represents a legislator. The cell entries show the voting behavior of legislators, with "y" indicating a vote for the proposal and "n" indicating a vote against the proposal. The percentages in parentheses show the distribution of proposals in the data.

Figure 1.5: Voting Data if Eight Legislators Are Necessary to Request a Roll Call Vote

Signal Vote Sample

	−7	−6	−5	−4	−3	−2	−1	0	1	2	3	4	5	6	7	
$p = -1$	n	n	n	n	n	y	y	y	y	y	y	y	y	y	y	(6.67%)
$p = 0$	n	n	n	n	n	y	y	y	y	y	y	y	y	y	y	(6.67%)
$p = 1$	n	n	n	n	n	n	y	y	y	y	y	y	y	y	y	(6.67%)
$p = 2$	n	n	n	n	n	n	y	y	y	y	y	y	y	y	y	(6.67%)
$p = 3$	n	n	n	n	n	n	n	y	y	y	y	y	y	y	y	(33.33%)

Roll Call Vote Sample

	−7	−6	−5	−4	−3	−2	−1	0	1	2	3	4	5	6	7	
$p = -4$	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	(40.00%)

Note: The figure shows the voting data a researcher encounters if roll call votes can be requested by eight legislators. The data consist of two sets: a set of signal votes (the top panel of the figure) and a set of roll call votes (the bottom panel of the figure). Each row in a panel shows a policy alternative proposed by an agenda setter and each column represents a legislator. The cell entries show the voting behavior of legislators, with "y" indicating a vote for the proposal and "n" indicating a vote against the proposal. The percentages in parentheses show the distribution of proposals in the data.

Figure 1.6: Voting Data if Seven or Less Legislators Are Necessary to Request a Roll Call Vote

Roll Call Vote Data

	−7	−6	−5	−4	−3	−2	−1	0	1	2	3	4	5	6	7	
$p = -4$	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	(33.33%)
$p = -2$	n	n	n	n	n	n	n	y	y	y	y	y	y	y	y	(6.67%)
$p = -1$	n	n	n	n	n	n	n	y	y	y	y	y	y	y	y	(6.67%)
$p = 0$	n	n	n	n	n	n	n	y	y	y	y	y	y	y	y	(6.67%)
$p = 1$	n	n	n	n	n	n	n	y	y	y	y	y	y	y	y	(6.67%)
$p = 2$	n	n	n	n	n	n	n	y	y	y	y	y	y	y	y	(40.00%)

Note: The figure shows the voting data a researcher encounters if seven or less legislators are necessary to request roll call votes. In these cases, all votes are decided by roll call voting. Each row in the figure shows a policy alternative proposed by an agenda setter and each column represents a legislator. The cell entries show the voting behavior of legislators, with "y" indicating a vote for the proposal and "n" indicating a vote against the proposal. The percentages in parentheses show the distribution of proposals in the data.

The toy model illustrates that for the analysis of legislatures where votes are not systematically carried out by roll call, understanding the selection and the effects of roll call votes on legislators' voting behavior is important. The goal of this dissertation is therefore to examine how roll call votes affect the voting behavior of legislators and when and why they are selected.

1.6 The Plan of the Dissertation

The remainder of the dissertation is organized as follows. Chapter 2 sets the stage for the chapters that follow. Based on original data from 76 parliamentary chambers in 50 democracies around the world, I demonstrate that the voting procedures used for final votes vary greatly across legislatures. The data show that while in a minority of chambers final votes are systematically carried out by roll call, most chambers record and publish only a subset of these votes. In the latter chambers, it is generally the legislators who have the power to decide when a vote is taken by roll call. Consequently, the missing data and selection problems discussed above are relevant to the analysis of voting data from a wide range of legislatures.

Chapter 3 provides an overview of the existing literature on the reasons why roll call votes are selected and the consequences of such votes for legislative behavior. I argued above that in many legislatures the selection of roll call votes is a two-step process: legislators choose, first, the requirements for roll call votes and second, given these constraints, whether a particular proposal shall be decided by roll call or

not. While only a few studies have addressed the question why legislatures differ in their requirements for roll call votes, studies on roll call requests are more numerous. Among these studies, several provide evidence suggesting that roll call votes are used for signaling rather than disciplining purposes. Finally, analyses of the effects of roll call votes on the behavior of legislators are scarce. The limited evidence that exists, however, indicates that legislators behave differently in roll call votes and signal votes.

In Chapter 4, I draw on voting data and new information about roll call requests from the 47th legislative period of the Swiss lower chamber to empirically evaluate the signaling argument. Based on an extension of the "two-parameter" item-response theory (IRT) model, I show that legislators behave differently when votes are taken by roll call, at least in a subset of votes. Moreover, I also find some evidence that legislators tend to request roll call votes that are electorally beneficial and tend not to request roll call votes that would damage their reelection prospects. Thus, as roll call votes affect the ability of legislators to achieve their goals, the question becomes how legislators design the rules governing the use of roll call votes in parliament.

In Chapter 5, I develop a game-theoretic model to explore the circumstances under which legislators choose to rely on roll call votes rather than signal votes. The model consists of three stages: an organizational stage, a policymaking stage, and an election stage. In the organizational stage, legislators bargain over the requirements for roll call voting. In the policymaking stage, legislators decide on policies, with the probability of a roll call vote depending on the outcome of the organizational stage. Finally, in the election stage, legislators are either reelected or voted out of office by their constituents. The comparative statics analysis of the model shows that roll call votes are least likely if the legislature is highly polarized, the value of reelection is low and constituents have different policy preferences than their representatives. On the other hand, roll call votes are most likely if the legislature is highly polarized, the value of reelection is high and the policy preferences of legislators are congruent with those of their constituents.

Finally, Chapter 6 reviews the main findings of the dissertation. The chapter also briefly discusses some limitations of my analyses and outlines suggestions for further research.

Chapter 2

Voting Procedures in Democratic Legislatures

In Chapter 1, I provided examples illustrating how voting procedures vary among democratic legislatures. The goal of this chapter is to explore these differences more systematically. To do so, I rely on original data on voting procedures from 76 parliamentary chambers in 50 democracies around the world. The analysis also serves as a motivation for the dissertation. I will show that in most legislatures only a subset of votes are decided by roll call, usually at the request of legislators. The missing data and selection problems discussed in the previous chapter are thus relevant to a wide range of legislatures. When analyzing voting data from legislatures that do not systematically vote by roll call, we need to know whether inferences about the general behavior of legislators are possible.

To begin with, Section 2.1 gives an overview of the existing data on parliamentary voting procedures. In Section 2.2, I explain the data collection process and the procedures used to validate the collected information. In Section 2.3, I descriptively analyze the data to show how voting procedures vary across democratic parliaments around the world. Finally, in Section 2.4 I conclude and briefly describe how the new information presented here compares to the existing data in the literature.

2.1 Existing Data on Legislative Voting Procedures

Little systematic information is available on the different voting procedures of different legislatures. About thirty years ago, the Inter-Parliamentary Union (1986) provided the first—and, so far, most comprehensive—comparative data on voting

procedures in legislatures (see also Union Interparlementaire 1986). Covering 112 parliamentary chambers in 83 countries, the data showed that voting on legislation is a public (rather than secret) act almost everywhere. But besides that, the data also revealed that legislatures vary substantially in the methods they use to cast votes and in how much information they make available about individual legislators' voting decisions.

More recent but less complete information is provided by Saalfeld (1995), Carey (2009), Crisp and Driscoll (2012), and Hug, Wegmann and Wüest (2015). Focusing on the lower chambers of the parliaments of 18 West European countries, Saalfeld (1995, 531-541) finds that most chambers' rules of procedure allow for at least one voting method from each of the three types of voting procedures defined in Chapter 1, i.e., secret voting, signal voting, and roll call voting.[1] Exceptions are the parliaments of Denmark, Ireland, Italy, and the United Kingdom, where secret voting is not permitted and votes, therefore, can only be taken by a signal voting or roll call voting method.

However, and in line with the findings of the Inter-Parliamentary Union (1986), Saalfeld's (1995) data also show that the vast majority of parliamentary votes are taken either by signal vote or by roll call vote.[2] Among the procedures for signal voting, rising in places is the method used most frequently. Roll call votes, on the other hand, are usually cast by roll call voting in the strict sense (i.e., literally calling the roll) or by use of an electronic voting system. Unfortunately, Saalfeld's (1995) data are rather crude. They do not specify whether signal or roll call voting is the chamber's "standard operating procedure" (SOP), nor do they provide information on whether and under what circumstances alternative voting methods can be invoked.[3]

In a survey of 24 legislative chambers in 15 Latin American countries and the United States, Carey (2009, 57-60) provides information on whether floor votes are cast electronically, whether the cameral rules establish signal or roll call voting as SOP, and, for chambers whose SOP is signal voting, what the requirements are for invoking a roll call vote.[4] Moreover, he reports for each chamber the average number

[1] Saalfeld's (1995) study covers the lower chambers of the following countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

[2] In most parliaments, secret voting is confined to certain non-legislative matters, such as elections or no-confidence motions (e.g., Inter-Parliamentary Union 1986; Saalfeld 1995).

[3] Saalfeld (1995, 538f.) only provides information on whether or not roll call votes are frequently used in a legislature (i.e., at least a few hundred roll call votes per legislative period), but not whether roll call voting is the standard operating procedure (SOP). In this dissertation, I use standard operating procedure to mean the standard method of voting in a legislature or, in the words of Crisp and Driscoll (2012, 92, n. 5), "the method of voting that will be used unless another method is explicitly selected."

[4] The countries (and chambers) covered by Carey's (2009) survey are Argentina (Chamber of

of roll calls taken per year. The data show that twelve chambers, and thus half of the cases analyzed, employ electronic voting systems. Among these chambers, four use roll call voting as their SOP and another five, using signal voting as SOP, publish vote records on request of 10% of MPs or less. In the remaining three chambers, a majority of legislators is necessary to invoke a roll call vote.

Of the twelve chambers without electronic voting systems, Carey (2009, 57) reports that only the US Senate uses roll call voting as its default procedure.[5] Two other chambers require 10% of MPs or less to invoke a roll call, whereas in seven chambers a majority of legislators is necessary to do so (as for the remaining two chambers without electronic voting, one records and publishes votes on request of one-third of MPs and in the other, the Uruguayan Senate, the rules allow but do not specify a procedure to request roll call votes).

The use of electronic voting is thus clearly associated with lower thresholds for roll call votes. As Carey (2009, 57) notes, "electronic voting systems automatically and instantly generate individual-level records of votes, reducing the cost of recording [...] to near zero." And where the cost of recording is negligible, "there is less reason to maintain rules that discourage recording."

Carey (2009, 60) further demonstrates that there is a negative relationship between the procedural barriers to recording votes and the number of votes actually taken by roll call in a chamber. The chambers where the SOP is to record votes by means of an electronic voting device have an average of 459 roll call votes per year; the US Senate, where, by default, votes are recorded manually, has an average number of 350 roll calls; chambers where votes are recorded electronically and roll call votes must be requested by a subset of legislators average 153 recorded votes; and, finally, chambers without electronic voting and where roll call votes must be requested have on average about two recorded and published votes per year.

However, it is important to note that in some chambers the SOP differs depending on whether voting is on an individual article or the final passage of a bill, an amendment to the constitution, a budget motion, or a no-confidence motion (e.g., Saalfeld 1995; Stecker 2010; Crisp and Driscoll 2012; Hug, Wegmann and Wüest

Deputies and Senate), Bolivia (Chamber of Deputies and Senate), Brazil (Chamber of Deputies and Federal Senate), Chile (Chamber of Deputies and Senate), Colombia (House of Representatives and Senate), Costa Rica (unicameral), Ecuador (unicameral), El Salvador (unicameral), Guatemala (unicameral), Mexico (Chamber of Deputies and Senate), Nicaragua (unicameral), Panama (unicameral), Peru (unicameral), United States (House of Representatives and Senate), Uruguay (Chamber of Deputies and Senate), and Venezuela (unicameral).

[5]Note that Carey (2009, 57) classifies the US Senate as a chamber where votes, by default, are manually recorded and then published, whereas Lynch and Madonna (2013, 533) report that to record and publish a vote in the Senate, "a member must request a roll call vote and needs a second of 'one-fifth of those present.' "

2015). A drawback of Carey's (2009) analysis is therefore that it is not clear to which type(s) of floor votes the SOP he reports refers.

To some extent, this problem is overcome by Crisp and Driscoll (2012), who distinguish between the SOP for final passage votes and the SOP used for most of the legislative business in a chamber. Covering 25 chambers in 17 Latin American countries, Crisp and Driscoll (2012, 76-79) find that for final passage votes chambers more often use roll call voting as SOP than they do for other votes on legislation.[6] More specifically, among the 25 chambers analyzed, the rules of ten chambers mandate the use of roll call voting when legislators are taking a final vote on a piece of legislation. On the other hand, for the vast majority of legislative business conducted in a chamber, only five chambers define roll call voting as SOP.

In all cases where votes are, by default, taken by a signal voting method, cameral rules allow some subset of legislators to invoke a roll call vote. The only exception is the Uruguayan Senate, whose rules allow recorded votes, but do not specify a procedure for requesting them. Crisp and Driscoll's (2012) data, furthermore, show that the requirements for invoking roll call votes vary widely across legislative chambers. In some of the chambers studied, requesting a roll call vote requires the consent of only a handful of MPs, while in others doing so takes a majority of the legislature or more.

Hug, Wegmann and Wüest (2015), finally, analyze the voting procedures of 54 parliamentary chambers in 40 European countries.[7] As the default method of voting may vary depending on the type of votes, they report the SOP chambers use for final

[6]Crisp and Driscoll (2012) provide information on the following countries (and chambers): Argentina (Chamber of Deputies and Senate), Bolivia (Chamber of Deputies and Senate), Chile (Chamber of Deputies and Senate), Colombia (House of Representatives and Senate), Costa Rica (unicameral), Dominican Republic (Chamber of Deputies and Senate), Ecuador (unicameral), El Salvador (unicameral), Guatemala (unicameral), Honduras (unicameral), Mexico (Chamber of Deputies and Senate), Nicaragua (unicameral), Panama (unicameral), Paraguay (Chamber of Deputies and Senate), Peru (unicameral), Uruguay (Chamber of Deputies and Senate), and Venezuela (unicameral).

[7]The countries (and chambers) analyzed by Hug, Wegmann and Wüest (2015) are Armenia (unicameral), Austria (National Council and Federal Council), Belarus (House of Representatives and Council of the Republic), Belgium (Chamber of Representatives and Senate), Bulgaria (unicameral), Croatia (unicameral), Cyprus (unicameral), Czech Republic (Chamber of Deputies), Denmark (unicameral), Estonia (unicameral), Finland (unicameral), France (National Assembly and Senate), Georgia (unicameral), Germany (Bundestag and Bundesrat), Greece (unicameral), Hungary (unicameral), Iceland (unicameral), Ireland (Dáil Éireann and Seanad Éireann), Isle of Man (House of Keys), Israel (unicameral), Italy (Chamber of Deputies and Senate), Latvia (unicameral), Lithuania (unicameral), Luxembourg (unicameral), Macedonia (unicameral), Moldova (unicameral), the Netherlands (House of Representatives and Senate), Norway (unicameral), Poland (Sejm and Senate), Portugal (unicameral), Romania (Chamber of Deputies), Russia (State Duma), Serbia (unicameral), Slovakia (unicameral), Slovenia (National Assembly and National Council), Spain (Congress of Deputies and Senate), Sweden (unicameral), Switzerland (National Council and Council of States), Turkey (unicameral), Ukraine (unicameral), and the United Kingdom (House of Commons and House of Lords).

votes. Hug, Wegmann and Wüest (2015, 949-952) find that among the 54 chambers analyzed, 33 use roll call voting as their SOP, while the remaining 21 rely on some form of signal voting to cast final passage votes. Of the 33 chambers whose default method is roll call voting, a large majority, i.e., 28 chambers, record their votes with an electronic voting system. On the other hand, among the 21 chambers that use signal voting as their SOP, voting by show of hands and casting votes by sitting and standing are the methods used most frequently.

All but one of the chambers using signal voting as SOP allow certain actors to invoke a roll call vote (note, however, that this information is missing for some of the chambers covered by Hug, Wegmann and Wüest 2015). In contrast, of the chambers where roll call voting is the SOP, most do not allow it to be set aside in favor of another voting method. Hug, Wegmann and Wüest (2015, 951f.) show, moreover, that in most cases it is the legislators—i.e., either a single MP or a number of MPs—who are eligible to request a roll call vote, while in a few chambers also the chamber chairman or parliamentary parties have discretion over voting methods.

In sum, the existing literature clearly demonstrates that legislatures vary widely in their voting procedures. Yet much of the information the literature provides is either dated (in the case of Inter-Parliamentary Union 1986 and Saalfeld 1995) or limited in terms of geographical coverage (in the case of Saalfeld 1995, Carey 2009, Crisp and Driscoll 2012, and Hug, Wegmann and Wüest 2015). The aim of this chapter is, therefore, to give a descriptive overview of the voting procedures currently used in democratic legislatures around the world. However, before presenting the information on voting methods, I turn in the next section to a description of the data collection process.

2.2 Data Collection

In this chapter, I provide systematic data on the voting procedures of 76 parliamentary chambers in 50 democracies. As in some chambers voting procedures vary according to the type of votes, I focus on the rules pertaining to final floor votes (see also Crisp and Driscoll 2012; Hug, Wegmann and Wüest 2015). A country is considered democratic if its Freedom House status is "free" (as of 2012).[8] According to this definition, 90 countries rank as free, while 104 are either "partly free" or "not

[8]The data for the Freedom House status come from Teorell et al.'s (2015) Quality of Government (QoG) data set (version January 2015). In this data set, 2012 is the last year for which the Freedom House status is available.

free" (Freedom House does not provide information for the remaining countries).[9] Consequently, the data I present in this chapter cover slightly more than half of all democracies in the world. Table 2.A.1 in the Appendix shows which countries I consider and for which ones data are missing.

The data were initially collected in the context of a larger project on parliamentary procedures in national parliaments around the world.[10] In this project, we (i.e., the research project team, which consisted of Simon Hug, Simone Wegmann, and myself) carried out an online survey among parliamentary experts to obtain information on voting methods and other procedural features of national parliaments. The survey ran from March 2012 to February 2013. Most of the respondents to the survey have an academic background, but we also surveyed members of the Association of Secretaries General of Parliaments (ASGP) and some other well-informed experts on parliaments such as MPs and members of local monitoring groups.

In total, 194 experts responded to the survey for at least one of the parliamentary chambers considered here (some experts provided information for more than one chamber). Table 2.B.1 in the Appendix shows for each chamber the names of the experts who participated in the survey. Overall, the median number of experts per chamber is three, and for all but 16 chambers at least two experts provided information.[11] Finally, it is important to note that as parliamentary rules may change over time, the experts were requested to refer to the procedures currently used in a chamber (at the time of the survey, i.e., as of 2012).

After completion of the survey, we manually validated the reported information according to the following strategy.[12] We first identified all instances where respondents provided conflicting information. For these cases, we then consulted the chambers' rules of procedure and, if necessary, the countries constitutions to extract the correct information. The drawback of this strategy is that we did not validate information obtained from only one expert and information that was consistent across experts.

[9]For a description of the methodology used by Freedom House, see `https://www.freedomhouse.org/report/freedom-world-2015/methodology#.VbFGhrft2TV` (last accessed on 07/23/2015).

[10]The project, called Understanding Roll Call Vote Requests and Their Consequences, was led by Simon Hug and funded by the Swiss National Science Foundation (SNSF) (grant no. 100012-111909). For more information on the project, see `http://www.unige.ch/ses/spo/static/simonhug/snsfurcv.html` (last accessed on 08/04/2015). Note that the data provided by Hug, Wegmann and Wüest (2015) are also based on the information collected in this project.

[11]No expert provided information for three of the chambers considered here (the Senate of the Czech Republic, the Council of States of India, and the Senate of Romania). The information I present for these chambers is based on my own research.

[12]The data were validated by Manoela Assayag, Mélanie Belfiore, Daphne van der Pas, Simone Wegmann, and myself.

Therefore, I independently validated—and in some cases completed or updated—all data that I present in this chapter. More precisely, by consulting the relevant legal documents (i.e., mainly the rules of procedures and constitutions), scientific literature, and reports on parliaments, I verified for each chamber that the information I provide is correct and up-to-date (as of summer 2015). Table 2.D.1 in the Appendix lists the names and URLs of all legal documents that I used for verifying the parliamentary voting procedures data presented in this chapter.

2.3 Voting Procedures in Democratic Legislatures Around the World

Voting procedures vary considerably among democratic parliaments. Of the 76 parliamentary chambers covered in this chapter, 30 define roll call voting as their SOP, while the remaining 46 use some form of signal voting. Not surprisingly, there is no chamber in which final votes, by default, are taken by secret vote (see also Inter-Parliamentary Union 1986). Table 2.C.1 in the Appendix provides a detailed overview of the voting procedures used for final votes in the chambers considered here.

Figure 2.1 shows the geographical distribution of SOPs across the lower (or single) chambers of democratic parliaments. In the Americas, most chambers take their final votes by signal vote. Only the lower chambers of Argentina and Chile and the unicameral parliament of Peru use roll call voting as SOP, whereas the lower and, respectively, single houses of Brazil, Canada, Costa Rica, the Dominican Republic, El Salvador, Trinidad and Tobago, the United States, and Uruguay all rely on some signal voting method. Carey (2009) argues that roll call voting should be more prevalent where votes are taken electronically. Indeed, all of the three Latin American chambers with roll call voting as SOP employ an electronic voting system; on the other hand, among the eight houses where signal voting is the SOP, only two use an electronic voting device (note, however, that in my data information on the exact voting procedures is missing for two American countries).

Among the European chambers, there is clear evidence of a west-east divide. While the parliaments of the new democracies in Eastern Europe almost invariably equipped themselves with electronic voting systems (Middlebrook 2003*a*; Hug, Wegmann and Wüest 2015), many parliaments in the West still record their votes manually. As in the case of Latin American parliaments, electronic voting often coincides with using roll call voting as SOP. Of the 13 Eastern European lower and single chambers covered in the data set, nine define roll call voting as SOP, while the

remaining four use a signal voting method (of these chambers, twelve record their votes electronically and for one data are missing). On the other hand, among the 19 Western European countries for which I have data, there are six chambers with a roll call SOP (all of them have electronic voting systems) and 13 that use signal voting as their SOP (four of which use electronic voting machines).

The data cover only two countries in Oceania, namely Australia and New Zealand. Votes are cast manually both in the lower house of Australia and in the unicameral parliament of New Zealand. However, while the former, by default, makes its final votes available to the public, this is not the case for the latter.

With regard to Asia, data are available for the parliaments of India, Japan, South Korea, and Taiwan. Among these parliaments, only the one of Taiwan uses roll call voting as SOP (votes are recorded electronically). The lower chambers of India and Japan and the unicameral parliament of South Korea, on the other hand, all rely on signal voting procedures. As for the latter chambers, only the South Korean parliament casts votes by use of an electronic voting system.

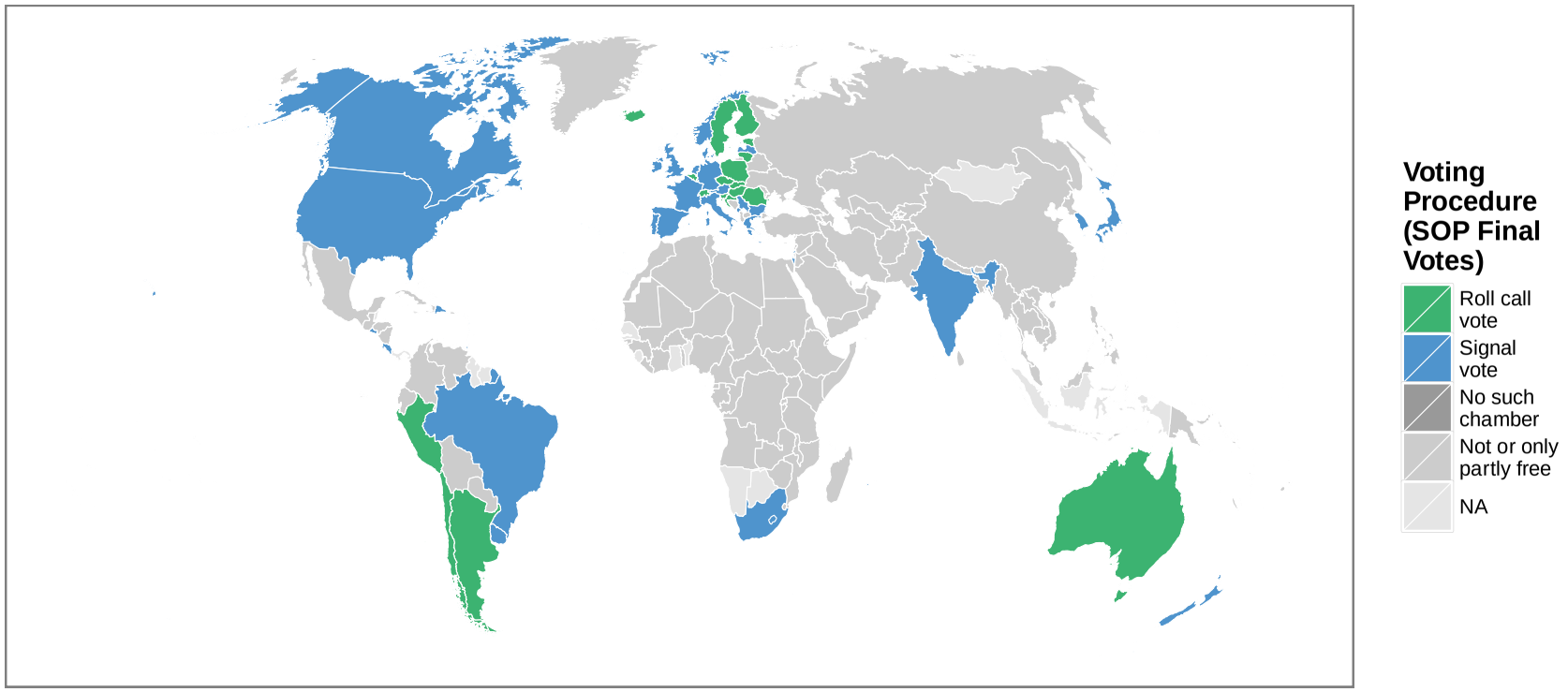
Finally, the South African National Assembly is the only democratic lower chamber in Africa for which data are available (most African countries, however, are ranked as not free or only partly free). The SOP of the National Assembly is signal voting and votes in that chamber are cast electronically.

Similarly, Figure 2.2 shows the distribution of SOPs across the upper houses of democratic parliaments. The pattern is very similar to the one observed for lower and single chambers. In the Americas, only the Argentinean Senate and the Chilean Senate use roll call voting as SOP (both record votes electronically), while votes are cast by some signal voting method in the upper chambers of Brazil, Canada, the Dominican Republic, Trinidad and Tobago, the United States, and Uruguay (two of which do so electronically).

There are only a few Eastern European parliaments that have upper chambers. All of those covered in the data set (namely, these are the upper chambers of the Czech Republic, Poland, Romania, and Slovenia) define roll call voting as SOP and use electronic voting systems to record their votes. Among the upper chambers in Western Europe, there are only three whose SOP is roll call voting (the Senates of Belgium and the Netherlands and the Swiss Council of States). The remaining seven Western European upper houses all have signal voting SOPs. Only in one of these latter chambers (the Spanish Senate) are votes taken by use of an electronic voting device, while in the others, voting is either by show of hands or viva voce (by voice).

The Australian Senate votes by division and, by default, makes its voting results available to the public. In contrast, the upper houses of India and Japan both

Figure 2.1: Voting Procedures in Lower Chambers and Unicameral Parliaments



Note: The figure shows which types of voting procedures (i.e., either roll call or signal voting) are used as standard operating procedures (SOPs) in democratic lower chambers and unicameral parliaments around the world. The SOP of a chamber is defined as the method of voting that will be used if no other method is explicitly selected. A country is considered democratic if its 2012 Freedom House status is "free" (voting procedures are only shown for parliaments in democratic countries). In total, there are 20 democratic lower/single chambers with roll call SOPs (shown in green), 30 democratic lower/single chambers with signal voting SOPs (shown in blue), 104 countries that are not free (shown in medium gray), and 40 countries that are democratic but for which data are missing (shown in light gray).

use signal voting as SOP (both of them do not rely on electronic voting systems). Finally, in South Africa's upper chamber, the SOP is signal voting as well and votes are taken by voice.

Recall that I defined the SOP of a chamber as the method of voting that will be used in that chamber if no other voting method is explicitly selected. While some chambers permit only one voting method, others allow their SOP to be set aside in favor of alternative voting procedures. Table 2.1 shows in how many chambers alternative voting methods may be invoked. The information in Table 2.1 is presented separately for different regions (America, Europe, and other regions) and for each type of SOP used (roll call voting and signal voting). Note that the data are pooled for lower/single and upper chambers of parliament.

Table 2.1: Alternative Voting Procedures for Final Votes

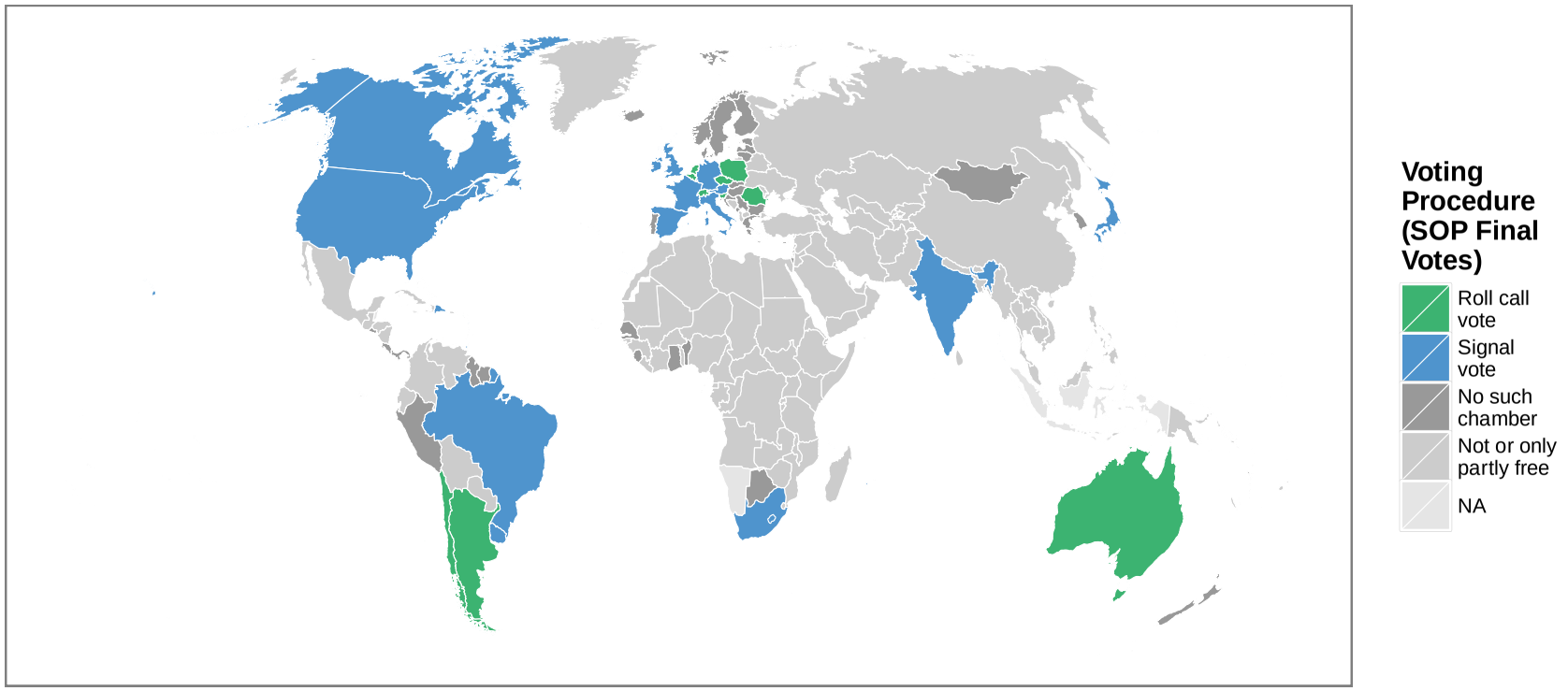
	America		**Europe**		**Other**	
SOP may be set aside in favor of ...	SOP RCV	SOP Signal	SOP RCV	SOP Signal	SOP RCV	SOP Signal
only secret voting	2	0	0	0	0	0
only signal voting	0	-	3	-	0	-
only roll call voting	-	12	-	17	-	7
secret and signal voting	0	-	2	-	0	-
secret and roll call voting	-	1	-	7	-	1
no other voting method	3	0	17	0	2	0
NA	0	1	0	0	1	0
N	5	14	22	24	3	8

Note: The table shows for different regions (America, Europe, and other regions) and for each type of SOP used (roll call voting and signal voting) in how many chambers alternative voting methods may be invoked. The data are pooled for lower/single and upper chambers of parliament.

In 45 of the 46 chambers where final votes, by default, are taken by signal vote, it is possible to invoke roll call voting (note that for the remaining chamber information is missing). Furthermore, nine of these chambers also allow secret votes to be invoked. In contrast, of the 30 chambers where roll call voting is the SOP, 22 do not allow the SOP to be set aside (information is missing for one case). Among the other eight chambers that do allow some change in voting procedures, five allow switching to a signal voting method and four permit secret votes.

The requirements for invoking alternative voting procedures vary considerably among the chambers that allow their SOP to be replaced with another voting method

Figure 2.2: Voting Procedures in Upper Chambers



Note: The figure shows which types of voting procedures (i.e., either roll call or signal voting) are used as standard operating procedures (SOPs) in democratic upper chambers around the world. The SOP of a chamber is defined as the method of voting that will be used if no other method is explicitly selected. A country is considered democratic if its 2012 Freedom House status is "free" (voting procedures are only shown for parliaments in democratic countries). In total, there are ten democratic upper chambers with roll call SOPs (shown in green), 16 democratic upper chambers with signal voting SOPs (shown in blue), 52 democratic parliaments that do not have upper chambers (shown in dark gray), 104 countries that are not free (shown in medium gray), and twelve countries that are democratic and have upper chambers but for which data are missing (shown in light gray).

(see also Crisp and Driscoll 2012; Hug, Wegmann and Wüest 2015). In principle, one or several of the following actors may be entitled to set the SOP aside in favor of an alternative method: legislators, parliamentary parties, the chairman of the chamber, the cabinet, and parliamentary committees. Table 2.2 shows in how many chambers each of these actors is entitled to request alternative methods of voting. Again, this information is presented separately for different regions (America, Europe, and other regions) and for each type of SOP used (roll call voting and signal voting). The data are pooled for lower/single and upper chambers of parliament.

Table 2.2: Actors Entitled to Request Alternative Voting Procedures for Final Votes

	America				**Europe**				**Other**			
Actors entitled to invoke	SOP RCV		SOP Signal		SOP RCV		SOP Signal		SOP RCV		SOP Signal	
alternative voting method	Secret	Signal	Secret	Roll call	Secret	Signal	Secret	Roll call	Secret	Signal	Secret	Roll call
Legislators	2	0	1	12	2	4	7	23	0	0	1	5
Parliamentary parties	0	0	0	1	0	0	2	5	0	0	0	0
Chamber chairman	0	0	0	0	0	2	0	7	0	0	0	5
Cabinet	0	0	0	0	0	0	0	3	0	0	0	0
Parliamentary committees	0	0	0	0	0	0	0	1	0	0	0	0
NA	0	0	0	1	0	0	0	0	0	0	0	0
N	2	0	1	13	2	5	7	24	0	0	1	8

Note: The table shows for different regions (America, Europe, and other regions) and for each type of SOP used (roll call voting and signal voting) in how many chambers particular actors are entitled to invoke alternative methods of voting. For example, column two of the table shows that in both American chambers where roll call voting is the SOP and the SOP can be set aside in favor of secret voting (see Table 2.1), it is the legislators who are entitled to invoke secret votes. The number of cases N shown in the last row thus refers only to those two out of five American chambers with a roll call SOP that allow secret voting to be invoked. Note that the data are pooled for lower/single and upper chambers of parliament.

Table 2.2 shows a clear pattern: in almost all chambers analyzed, it is the members of parliament—i.e., either a single MP or a number of MPs—who are eligible to invoke alternative voting procedures. There are only a few houses where this power is also given to other actors, such as parliamentary parties, the chamber chairman, the cabinet, and parliamentary committees.

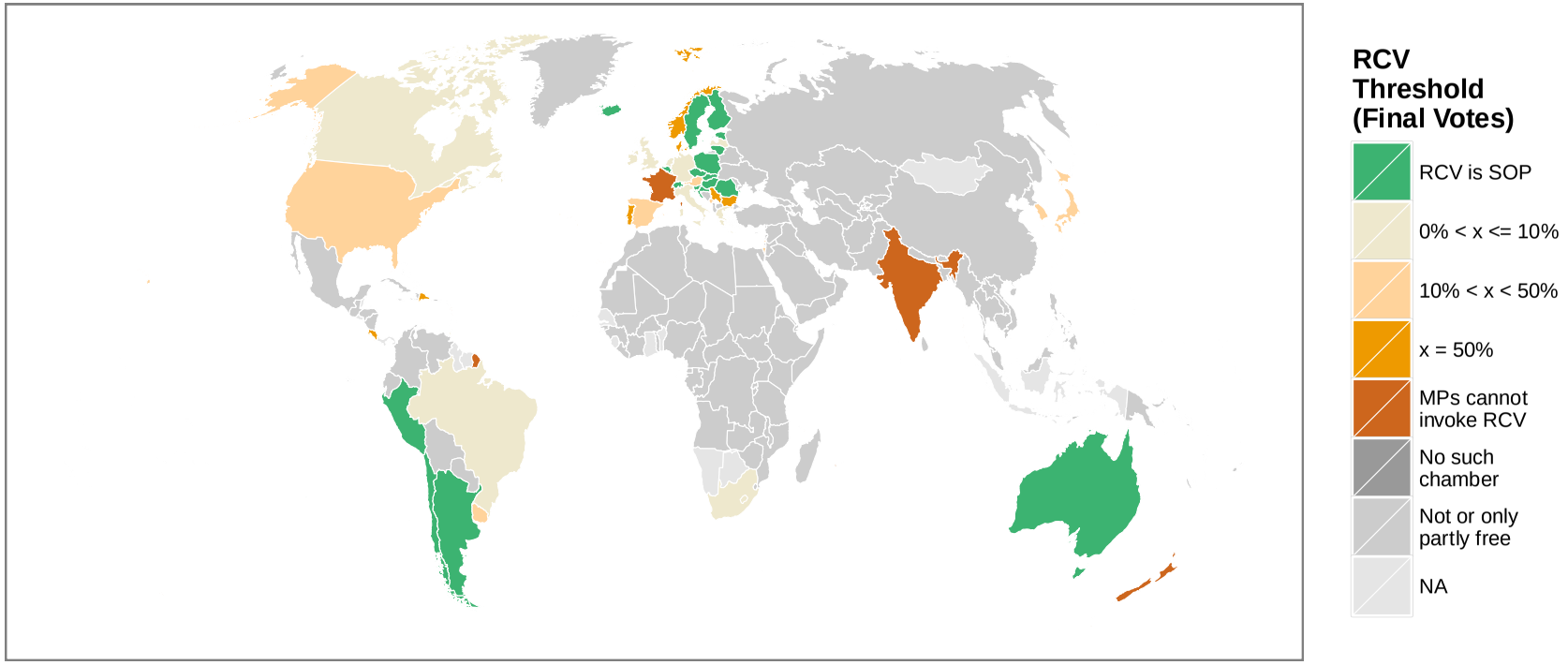
The number of legislators necessary to invoke alternative voting procedures varies widely among chambers that give their members discretion over how to vote. While some chambers set their SOP aside at the request of a single legislator, others do so only with the consent of a qualified majority (e.g., 66% of MPs are necessary to invoke a secret vote in the Peruvian Congress; see Table 2.C.1 in the Appendix for a detailed overview). As I am mainly interested in when and why legislators wish to make their voting behavior public, Figure 2.3 shows how difficult it is for members of lower and, respectively, single chambers to go on record. More precisely, the figure classifies the chambers according to their roll call vote threshold, that is the percentage of MPs required for requesting a roll call vote.[13] I distinguish the following categories: (i) roll call voting is the default method of voting; (ii) at least one member but no more than 10% of MPs are required to invoke a roll call vote; (iii) more than 10% but less than 50% of MPs are necessary to request a roll call vote; (iv) 50% of MPs are needed to vote by roll call; and (v) MPs cannot invoke roll call votes.

Three chambers do not allow their legislators to request roll call votes (these are the French National Assembly, the Indian House of People, and New Zealand's House of Representatives). In all other lower (or single) chambers, voting records are publicized automatically or upon request of some of their members. The general pattern is that in the US and parts of Western Europe (Austria, Denmark, Norway, Portugal, Spain), South Eastern Europe (Bulgaria, Montenegro, Serbia), and Asia (Japan and South Korea), chambers create relatively high barriers for legislators to have their votes published.[14] On the other hand, in most of Latin America and Eastern Europe, chambers either vote systematically by roll call or have relatively low thresholds for invoking roll call votes.

[13]The rules of procedure of the chambers that give their members discretion over voting procedures specify either a percentage or an absolute number of MPs that are necessary to invoke roll call votes. In the latter cases, I divided these numbers by the sizes of the chambers (i.e, the chambers' total number of MPs). The data for legislature size come from the Inter-Parliamentary Union's (IPU) Parline database (see `http://www.ipu.org/parline-e/parlinesearch.asp`, last accessed on 08/07/2015). In addition, for each chamber, I verified the data from the IPU with information that the chamber provides on its website.

[14]Of course, high roll call thresholds are not the only barriers to roll call voting. Other such barriers exist, e.g., if votes are recorded manually (e.g., Carey 2009) and if parties are not entitled to submit roll call requests (if they are allowed to do so, they can request roll call votes on behalf of their members).

Figure 2.3: Roll Call Threshold for MPs in Lower Chambers and Unicameral Parliaments



Note: The figure shows the roll call vote thresholds (i.e., the percentage of MPs necessary to request a roll call vote) in democratic lower chambers and unicameral parliaments around the world. In total, there are 20 democratic lower/single chambers where roll call voting is the default method (shown in dark green), eleven chambers where at least one member but no more than 10% of MPs are required to invoke a roll call vote (shown in light green), eight chambers where more than 10% but less than 50% of MPs are necessary to request a roll call vote (shown in light orange), seven chambers where 50% of MPs are needed to vote by roll call (shown in medium orange), and three chambers that do not allow their members to invoke roll call votes (shown in dark orange). Finally, 104 countries are not democratic (shown in medium gray) and 40 countries are democratic but data are missing (shown in light gray).

Figure 2.4 presents the same information for the upper chambers of democratic parliaments. Among the upper chambers, only the Indian Council of States does not allow its legislators to request roll call votes. Moreover, there are now just a handful of chambers with relatively high roll call thresholds (these are the upper chambers of Brazil, the Dominican Republic, Japan, Spain, and the US).

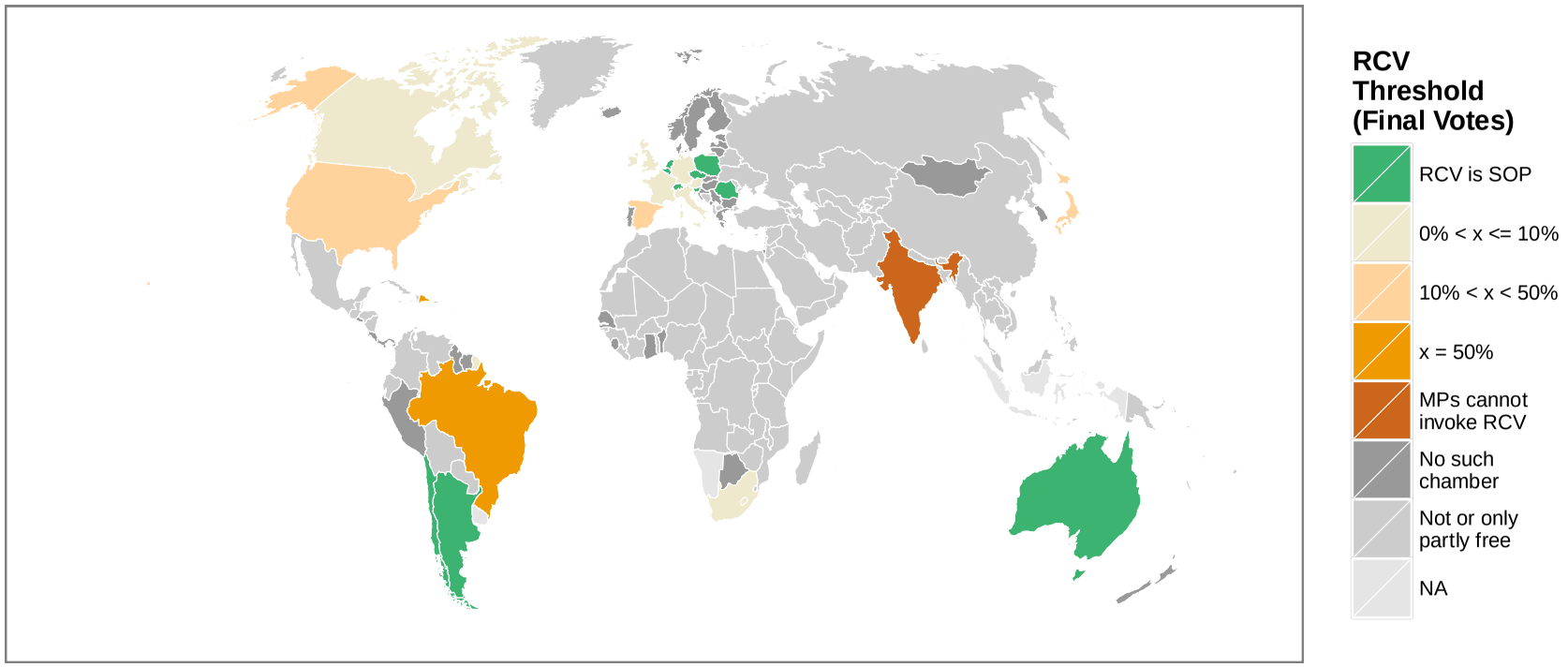
2.4 Conclusion

The data presented in this chapter provide three key insights into how legislators vote in democratic countries around the world. First, the data show that voting procedures vary considerably across democratic parliaments. Although the majority of chambers use some form of signal voting as SOP for final votes, there is a sizable minority that, by default, takes such votes by roll call. Moreover, a comparison with older data (e.g., the data provided by Inter-Parliamentary Union 1986 and Saalfeld 1995) reveals that roll call voting has recently become more widespread. As Hug, Wegmann and Wüest (2015, 952) suggest, this change is related to two reasons. First, the parliaments of many new democracies in Eastern Europe introduced electronic voting systems. Most of them make the voting records of their members publicly available (see also Middlebrook 2003*a*,*b*). Second, even among the older democracies, several chambers have recently introduced electronic voting and started to publicize individual votes (e.g., the lower chamber of Switzerland did so in 1994 and the upper chamber in 2014; see, e.g., Hug 2010; Bütikofer 2014; Hug, Wegmann and Wüest 2015).

Second, all of the chambers that, by default, take their final votes by a signal voting method allow that method to be set aside in favor of roll call voting. What is more, almost all of these chambers give the power to invoke roll calls to their members. Many do so exclusively, yet there are some houses where this power is also given to parliamentary parties, the chamber chairman, the cabinet, and parliamentary committees. A comparison with older data suggests that this is no new development. For example, Saalfeld's (1995, 549) data covering the period from 1970 to 1990 show that already then it was usually the legislators who were entitled to request roll call votes and only in some cases this power was also granted to other actors.

Third, the number of legislators that are necessary to invoke a roll call vote varies significantly among chambers that use signal voting as SOP and give their members discretion over voting procedures. While some chambers invoke roll call voting at the request of a single legislator, others do so only with the consent of a majority of

Figure 2.4: Roll Call Threshold for MPs in Upper Chambers



Note: The figure shows the roll call vote thresholds (i.e., the percentage of MPs necessary to request a roll call vote) in democratic upper chambers around the world. In total, there are ten democratic upper chambers where roll call voting is the default method (shown in dark green), nine chambers where at least one member but no more than 10% of MPs are required to invoke a roll call vote (shown in light green), three chambers where more than 10% but less than 50% of MPs are necessary to request a roll call vote (shown in light orange), two chambers where 50% of MPs are needed to vote by roll call (shown in medium orange), and one chamber that does not allow its members to invoke roll call votes (shown in dark orange). Finally, 52 democratic countries have no upper chamber (shown in dark gray), 104 countries are not democratic (shown in medium gray), and twelve countries are democratic and have an upper chamber but data are missing (shown in light gray).

MPs.

This chapter has shown that the provisions for roll call votes vary substantially across democratic legislatures. Therefore, understanding the reasons for and consequences of such votes is empirically relevant. In the following chapters, I will develop theoretical and empirical models that help explain why roll call votes are used and how they affect the voting behavior of legislators. Before doing so, however, I review in the next chapter what can be learned from the existing literature on these questions.

Appendix

2.A Availability of Data on Voting Procedures for Democratic Countries

Table 2.A.1: Data Availability for Democratic Countries

Country	**Data**	
	Available	Missing
Andorra		✓
Antigua and Barbuda		✓
Argentina	✓	
Australia	✓	
Austria	✓	
Bahamas		✓
Barbados		✓
Belgium	✓	
Belize		✓
Benin		✓
Botswana		✓
Brazil	✓	
Bulgaria	✓	
Canada	✓	
Cape Verde		✓
Chile	✓	
Costa Rica	✓	
Croatia	✓	
Cyprus		✓
Czech Republic	✓	
Denmark	✓	
Dominica		✓
Dominican Republic	✓	
El Salvador	✓	
Estonia	✓	

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Country	**Data**	
	Available	Missing
Finland	✓	
France	✓	
Germany	✓	
Ghana		✓
Greece	✓	
Grenada		✓
Guyana		✓
Hungary	✓	
Iceland	✓	
India	✓	
Indonesia		✓
Ireland	✓	
Israel	✓	
Italy	✓	
Jamaica		✓
Japan	✓	
Kiribati		✓
Latvia	✓	
Lesotho		✓
Liechtenstein		✓
Lithuania	✓	
Luxembourg	✓	
Malta		✓
Marshall Islands		✓
Mauritius		✓
Micronesia		✓
Monaco		✓
Mongolia		✓
Montenegro	✓	
Namibia		✓
Nauru		✓
Netherlands	✓	
New Zealand	✓	
Norway	✓	
Palau		✓
Panama		✓
Peru	✓	
Poland	✓	
Portugal	✓	
Romania	✓	

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Country	**Data**	
	Available	Missing
Saint Kitts and Nevis		✓
Saint Lucia		✓
Saint Vincent and the Grenadines		✓
Samoa		✓
San Marino		✓
Sao Tome and Principe		✓
Senegal		✓
Serbia	✓	
Sierra Leone		✓
Slovakia	✓	
Slovenia	✓	
South Africa	✓	
South Korea	✓	
Spain	✓	
Suriname		✓
Sweden	✓	
Switzerland	✓	
Taiwan	✓	
Tonga		✓
Trinidad and Tobago	✓	
Tuvalu		✓
United Kingdom	✓	
United States	✓	
Uruguay	✓	
Vanuatu		✓

Note: According to Freedom House, there are 90 "free" (and thus democratic) countries in 2012. The data I present cover 50 of these countries, while data are missing for the remaining 40 countries classified as democracies.

2.B Experts Who Participated in the Survey on Parliamentary Procedures

Table 2.B.1: Experts Who Participated in the Survey

Country	Chamber	Expert
Argentina	Chamber of Deputies	Baron, Maria
		Jones, Mark P.
		Mustapic, Ana M.
Argentina	Senate	Baron, Maria
		Calvo, Ernesto
		Estrada, Juan Hector
Australia	House of Representatives	Elder, David
Australia	Senate	Laing, Rosemary
Austria	National Council	Campbell, David
		Janistyn, Susanne
		Konrath, Christoph
		Müller, Wolfgang C.
		Sickinger, Hubert
Austria	Federal Council	Konrath, Christoph
		Wintoniak, Alexis
Belgium	Chamber of Representatives	Dandoy, Régis
		Deschouwer, Kris
		De Prins, Emma
Belgium	Senate	Deschouwer, Kris
		De Winter, Lieven
Brazil	Chamber of Deputies	Desposato, Scott W.
		Sampaio Contreiras de Almeida, Sérgio
Brazil	Federal Senate	Desposato, Scott W.
Bulgaria	National Assembly	Ganev, Gerogi
		Kolarova, Rumyana
		Slavchov, Ivan
		Smilova, Ruzha
		Stoyanov, Dragomir
		Stoychev, Stoycho
Canada	House of Commons	Bosc, Marc
		Godbout, Jean-François
		Kam, Christopher
Canada	Senate	Godbout, Jean-François
		Heard, Andrew
		Schultz, Richard
Chile	Chamber of Deputies	Alvarez, Adrian
		Álvarez Burgos, Luis Felipe

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Country	Chamber	Expert(s)
		Carey, John M.
		Navia, Patricio D.
Chile	Senate	Carey, John M.
		Navia, Patricio D.
Costa Rica	Legislative Assembly	Esobar-Lemmon, Maria C.
		Schwindt-Bayer, Leslie
		Wilson, Bruce M.
Croatia	Parliament	Baskin, Mark
		Miošić, Nives
		Sirinic, Daniela
Cyprus	House of Representatives	Emilianides, Achilles
		Grigoriadis, Theocharis
Czech Republic	Chamber of Deputies	Linek, Lukas
		Lyons, Pat
		Mielcova, Elena
		Saradin, Pavel
		Syllova, Jindriska
Czech Republic	Senate	- (my input)
Denmark	Folketing	Green-Pedersen, Christoffer
		Larsen, Carsten Ulrick
		Mortensen, Peter Bjerre
		Skjaeveland, Asbjørn
Dominican Republic	Chamber of Deputies	Espinal, Flavio Dario
		Marsteintredet, Leiv
Dominican Republic	Senate	Gerrits, Pepijn
El Salvador	Legislative Assembly	España, Annabella
Estonia	Riigikogu	Sibul, Heiki
		Taagepera, Rein
Finland	Parliament	Mattila, Mikko
		Pajala, Antti
		Raunio, Tapio
		Sundberg, Jan
		Tiitinen, Seppo
		Vuorinen, Jarmo
France	National Assembly	Foucault, Martial
		Ooghe-Tabanou, Benjamin
		Rozenberg, Olivier
		Surel, Yves
France	Senate	Ooghe-Tabanou, Benjamin
Germany	Bundestag	Schoeler, Ulrich
		Sieberer, Ulrich

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Country	**Chamber**	**Expert(s)**
		Stecker, Christian
Germany	Bundesrat	Schmitt, Gerd
Greece	Hellenic Parliament	Dimitrakopoulos, Dionyssis G.
		Exadaktylos, Theofanis
		Gerodimos, Roman
		Konstantinidis, Yannis
		Kosmidis, Spyros
Hungary	National Assembly	Andras, Biro Nagy
		Benoit, Kenneth
		Keseru, Julia
Iceland	Althingi	Bernodusson, Helgi
		Eythorsson, Gretar Thor
		Hardarson, Olafur Th.
		Indridason, Indridi
		Kristinsson, Gunnar Helgi
		Magnusson, Þorsteinn
India	House of the People	Prakash, Amit
		Roy, Chakshu
		Spary, Carole
India	Council of States	- (my input)
Ireland	Dáil Éireann	Coughlan, Kieran
		Gallagher, Michael
		O'Malley, Eoin
Ireland	Seanad Éireann	Gallagher, Michael
		Lane, Deirdre
		O'Malley, Eoin
Israel	Knesset	Friedberg, Chen
		Itzkovitch Malka, Reut
		Meller-Horowity, Yardena
		Shomer, Yael
Italy	Chamber of Deputies	De Giorgi, Elisabetta
		Di Palma, Guiseppe
		Giannetti, Daniela
		Guiliani, Marco
		Ieraci, Guiseppe
		Kreppel, Amie
		Newell, James
		Posteraro, Francesco
		Zucchini, Francesco
Italy	Senate of the Republic	Giannetti, Daniela
Japan	House of Representatives	Masuyama, Mikitaka

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Country	**Chamber**	**Expert(s)**
		Onitsuka, Makoto
Japan	House of Councillors	Masuyama, Mikitaka
South Korea	National Assembly	Jun, Hae-Won
		Koo, Hee Kwon
Latvia	Saeima	Auers, Daunis
		Bloom, Stephen
		Gruzina, Ieva
		Ikstens, Janis
Lithuania	Seimas	Ibenskas, Raimondas
		Lukosaitis, Alvaidas
		Zeruolis, Darius
Luxembourg	Chamber of Deputies	Poirier, Philippe
		Spreitzer, Astrid
Montenegro	Parliament	Komnenic, Natasa
		Kovacevic, Milica
		Maras, Vuk
Netherlands	House of Representatives	Andeweg, Rudy B.
		Bakker, Henk
		Louwerse, Tom
		Otjes, Simon
		Thomassen, Jacques
		Timmermans, Arco
		van Schendelen, M.P.C.M.
		Woldendorp, J.J.
Netherlands	Senate	Gradenwitz, Christward
		Hamilton, Geert Jan A.
		Otjes, Simon
		Thomassen, Jacques
		van Schendelen, M.P.C.M.
New Zealand	House of Representatives	Harris, Mary
		Roberts, Nigel
Norway	Storting	Brattesta, Hans
		Laegreid, Per
		Matland, Richard E.
		Rasch, Bjørn Erik
		Rommetvedt, Hilmar
Peru	Congress of the Republic	Aguayo, Julio Javier
		Elice, Jose
Poland	Sejm	Jasiewicz, Krzysztof
		Staniek, Magdalena
Poland	Senate	Gorecki, Maciej

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Country	**Chamber**	**Expert(s)**
		Mazurkiewicz, Mariusz
		Polkowska, Ewa
		Sawicki, Wojciech
Portugal	Assembly of the Republic	Freire, Andre
		Leston-Bandeira, Cristina
		Magalhães, Pedro
		Magone, José M.
		Manuel, Paul Christopher
Romania	Chamber of Deputies	Frantescu, Doru
Romania	Senate	- (my input)
Serbia	National Assembly	Crnjanski, Vukosava
		Ristic, Irena
		Slavisa, Orlovic
		Spasojevic, Dusan
Slovakia	National Council	Deegan-Krause, Kevin Robert
		Láštic, Erik
Slovenia	National Assembly	Krasovec, Alenka
		Plevelj, Matjaz
		Toplak, Jurij
		Zajc, Drago
Slovenia	National Council	Antic-Gaber, Milica
		Dezelan, Tomaz
		Prelesnik, Mojca
		Toplak, Jurij
		Zajc, Drago
South Africa	National Assembly	Mansura, Mohamed Kamal
South Africa	National Council of Provinces	Phindela, Modibedi Eric
		Rotberg, Robert I.
Spain	Congress of Deputies	Alba Navarro, Manuel
		Closa, Carlos
		Ramiro, Luis
Spain	Senate	Cavero Gomez, Manuel
		Lancaster, Thomas D.
Sweden	Riksdag	Aylott, Nicholas
		Flossing, Kathrin
		Hagevi, Magnus
		Hinnfors, Jonas
		Lindvall, Johannes
		Pierre, Jon
Switzerland	National Council	Lanz, Christoph
		Schwarz, Daniel

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Country	**Chamber**	**Expert(s)**
Switzerland	Council of State	Schwab, Philippe
Taiwan	Legislative Yuan	Gold, Thomas B.
		Wang, T.Y.
Trinidad and Tobago	House of Representatives	Pemberton, Rita
Trinidad and Tobago	Senate	Premdas, Ralph R.
United Kingdom	House of Commons	Cranmer, Frank
		Natzler, David
		Rogers, Robert
United Kingdom	House of Lords	Ollard, Edward
United States	House of Representatives	Koger, Gregory
		Tauberer, Joshua
United States	Senate	Binder, Sarah
Uruguay	Chamber of Deputies	Altman, David
		Chaquetti, Daniel
Uruguay	Senate	Rial, Juan
		Sanchez, Gustavo

2.C Voting Procedures For Final Passage Votes in Democratic Legislatures

Table 2.C.1: Voting Procedures for Final Passage Votes

Country	**Chamber**	**Type**	**SOP**	**Invoke Secret Vote**					**Invoke Signal Vote**					**Invoke Roll Call Vote**				
				M	P	Ch	Ca	Co	M	P	Ch	Ca	Co	M	P	Ch	Ca	Co
Argentina	Chamber of Deputies	L	RCV (EVS)	-	-	-	-	-	-	-	-	-	-	×	×	×	×	×
Argentina	Senate	U	RCV (EVS)	-	-	-	-	-	-	-	-	-	-	×	×	×	×	×
Australia	House of Representatives	L	RCV (Div)	-	-	-	-	-	-	-	-	-	-	×	×	×	×	×
Australia	Senate	U	RCV (Div)	-	-	-	-	-	-	-	-	-	-	×	×	×	×	×
Austria	National Council	L	Signal (Place)	50%	-	-	-	-	×	×	×	×	×	20	-	Yes	-	-
Austria	Federal Council	U	Signal (Hand)	50%	-	-	-	-	×	×	×	×	×	5	-	Yes	-	-
Belgium	Chamber of Representatives	L	RCV (EVS)	-	-	-	-	-	-	-	-	-	-	×	×	×	×	×
Belgium	Senate	U	RCV (EVS)	-	-	-	-	-	-	-	-	-	-	×	×	×	×	×
Brazil	Chamber of Deputies	L	Signal (Place)	50%	-	-	-	-	×	×	×	×	×	6%	1[a]	-	-	-
Brazil	Federal Senate	U	Signal (Place)	-	-	-	-	-	×	×	×	×	×	50%	-	-	-	-

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Country	Chamber	Type	SOP	Invoke Secret Vote					Invoke Signal Vote					Invoke Roll Call Vote				
				M	P	Ch	Ca	Co	M	P	Ch	Ca	Co	M	P	Ch	Ca	Co
Bulgaria	National Assembly	S	Signal (NA)	50%	-	-	-	-	×	×	×	×	×	50%	-	-	-	-
Canada	House of Commons	L	Signal (NA)	-	-	-	-	-	×	×	×	×	×	5	-	-	-	-
Canada	Senate	U	Signal (Voice)	-	-	-	-	-	×	×	×	×	×	2	-	-	-	-
Chile	Chamber of Deputies	L	RCV (EVS)	-	-	-	-	-	-	-	-	-	-	×	×	×	×	×
Chile	Senate	U	RCV (EVS)	60%	-	-	-	-	-	-	-	-	-	×	×	×	×	×
Costa Rica	Legislative Assembly	S	Signal (Place)	-	-	-	-	-	×	×	×	×	×	50%	-	-	-	-
Croatia	Parliament	S	RCV (EVS)	-	-	-	-	-	-	-	-	-	-	×	×	×	×	×
Cyprus	House of Representatives	S	NA (NA)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Czech Republic	Chamber of Deputies	L	RCV (EVS)	-	-	-	-	-	-	-	-	-	-	×	×	×	×	×
Czech Republic	Senate	U	RCV (EVS)	-	-	-	-	-	-	-	-	-	-	×	×	×	×	×
Denmark	Folketing	S	Signal (EVS)	-	-	-	-	-	×	×	×	×	×	50%	-	Yes	-	-

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Country	Chamber	Type	SOP	Invoke Secret Vote					Invoke Signal Vote					Invoke Roll Call Vote				
				M	P	Ch	Ca	Co	M	P	Ch	Ca	Co	M	P	Ch	Ca	Co
Dominican Republic	Chamber of Deputies	L	Signal (EVS)	-	-	-	-	-	×	×	×	×	×	50%	-	-	-	-
Dominican Republic	Senate	U	Signal (EVS)	-	-	-	-	-	×	×	×	×	×	50%	-	-	-	-
El Salvador	Legislative Assembly	S	Signal (NA)	NA	NA	NA	NA	NA	×	×	×	×	×	NA	NA	NA	NA	NA
Estonia	Riigikogu	S	RCV (EVS)	-	-	-	-	-	-	-	-	-	-	×	×	×	×	×
Finland	Parliament	S	RCV (EVS)	-	-	-	-	-	-	-	-	-	-	×	×	×	×	×
France	National Assembly	L	Signal (Hand)	-	-	-	-	-	×	×	×	×	×	-	-	-	1[b]	-
France	Senate	U	Signal (Hand)	-	-	-	-	-	×	×	×	×	×	30	1	Yes	Yes	Yes
Germany	Bundestag	L	Signal (Place)	-	-	-	-	-	×	×	×	×	×	5%	1	-	-	-
Germany	Bundesrat	U	Signal (Hand)	-	-	-	-	-	×	×	×	×	×	1[c]	-	-	-	-
Greece	Hellenic Parliament	S	Signal (Hand)	-	-	-	-	-	×	×	×	×	×	5%	-	Yes	-	-
Hungary	National Assembly	S	RCV (EVS)	-	-	-	-	-	-	-	-	-	-	×	×	×	×	×

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Country	Chamber	Type	SOP	Invoke Secret Vote					Invoke Signal Vote					Invoke Roll Call Vote				
				M	P	Ch	Ca	Co	M	P	Ch	Ca	Co	M	P	Ch	Ca	Co
Iceland	Althingi	S	RCV (EVS)	-	-	-	-	-	-	-	-	-	-	×	×	×	×	×
India	House of the People	L	Signal (Voice)	-	-	-	-	-	×	×	×	×	×	-	-	Yes[d]	-	-
India	Council of States	U	Signal (Voice)	-	-	-	-	-	×	×	×	×	×	-	-	Yes	-	-
Ireland	Dáil Éireann	L	Signal (Voice)	-	-	-	-	-	×	×	×	×	×	1	-	-	-	-
Ireland	Seanad Éireann	U	Signal (Voice)	-	-	-	-	-	×	×	×	×	×	1	-	-	-	-
Israel	Knesset	S	Signal (EVS)	-	-	-	-	-	×	×	×	×	×	20	-	-	Yes	-
Italy	Chamber of Deputies	L	Signal (Hand)	30	1[e]	-	-	-	×	×	×	×	×	20	1[f]	-	-	-
Italy	Senate of the Republic	U	Signal (Hand)	20	-	-	-	-	×	×	×	×	×	15	-	-	-	-
Japan	House of Representatives	L	Signal (Hand)	-	-	-	-	-	×	×	×	×	×	20%	-	Yes[g]	-	-
Japan	House of Councillors	U	Signal (Place)	-	-	-	-	-	×	×	×	×	×	20%	-	Yes	-	-
Latvia	Saeima	S	Signal (EVS)	-	-	-	-	-	×	×	×	×	×	10	-	-	-	-

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Country	**Chamber**	**Type**	**SOP**	**Invoke Secret Vote**					**Invoke Signal Vote**					**Invoke Roll Call Vote**				
				M	P	Ch	Ca	Co	M	P	Ch	Ca	Co	M	P	Ch	Ca	Co
Lithuania	Seimas	S	RCV (EVS)	-	-	-	-	-	-	-	Yes	-	-	×	×	×	×	×
Luxembourg	Chamber of Deputies	S	RCV (EVS)	-	-	-	-	-	-	-	-	-	-	×	×	×	×	×
Montenegro	Parliament	S	Signal (EVS)	-	-	-	-	-	×	×	×	×	×	10	-	Yes	-	-
Netherlands	House of Representatives	L	Signal[h] (Hand)	-	-	-	-	-	×	×	×	×	×	1	-	-	-	-
Netherlands	Senate	U	RCV (RCV)	-	-	-	-	-	50%	-	-	-	-	×	×	×	×	×
New Zealand	House of Representatives	S	Signal (Voice)	-	-	-	-	-	×	×	×	×	×	-	-	Yes[i]	-	-
Norway	Storting	S	Signal (EVS)	-	-	-	-	-	×	×	×	×	×	50%	-	Yes	-	-
Peru	Congress of the Republic	S	RCV (EVS)	66%	-	-	-	-	-	-	-	-	-	×	×	×	×	×
Poland	Sejm	L	RCV (EVS)	-	-	-	-	-	-	-	-	-	-	×	×	×	×	×
Poland	Senate	U	RCV (EVS)	-	-	-	-	-	20	-	Yes	-	-	×	×	×	×	×
Portugal	Assembly of the Republic	S	Signal (Place)	-	-	-	-	-	×	×	×	×	×	50%	[j]	-	-	-

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Country	**Chamber**	**Type**	**SOP**	**Invoke Secret Vote**					**Invoke Signal Vote**					**Invoke Roll Call Vote**				
				M	P	Ch	Ca	Co	M	P	Ch	Ca	Co	M	P	Ch	Ca	Co
Romania	Chamber of Deputies	L	RCV (EVS)	50%	-	-	-	-	50%	-	-	-	-	×	×	×	×	×
Romania	Senate	U	RCV[k] (EVS)	50%	-	-	-	-	50%	-	-	-	-	×	×	×	×	×
Serbia	National Assembly	S	Signal[l] (EVS)	-	-	-	-	-	×	×	×	×	×	50%	-	-	-	-
Slovakia	National Council	S	RCV (EVS)	-	-	-	-	-	-	-	-	-	-	×	×	×	×	×
Slovenia	National Assembly	L	RCV[m] (EVS)	-	-	-	-	-	-	-	-	-	-	×	×	×	×	×
Slovenia	National Council	U	RCV (EVS)	-	-	-	-	-	-	-	-	-	-	×	×	×	×	×
South Africa	National Assembly	L	Signal (EVS)	-	-	-	-	-	×	×	×	×	×	4	-	-	-	-
South Africa	National Council of Provinces	U	Signal (Voice)	-	-	-	-	-	×	×	×	×	×	4	-	-	-	-
South Korea	National Assembly	S	Signal (EVS)	20%	-	-	-	-	×	×	×	×	×	20%	-	-	-	-
Spain	Congress of Deputies	L	Signal (EVS)	20%	2	-	-	-	×	×	×	×	×	20%	2	-	-	-
Spain	Senate	U	Signal (EVS)	50	-	-	-	-	×	×	×	×	×	50	-	-	-	-

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Country	**Chamber**	**Type**	**SOP**	**Invoke Secret Vote**					**Invoke Signal Vote**					**Invoke Roll Call Vote**				
				M	P	Ch	Ca	Co	M	P	Ch	Ca	Co	M	P	Ch	Ca	Co
Sweden	Riksdag	S	RCV (EVS)	-	-	-	-	-	-	-	-	-	-	×	×	×	×	×
Switzerland	National Council	L	RCV (EVS)	-	-	-	-	-	-	-	-	-	-	×	×	×	×	×
Switzerland	Council of States	U	RCV (EVS)	-	-	-	-	-	-	-	-	-	-	×	×	×	×	×
Taiwan	Legislative Yuan	S	RCV (EVS)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	×	×	×	×	×
Trinidad and Tobago	House of Representatives	L	Signal (Voice)	-	-	-	-	-	×	×	×	×	×	1	-	-	-	-
Trinidad and Tobago	Senate	U	Signal (Voice)	-	-	-	-	-	×	×	×	×	×	1	-	-	-	-
United Kingdom	House of Commons	L	Signal (Voice)	-	-	-	-	-	×	×	×	×	×	1	-	-	-	-
United Kingdom	House of Lords	U	Signal (Voice)	-	-	-	-	-	×	×	×	×	×	1	-	-	-	-
United States	House of Representatives	L	Signal (Voice)	-	-	-	-	-	×	×	×	×	×	20%	-	-	-	-
United States	Senate	U	Signal (Voice)	-	-	-	-	-	×	×	×	×	×	20%	-	-	-	-
Uruguay	Chamber of Deputies	L	Signal (EVS)	-	-	-	-	-	×	×	×	×	×	33.3%	-	-	-	-

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Country	Chamber	Type	SOP	Invoke Secret Vote					Invoke Signal Vote					Invoke Roll Call Vote				
				M	P	Ch	Ca	Co	M	P	Ch	Ca	Co	M	P	Ch	Ca	Co
Uruguay	Senate	U	Signal (EVS)	-	-	-	-	-	×	×	×	×	×	?	?	?	?	?[n]

[a] One or multiple parties that account for at least 6% of the MPs (Rules of Procedure, Art. 185, Sec. 3).

[b] Roll call votes are invoked by majority decision of the Board of Party Presidents ("Conférence des présidents"), which is controlled by the government (see Godbout and Foucault 2013, 312).

[c] One state ("Land") can invoke a roll call vote (Rules of Procedure, Art. 29, Sec. 1).

[d] See also Patil (2011).

[e] One or multiple parties that account for at least 30 MPs (Rules of Procedure, Art. 51, Sec. 2).

[f] One or multiple parties that account for at least 20 MPs (Rules of Procedure, Art. 51, Sec. 2).

[g] See also Curtis (1999, 174).

[h] "In the case of voting by show of hands, the Speaker of the House presumes that MPs are voting on behalf of their political group" (`http://www.houseofrepresentatives.nl/voting`, last accessed on 07/12/2015).

[i] If, after a voice vote, an MP calls for a further vote to be held and the chamber chairman considers that the subject of the vote is to be treated as a conscience issue, the chairman will permit a roll call vote instead of a party vote (Standing Orders, Art. 142). According to Kam (2009, 6), in a party vote, "the party whips cast [...] 'party votes' on behalf of all the MPs in the party." Furthermore, a roll call vote may be held following a party vote if an MP requests one and the chairman considers that the decision on the party vote is so close that a roll call vote may make a material difference to the result (Standing Orders, Art. 144).

[j] Any matter may be put to a roll call vote if the "Conference of Leaders" so decides (Rules of Procedure, Art. 98, Sec. 2).

[k] Art. 131, Sec. 5 of the Regulations of the Senate stipulates that the individual voting decisions are published on request of a parliamentary party group. However, according to Iorga (2008, 23), in practice the individual votes are published on the website of the Senate without a request.

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[l] According to Art. 126 of the Rules of Procedure, the public media is provided with information about the individual voting decisions.

[m] See also Deželan and Sever (2007, 48), who note that "[m]ore than 95% of votes taken in the National Assembly are recorded."

[n] The rules of procedure allow, but do not specify a procedure to invoke, roll call votes (see also Carey 2009, 59; Crisp and Driscoll 2012, 77.)

Note: The actors that may invoke alternative voting procedures are: MPs (M), parliamentary parties (P), the chamber chairman (Ch), the cabinet (Ca), and parliamentary committees (Co). The types of chambers are: lower chamber (L), upper chamber (U), single chamber (S). There are two types of voting procedures, signal votes (Signal) and roll call votes (RCV). Finally, the precise methods of voting are: voting by voice (Voice), show of hands (Hand), rising in places (Place), electronic voting system (EVS), roll call vote in the strict sense (RCV), and division (Div).

2.D Sources for Information on Voting Procedures in Democratic Legislatures

Table 2.D.1: Sources for Information on Voting Procedures

Country	Chamber	Source	Last Accessed	URL
Argentina	Chamber of Deputies	Rules of the Chamber of Deputies	07/02/2015	http://www.diputados.gov.ar/institucional/reglamento/reglamentoPDF.html
Argentina	Senate	Rules of the Senate	07/02/2015	http://www.senado.gov.ar/reglamento
Australia	House of Representatives	Standing Orders of the House of Representatives	07/02/2015	http://www.aph.gov.au/About_Parliament/House_of_Representatives/Powers_practice_and_procedure/House_of_Representatives_Standing_Orders
Australia	Senate	Standing Orders of the Senate	07/02/2015	http://www.aph.gov.au/About_Parliament/Senate/Powers_practice_n_procedures/~/link.aspx?_id=F1802436C16E42378CE967C305619DA6&_z=z
Austria	National Council	Rules of Procedure of the National Council	07/04/2015	http://www.parlament.gv.at/ENGL/PERK/RGES/GOGNR/index.shtml
Austria	Federal Council	Rules of Procedure of the Federal Council	07/04/2015	http://www.parlament.gv.at/ENGL/PERK/RGES/GOBR/index.shtml
Belgium	Chamber of Representatives	Belgian Constitution	07/04/2015	http://www.lachambre.be/kvvcr/pdf_sections/publications/constitution/GrondwetUK.pdf
		Rules of Procedure of the House of Representatives	07/04/2015	http://www.lachambre.be/kvvcr/pdf_sections/publications/reglement/reglement_UK.pdf
Belgium	Senate	Belgian Constitution	07/04/2015	http://www.lachambre.be/kvvcr/pdf_sections/publications/constitution/GrondwetUK.pdf
		Rules of Procedure of the Senate (in French)	07/04/2015	http://www.senate.be/doc/BAT_Reglement_20150619_FR.pdf

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Country	Chamber	Source	Last Accessed	URL
Brazil	Chamber of Deputies	Rules of Procedure of the Chamber of Deputies (in Portuguese)	07/04/2015	http://www2.camara.leg.br/atividade-legislativa/legislacao/regimento-interno-da-camara-dos-deputados
Brazil	Federal Senate	Rules of Procedure of the Federal Senate (in Portuguese)	07/04/2015	http://www.senado.gov.br/legislacao/regsf/RISF2015.pdf
Bulgaria	National Assembly	Rules of Organization and Procedure	07/04/2015	http://parliament.bg/en/rulesoftheorganisations
Canada	House of Commons	Standing Orders of the House of Commons	07/05/2015	http://www.parl.gc.ca/About/House/StandingOrders/toc-e.htm
Canada	Senate	Rules of the Senate	07/05/2015	http://www.parl.gc.ca/About/Senate/Rules/senrules_00-e.htm
Chile	Chamber of Deputies	Rules of Procedure of the Chamber of Deputies (in Spanish)	07/05/2015	http://www.camara.cl/camara/media/docs/reglamento_15.pdf
Chile	Senate	Rules of Procedure of the Senate (in Spanish)	07/06/2015	http://www.senado.cl/reglamento-del-senado/prontus_senado/2012-11-07/110101.html
Costa Rica	Legislative Assembly	Rules of Procedure of the Legislative Assembly (in Spanish)	07/06/2015	http://www.asamblea.go.cr/Documents/Reglamento_de_la_Asamblea_Legislativa.pdf
Croatia	Parliament	Standing Orders of the Parliament	07/06/2015	http://www.sabor.hr/january-2002-nn-62002
Cyprus	House of Representatives	Standing Orders of the House of Representatives (in Greek)	07/06/2015	http://www.parliament.cy/easyconsole.cfm/id/151

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Country	Chamber	Source	Last Accessed	URL
Czech Republic	Chamber of Deputies	Rules of Procedure of the Chamber of Deputies	07/06/2015	http://www.psp.cz/en/docs/laws/1995/90_index.html
Czech Republic	Senate	Standing Rules of the Senate	07/06/2015	http://www.senat.cz/informace/zakon106/zakony/zak107-eng.php
Denmark	Folketing	Standing Orders of the Folketing	07/06/2015	http://www.thedanishparliament.dk/Publications/Standing%20Orders%20of%20the%20Folketing
Dominican Republic	Chamber of Deputies	Rules of Procedure of the Chamber of Deputies (in Spanish)	07/06/2015	http://www.camaradediputados.gob.do/serve/listfile_download.aspx?id=2948&num=1
Dominican Republic	Senate	Rules of Procedure of the Senate (in Spanish)	07/06/2015	http://www.senado.gob.do/oai/Portals/0/Documentos/REGLAMENTODELSENADO2010.pdf
El Salvador	Legislative Assembly	Rules of Procedure of the Legislative Assembly (in Spanish)	07/10/2015	http://www.asamblea.gob.sv/eparlamento/indice-legislativo/buscador-de-documentos-legislativos/reglamento-interior-de-la-asamblea-legislativa/
Estonia	Riigikogu	Riigikogu Rules of Procedure and Internal Rules Act	07/10/2015	https://www.riigiteataja.ee/en/eli/ee/Riigikogu/act/512032015002/consolide/current
Finland	Parliament	Rules of Procedure of the Parliament	07/10/2015	https://www.eduskunta.fi/EN/tietoaeduskunnasta/Documents/parliaments_rules_of_procedure.pdf#search=rules%20of%20procedure
France	National Assembly	Rules of Procedure of the National Assembly	07/10/2015	http://www2.assemblee-nationale.fr/langues/welcome-to-the-english-website-of-the-french-national-assembly#node_9440
France	Senate	Standing Orders of the Senate	07/10/2015	http://www.senat.fr/fileadmin/Fichiers/Images/lng/Standing_orders_of_the_Senate.pdf

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Country	Chamber	Source	Last Accessed	URL
Germany	Bundestag	Rules of Procedure of the Bundestag	07/10/2015	https://www.btg-bestellservice.de/pdf/80060000.pdf
Germany	Bundesrat	Rules of Procedure of the Bundesrat	07/10/2015	http://www.bundesrat.de/EN/funktionen-en/go-en/go-en-node.html
Greece	Hellenic Parliament	Standing Orders of the Hellenic Parliament	07/10/2015	http://www.hellenicparliament.gr/en/Vouli-ton-Ellinon/Kanonismos-tis-Voulis/
Hungary	National Assembly	Rules of Procedure of the National Assembly	07/10/2015	http://www-archiv.parlament.hu/hazszabaly/resolution.htm
Iceland	Althingi	Standing Orders of the Althingi	07/10/2015	http://www.althingi.is/english/about-the-parliament/standing-orders-of-the-althingi-/
India	House of the People	Rules of Procedure and Conduct of Business in the House of the People	07/11/2015	http://164.100.47.132/LssNew/rules/rules.aspx
India	Council of States	Rules of Procedure and Conduct of Business in the Council of States	07/11/2015	http://rajyasabha.nic.in/rsnew/rs_rule/rules_pro.pdf
Ireland	Dáil Éireann	Standing Orders of the Dáil	07/11/2015	http://www.oireachtas.ie/documents/proceduraldocuments/Standorders2011_revised.pdf
Ireland	Seanad Éireann	Standing Orders of the Seanad	07/11/2015	http://www.oireachtas.ie/documents/proceduraldocuments/SeanadStandingOrders2011.pdf
Israel	Knesset	Knesset Rules of Procedure	07/11/2015	http://knesset.gov.il/rules/eng/contents.htm
Italy	Chamber of Deputies	Rules of Procedure of the Chamber of Deputies	07/11/2015	http://en.camera.it/application/xmanager/projects/camera_eng/file/RULES_OF_PROCEDURE_CHAMBRE_OF_DEPUTIES.pdf

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Country	Chamber	Source	Last Accessed	URL
Italy	Senate of the Republic	Rules of the Senate	07/11/2015	http://www.senato.it/documenti/repository/istituzione/reg.%20ing.pdf
Japan	House of Representatives	Guide to the House of Representatives	07/12/2015	http://www.shugiin.go.jp/internet/itdb_english.nsf/html/statics/guide/voting.htm
Japan	House of Councillors	Rules of the House of Councillors	07/12/2015	http://www.sangiin.go.jp/eng/law/rothoc/index.htm
Latvia	Saeima	Rules of Procedure of the Saeima	07/12/2015	http://www.saeima.lv/en/legislation/rules-of-procedure
Lithuania	Seimas	Statute of the Seimas	07/12/2015	http://www3.lrs.lt/pls/inter2/dokpaieska.showdoc_e?p_id=492370
Luxembourg	Chamber of Deputies	Rules of Procedure of the Chamber of Deputies (in French)	07/12/2015	http://www.chd.lu/wps/wcm/connect/f57f45e4-3501-4907-b777-0ad0ca77212e/Reglement_02122014.pdf?MOD=AJPERES
Montenegro	Parliament	Rules of Procedure of the Parliament	07/12/2015	http://www.skupstina.me/images/documents/rules_of_procedure_00-63-2.pdf
Netherlands	House of Representatives	Rules of Procedure of the House of Representatives	07/12/2015	http://www.houseofrepresentatives.nl/sites/default/files/content/141120-rules_of_procedure.pdf
Netherlands	Senate	Rules of Procedure of the Senate	07/12/2015	http://www.eerstekamer.nl/id/vjtockpd5v8b/document_extern/rules_of_procedure_of_the_senate_of/f=/vjtocl2l71ov.pdf
New Zealand	House of Representatives	Standing Orders of the House of Representatives	07/12/2015	http://www.parliament.nz/resource/en-nz/00HOHPBReferenceStOrders4/eb7c8b9e4a6c7aa88a47d14dc4100513b2557e60

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Country	Chamber	Source	Last Accessed	URL
Norway	Storting	Rules of Procedure of the Storting	07/12/2015	https://www.stortinget.no/globalassets/pdf/diverse/forretningsorden_engelsk_2014.pdf
Peru	Congress of the Republic	Rules of Procedure of the Congress of the Republic (in Spanish)	07/12/2015	http://www.congreso.gob.pe/Docs/files/reglamentocongreso(modificado-20.03.2015).pdf
Poland	Sejm	Standing Orders of the Sejm	07/12/2015	http://oide.sejm.gov.pl/oide/en/index.php?option=com_content&view=article&id=14798:the-standing-orders-of-the-sejm-of-the-republic-of-poland&catid=7&Itemid=361
Poland	Senate	Rules and Regulations of the Senate	07/13/2015	http://www.senat.gov.pl/en/about-the-senate/regulamin-senatu/
Portugal	Assembly of the Republic	Rules of Procedure of the Assembly of the Republic	07/13/2015	http://www.en.parlamento.pt/Legislation/Rules_of_Procedure.pdf
Romania	Chamber of Deputies	Regulations of the Chamber of Deputies	07/13/2015	http://www.cdep.ro/pls/dic/site.page?id=243
Romania	Senate	Regulations of the Senate (in Romanian)	07/13/2015	http://senat.ro/index.aspx?Sel=364540B4-B1A9-4C6B-A50B-92D7A4B335F8
Serbia	National Assembly	Rules of Procedure of the National Assembly	07/13/2015	http://www.parlament.rs/national-assembly/important-documents/rules-of-procedure-%28consolidated-text%29/introductory-provision.1351.html
Slovakia	National Council	Rules of Procedure of the National Council	07/13/2015	http://www.nrsr.sk/web/Static/en-US/NRSR/Dokumenty/rules_of_procedure.pdf

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Country	Chamber	Source	Last Accessed	URL
Slovenia	National Assembly	Rules of Procedure of the National Assembly	07/13/2015	http://www.dz-rs.si/wps/portal/en/Home/ODrzavnemZboru/PristojnostiInFunkcije/RulesoftheProcedureText
Slovenia	National Council	Rules of Procedure of the National Council (in Slovenian)	07/14/2015	http://www.ds-rs.si/sites/default/files/dokumenti/pslovnik_ds.pdf
South Africa	National Assembly	Rules of the National Assembly	07/14/2015	http://www.parliament.gov.za/content/NA%20RULES%202014.pdf
South Africa	National Council of Provinces	Rules of the National Council of Provinces	07/14/2015	http://www.parliament.gov.za/content/Rules_of_NCOP_9th_edition.pdf
South Korea	National Assembly	National Assembly Act	07/12/2015	http://korea.na.go.kr/res/low_02_read.jsp?boardid=1000000036
Spain	Congress of Deputies	Standing Orders of the Congress of Deputies	07/14/2015	http://www.congreso.es/portal/page/portal/Congreso/Congreso/Hist_Normas/Norm/standing_orders_02.pdf
Spain	Senate	Senate Standing Orders	07/14/2015	http://www.senado.es/web/conocersenado/normas/reglamentootrasnormassenado/index.html
Sweden	Riksdag	Riksdag Act	07/14/2015	http://www.riksdagen.se/en/Documents-and-laws/
Switzerland	National Council	Standing Orders of the National Council	07/14/2015	https://www.admin.ch/opc/en/classified-compilation/20030895/index.html
Switzerland	Council of States	Standing Orders of the Council of States	07/14/2015	https://www.admin.ch/opc/en/classified-compilation/20030743/index.html
Taiwan	Legislative Yuan	Rules of Procedure of the Legislative Yuan (in Chinese)	07/14/2015	http://www.na.gov.tw/ch/law/LawView76b8.html?itemid=345&titleid=466

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Country	Chamber	Source	Last Accessed	URL
Trinidad and Tobago	House of Representatives	Standing Orders of the House of Representatives	07/14/2015	http://www.ttparliament.org/documents/2245.pdf
Trinidad and Tobago	Senate	Standing Orders of the Senate	07/14/2015	http://www.ttparliament.org/documents/2306.pdf
United Kingdom	House of Commons	Standing Orders of the House of Commons	07/14/2015	http://www.publications.parliament.uk/pa/cm201516/cmstords/1154/1154.pdf
United Kingdom	House of Lords	Standing Orders of the House of Lords	07/14/2015	http://www.publications.parliament.uk/pa/ld/ldstords/105/105.pdf
United States	House of Representatives	Constitution of the United States	07/14/2015	http://www.archives.gov/exhibits/charters/constitution_transcript.html
		Rules of the House of Representatives	07/14/2015	http://clerk.house.gov/legislative/house-rules.pdf
United States	Senate	Constitution of the United States	07/14/2015	http://www.archives.gov/exhibits/charters/constitution_transcript.html
		Rules of the Senate	07/14/2015	http://www.rules.senate.gov/public/index.cfm?p=RulesOfSenateHome
Uruguay	Chamber of Deputies	Rules of Procedure of the Chamber of Deputies (in Spanish)	07/15/2015	http://www.parlamento.gub.uy/htmlstat/pl/reglamentos/indregcrr.asp
Uruguay	Senate	Rules of Procedure of the Senate (in Spanish)	07/15/2015	http://www.parlamento.gub.uy/htmlstat/pl/reglamentos/RegCSS-2014.pdf

Note: The table shows the legal documents I used for verifying the data on parliamentary voting procedures presented in this chapter. If a document is available in English (either as original or as a translation), I provide the URL of the English version. Otherwise, I provide the URL of the document in the original language.

Chapter 3

Lessons From Previous Research About the Reasons For and Consequences of Roll Call Votes

The aim of this chapter is to examine what the literature tells us about the reasons why roll call votes are used and how they affect the voting behavior of legislators. The chapter is structured as follows. I first review in Section 3.1 the literature on the reasons for roll call votes. The section is divided into two subsections. Subsection 3.1.1 deals with the requirements for roll call voting and Subsection 3.1.2 focuses on roll call requests. Next, in Section 3.2, I discuss the available evidence on the effects of roll call votes on legislative behavior. In Section 3.3, I conclude the chapter with a brief discussion of what I see as shortcomings in the existing literature.

3.1 Literature on the Reasons for Roll Call Votes

In many legislatures, the selection of roll call votes involves two steps. In a first step, legislators decide on the rules specifying the requirements for roll call votes. Second, if the rules do not mandate a roll call vote for a particular proposal, some actors may choose to request that the proposal be decided by roll call vote. As Chapter 2 has shown, in practically all legislatures in which the use of roll call votes is not mandated, the power to invoke roll call voting rests with the legislators. In the following, I discuss in turn the literature on roll call requirements and the literature dealing with roll call requests.

3.1.1 Explaining the Requirements for Roll Call Votes

There are only a few studies that attempt to explain why legislatures differ in their constraints on roll call votes.[1] One explanation is provided by Carey (2009, 70ff.), who argues that the incentive to vote by roll call is strongest in systems with single-member districts (SMDs) and two dominant parties. Elections in these systems represent a zero-sum game in which the votes lost by one party's candidate are won by the candidate of the other party. Because such a zero-sum game gives candidates a strong incentive to deliver "bad news" about their opponents and voting records provide a useful tool to do so, Carey (2009) expects legislatures elected under SMD systems with two dominant parties to have the least constraints on roll call votes.

However, the weakness of this argument is that roll call votes are explained by the incentives of challengers, while in most parliaments it is the incumbent legislators who decide on the requirements for roll call votes. Sieberer, Müller and Heller (2011) point out that parliamentary rules are chosen by parliamentary actors whose preferences over institutions derive from their substantive goals (see also Diermeier and Krehbiel 2003; Shepsle 2006*a*; Diermeier 2014). Thus, explanations of why roll call constraints vary across legislatures should focus on the preferences and incentives of their members.

An explanation focusing on the preferences of legislators is offered by Hug, Wegmann and Wüest (2015). Drawing on Carey's (2009) work, Hug, Wegmann and Wüest (2015, 946f.) argue that SMD elections encourage candidates to provide not only bad news about their adversaries but also good news about themselves. Roll call votes allow legislators to establish and maintain favorable reputations with their voters (e.g, Mayhew 1974; Fiorina 1974, 1989; Cain, Ferejohn and Fiorina 1987; Lynch and Madonna 2013). Thus, as legislators elected in SMDs have greater incentives to cultivate personal reputations than legislators in other electoral systems (e.g., Bawn and Thies 2003, 14), they should make the requirements for roll call voting relatively less restrictive.

Hug, Wegmann and Wüest (2015) also argue that legislators have less incentive to publicize their votes if candidate selection is concentrated in the hands of party leaders. In most instances, party leaders are present when voting takes place on the parliamentary floor (Carey 2009; Stecker 2013). Because leaders are able to monitor their members' behavior in both signal votes and roll call votes, legislators' chances

[1] In general, the literature on variations in parliamentary rules is rather scarce. This might be due to the fact that the field of legislative studies is largely dominated by research on the US Congress. As Gamm and Huber (2002) argue, the procedural rules of Congress are fairly stable, making research on rule variation less interesting (but see Binder 1996, 1997; Dion 1997; Schickler 2000, 2001; Jenkins and Stewart 2003; Roberts and Smith 2003; Roberts 2007).

of getting nominated for reelection do not depend on the method of voting. On the other hand, if the power to select candidates rests with actors outside parliament, roll call votes become more important, as they allow legislators to display their loyalty to these actors by voting in line with the actors' preferences.

In their analysis of 54 European parliamentary chambers, Hug, Wegmann and Wüest (2015) find mixed evidence for their explanations of roll call vote constraints. In line with their expectation, partisan control over the candidate nomination process is negatively related to the probability that a chamber uses roll call voting as SOP. However, the effect of SMD elections on the probability of using roll call voting as SOP turns out to be negative and not statistically significant. This suggests that legislators rely on roll call votes to signal their loyalty to selectorates, but not so much as a means to build a reputation with voters.

Focusing on the US Congress, Lynch and Madonna (2013, 539ff.) offer another explanation for why constraints on roll call votes may vary across legislatures. Starting from the assumption that legislators are motivated by reelection (e.g., Mayhew 1974; Fenno 1978; Fiorina 1989; Cox and McCubbins 2005, 2007), they argue that the introduction of electronic voting in the House of Representatives in 1973 was a response to public pressure for more accountability. This suggests that legislators also opt for less restrictive roll call requirements when constituent demand for accountability is high.

There is at best suggestive evidence for this explanation. The parliaments of many newly democratic Central and East European countries adopted roll call voting as their SOP (e.g., Middlebrook 2003*a*,*b*; Hug, Wegmann and Wüest 2015) and it is possible that these reforms were, at least in part, driven by a public expectation for increased transparency and accountability. Yet it is less clear whether, and to what extent, public pressure explains the variation in roll call requirements found among West European and Latin American parliaments.[2]

In summary, with the exception of candidate selection procedures, the literature provides little empirical evidence concerning the reasons for why in some legislatures votes are systematically conducted by roll call, while in others requirements for roll call voting are rather restrictive. If in a legislature the constraints are such that roll call voting requires the consent of a subset of its members, the next question becomes under what circumstances legislators decide to take a vote by roll call. I review the literature on this question in the next subsection.

[2]See Carey (2009, 80f.) for some examples of public pressure for voting transparency in Latin American countries.

3.1.2 Explaining the Requests of Roll Call Votes

While most of the research on roll call requirements focuses on the signaling argument, studies explaining roll call vote requests often attempt to assess both the signaling motivation and the disciplining motivation. Within the latter literature, some suggestive evidence for the disciplining argument comes from an early study by Fennell (1974) on the Argentine Chamber of Deputies.[3] In interviews with legislators who served in the 1965-1966 session Fennell (1974, 400) asked why there has been so much variation over time in the occurrence of roll call votes. The deputies' explanations most frequently dealt with the use of roll call votes to maintain party unity, followed by the number of parties present in parliament and the purpose of embarrassing the opposition.

Stecker (2010), in contrast, finds little evidence that roll call votes serve as a means to discipline party members. Analyzing the frequency of roll call votes in German state parliaments, Stecker (2010) shows that smaller government majorities are associated with more roll call vote requests. At first glance, this finding seems to be in line with the disciplining argument: if roll call votes enable party leaders to keep backbenchers in line, then government parties with narrow majorities should rely on roll call votes more often. However, Stecker's (2010, 453) data also show that the requests for roll call votes come almost exclusively from opposition parties. He thus concludes that disciplining does not appear to be the primary motivation for roll call votes and that such votes are better understood as position-taking (i.e., signaling) devices.

From the perspective of the signaling argument, a legislator has the greatest incentive to publicize a vote when the issue of the vote is politically salient, the legislator's voting behavior is in line with voter preferences, and political opponents vote against the preferences of their voters. It is these votes that best allow a legislator to promote (and differentiate) her reputation with voters and outside actors more generally. Saalfeld (1995, 541-546) makes a similar argument on the party level. He argues that votes on salient issues pitting unified parties against one another provide party leaders with the greatest incentive to signal party positions to the public. Therefore, roll call votes should occur more frequently in parliaments with unified parties and strong party competition. This expectation, however, is not borne out in the data. Based on information from the lower chambers of 18 West European countries, Saalfeld (1995) finds little evidence that roll call votes are more

[3]The rules of the Argentine Chamber of Deputies mandate roll call voting for final votes. For other votes, roll call voting can be invoked by 10% of the deputies present in the chamber (Carey 2009, 58; Crisp and Driscoll 2012, 77).

frequent in competitive parliaments than in parliaments where decision-making is more consensual.

One reason for this negative finding could be that the signaling motivation is actually less relevant in the context of unified parties and strong party competition. If parties act as cohesive blocs and competition is intense, it is likely that legislative outsiders are informed about party positions even when individual votes are not made public (see also Fennell 1974, 396; Carey 2009, 44).[4] Thus, if this is the case, there is simply not much incentive for parties to signal their positions via roll call votes.

In a more recent study, Finke (2015) provides supporting evidence for the hypothesis that party leaders use roll call votes to appeal to their electorates. His analysis of all votes in the Sixth European Parliament (EP) shows that parties on the fringe of the political spectrum often request roll call votes for their amendments, although it is clear from the outset that the amendments they introduce will not receive a majority of votes. The requesting parties' intention is thus not to win votes, but to demonstrate commitment to voter preferences (see Thiem 2006 and Finke and Thiem 2010 for further studies on the EP providing evidence in favor of the signaling hypothesis).

Finally, Lynch and Madonna (2013) test the signaling argument with data on all landmark enactments passed by the US Congress from 1865 to 1996. Lynch and Madonna (2013) hypothesize that legislators have a strong incentive to publicize their positions on issues featuring particularized costs and benefits. Their analysis confirms that such issues are indeed more likely to receive a roll call vote than other types of issues. In the words of Lynch and Madonna (2013, 546), this shows that "[b]ecause of the direct positive or negative effect that issues like these have on districts, members have a strong electoral incentive to register their vote as being on the 'right' side for the interests of their district."[5]

[4]For example, Carey (2009, 44) argues that "[e]ven when individual voting records are unavailable, those outside the legislature can get access to information about policy positions and actions of major collective actors—parties, unions, business associations—at relatively low cost through newspapers and broadcast media."

[5]Lynch and Madonna's (2013) finding also has implications for the choice of roll call constraints. There are two strategies that reelection-seeking legislators can pursue: they can either appeal broadly to all voters by providing public goods or they can distribute public resources more narrowly by providing pork-barrel projects to particular groups (Myerson 1993; Lizzeri and Persico 2001). Myerson (1993) shows that in some electoral systems, such as winner-takes-all, two-candidate systems, legislators are *less* likely to use pork-barrel spending as a strategy to win elections. Thus, if Lynch and Madonna (2013) are right that legislators have a stronger incentive to use roll call voting for proposals providing particularized costs and benefits than for proposals providing public goods, we would expect roll call constraints to be lower in systems that motivate legislators to distribute resources narrowly. Note that this mechanism could also explain why Hug, Wegmann and Wüest (2015) failed to find evidence for their hypothesis that legislatures elected under SMD

3.2 Literature on the Effects of Roll Call Votes on Legislative Behavior

Studies examining how roll call votes affect the behavior of legislators are scarce. This is mainly due to the fact that data on signal votes are generally not available. Consequently, the limited knowledge we have about the effects of roll call votes on legislator behavior comes either from theoretical work or from a few cases for which information on signal votes could be obtained.

Carrubba, Gabel and Hug (2008) propose a theoretical model in which roll call votes are requested for disciplining purposes only. In this model, two party leaders decide simultaneously whether or not to invoke a roll call vote prior to the vote on a proposal in the legislature. Since party leaders can only discipline backbenchers when votes are taken by roll call, the leaders' decision to request a roll call vote involves a trade-off between increasing the probability that their preferred alternative will be adopted and the cost of imposing discipline on party members. Carrubba, Gabel and Hug's (2008) results show that the roll call voting behavior of legislators differs from how they would have voted had a vote not been taken by roll call and that the party unity observed in roll call votes always overstates pre-disciplined party cohesion.

To study the effects of roll call votes empirically, Hug (2010) relies on voting data from the Swiss National Council from the period 1995 to 2003.[6] At that time, votes in the National Council were either automatically roll called, roll called at the request of 30 or more legislators, or taken by a signal voting method (in the last case, individual votes were recorded but not published). Comparing party unity across these different types of votes, Hug (2010) shows that most parties were more unified in automatically published votes than in signal votes and requested roll call votes (see also Traber, Hug and Sciarini 2014).[7] As Hug (2010, 228) argues, one possible reason for this finding is that most automatic roll call votes were total and final votes and party whips are more active on such votes. However, it is also possible that parties mainly use total and final votes to signal their positions to external actors or that party unity is higher in these votes simply because conflict was resolved in earlier stages of the legislative process.

Benesch, Bütler and Hofer (2016) study the effect of roll call votes on the voting

rules are more likely to use roll call voting as their SOP.

[6]The data Hug (2010) uses cover the 45th legislative period (1995-1999) and the 46th legislative period (1999-2003) of the Swiss parliament.

[7]The exception to this pattern are the parties on the left, whose members were most united in requested roll call votes.

behavior of legislators in the Swiss Council of States by means of a difference-in-differences approach. They exploit the introduction of mandatory roll call voting for final passage votes in the Council of States during the 2011-2015 legislative period, while the National Council voted systematically by roll call throughout the entire period. Using individual vote data from before and after the change in voting procedures in the Council of States and taking the National Council as the control group, their difference-in-differences analysis finds that legislators' deviation from the party line in the Council of States decreased by 2.9 percentage points as an effect of roll call voting. Benesch, Bütler and Hofer (2016) interpret this finding as evidence in favor of the hypothesis that voting transparency affords parties more leverage to discipline legislators. In light thereof, they discount the alternative hypothesis that roll call votes give voters rather than parties more influence over legislators' voting behavior.

3.3 Conclusion

The literature survey in this chapter has shown that there is mixed evidence on the reasons commonly given for the selection of roll call votes. Hug, Wegmann and Wüest (2015) find that legislators choose to adopt roll call voting procedures to reveal their positions to selectorates outside the legislature. Similarly, Stecker (2010), Lynch and Madonna (2013), and Finke (2015) show that legislators and, respectively, parties request roll call votes to demonstrate their loyalty to voters. On the other hand, authors studying the reasons for roll call voting generally fail to find evidence in support of the disciplining argument. Regarding the effects of roll call votes on legislative behavior, the theoretical model developed by Carrubba, Gabel and Hug (2008) suggests that parties are more unified when votes are decided by roll call, while Hug's (2010) study provides empirical evidence largely consistent with this proposition.

The discussion in this chapter has also shown that a large part of the literature is based on the assumption that roll call votes are called for by party leaders.[8] Carrubba et al. (2006, 692), for example, claim that it is the party leaders "who normally control the selection of [roll call votes]" (see also Depauw and Martin 2009, Ainsley and Maxwell 2012, and Stecker 2013 for similar assumptions). However, the cameral rules of almost all democratic legislatures give the power to request roll call votes to the legislators (and sometimes other actors) and it is typically the legislators

[8]Exceptions are the studies by Lynch and Madonna (2013) and Hug, Wegmann and Wüest (2015).

themselves who choose and can modify these rules. Consequently, explanations of roll call vote selection should account for the fact that in most legislatures it is the legislators who ultimately decide whether or not a vote is taken by roll call.[9]

Therefore, I will propose models that focus on legislators' incentives for roll call voting in the following two chapters. In Chapter 4, I will develop an empirical model to assess how roll call votes affect the behavior of legislators. Next, in Chapter 5, I will offer a theoretical model of the choice of roll call requirements by legislators.

[9]Of course, it is possible that party leaders and other actors can influence legislators' ability of roll call vote selection (e.g., Tiefer 1989 notes that during the 1950s it was extremely difficult for US senators to obtain roll call votes without the support of party leaders). If for a legislature such influences are deemed important, they should be included in the model of roll call selection.

Chapter 4

The Requests of Roll Coll Votes and Their Effects on the Voting Behavior of Legislators

> *"I do really take it for an indisputable truth, and a truth that is one of the corner stones of political science—the more strictly we are watched, the better we behave."*
>
> Jeremy Bentham, *1748-1832*

After a new parliament is elected and legislators have adopted the internal rules, they begin conducting their ordinary parliamentary business: issues appear on the political agenda, policy proposals are introduced, and votes are taken.[1] When deciding how to vote on proposals, legislators are, at least to some extent, guided by their personal preferences and convictions (e.g., Kau and Rubin 1979; Kalt and Zupan 1984, 1990; Levitt 1996; Burden 2007; Kam 2009). Yet in addition to following their own preferences, legislators may also have an incentive to cater to the demands of internal and external actors who control resources they value (e.g., Hix 2002; Stratmann 2002; Carey 2007, 2009). Legislators' decision calculus is straightforward if all stakeholders have the same preferences over policy alternatives. However, if this is not the case, then legislators must balance the competing pressures they are subject to.

[1]Of course, this is a highly stylized description of parliamentary business. The lawmaking process involves a number of stages that occur between the introduction of proposals and voting in the plenary (e.g., deliberation in committees, hearings, etc.). Moreover, as students of legislative politics have long recognized, parliaments perform many functions other than making laws, which may not even be the most important one (e.g., Bagehot (1867) 2001; Wheare 1968; Blondel 1973; Norton 1993).

The signaling argument leads us to expect that legislators behave differently in roll call votes than in signal votes because only the former provide them with an incentive to respond not only to their personal preferences and those of internal actors, but also to the preferences of actors outside the legislature. If this is true, then legislators should also care about when to vote by roll call: they should prefer roll call votes when intending to vote in line with the preferences of outside actors and no roll call votes when intending not to vote in line with the preferences of those actors. The objective of this chapter is to assess these expectations empirically based on data from the 2003-2007 legislative period of the Swiss National Council. To do so, I proceed as follows. In Section 4.1 I begin with a more detailed description of the expectations I wish to assess in this chapter. Next, I describe the data in Section 4.2. In Section 4.3 I develop the model I will use to evaluate the expectations and in Section 4.4 I discuss the essential assumptions underlying the model. Section 4.5 then presents the results of the analysis and, finally, Section 4.6 concludes the chapter.

4.1 Expectations

If legislators have different policy preferences than actors who control valuable resources, or if legislators face competing demands from such actors, they must decide whose preferences to follow and whose not to follow when deciding how to vote. The weights that legislators attach to the preferences of other actors depend on two factors (Saalfeld 1995, 556f.). First, legislators are only responsive to the preferences of actors who are able to sanction them in response to their voting behavior. The ability of actors to sanction legislators requires the ability to detect shirking. As the signaling argument suggests, the ability to observe legislators' voting behavior, and thus to detect shirking, varies between different types of actors and voting procedures. Whereas actors inside the legislature can monitor individual voting behavior in signal votes and roll call votes, actors outside the legislature can do so only in the latter type of votes.

The second factor influencing the weights legislators attach to the preferences of other actors is the relative values of the resources these actors control. Provided that an actor is able to monitor and sanction a legislator's voting behavior, the legislator only has an incentive to respond to the preferences of this actor if she places a sufficiently high relative value on the resources the actor commands. How legislators value the resources of actors depends largely on their goals. For example, if the primary goal of legislators is to win reelection (e.g., Mayhew 1974; Fiorina 1989; Cox and McCubbins 2005, 2007), then the preferences of voters and selectorates are

likely to carry more weight in their voting decision calculus than the preferences of other actors, particularly with regard to issues that voters and selectorates consider important. In contrast, if legislators have strong personal convictions about what policy ought to be (e.g., Burden 2007; Carnes 2012), they may assign more weight to their own preferences and less weight to those of other actors, both inside and outside the legislature.

Therefore, legislators behave differently in roll call votes than in signal votes if at least one of the following two conditions is true: first, actors inside the legislature have different preferences than actors outside the legislature and both types of actors control resources that are relatively valuable to legislators; second, legislators have different personal preferences than actors outside the legislature and the latter control relatively valuable resources. Assuming that this is the case, the first expectation is as follows:

Expectation 1. *Legislators tend to behave differently in roll call votes than in signal votes.*

If legislators care about the resources controlled by outside actors and expect that the actors will make the provision of these resources contingent upon their behavior in roll call votes, then they should also care about whether votes are decided by roll call or not. More precisely, legislators should prefer a roll call vote if they expect that such a vote will allow them to curry favor with outside actors and they should prefer not to take a vote by roll call if they expect that a roll call vote will damage their relationship with external actors. Assuming that legislators have discretion over how to vote, the second expectation therefore is the following:

Expectation 2. *Legislators tend to request roll call votes that they expect will improve their reputation with outside actors and they tend not to request roll call votes that they expect will damage their reputation with outside actors.*

In the next section, I turn to a description of the data I will use to empirically evaluate the above expectations.

4.2 The Data

To empirically evaluate the expectations presented in the previous section, I rely on voting data and information about roll call requests from the 47th legislative period (2003-2007) of the Swiss National Council. The 47th National Council provides an ideal case to study the effect of roll call votes on the voting behavior of

legislators. Since 1994, the National Council is equipped with an electronic voting system that records legislators' voting decisions for all votes taken on the floor (Hug 2010; Bütikofer 2014).[2] Until 2007, however, these individual voting decisions were only published for a subset of votes. More precisely, a vote was automatically roll called if it was a total or final passage vote, if it concerned an urgent matter and, since 2003, if it dealt with the so-called "Schuldenbremse" (i.e., a break on increases in public debt). In addition, individual voting decisions were also made public if at least 30 legislators submitted a formal request for a roll call vote. Otherwise, if there was neither an automatic nor a requested roll call vote, the individual votes of legislators were only recorded but not published. While since 2007 the National Council makes individual voting behavior public for all votes, the full voting record for the period from 1994 to 2007 has been made available only for scientific research.

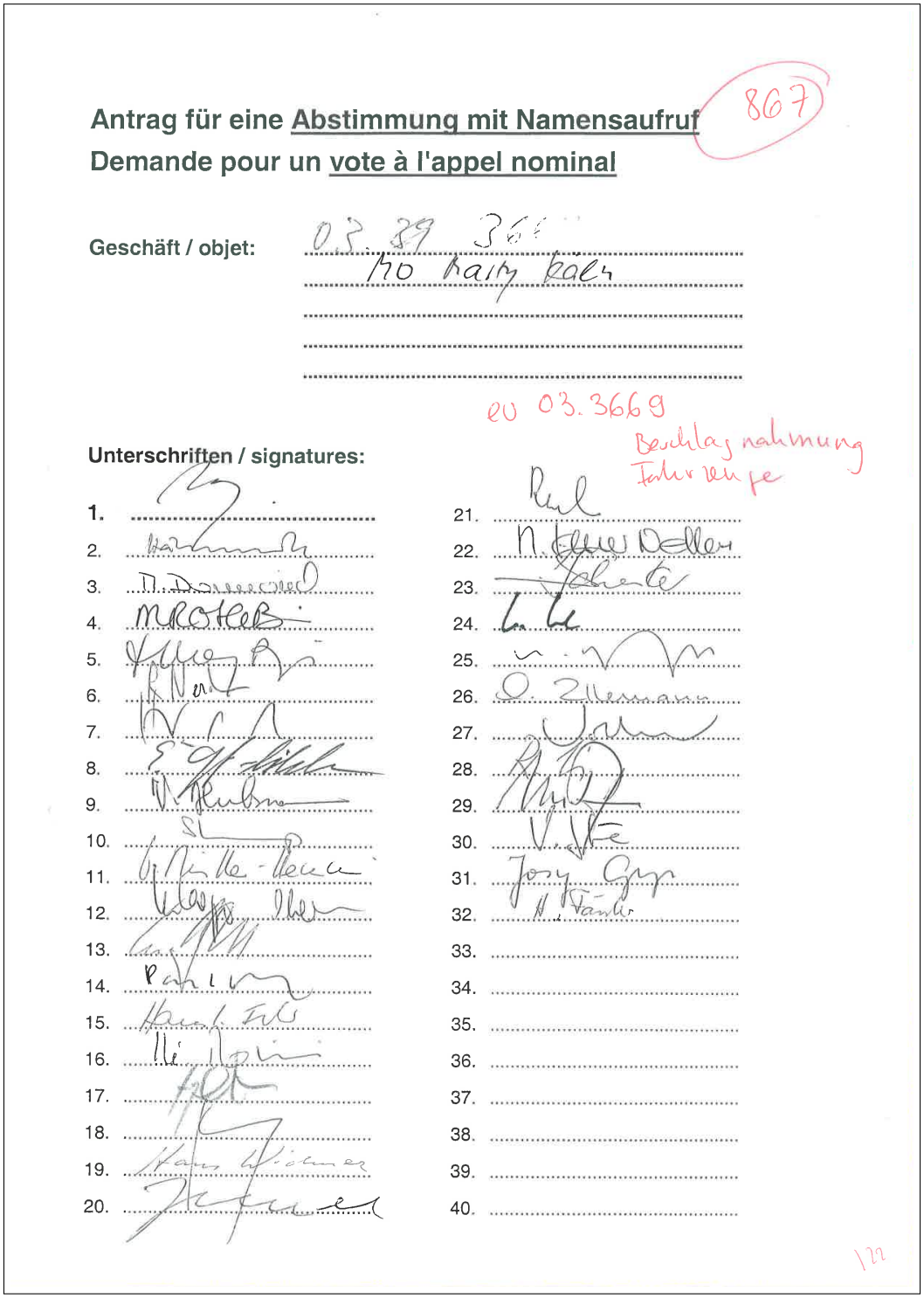
Hence, until 2007, legislators could request votes to be taken by roll call. Such requests for roll call votes were submitted to the chairman of the National Council on a simple piece of paper signed by at least 30 legislators. The identity of the roll call vote requesters was not published in the minutes of the parliament and thus unknown to outside observers. However, for the 47th legislative period, we were able to retrieve a substantial share of the petitions for roll call votes submitted by legislators (see also Hug and Wüest 2014; Chiou and Hug 2015). Figure 4.1 shows an example of such a petition for a roll call vote that was signed by 32 legislators.

Table 4.1 shows for each of the 17 sessions during the 47th legislative period of the National Council how many votes were signal votes, automatic roll call votes, and requested roll call votes.[3] Of the 3,764 floor votes that occurred in the 17 sessions, 2,302 were signal votes, 755 were automatic roll call votes, and 707 were requested roll call votes. Thus, on average, 38.84% of all votes were decided by roll call (note, however, that the proportion of roll call votes varies from a minimum of 14.67% to a maximum of 60.74% per session).

[2]For more information, see `https://www.parlament.ch/de/ratsbetrieb/suche-curia-vista/geschaeft?AffairId=19940429` (last accessed on 07/04/2016).

[3]The members of the Swiss parliament meet for four ordinary plenary sessions per year, each lasting three weeks (Kriesi and Trechsel 2008, 70). In the 47th legislative period, legislators also met for an extraordinary session in addition to the 16 ordinary sessions (see `http://www.parlament.ch/d/sessionen/sessionsdaten/seiten/legislaturen.aspx`, last accessed on 11/06/2015).

Figure 4.1: Example of a Petition for a Roll Call Vote Signed by Legislators



Note: Until 2007, 30 or more members of the Swiss National Council could request a roll call vote by signing a petition that was then submitted to the chairman of the chamber. The figure shows an example of such a petition for a roll call vote.

Table 4.1: Votes in the 47th Legislative Period of the Swiss National Council

Session	Signal Votes	Automatic Roll Call Votes	Requested Roll Call Votes	Proportion of Roll Call Votes
1	118	58	23	0.41
2	181	23	14	0.17
3	178	6	40	0.21
4	231	31	19	0.18
5	136	47	26	0.35
6	145	54	43	0.40
7	110	37	29	0.38
8	108	33	38	0.40
9	167	26	34	0.26
10	127	62	44	0.45
11	138	41	43	0.38
12	64	6	5	0.15
13	100	55	41	0.49
14	119	37	34	0.37
15	137	64	148	0.61
16	113	81	59	0.55
17	130	94	67	0.55
Total	2,302	755	707	0.39

Note: The table shows for each session of the 47th legislative period of the Swiss National Council the number of signal votes, automatic roll call votes, and requested roll call votes. The last column in the table shows the proportion of roll call votes among all votes taken in a session.

In total, we could retrieve the petitions for 181, or 25.60%, of the 707 requested roll call votes that occurred in the 47th legislative period. Based on these petitions, we were then able to identify a large share of the legislators who requested the roll call votes. The following strategy was adopted to identify the roll call vote requesters. In a first step, we obtained from the Parliamentary Services of the Swiss parliament the attendance lists of several plenary meetings. All legislators attending a plenary session have to put their signatures on an attendance list, next to their printed names. Based on these lists, we could identify the signatures of most members of the 47th National Council.[4]

Second, having identified the signatures of most legislators, we went through all

[4]In addition, we also searched the Web for documents bearing the signatures of legislators in order to complement and verify the set of signatures identified based on the attendance lists.

the 181 roll call petitions (such as the one shown in Figure 4.1) to determine which legislators requested a particular roll call vote (the coding was done by three coders, namely Jovita Vuest, Jon Snoek, and myself). Each petition was first coded by one coder and the result was then reviewed and revised by a second coder. On average, a roll call petition was signed by 31.53 legislators (the maximum number of legislators signing a petition is 40 in our data). We were able to identify, on average, 88.86% of the petitioners on a list (the percentage of identified petitioners on a list varies between 70% and 100%).

Finally, we combined the information obtained from the roll call petitions with the data on legislators' voting behavior. We were able to do this for 150 of the 181 roll call petitions. For these roll call votes, we thus know who the roll call requesters were and how the legislators voted. Unfortunately, for the remaining 31 petitions, either roll call data are missing or there was not enough information to determine for which proposal a roll call vote was requested. It is important to note, however, that I have no reason to believe that the missing data arising from missing roll call records, petitions we were unable to match to voting data, signatures we could not identify, and petitions we could not retrieve from the archive are not missing completely at random (MCAR) (Rubin 1976).

4.3 The Model

The empirical analysis consists of two steps. First, I estimate an item-response theory (IRT) model in order to examine whether legislators tend to behave differently in roll call votes than in signal votes (Expectation 1). As in Section 1.5 in the introductory chapter, I assume that legislators care about both policy and reelection. Each vote in the legislature pits a proposal $p \in \mathbb{R}$ against a status quo (or some other alternative), denoted by $sq(p) \in \mathbb{R}$, which prevails if p is rejected.[5] Let $U(i, p, 1)$ and $U(i, sq(p), 1)$ denote the utilities legislator i receives from voting for proposal p and the status quo $sq(p)$, respectively, in a roll call vote. Likewise, let $U(i, p, 0)$ and $U(i, sq(p), 0)$ be the utilities i receives from voting for p and $sq(p)$, respectively, in a signal vote. Different from Section 1.5 where I assumed perfect voting, I assume

[5]More precisely, p is the yes alternative and $sq(p)$ is the no alternative in a vote on a proposal p. For simplicity, I refer to these two alternatives as proposal and status quo, although it is clear that in many votes the no position is not a vote for the status quo. This is, e.g., the case when bills are voted on article by article, in votes on mutually exclusive proposals, and in votes on proposals that relate to the same part of a bill. For more information on the voting order of proposals in the Swiss National Council, see `https://www.parlament.ch/en/%C3%BCber-das-parlament/parlamentsw%C3%B6rterbuch/parlamentsw%C3%B6rterbuch-detail?WordId=54` (last accessed on 07/04/2016). For more general information on voting orders, see Rasch (1995, 516-523).

here that the utilities of legislators are not deterministic but contain stochastic components (e.g., McFadden 1976; Poole 2005). Thus, if proposal p is decided by a roll call vote, legislator i's utilities are given by

$$U(i, p, 1) = U_p(i, p) + U_e(i, p) + e(i, p) \tag{4.1}$$
$$U(i, sq(p), 1) = U_p(i, sq(p)) + U_e(i, sq(p)) + e(i, sq(p)), \tag{4.2}$$

where $U_p(i, p)$ and $U_p(i, sq(p))$ are the personal utilities i receives from voting for policy p and $sq(p)$, respectively, $U_e(i, p)$ and $U_e(i, sq(p))$ are the utilities that i attaches to the (expected) changes in her probability of reelection brought about by a vote for p and $sq(p)$, respectively, and $e(i, p)$ and $e(i, sq(p))$ are the stochastic elements, or "errors," of utility.[6]

On the other hand, if proposal p is voted on by signal vote, legislator i's utilities are simply given as

$$U(i, p, 0) = U_p(i, p) + e(i, p) \tag{4.3}$$
$$U(i, sq(p), 0) = U_p(i, sq(p)) + e(i, sq(p)). \tag{4.4}$$

Assuming that legislators' personal preferences over policy alternatives are characterized by quadratic utility functions, it is

$$U_p(i, p) = -(p - \xi_i)^2$$
$$U_p(i, sq(p)) = -(sq(p) - \xi_i)^2,$$

where $\xi_i \in \mathbb{R}$ denotes legislator i's ideal point in a one-dimensional policy space.[7] With regard to legislators' reelection utilities, I assume that the electoral rewards and punishments legislators expect to receive for their roll call voting behavior are constant across all reelection-seeking members of a parliamentary party.[8] For legisla-

[6]More precisely, $U_p(i, p)$ and $U_p(i, sq(p))$ capture both the utility legislator i derives from her personal policy preferences and the utility derived from any rewards and punishments i receives from inside actors in response to her voting behavior. $U_e(i, p)$ and $U_e(i, sq(p))$ capture the utility that i derives from a change in her probability of reelection caused by any rewards and punishments meted out by outside actors in response to her voting behavior. For simplicity, I refer to $U_p(i, p)$ and $U_p(i, sq(p))$ as personal policy utilities and to $U_e(i, p)$ and $U_e(i, sq(p))$ as the electoral utilities derived from voters' rewards and punishments.

[7]Notice that an alternative would be to assume normal utility functions instead of quadratic utility functions (see Carroll et al. 2013).

[8]There were six parliamentary parties in the 47th National Council. Of the 225 legislators who were (at least for some time) in the 200-seat National Council during the 47th legislative period, 219 were affiliated to one of the six parties in parliament. The remaining six were independent legislators not affiliated to any parliamentary party (see `http://www.parlament.ch/D/ORGANE-MITGLIEDER/BUNDESVERSAMMLUNG/FRAKTIONEN/47LEGISLATUR/Seiten/default.aspx`, last ac-

tors who do not seek reelection to the next legislature, I assume that the anticipated electoral rewards and punishments are zero. Letting $j(i)$ be the index variable for party membership (respectively, the ideological group of independent legislators), it is

$$U_e(i,p) = \begin{cases} \delta_{j(i),p} & \text{if } i \text{ seeks reelection} \\ 0 & \text{if } i \text{ does not seek reelection} \end{cases}$$

and

$$U_e(i,sq(p)) = \begin{cases} \delta_{j(i),sq(p)} & \text{if } i \text{ seeks reelection} \\ 0 & \text{if } i \text{ does not seek reelection.} \end{cases}$$

Based on these assumptions, equations (4.1) and (4.2) can be rewritten as

$$\begin{aligned} U(i,p,1) &= -(p-\xi_i)^2 + \delta_{j(i),p}\mathbb{1}\{i \text{ reelect}\} + e(i,p) \\ U(i,sq(p),1) &= -(sq(p)-\xi_i)^2 + \delta_{j(i),sq(p)}\mathbb{1}\{i \text{ reelect}\} + e(i,sq(p)), \end{aligned}$$

where $\mathbb{1}\{i \text{ reelect}\}$ is an indicator variable taking the value of one if legislator i is a reelection seeker and zero otherwise. Similarly, equations (4.3) and (4.4) can be rewritten as

$$\begin{aligned} U(i,p,0) &= -(p-\xi_i)^2 + e(i,p) \\ U(i,sq(p),0) &= -(sq(p)-\xi_i)^2 + e(i,sq(p)). \end{aligned}$$

Let $Y(i,p,1) \in \{0,1\}$ be legislator i's vote on proposal p in a roll call vote, with one denoting a vote for p and zero denoting a vote for the status quo sq (or whatever the reversion point is).[9] If proposal p is voted on by roll call, a rational legislator i votes for p, i.e., $Y(i,p,1) = 1$, if $U(i,p,1) > U(i,sq(p),1)$ and for $sq(p)$ otherwise. It follows that

$$\begin{aligned} \Pr(Y(i,p,1)=1) &= \Pr(U(i,p,1) > U(i,sq(p),1)) \\ &= \Pr(e(i,sq(p)) - e(i,p) < \ 2(p-sq(p))\xi_i - (p^2 - sq(p)^2) \\ &\qquad + (\delta_{j(i)p} - \delta_{j(i)sq(p)})\mathbb{1}\{i \text{ reelect}\}) \\ &= F(\beta_p\xi_i - \alpha_p + \lambda_{j(i)p}\mathbb{1}\{i \text{ reelect}\}), \end{aligned} \tag{4.5}$$

where $\epsilon_{ip} = e(i,sq(p)) - e(i,p)$, typically with the assumption that $\epsilon_{ip} \sim N(0,\sigma_p^2)$ or $\epsilon_{ip} \sim Logistic(0,\sigma_p)$, $\beta_p = \frac{2(p-sq(p))}{\sigma_p}$, $\alpha_p = \frac{p^2-sq(p)^2}{\sigma_p}$, $\lambda_{j(i)p} = \frac{\delta_{j(i)p}-\delta_{j(i)sq(p)}}{\sigma_p}$, and $F(\cdot)$

cessed on 11/07/2015). I divide these independent legislators into three ideological groups (liberal, center, and conservative) and assume that the electoral rewards and punishments legislators expect to receive are constant within each of those groups.

[9] Abstentions and absences are treated as missing data, which I remove from the analysis.

is a monotone function mapping the real line onto the unit interval, typically the standard normal or standard logistic CDF (depending on the distributional assumption imposed on ϵ_{ip}) (Jackman 2009, 455).[10] Note that the model is an extension of the "two-parameter" IRT model (e.g., Londregan 1999; Clinton, Jackman and Rivers 2004; Bafumi et al. 2005; Jackman 2009): α_p is the item-difficulty parameter of proposal p, β_p is the item-discrimination parameter of proposal p, and $\lambda_{j(i)p}$ is the net electoral utility that the reelection-seeking members of party j expect to receive when voting for proposal p in a roll call vote.

Likewise, let $Y(i, p, 0) \in \{0, 1\}$ be legislator i's vote on proposal p in a signal vote, with one denoting a vote for p and zero denoting a vote for the status quo sq (or another alternative).[11] If proposal p is voted on by signal vote, legislator i votes for p, i.e., $Y(i, p, 0) = 1$, if $U(i, p, 0) > U(i, sq(p), 0)$. It thus follows that

$$\begin{aligned}
\Pr(Y(i,p,0)=1) &= \Pr(U(i,p,0) > U(i,sq(p),0)) \\
&= \Pr(e(i,sq(p)) - e(i,p) < 2(p - sq(p))\xi_i - (p^2 - sq(p)^2)) \\
&= F(\beta_p \xi_i - \alpha_p), \qquad (4.6)
\end{aligned}$$

which is a standard two-parameter IRT model. Letting $D(p, 1)$ be an indicator variable that takes on the value one if p is voted on by roll call vote and zero otherwise, the models in (4.5) and (4.6) can be combined in one model:

$$\begin{aligned}
\Pr(Y(i,p)=1) = {} & F(\beta_p \xi_i - \alpha_p + \lambda_{j(i)p} \mathbb{1}\{i \text{ reelect}\}) D(p,1) \\
& + F(\beta_p \xi_i - \alpha_p)(1 - D(p,1)). \qquad (4.7)
\end{aligned}$$

I estimate model (4.7) using `RStan` (Stan Development Team 2016). $F(\cdot)$ is assumed to be the standard logistic CDF. In addition, I assume normal priors with mean zero and standard deviation one for all model parameters. The `Stan` code is shown in Appendix 4.A.

In a second step, I turn to the analysis of roll call requests in order to examine whether legislators tend to request roll call votes that they expect will improve their standing with actors outside the legislature and whether they tend not to request roll call votes that they expect will damage their standing with outside actors (Expectation 2). I distinguish the following four cases to analyze the requests

[10] In their analyses of voting data from the Swiss National Council, Hug and Schulz (2007) and Hug and Wüest (2014) show that adding a second dimension to their scaling models improves the classification fit only modestly. Given these results, I confine myself to the discussion of a one-dimensional policy space.

[11] Again, abstentions and absences are treated as missing data and, therefore, not included in the analysis.

of roll call votes: (i) $\lambda_{j(i)p} < 0$ and $y(i,p,1) = 1$, (ii) $\lambda_{j(i)p} < 0$ and $y(i,p,1) = 0$, (iii) $\lambda_{j(i)p} > 0$ and $y(i,p,1) = 1$, and (iv) $\lambda_{j(i)p} > 0$ and $y(i,p,1) = 0$.[12]

Case (i). Suppose that $\lambda_{j(i)p} < 0$ and $y(i,p,1) = 1$. This requires that

$$U(i,p,1) > U(i,sq(p),1)$$
$$e(i,sq(p)) - e(i,p) < 2(p - sq(p))\xi_i - (p^2 - sq(p)^2) + (\delta_{j(i)p} - \delta_{j(i)sq(p)})\mathbb{1}\{i \text{ reelect}\}.$$

Because $\lambda_{j(i)p} = \frac{\delta_{j(i)p} - \delta_{j(i)sq(p)}}{\sigma_p} < 0$ and $\sigma_p > 0$, it follows that $\delta_{j(i)p} - \delta_{j(i)sq(p)} < 0$. Thus, it also is

$$e(i,sq(p)) - e(i,p) < 2(p - sq(p))\xi_i - (p^2 - sq(p)^2).$$

This implies that legislator i would also have voted in favor of proposal p had p been voted on by signal vote. With regard to the treatment assignment rule r, I now simply maintain the assumption of rational legislators. From this assumption it follows that each legislator i prefers roll call voting over signal voting for proposal p if $\max\{U(i,p,1), U(i,sq(p),1)\} > \max\{U(i,p,0), U(i,sq(p),0)\}$. In this first case this means that i prefers a roll call vote on p if

$$U(i,p,1) > U(i,p,0)$$
$$\delta_{j(i)p}\mathbb{1}\{i \text{ reelect}\} > 0. \tag{4.8}$$

On the other hand, if $\delta_{j(i)p}\mathbb{1}\{i \text{ reelect}\} \leq 0$, i prefers not to request a roll call vote on p.

Case (ii). Suppose that $\lambda_{j(i)p} < 0$ and $y(i,p,1) = 0$, in which case it follows that

$$U(i,p,1) \leq U(i,sq(p),1).$$

If proposal p was voted on by signal vote, legislator i would have voted for p with probability $F(\beta_p\xi_i - \alpha_p)$. And provided that i prefers p over $sq(p)$ in a signal vote, i prefers to have a roll call vote on p if

$$U(i,sq(p),1) > U(i,p,0)$$
$$e(i,sq(p)) - e(i,p) > 2(p - sq(p))\xi_i - (p^2 - sq(p)^2) - \delta_{j(i)sq(p)}\mathbb{1}\{i \text{ reelect}\}. \tag{4.9}$$

On the other hand, legislator i would have voted for $sq(p)$ with probability $1 - F(\beta_p\xi_i - \alpha_p)$ in a signal vote. In this case, provided that i prefers $sq(p)$ over p in a

[12] I do not consider the case where $\lambda_{j(i)p} = 0$ because this implies that legislators are indifferent between having a roll call vote and having a signal vote on proposal p.

signal vote, i prefers that the vote on p is taken by roll call if

$$\begin{aligned} U(i, sq(p), 1) &> U(i, sq(p), 0) \\ \delta_{j(i)sq(p)} \mathbb{1}\{i \text{ reelect}\} &> 0 \end{aligned} \tag{4.10}$$

and that the vote on p is decided by signal vote if $\delta_{j(i)sq(p)} \mathbb{1}\{i \text{ reelect}\} \leq 0$.

Case (iii). Suppose that $\lambda_{j(i)p} > 0$ and $y(i, p, 1) = 1$, which implies that

$$U(i, p, 1) > U(i, sq(p), 1).$$

Again, if proposal p was voted on by signal vote, legislator i would have voted for p with probability $F(\beta_p \xi_i - \alpha_p)$. Provided that i favors p over $sq(p)$ if the vote is decided by signal voting, i prefers to have a roll call vote on p if

$$\begin{aligned} U(i, p, 1) &> U(i, p, 0) \\ \delta_{j(i)p} \mathbb{1}\{i \text{ reelect}\} &> 0 \end{aligned} \tag{4.11}$$

and to have a signal vote on p if $\delta_{j(i)p} \mathbb{1}\{i \text{ reelect}\} \leq 0$. On the other hand, legislator i would have voted for $sq(p)$ with probability $1 - F(\beta_p \xi_i - \alpha_p)$ in a signal vote. Then, provided that in a signal vote i prefers $sq(p)$ over p, i prefers to take a roll call vote on p if

$$\begin{aligned} U(i, p, 1) &> U(i, sq(p), 0) \\ e(i, sq(p)) - e(i, p) &< 2(p - sq(p))\xi_i - (p^2 - sq(p)^2) - \delta_{j(i)p} \mathbb{1}\{i \text{ reelect}\}. \end{aligned} \tag{4.12}$$

Case (iv). Suppose that $\lambda_{j(i)p} > 0$ and $y(i, p, 1) = 0$, which means that

$$\begin{aligned} U(i, p, 1) &\leq U(i, sq(p), 1) \\ e(i, sq(p)) - e(i, p) &\geq 2(p - sq(p))\xi_i - (p^2 - sq(p)^2) + (\delta_{j(i)p} - \delta_{j(i)sq(p)}) \mathbb{1}\{i \text{ reelect}\}. \end{aligned}$$

Because $\delta_{j(i)p} - \delta_{j(i)sq(p)} > 0$, it follows that

$$e(i, sq(p)) - e(i, p) > 2(p - sq(p))\xi_i - (p^2 - sq(p)^2),$$

implying that legislator i would also have voted for the status quo $sq(p)$ had proposal p been voted on by signal vote. Thus, legislator i prefers a roll call vote on p if

$$\begin{aligned} U(i, sq(p), 1) &> U(i, sq(p), 0) \\ \delta_{j(i)sq(p)} \mathbb{1}\{i \text{ reelect}\} &> 0. \end{aligned} \tag{4.13}$$

On the other hand, if $\delta_{j(i)sq(p)}\mathbb{1}\{i \text{ reelect}\} \leq 0$, i prefers not to request a roll call vote on p.

Because in model (4.7) the parameters $\delta_{j(i)p}$ and $\delta_{j(i)sq(p)}$ are not identified, it is not possible to assess Expectation 2 by a direct evaluation of the four cases discussed above. It is possible, however, to derive and empirically evaluate the following implications. Condition (4.8) implies that if $\lambda_{j(i)p} < 0$, all members of party j casting a roll call vote in favor of proposal p should prefer either roll call voting or signal voting for p. Thus, if the members of party j who cast a roll call vote for p are also the roll call vote requesters, there is strong indication that $\delta_{j(i)p} > 0$, while if they opt for a signal vote, it is likely that $\delta_{j(i)p} \leq 0$. The roll call requesting behavior of the party j members who in a roll call vote are in favor of p has also implications for the requesting behavior of the party j members who in a roll call vote are against p. If the requesting behavior of the party j members who in a roll call vote favor p suggests that $\delta_{j(i)p} > 0$, Conditions (4.9) and (4.10) imply that the probability that the party j members who in a roll call vote are against p prefer a roll call vote on p is given by

$$(1 - F(\beta_p\xi_i - \alpha_p)) + F(\beta_p\xi_i - \alpha_p)\left(1 - F\left(\beta_p\xi_i - \alpha_p - \frac{\delta_{j(i)sq(p)}}{\sigma_p}\right)\right),$$

where $\delta_{j(i)sq(p)} > 0$. Therefore, the probability that the members of party j who in a roll call vote are against p request a roll call vote on p is strictly decreasing in $\beta_p\xi_i - \alpha_p$. In other words, among the party j members who in a roll call vote are against p, it is more likely that those whose ideal points lead to a relatively small value $\beta_p\xi_i - \alpha_p$ are the ones who request a roll call vote on p.[13]

Likewise, Condition (4.13) implies that if $\lambda_{j(i)p} > 0$, all members of party j casting a roll call vote against p should prefer either roll call voting or signal voting for p. Thus, if these legislators request a roll call vote on p, there is strong indication that $\delta_{j(i)sq(p)} > 0$. On the other hand, if they do not demand a roll call vote, it is likely that $\delta_{j(i)sq(p)} \leq 0$. If the roll call requesting behavior of the members of party j who in a roll call vote are against p suggests that $\delta_{j(i)sq(p)} > 0$, Conditions (4.11) and (4.12) further imply that the probability that the party j members who in a roll call vote favor p prefer a roll call vote on p is given by

$$F(\beta_p\xi_i - \alpha_p) + (1 - F(\beta_p\xi_i - \alpha_p))F\left(\beta_p\xi_i - \alpha_p - \frac{\delta_{j(i)p}}{\sigma_p}\right),$$

[13]It is not possible to derive a clear expectation for the alternative case where the requesting behavior of the party j members who in a roll call vote favor p suggests that $\delta_{j(i)p} \leq 0$. In this case, Conditions (4.9) and (4.10) lead to a probability distribution whose mode depends on the value of $\delta_{j(i)sq(p)}$, which is unidentified.

where $\delta_{j(i)p} > 0$. Consequently, the probability that the members of party j who in a roll call vote are for p request a roll call vote on p is strictly increasing in $\beta_p\xi_i - \alpha_p$. Members of party j who in a roll call vote favor p should thus be more likely to request a roll call vote when their ideal points imply a relatively large value $\beta_p\xi_i - \alpha_p$.[14] Table 4.2 summarizes the implications for legislators' roll call vote request behavior derived from the four cases presented above.

Table 4.2: Empirically Testable Implications for the Roll Call Vote Request Behavior of Legislators

(1) If $\lambda_{j(i)p} < 0$		
Party j members for which $y(i,p,1) = 1$		Party j members for which $y(i,p,1) = 0$
(a) All members request a roll call vote	$\Longrightarrow$	(a) Probability of requesting a roll call is strictly decreasing in $\beta_p\xi_i - \alpha_p$
(b) No one requests a roll call vote	$\Longrightarrow$	(b) ?

(2) If $\lambda_{j(i)p} > 0$		
Party j members for which $y(i,p,1) = 0$		Party j members for which $y(i,p,1) = 1$
(a) All members request a roll call vote	$\Longrightarrow$	(a) Probability of requesting a roll call is strictly increasing in $\beta_p\xi_i - \alpha_p$
(b) No one requests a roll call vote	$\Longrightarrow$	(b) ?

4.4 Assumptions of the Model

The model I propose relies on three critical assumptions. First, I assume that legislators who do not run for reelection have no interest in signaling their roll call positions to constituents (or other external actors with resources that are valuable to legislators). Note that this assumption is important for model identification. According to information provided by the Parliamentary Services of the Swiss parliament, 24 of the 225 legislators who served in the 47th National Council did not seek reelection to another term in the National Council.[15] However, the following three legislators were likely to have been interested in roll call position taking, at least for a large

[14] Again, for the alternative case where $\delta_{j(i)sq(p)} \leq 0$, it is not possible to derive a clear expectation about the requesting behavior of party j members who in a roll call vote favor p.

[15] This information is available at `http://www.parlament.ch/d/wahlen-abstimmungen/parlamentswahlen/wahlen-2007/resultate-nr/ruecktritte-nr/Seiten/default.aspx` (last accessed on 11/07/2015).

part of the 47th legislative period: Liliane Maury Pasquier (SPS – GE), who ran for the Council of States; John Dupraz (FDP – GE), who initially intended to run for the Council of States but then withdrew his candidacy in early July 2007;[16] and Jean-Paul Glasson (FDP – FR), who announced in January 2007 that he will run for both the National Council and the Council of States but then decided in April 2007 that he will not run for any federal office (due to exhaustion).[17] Therefore, I will treat Liliane Maury Pasquier as a reelection seeker for the entire 47th legislative period, John Dupraz as a reelection seeker until the end of the summer session (i.e., until 22.06.2007), and Jean-Paul Glasson as a reelection seeker until the end of the spring session (i.e., until 23.03.2007).

The remaining 21 legislators are treated as non-reelection seekers for the entire 47th legislative period. I thus impose the assumption that all of them made the decision not to run for reelection at the beginning of the 47th legislative term. As it is likely that at least some legislators decided not to run again at a later point in time (i.e., over the course of the legislative period), this assumption should lead to an underestimation of the difference between reelection seekers and non-reelection seekers, and especially so for votes that occurred early in the legislative period.[18]

Second, I assume that all reelection-seeking members of a parliamentary party expect to receive the same rewards and punishments from legislative outsiders for their voting behavior in roll call votes. This assumption is based on the idea that parliamentary parties are groups of like-minded legislators (Krehbiel 1991, 1993; Laver 2006; Diermeier and Vlaicu 2011), who respond to similar, and sometimes even identical, outside actors. For example, representatives from the same party and district might be nominated by the same selectorate. In addition, because preferences are correlated across voters of the same party, a legislator from one district is often confronted with similar voter preferences as her co-partisan legislators from other districts. And finally, legislators with similar ideological positions may attract campaign contributions from the same or at least ideologically similar donors. In all of these cases, legislators from the same party face similar pressures from external actors in roll call votes. While this assumption allows me to considerably

[16]See `http://www.lecourrier.ch/john_dupraz_contraint_les_radicaux_genevois_a_capituler` (last accessed on 04/20/2016).

[17]See `http://www.20min.ch/ro/news/romandie/story/16109408` (last accessed on 04/20/2016).

[18]Table 4.B.1 in the appendix provides information on the career paths of all legislators who did not seek reelection to the National Council. With the exception of Liliane Maury Pasquier, who was elected to the Council of States, and a few individuals who pursued a political career at the local or cantonal level, most legislators retired from electoral politics after leaving the National Council. This suggests that after deciding not to run again, most legislators indeed had little interest in position taking through roll call voting—or if they had, the set of actors they targeted was likely much smaller than the one they had addressed as reelection seekers.

reduce the number of parameters in the model, it comes with the cost that no individual-specific roll call effects can be estimated.

Third, the model I propose, and the signaling argument more generally, is based on the assumption that external actors (e.g., constituents) make the provision of the resources they control contingent on legislators' roll call voting behavior. This does not require that the actors themselves have to pay close attention to how legislators vote. It suffices that the information contained in roll call votes gets transmitted to these actors, such as by opinion leaders, interest groups, or the media (see, e.g., Arnold 2004). In Switzerland, there are several ratings that inform the public about legislators' roll call behavior along a number of dimensions. For example, the newspaper *Neue Zürcher Zeitung* publishes annual ratings of parliamentarians that position them on a left-right scale.[19] The "Smartmonitor," developed by Politools, shows the patterns of coalition among parties as well as the attendance rate, legislative success, and deviation from the party line for each legislator.[20] A group of environmental organizations publishes the "Umweltrating," which reveals how legislators vote on environmental issues.[21] The "KMU-Rating" of the Swiss Trade Association shows the extent to which legislators represent the interests of small and medium-sized enterprises,[22] while ratings by the Swiss TV program Eco show how often legislators voted according to the preferences of economic interest groups, a labor union, a development NGO, and environmental organizations.[23] An analysis by Politnetz of voting data from the 2011-2015 legislative period reveals the extent to which legislators were in favor of deregulation,[24] and a rating published in 2013 by the newspaper *20 Minuten* checks how often legislators' voting behavior was in line with their campaign promises.[25] These ratings often garner considerable media attention.[26]

[19]See `http://www.nzz.ch/schweiz/wahlen2015/wie-der-nationalrat-tickt-ld.1813` (last accessed on 07/05/2016).

[20]See `http://smartmonitor.ch/` (last accessed on 07/05/2016).

[21]See `http://www.umweltrating.ch/eidgenoessisch/abstimmungsverhalten/` (last accessed on 07/05/2016).

[22]See `http://www.sgv-usam.ch/kmu-rating-2011-2014.html` (last accessed on 07/05/2016).

[23]See `http://www.srf.ch/news/wahlen/wahl-lokal/so-wirtschaftsfreundlich-ist-die-schweizer-politik` (last accessed on 07/05/2016).

[24]See `https://blog.politnetz.ch/` (last accessed on 07/05/2016).

[25]See `http://www.20min.ch/schweiz/news/story/31958078` (last accessed on 07/05/2016).

[26]For example, the newspaper *Aargauer Zeitung* asked Philipp Müller (FDP – AG) in an interview how the low score he achieved in the above mentioned "Umweltrating" could be aligned with his statement that his party advocated environmental protection (see `http://www.aargauerzeitung.ch/dossiers/eidgenoessische-wahlen-2015-ag/fdp-mueller-hat-sich-an-die-rolle-als-zielscheibe-gewoehnt-129532025`, last accessed on 07/05/2016).

4.5 Empirical Analysis

I estimated model (4.7) using `RStan` (Stan Development Team 2016). The estimation is based on 225 legislators and 3,481 votes, of which 2,272 were signal votes and 1,209 were roll call votes. The number of votes analyzed is somewhat lower than the total number of votes that occurred in the 47th legislative period (shown in Table 4.1). This is due to two reasons: first, I eliminated seven roll call votes for which data are missing for all legislators who did not seek reelection since model (4.7) is not identified for these votes; second, I removed from the data set 276 votes that were unanimous.

I ran a chain of 200,000 iterations, of which I discarded the first 100,000 as burn-in. I then retained every 20th from the remaining 100,000 iterations to generate the posterior distributions. Convergence diagnostics are shown in Appendix 4.C (see Gill 2008, 475-489 and Jackman 2009, 252-256 for overviews of diagnostics that are commonly used to assess the convergence of Markov chains). While the Geweke (1992) diagnostic and the Raftery and Lewis (1992) diagnostic show no indication of nonconvergence, the Half-width test of Heidelberger and Welch (1983) indicates that for 29.34% of the parameters the estimated mean of the posterior density has a relatively large error (Jackman 2009, 254). Therefore, these estimates have rather low accuracy.[27]

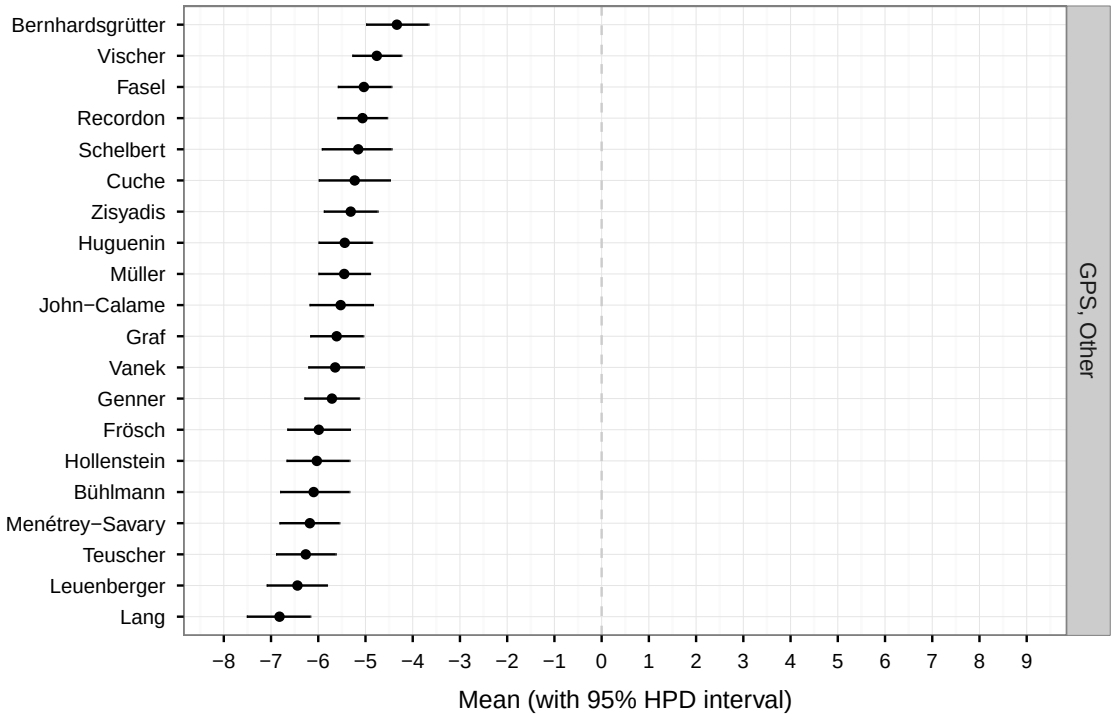
The estimated ideal points of legislators, i.e., the ξ_i's in model (4.7), are presented separately by party and ideological group of independent legislators, respectively, in Figures 4.2 to 4.7.[28] Each figure shows the means and 95% HPD intervals of the posterior distributions for the ideal points of legislators.[29] Figure 4.2 shows the ideal points of legislators from the Green Party (GPS) and left-wing legislators who were not affiliated to a parliamentary party (the latter are Marianne Huguenin and Josef Zisyadis from the Swiss communist party PdA as well as Pierre Vanek from a small anticapitalist party called "solidaritéS"). Together with the members of the Social Democratic Party (SPS), these legislators are positioned at the left end of the ideological spectrum in the legislature.

[27] I also fit the model to fake data that are similar to my real-world data. The fake data analysis is shown in Appendix 4.D. The results suggest that for 225 legislators, nine parties, 1,209 roll call votes, and 2,272 signal votes (and, therefore, 18,071 model parameters to be estimated), a Markov chain with 200,000 iterations (100,000 burn-in and thinning the chain by 20) does not fully converge to its stationary distribution.

[28] For a comparison, see, e.g., Hermann and Jeitziner's multidimensional scaling (MDS) of roll call votes from the 47th Swiss National Council (`http://www.nzz.ch/das-parlamentarier-rating-fuer-die-47-legislatur--1.567955`, last accessed on 11/10/2015).

[29] The 95% highest probability density (HPD) interval is defined as the interval of minimum length (in the one-parameter case) that contains 95% of the area of the marginal probability distribution (see Jackman 2009, 27 for a more technical definition).

Figure 4.2: Ideal Points of Legislators from the Green Party (GPS) and Liberal Independents



Note: The figure shows the means and 95% HPD intervals of the posterior distributions for the ideal points of legislators from the Green Party (GPS) and left-wing legislators who were not affiliated to a parliamentary party. The latter are Marianne Huguenin and Josef Zisyadis from the Swiss communist party (PdA) as well as Pierre Vanek from a small left-wing party called "solidaritéS."

Figure 4.3 presents the ideal points of the members of the Social Democratic Party (SPS). The rank order of legislators is hardly surprising to observers of Swiss politics. Left-wing politicians such as Franco Cavalli as well as André Daguet and Jean-Claude Rennwald, who at the time were both also on the board of a large labor union (UNIA, respectively, its predecessor SMUV), have ideal points located at the left side of the ideological scale. On the other hand, members of the Social Democrats who are commonly considered as relative moderates, such as Claude Janiak and Rudolf Strahm, have ideal points that are clearly to the right of those of left-wing co-partisans.

Figure 4.4 shows the ideal points of the legislators from a parliamentary party that consisted of the centrist Evangelical People's Party (EVP) and the right-wing Swiss Democratic Union (EDU). In addition, the figure also shows the ideological positions of moderate and conservative legislators who were not affiliated to a legislative party (these are Martin Bäumle from the Green Liberal Party Zurich GLiZ, Bernhard Hess from the right-wing Swiss Democrats SD, and Ulrich Siegrist, a former, relatively moderate, member of the conservative Swiss People's Party SVP).

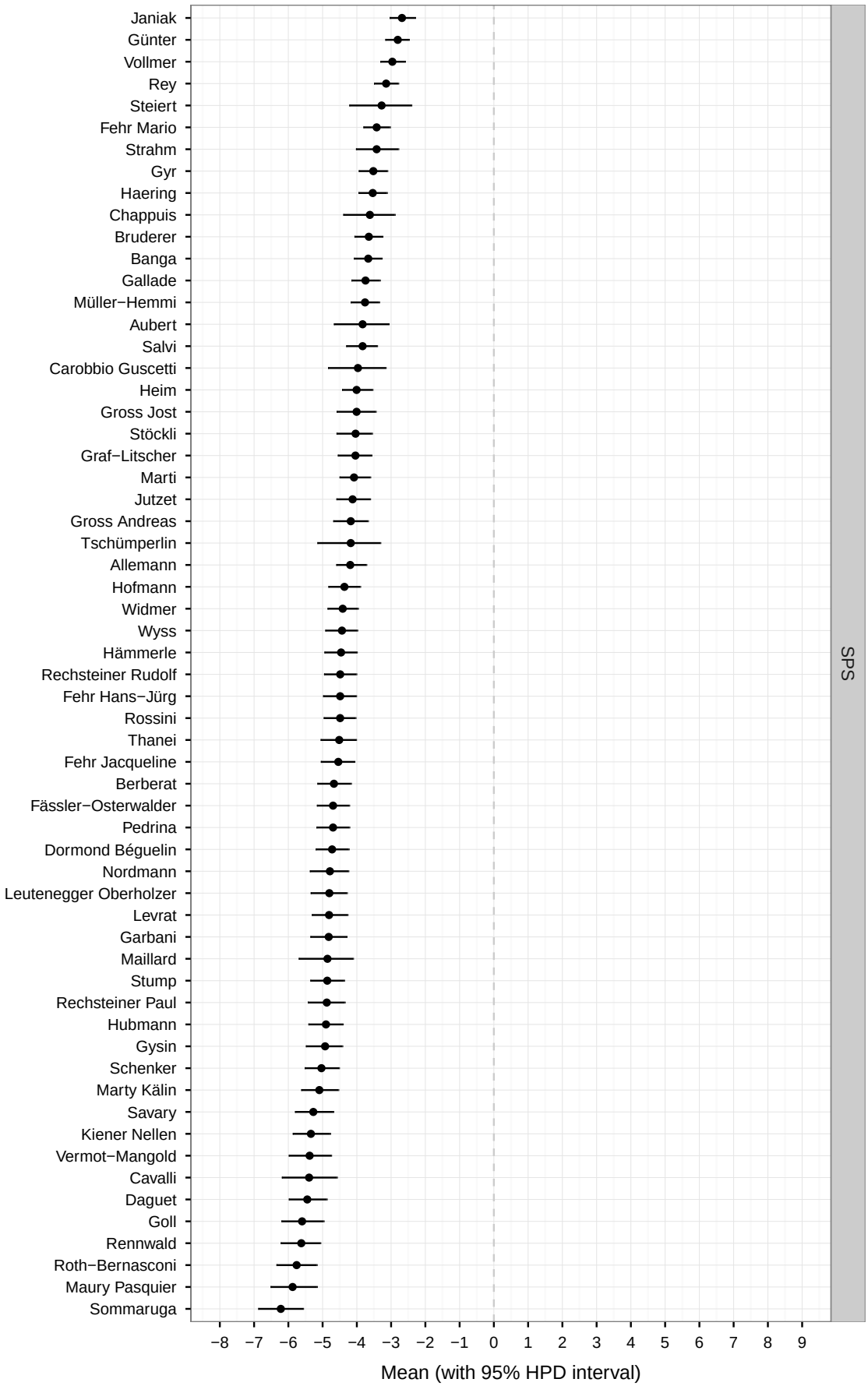
The ideal points of the members of the centrist Christian Democratic People's Party (CVP) are plotted in Figure 4.5. As expected, the ideal points of relatively liberal Christian Democratic politicians, such as Meinrado Robbiani, who is on the board of an umbrella organization of labor unions (Travail.Suisse), and Rosmarie Zapfl, who used to be president of the umbrella women's organization Alliance F, are located on the left side of the party's ideological spectrum. On the other hand, Christian Democratic members with conservative reputations like Arthur Loepfe and Gerhard Pfister have ideal points positioned at the right end of the party.

Figure 4.6 shows the ideological positions of the members of the center-right Liberal Democratic Party (FDP) and Figure 4.7, finally, presents the ideal points of legislators from the conservative Swiss People's Party (SVP). Most members of the latter party are clearly situated at the right end of the ideological spectrum (see also Hug and Schulz 2007).

I next present the estimated net electoral utilities reelection-seeking legislators expected to receive for voting in favor of the proposals in roll call votes, i.e., the $\lambda_{j(i)p}$'s in model (4.7). Figures 4.8 to 4.16 show these estimated utilities by party and ideological group of independent legislators, respectively.[30] Each of the figures shows the means and 95% HPD intervals of the posterior distributions for the party-

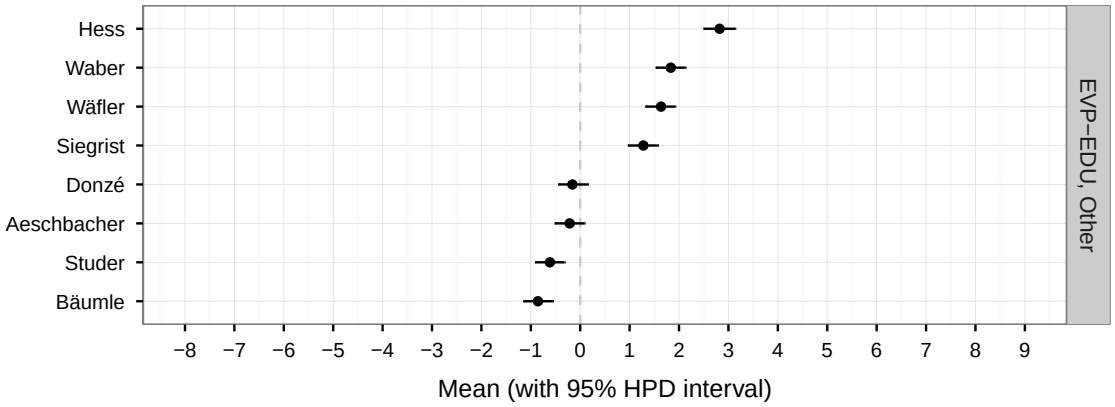
[30]Note that estimation of the net electoral utility $\lambda_{j(i)p}$ is not possible if for p voting data are missing for all members of party (or ideological group of independent legislators) j. For this reason, there is some variation in the number of estimated net utilities across parties and groups of independent legislators, respectively. I indicate in the text and notes to the figures how many net utility parameters were estimated for each party or group of independent legislators.

Figure 4.3: Ideal Points of Legislators from the Social Democratic Party (SPS)



Note: The figure shows the means and 95% HPD intervals of the posterior distributions for the ideal points of the legislators from the Social Democratic Party (SPS).

Figure 4.4: Ideal Points of Legislators from the Parliamentary Party EVP-EDU and Center and Conservative Independents



Note: The figure shows the means and 95% HPD intervals of the posterior distributions for the ideal points of the legislators from a parliamentary party that consisted of the centrist Evangelical People's Party (EVP) and the right-wing Swiss Democratic Union (EDU). It also shows the means and 95% HPD intervals for the ideal points of moderate and conservative legislators who were not affiliated to a parliamentary party. These are Martin Bäumle from the Green Liberal Party Zurich (GLiZ), Bernhard Hess from the right-wing Swiss Democrats (SD), and Ulrich Siegrist, who is a former, relatively moderate, member of the conservative Swiss People's Party (SVP).

specific (or group of independent legislators-specific) net electoral utilities, ordered from the lowest to the highest mean value.[31]

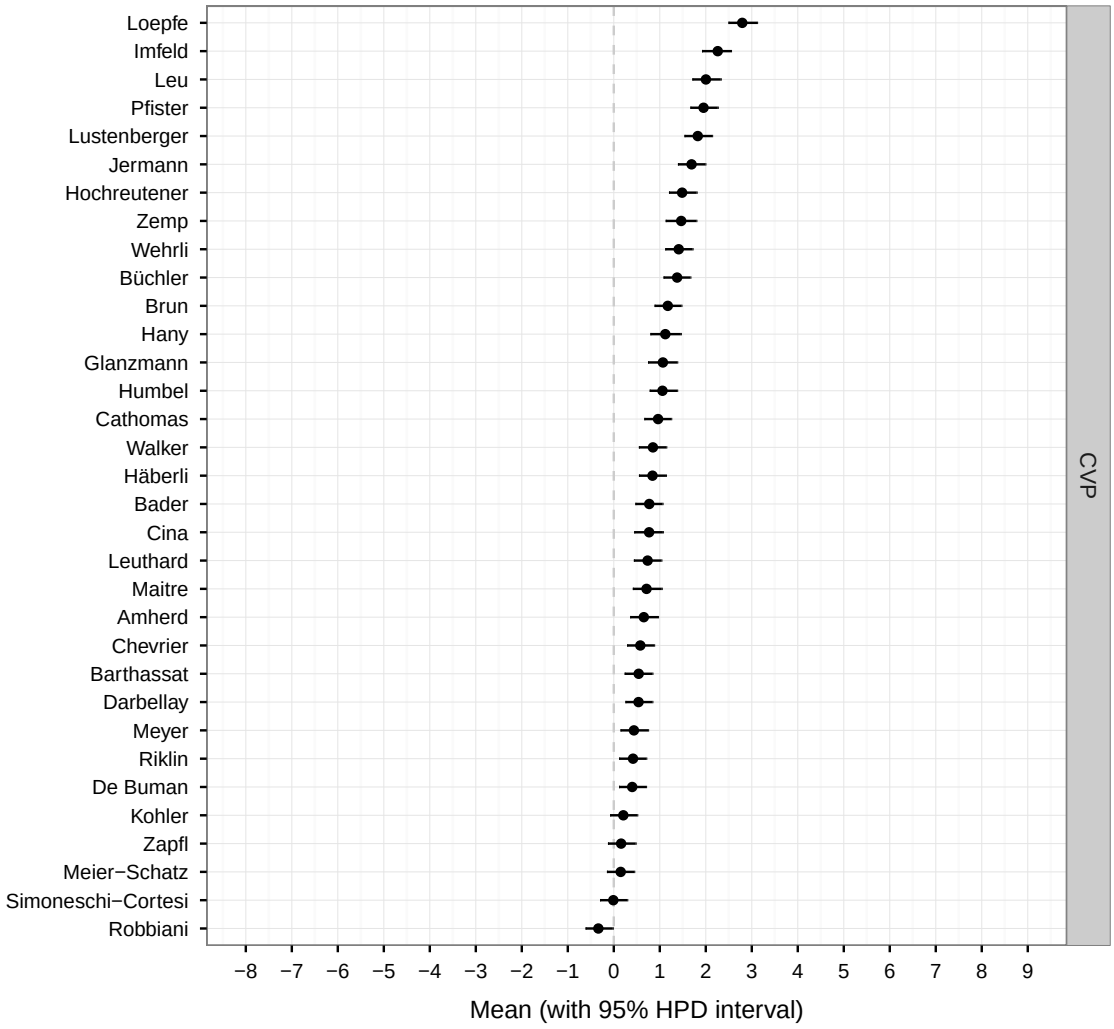
Figure 4.8 shows the net electoral utilities of voting for the proposals in roll call votes for reelection-seeking legislators from the Green Party (GPS). Of the 1,205 estimated parameters, $\{\lambda_{j(i)p}\}_{j=GPS}$, 110 are negative and statistically significant (i.e., their 95% credible intervals do not overlap zero). Because it is

$$\lambda_{j(i)p} = \frac{\delta_{j(i)p} - \delta_{j(i)sq(p)}}{\sigma_p}$$

and $\sigma_p > 0$, a negative net utility $\lambda_{j(i)p}$ implies that $\delta_{j(i)p} < \delta_{j(i)sq(p)}$. Therefore, there are 110 roll call votes where the reelection-seeking members of the Green Party expected that voting for the proposal would hurt their reelection chances relative to voting against the proposal. 1,064 of the 1,095 remaining net utility parameters also have negative means. However, because their credible intervals overlap zero, they

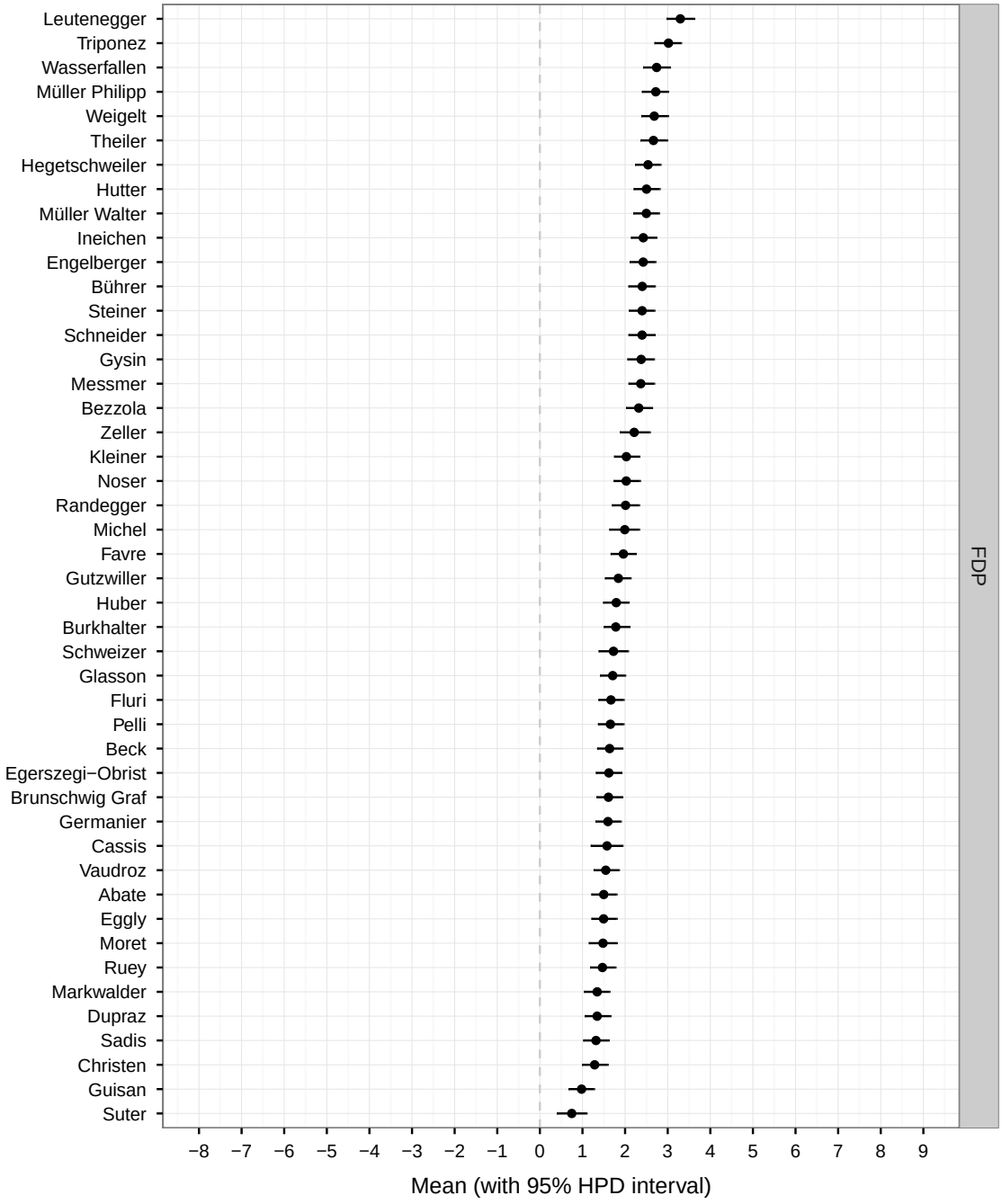
[31] As mentioned above, the assumption that the non-reelection-seeking legislators made the decision not to run again at the beginning of the legislative period (with the exception of John Dupraz and Jean-Paul Glasson) may lead to an underestimation of the difference between reelection seekers and non-reelection seekers, especially for votes that occurred early in the legislative period. Therefore, in order to examine whether the precision of the estimated net electoral utilities increases over time, I also plotted the 95% HPD intervals for the net electoral utilities in chronological order. There is no indication that the intervals shrink over time (the figures showing the intervals in chronological order are available upon request).

Figure 4.5: Ideal Points of Legislators from the Christian Democratic People's Party (CVP)



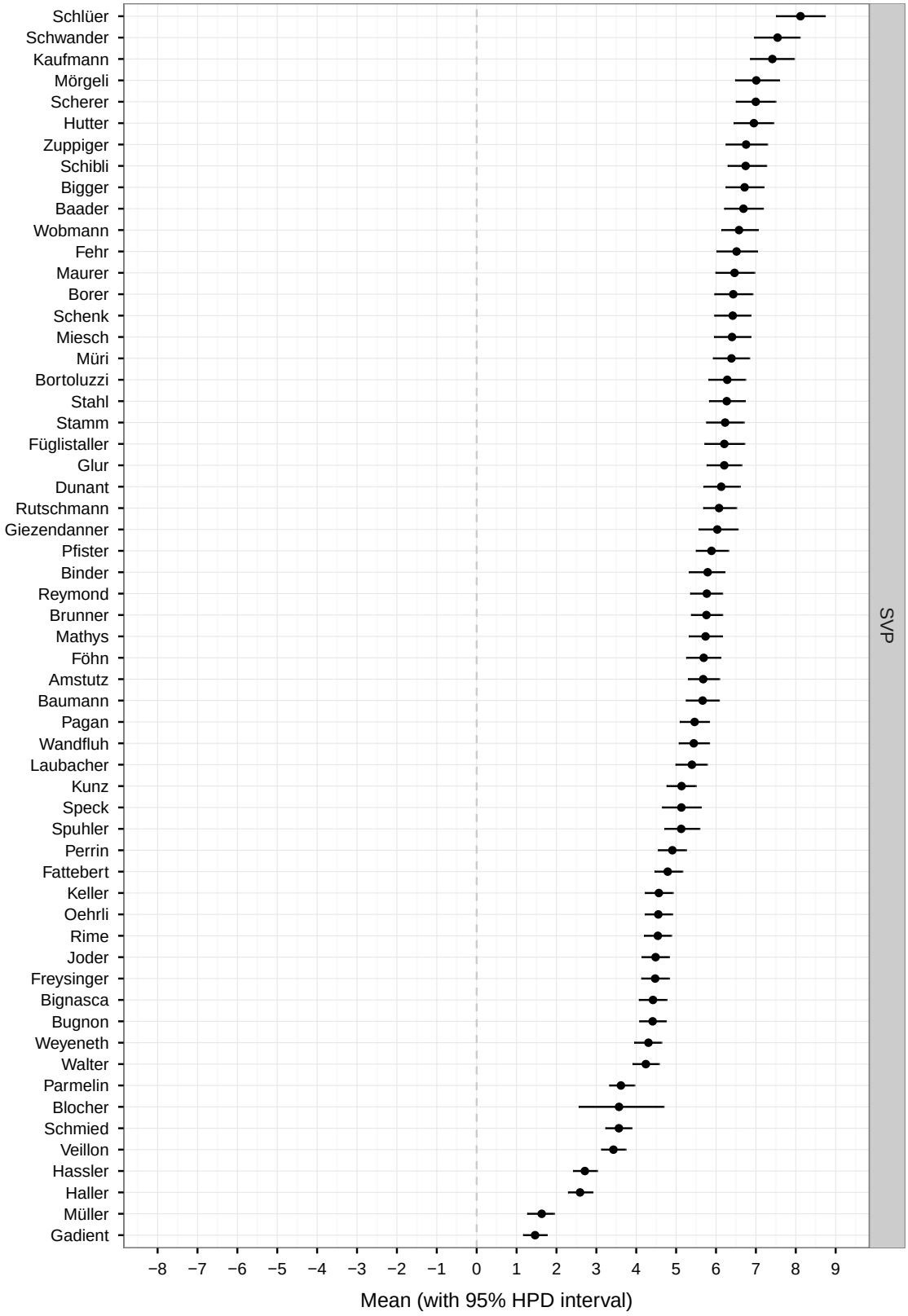
Note: The figure shows the means and 95% HPD intervals of the posterior distributions for the ideal points of the legislators from the centrist Christian Democratic People's Party (CVP).

Figure 4.6: Ideal Points of Legislators from the Liberal Democratic Party (FDP)



Note: The figure shows the means and 95% HPD intervals of the posterior distributions for the ideal points of the legislators from the center-right Liberal Democratic Party (FDP).

Figure 4.7: Ideal Points of Legislators from the Swiss People's Party (SVP)



Note: The figure shows the means and 95% HPD intervals of the posterior distributions for the ideal points of the legislators from the conservative Swiss People's Party (SVP).

are not statistically significant. Of the 31 net utilities with positive means, there are only two that are statistically significant (all others have credible intervals that overlap zero). In other words, in only two roll call votes did the reelection-seeking legislators of the Green Party almost surely expect that casting a vote in favor of the proposal would increase their reelection prospects relative to casting a vote against it.

In 49 of the 110 roll call votes with a negative $\lambda_{j(i)p}$, the proposal represented the more liberal alternative, while in 61 votes it was the more conservative option.[32] In the two votes with a positive net utility, the proposal was the more conservative alternative. Hence, in 54.46% of the roll call votes where the reelection-seeking members of the Green Party expected that voters would reward or punish them for their voting behavior, voting for the more liberal alternative was expected to be of advantage. In the other 45.54% of these roll call votes the reelection-seeking legislators expected that voting for the more conservative option would increase their reelection prospects.

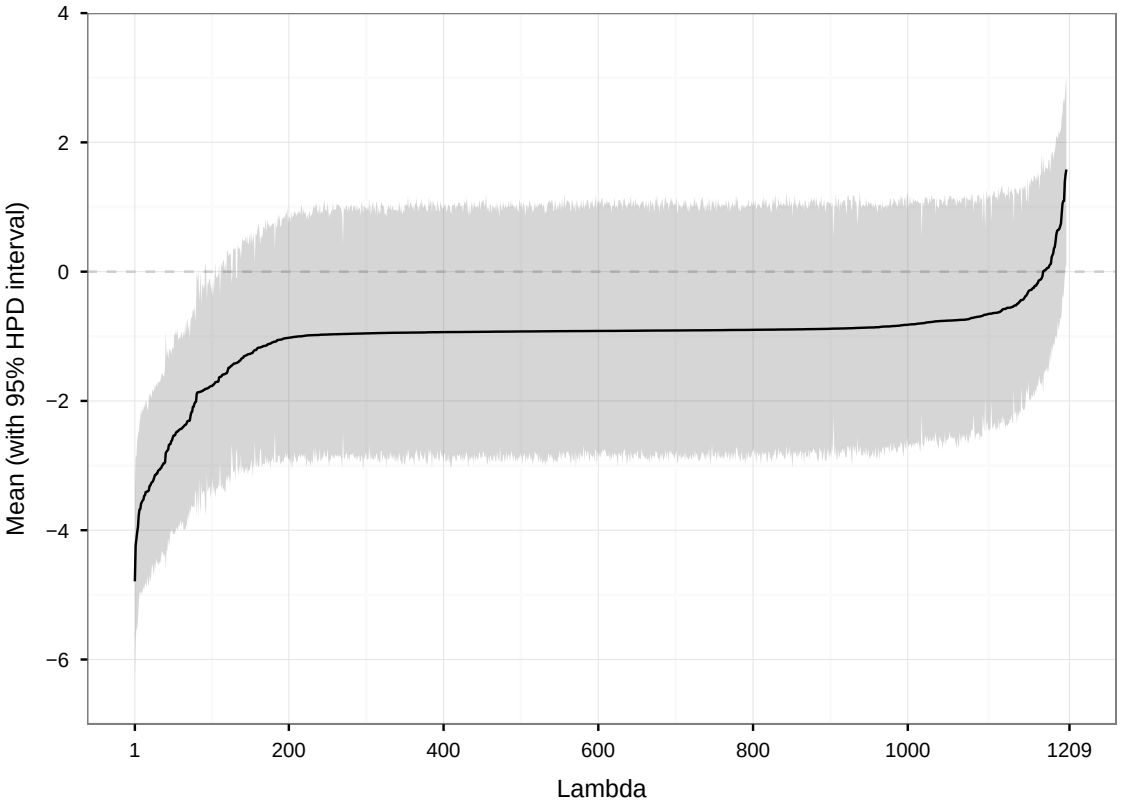
Figure 4.9 shows the net electoral utilities of voting for the proposals in roll call votes for reelection-seeking members of the Social Democratic Party (SPS). 82 of the 1,204 estimated parameters are negative and significant. There are 1,025 additional parameters with negative means, but their confidence intervals overlap zero. On the other hand, among the remaining 97 parameters that have positive means, there is none that is also statistically significant.

In 44 of the 82 roll call votes with a negative $\lambda_{j(i)p}$, the proposal was the more liberal alternative, while in 38 votes it represented the more conservative choice. Therefore, in 46.34% of the roll call votes where the reelection-seeking Social Democrats expected that voters would sanction them for their voting decisions, voting for the more liberal alternative was expected to be advantageous. In the other 53.66% the legislators expected that voting in favor of the more conservative option would help their reelection.

Figure 4.10 plots the net electoral utilities in roll call votes for reelection-seeking legislators who belonged to the parliamentary party formed by the Evangelical People's Party (EVP) and the Swiss Democratic Union (EDU). Of the 1,207 estimated net electoral utilities, 302 are negative and significant. 848 other parameters also have negative means, but since their confidence intervals overlap zero they are not significant. On the other hand, 57 parameters have positive means, yet none of them is significant.

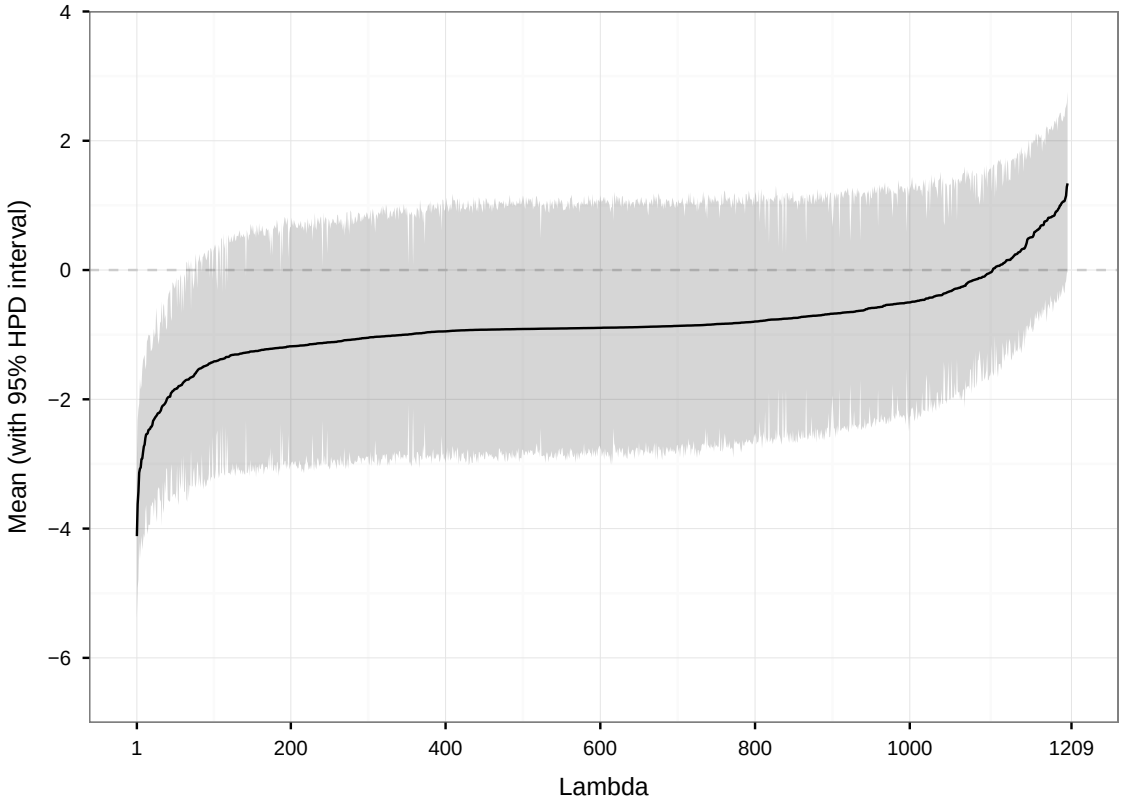
[32]Notice that the item-discrimination parameter $\beta_p = \frac{2(p-sq(p))}{\sigma_p}$ shows the direction of p relative to $sq(p)$. A negative sign of β_p means that p lies to the left of $sq(p)$ and a positive sign indicates that p is to the right of $sq(p)$.

Figure 4.8: Net Electoral Utilities of Voting for the Proposals in Roll Call Votes for Reelection-Seeking Legislators from the GPS



Note: The figure shows the means and 95% HPD intervals of the posterior distributions for the net electoral utilities of voting for the proposals in roll call votes for reelection-seeking legislators from the Green Party (GPS). There were 1,205 net electoral utility parameters estimated for the GPS.

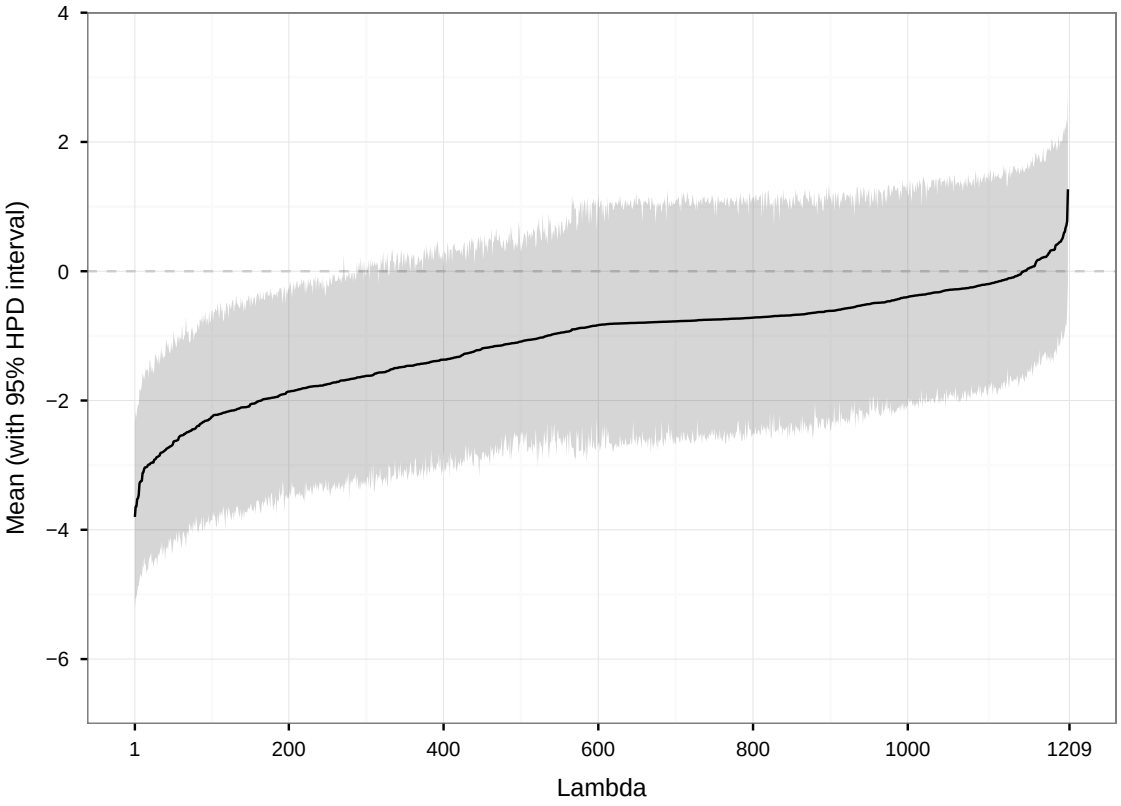
Figure 4.9: Net Electoral Utilities of Voting for the Proposals in Roll Call Votes for Reelection-Seeking Legislators from the SPS



Note: The figure shows the means and 95% HPD intervals of the posterior distributions for the net electoral utilities of voting for the proposals in roll call votes for reelection-seeking legislators from the Social Democratic Party (SPS). There were 1,204 net electoral utility parameters estimated for the SPS.

The proposal was the more liberal alternative in 173 of the 302 roll call votes for which $\lambda_{j(i)p}$ is negative. On the other hand, in the remaining 129 votes, the proposal was more conservative relative to the status quo (or whatever the alternative to the proposal was). Voting for the more liberal alternative was thus expected to benefit members' reelection chances in 42.72% of the roll call votes that were electorally relevant, whereas in the other 57.28% voting for the more conservative choice was expected to enhance the prospects of reelection.

Figure 4.10: Net Electoral Utilities of Voting for the Proposals in Roll Call Votes for Reelection-Seeking Legislators from the EVP-EDU



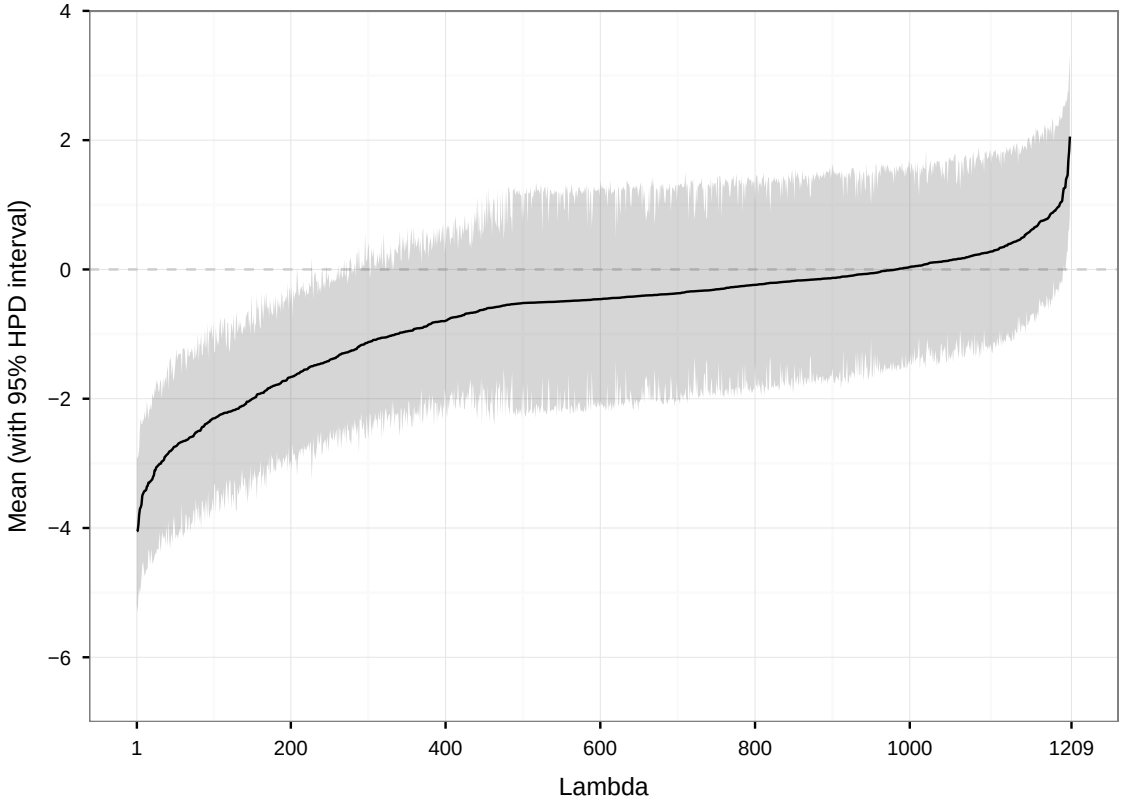
Note: The figure shows the means and 95% HPD intervals of the posterior distributions for the net electoral utilities of voting for the proposals in roll call votes for reelection-seeking legislators who belonged to the party group formed by the Evangelical People's Party (EVP) and the Swiss Democratic Union (EDU). There were 1,207 net electoral utility parameters estimated for the EVP-EDU.

The 1,207 estimated net electoral utility parameters for reelection-seeking members of the Christian Democratic People's Party (CVP) are shown in Figure 4.11. Here, 278 parameters are negative and significant, 704 have negative means but are not significant, 217 have positive means but are also not significant, and eight are positive and significant.

In 160 of the 278 roll call votes for which $\lambda_{j(i)p}$ is negative, the proposal was the

more liberal alternative, while in 118 votes it was the more conservative option. On the other hand, among the eight roll call votes with a positive $\lambda_{j(i)p}$, all but one proposal represented the more liberal choice. In 43.71% of all electorally relevant roll call votes reelection-seeking Christian Democratic legislators therefore expected that voters would reward them for liberal voting decisions, while in the other 56.29% voting for the more conservative alternative was expected to be electorally beneficial.

Figure 4.11: Net Electoral Utilities of Voting for the Proposals in Roll Call Votes for Reelection-Seeking Legislators from the CVP



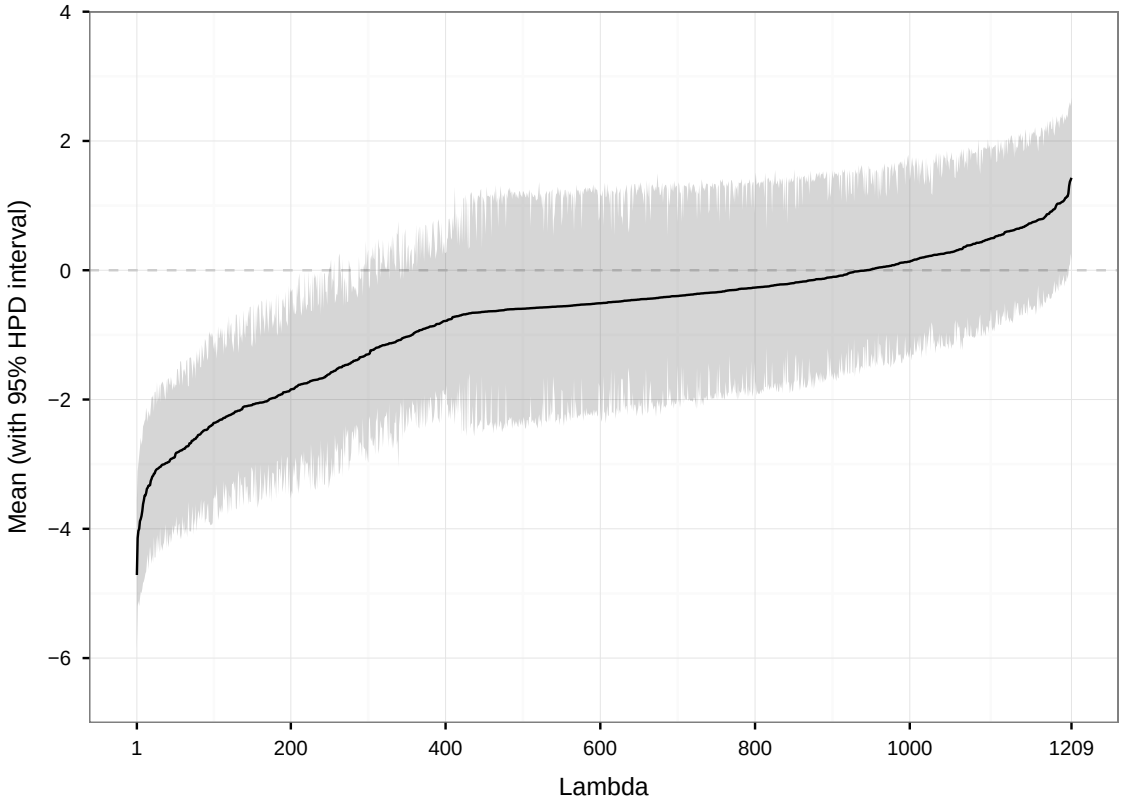
Note: The figure shows the means and 95% HPD intervals of the posterior distributions for the net electoral utilities of voting for the proposals in roll call votes for reelection-seeking legislators from the Christian Democratic People's Party (CVP). There were 1,207 net electoral utility parameters estimated for the CVP.

Next, Figure 4.12 presents the net electoral utilities for reelection-seeking legislators from the Liberal Democratic Party (FDP). Of the 1,209 parameters estimated for this party, 294 are negative and significant, 650 have negative means and credible intervals that overlap zero, 261 have positive means and credible intervals that also overlap zero, and four are both positive and significant.

The proposal was the more liberal alternative in 191 of the 294 roll call votes for which $\lambda_{j(i)p}$ is negative, while in the remaining 103 votes it was the more conservative alternative. On the other hand, in all four votes with a positive net electoral

utility, the proposal was more liberal compared to the status quo (or whatever the alternative to the proposal was). In 35.91% of the roll call votes that were electorally relevant, the reelection-seeking members of the Liberal Democratic Party therefore expected that casting a liberal vote would foster their reelection prospects relative to casting a conservative vote, while in the other 64.09% they expected that casting a conservative vote would increase their chances of reelection.

Figure 4.12: Net Electoral Utilities of Voting for the Proposals in Roll Call Votes for Reelection-Seeking Legislators from the FDP



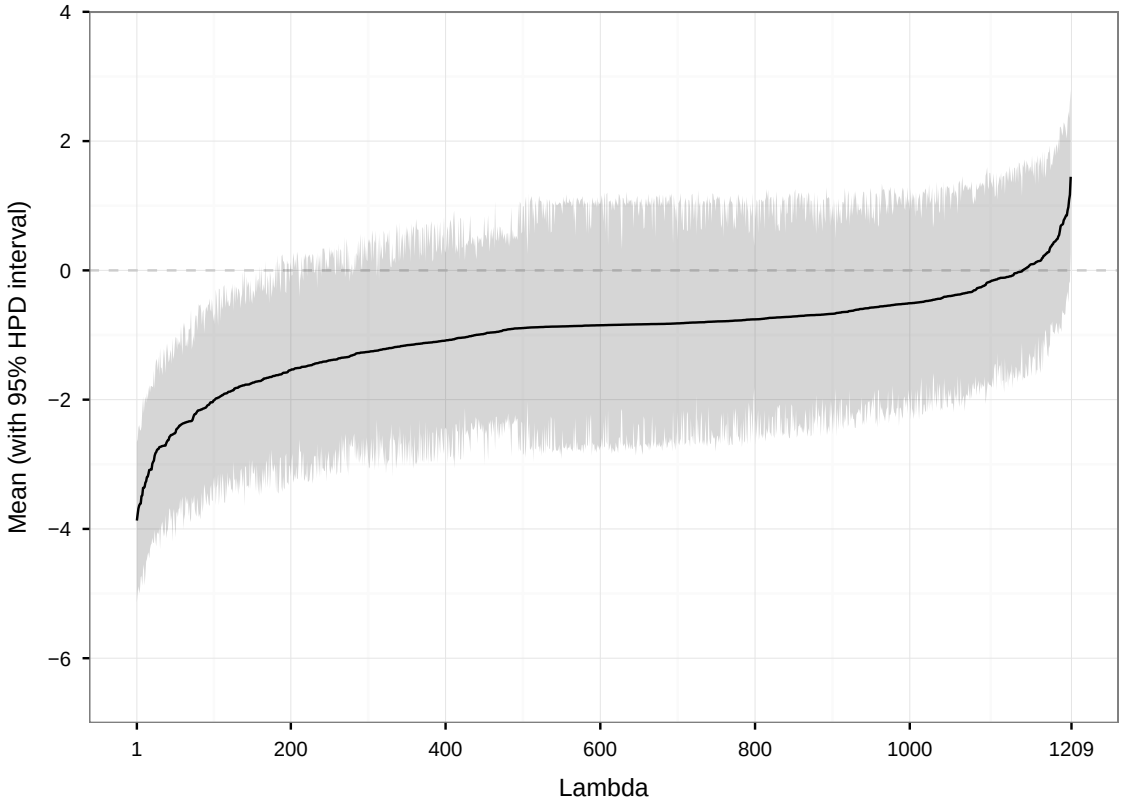
Note: The figure shows the means and 95% HPD intervals of the posterior distributions for the net electoral utilities of voting for the proposals in roll call votes for reelection-seeking legislators from the Liberal Democratic Party (FDP). There were 1,209 net electoral utility parameters estimated for the FDP.

The net electoral utilities for reelection-seeking members of the Swiss People's Party (SVP) are presented in Figure 4.13. There were 1,208 net electoral utility parameters estimated for this party. Of these parameters, 211 are negative and significant, 934 have negative means but are not significant, 62 have positive means but are also not significant, and only one is both positive and significant.

The proposal was the more liberal alternative in 120 of the 211 roll call votes with a negative $\lambda_{j(i)p}$ and in the remaining 91 votes it was the more conservative option. Finally, in the one vote with a positive net electoral utility, the proposal

represented the more liberal choice. The reelection-seeking members of the Swiss People's Party thus expected a liberal vote to benefit their reelection prospects in 43.40% of the electorally relevant roll call votes and a conservative vote to help their reelection chances in 56.60% of these roll call votes.

Figure 4.13: Net Electoral Utilities of Voting for the Proposals in Roll Call Votes for Reelection-Seeking Legislators from the SVP

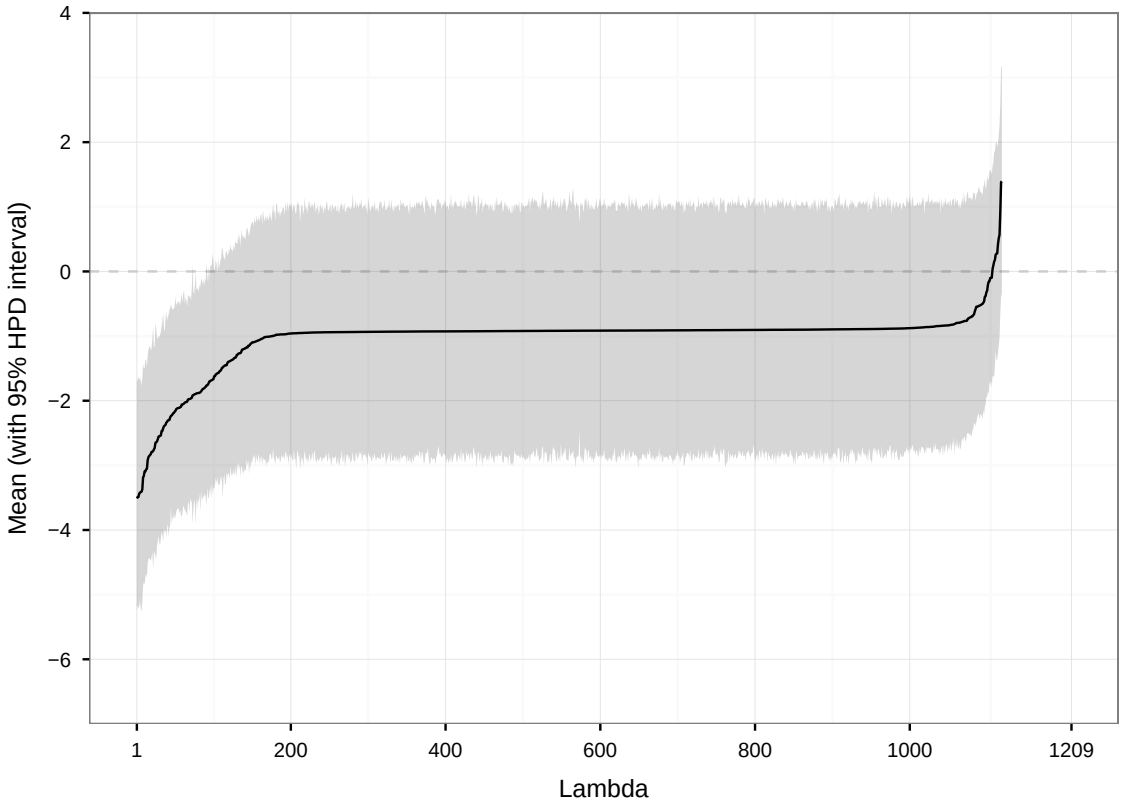


Note: The figure shows the means and 95% HPD intervals of the posterior distributions for the net electoral utilities of voting for the proposals in roll call votes for reelection-seeking legislators from the Swiss People's Party (SVP). There were 1,208 net electoral utility parameters estimated for the SVP.

Figure 4.14 shows the net electoral utilities for the three left-wing legislators who were not affiliated to a parliamentary party. Of the 1,119 parameters estimated for these legislators, 94 are negative and significant, while 1,012 have negative means but are not significant. Finally, 13 parameters have positive means, yet all of them do not reach significance.

In 54 of the 94 roll call votes where $\lambda_{j(i)p}$ is negative, the proposal represented the more liberal alternative, while in 40 votes it was the more conservative option. This means that in 42.55% of the electorally relevant roll call votes the legislators expected that voters would reward them for casting a liberal vote and in 57.45% they expected that voters would reward them for casting a conservative vote.

Figure 4.14: Net Electoral Utilities of Voting for the Proposals in Roll Call Votes for Liberal Independent Legislators

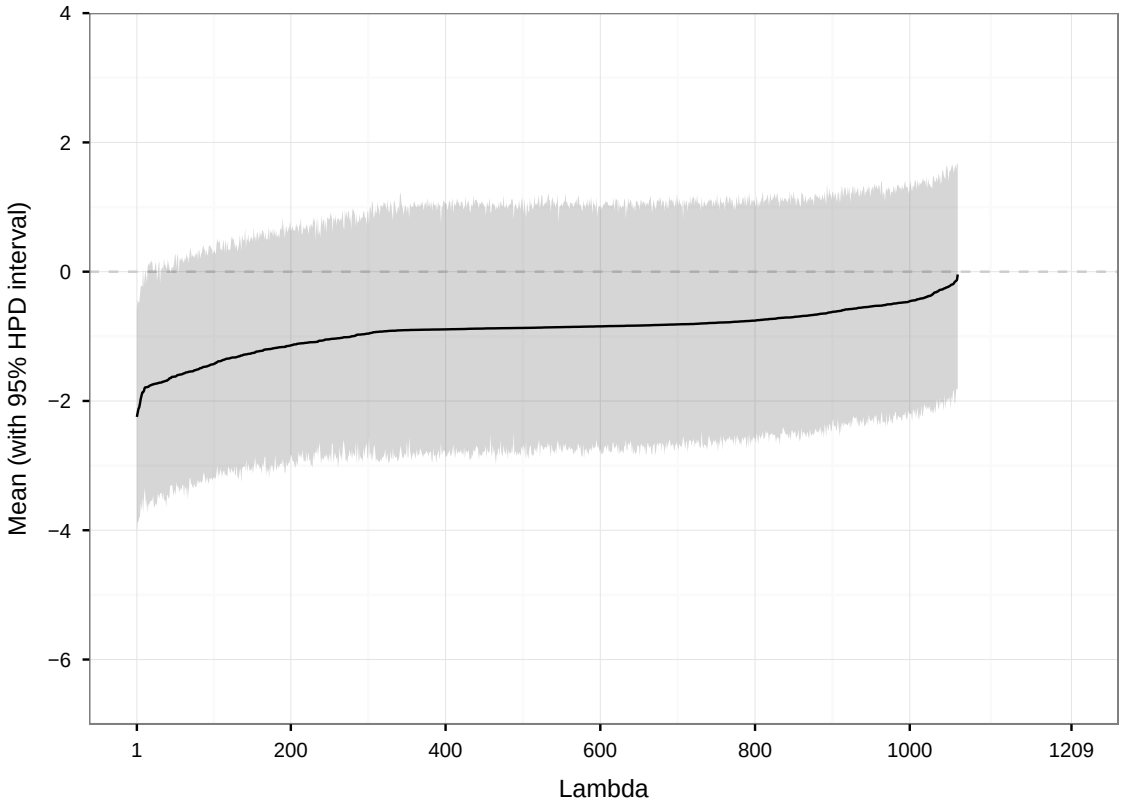


Note: The figure shows the means and 95% HPD intervals of the posterior distributions for the net electoral utilities of voting for the proposals in roll call votes for liberal legislators who were not affiliated to a parliamentary party. There were 1,119 net electoral utility parameters estimated for these legislators.

Figure 4.15 shows the net electoral utilities for the two moderate legislators who did not belong to a parliamentary party. 1,062 parameters were estimated. Of these parameters, 18 are negative and significant and 1,044 have negative means but are not significant. None of the parameters has a positive mean.

In ten of the 18 roll call votes for which $\lambda_{j(i)p}$ is negative, the proposal was the more liberal alternative, while in the remaining eight votes it represented the more conservative choice. Hence, the legislators expected that voters would reward them for casting a liberal vote in 44.44% of the electorally relevant roll call votes and that they would reward them for casting a conservative vote in 55.56% of these votes.

Figure 4.15: Net Electoral Utilities of Voting for the Proposals in Roll Call Votes for Moderate Independent Legislators

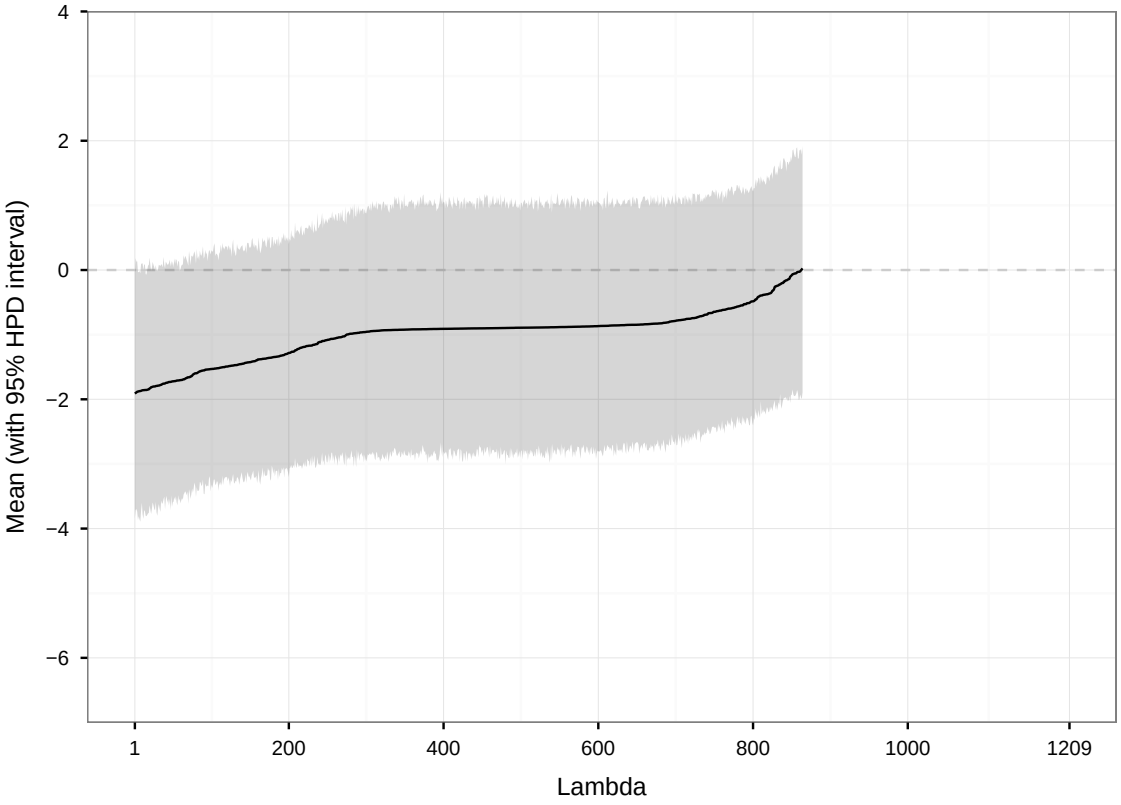


Note: The figure shows the means and 95% HPD intervals of the posterior distributions for the net electoral utilities of voting for the proposals in roll call votes for moderate legislators who were not affiliated to a parliamentary party. There were 1,062 net electoral utility parameters estimated for these legislators.

Finally, Figure 4.16 shows the net electoral utilities for Bernhard Hess, a right-wing politician who was not affiliated to a parliamentary party. Of the 864 parameters estimated for this legislator, 12 are negative and significant (in five of these votes the proposal was the more liberal option and in seven votes it was the more

conservative alternative). The remaining parameters, of which 850 have negative means and two have positive means, are all not statistically significant.

Figure 4.16: Net Electoral Utilities of Voting for the Proposals in Roll Call Votes for the Conservative Independent Legislator



Note: The figure shows the means and 95% HPD intervals of the posterior distributions for the net electoral utilities of voting for the proposals in roll call votes for the conservative legislator who was not affiliated to a parliamentary party. There were 864 net electoral utility parameters estimated for this legislator.

Figures 4.8 to 4.16 suggest three key findings. First, in a majority of roll call votes, reelection-seeking legislators attach relatively little weight to the electoral consequences of their voting behavior. Second, however, the analysis also shows that roll call voting matters for some votes. Among the moderate and conservative parties (EVP-EDU, CVP, FDP, and SVP), the proportion of roll call votes where reelection seekers attached utility to the electoral consequences of their behavior ranges from 17.55% for the SVP to 25.02% for the EVP-EDU. Among the liberal parties (GPS and SPS), the proportion is 6.81% for the SPS and 9.29% for the GPS. And finally, the proportion is 8.4% for liberal independents, while it only is between one and two percent for moderate and conservative independents.[33] Third, only the

[33]As I simultaneously assess a large number of parameters, the question arises what the proba-

reelection-seeking members of the GPS (and the conservative independent legislator) expected in a majority of the electorally relevant roll call votes that voters would reward them for voting in favor of the more liberal alternative. All other reelection-seeking legislators expected more often that a conservative vote rather than a liberal vote would increase their reelection prospects.[34]

Based on the estimated parameters, I can now compute counterfactual predictions that allow me to gauge the extent to which roll call votes affected the voting behavior of reelection-seeking legislators. More precisely, I calculate for each reelection seeker i and proposal p that was voted on by roll call vote the difference

$$\begin{aligned}&\Pr(\widehat{Y(i,p,1)}=1)-\Pr(\widehat{Y(i,p,0)}=1)\\&=F(\hat{\beta}_p\hat{\xi}_i-\hat{\alpha}_p+\hat{\lambda}_{j(i)p}\mathbb{1}\{i \text{ reelect}\})-F(\hat{\beta}_p\hat{\xi}_i-\hat{\alpha}_p),\end{aligned} \tag{4.14}$$

where $\hat{\alpha}_p$, $\hat{\beta}_p$, $\hat{\xi}_i$, and $\hat{\lambda}_{j(i)p}$ are the estimated means of the respective posterior distributions. Equation (4.14) thus shows how reelection seeker i's predicted probability of voting for proposal p changed in terms of percentage points as a result of roll call voting relative to signal voting.

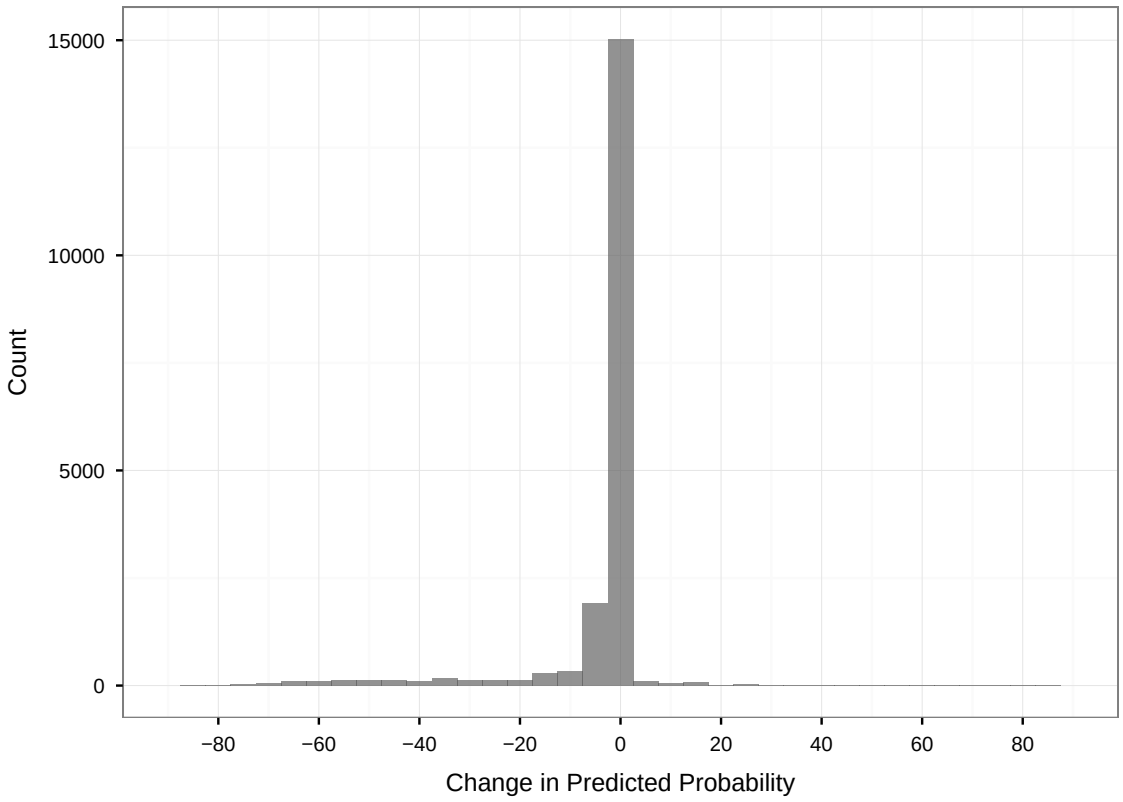
Figure 4.17 shows the changes in predicted probability for the reelection-seeking legislators of the GPS. In most cases, the legislators' roll call behavior did not differ much from their counterfactual signal voting behavior. In only 14.05% of the cases voting by roll call lead to a change of at least five percentage points in the predicted probability of voting for the proposal and in only 10.41% of the cases this change was at least ten percentage points.

Figure 4.18 presents the changes in predicted probability for the reelection seekers of the SPS. Again, the legislators' roll call behavior did in most cases not differ much from their counterfactual signal voting behavior. Roll call voting changed the predicted probability of voting in favor of the proposal by at least five percentage points in only 14.07% of the cases and by at least ten percentage points in only

bility is that some of the significant parameters are Type 1 errors. For example, for the reelection-seeking members of the EVP-EDU I found that 302 net electoral utility parameters are negative and significant. The probability that no more than 15 (or about 5%) of these are Type 1 errors is at least $\sum_{j=0}^{15}\binom{302}{j}0.025^j(1-0.025)^{302-j}=0.996$. To give another example, for the reelection seekers of the SPS I found that 82 net electoral utility parameters are negative and significant. Here, the probability that no more than four (or about 5%) of these are Type 1 errors is at least 0.945.

[34]However, it is important to note that legislators may not always correctly predict the preferences of their voters. Several authors have argued that legislators often have only limited information about voter preferences (e.g., Stokes and Miller 1963; Matsusaka 1992, 1995). This is, for example, reflected in the following statement of a member of Congress interviewed by Kingdon (1989, 32) in the 1960s: "That's the big problem. You're here to represent your people but you don't know what they want. The only way to really know is to take a referendum." Consequently, legislators' perception of voters' policy preferences does not necessarily reflect their true preferences.

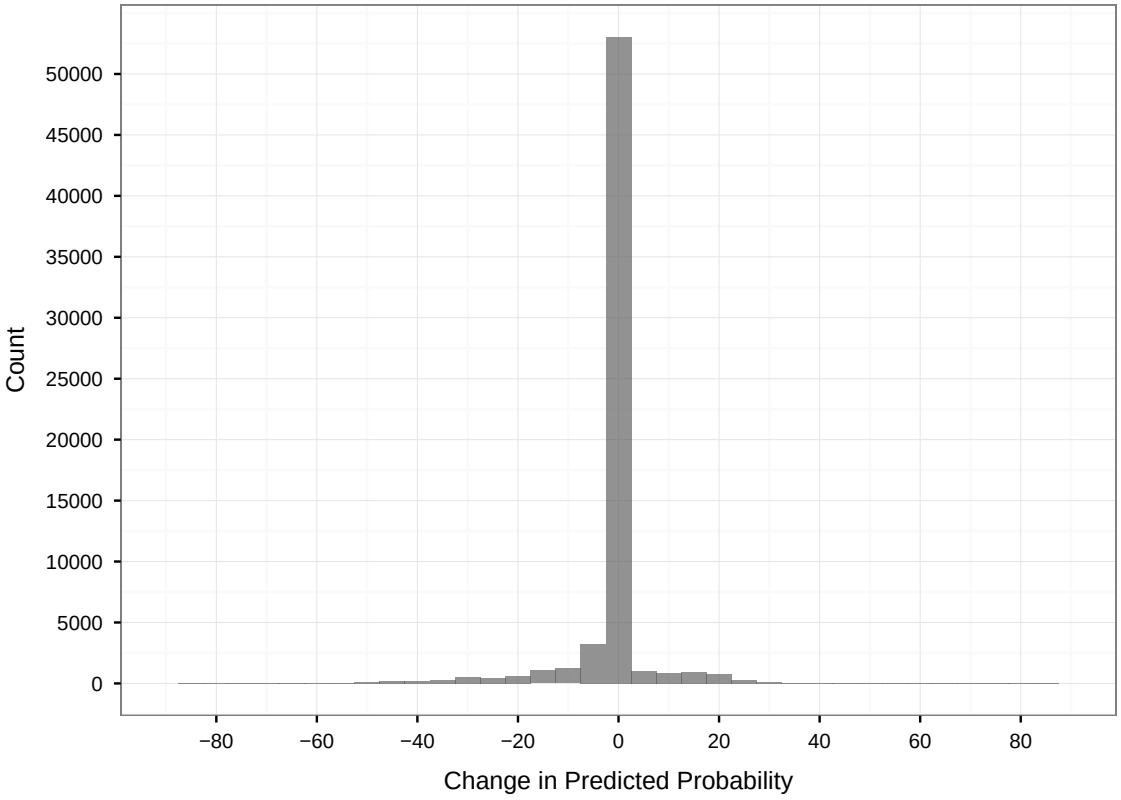
Figure 4.17: Change in the Predicted Probability of Voting in Favor of the Proposal As a Result of Roll Call Voting for Reelection-Seeking Legislators of the GPS



Note: The figure shows how much the predicted probability of voting in favor of the proposal changed for reelection-seeking legislators of the GPS because the vote on the proposal was taken by roll call vote rather than signal vote. The changes are expressed in percentage points.

10.05% of the cases.

Figure 4.18: Change in the Predicted Probability of Voting in Favor of the Proposal As a Result of Roll Call Voting for Reelection-Seeking Legislators of the SPS



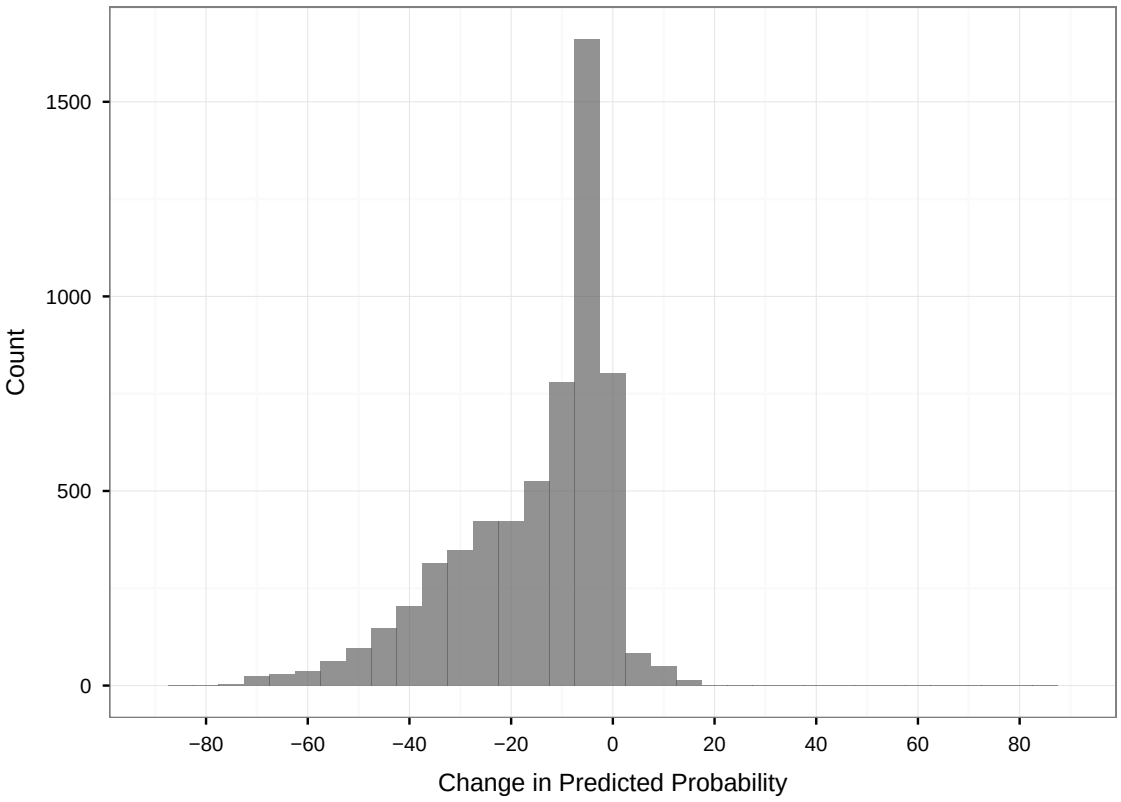
Note: The figure shows how much the predicted probability of voting in favor of the proposal changed for reelection-seeking legislators of the SPS because the vote on the proposal was taken by roll call vote rather than signal vote. The changes are expressed in percentage points.

The changes in predicted probability for the reelection-seeking members of the EVP-EDU are shown in Figure 4.19. There are considerable differences between the roll call and the counterfactual signal voting behavior of these legislators. In 72.51% of the cases the predicted probability of voting for the proposal changed by at least five percentage points due to the fact that roll call and not signal voting was used—and in 49.35% this change was even ten percentage points or more.

Figure 4.20 depicts the changes in predicted probability for the reelection seekers of the CVP. The contrast between roll call and counterfactual signal voting is again considerable. The difference in the predicted probability of voting for the proposal that results from roll call voting is at least five percentage points in 47.01% of the cases and at least ten percentage points in 34.23%.

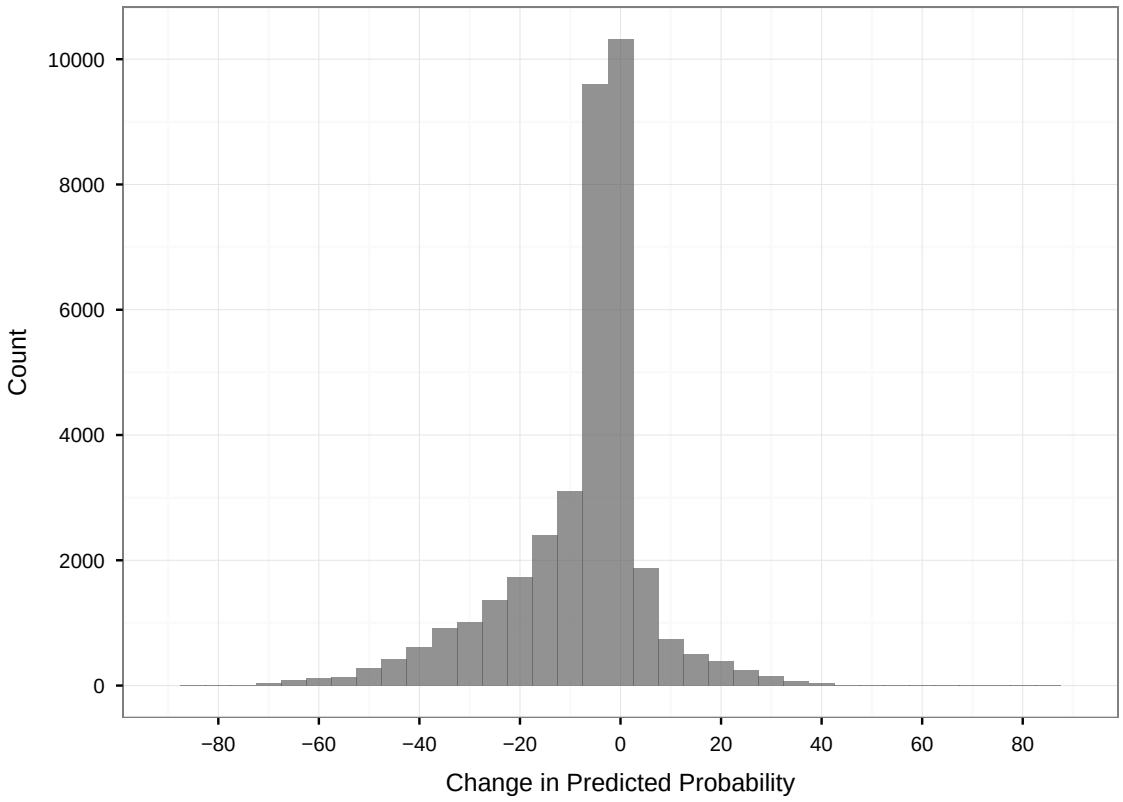
For the reelection-seeking members of the FDP, the changes in the predicted probability of voting for the proposal are shown in Figure 4.21. Again, roll call

Figure 4.19: Change in the Predicted Probability of Voting in Favor of the Proposal As a Result of Roll Call Voting for Reelection-Seeking Legislators of the EVP-EDU



Note: The figure shows how much the predicted probability of voting in favor of the proposal changed for reelection-seeking legislators of the EVP-EDU because the vote on the proposal was taken by roll call vote rather than signal vote. The changes are expressed in percentage points.

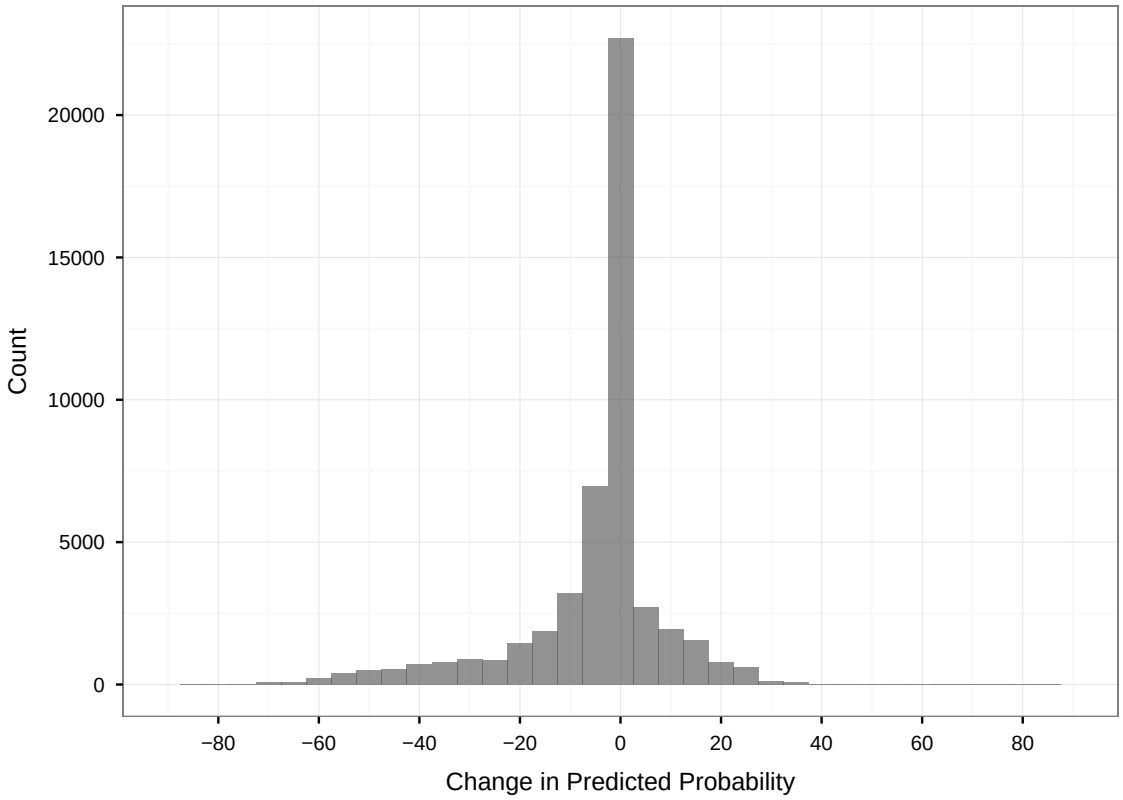
Figure 4.20: Change in the Predicted Probability of Voting in Favor of the Proposal As a Result of Roll Call Voting for Reelection-Seeking Legislators of the CVP



Note: The figure shows how much the predicted probability of voting in favor of the proposal changed for reelection-seeking legislators of the CVP because the vote on the proposal was taken by roll call vote rather than signal vote. The changes are expressed in percentage points.

voting matters for legislators' voting behavior as the change in predicted probability is at least five percentage points in 40.84% of the cases and at least ten percentage points in 28.00% of the cases.

Figure 4.21: Change in the Predicted Probability of Voting in Favor of the Proposal As a Result of Roll Call Voting for Reelection-Seeking Legislators of the FDP



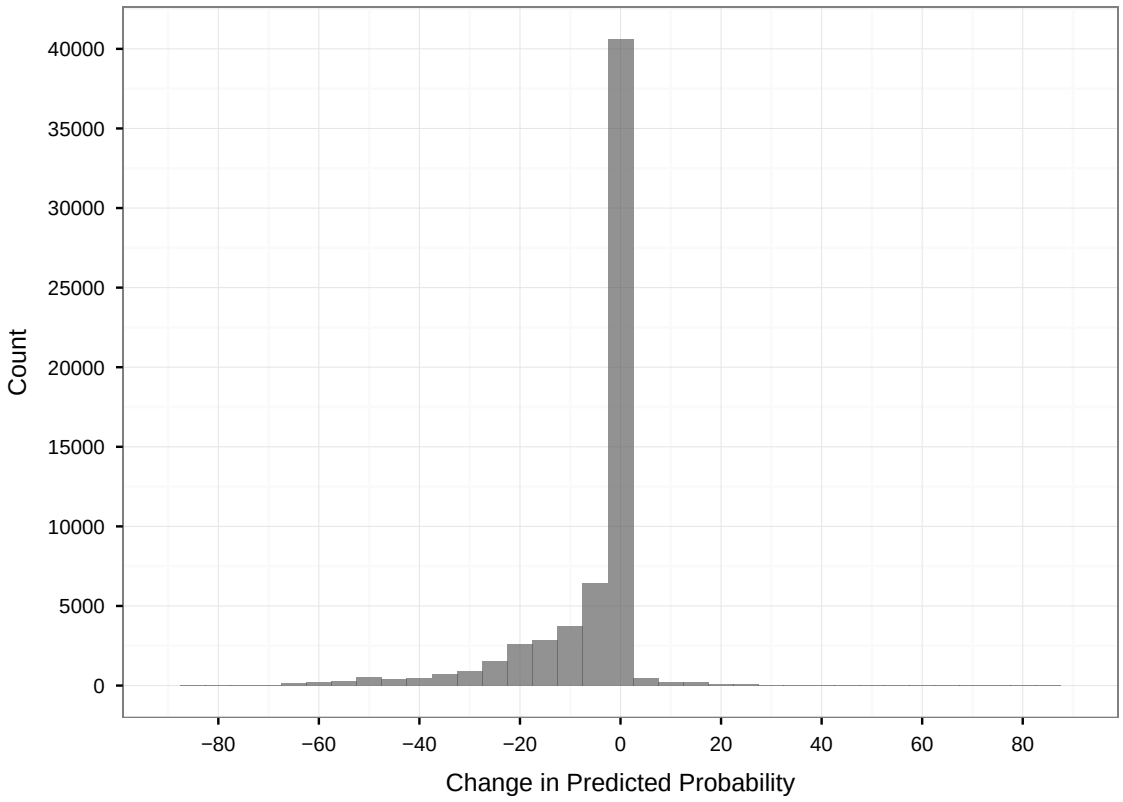
Note: The figure shows how much the predicted probability of voting in favor of the proposal changed for reelection-seeking legislators of the FDP because the vote on the proposal was taken by roll call vote rather than signal vote. The changes are expressed in percentage points.

Figure 4.22 shows the changes in predicted probability for the reelection-seeking legislators of the SVP. For these legislators, roll call voting changes the predicted probability of voting for the proposal by five percentage points or more in 29.53% of the cases and by ten percentage points or more in 21.28% of the cases.

Figure 4.23 depicts the predicted probability changes for the left-wing legislators who were not affiliated to a parliamentary party. For the liberal independent legislators, the difference between the predicted probability of voting for the proposal under roll call voting and the counterfactual predicted probability under signal voting is at least five percentage points in 17.75% of the cases and at least ten percentage points in 13.17% of the cases.

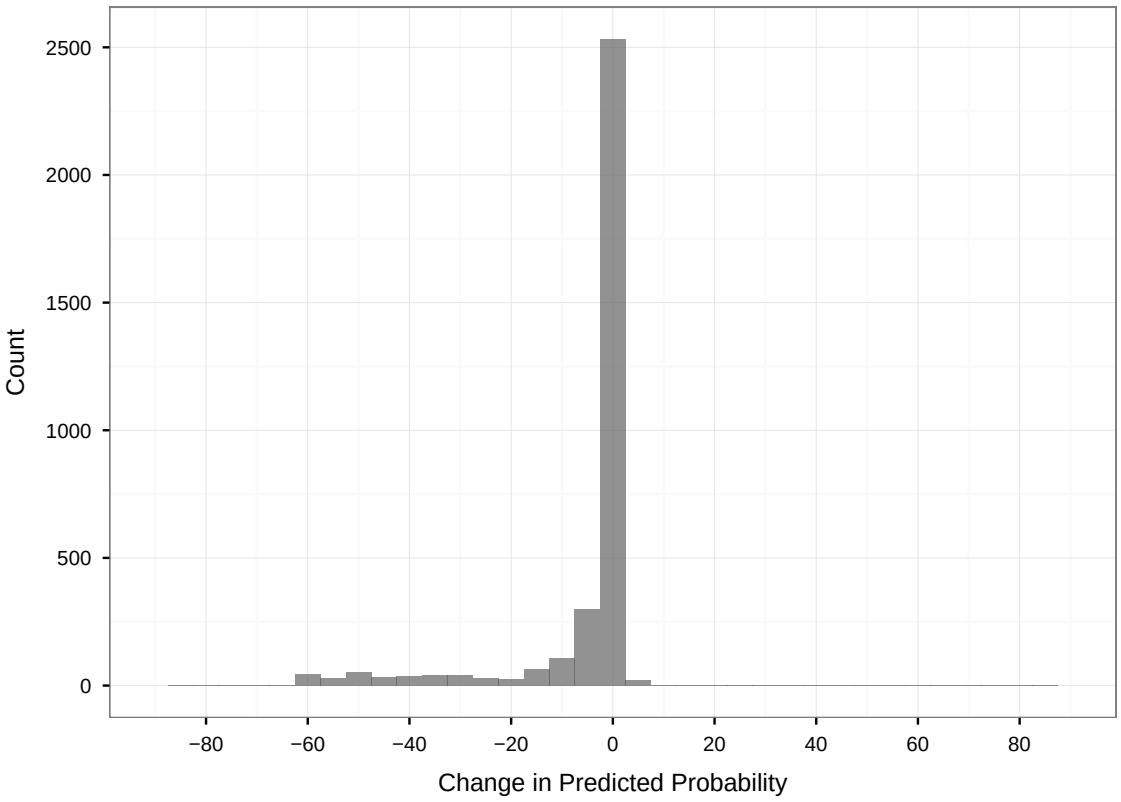
The changes in predicted probability for the moderate legislators who did not

Figure 4.22: Change in the Predicted Probability of Voting in Favor of the Proposal As a Result of Roll Call Voting for Reelection-Seeking Legislators of the SVP



Note: The figure shows how much the predicted probability of voting in favor of the proposal changed for reelection-seeking legislators of the SVP because the vote on the proposal was taken by roll call vote rather than signal vote. The changes are expressed in percentage points.

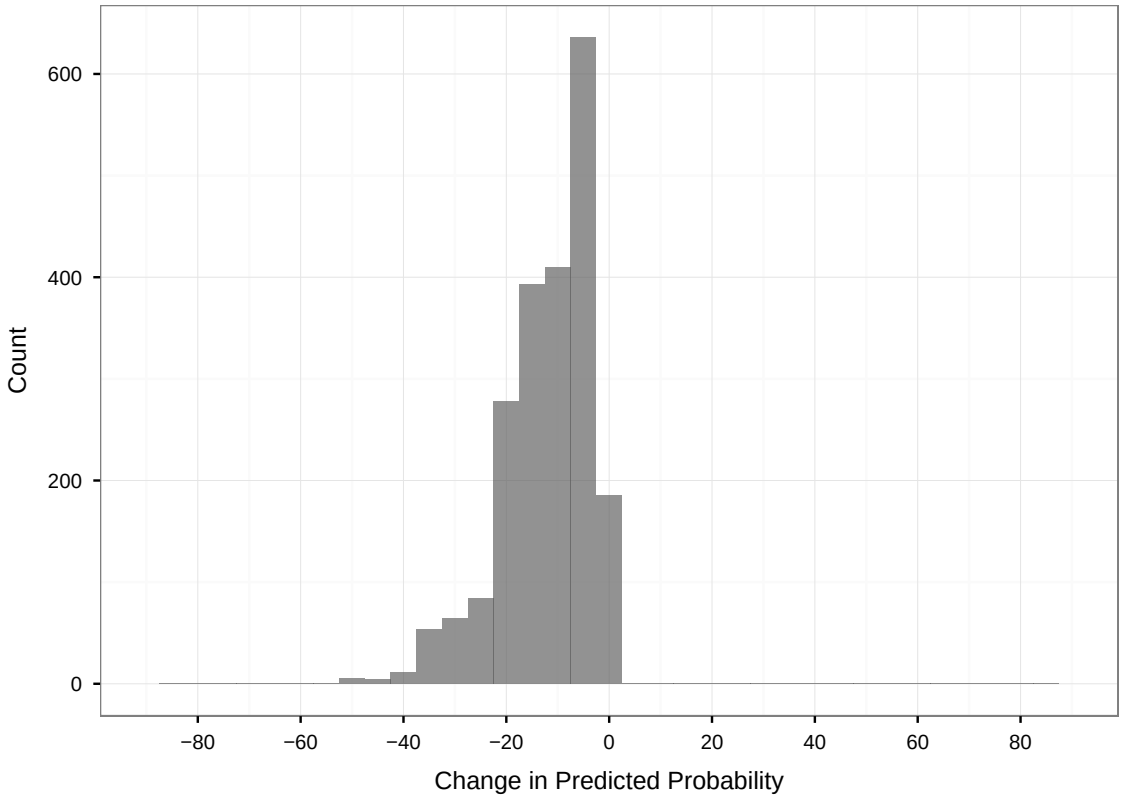
Figure 4.23: Change in the Predicted Probability of Voting in Favor of the Proposal As a Result of Roll Call Voting for Liberal Independent Legislators



Note: The figure shows how much the predicted probability of voting in favor of the proposal changed for liberal independent legislators because the vote on the proposal was taken by roll call vote rather than signal vote. The changes are expressed in percentage points.

belong to a parliamentary party are depicted in Figure 4.24. For these legislators, roll call voting changed the predicted probability of voting for the proposal by at least five percentage points in 74.25% of the cases and by at least ten percentage points in 52.17% of the cases.

Figure 4.24: Change in the Predicted Probability of Voting in Favor of the Proposal As a Result of Roll Call Voting for Moderate Independent Legislators

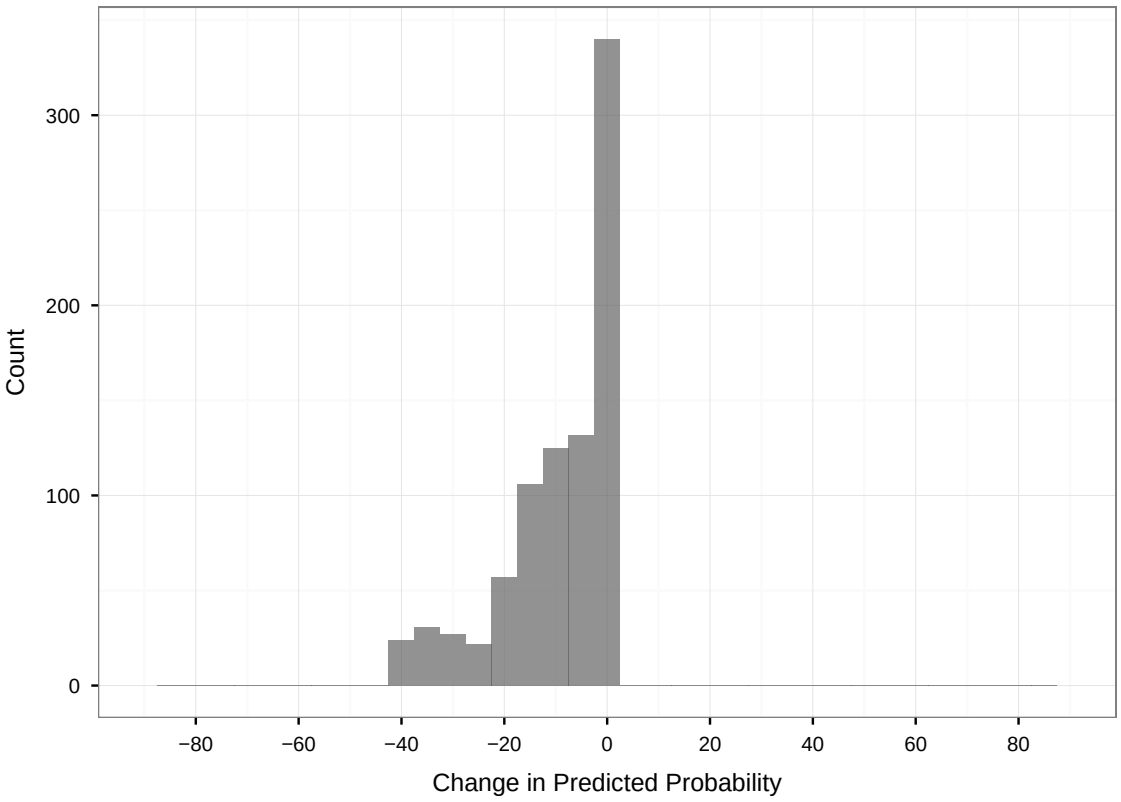


Note: The figure shows how much the predicted probability of voting in favor of the proposal changed for moderate independent legislators because the vote on the proposal was taken by roll call vote rather than signal vote. The changes are expressed in percentage points.

Finally, Figure 4.25 shows the changes in predicted probability for Bernhard Hess, the right-wing legislator who was not affiliated to a parliamentary party. In 52.43% of the cases roll call voting changed his predicted probability of voting in favor of the proposal by at least five percentage points and in 38.31% it changed his predicted probability of voting in favor of the proposal by at least ten percentage points.

The data therefore provide partial support for Expectation 1. Especially for moderate and conservative legislators, but also, although to a lesser extent, for legislators with liberal ideologies, there is evidence that at least in a subset of votes, voting transparency affects legislators' voting decision calculus. Moreover, the analysis has

Figure 4.25: Change in the Predicted Probability of Voting in Favor of the Proposal As a Result of Roll Call Voting for Conservative Independent Legislators



Note: The figure shows how much the predicted probability of voting in favor of the proposal changed for conservative independent legislators because the vote on the proposal was taken by roll call vote rather than signal vote. The changes are expressed in percentage points.

also shown that for most votes where the voting procedure affects the behavior of reelection-seeking legislators, these legislators are less likely to vote in favor of the proposal under roll call voting than under signal voting. In the light of these findings, I next turn to the question of whether legislators tend to request roll call votes that they expect will improve their reelection prospects and whether they tend not to request roll call votes that they expect will damage their chances of reelection (Expectation 2).

Roll call requests are structured along party lines.[35] As mentioned above, there are 150 roll call petitions which we could match to a proposal and for which voting data are available. Table 4.3 shows how many petitions for roll call votes reelection-seeking legislators of each party submitted and, for the petitions they submitted, how often the net electoral utility was negative, positive, or not statistically significant (the sum of those numbers is greater than 150 because some petitions were submitted by legislators from multiple parties).

Table 4.3: Roll Call Requests by Parliamentary Party and Net Electoral Utility

	Net Electoral Utility			N
	$\lambda_{j(i)p} < 0$	$\lambda_{j(i)p}$ is n.s.	$\lambda_{j(i)p} > 0$	
GPS	0	3	0	3
SPS	5	90	0	95
EVP-EDU	6	9	0	15
CVP	9	7	0	16
FDP	0	2	0	2
SVP	20	28	0	48
N	40	139	0	179

Note: The table shows how many roll call petitions reelection-seeking legislators of each party submitted and, for the petitions they submitted, how often the net electoral utility was negative, positive, or not statistically significant (denoted as "n.s."). Note that the N is greater than the total number of petitions analyzed (which is 150) because some petitions were submitted by legislators coming from multiple parties.

First, the table shows that among the 95 roll call votes requested by reelection-seeking members of the SPS, only for five votes the net electoral utility is significantly

[35]This does not imply that party leaders are the primary drivers of roll call requests. As mentioned above, legislators of the same party may have similar preferences for roll call voting if the outside actors they respond to have correlated preferences.

different from zero. Among the 48 roll call votes requested by reelection-seeking members of the SVP 20 were likely to have electoral consequences, while among the roll call votes requested by reelection seekers of the CVP and the EVP-EDU this was the case for nine (out of 16) and, respectively, six (out of 15). Finally, none of the few roll call votes requested by reelection-seeking legislators of the GPS and the FDP is characterized by a net electoral utility that reaches statistical significance.

Second, Table 4.3 also shows that in case of all requested roll call votes that were likely to be electorally relevant, the legislators requesting a roll call faced a negative net electoral utility. As I showed in Subsection 4.3, if the members of a party expect the net electoral utility to be negative, all those who seek reelection and in a roll call vote favor the proposal over the alternative should prefer either to vote by roll call or to have a signal vote on the proposal. On the other hand, if party members expect the net electoral utility to be positive, all those who stand for reelection and are against the proposal should prefer either a roll call vote or a signal vote. Table 4.4 shows whether these expectations are borne out by the data. The top panel of the table shows for each party j and all requested roll call votes for which the members of party j expected a negative net electoral utility, i.e., $\lambda_{j(i)p} < 0$, the percentages of reelection-seeking party members who were in favor of the proposal and among the requesters of a roll call vote. Similarly, the bottom panel of the table shows for each party j and all requested roll call votes for which the members of party j expected a positive net electoral utility, i.e., $\lambda_{j(i)p} > 0$, the percentages of reelection-seeking members who were against the proposal and among the requesters of a roll call vote.

The table shows that the data are largely in line with the implications I derived from Expectation 2. In most cases where the members of a party expected that a roll call vote on a proposal is characterized by a negative net electoral utility, the reelection-seeking members who were in favor of the proposal either all requested or all did not request a roll call vote (the exception is the SVP and, in two cases, the SPS, whose reelection-seeking members were not always united in requesting and, respectively, not requesting a roll call vote). Moreover, in the one case where party members expected the net electoral utility to be positive and where some of them voted against the proposal, all of the members who stood for reelection and were against the proposal did not demand a roll call vote.

In total, there are nine cases where the members of a party faced a negative net electoral utility and those who were in favor of the proposal all requested a roll call vote. In these cases, I expect that for the reelection-seeking party members who were against the proposal the probability of requesting a roll call vote decreases in $\beta_p \xi_i - \alpha_p$. However, because in eight of these cases all of the party members who were

Table 4.4: Roll Call Requests of Reelection-Seeking Legislators for Votes that Were Likely to Have Electoral Consequences

$\lambda_{j(i)p} < 0$ and all members of party j for which $y(i,p,1) = 1$

	$x = 0\%$	$0\% < x < 33.33\%$	$33.33\% \leq x \leq 66.67\%$	$66.67\% < x < 100\%$	$x = 100\%$
GPS	8	0	0	0	0
SPS	7	0	1	1	1
EVP-EDU	20	0	0	0	0
CVP	41	0	0	0	8
FDP	39	0	0	0	0
SVP	15	2	9	0	0
Total	**130**	**2**	**10**	**1**	**9**

$\lambda_{j(i)p} > 0$ and all members of party j for which $y(i,p,1) = 0$

	$x = 0\%$	$0\% < x < 33.33\%$	$33.33\% \leq x \leq 66.67\%$	$66.67\% < x < 100\%$	$x = 100\%$
GPS	0	0	0	0	0
SPS	0	0	0	0	0
EVP-EDU	0	0	0	0	0
CVP	0	0	0	0	0
FDP	1	0	0	0	0
SVP	0	0	0	0	0
Total	**1**	**0**	**0**	**0**	**0**

Note: The top panel of the table shows for each party j and all requested roll call votes for which the members of party j expected a negative net electoral utility, i.e., $\lambda_{j(i)p} < 0$, the percentages of reelection-seeking party members who were in favor of proposal p, i.e., $y(i,p,1) = 1$, and among the requesters of the roll call vote on p. The bottom panel of the table shows for each party j and all requested roll call votes for which the members of party j expected a positive net electoral utility, i.e., $\lambda_{j(i)p} > 0$, the percentages of reelection-seeking members who were against proposal p, i.e., $y(i,p,1) = 0$, and among the requesters of the roll call vote on p. In the table, x denotes the percentage of reelection-seeking party members in favor of p and against p, respectively, who were among the requesters of the roll call vote on p. Note that I only consider cases for which $\lambda_{j(i)p}$ reaches statistical significance. According to the implications derived from Expectation 2, most cases should lie in the light-gray columns of the table.

against the proposal also requested a roll call vote, there is only one case for which I can evaluate this implication. In this one case, the reelection-seeking members of the Social Democratic Party (SPS) were split on a proposal. Two reelection-seeking members preferred the proposal over the alternative and both requested a roll call vote. On the other hand, of the 34 reelection-seeking members who voted against the proposal, 20 requested a roll call vote and 14 did not. For the latter set of legislators, I thus ran a logistic regression of roll call request behavior (= 1 if a legislator requested a roll call vote and zero otherwise) on $\hat{\beta}_p\hat{\xi}_i - \hat{\alpha}_p$, where the estimates $\hat{\xi}_i$, $\hat{\alpha}_p$, and $\hat{\beta}_p$ are obtained from the estimation of model (4.7).

Table 4.5: Roll Call Requests of Reelection-Seeking SPS Party Members Who Were Against the Proposal

	Roll Call Request
Intercept	−1.65
	(2.69)
$\hat{\beta}_p\hat{\xi}_i - \hat{\alpha}_p$	−0.73
	(0.97)
N	34
AIC	49.49
log$L$	−22.75

Note: Standard errors in parentheses.

Table 4.5 shows that, as expected, $\beta_p\xi_i - \alpha_p$ is negatively related to the probability that reelection-seeking party members who are against the proposal request a roll call vote if the net electoral utility is negative and the party members who are in favor of the proposal prefer to take a roll call vote. However, this association is not statistically significant and the result should certainly be taken with a grain of salt, as the analysis is based on only one roll call vote petition.

Overall, the findings lend some support to the expectation that if legislators have discretion over how to vote, they tend to request roll call votes that they expect will improve their reputation with voters and not to request roll call votes that they expect will damage their reputation with them. The selection of roll call vote for position-taking purposes also provides a possible explanation for why almost all estimated net electoral utilities are negative. If proposals with little support do not reach a floor vote, uncontested proposals tend to be voted on by signal vote (because

they do not contain meaningful information for position-taking), and controversial proposals tend to be voted on by roll call vote (because they provide opportunities for position-taking), then most legislators will support the proposal in signal votes, while more will vote against the proposal in roll call votes.

Finally, the analysis has also shown that roll call requests may be driven by more than just electoral concerns. In particular the members of the Social Democratic Party requested many roll call votes for which I can not exclude the possibility that voting transparency had only negligible consequences for their reelection prospects. In addition, there were several instances where the members of the SVP faced a negative net electoral utility, but those who preferred the proposal over the alternative did not consistently request or not request a roll call vote. These observations cannot readily be explained by a model in which legislators use roll call votes to signal their voting behavior to voters.

4.6 Conclusion

In this chapter, I have set out to examine the signaling argument by evaluating the following two expectations. First, legislators should tend to behave differently in roll call votes than in signal votes. This expectation should hold if actors inside the legislature have different preferences than actors outside the legislature and both types of actors control resources that are valuable to legislators, or if legislators have different personal preferences than actors outside the legislature and the latter control valuable resources. Provided that legislators care about the resources controlled by outside actors and expect that these actors make the provision of their resources contingent upon legislators' behavior in roll call votes, then the legislators should also care about whether votes are decided by roll call or not. The second expectation is therefore that if legislators have discretion over voting procedures, they tend to request roll call votes that they expect will improve their reputation with outside actors and tend not to request roll call votes that they expect will damage their reputation with outside actors.

Based on voting data and information about roll call requests from the 47th legislative period of the Swiss National Council, I found partial support for these expectations. Regarding Expectation 1, I showed that especially for moderate and conservative legislators, and to a lesser extent also for liberal legislators, there is evidence that voting transparency affects the voting behavior of legislators by exposing them to outside pressures, at least for a subset of votes. Furthermore, with regard to Expectation 2, I found that legislators who have the same preferences over

voting procedures tend to collectively request roll call votes, which suggests that roll call voting is electorally rewarding for them, or not to request roll call votes, which indicates that roll call voting has negative consequences for their electoral prospects.

These findings show that roll call votes are a form of public behavior (Clark and Golder 2015, 67). The increased transparency brought about by the publication of individual votes affects the voting behavior of legislators. Moreover, provided that the parliamentary rules allow legislators to request roll call votes, legislators use their discretion over voting procedures strategically to reveal or not reveal information about their voting decisions to legislative outsiders. The question thus becomes how legislators design the rules governing the use of roll call votes in the legislature. In the next chapter, I will develop a game-theoretic model to explain under what circumstances legislators choose to constrain the use of roll call votes.

Appendix

4.A Stan Code for the IRT Model

```
data {
  int<lower=1> n; // number of legislators
  int<lower=1> m; // number of proposals
  int<lower=1> mrcv; // number of proposals that are roll called
  int<lower=1> nobs; // number of observations
  int<lower=1,upper=n> i[nobs]; // legislator for observation obs
  int<lower=1,upper=m> p[nobs]; // proposal for observation obs
  int<lower=0,upper=1> y[nobs]; // vote decision for observation obs
  int<lower=1> nobsgps; // no. of obs. for reelection-seeking GPS and rcvs
  int<lower=1> nobssps; // no. of obs. for reelection-seeking SPS and rcvs
  int<lower=1> nobsevp; // no. of obs. for reelection-seeking EVP-EDU and rcvs
  int<lower=1> nobscvp; // no. of obs. for reelection-seeking CVP and rcvs
  int<lower=1> nobsfdp; // no. of obs. for reelection-seeking FDP and rcvs
  int<lower=1> nobssvp; // no. of obs. for reelection-seeking SVP and rcvs
  int<lower=1> nobsnol; // no. of obs. for reelection-seeking left ind. and rcvs
  int<lower=1> nobsnoc; // no. of obs. for reelection-seeking center ind. and rcvs
  int<lower=1> nobsnor; // no. of obs. for reelection-seeking right ind. and rcvs
  int<lower=1> nobsnre; // no. of obs. for non-reelection seekers and rcvs
}
parameters {
  real xi_mean; // mean legislator ideology
  real xi[n]; // ideology of legislator i - mean ideology
  real alpha[m]; // item-difficulty parameter for proposal p
  real beta[m]; // item-discrimination parameter for proposal p
  real lambda_mean; // mean rcv utility
  real lambdagps[mrcv]; // rcv utility for proposal p for GPS - mean rcv utility
  real lambdasps[mrcv]; // rcv utility for proposal p for SPS - mean rcv utility
  real lambdaevp[mrcv]; // rcv utility for proposal p for EVP - mean rcv utility
  real lambdacvp[mrcv]; // rcv utility for proposal p for CVP - mean rcv utility
  real lambdafdp[mrcv]; // rcv utility for proposal p for FDP - mean rcv utility
  real lambdasvp[mrcv]; // rcv utility for proposal p for SVP - mean rcv utility
  real lambdanol[mrcv]; // rcv utility for proposal p for left ind. - mean rcv u.
  real lambdanoc[mrcv]; // rcv utility for proposal p for center ind. - mean rcv u.
```

```
  real lambdanor[mrcv]; // rcv utility for proposal p for right ind. - mean rcv u.
}
model {
  xi_mean ~ normal(0,1);
  xi ~ normal(0,1);
  alpha ~ normal(0,1);
  beta ~ normal(0,1);
  lambda_mean ~ normal(0,1);
  lambdagps ~ normal(0,1);
  lambdasps ~ normal(0,1);
  lambdaevp ~ normal(0,1);
  lambdacvp ~ normal(0,1);
  lambdafdp ~ normal(0,1);
  lambdasvp ~ normal(0,1);
  lambdanol ~ normal(0,1);
  lambdanoc ~ normal(0,1);
  lambdanor ~ normal(0,1);
  for (obs in 1:nobsgps) {
    // loop for reelection-seeking GPS and rcvs
    y[obs] ~ bernoulli_logit( beta[p[obs]] * (xi[i[obs]] - xi_mean) -
                              alpha[p[obs]] + lambdagps[p[obs]] - lambda_mean );
  }
  for (obs in (nobsgps + 1):(nobsgps + nobssps)) {
    // loop for reelection-seeking SPS and rcvs
    y[obs] ~ bernoulli_logit( beta[p[obs]] * (xi[i[obs]] - xi_mean) -
                              alpha[p[obs]] + lambdasps[p[obs]] - lambda_mean );
  }
  for (obs in (nobsgps + nobssps + 1):(nobsgps + nobssps + nobsevp)) {
    // loop for reelection-seeking EVP-EDU and rcvs
    y[obs] ~ bernoulli_logit( beta[p[obs]] * (xi[i[obs]] - xi_mean) -
                              alpha[p[obs]] + lambdaevp[p[obs]] - lambda_mean );
  }
  for (obs in (nobsgps + nobssps + nobsevp + 1):
    (nobsgps + nobssps + nobsevp + nobscvp)) {
    // loop for reelection-seeking CVP and rcvs
    y[obs] ~ bernoulli_logit( beta[p[obs]] * (xi[i[obs]] - xi_mean) -
                              alpha[p[obs]] + lambdacvp[p[obs]] - lambda_mean );
  }
  for (obs in (nobsgps + nobssps + nobsevp + nobscvp + 1):
    (nobsgps + nobssps + nobsevp + nobscvp + nobsfdp)) {
    // loop for reelection-seeking FDP and rcvs
    y[obs] ~ bernoulli_logit( beta[p[obs]] * (xi[i[obs]] - xi_mean) -
                              alpha[p[obs]] + lambdafdp[p[obs]] - lambda_mean );
  }
  for (obs in (nobsgps + nobssps + nobsevp + nobscvp + nobsfdp + 1):
```

```
    (nobsgps + nobssps + nobsevp + nobscvp + nobsfdp + nobssvp)) {
    // loop for reelection-seeking SVP and rcvs
    y[obs] ~ bernoulli_logit( beta[p[obs]] * (xi[i[obs]] - xi_mean) -
                              alpha[p[obs]] + lambdasvp[p[obs]] - lambda_mean );
  }
  for (obs in (nobsgps + nobssps + nobsevp + nobscvp + nobsfdp + nobssvp + 1):
    (nobsgps + nobssps + nobsevp + nobscvp + nobsfdp + nobssvp + nobsnol)) {
    // loop for reelection-seeking None (left) and rcvs
    y[obs] ~ bernoulli_logit( beta[p[obs]] * (xi[i[obs]] - xi_mean) -
                              alpha[p[obs]] + lambdanol[p[obs]] - lambda_mean );
  }
  for (obs in (nobsgps + nobssps + nobsevp + nobscvp + nobsfdp + nobssvp
    + nobsnol + 1):(nobsgps + nobssps + nobsevp + nobscvp + nobsfdp
    + nobssvp + nobsnol + nobsnoc)) {
    // loop for reelection-seeking None (center) and rcvs
    y[obs] ~ bernoulli_logit( beta[p[obs]] * (xi[i[obs]] - xi_mean) -
                              alpha[p[obs]] + lambdanoc[p[obs]] - lambda_mean );
  }
  for (obs in (nobsgps + nobssps + nobsevp + nobscvp + nobsfdp + nobssvp
    + nobsnol + nobsnoc + 1):(nobsgps + nobssps + nobsevp + nobscvp
    + nobsfdp + nobssvp + nobsnol + nobsnoc + nobsnor)) {
    // loop for reelection-seeking None (right) and rcvs
    y[obs] ~ bernoulli_logit( beta[p[obs]] * (xi[i[obs]] - xi_mean) -
                              alpha[p[obs]] + lambdanor[p[obs]] - lambda_mean );
  }
  for (obs in (nobsgps + nobssps + nobsevp + nobscvp + nobsfdp + nobssvp
    + nobsnol + nobsnoc + nobsnor + 1):nobs) {
    // loop for (i) non-reelection seekers and rcvs and (ii) all MPs and sigs
    y[obs] ~ bernoulli_logit( beta[p[obs]] * (xi[i[obs]] - xi_mean) -
                              alpha[p[obs]] );
  }
}
```

4.B Career Paths of Legislators Who Did Not Seek Reelection to the National Council

Table 4.B.1: Career Paths of Legislators Who Did Not Seek Reelection to the National Council

Legislator	**Career Path**	**Source(s)**
Bührer, Gerold (FDP – SH)	Works in private sector (from 2007-2012 president of Economiesuisse)	https://de.wikipedia.org/wiki/Gerold_B%C3%BChrer (last accessed on 07/05/2016)
Dormond-Béguelin, Marlyse (SPS – VD)	No information on subsequent career in politics or private sector	-
Dupraz, John (FDP – GE)	Intended to run as candidate for the Council of States, but withdrew his candidacy on July 5, 2007; works in his family business as a winemaker	http://www.lecourrier.ch/john_dupraz_contraint_les_radicaux_genevois_a_capituler (last accessed on 07/05/2016) http://www.geneveterroir.ch/en/content/john-dupraz (last accessed on 07/05/2016) https://fr.wikipedia.org/wiki/John_Dupraz (last accessed on 07/05/2016)
Eggly, Jacques-Simon (LPS – GE)	Went on to preside the Swiss Commission for International Peacekeeping; from 2007-2015 he was president of the Organization of the Swiss Abroad (OSA)	http://aso.ch/de/information/pressemitteilungen/neuer-praesident-fuer-die-auslandschweizerorganisation?page=1 (last accessed on 07/05/2016) http://www2.unil.ch/elitessuisses/index.php?page=detailEntite&idEntite=entite1851 (last accessed on 07/05/2016)
Fattebert, Jean (SVP – VD)	Gave up his professional activities; no indication on subsequent career in politics or private sector	http://www.fattebert.ch/cv.html (last accessed on 07/05/2016)

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Legislator	Career Path	Source(s)
Glasson, Jean-Paul (FDP – FR)	In January 2007, he intended to run for both the National Council and the Council of States, but three months later (April 2007) he decided not to run again for federal office; continued political career at local level (Mayor of Bulle FR until 2009)	http://www.20min.ch/ro/news/romandie/story/16109408 (last accessed on 07/05/2016)
		http://www.lagrue.ch/archives/2007/07.01.13/gruyere.htm (last accessed on 07/05/2016)
Guisan, Yves (FDP – VD)	Carried on his profession as physician and became Swiss Honorary Consul in Gibraltar, where he now lives	http://www.yvesguisan.ch/perso/fiche.html (last accessed on 07/05/2016)
Günter, Paul (SPS – BE)	No information on subsequent career in politics or private sector (he was a physician at the Spital Interlaken until 2007)	http://www.jungfrauzeitung.ch/artikel/72149/ (last accessed on 07/05/2016)
Gysin, Remo (SPS – BS)	Became vice-president of OSA (and since 2015 president) and co-president of the Gray Panthers	http://www.tageswoche.ch/de/2014_31/basel/664762/ (last accessed on 07/05/2016)
		http://www.blick.ch/news/schweiz/auslandschweizer-remo-gysin-zum-neuen-praesidenten-der-auslandschweizer-gewaehlt-id4072270.html (last accessed on 07/05/2016)
Haering, Barbara (SPS – ZH)	Chair of the board of directors of Econcept, a private think-tank	http://www.barbara-haering.ch/cv-and-contacts.html (last accessed on 07/05/2016)
Hegetschweiler, Rolf (FDP – ZH)	Announced resignation on 11/29/2006, seems to have retired after 2007	http://www.nzz.ch/articleEPAZ1-1.79475 (last accessed on 07/05/2016)

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Legislator	**Career Path**	**Source(s)**
Imfeld, Adriano (CVP – OW)	Remains active in own consulting company	http://www.imfeld-consulting.ch/cgi-bin/sys/contray.cgi?DATA=&ID=000006&GROUP=001 (last accessed on 07/05/2016)
Jermann, Walter (CVP – BL)	Was active in the Chamber of Commerce BL	http://www.basellandschaftlichezeitung.ch/basel/baselbiet/jermann-ist-fuer-die-cvp-nicht-mehr-tragbar-114358108 (last accessed on 07/05/2016)
Keller, Robert (SVP – ZH)	Remains active in the Homeowner Association ZH	http://www.nzz.ch/articleF5W52-1.356030 (last accessed on 07/05/2016) http://www.hev-zh.ch/home/vorstand/ (last accessed on 07/05/2016)
Kohler, Pierre (CVP – JU)	Continues political career at local and cantonal level (Mayor of Delemont)	http://www.pierrekohler.ch/a-propos (last accessed on 07/05/2016) https://fr.wikipedia.org/wiki/Pierre_Kohler (last accessed on 07/05/2016)
Laubacher, Otto (SVP – LU)	No indication on subsequent career in politics or private sector	https://de.wikipedia.org/wiki/Otto_Laubacher (last accessed on 07/05/2016) http://www.blick.ch/news/luzern-ruecktritt-des-luzerner-svp-kantonalpraesident-id1461445.html (last accessed on 07/05/2016)
Maury Pasquier, Liliane (SPS – GE)	Since 2007 member of the Council of States	http://www.maurypasquier.ch/portrait (last accessed on 07/05/2016)
Menétrey-Savary, Anne-Catherine (GPS – VD)	No information on subsequent career in politics or private sector	https://fr.wikipedia.org/wiki/Anne-Catherine_Men%C3%A9trey (last accessed on 07/05/2016)

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Legislator	Career Path	Source(s)
Oehrli, Fritz Abraham (SVP – BE)	Probably returned to his profession as mountain farmer	http://www.svp-bern.ch/unsere-politik/medienmitteilungen?y=2006&v=VTJGc2RHVmtYMStSdFp5SURMT0dQVmt0U2F1VUlYM2RjNExiT08zVFdCND0= (last accessed on 07/05/2016)
Schmied, Walter (SVP – BE)	Works in renewable energy	https://www.diju.ch/f/notices/detail/4477/walter+schmied (last accessed on 07/05/2016) http://www.nzz.ch/zuerich/ein-windpark-oberhalb-von-baeretswil-1.18102078 (last accessed on 07/05/2016)
Vaudroz, René (FDP – VD)	Went on to work locally (president of tele-leysin) and probably also sat in the local government	http://www.leysin-commune.ch/pics/commun/cms/externLink/1386_PV_no_16_du_25.06.2015.pdf (last accessed on 07/05/2016) http://www.blick.ch/news/schweiz/auch-rene-vaudroz-tritt-zurueck-id1444633.html (last accessed on 07/05/2016)
Vermot-Mangold, Ruth-Gaby (SPS – BE)	Works for her firm Hekate	http://www.hekate.ch/team/vermot.htm (last accessed on 07/05/2016)
Vollmer, Peter (SPS – BE)	After resignation, he was director of the Public Transport Association	https://de.wikipedia.org/wiki/Peter_Vollmer_(Politiker) (last accessed on 07/05/2016) http://peter.vollmer.ch/ (last accessed on 07/05/2016)
Weyeneth, Hermann (SVP – BE)	No indication on subsequent career in politics or private sector	https://de.wikipedia.org/wiki/Hermann_Weyeneth (last accessed on 07/05/2016)

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Legislator	Career Path	Source(s)
		`http://www.nzz.ch/hermann-weyeneth--ein-bernisches-urgestein-1.525886` (last accessed on 07/05/2016)

Note: The table provides information on the post-National Council career paths of those legislators who served during the 47th legislative period and did not seek reelection to a further term. The information comes largely from online biographies, newspaper articles, and press releases issued by interest groups and parties.

4.C Convergence Diagnostics for the IRT Model

Figure 4.C.1 shows the Z-scores of the Geweke diagnostic (Geweke 1992) for the estimation of model (4.7). The Geweke diagnostic takes two nonoverlapping parts of a Markov chain (I am using here the first 10% and the last 50% of the chain after the burn-in period, which are the default values in the `coda` package) and compares the means of the two parts, using a difference of means test. Since the test statistic (Z-score) is asymptotically standard normal, values that are atypical of a standard normal distribution provide evidence that the two portions of the chain differ and, therefore, that the chain has not converged (Gill 2008, 475ff.). The figure shows that the values for the estimated parameters are approximately standard normally distributed. The Geweke diagnostic therefore provides no evidence of nonconvergence of the Markov chain.

Figure 4.C.2 plots the Dependence factors from the Raftery and Lewis diagnostic (Raftery and Lewis 1992). The Raftery and Lewis diagnostic calculates the number of iterations required to estimate some posterior quantile of interest, q, within an accuracy of $+/-r$ with probability p (I report results for the default values in the `coda` package, which are $q = 0.025$, $r = 0.005$, and $s = 0.95$). In addition, the Raftery and Lewis diagnostic also provides a "Dependence factor" that estimates the extent to which autocorrelation inflates the required number of iterations. According to Raftery and Lewis (1992), values larger than five indicate strong autocorrelation, which may be due to an influential starting value, high correlations between coefficients, or poor mixing (Gill 2008, 482-485). The Raftery and Lewis diagnostic shows no indication that the number of iterations of the chain is too small. Moreover, as is shown in the figure, there are no large Dependence factors to worry about.

Finally, Table 4.C.1 shows the percentage of estimated parameters that pass the "Stationarity test" (Column 2) and the "Halfwidth test" (Column 3) from the

Figure 4.C.1: Geweke Diagnostic for the IRT Model

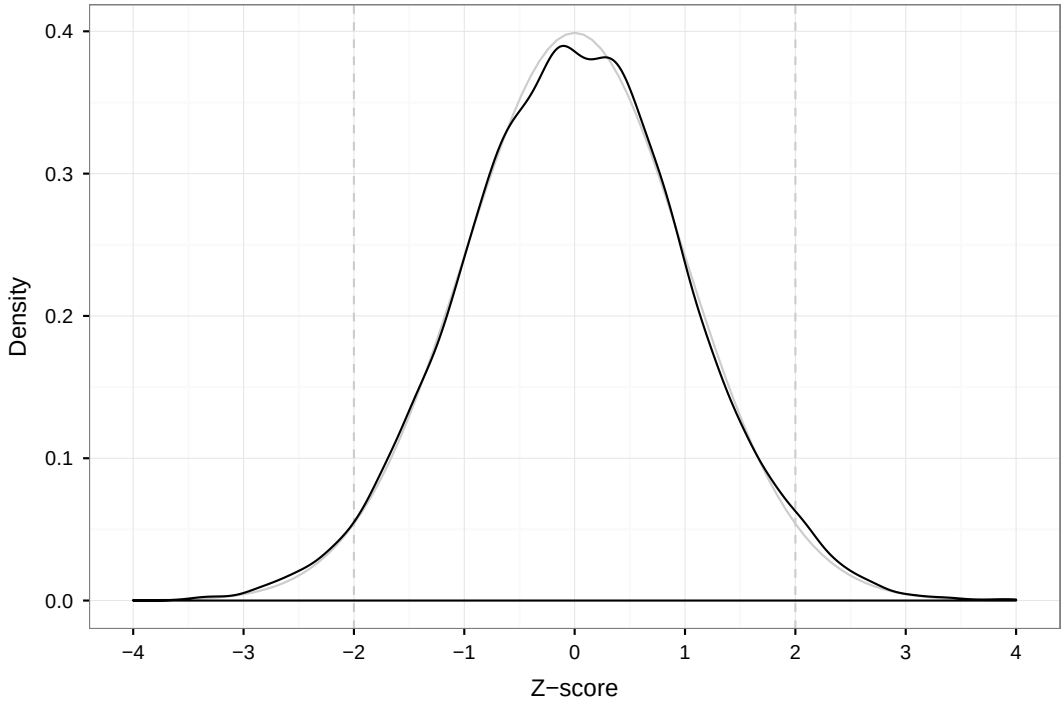
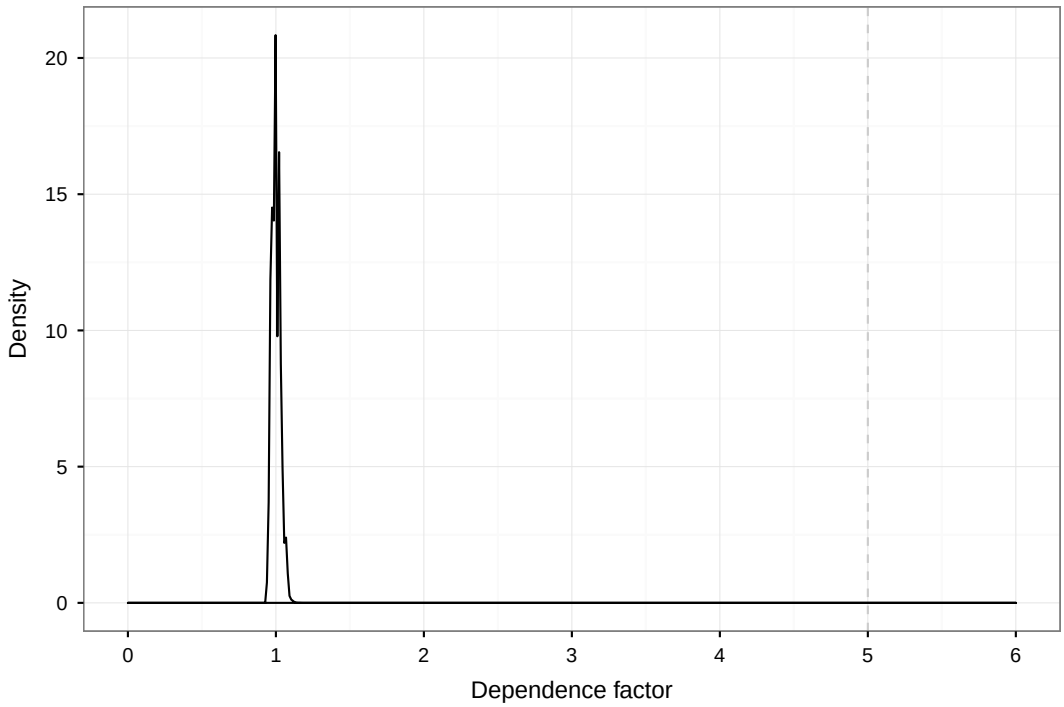


Figure 4.C.2: Raftery and Lewis Diagnostic for the IRT Model



Heidelberger and Welch diagnostic (Heidelberger and Welch 1983). The Heidelberger and Welch diagnostic consists of two parts. It starts with the Stationarity test that uses the Cramer-von-Mises statistic to test whether some portion of the Markov chain is found to be consistent with stationarity. If this is the case, then the Halfwidth test is performed. Using the portion of the chain that passed the Stationarity test, the Halfwidth test calculates a 95% confidence interval for the mean. Half the width of this interval is then compared with the estimate of the mean. If the ratio between the halfwidth and the mean is lower than some level of accuracy, ϵ (the default value in `coda` is $\epsilon = 0.1$), then the chain is considered to be converged (Plummer et al. 2006).

The model shows good convergence properties according to the Stationarity test of the Heidelberger and Welch diagnostic. However, 29.34% of the parameters of the model did not pass the Halfwidth test. This means that for these parameters the Monte Carlo error of the estimated mean of the posterior density is relatively large (Jackman 2009, 254).

Table 4.C.1: Heidelberger and Welch Diagnostic for the IRT Model

	Stationarity Test	**Halfwidth Test**
Parameters that passed the test	99.31%	70.66%
Parameters that failed the test	0.69%	29.34%
Total	100%	100%

4.D Fake Data Analysis

This section presents the results of the fake data analysis. The fake data closely reflect the real-world data from the 47th legislative period of the Swiss National Council. There are 225 legislators and 3,481 votes. Of the 3,481 votes, 1,209 are roll call votes and 2,272 are signal votes. Each legislator is a member of one of nine parties. Party 1 has 17 members, Party 2 has 60 members, Party 3 has five members, Party 4 has 33 members, Party 5 has 46 members, Party 6 has 58 members, Party 7 has three members, Party 8 has two members, and Party 9 consists of a single legislator. Finally, 202 of the 225 legislators are reelection seekers and 23 do not seek reelection to the legislature.

As in the real data analysis, I assume that the probability that legislator i votes

for proposal p is given by

$$\Pr(Y(i,p)=1) = F(\beta_p\xi_i - \alpha_p + \lambda_{j(i)p}\mathbb{1}\{i \text{ reelect}\})D(p,1) + F(\beta_p\xi_i - \alpha_p)(1 - D(p,1)),$$

where $j(i)$ is an index variable for party membership, $D(p,1)$ is an indicator variable that takes the value one if p is voted on by roll call vote and zero otherwise, and $F(\cdot)$ is the standard logistic CDF.

In a first step, I simulated individual voting data (i.e., the $Y(i,p)$) based on (known) random values for α_p, β_p, ξ_i, and $\lambda_{j(i)p}$. In a second step, I fit my model to the simulated voting data to estimate the model parameters. As for the analysis of the real data, I ran a chain of 200,000 iterations, of which I discarded the first 100,000 as burn-in. I then retained every 20th from the remaining 100,000 iterations to generate the posterior distributions for the parameters.

Figure 4.D.1, Figure 4.D.2, and Table 4.D.1 show the convergence diagnostics. Figure 4.D.1 shows the Z-scores of the Geweke diagnostic, Figure 4.D.2 plots the Dependence factors of the Raftery and Lewis diagnostic, and Table 4.D.1 presents the percentages of estimated parameters that pass the Stationarity test and the Halfwidth test of the Heidelberger and Welch diagnostic. While the model shows good convergence properties according to the Geweke diagnostic and the Raftery and Lewis diagnostic, the Halfwidth test of the Heidelberger and Welch diagnostic indicates convergence problems.

Table 4.D.1: Heidelberger and Welch Diagnostic for the Fake Data Analysis

	Stationarity Test	**Halfwidth Test**
Parameters that passed the test	99.32%	68.05%
Parameters that failed the test	0.68%	31.95%
Total	100%	100%

Figure 4.D.3 shows the true and the estimated legislator ideal points. The true values are shown in black color, while the estimated means and 95% HPD intervals of the posterior distributions for the ideal points are shown in gray color. Figure 4.D.4 and Figure 4.D.5 show the true and the estimated item-difficulty parameters and item-discrimination parameters, respectively. The true parameters are printed in black color, while the estimated means and 95% HPD intervals of the posterior

Figure 4.D.1: Geweke Diagnostic for the Fake Data Analysis

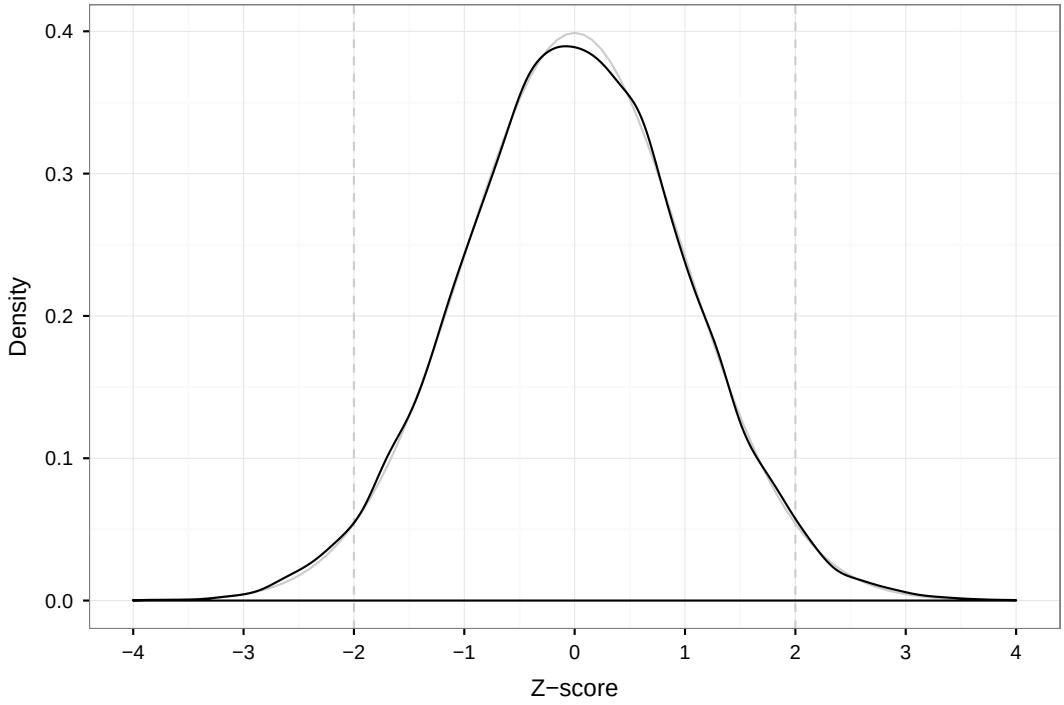
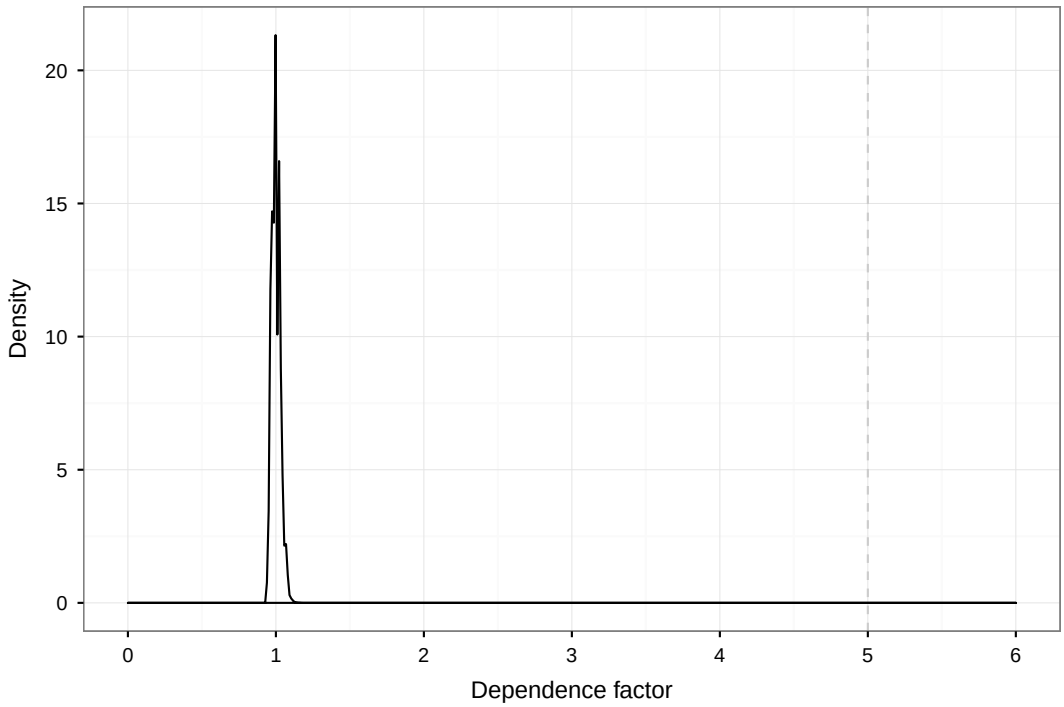


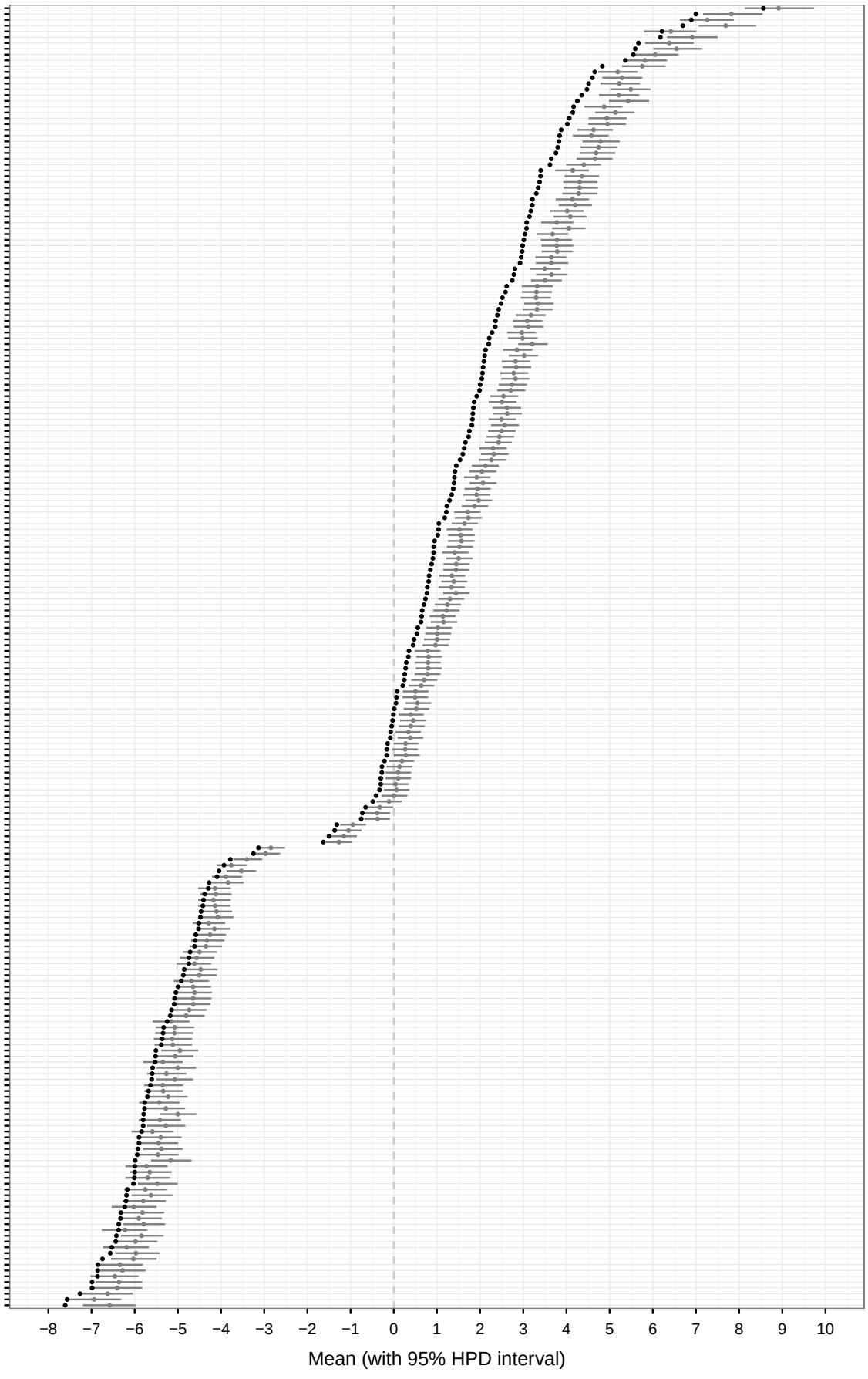
Figure 4.D.2: Raftery and Lewis Diagnostic for the Fake Data Analysis



distributions for these parameters are in dark gray and light gray, respectively. Although most point estimates are close to their true values, the figures suggest that the chain has not yet converged to stationarity.

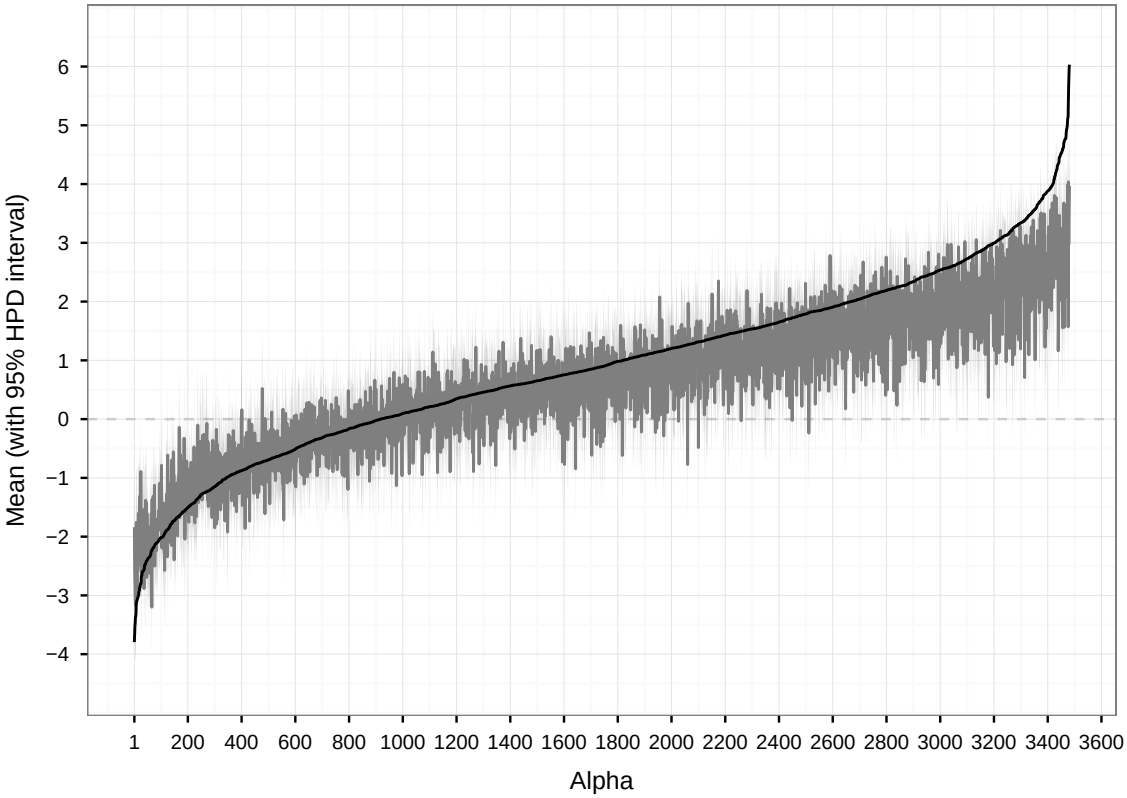
Finally, Figures 4.D.6 to 4.D.14 show for each party the true and the estimated net electoral utilities for reelection-seeking legislators. Again, the true values are shown in black color, while the estimated means and 95% HPD intervals of the posterior distributions are shown in dark gray and light gray, respectively. Most of the true values lie within the 95% CIs. However, as the CIs are rather wide and the estimated means are rather far from the true values, the figures provide additional evidence for the possibility that the chain has not yet fully converged to its stationary distribution.

Figure 4.D.3: Ideal Points of Legislators for the Fake Data Analysis



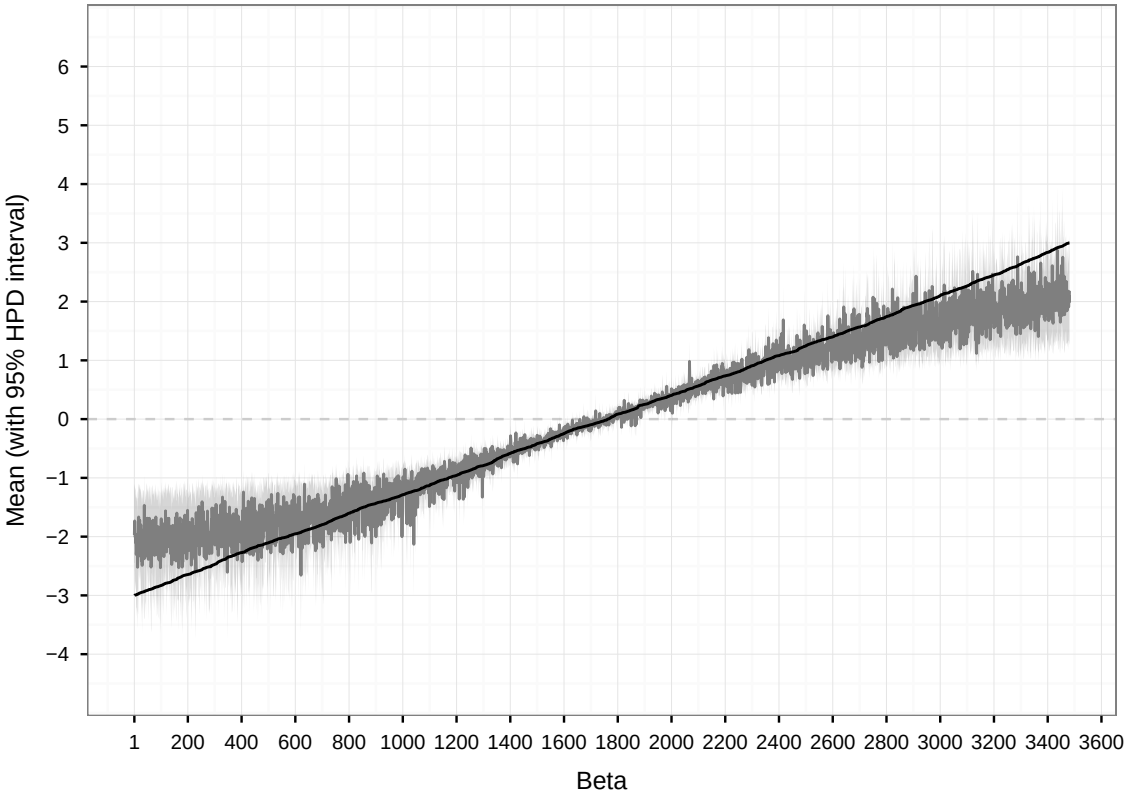
Note: The figure shows the true legislator ideal points (in black color) as well as the estimated means and 95% HPD intervals of the posterior distributions for the ideal points (in gray color).

Figure 4.D.4: Item-Difficulty Parameters for the Fake Data Analysis



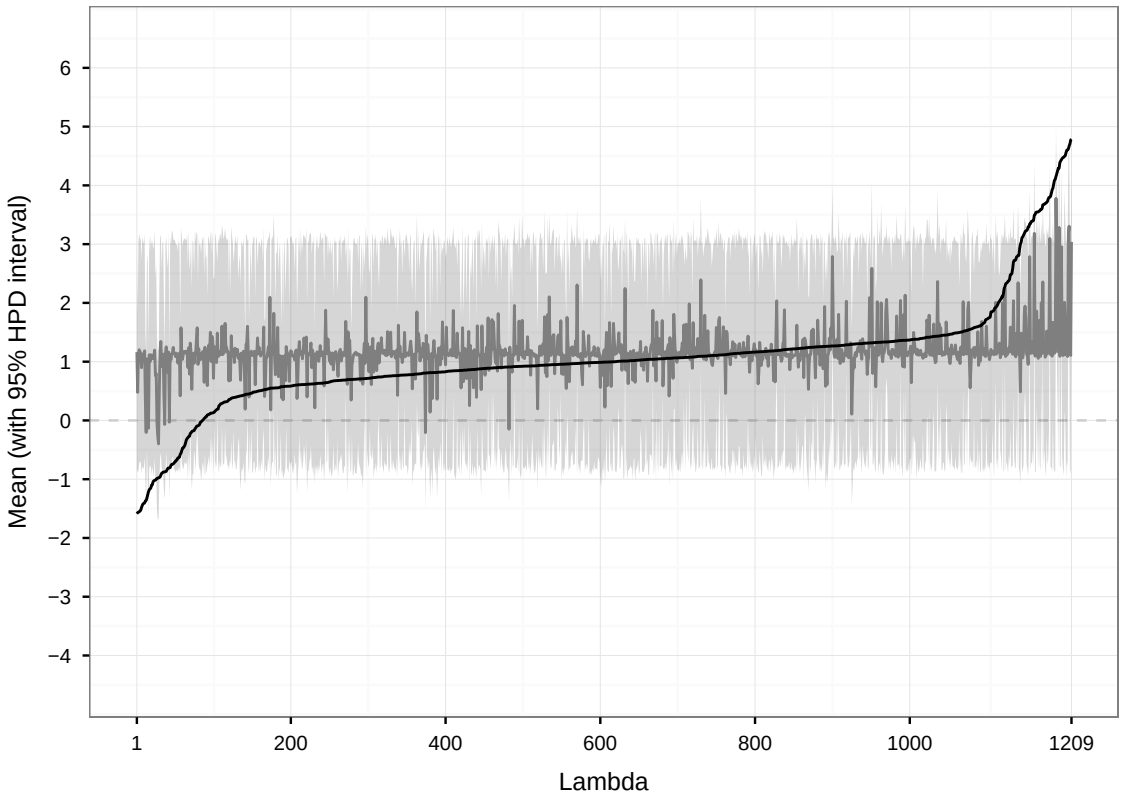
Note: The figure shows the true item-difficulty parameters (in black color) as well as the means and 95% HPD intervals of the posterior distributions for the item-difficulty parameters (in dark gray and light gray, respectively).

Figure 4.D.5: Item-Discrimination Parameters for the Fake Data Analysis



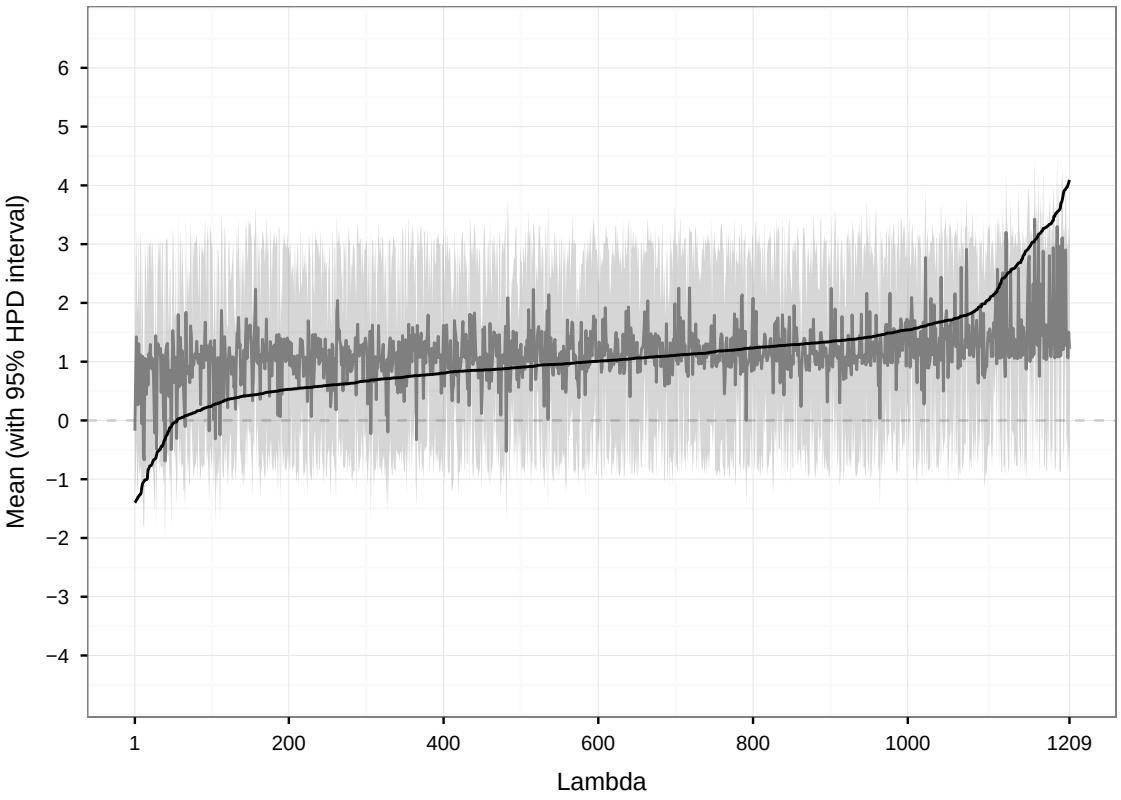
Note: The figure shows the true item-discrimination parameters (in black color) as well as the means and 95% HPD intervals of the posterior distributions for the item-discrimination parameters (in dark gray and light gray, respectively).

Figure 4.D.6: Net Electoral Utilities of Voting for the Proposals in Roll Call Votes for Reelection-Seeking Legislators from Party 1



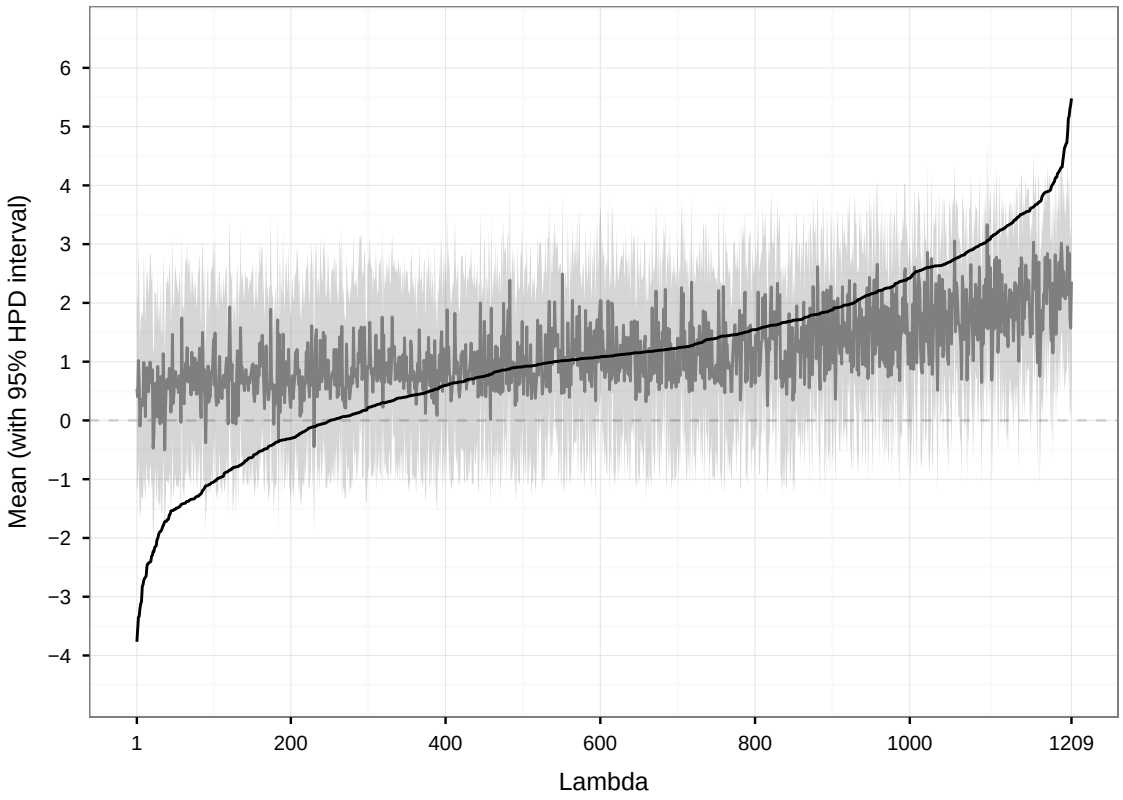
Note: The figure shows the true net electoral utilities of voting for the proposals in roll call votes for reelection-seeking legislators from Party 1 (in black color) as well as the means and 95% HPD intervals of the posterior distributions for these parameters (in dark gray and light gray, respectively).

Figure 4.D.7: Net Electoral Utilities of Voting for the Proposals in Roll Call Votes for Reelection-Seeking Legislators from Party 2



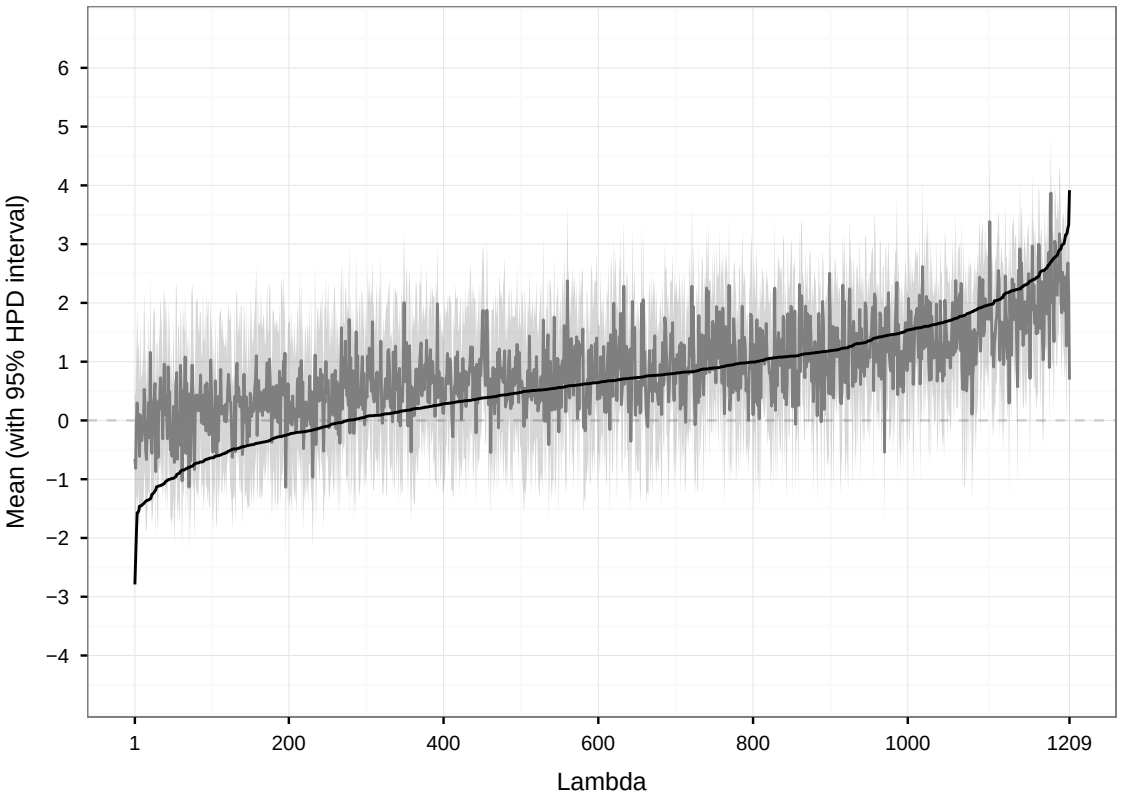
Note: The figure shows the true net electoral utilities of voting for the proposals in roll call votes for reelection-seeking legislators from Party 2 (in black color) as well as the means and 95% HPD intervals of the posterior distributions for these parameters (in dark gray and light gray, respectively).

Figure 4.D.8: Net Electoral Utilities of Voting for the Proposals in Roll Call Votes for Reelection-Seeking Legislators from Party 3



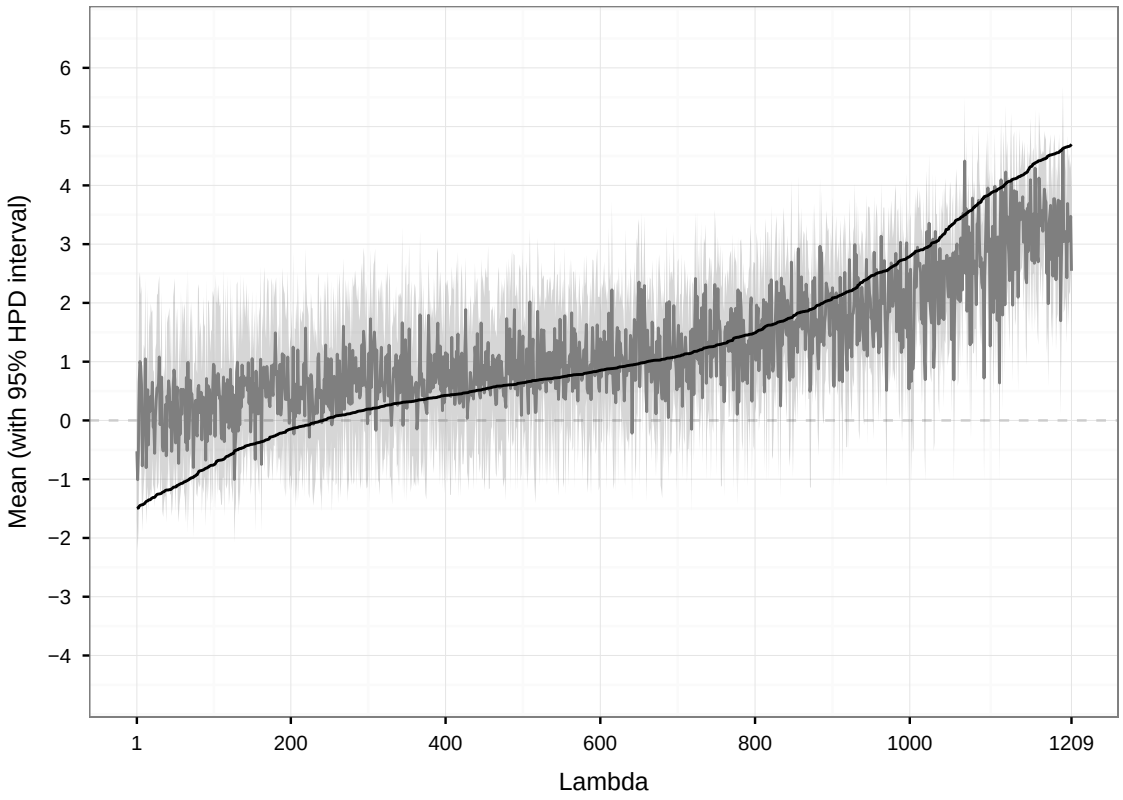
Note: The figure shows the true net electoral utilities of voting for the proposals in roll call votes for reelection-seeking legislators from Party 3 (in black color) as well as the means and 95% HPD intervals of the posterior distributions for these parameters (in dark gray and light gray, respectively).

Figure 4.D.9: Net Electoral Utilities of Voting for the Proposals in Roll Call Votes for Reelection-Seeking Legislators from Party 4



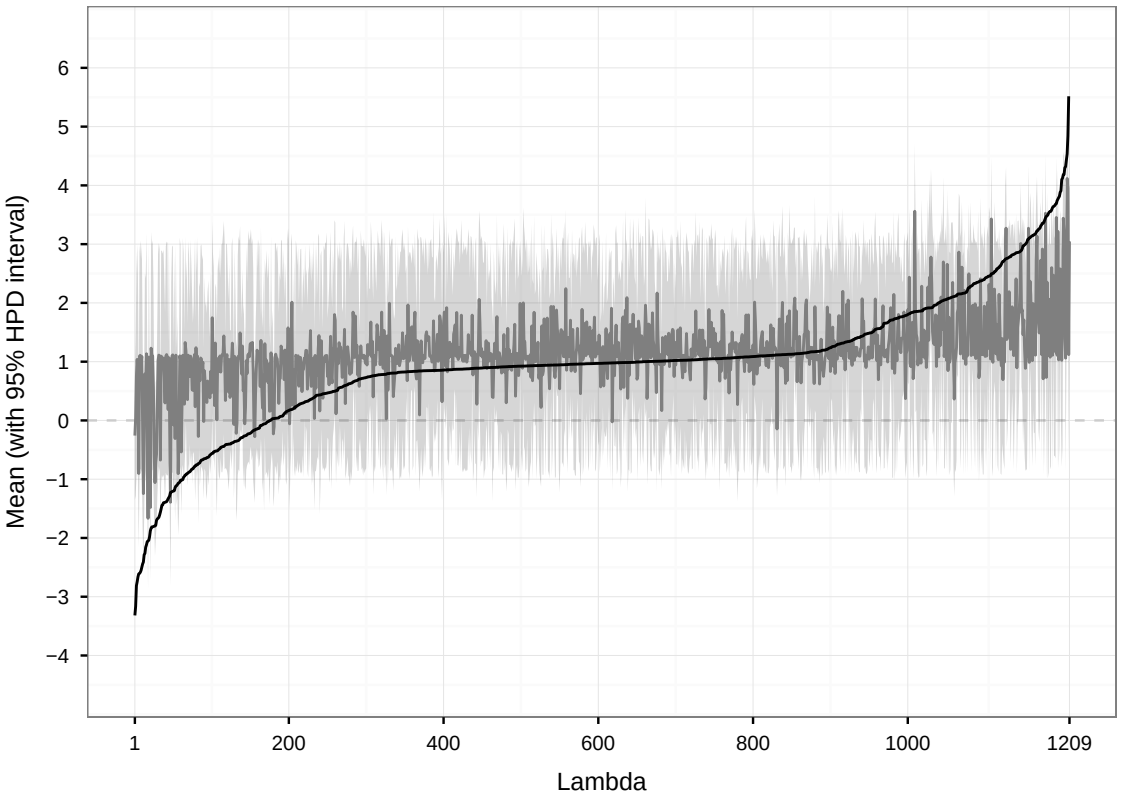
Note: The figure shows the true net electoral utilities of voting for the proposals in roll call votes for reelection-seeking legislators from Party 4 (in black color) as well as the means and 95% HPD intervals of the posterior distributions for these parameters (in dark gray and light gray, respectively).

Figure 4.D.10: Net Electoral Utilities of Voting for the Proposals in Roll Call Votes for Reelection-Seeking Legislators from Party 5



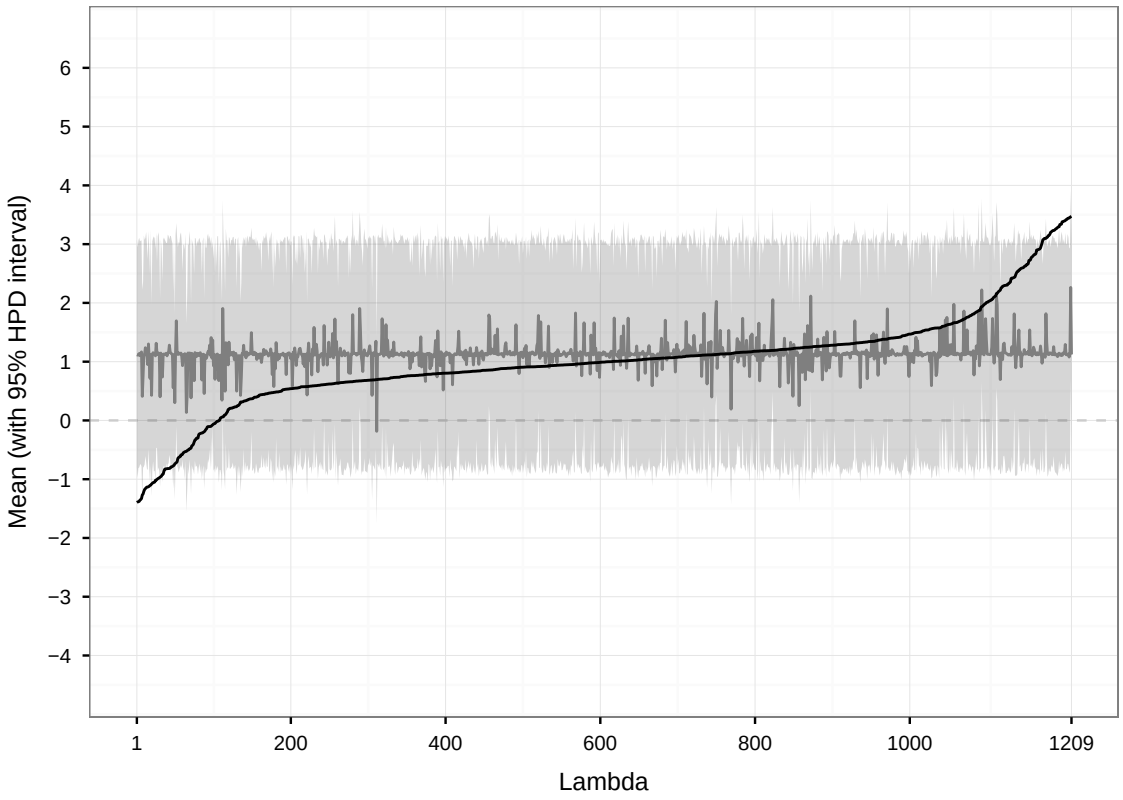
Note: The figure shows the true net electoral utilities of voting for the proposals in roll call votes for reelection-seeking legislators from Party 5 (in black color) as well as the means and 95% HPD intervals of the posterior distributions for these parameters (in dark gray and light gray, respectively).

Figure 4.D.11: Net Electoral Utilities of Voting for the Proposals in Roll Call Votes for Reelection-Seeking Legislators from Party 6



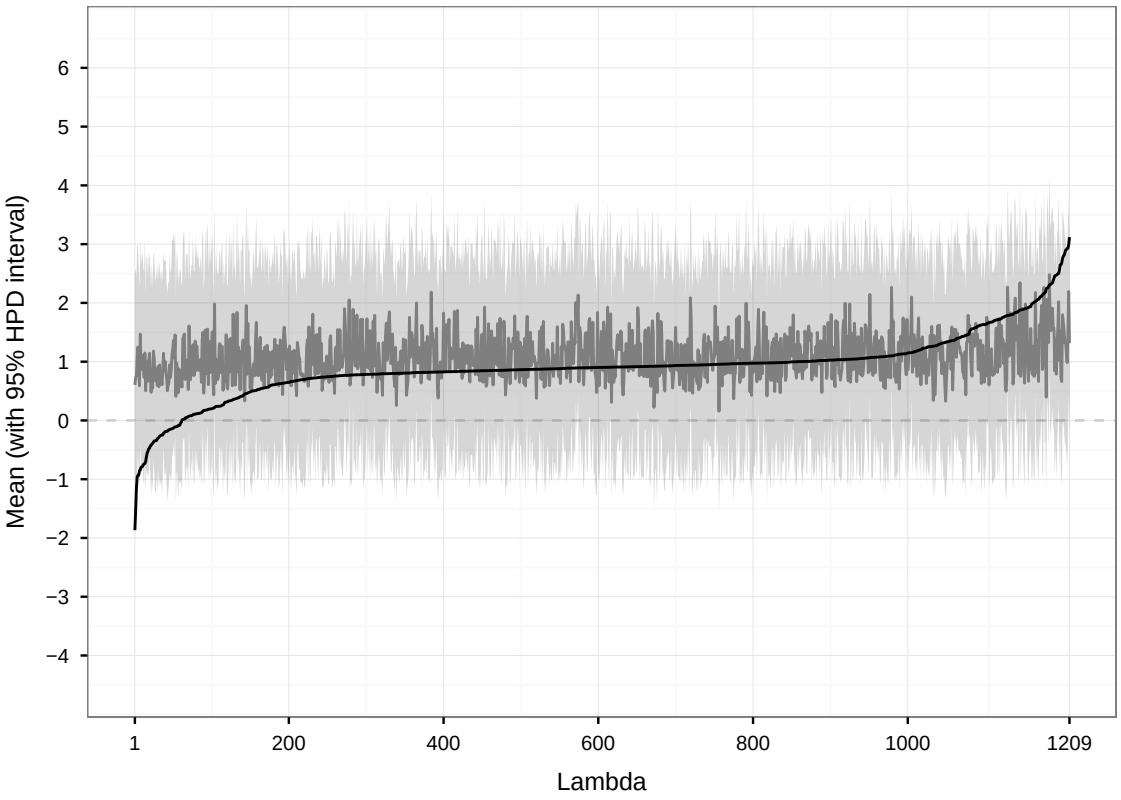
Note: The figure shows the true net electoral utilities of voting for the proposals in roll call votes for reelection-seeking legislators from Party 6 (in black color) as well as the means and 95% HPD intervals of the posterior distributions for these parameters (in dark gray and light gray, respectively).

Figure 4.D.12: Net Electoral Utilities of Voting for the Proposals in Roll Call Votes for Reelection-Seeking Legislators from Party 7



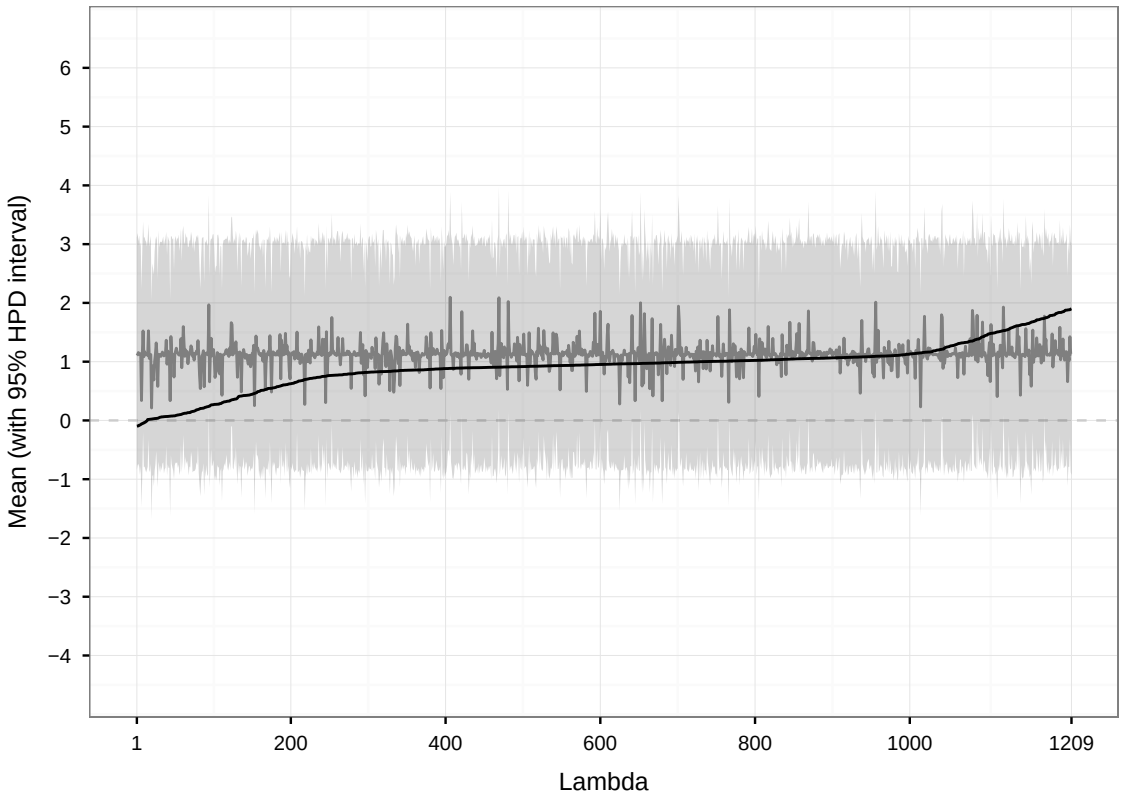
Note: The figure shows the true net electoral utilities of voting for the proposals in roll call votes for reelection-seeking legislators from Party 7 (in black color) as well as the means and 95% HPD intervals of the posterior distributions for these parameters (in dark gray and light gray, respectively).

Figure 4.D.13: Net Electoral Utilities of Voting for the Proposals in Roll Call Votes for Reelection-Seeking Legislators from Party 8



Note: The figure shows the true net electoral utilities of voting for the proposals in roll call votes for reelection-seeking legislators from Party 8 (in black color) as well as the means and 95% HPD intervals of the posterior distributions for these parameters (in dark gray and light gray, respectively).

Figure 4.D.14: Net Electoral Utilities of Voting for the Proposals in Roll Call Votes for Reelection-Seeking Legislators from Party 9



Note: The figure shows the true net electoral utilities of voting for the proposals in roll call votes for reelection-seeking legislators from Party 9 (in black color) as well as the means and 95% HPD intervals of the posterior distributions for these parameters (in dark gray and light gray, respectively).

Chapter 5

The Choice of Roll Call Vote Constraints in Democratic Legislatures

> *"He who loves practice without theory is like the sailor who boards ship without a rudder and compass and never knows where he may be cast."*
>
> Leonardo da Vinci, *1452-1519*

I have shown in Chapter 2 that the requirements for roll call votes vary considerably across democratic legislatures. While in some chambers practically all business is conducted by roll call, in others invoking a roll call vote requires the consent of a majority of the chamber. Legislators care about whether votes are taken by roll call or not because voting transparency, as the analysis in Chapter 4 has demonstrated, enables actors outside the legislature to reward and punish officeholders for their voting behavior.

In this chapter, I will develop a game-theoretic model to explore the conditions under which legislators choose to constrain the use of roll call votes in the legislature. The chapter is structured as follows. I first describe the model in Section 5.1 and then present the equilibrium analysis in Section 5.2. In Section 5.3, I derive comparative statics and Section 5.4, finally, concludes the chapter.

5.1 The Model

A legislature consists of $2n + 1$ legislators, where n is a positive integer. Denote the set of legislators by N. The set of legislators is divided into two parties, A and B,

with $A \cup B = N$ and $A \cap B = \varnothing$. Without loss of generality, assume that party A is more left-wing than party B. Furthermore, assume that party A has a simple majority in the legislature, i.e., $|A| = n + 1$ and $|B| = n$.

The game has three stages, an *organizational stage*, a *policymaking stage*, and an *election stage*. First, in the organizational stage, legislators bargain over the requirements for roll call voting, $c \in C$. I assume here a uniform roll call constraint assignment rule $g \in G$, which means that $g(p) = c$ for all policy proposals $p \in M$.

Second, in the policymaking stage, legislators bargain over policies. Let the treatment status variable $D_g(p, 1) \in \{0, 1\}$ be a random indicator variable that takes on the value one if proposal p is voted on by roll call and zero otherwise. Its probability mass function is $f(d) = \Pr(D_g(p, 1) = d)$.[1] I assume that $\Pr(D_g(p, 1) = 1) < \Pr(D_{g'}(p, 1) = 1)$, where $g \in G$ is a roll call constraint assignment rule that imposes a constraint $c \in C$ that is stronger than the constraint $c' \in C$ assigned by rule $g' \in G$, thus making it less likely for a roll call vote to occur.[2]

Third, after the bargaining over policy has ended, parliamentary elections take place. In the election stage, the fate of each reelection-seeking legislator depends on a representative voter who decides whether to reelect the legislator or to replace her with a challenger.[3]

The purpose of the model is to explain why roll call constraints vary across legislatures. Provided that different constraints $c \in C$ make the occurrence of roll call votes more or less likely, and assuming that $f(d)$ is common knowledge, legislators can choose c so as to attain their preferred probability of roll call vot-

[1] Treating $D_g(p, 1)$ as a random variable depending on c is a simplification that allows me to abstract from modeling the treatment selection process r. Note that by writing $D_g(p, 1)$ I explicitly recognize that variable D depends on the roll call constraint assignment rule $g \in G$, which assigns constraint $c \in C$ to proposal p (in contrast, in Chapter 1, I dropped subscript g, keeping the dependence of D on g implicit).

[2] This assumption implies that the treatment assignment rule r is a random process depending on roll call constraint $c \in C$ assigned by rule $g \in G$: the stricter the constraint c that legislators choose in the organizational stage, the less likely it is that in the policymaking stage some proposal p is voted on by roll call. Carey (2009) and Stecker (2010, 2013, 2015) provide empirical evidence supporting this assumption. As already mentioned in Chapter 2, Carey (2009, 57-60) shows in his analysis of 24 legislative chambers in 15 Latin American countries and the United States that the size of the roll call request threshold (i.e., the proportion of legislators necessary to request a roll call vote) is clearly negatively associated with the number of votes that are taken by roll call in a legislature. Similar, though more suggestive, evidence also comes from Stecker's (2010; 2013; 2015) data on roll call voting in German state parliaments: roll call votes are relatively frequent in parliaments with low roll call thresholds (e.g., the parliaments of Bavaria, Baden-Württemberg, and Brandenburg), whereas only a few such votes occur in parliaments with higher thresholds (e.g., the parliaments of Lower Saxony, Rhineland-Palatinate, and Schleswig-Holstein). There are, however, also some notable exceptions, such as the Saarland parliament, where roll call votes are rare despite a low threshold for roll call voting.

[3] Clearly, legislators' reelection concerns relate not only to voters but also to other outside actors that control valuable resources (such as selectorates, interest groups, campaign donors, etc.). For reasons of simplicity, I refer to them as "voters" in my model.

ing. To simplify notation, I let x denote the probability of voting by roll call, i.e., $x \equiv \Pr(D_g(p,1)=1) \in [0,1]$. Moreover, to simplify further, I let legislators bargain directly over probability x (rather than over $g \in G$, which would then determine x) in the organizational stage.

Consequently, if in the organizational stage legislators choose $x = 0$, then roll call votes occur with zero probability and policy proposals are systematically voted on by signal vote in the policymaking stage. On the other hand, if legislators choose $x = 1$, then all policy proposals are voted on by roll call vote. Finally, if $0 < x < 1$, then signal votes are the legislature's standard method of voting, but legislative decisions are taken by roll call with a positive probability less than one.

5.1.1 Legislator Preferences and Their Beliefs About Constituent Preferences

As in Section 1.5 and Chapter 4, I assume that legislators care about both policy and reelection. In the policymaking stage, the legislature makes policy on one-dimensional policy issues, $s \in S$. Following Diermeier and Vlaicu (2011), I define a policy issue s as a particular ordering of legislator ideal points. In addition, I impose the assumption that for each issue $s \in S$ the ideal points of co-partisans must be adjacent to each other. When a policy issue is taken up at the beginning of the policymaking stage, the ordering of legislator ideal points is fixed and common knowledge.

Policy issues can be more or less polarized. If issue s is completely polarized, then the legislators of party A have ideal points to the left of the median and at the median position, while the legislators of party B have ideal points that are to the right of the median. For a completely polarized issue, I thus assume that the legislators' ideal points are the integers $\{-n, -n+1, \ldots, -1, 0, 1, \ldots, n-1, n\}$, with party A members' ideal points ranging from $-n$ to 0 and party B members' ideal points ranging from 1 to n.

On the other hand, if issue s is not completely polarized, then there is an overlap between the legislators of party A and party B. I assume that in this case, the legislators' ideal points are given by $\{-n+\kappa, -n+\kappa+1, \ldots, -1+\kappa, \kappa, 1-\kappa, \ldots, n-\kappa-1, n-\kappa\}$, where 2κ is the overlap between party A and party B, with $2\kappa < n$ for some positive integer κ.[4] The ideal points of the members of party A now range

[4] Assuming that the overlap of ideal points is an even number ensures that the median ideal point is always located at zero, which simplifies the algebra. Constraint $2\kappa < n$ follows from the assumption that party A is more left-wing than party B. More precisely, $2\kappa < n$ ensures that there is no complete overlap between the two parties, which implies that the left-most legislator in parliament is always a member of party A and the right-most legislator is always a member of

from $-n+\kappa$ to κ and the ideal points of the members of party B range from $1-\kappa$ to $n-\kappa$. Hence, not complete polarization implies that at least one member of party A is on the right of the median ideal point.[5] Let $k(s)$ be a variable that measures the degree of party similarity with regard to issue s, taking on the value zero if party A and B are completely polarized and the value κ if they are not completely polarized over issue s. Thus, it is

$$k(s) = \begin{cases} 0 & \text{if party } A \text{ and } B \text{ are completely polarized on issue } s \\ \kappa & \text{if party } A \text{ and } B \text{ are not completely polarized on issue } s. \end{cases}$$

To illustrate, Figure 5.1 shows the ideal points of legislators in a parliament with 15 members (i.e., $n = 7$) and party overlap parameter $\kappa = 2$ for (i) a completely polarized issue (in the left panel of the figure) and (ii) a not completely polarized issue (in the right panel of the figure). Note that if the legislature is completely polarized over an issue, the legislators' ideal points range from $-n$ to n. On the other hand, if the legislature bargains over an issue that does not completely polarize the parties, then the ideal points of legislators range from $-n+\kappa$ to $n-\kappa$ (and the overlap between party A and B is $2\kappa = 4$).

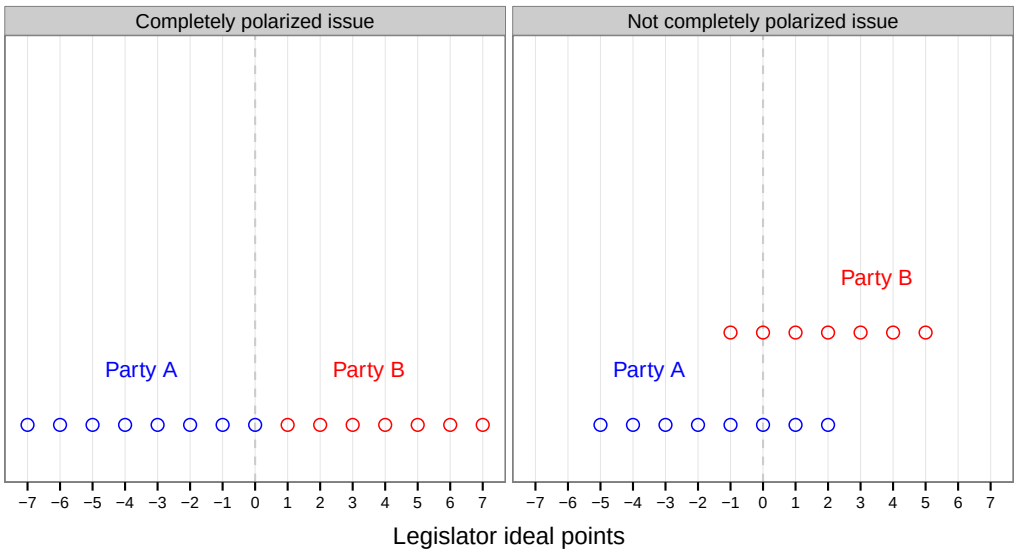
For each issue $s \in S$, a policy alternative p is a real number in the interval $[-n+k, n-k]$. I assume that if the legislators fail to agree on a policy proposal and bargaining over issue s ends, the status quo, denoted $sq(s)$, prevails.[6] Let $\xi_i(s)$ denote the ideal point of legislator i on issue s and let $U_p(i,\cdot)$ be the utility that i obtains from policymaking. Legislator i's preferences over policy alternatives $p \in [-n+k, n-k]$ and the status quo $sq(s)$ are then represented by the following

party B.

[5] In Diermeier and Vlaicu's (2011) model a not completely polarized issue also implies that at least one member of party A has an ideal point to the right of the issue median (they call this a "mixed" issue). However, Diermeier and Vlaicu's (2011) structure of legislator preferences differs in two ways from the structure in my model. First, their model does not require the ideal points of co-partisan legislators to be next to each other. Second, they impose the restriction that legislators cannot have identical ideal points. Therefore, in their model, the legislator ideal points are always given by the integers $\{-n, -n+1, \ldots, -1, 0, 1, \ldots, n-1, n\}$.

[6] I assume in the model that bargaining over an issue can end due to opportunity costs, which are a consequence of the "plenary bottleneck" problem that arises in all busy legislatures (Cox and McCubbins 2005; Cox 2006). As Cox (2006, 143) argues, "(1) bills can only pass pursuant to formal motions and votes in the plenary session; (2) motions pass if a majority of members vote for them; (3) the plenary session faces a hard budget constraint on time [...]." These premises imply that a vote on any bill is subject to an opportunity cost, as the time spent on the bill could be used to consider some other bill (Diermeier and Vlaicu 2011, 363; see also Diermeier, Prato and Vlaicu 2015).

Figure 5.1: Legislator Ideal Points for a Completely Polarized Issue and a Not Completely Polarized Issue (for $n = 7$ and $\kappa = 2$)



Note: The figure shows the legislator ideal points for a completely polarized issue (in the left panel) and a not completely polarized issue (in the right panel) for $n = 7$ and $\kappa = 2$. The ideal points of the legislators of party A are shown in blue and the ideal points of the legislators of party B are shown in red color. If the legislature is completely polarized over an issue, then the legislator ideal points range from $-n$ to n. On the other hand, if there is no complete polarization in the legislature, then the ideal points of legislators range from $-n+\kappa$ to $n-\kappa$ (and the overlap between party A and B is $2\kappa = 4$).

utility function:

$$U_p(i,\cdot) = \begin{cases} h(|p - \xi_i(s)|) & \text{if policy proposal } p \text{ is adopted} \\ 0 & \text{if the status quo policy } sq(s) \text{ prevails,} \end{cases}$$

where h is twice continuously differentiable, strictly decreasing, strictly concave, $h'(0) = 0$, and $h(2n) \geq 0$. Note that these assumptions imply that function $U_p(i,\cdot)$ is symmetrically single-peaked at legislator i's ideal point, $\xi_i(s)$. Moreover, the assumption that payoffs from policy proposals are nonnegative ensures that all legislators prefer to agree on some proposal p than to bargain forever over an issue (this assumption is standard in bargaining models with a status quo that gives zero utility to everyone; see, e.g., Banks and Duggan 2000; Diermeier and Vlaicu 2011).

In addition to policy, legislators also care about reelection. In the election stage, voters decide whether to reelect their incumbent legislators or vote them out of office. I assume that legislator i's preferences over election outcomes are represented by the following utility function:

$$U_e(i,\cdot) = \begin{cases} \lambda & \text{if legislator } i \text{ is reelected} \\ 0 & \text{otherwise,} \end{cases}$$

where $\lambda > 0$. Thus, all legislators are assumed to attach a common (positive) value to being reelected. Assuming that the utility obtained from policymaking, $U_p(i,\cdot)$, and the utility obtained from the election outcome, $U_e(i,\cdot)$, are additively separable, legislator i's utility function is given by

$$U(i,\cdot) = U_p(i,\cdot) + U_e(i,\cdot).$$

In the election stage, voters can either reelect their legislators or vote them out of office. I model the voters as part of the environment (and not as players in the game) and assume that they act according to the following decision rule. Voters care about the policymaking behavior of their legislators. Let ν_i denote the representative voter that decides on the fate of legislator i.[7] If in the policymaking stage the legislature votes by roll call vote, then voter ν_i can observe whether the voting behavior of legislator i reflects her policy preferences. I assume that voter ν_i decides to reelect legislator i if only if i votes in line with her preferences. Otherwise, if legislator i votes against ν_i's preferences, ν_i decides to elect i's challenger in the election stage.

[7]For example, if candidates are elected by majority rule, the policy space is unidimensional, and voters' policy preferences are single-peaked, then the representative voter (also called the pivotal or decisive voter) is the median voter (e.g., Hotelling 1929; Downs 1957; Mueller 2003).

On the other hand, if in the policymaking stage the legislature votes by signal vote, then voter ν_i is not able to observe the voting behavior of legislator i and, therefore, cannot learn whether or not i votes in line with her policy preferences. In this case, I assume that in the election stage voter ν_i flips a (fair) coin in order to decide whether to reelect legislator i or elect i's challenger to parliament. Consequently, if the legislature passes a proposal by signal vote, each legislator has a fixed probability of 0.5 of being reelected.

In addition, as with legislators, I assume that voters prefer some agreement over indefinite bargaining. Voters therefore want their representatives to eventually settle on some policy proposal. Thus, if the legislature fails to adopt a policy proposal (which means that the status quo $sq(s)$ prevails), all legislators are replaced with their challengers in the election stage.

At the beginning of the policymaking stage, when an issue is taken up and bargaining over policies begins, the policy preferences of voters are common knowledge (e.g., due to opinion polls, media coverage, information from interest groups, letters from constituents, etc.). In the organizational stage, however, legislators are assumed to be uncertain about their constituents' policy preferences. For simplicity, I assume that for each issue $s \in S$, the constituents can be either of two types: left-wing (denoted as type e) or conservative (denoted as type o). If constituents are of the left-wing type, then they prefer policies that are to the left or at the position of the median legislator to policies that are to the right of the median. On the other hand, if constituents are conservative, then they endorse policies that are to the right of or at the median position and reject those that are to the left of the median. Let $\theta \in \Theta = \{e, o\}$ denote the type of voters and let $\rho \in [0, 1]$ be the belief of legislators in the organizational stage that constituents are of the left-wing type, i.e., $\theta = e$.

Finally, I assume that in the organizational stage, legislators are uncertain about which policy issues will arise in the policymaking stage. Let $\pi \in [0, 1]$ denote the probability that a completely polarized issue occurs (thus implying that $k = 0$) and let $(1 - \pi)$ be the probability that a not completely polarized issue occurs (which implies that $k = \kappa$) in the policymaking stage. All completely polarized issues are equally likely and, for a given κ, all not completely polarized issues are equally likely. This means that the probability of any completely polarized issue is given by $\frac{\pi}{n!(n+1)!}$ and the probability of any not completely polarized issue is given by $\frac{1-\pi}{(n-\kappa)!(n-\kappa+1)!}$. Both probability π and the party overlap parameter κ are exogenous and common knowledge among legislators.

5.1.2 Timing of the Game

The legislators bargain first over the probability of roll call votes and then, with the agreed roll call probability in place, over policy alternatives. After a policy proposal has been adopted (or, alternatively, if the status quo prevails), the representative voters decide whether or not to reelect their legislators. More precisely, the timing of the game is as follows.

Organizational stage:

1. Bargaining over roll call probability $x \in [0,1]$ begins with an agenda setter who is randomly selected from the set of legislators N to make a proposal for x.
2. All legislators simultaneously vote on the proposal for x.
   a. If a majority votes in favor, then the proposal is adopted. Bargaining over the probability of roll call votes ends and the game moves to the policymaking stage.
   b. If the proposal does not receive a majority of votes, then bargaining over the probability of roll call votes continues.
3. Step 1 is repeated.

Policymaking stage:

4. A policy issue $s \in S$ is taken up. Nature decides with probability $\pi \in [0,1]$ (respectively, $1-\pi$) that s is a completely polarized issue (respectively, not completely polarized issue), with probability $\rho \in [0,1]$ (respectively, $1-\rho$) that voters are of the left-wing type, $\theta = e$ (respectively, conservative type, $\theta = o$), and with probability x (respectively, $1-x$) that the decisions on issue s are taken by roll call vote (respectively, signal vote). The type of the issue, the voters, and the voting procedure are known to all.
5. Bargaining on issue s begins with an agenda setter who is randomly selected from the set of legislators N to make a policy proposal $p \in [-n+k, n-k]$.
6. All legislators simultaneously vote on proposal p.
   a. If a majority votes in favor, then the proposal is adopted. Bargaining on issue s ends and the game moves to the election stage.
   b. If the proposal does not receive a majority of votes, then bargaining ends with probability $\gamma \in (0,1)$ (due to opportunity costs). If bargaining ends, the status quo $sq(s)$ prevails and the game moves to the election stage.
7. If bargaining on s continues, then a legislator is randomly selected from N to make an amendment p.
8. All legislators simultaneously vote on amendment p.
   a. If a majority votes in favor, then the amendment is adopted. Bargaining on issue s ends and the game moves to the election stage.

b. If the amendment does not receive a majority of votes, then bargaining ends with probability γ (due to opportunity costs). If bargaining ends, the status quo $sq(s)$ prevails and the game moves to the election stage.

9. Step 7 is repeated.

Election stage:

10. Each legislator i is either reelected or voted out of office, depending on (a) whether a policy proposal p was adopted or the status quo $sq(s)$ prevailed; (b) if a proposal p was adopted, whether a roll call vote or a signal vote was used to vote on p; and (c) if p was adopted by a roll call vote, whether legislator i voted according to or against the preferences of her representative voter ν_i.

    a. If in the policymaking stage the status quo $sq(s)$ prevailed, voter ν_i decides to elect legislator i's challenger. Legislator i is not reelected and, therefore, receives a zero payoff.

    b. If in the policymaking stage proposal p was adopted by a signal vote, voter ν_i flips a (fair) coin to decide whether to reelect legislator i or elect i's challenger to parliament.

    c. If in the policymaking stage proposal p was adopted by a roll call vote, voter ν_i decides to reelect legislator i if i voted in line with ν_i's preferences on issue s. On the other hand, if i voted against the preferences of ν_i, then ν_i decides to vote i out of office.

5.1.3 Equilibrium Concept

I characterize strategy profiles for legislators that are sequentially rational. Each bargaining game has two types of strategies: proposal strategies and voting strategies. As in Diermeier and Vlaicu (2011), there are two requirements for proposal strategies: first, proposal strategies are stationary; and second, stationary strategies are no-delay, which means that legislators only make proposals that a majority prefers over waiting for the next round of bargaining. For voting strategies, I require that they are weakly undominated (see, again, Diermeier and Vlaicu 2011).

5.2 Equilibrium Analysis

I first analyze the policymaking equilibrium in Subsection 5.2.1. Then, based on legislators' expectations about future policymaking behavior, I solve for the equilibrium in the organizational stage in Subsection 5.2.2.

5.2.1 Policymaking Equilibrium

In the policymaking stage, legislators bargain over a one-dimensional policy issue $s \in S$. When they start bargaining over a particular issue s, both the ordering of legislator ideal points and the type of constituents, $\theta \in \Theta$, is common knowledge. Moreover, legislators know whether proposals on issue s are voted on by signal vote or roll call vote. After a randomly selected agenda setter has made a policy proposal $p \in [-n+k, n-k]$, a vote on that proposal takes place.

The following three cases can be distinguished: first, proposals on issue s are voted on by signal vote and constituents are either of the left-wing type ($\theta = e$) or of the conservative type ($\theta = o$); second, proposals are voted on by roll call vote and constituents are of the left-wing type ($\theta = e$); and third, proposals are voted on by roll call vote and constituents are of the conservative type ($\theta = o$).

Case I: Signal Voting With Constituents of Type $\theta = e$ or Type $\theta = o$

Suppose, first, that proposals on issue s are voted on by signal vote and constituents are either of the left-wing type or of the conservative type. This case occurs with probability $(1 - x)$. Because voter ν_i is not able to monitor legislator i's voting behavior, she flips a coin to decide whether or not to reelect i in the election stage if in the policymaking stage a proposal p was adopted. Assuming, without loss of generality, that a legislator is reelected if the coin turns up heads, legislator i's payoff from adopting proposal p in a signal vote is

$$U_{sig}(i, p; \lambda) = \begin{cases} h(|p - \xi_i(s)|) + \lambda & \text{if the coin lands heads} \\ h(|p - \xi_i(s)|) & \text{otherwise.} \end{cases}$$

The reelection probability of legislator i does not depend on her voting behavior but on a random coin toss. Thus, in the policymaking stage, legislator i's expected payoff from passing proposal p in a signal vote is given by

$$E[U_{sig}(i, p; \lambda)] = h(|p - \xi_i(s)|) + 0.5\lambda.$$

Depending on whether the legislature is completely polarized (i.e., $k = 0$) or not

(i.e., $k = \kappa$), there may be one (if $k = 0$) or two (if $k = \kappa$) legislators with ideal points located at zero (see, e.g., Figure 5.1). Note that in any case, the median legislator's ideal point is equal to zero. In equilibrium, the legislator(s) with ideal point(s) at zero is/are pivotal at any vote.[8] Let $\Delta^*_{sig}(k;\gamma,\lambda)$ denote the maximal equilibrium policy deviation that a pivotal legislator is willing to tolerate in a signal vote. Distance Δ^*_{sig} is implicitly given by the following recursive equation:

$$\begin{aligned} h(\Delta_{sig}) + 0.5\lambda = (1-\gamma)\Bigg(&\frac{1}{2n+1}\Big[\mathbb{1}\{0 \geq \Delta_{sig} - k\}h(\Delta_{sig}) \\ &\qquad + \mathbb{1}\{0 < \Delta_{sig} - k\}h(k)\Big] \\ &+ \frac{2}{2n+1}\sum_{i=1}^{n}\Big[\mathbb{1}\{i \geq \Delta_{sig} + k\}h(\Delta_{sig}) \\ &\qquad + \mathbb{1}\{i < \Delta_{sig} + k\}\mathbb{1}\{i \leq -\Delta_{sig} + k\}h(\Delta_{sig}) \\ &\qquad + \mathbb{1}\{i < \Delta_{sig} + k\}\mathbb{1}\{i > -\Delta_{sig} + k\}h(|i-k|)\Big] \\ &+ 0.5\lambda\Bigg). \end{aligned} \tag{5.1}$$

The LHS of equation (5.1) is the utility that the legislators with ideal points at zero expect from approving a policy proposal p that is Δ_{sig} away from their ideal points (i.e., zero). The RHS is their equilibrium expected utility from rejecting that policy proposal. After rejection, and provided that bargaining continues (bargaining ends with probability γ), legislators expect a distribution over policies $p \in [-\Delta_{sig}, \Delta_{sig}]$. Rearranging terms, equation (5.1) can be written as

$$\begin{aligned} h(\Delta_{sig}) = (1-\gamma)\Bigg(&\frac{1}{2n+1}\Big[\mathbb{1}\{0 \geq \Delta_{sig} - k\}h(\Delta_{sig}) \\ &\qquad + \mathbb{1}\{0 < \Delta_{sig} - k\}h(k)\Big] \\ &+ \frac{2}{2n+1}\sum_{i=1}^{n}\Big[\mathbb{1}\{i \geq \Delta_{sig} + k\}h(\Delta_{sig}) \\ &\qquad + \mathbb{1}\{i < \Delta_{sig} + k\}\mathbb{1}\{i \leq -\Delta_{sig} + k\}h(\Delta_{sig}) \\ &\qquad + \mathbb{1}\{i < \Delta_{sig} + k\}\mathbb{1}\{i > -\Delta_{sig} + k\}h(|i-k|)\Big]\Bigg) \\ &- 0.5\gamma\lambda. \end{aligned} \tag{5.2}$$

The range $[-\Delta_{sig}, \Delta_{sig}]$ is what Banks and Duggan (2000) call the "social acceptance set" and Diermeier and Vlaicu (2011) dub the "majority acceptance set." Here, I refer to the set $[-\Delta_{sig}, \Delta_{sig}]$ as the "majority acceptance set for signal votes"

[8] For expositional convenience, I will from now on only refer to the plural of zero-ideal point legislators. Of course, this is only true in the case of $k = \kappa$, whereas with $k = 0$, there is only a single legislator that has a zero ideal point.

in order to distinguish it from the results of the cases with roll call voting.

In equilibrium, an agenda setter proposes the policy $p \in [-\Delta_{sig}, \Delta_{sig}]$ that is closest to her ideal point. The properties of the majority acceptance set for signal votes are formally stated in the following proposition. See Appendix 5.A for the proof.

Proposition 1. *If the proposals on issue s are voted on by signal vote, then the pivotal legislators (i.e., the legislators with ideal points at zero) allow policy to deviate from their ideal points up to a distance $\Delta^*_{sig}(k; \gamma, \lambda)$. This tolerance to deviations is strictly increasing in opportunity costs, γ, and the value of being reelected, λ, and monotonically decreasing (i.e., non-increasing) in the overlap between the parties in the legislature, k.*

The idea conveyed by this result is that increasing opportunity costs and a greater value of reelection decrease the pivotal legislators' bargaining power relative to the agenda setter, whereas a greater overlap between parties increases their bargaining power (see also Diermeier and Vlaicu 2011 for a similar result on opportunity costs). First, note that as opportunity costs γ increase, it becomes more likely that after a proposal fails to receive a majority of votes, bargaining ends and legislators receive a zero payoff. Therefore, the greater γ, the greater the concession the pivotal legislators are willing to make: they would rather accept proposals that are farther away from their ideal points than to risk a failure of bargaining leading to a zero payoff.

Second, the greater λ, the greater the legislators' payoff from being reelected. Because the adoption of a proposal is a necessary condition for reelection, a larger λ implies that it becomes more attractive for legislators to agree on a proposal and avoid the risk of bargaining failure.

Finally, the pivotal legislators' bargaining power increases in the overlap between the parties in the legislature. This is due to the fact that less heterogeneity between parties means that the pivots are surrounded by more "like-minded" members in the legislature, which, in turn, makes it easier for them to pass proposals that are closer to their ideal points. Consequently, the pivotal legislators' equilibrium expected utility from waiting for the next period increases, which makes the rejection of proposals that are far away from their ideal points more attractive.

Case II: Roll Call Voting With Constituents of Type $\theta = e$

Second, suppose that proposals on issue s are voted on by roll call vote and constituents are of the left-wing type. This case occurs with probability ρx. Note that voter ν_i is now able to observe whether or not legislator i's vote reflects her policy

preferences. Because ν_i is of the left-wing type, she will reelect legislator i only if in the policymaking stage i votes for a proposal that is to the left of or at the median position and against a proposal that is to the right of the median, respectively. Hence, legislator i's payoff from the adoption of proposal p in a roll call vote with left-wing constituents is

$$U_{rcv,e}(i,p;\lambda) = \begin{cases} h(|p-\xi_i(s)|)+\lambda & \text{if } i \text{ votes for } p \text{ and } p \text{ is to the left of or at the median position} \\ h(|p-\xi_i(s)|)+\lambda & \text{if } i \text{ votes against } p \text{ and } p \text{ is to the right of the median position} \\ h(|p-\xi_i(s)|) & \text{otherwise.} \end{cases}$$

Again, in equilibrium, the legislators whose ideal points are located at zero are pivotal at any vote. Let $-\Delta^*_{rcv,e,L}(k;\gamma,\lambda)$ be the maximal equilibrium policy deviation to the left that a pivotal legislator is willing to tolerate in a roll call vote with left-wing constituents. Distance $-\Delta^*_{rcv,e,L}$ is implicitly given by the following recursive equation:

$$
\begin{aligned}
h(\Delta_{rcv,e,L}) + \lambda = (1-\gamma)\Bigg(\frac{1}{2n+1} \sum_{i=-n}^{0} \Bigg[& \mathbb{1}\{i \leq -\Delta_{rcv,e,L} - k\}\Big(h(\Delta_{rcv,e,L}) + \lambda\Big) \\
& + \mathbb{1}\{i > -\Delta_{rcv,e,L} - k\}\mathbb{1}\{i \leq -k\} \\
& \times \Big(h(|i+k|) + \lambda\Big) \\
& + \mathbb{1}\{i > -k\}\mathbb{1}\{i < \Delta_{rcv,e,R} - k\} \\
& \times \mathbb{1}\{h(|-i-k|) + \lambda \geq h(0)\}\Big(h(0) + \lambda\Big) \\
& + \mathbb{1}\{i > -k\}\mathbb{1}\{i < \Delta_{rcv,e,R} - k\} \\
& \times \mathbb{1}\{h(|-i-k|) + \lambda < h(0)\}h(|i+k|) \\
& + \mathbb{1}\{i \geq \Delta_{rcv,e,R} - k\}\mathbb{1}\{h(|-i-k|) + \lambda \\
& \qquad \geq h(|\Delta_{rcv,e,R} - i - k|)\}\Big(h(0) + \lambda\Big) \\
& + \mathbb{1}\{i \geq \Delta_{rcv,e,R} - k\}\mathbb{1}\{h(|-i-k|) + \lambda \\
& \qquad < h(|\Delta_{rcv,e,R} - i - k|)\}\Big(h(\Delta_{rcv,e,L}) + \lambda\Big)\Bigg] \\
+ \frac{1}{2n+1} \sum_{i=1}^{n} \Bigg[& \mathbb{1}\{i \leq -\Delta_{rcv,e,L} + k\}\Big(h(\Delta_{rcv,e,L}) + \lambda\Big) \\
& + \mathbb{1}\{i > -\Delta_{rcv,e,L} + k\}\mathbb{1}\{i \leq k\} \\
& \times \Big(h(|i-k|) + \lambda\Big) \\
& + \mathbb{1}\{i > k\}\mathbb{1}\{i < \Delta_{rcv,e,R} + k\} \\
& \times \mathbb{1}\{h(|-i+k|) + \lambda \geq h(0)\}\Big(h(0) + \lambda\Big) \\
& + \mathbb{1}\{i > k\}\mathbb{1}\{i < \Delta_{rcv,e,R} + k\} \\
& \times \mathbb{1}\{h(|-i+k|) + \lambda < h(0)\}h(|i-k|) \\
& + \mathbb{1}\{i \geq \Delta_{rcv,e,R} + k\}\mathbb{1}\{h(|-i+k|) + \lambda \\
& \qquad \geq h(|\Delta_{rcv,e,R} - i + k|)\}\Big(h(0) + \lambda\Big) \\
& + \mathbb{1}\{i \geq \Delta_{rcv,e,R} + k\}\mathbb{1}\{h(|-i+k|) + \lambda \\
& \qquad < h(|\Delta_{rcv,e,R} - i + k|)\}\Big(h(\Delta_{rcv,e,L}) + \lambda\Big)\Bigg]\Bigg).
\end{aligned}
\tag{5.3}
$$

Likewise, let $\Delta^*_{rcv,e,R}(k;\gamma,\lambda)$ be the maximal equilibrium policy deviation to the right that a pivotal legislator is willing to tolerate in a roll call vote with left-wing constituents. Distance $\Delta^*_{rcv,e,R}$ is implicitly given by the following recursive equation:

$$
\begin{aligned}
h(\Delta_{rcv,e,R}) = (1-\gamma)\Bigg(\frac{1}{2n+1} \sum_{i=-n}^{0} \Bigg[& \mathbb{1}\{i \leq -\Delta_{rcv,e,L} - k\} h(\Delta_{rcv,e,R}) \\
& + \mathbb{1}\{i > -\Delta_{rcv,e,L} - k\} \mathbb{1}\{i \leq -k\} \\
& \times \Big(h(|i+k|) + \lambda \Big) \\
& + \mathbb{1}\{i > -k\} \mathbb{1}\{i < \Delta_{rcv,e,R} - k\} \\
& \times \mathbb{1}\{h(|-i-k|) + \lambda \geq h(0)\} \Big(h(0) + \lambda \Big) \\
& + \mathbb{1}\{i > -k\} \mathbb{1}\{i < \Delta_{rcv,e,R} - k\} \\
& \times \mathbb{1}\{h(|-i-k|) + \lambda < h(0)\} h(|i+k|) \\
& + \mathbb{1}\{i \geq \Delta_{rcv,e,R} - k\} \mathbb{1}\{h(|-i-k|) + \lambda \\
& \qquad \geq h(|\Delta_{rcv,e,R} - i - k|)\} \Big(h(0) + \lambda \Big) \\
& + \mathbb{1}\{i \geq \Delta_{rcv,e,R} - k\} \mathbb{1}\{h(|-i-k|) + \lambda \\
& \qquad < h(|\Delta_{rcv,e,R} - i - k|)\} h(\Delta_{rcv,e,R}) \Bigg] \\
+ \frac{1}{2n+1} \sum_{i=1}^{n} \Bigg[& \mathbb{1}\{i \leq -\Delta_{rcv,e,L} + k\} h(\Delta_{rcv,e,R}) \\
& + \mathbb{1}\{i > -\Delta_{rcv,e,L} + k\} \mathbb{1}\{i \leq k\} \\
& \times \Big(h(|i-k|) + \lambda \Big) \\
& + \mathbb{1}\{i > k\} \mathbb{1}\{i < \Delta_{rcv,e,R} + k\} \\
& \times \mathbb{1}\{h(|-i+k|) + \lambda \geq h(0)\} \Big(h(0) + \lambda \Big) \\
& + \mathbb{1}\{i > k\} \mathbb{1}\{i < \Delta_{rcv,e,R} + k\} \\
& \times \mathbb{1}\{h(|-i+k|) + \lambda < h(0)\} h(|i-k|) \\
& + \mathbb{1}\{i \geq \Delta_{rcv,e,R} + k\} \mathbb{1}\{h(|-i+k|) + \lambda \\
& \qquad \geq h(|\Delta_{rcv,e,R} - i + k|)\} \Big(h(0) + \lambda \Big) \\
& + \mathbb{1}\{i \geq \Delta_{rcv,e,R} + k\} \mathbb{1}\{h(|-i+k|) + \lambda \\
& \qquad < h(|\Delta_{rcv,e,R} - i + k|)\} h(\Delta_{rcv,e,R}) \Bigg] \Bigg).
\end{aligned}
\tag{5.4}
$$

The LHS of equation (5.3) and the LHS of equation (5.4) are the utilities that the pivotal legislators receive from approving a policy proposal p that is $-\Delta_{rcv,e,L}$ and $\Delta_{rcv,e,R}$, respectively, away from their ideal points (i.e., zero). The RHS in equations (5.3) and (5.4) is the pivotal legislators' equilibrium expected utility when they reject proposal $-\Delta_{rcv,e,L}$ and $\Delta_{rcv,e,R}$, respectively. After rejection, and provided that bargaining continues, legislators expect a distribution over policies

$p \in [-\Delta_{rcv,e,L}, \Delta_{rcv,e,R}]$.

I refer to the set $[-\Delta_{rcv,e,L}, \Delta_{rcv,e,R}]$ as the "majority acceptance set for roll call votes and left-wing constituents." In equilibrium, an agenda setter with ideal point $\xi_i(s) \leq 0$ proposes the policy $p \in [-\Delta_{rcv,e,L}, 0]$ that is closest to her ideal point. On the other hand, an agenda setter with ideal point $\xi_i(s) > 0$ proposes policy $\arg\max_{p \in \{0,p'\}}\{U_{rcv,e}(i,p)\}$, where p' is the policy $p \in (0, \Delta_{rcv,e,R}]$ that is closest to the ideal point of the agenda setter. The properties of the majority acceptance set for roll call votes and left-wing constituents are formally stated in the following proposition. See Appendix 5.A for the proof.

Proposition 2. *If the proposals on issue s are voted on by roll call vote and constituents are of the left-wing type, then the pivotal legislators (i.e., the legislators with ideal points at zero) allow policy to deviate from their ideal points up to a distance $-\Delta^*_{rcv,e,L}(k;\gamma,\lambda)$ to the left and $\Delta^*_{rcv,e,R}(k;\gamma,\lambda)$ to the right. The tolerance to deviations to the left is strictly increasing in opportunity costs, γ, and the value of being reelected, λ, and monotonically decreasing (i.e., non-increasing) in the overlap between the parties in the legislature, k. The tolerance to deviations to the right is strictly increasing in opportunity costs, γ, strictly decreasing in the value of being reelected, λ, and monotonically decreasing in the overlap between the parties in the legislature, k.*

As in the case of signal votes, increasing opportunity costs decrease the pivotal legislators' bargaining power relative to the agenda setter, while less polarization between the parties increases it. A greater value of reelection, on the other hand, decreases the pivots' bargaining power vis-à-vis a left-wing agenda setter (i.e., an agenda setter with an ideal point $\xi_i(s) < 0$) and increases it vis-à-vis a conservative agenda setter (i.e., one with an ideal point $\xi_i(s) > 0$).

Case III: Roll Call Voting With Constituents of Type $\theta = o$

Suppose, finally, that proposals on issue s are voted on by roll call vote and constituents are of the conservative type. This case occurs with probability $(1-\rho)x$. As in the previous case, voter ν_i can monitor legislator i's voting behavior. However, because ν_i is now of the conservative type, she will reelect legislator i only if in the policymaking stage i votes for a proposal that is to the right of or at the median position and against a proposal that is to the left of the median, respectively. Legislator i's payoff from the adoption of proposal p in a roll call vote with conservative

constituents is thus given by

$$U_{rcv,o}(i,p;\lambda) = \begin{cases} h(|p-\xi_i(s)|)+\lambda & \text{if } i \text{ votes for } p \text{ and } p \text{ is to the right of or at the median position} \\ h(|p-\xi_i(s)|)+\lambda & \text{if } i \text{ votes against } p \text{ and } p \text{ is to the left of the median position} \\ h(|p-\xi_i(s)|) & \text{otherwise.} \end{cases}$$

As in the previous cases, in equilibrium, it is the legislators with zero ideal points that are pivotal at any vote. Let $-\Delta^*_{rcv,o,L}(k;\gamma,\lambda)$ denote the maximal equilibrium policy deviation to the left that a pivotal legislator is willing to tolerate in a roll call vote with conservative constituents. Distance $-\Delta^*_{rcv,o,L}$ is implicitly given by the following recursive equation:

$$
\begin{aligned}
h(\Delta_{rcv,o,L}) = (1-\gamma)\Bigg(\frac{1}{2n+1} \sum_{i=-n}^{0} \Bigg[& \mathbb{1}\{i \leq -\Delta_{rcv,o,L} - k\}\mathbb{1}\{h(|-i-k|) + \lambda \\
& \quad < h(|-\Delta_{rcv,o,L} - i - k|)\} h(\Delta_{rcv,o,L}) \\
& + \mathbb{1}\{i \leq -\Delta_{rcv,o,L} - k\}\mathbb{1}\{h(|-i-k|) + \lambda \\
& \quad \geq h(|-\Delta_{rcv,o,L} - i - k|)\} \Big(h(0) + \lambda \Big) \\
& + \mathbb{1}\{i > -\Delta_{rcv,o,L} - k\}\mathbb{1}\{i < -k\} \\
& \times \mathbb{1}\{h(|-i-k|) + \lambda < h(0)\} h(|i+k|) \\
& + \mathbb{1}\{i > -\Delta_{rcv,o,L} - k\}\mathbb{1}\{i < -k\} \\
& \times \mathbb{1}\{h(|-i-k|) + \lambda \geq h(0)\} \Big(h(0) + \lambda \Big) \\
& + \mathbb{1}\{i \geq -k\}\mathbb{1}\{i < \Delta_{rcv,o,R} - k\} \\
& \times \Big(h(|i+k|) + \lambda \Big) \\
& + \mathbb{1}\{i \geq \Delta_{rcv,o,R} - k\} h(\Delta_{rcv,o,L}) \Bigg] \\
+ \frac{1}{2n+1} \sum_{i=1}^{n} \Bigg[& \mathbb{1}\{i \leq -\Delta_{rcv,o,L} + k\}\mathbb{1}\{h(|-i+k|) + \lambda \\
& \quad < h(|-\Delta_{rcv,o,L} - i + k|)\} h(\Delta_{rcv,o,L}) \\
& + \mathbb{1}\{i \leq -\Delta_{rcv,o,L} + k\}\mathbb{1}\{h(|-i+k|) + \lambda \\
& \quad \geq h(|-\Delta_{rcv,o,L} - i + k|)\} \Big(h(0) + \lambda \Big) \\
& + \mathbb{1}\{i > -\Delta_{rcv,o,L} + k\}\mathbb{1}\{i < k\} \\
& \times \mathbb{1}\{h(|-i+k|) + \lambda < h(0)\} h(|i-k|) \\
& + \mathbb{1}\{i > -\Delta_{rcv,o,L} + k\}\mathbb{1}\{i < k\} \\
& \times \mathbb{1}\{h(|-i+k|) + \lambda \geq h(0)\} \Big(h(0) + \lambda \Big) \\
& + \mathbb{1}\{i \geq k\}\mathbb{1}\{i < \Delta_{rcv,o,R} + k\} \\
& \times \Big(h(|i-k|) + \lambda \Big) \\
& + \mathbb{1}\{i \geq \Delta_{rcv,o,R} + k\} h(\Delta_{rcv,o,L}) \Bigg] \Bigg).
\end{aligned}
\tag{5.5}
$$

Likewise, let $\Delta^*_{rcv,o,R}(k;\gamma,\lambda)$ be the maximal equilibrium policy deviation to the right that a pivotal legislator is willing to tolerate in a roll call vote with conservative constituents. Distance $\Delta^*_{rcv,o,R}$ is implicitly given by the following recursive equation:

$$
\begin{aligned}
h(\Delta_{rcv,o,R}) + \lambda = (1-\gamma)\Bigg(\frac{1}{2n+1} \sum_{i=-n}^{0} \Bigg[& \mathbb{1}\{i \le -\Delta_{rcv,o,L} - k\}\mathbb{1}\{h(|-i-k|) + \lambda \\
& \quad < h(|-\Delta_{rcv,o,L} - i - k|)\}\Big(h(\Delta_{rcv,o,R}) + \lambda\Big) \\
& + \mathbb{1}\{i \le -\Delta_{rcv,o,L} - k\}\mathbb{1}\{h(|-i-k|) + \lambda \\
& \quad \ge h(|-\Delta_{rcv,o,L} - i - k|)\}\Big(h(0) + \lambda\Big) \\
& + \mathbb{1}\{i > -\Delta_{rcv,o,L} - k\}\mathbb{1}\{i < -k\} \\
& \times \mathbb{1}\{h(|-i-k|) + \lambda < h(0)\}h(|i+k|) \\
& + \mathbb{1}\{i > -\Delta_{rcv,o,L} - k\}\mathbb{1}\{i < -k\} \\
& \times \mathbb{1}\{h(|-i-k|) + \lambda \ge h(0)\}\Big(h(0) + \lambda\Big) \\
& + \mathbb{1}\{i \ge -k\}\mathbb{1}\{i < \Delta_{rcv,o,R} - k\} \\
& \times \Big(h(|i+k|) + \lambda\Big) \\
& + \mathbb{1}\{i \ge \Delta_{rcv,o,R} - k\}\Big(h(\Delta_{rcv,o,R}) + \lambda\Big)\Bigg] \\
+ \frac{1}{2n+1} \sum_{i=1}^{n} \Bigg[& \mathbb{1}\{i \le -\Delta_{rcv,o,L} + k\}\mathbb{1}\{h(|-i+k|) + \lambda \\
& \quad < h(|-\Delta_{rcv,o,L} - i + k|)\}\Big(h(\Delta_{rcv,o,R}) + \lambda\Big) \\
& + \mathbb{1}\{i \le -\Delta_{rcv,o,L} + k\}\mathbb{1}\{h(|-i+k|) + \lambda \\
& \quad \ge h(|-\Delta_{rcv,o,L} - i + k|)\}\Big(h(0) + \lambda\Big) \\
& + \mathbb{1}\{i > -\Delta_{rcv,o,L} + k\}\mathbb{1}\{i < k\} \\
& \times \mathbb{1}\{h(|-i+k|) + \lambda < h(0)\}h(|i-k|) \\
& + \mathbb{1}\{i > -\Delta_{rcv,o,L} + k\}\mathbb{1}\{i < k\} \\
& \times \mathbb{1}\{h(|-i+k|) + \lambda \ge h(0)\}\Big(h(0) + \lambda\Big) \\
& + \mathbb{1}\{i \ge k\}\mathbb{1}\{i < \Delta_{rcv,o,R} + k\} \\
& \times \Big(h(|i-k|) + \lambda\Big) \\
& + \mathbb{1}\{i \ge \Delta_{rcv,o,R} + k\}\Big(h(\Delta_{rcv,o,R}) + \lambda\Big)\Bigg]\Bigg).
\end{aligned}
\tag{5.6}
$$

The LHS of equation (5.5) and the LHS of equation (5.6) are the utilities that the pivotal legislators receive from approving a policy proposal p that is $-\Delta_{rcv,o,L}$ and $\Delta_{rcv,o,R}$, respectively, away from their ideal points (i.e., zero). The RHS in equations (5.5) and (5.6) is the pivotal legislators' equilibrium expected utility when they reject proposal $-\Delta_{rcv,o,L}$ and $\Delta_{rcv,o,R}$, respectively. After rejection, and

provided that bargaining continues, legislators expect a distribution over policies $p \in [-\Delta_{rcv,o,L}, \Delta_{rcv,o,R}]$.

I refer to the set $[-\Delta_{rcv,o,L}, \Delta_{rcv,o,R}]$ as the "majority acceptance set for roll call votes and conservative constituents." In equilibrium, an agenda setter with ideal point $\xi_i(s) \geq 0$ proposes the policy $p \in [0, \Delta_{rcv,o,R}]$ that is closest to her ideal point. On the other hand, an agenda setter with ideal point $\xi_i(s) < 0$ proposes policy $\arg\max_{p \in \{0,p'\}}\{U_{rcv,o}(i,p)\}$, where p' is the policy $p \in [-\Delta_{rcv,o,L}, 0)$ that is closest to the ideal point of the agenda setter. The properties of the majority acceptance set for roll call votes and conservative constituents are formally stated in the following proposition. See Appendix 5.A for the proof.

Proposition 3. *If the proposals on issue s are voted on by roll call vote and constituents are of the conservative type, then the pivotal legislators (i.e., the legislators with ideal points at zero) allow policy to deviate from their ideal points up to a distance $-\Delta^*_{rcv,o,L}(k;\gamma,\lambda)$ to the left and $\Delta^*_{rcv,o,R}(k;\gamma,\lambda)$ to the right. The tolerance to deviations to the left is strictly increasing in opportunity costs, γ, strictly decreasing in the value of being reelected, λ, and monotonically decreasing (i.e., non-increasing) in the overlap between the parties in the legislature, k. The tolerance to deviations to the right is strictly increasing in opportunity costs, γ, and the value of being reelected, λ, and monotonically decreasing in the overlap between the parties in the legislature, k.*

Again, increasing opportunity costs decrease the pivotal legislators' bargaining power relative to the agenda setter, while less polarization between the parties increases it. A greater value of reelection now increases the pivots' bargaining power vis-à-vis a left-wing agenda setter (i.e., an agenda setter with an ideal point $\xi_i(s) < 0$) and decreases it vis-à-vis a conservative agenda setter (i.e., one with an ideal point $\xi_i(s) > 0$).

When legislators bargain over voting procedures in the organizational stage, they anticipate the equilibrium policymaking behavior in the policymaking stage. I derive in the next subsection the organizational equilibrium given that legislators anticipate the policy consequences of the voting procedure they are putting in place in the organizational stage.

5.2.2 Organizational Equilibrium

In the organizational stage, legislators bargain over voting procedures determining the probability x that in the policymaking stage the proposals on an issue $s \in S$ will be voted on by roll call. Notice that in the organizational stage, all legislators of

the same party are strategically equal and, therefore, have the same preferences over voting procedures. Because voting procedures are chosen by majority rule and party A has a majority in the legislature, it suffices to analyze the equilibrium behavior of the members of party A. Define the following expected payoffs for a member of party A:

$E_A[U_{sig}(i, P^*_{sig})|k = 0]$ for a signal vote on a completely polarized issue
$E_A[U_{sig}(i, P^*_{sig})|k = \kappa]$ for a signal vote on a not completely polarized issue
$E_A[U_{rcv,e}(i, P^*_{rcv,e})|k = 0]$ for a roll call vote on a completely polarized issue with left-wing constituents.
$E_A[U_{rcv,e}(i, P^*_{rcv,e})|k = \kappa]$ for a roll call vote on a not completely polarized issue with left-wing constituents
$E_A[U_{rcv,o}(i, P^*_{rcv,o})|k = 0]$ for a roll call vote on a completely polarized issue with conservative constituents.
$E_A[U_{rcv,o}(i, P^*_{rcv,o})|k = \kappa]$ for a roll call vote on a not completely polarized issue with conservative constituents.

The expected payoff of a member of party A in the organizational stage is then given by

$$\begin{aligned} E_A[U(i,P^*)] \;=\; & (1-x)\Big(E_A[U_{sig}(i,P^*_{sig})|k=0]\pi \\ & \qquad + E_A[U_{sig}(i,P^*_{sig})|k=\kappa](1-\pi)\Big) \\ & + x\Big(E_A[U_{rcv,e}(i,P^*_{rcv,e})|k=0]\pi\rho \\ & \quad + E_A[U_{rcv,e}(i,P^*_{rcv,e})|k=\kappa](1-\pi)\rho \\ & \quad + E_A[U_{rcv,o}(i,P^*_{rcv,o})|k=0]\pi(1-\rho) \\ & \quad + E_A[U_{rcv,o}(i,P^*_{rcv,o})|k=\kappa](1-\pi)(1-\rho)\Big). \end{aligned} \tag{5.7}$$

Differentiating (5.7) with respect to x yields

$$\begin{aligned} \frac{\partial}{\partial x}E_A[U(i,P^*)] = & E_A[U_{rcv,e}(i,P^*_{rcv,e})|k=0]\pi\rho \\ & + E_A[U_{rcv,e}(i,P^*_{rcv,e})|k=\kappa](1-\pi)\rho \\ & + E_A[U_{rcv,o}(i,P^*_{rcv,o})|k=0]\pi(1-\rho) \\ & + E_A[U_{rcv,o}(i,P^*_{rcv,o})|k=\kappa](1-\pi)(1-\rho) \\ & - E_A[U_{sig}(i,P^*_{sig})|k=0]\pi \\ & - E_A[U_{sig}(i,P^*_{sig})|k=\kappa](1-\pi). \end{aligned}$$

Let $\delta_A = \frac{\partial}{\partial x} E_A[U(i, P^*)]$. The organizational equilibrium is characterized in the following proposition. See Appendix 5.B for the proof.

Proposition 4. *Party A members' preferences for roll call votes over signal votes are determined by δ_A. If $\delta_A > 0$, all members of party A prefer to vote exclusively by roll call in the policymaking stage. Because $x = 1$ is the only proposal that will receive a majority of votes in the organizational stage, the agenda setter proposes $x^* = 1$ and all legislators of party A vote in favor of the proposal.*

On the other hand, if $\delta_A < 0$, all members of party A prefer to rely exclusively on signal voting in the policymaking stage. Because $x = 0$ is the only proposal that will receive a majority of votes in the organizational stage, the agenda setter proposes $x^* = 0$ and all legislators of party A vote in favor of the proposal.

In the next section, I present comparative static results showing how party A members' preferences for roll call votes change as the probability of a completely polarized legislature and the probability of left-wing constituents changes.

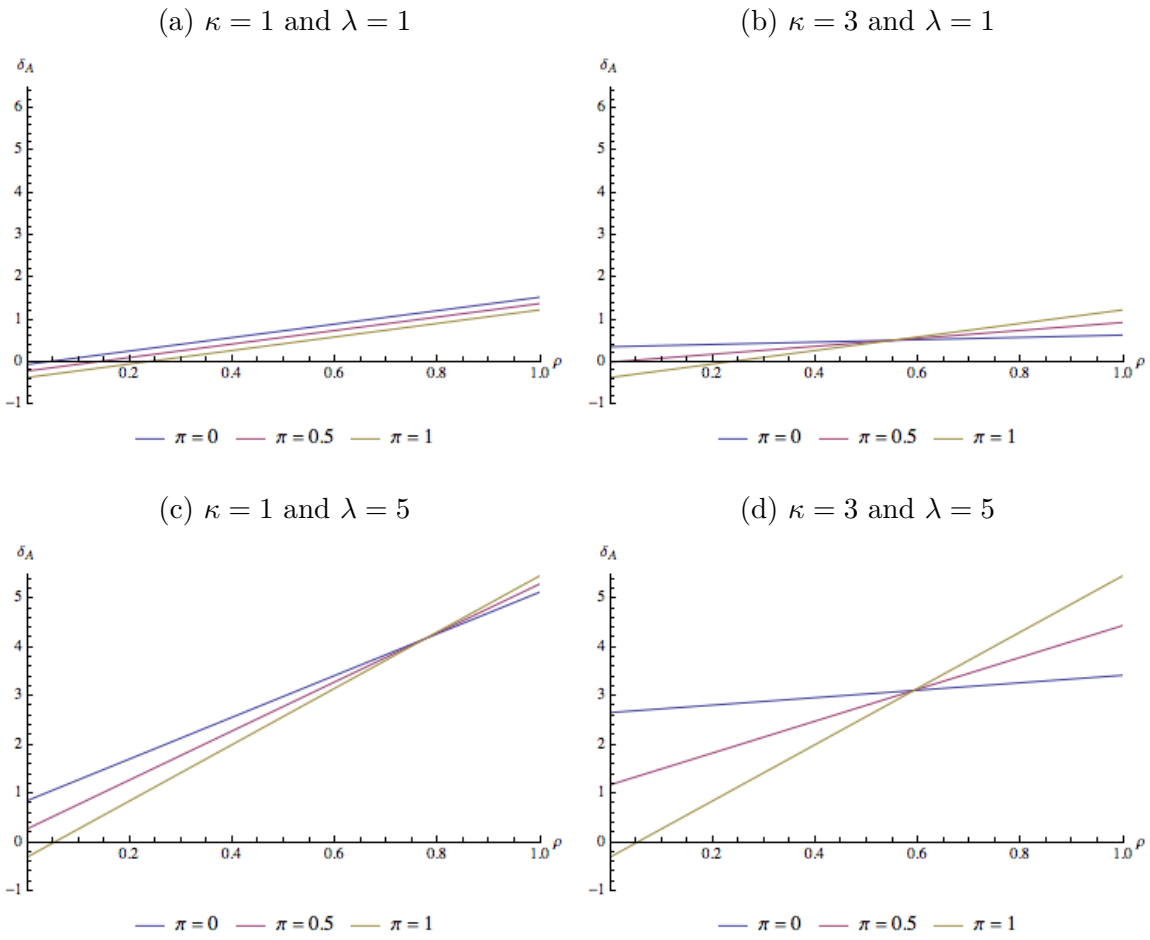
5.3 Comparative Statics

To explain why roll call constraints vary across legislatures, I conduct a comparative statics analysis of how changes in the probability of a completely polarized legislature and the probability of left-wing constituents affect legislators' preference for roll call voting. Figure 5.2 shows the comparative statics for four combinations of the party overlap parameter (κ) and the reelection value parameter (λ) for a legislature with 15 members ($n = 7$) and low opportunity costs ($\gamma = \frac{1}{30}$). The four combinations are: (a) a low party overlap in not polarized issues ($\kappa = 1$) and a low value of reelection ($\lambda = 1$); (b) a high party overlap in not polarized issues ($\kappa = 3$) and a low value of reelection ($\lambda = 1$); (c) a low party overlap in not polarized issues ($\kappa = 1$) and a high value of reelection ($\lambda = 5$); and (d) a high party overlap in not polarized issues ($\kappa = 3$) and a high value of reelection ($\lambda = 5$).[9]

The analysis yields three important insights. First, party A members' preference for roll call votes increases in the value of reelection (λ). Second, party A members' preference for roll call votes increases in the probability that voters are of the left-wing type (ρ). Third, there is a negative interaction between the probability of left-wing voters and the degree of party overlap in not polarized issues. Therefore, legislators are especially interested in roll call votes if they place a high value on being reelected and if there is a large degree of ideological alignment between them and their voters.

[9]The Mathematica code to compute the comparative static predictions is available upon request.

Figure 5.2: Preference of Party A Members for Roll Call Voting in the Policymaking Stage



Note: The figure shows for four combinations of the party overlap parameter (κ) and the reelection value parameter (λ) how party A members' preference for roll call votes (δ_A) changes as the probability of a completely polarized legislature (π) and the probability of left-wing constituents (ρ) changes. The four combinations are: (a) a low party overlap in not polarized issues ($\kappa = 1$) and a low value of reelection ($\lambda = 1$); (b) a high party overlap in not polarized issues ($\kappa = 3$) and a low value of reelection ($\lambda = 1$); (c) a low party overlap in not polarized issues ($\kappa = 1$) and a high value of reelection ($\lambda = 5$); and (d) a high party overlap in not polarized issues ($\kappa = 3$) and a high value of reelection ($\lambda = 5$). The size of the legislature and the opportunity costs are held fixed at $n = 7$ and $\gamma = \frac{1}{30}$, respectively.

5.4 Conclusion

The aim of this chapter was to explore the circumstances under which legislators choose to rely on roll call votes rather than signal votes. To do so, I developed a game-theoretic model consisting of three stages: an organizational stage, a policymaking stage, and an election stage. In the organizational stage, legislators decide whether—and, if so, to what extent—to constrain the use of roll call votes in the policymaking stage. In the policymaking stage, legislators then bargain over policy issues, with the probability of a roll call vote depending on the outcome of the organizational stage. Finally, in the election stage, voters either reelect their legislators or replace them with challengers. Because only roll call votes make individual voting decisions transparent to actors outside the legislature, voters can reward or punish legislators based on their voting behavior only if votes were taken by roll call in the policymaking stage.

The comparative statics analysis of the model has shown that legislators' preference for roll call voting increases in the value they place on reelection and in the degree of ideological congruence with their voters. These results have important implications for the empirical analysis of roll call votes. First, legislators are more likely to facilitate roll call voting for votes that are important for their reelection prospects.[10] For example, if outside actors with control over valuable resources are likely to pay special attention to final passage votes, legislators may wish to facilitate—or even mandate—roll call voting for these votes. While legislators have an incentive to respond to outside actors' preferences in votes that have a high reelection value and are thus taken by roll call, this is not necessarily the case for votes with a low reelection value. Consequently, generalizing from legislators' responsiveness to outside actors in roll call votes may lead to an overestimation of their responsiveness in other votes.

Second, legislators are more likely to encourage the use of roll call votes if their preferences are congruent with those of external actors. This complicates comparisons of legislative representation based on roll call data, especially across different legislatures (e.g., Tavits 2009). For example, legislatures whose members have preferences that are often different from those of their constituents may constrain roll call voting, so that much of the conflict between legislators' behavior and voters'

[10] In the game-theoretic model, legislators were reelected after they voted according to their voters' preferences in a roll call vote. I therefore defined λ as the value legislators attach to being reelected. In the real world, roll call decisions that are in line with the preferences of outside actors increase the probability of rather than secure the reelection of legislators. With regard to real world situations, I thus redefine λ as the reelection value legislators attach to a vote. For example, if outside actors make the provision of valuable resources contingent on legislators' behavior in final passage votes, then legislators would attach a high reelection value to these votes.

preferences remains hidden from both voters and researchers.

Analyses of representation that are based on roll call data from legislatures where votes are not systematically taken by roll call are therefore prone to overestimate the degree to which legislators represent the preferences of outside actors. The extent of this overestimation will likely depend on the importance of roll call voting for legislators' reelection bids and the congruence between the preferences of legislators and outside actors.

Appendix

5.A Proofs of Propositions for the Policymaking Stage

Proof of Proposition 1. The proof is similar to Diermeier and Vlaicu's (2011, 372f.) proof of their Proposition 2. The strategy of proof consists of three steps: (1) show that the majority acceptance set for signal votes is a compact interval; (2) show that the legislators with ideal points at zero are pivotal over both bounds of the majority acceptance set for signal votes; and (3) characterize the bounds of the majority acceptance set for signal votes, show uniqueness, and do comparative statics on γ, λ, and k.

Step 1. A no-delay stationary equilibrium is fully characterized by a stationary majority acceptance set $\mathcal{A}^*_{sig} = \mathcal{A}_{sig,t}$ for all t (see Banks and Duggan 2000; Cho and Duggan 2003). Let 2κ, with $2\kappa < n$ for some positive integer κ, be the overlap between party A and party B when the legislature is not completely polarized over an issue. Further, let $k \in \{0, \kappa\}$ be a variable that takes on the value zero if the legislature is completely polarized over an issue and the value κ if the legislature is not completely polarized over an issue. The majority acceptance set for signal votes then satisfies the following recursive formula:

$$\mathcal{A}_{sig,t} = \bigcup_{\substack{\mathcal{M}\subseteq N \\ |\mathcal{M}|\geq n+1}} \bigcap_{i\in\mathcal{M}} \Big\{ p_t \in [-n+k, n-k] : E\Big[U_{sig}(i,p_t)\Big] \geq (1-\gamma)E\Big[E\Big[U_{sig}(i,P^*_{sig,t+1})\Big|P^*_{sig,t+1}\Big]\Big]\Big\},$$

where

$$E\Big[E\Big[U_{sig}(i,P^*_{sig,t+1})\Big|P^*_{sig,t+1}\Big]\Big] = \frac{1}{2n+1} \times \left(\sum_{j=1}^{2n+1} E\left[U_{sig}\left(i, \underset{p_{t+1}\in\mathcal{A}_{sig,t+1}}{\arg\max} \{E\left[U_{sig}(j,p_{t+1})\right]\}\right)\Big| p_{t+1}\right]\right).$$

The majority acceptance set for signal votes at time t, $\mathcal{A}_{sig,t}$, is the union of the acceptance sets of all majorities $\mathcal{M} \subseteq N$. The acceptance set of majority $\mathcal{M}$, in turn, contains all policies $p_t \in [-n+k, n-k]$ that legislators $i \in \mathcal{M}$ prefer over waiting for the next round of bargaining at $t+1$, which takes place with probability $(1-\gamma)$. With regard to the next round of bargaining, legislator i expects that the recognized legislator j will propose her preferred policy from the next period's majority acceptance set for signal votes, $\mathcal{A}_{sig,t+1}$ (which is the policy p_{t+1} that maximizes j's expected payoff). Let $P^*_{sig} = P^*_{sig,t}$ for all t.

Notice that because function $E[U_{sig}(i,\cdot)]$ is strictly concave, it follows as a corollary of Jensen's inequality that $E[U_{sig}(i, E[P^*_{sig}])] > E[E[U_{sig}(i, P^*_{sig})|P^*_{sig}]]$. Moreover, by the nonnegativity of the expected utility function, it also follows that $E[E[U_{sig}(i, P^*_{sig})|P^*_{sig}]] \geq (1-\gamma)E[E[U_{sig}(i, P^*_{sig})|P^*_{sig}]]$. The "average" equilibrium amendment $E[P^*_{sig}]$ is thus contained in all individual acceptance sets.

Furthermore, because of the compactness of $[-n+k, n-k]$ and the strict concavity of $E[U_{sig}(i,\cdot)]$, an individual legislator's acceptance set is a compact interval. Since the acceptance set of majority $\mathcal{M}$ is an intersection of individual acceptance sets that contain $E[P^*_{sig}]$, it is also a compact interval containing the average amendment. It then follows that the majority acceptance set for signal votes, which is the union of the overlapping acceptance sets of majorities $\mathcal{M} \subseteq N$, is itself a compact interval. Denote it by $\mathcal{A}^*_{sig} = [p^*_{sig,L}, p^*_{sig,R}]$.

Step 2. The claim is that the ideal points located at zero, i.e., $\xi_i(s) = 0$, have to be inside the equilibrium majority acceptance set for signal votes, $\mathcal{A}^*_{sig}$. Suppose not. Without loss of generality, suppose that $p^*_{sig,L} > 0$. Then, if $p = 0$ is proposed, the legislators with ideal points $\xi_i(s) = 0$ and all legislators to their left prefer p to all policies in $\mathcal{A}^*_{sig}$. Rather than waiting for the next round of bargaining, these legislators thus vote in favor of the proposal, so it will pass and must therefore be in $\mathcal{A}^*_{sig}$.

Next, show that the legislators with ideal points at zero are pivotal over $p^*_{sig,L}$ (i.e., when $p^*_{sig,L}$ is proposed, the legislators whose ideal points are at zero and everybody to their left vote in favor, whereas all legislators to their right vote against the proposal). Clearly, all legislators with ideal points to the left of $p^*_{sig,L}$ prefer to accept proposal $p^*_{sig,L}$ than to wait for another round of bargaining because $p^*_{sig,L}$ is closer to their ideal points than any other policy in $\mathcal{A}^*_{sig}$.

Show next that support for proposal $p^*_{sig,L}$ over waiting for P^*_{sig} strictly decreases as we move from $p^*_{sig,L}$ to the right of the legislature. Let

$$f_i = E[U_{sig}(i, p^*_{sig,L})] - (1-\gamma)E[E[U_{sig}(i, P^*_{sig})|P^*_{sig}]]$$

be legislator i's equilibrium support for $p^*_{sig,L}$ today over P^*_{sig} in the next period. Show that for legislator j with an ideal point located to the right of that of i (i.e., $p^*_{sig,L} \leq \xi_i(s) < \xi_j(s)$), support for $p^*_{sig,L}$ declines (i.e., $f_i > f_j$), implying that

$$E[U_{sig}(i, p^*_{sig,L})] - (1-\gamma)E[E[U_{sig}(i, P^*_{sig})|P^*_{sig}]]$$
$$>$$
$$E[U_{sig}(j, p^*_{sig,L})] - (1-\gamma)E[E[U_{sig}(j, P^*_{sig})|P^*_{sig}]].$$

Rearranging terms, it is

$$E[U_{sig}(i, p^*_{sig,L})] - E[U_{sig}(j, p^*_{sig,L})]$$
$$>$$
$$(1-\gamma)E[E[U_{sig}(i, P^*_{sig})|P^*_{sig}] - E[U_{sig}(j, P^*_{sig})|P^*_{sig}]].$$

Because functions $E[U_{sig}(i, \cdot)]$ and $E[U_{sig}(j, \cdot)]$ are strictly concave, their slopes are strictly decreasing. It follows then that $E[U_{sig}(i, p)] - E[U_{sig}(j, p)]$ strictly decreases in p from a positive level at $p^*_{sig,L}$. Consequently, it is $E[U_{sig}(i, p^*_{sig,L})] - E[U_{sig}(j, p^*_{sig,L})] > E[E[U_{sig}(i, P^*_{sig})|P^*_{sig}] - E[U_{sig}(j, P^*_{sig})|P^*_{sig}]]$ and, because the LHS of this inequality is positive, it is also $E[U_{sig}(i, p^*_{sig,L})] - E[U_{sig}(j, p^*_{sig,L})] > (1-\gamma)E[E[U_{sig}(i, P^*_{sig})|P^*_{sig}] - E[U_{sig}(j, P^*_{sig})|P^*_{sig}]]$. Thus, as we move from $p^*_{sig,L}$ to the right, support for $p^*_{sig,L}$ strictly decreases (i.e., $f_i > f_j$). Since $p^*_{sig,L}$ is the left-most proposal that a majority of legislators is still willing to support, it follows that the legislators with ideal points at zero and everybody to their left must vote in favor, whereas all legislators to their right vote against that proposal. Hence, proposal $p^*_{sig,L}$ receives a majority of votes and the legislators with $\xi_i(s) = 0$ are pivotal.

The argument for the claim that the legislators with ideal points at zero are pivotal over $p^*_{sig,R}$ is analogous. Consequently, the majority acceptance set for signal votes is the acceptance set of the legislators with ideal points at zero or, equivalently, of the median legislator, i.e., $\mathcal{A}^*_{sig} = \mathcal{A}_{sig,med} = [p^*_{sig,L}, p^*_{sig,R}]$, where med stands for median legislator.

Step 3. The median legislator's acceptance set for signal votes, $\mathcal{A}^*_{sig}$, is characterized by policies p that satisfy

$$E[U_{sig}(med, p)] \geq (1-\gamma)E[E[U_{sig}(med, P^*_{sig})|P^*_{sig}]].$$

Because $E[U_{sig}(med, \cdot)]$ is symmetric around zero, the majority acceptance set for signal votes is symmetric around zero as well. It thus takes the form $\mathcal{A}^*_{sig} =$

$[-\Delta_{sig}, \Delta_{sig}]$. From the policies in this set, a proposer chooses the policy that is closest to her ideal point.

The maximal equilibrium policy deviation Δ^*_{sig} that the median legislator is willing to tolerate in signal votes is implicitly given by

$$\begin{aligned} h(\Delta_{sig}) + 0.5\lambda = (1-\gamma)\Bigg(& \frac{1}{2n+1}\Big[\mathbb{1}\{0 \geq \Delta_{sig} - k\}h(\Delta_{sig}) \\ & \quad + \mathbb{1}\{0 < \Delta_{sig} - k\}h(k)\Big] \\ & + \frac{2}{2n+1}\sum_{i=1}^{n}\Big[\mathbb{1}\{i \geq \Delta_{sig} + k\}h(\Delta_{sig}) \\ & \quad + \mathbb{1}\{i < \Delta_{sig} + k\}\mathbb{1}\{i \leq -\Delta_{sig} + k\}h(\Delta_{sig}) \\ & \quad + \mathbb{1}\{i < \Delta_{sig} + k\}\mathbb{1}\{i > -\Delta_{sig} + k\}h(|i-k|)\Big] \\ & + 0.5\lambda\Bigg). \end{aligned} \tag{5.8}$$

Rearranging terms, equation (5.8) can be written as

$$\begin{aligned} h(\Delta_{sig}) = (1-\gamma)\Bigg(& \frac{1}{2n+1}\Big[\mathbb{1}\{0 \geq \Delta_{sig} - k\}h(\Delta_{sig}) \\ & \quad + \mathbb{1}\{0 < \Delta_{sig} - k\}h(k)\Big] \\ & + \frac{2}{2n+1}\sum_{i=1}^{n}\Big[\mathbb{1}\{i \geq \Delta_{sig} + k\}h(\Delta_{sig}) \\ & \quad + \mathbb{1}\{i < \Delta_{sig} + k\}\mathbb{1}\{i \leq -\Delta_{sig} + k\}h(\Delta_{sig}) \\ & \quad + \mathbb{1}\{i < \Delta_{sig} + k\}\mathbb{1}\{i > -\Delta_{sig} + k\}h(|i-k|)\Big]\Bigg) \\ & - 0.5\gamma\lambda. \end{aligned} \tag{5.9}$$

After the rejection of a proposal and provided that bargaining continues, the median expects a distribution over policies $p \in [-\Delta_{sig}, \Delta_{sig}]$. Because h is strictly monotone, equation (5.9) has a unique solution.

The median's equilibrium tolerance to policy deviations in signal votes is a function of the variable k and the parameters γ and λ: $\Delta^*_{sig}(k;\gamma,\lambda)$. By the implicit function theorem (see, e.g., Simon and Blume 1994, 334-341),

$$\frac{\partial}{\partial\gamma}\Delta^*_{sig}(k;\gamma,\lambda) = -\frac{\frac{\partial}{\partial\gamma}G(k;\gamma,\lambda)}{\frac{\partial}{\partial\Delta_{sig}}G(k;\gamma,\lambda)},$$

where

$$\frac{\partial}{\partial\gamma}G(k;\gamma,\lambda) = -\left(\frac{h(\Delta_{sig}) + 0.5\gamma\lambda}{1-\gamma} + 0.5\lambda\right) \tag{5.10}$$

and

$$\frac{\partial}{\partial \Delta_{sig}} G(k;\gamma,\lambda) = h'(\Delta_{sig})\Bigg(\frac{1-\gamma}{2n+1}\Bigg[\mathbb{1}\{0 \geq \Delta_{sig} - k\} + 2\sum_{i=1}^{n}\Big[\mathbb{1}\{i \geq \Delta_{sig} + k\} + \mathbb{1}\{i < \Delta_{sig} + k\} \times \mathbb{1}\{i \leq -\Delta_{sig} + k\}\Big]\Bigg] - 1\Bigg). \tag{5.11}$$

Note that the RHS of equation (5.10) is negative. The RHS of equation (5.11) is positive because h is strictly decreasing and

$$(1-\gamma)\Bigg[\mathbb{1}\{0 \geq \Delta_{sig} - k\} + 2\sum_{i=1}^{n}\Big[\mathbb{1}\{i \geq \Delta_{sig} + k\} + \mathbb{1}\{i < \Delta_{sig} + k\} \times \mathbb{1}\{i \leq -\Delta_{sig} + k\}\Big]\Bigg] < 2n+1.$$

Consequently, it follows that

$$\frac{\partial}{\partial \gamma}\Delta^*_{sig}(k;\gamma,\lambda) > 0.$$

Similarly, it is

$$\frac{\partial}{\partial \lambda}\Delta^*_{sig}(k;\gamma,\lambda) = -\frac{\frac{\partial}{\partial \lambda}G(k;\gamma,\lambda)}{\frac{\partial}{\partial \Delta_{sig}}G(k;\gamma,\lambda)},$$

where

$$\frac{\partial}{\partial \lambda}G(k;\gamma,\lambda) = -0.5\gamma$$

and $\frac{\partial}{\partial \Delta_{sig}}G(k;\gamma,\lambda)$ is given in (5.11). Therefore, it follows that

$$\frac{\partial}{\partial \lambda}\Delta^*_{sig}(k;\gamma,\lambda) > 0.$$

Finally, it is

$$\frac{\partial}{\partial k}\Delta^*_{sig}(k;\gamma,\lambda) = -\frac{\frac{\partial}{\partial k}G(k;\gamma,\lambda)}{\frac{\partial}{\partial \Delta_{sig}}G(k;\gamma,\lambda)},$$

where

$$\frac{\partial}{\partial k}G(k;\gamma,\lambda) = \frac{1-\gamma}{2n+1}\Bigg(\mathbb{1}\{0 < \Delta_{sig} - k\}h'(k) + 2\sum_{i=1}^{n}\Bigg[\mathbb{1}\{i < \Delta_{sig} + k\}\mathbb{1}\{i > -\Delta_{sig} + k\} \times h'(|i-k|)\left(\frac{i-k}{|i-k|}\right)(-1)\Bigg]\Bigg) \tag{5.12}$$

and, again, $\frac{\partial}{\partial \Delta_{sig}}G(k;\gamma,\lambda)$ is given in (5.11).

The RHS of equation (5.12) is nonnegative. To see this, note that $2\sum_{i=1}^{n}\Big[\mathbb{1}\{i < \Delta_{sig} + k\}\mathbb{1}\{i > -\Delta_{sig} + k\}h'(|i-k|)\Big(\frac{i-k}{|i-k|}\Big)(-1)\Big]$ can be written as

$$2\sum_{i=1}^{n}\Big[\mathbb{1}\{i < \Delta_{sig} + k\}\mathbb{1}\{i > -\Delta_{sig} + k\}\Big(\mathbb{1}\{i = k\}h'(0) + \mathbb{1}\{i > k\}h'(i-k)(-1) + \mathbb{1}\{i < k\}h'(k-i)\Big)\Big]. \tag{5.13}$$

Note that the indicator functions $\mathbb{1}\{i < \Delta_{sig} + k\}$ and $\mathbb{1}\{i > -\Delta_{sig} + k\}$ imply that $-\Delta_{sig} < i - k < \Delta_{sig}$. Now distinguish two cases, $\Delta_{sig} \leq k$ and $\Delta_{sig} > k$. First, if $\Delta_{sig} \leq k$, the indicator function $\mathbb{1}\{0 < \Delta_{sig} - k\}$ in equation (5.12) equals zero. Furthermore, condition $-\Delta_{sig} < i - k < \Delta_{sig}$ ensures that there is an equal number of i's greater and less than k so that expression (5.13) is equal to zero. Second, if $\Delta_{sig} > k$, the indicator function $\mathbb{1}\{0 < \Delta_{sig} - k\}$ equals one. Expression (5.13) now takes a value greater than $h'(k)$ if $\Delta_{sig} > 1$ and the value zero if $\Delta_{sig} \leq 1$. Consequently, the RHS of equation (5.12) is nonnegative and it thus follows that $\Delta^{*}_{sig}(k;\gamma,\lambda)$ is monotonically decreasing (i.e., non-increasing) in k:[11]

$$\frac{\partial}{\partial k}\Delta^{*}_{sig}(k;\gamma,\lambda) \leq 0.$$

□

Proof of Proposition 2. The strategy of proof consists of three steps: (1) show that the majority acceptance set for roll call votes and left-wing constituents is a compact interval; (2) show that the legislators with ideal points at zero are pivotal over both bounds of the majority acceptance set for roll call votes and left-wing constituents; and (3) characterize the bounds of the majority acceptance set for roll call votes and left-wing constituents, show uniqueness, and do comparative statics

[11] See, e.g., Rudin (1964, 55) for a definition of a monotonically decreasing sequence of real numbers.

on γ, λ, and k.

Step 1. A no-delay stationary equilibrium is fully characterized by a stationary majority acceptance set $\mathcal{A}^*_{rcv,e} = \mathcal{A}_{rcv,e,t}$ for all t. Let 2κ, with $2\kappa < n$ for some positive integer κ, be the overlap between party A and party B when the legislature is not completely polarized over an issue. Further, let $k \in \{0, \kappa\}$ be a variable that takes on the value zero if the legislature is completely polarized over an issue and the value κ if the legislature is not completely polarized over an issue. The majority acceptance set for roll call votes and left-wing constituents then satisfies the following recursive formula:

$$\begin{aligned}\mathcal{A}_{rcv,e,t} = \bigcup_{\substack{\mathcal{M}\subseteq N \\ |\mathcal{M}|\geq n+1}} \bigcap_{i\in\mathcal{M}} \Bigg(\Big\{ p_t \in [-n+k, 0] : U^+_{rcv,e}(i, p_t) \geq \\ (1-\gamma)E\Big[U_{rcv,e}(i, P^*_{rcv,e,t+1})\Big] \Big\} \\ \cup \Big\{ p_t \in (0, n-k] : \quad U^-_{rcv,e}(i, p_t) \geq \\ (1-\gamma)E\Big[U_{rcv,e}(i, P^*_{rcv,e,t+1})\Big] \Big\} \Bigg),\end{aligned}$$

where

$$\begin{aligned}E\Big[U_{rcv,e}(i, P^*_{rcv,e,t+1})\Big] = \frac{1}{2n+1} \sum_{j=1}^{2n+1} \Bigg(& U^+_{rcv,e}\Big(i, \underset{p_{t+1}\in\mathcal{A}_{rcv,e,t+1}}{\arg\max} \{U_{rcv,e}(j, p_{t+1})\}\Big) \\ & \times \mathbb{1}\{p_{t+1} \leq 0\} \\ & + U^-_{rcv,e}\Big(i, \underset{p_{t+1}\in\mathcal{A}_{rcv,e,t+1}}{\arg\max} \{U_{rcv,e}(j, p_{t+1})\}\Big) \\ & \times \mathbb{1}\{p_{t+1} > 0\}\mathbb{1}\{i \in \mathcal{M}_{t+1}\} \\ & + U^+_{rcv,e}\Big(i, \underset{p_{t+1}\in\mathcal{A}_{rcv,e,t+1}}{\arg\max} \{U_{rcv,e}(j, p_{t+1})\}\Big) \\ & \times \mathbb{1}\{p_{t+1} > 0\}\mathbb{1}\{i \notin \mathcal{M}_{t+1}\} \Bigg),\end{aligned}$$

and where $U^+_{rcv,e}(i, p_t)$ denotes the utility legislator i receives when she votes according to the preferences of her representative voter ν_i and $U^-_{rcv,e}(i, p_t)$ denotes the utility she receives when she votes against the preferences of ν_i.

Let $P^*_{rcv,e} = P^*_{rcv,e,t}$ for all t. Notice that if the value of being reelected, λ, was equal to zero, function $U_{rcv,e}(i, \cdot)$ would be strictly concave and it would follow that

$$\begin{aligned}U_{rcv,e}(i, E[P^*_{rcv,e}]) &> E[U_{rcv,e}(i, P^*_{rcv,e})] \\ &\geq (1-\gamma)E[U_{rcv,e}(i, P^*_{rcv,e})].\end{aligned}$$

Thus, if λ was zero, the average amendment $E[P^*_{rcv,e}]$ would be contained in all individual acceptance sets. Furthermore, because the majority acceptance set would be symmetric around zero and because all $i \in N$ have an equal probability of being recognized as agenda setter, the average amendment would be equal to zero, i.e., $E[P^*_{rcv,e}] = 0$. Consequently, if λ was equal to zero, the value zero would be contained in all individual acceptance sets and legislator i's utility from accepting proposal $p = 0$ would be $h(|\xi_i(s)|)$.

Now, if $\lambda > 0$, legislator i's utility from voting for proposal $p = 0$ is given by $h(|\xi_i(s)|) + \lambda$. Note that i's expected utility from rejecting $p = 0$ and waiting for the next round of bargaining may increase as well, but—at least for all i with ideal points $\xi_i(s) \geq 0$—by less than λ.[12] If $\lambda > 0$, the individual acceptance set of any legislator with an ideal point $\xi_i(s) \geq 0$ thus continues to contain the value zero. Therefore, if proposal $p = 0$ is introduced, it passes with the support of all legislators whose ideal points are located at zero or to the right of zero. It follows that because $p = 0$ receives a majority of votes, the legislators with ideal points to the left of zero also prefer to support the proposal (supporting proposal $p = 0$ gives them a utility of $h(|\xi_i(s)|) + \lambda$, while voting against $p = 0$ only gives $h(|\xi_i(s)|)$). Consequently, zero remains in all individual acceptance sets if $\lambda > 0$.

Furthermore, because of the compactness of $[-n + k, n - k]$ and the quasiconcavity and upper semicontinuity of function $U_{rcv,e}(i, \cdot)$, an individual legislator's acceptance set is a compact interval. Since the acceptance set of majority $\mathcal{M}$ is an intersection of individual acceptance sets that contain the value zero, it is also a compact interval containing zero. It then follows that the majority acceptance set for roll call votes and left-wing constituents, which is the union of the overlapping acceptance sets of majorities $\mathcal{M} \subseteq N$, is itself a compact interval. Denote it by $\mathcal{A}^*_{rcv,e} = [p^*_{rcv,e,L}, p^*_{rcv,e,R}]$.

Step 2. Show that the legislators with ideal points at zero are pivotal over $p^*_{rcv,e,L}$ (i.e., when $p^*_{rcv,e,L}$ is proposed, the legislators whose ideal points are at zero and everybody to their left vote in favor, whereas all legislators to their right vote against the proposal). Clearly, all legislators with ideal points to the left of $p^*_{rcv,e,L}$ prefer to accept proposal $p^*_{rcv,e,L}$ than to wait for another round of bargaining because $p^*_{rcv,e,L}$ is closer to their ideal points than any other policy in $\mathcal{A}^*_{rcv,e}$ and, in addition, they

[12] Because the majority acceptance set moves to the left when $\lambda > 0$, the policymaking utility that the legislators with ideal points at zero or to the right of zero expect to receive in the next round of bargaining is less than the utility they would expect to receive if λ was zero. In addition, even if the legislators always vote in line with the preferences of their constituents, the expected value of reelection in the next round of bargaining is less than λ because bargaining ends with probability $\gamma > 0$. Consequently, if $\lambda > 0$, the expected utility from waiting for the next round of bargaining increases by less than λ (compared to the expected utility of waiting if λ was zero) for any legislator i with an ideal point $\xi_i(s) \geq 0$.

receive λ when voting for $p^*_{rcv,e,L}$.

Show next that support for proposal $p^*_{rcv,e,L}$ over waiting for $P^*_{rcv,e}$ strictly decreases as we move from $p^*_{rcv,e,L}$ to the right of the legislature. Let

$$f_i = U^+_{rcv,e}(i, p^*_{rcv,e,L}) - (1-\gamma)E[U_{rcv,e}(i, P^*_{rcv,e})]$$

be legislator i's equilibrium support for $p^*_{rcv,e,L}$ today over $P^*_{rcv,e}$ in the next period. Show that for legislator j with an ideal point located to the right of that of i (i.e., $p^*_{rcv,e,L} \leq \xi_i(s) < \xi_j(s)$), support for $p^*_{rcv,e,L}$ declines (i.e., $f_i > f_j$), implying that

$$\begin{gathered} U^+_{rcv,e}(i, p^*_{rcv,e,L}) - (1-\gamma)E[U_{rcv,e}(i, P^*_{rcv,e})] \\ > \\ U^+_{rcv,e}(j, p^*_{rcv,e,L}) - (1-\gamma)E[U_{rcv,e}(j, P^*_{rcv,e})]. \end{gathered}$$

Rearranging terms, it is

$$\begin{gathered} U^+_{rcv,e}(i, p^*_{rcv,e,L}) - U^+_{rcv,e}(j, p^*_{rcv,e,L}) \\ > \\ (1-\gamma)E[U_{rcv,e}(i, P^*_{rcv,e}) - U_{rcv,e}(j, P^*_{rcv,e})]. \end{gathered}$$

Because the functions $U^+_{rcv,e}(i,\cdot)$ and $U^+_{rcv,e}(j,\cdot)$ are strictly concave, their slopes are strictly decreasing. It follows then that $U^+_{rcv,e}(i,p) - U^+_{rcv,e}(j,p)$ strictly decreases in p from a positive level at $p^*_{rcv,e,L}$. Consequently, it is

$$\begin{aligned} U^+_{rcv,e}(i, p^*_{rcv,e,L}) - U^+_{rcv,e}(j, p^*_{rcv,e,L}) &> E[U^+_{rcv,e}(i, P^*_{rcv,e}) - U^+_{rcv,e}(j, P^*_{rcv,e})] \\ &> E[U_{rcv,e}(i, P^*_{rcv,e}) - U_{rcv,e}(j, P^*_{rcv,e})] \end{aligned}$$

and, because the LHS of this inequality is positive, it is also $U^+_{rcv,e}(i, p^*_{rcv,e,L}) - U^+_{rcv,e}(j, p^*_{rcv,e,L}) > (1-\gamma)E[U_{rcv,e}(i, P^*_{rcv,e}) - U_{rcv,e}(j, P^*_{rcv,e})]$. Thus, as we move from $p^*_{rcv,e,L}$ to the right, support for $p^*_{rcv,e,L}$ strictly decreases (i.e., $f_i > f_j$). Since $p^*_{rcv,e,L}$ is the left-most proposal that a majority of legislators is still willing to support, it follows that the legislators with ideal points at zero and everybody to their left must vote in favor, whereas all legislators to their right vote against that proposal. Hence, proposal $p^*_{rcv,e,L}$ receives a majority of votes and the legislators with $\xi_i(s) = 0$ are pivotal.

The argument for the claim that the legislators with ideal points at zero are pivotal over $p^*_{rcv,e,R}$ is analogous. Consequently, the majority acceptance set for roll call votes and left-wing constituents is the acceptance set of the legislators with ideal

points at zero or, equivalently, of the median legislator, i.e., $\mathcal{A}^*_{rcv,e} = \mathcal{A}_{rcv,e,med} = [p^*_{rcv,e,L}, p^*_{rcv,e,R}]$.

Step 3. The median legislator's acceptance set for roll call votes and left-wing constituents, $\mathcal{A}^*_{rcv,e}$, is characterized by policies p that satisfy

$$U^+_{rcv,e}(med, p) \geq (1-\gamma)E[U_{rcv,e}(med, P^*_{rcv,e})].$$

Denote it by $\mathcal{A}^*_{rcv,e} = [-\Delta_{rcv,e,L}, \Delta_{rcv,e,R}]$, where $-\Delta_{rcv,e,L} \leq 0$ and $\Delta_{rcv,e,R} \geq 0$. From the policies in this set, a proposer with ideal point $\xi_i(s) \leq 0$ always chooses the policy that is closest to her ideal point. On the other hand, a proposer with ideal point $\xi_i(s) > 0$ chooses the policy that is closest to her ideal point if $U^-_{rcv,e}(i, p') > U^+_{rcv,e}(i, 0)$, where p' denotes the policy that is closest to the ideal point of the proposer, and zero otherwise.

The maximal equilibrium policy deviation to the left that the median legislator is willing to tolerate in roll call votes with left-wing constituents, $-\Delta^*_{rcv,e,L}$, is implicitly given by

$$
\begin{aligned}
h(\Delta_{rcv,e,L}) + \lambda = (1-\gamma)\Bigg(\frac{1}{2n+1} \sum_{i=-n}^{0} \Bigg[& \mathbb{1}\{i \leq -\Delta_{rcv,e,L} - k\}\Big(h(\Delta_{rcv,e,L}) + \lambda\Big) \\
& + \mathbb{1}\{i > -\Delta_{rcv,e,L} - k\}\mathbb{1}\{i \leq -k\} \\
& \times \Big(h(|i+k|) + \lambda\Big) \\
& + \mathbb{1}\{i > -k\}\mathbb{1}\{i < \Delta_{rcv,e,R} - k\} \\
& \times \mathbb{1}\{h(|-i-k|) + \lambda \geq h(0)\}\Big(h(0) + \lambda\Big) \\
& + \mathbb{1}\{i > -k\}\mathbb{1}\{i < \Delta_{rcv,e,R} - k\} \\
& \times \mathbb{1}\{h(|-i-k|) + \lambda < h(0)\}h(|i+k|) \\
& + \mathbb{1}\{i \geq \Delta_{rcv,e,R} - k\}\mathbb{1}\{h(|-i-k|) + \lambda \\
& \qquad \geq h(|\Delta_{rcv,e,R} - i - k|)\}\Big(h(0) + \lambda\Big) \\
& + \mathbb{1}\{i \geq \Delta_{rcv,e,R} - k\}\mathbb{1}\{h(|-i-k|) + \lambda \\
& \qquad < h(|\Delta_{rcv,e,R} - i - k|)\}\Big(h(\Delta_{rcv,e,L}) + \lambda\Big)\Bigg] \\
+ \frac{1}{2n+1} \sum_{i=1}^{n} \Bigg[& \mathbb{1}\{i \leq -\Delta_{rcv,e,L} + k\}\Big(h(\Delta_{rcv,e,L}) + \lambda\Big) \\
& + \mathbb{1}\{i > -\Delta_{rcv,e,L} + k\}\mathbb{1}\{i \leq k\} \\
& \times \Big(h(|i-k|) + \lambda\Big) \\
& + \mathbb{1}\{i > k\}\mathbb{1}\{i < \Delta_{rcv,e,R} + k\} \\
& \times \mathbb{1}\{h(|-i+k|) + \lambda \geq h(0)\}\Big(h(0) + \lambda\Big) \\
& + \mathbb{1}\{i > k\}\mathbb{1}\{i < \Delta_{rcv,e,R} + k\} \\
& \times \mathbb{1}\{h(|-i+k|) + \lambda < h(0)\}h(|i-k|) \\
& + \mathbb{1}\{i \geq \Delta_{rcv,e,R} + k\}\mathbb{1}\{h(|-i+k|) + \lambda \\
& \qquad \geq h(|\Delta_{rcv,e,R} - i + k|)\}\Big(h(0) + \lambda\Big) \\
& + \mathbb{1}\{i \geq \Delta_{rcv,e,R} + k\}\mathbb{1}\{h(|-i+k|) + \lambda \\
& \qquad < h(|\Delta_{rcv,e,R} - i + k|)\}\Big(h(\Delta_{rcv,e,L}) + \lambda\Big)\Bigg]\Bigg).
\end{aligned}
\tag{5.14}
$$

Similarly, the maximal equilibrium policy deviation to the right that the median legislator is willing to tolerate in roll call votes with left-wing constituents, $-\Delta^*_{rcv,e,R}$, is implicitly given by

$$
\begin{aligned}
h(\Delta_{rcv,e,R}) = (1-\gamma)\Bigg(\frac{1}{2n+1} \sum_{i=-n}^{0} \Bigg[& \mathbb{1}\{i \leq -\Delta_{rcv,e,L} - k\} h(\Delta_{rcv,e,R}) \\
& + \mathbb{1}\{i > -\Delta_{rcv,e,L} - k\} \mathbb{1}\{i \leq -k\} \\
& \times \Big(h(|i+k|) + \lambda \Big) \\
& + \mathbb{1}\{i > -k\} \mathbb{1}\{i < \Delta_{rcv,e,R} - k\} \\
& \times \mathbb{1}\{h(|-i-k|) + \lambda \geq h(0)\} \Big(h(0) + \lambda \Big) \\
& + \mathbb{1}\{i > -k\} \mathbb{1}\{i < \Delta_{rcv,e,R} - k\} \\
& \times \mathbb{1}\{h(|-i-k|) + \lambda < h(0)\} h(|i+k|) \\
& + \mathbb{1}\{i \geq \Delta_{rcv,e,R} - k\} \mathbb{1}\{h(|-i-k|) + \lambda \\
& \qquad \geq h(|\Delta_{rcv,e,R} - i - k|)\} \Big(h(0) + \lambda \Big) \\
& + \mathbb{1}\{i \geq \Delta_{rcv,e,R} - k\} \mathbb{1}\{h(|-i-k|) + \lambda \\
& \qquad < h(|\Delta_{rcv,e,R} - i - k|)\} h(\Delta_{rcv,e,R}) \Bigg] \\
+ \frac{1}{2n+1} \sum_{i=1}^{n} \Bigg[& \mathbb{1}\{i \leq -\Delta_{rcv,e,L} + k\} h(\Delta_{rcv,e,R}) \\
& + \mathbb{1}\{i > -\Delta_{rcv,e,L} + k\} \mathbb{1}\{i \leq k\} \\
& \times \Big(h(|i-k|) + \lambda \Big) \\
& + \mathbb{1}\{i > k\} \mathbb{1}\{i < \Delta_{rcv,e,R} + k\} \\
& \times \mathbb{1}\{h(|-i+k|) + \lambda \geq h(0)\} \Big(h(0) + \lambda \Big) \\
& + \mathbb{1}\{i > k\} \mathbb{1}\{i < \Delta_{rcv,e,R} + k\} \\
& \times \mathbb{1}\{h(|-i+k|) + \lambda < h(0)\} h(|i-k|) \\
& + \mathbb{1}\{i \geq \Delta_{rcv,e,R} + k\} \mathbb{1}\{h(|-i+k|) + \lambda \\
& \qquad \geq h(|\Delta_{rcv,e,R} - i + k|)\} \Big(h(0) + \lambda \Big) \\
& + \mathbb{1}\{i \geq \Delta_{rcv,e,R} + k\} \mathbb{1}\{h(|-i+k|) + \lambda \\
& \qquad < h(|\Delta_{rcv,e,R} - i + k|)\} h(\Delta_{rcv,e,R}) \Bigg] \Bigg).
\end{aligned}
\tag{5.15}
$$

After rejection of a proposal and provided that bargaining continues, the median expects a distribution over policies $p \in [-\Delta_{rcv,e,L}, \Delta_{rcv,e,R}]$. Because h is strictly monotone, the equations (5.14) and (5.15) have a unique solution.

The median's equilibrium tolerance to policy deviations in roll call votes with left-wing constituents is a function of the variable k and the parameters γ and λ: $\Delta^*_{rcv,e,L}(k;\gamma,\lambda)$ and $\Delta^*_{rcv,e,R}(k;\gamma,\lambda)$. I first do comparative statics on the opportunity costs, γ. By the implicit function theorem,

$$\frac{\partial}{\partial\gamma}\Delta^*_{rcv,e,L}(k;\gamma,\lambda) = -\frac{\frac{\partial}{\partial\gamma}G_{rcv,e,L}(k;\gamma,\lambda)}{\frac{\partial}{\partial\Delta_{rcv,e,L}}G_{rcv,e,L}(k;\gamma,\lambda)}$$
$$\frac{\partial}{\partial\gamma}\Delta^*_{rcv,e,R}(k;\gamma,\lambda) = -\frac{\frac{\partial}{\partial\gamma}G_{rcv,e,R}(k;\gamma,\lambda)}{\frac{\partial}{\partial\Delta_{rcv,e,R}}G_{rcv,e,R}(k;\gamma,\lambda)},$$

where

$$\frac{\partial}{\partial\gamma}G_{rcv,e,L}(k;\gamma,\lambda) = -\frac{h(\Delta_{rcv,e,L})+\lambda}{1-\gamma} \tag{5.16}$$
$$\frac{\partial}{\partial\gamma}G_{rcv,e,R}(k;\gamma,\lambda) = -\frac{h(\Delta_{rcv,e,R})}{1-\gamma} \tag{5.17}$$

and

$$\begin{aligned}\frac{\partial}{\partial\Delta_{rcv,e,L}}G_{rcv,e,L}(k;\gamma,\lambda) = h'(\Delta_{rcv,e,L})\Bigg(&\frac{1-\gamma}{2n+1}\Bigg(\sum_{i=-n}^{0}\Big[\,\mathbb{1}\{i\le-\Delta_{rcv,e,L}-k\}\\ &+\mathbb{1}\{i\ge\Delta_{rcv,e,R}-k\}\\ &\times\mathbb{1}\{h(|-i-k|)+\lambda\\ &\qquad<h(|\Delta_{rcv,e,R}-i-k|)\}\Big]\\ &+\sum_{i=1}^{n}\Big[\,\mathbb{1}\{i\le-\Delta_{rcv,e,L}+k\}\\ &+\mathbb{1}\{i\ge\Delta_{rcv,e,R}+k\}\\ &\times\mathbb{1}\{h(|-i+k|)+\lambda\\ &\qquad<h(|\Delta_{rcv,e,R}-i+k|)\}\Big]\Bigg)\\ &-\;1\Bigg)\end{aligned} \tag{5.18}$$

$$\frac{\partial}{\partial \Delta_{rcv,e,R}} G_{rcv,e,R}(k;\gamma,\lambda) = h'(\Delta_{rcv,e,R})\Bigg(\frac{1-\gamma}{2n+1}\Bigg(\sum_{i=-n}^{0}\Big[\mathbb{1}\{i \le -\Delta_{rcv,e,L} - k\} + \mathbb{1}\{i \ge \Delta_{rcv,e,R} - k\} \times \mathbb{1}\{h(|-i-k|) + \lambda < h(|\Delta_{rcv,e,R} - i - k|)\}\Big] + \sum_{i=1}^{n}\Big[\mathbb{1}\{i \le -\Delta_{rcv,e,L} + k\} + \mathbb{1}\{i \ge \Delta_{rcv,e,R} + k\} \times \mathbb{1}\{h(|-i+k|) + \lambda < h(|\Delta_{rcv,e,R} - i + k|)\}\Big]\Bigg) - 1\Bigg). \tag{5.19}$$

Note that the RHS of equation (5.16) and the RHS of equation (5.17) are negative. The RHS of equation (5.18) and the RHS of equation (5.19) are positive because h is strictly decreasing and

$$(1-\gamma)\Bigg(\sum_{i=-n}^{0}\Big[\mathbb{1}\{i \le -\Delta_{rcv,e,L} - k\} + \mathbb{1}\{i \ge \Delta_{rcv,e,R} - k\} \times \mathbb{1}\{h(|-i-k|) + \lambda < h(|\Delta_{rcv,e,R} - i - k|)\}\Big] + \sum_{i=1}^{n}\Big[\mathbb{1}\{i \le -\Delta_{rcv,e,L} + k\} + \mathbb{1}\{i \ge \Delta_{rcv,e,R} + k\} \times \mathbb{1}\{h(|-i+k|) + \lambda < h(|\Delta_{rcv,e,R} - i + k|)\}\Big]\Bigg) < 2n+1.$$

Consequently, it follows that

$$\frac{\partial}{\partial \gamma}\Delta^*_{rcv,e,L}(k;\gamma,\lambda) > 0$$
$$\frac{\partial}{\partial \gamma}\Delta^*_{rcv,e,R}(k;\gamma,\lambda) > 0.$$

Next, I do comparative statics on the value of being reelected, λ. Again, by the implicit function theorem,

$$\frac{\partial}{\partial\lambda}\Delta^*_{rcv,e,L}(k;\gamma,\lambda) = -\frac{\frac{\partial}{\partial\lambda}G_{rcv,e,L}(k;\gamma,\lambda)}{\frac{\partial}{\partial\Delta_{rcv,e,L}}G_{rcv,e,L}(k;\gamma,\lambda)}$$
$$\frac{\partial}{\partial\lambda}\Delta^*_{rcv,e,R}(k;\gamma,\lambda) = -\frac{\frac{\partial}{\partial\lambda}G_{rcv,e,R}(k;\gamma,\lambda)}{\frac{\partial}{\partial\Delta_{rcv,e,R}}G_{rcv,e,R}(k;\gamma,\lambda)},$$

where $\frac{\partial}{\partial\Delta_{rcv,e,L}}G_{rcv,e,L}(k;\gamma,\lambda)$ is given in (5.18), $\frac{\partial}{\partial\Delta_{rcv,e,R}}G_{rcv,e,R}(k;\gamma,\lambda)$ is given in (5.19), and

$$\begin{aligned}
\frac{\partial}{\partial\lambda}G_{rcv,e,L}(k;\gamma,\lambda) = \frac{1-\gamma}{2n+1}\Bigg(\sum_{i=-n}^{0} \Big[& \mathbb{1}\{i \le -\Delta_{rcv,e,L} - k\} \\
& + \mathbb{1}\{i > -\Delta_{rcv,e,L} - k\}\mathbb{1}\{i \le -k\} \\
& + \mathbb{1}\{i > -k\}\mathbb{1}\{i < \Delta_{rcv,e,R} - k\} \\
& \times \mathbb{1}\{h(|-i-k|) + \lambda \ge h(0)\} \\
& + \mathbb{1}\{i \ge \Delta_{rcv,e,R} - k\}\mathbb{1}\{h(|-i-k|) + \lambda \\
& \qquad \ge h(|\Delta_{rcv,e,R} - i - k|)\} \\
& + \mathbb{1}\{i \ge \Delta_{rcv,e,R} - k\}\mathbb{1}\{h(|-i-k|) + \lambda \\
& \qquad < h(|\Delta_{rcv,e,R} - i - k|)\}\Big] \\
+ \sum_{i=1}^{n} \Big[& \mathbb{1}\{i \le -\Delta_{rcv,e,L} + k\} \\
& + \mathbb{1}\{i > -\Delta_{rcv,e,L} + k\}\mathbb{1}\{i \le k\} \\
& + \mathbb{1}\{i > k\}\mathbb{1}\{i < \Delta_{rcv,e,R} + k\} \\
& \times \mathbb{1}\{h(|-i+k|) + \lambda \ge h(0)\} \\
& + \mathbb{1}\{i \ge \Delta_{rcv,e,R} + k\}\mathbb{1}\{h(|-i+k|) + \lambda \\
& \qquad \ge h(|\Delta_{rcv,e,R} - i + k|)\} \\
& + \mathbb{1}\{i \ge \Delta_{rcv,e,R} + k\}\mathbb{1}\{h(|-i+k|) + \lambda \\
& \qquad < h(|\Delta_{rcv,e,R} - i + k|)\}\Big]\Bigg) - 1 \qquad (5.20)
\end{aligned}$$

$$\begin{aligned}\frac{\partial}{\partial\lambda}G_{rcv,e,R}(k;\gamma,\lambda) = \frac{1-\gamma}{2n+1}\Bigg(\sum_{i=-n}^{0}\Big[\,&\mathbb{1}\{i > -\Delta_{rcv,e,L} - k\}\mathbb{1}\{i \le -k\}\\ &+ \mathbb{1}\{i > -k\}\mathbb{1}\{i < \Delta_{rcv,e,R} - k\}\\ &\times \mathbb{1}\{h(|-i-k|) + \lambda \ge h(0)\}\\ &+ \mathbb{1}\{i \ge \Delta_{rcv,e,R} - k\}\mathbb{1}\{h(|-i-k|) + \lambda\\ &\quad \ge h(|\Delta_{rcv,e,R} - i - k|)\}\Big]\\ +\sum_{i=1}^{n}\Big[\,&\mathbb{1}\{i > -\Delta_{rcv,e,L} + k\}\mathbb{1}\{i \le k\}\\ &+ \mathbb{1}\{i > k\}\mathbb{1}\{i < \Delta_{rcv,e,R} + k\}\\ &\times \mathbb{1}\{h(|-i+k|) + \lambda \ge h(0)\}\\ &+ \mathbb{1}\{i \ge \Delta_{rcv,e,R} + k\}\mathbb{1}\{h(|-i+k|) + \lambda\\ &\quad \ge h(|\Delta_{rcv,e,R} - i + k|)\}\Big]\Bigg). \end{aligned} \tag{5.21}$$

The RHS of equation (5.20) is negative because

$$\begin{aligned}(1-\gamma)\Bigg(\sum_{i=-n}^{0}\Big[\,&\mathbb{1}\{i \le -\Delta_{rcv,e,L} - k\}\\ &+ \mathbb{1}\{i > -\Delta_{rcv,e,L} - k\}\mathbb{1}\{i \le -k\}\\ &+ \mathbb{1}\{i > -k\}\mathbb{1}\{i < \Delta_{rcv,e,R} - k\}\\ &\times \mathbb{1}\{h(|-i-k|) + \lambda \ge h(0)\}\\ &+ \mathbb{1}\{i \ge \Delta_{rcv,e,R} - k\}\\ &\times \mathbb{1}\{h(|-i-k|) + \lambda \ge h(|\Delta_{rcv,e,R} - i - k|)\}\\ &+ \mathbb{1}\{i \ge \Delta_{rcv,e,R} - k\}\\ &\times \mathbb{1}\{h(|-i-k|) + \lambda < h(|\Delta_{rcv,e,R} - i - k|)\}\Big]\\ +\sum_{i=1}^{n}\Big[\,&\mathbb{1}\{i \le -\Delta_{rcv,e,L} + k\}\\ &+ \mathbb{1}\{i > -\Delta_{rcv,e,L} + k\}\mathbb{1}\{i \le k\}\\ &+ \mathbb{1}\{i > k\}\mathbb{1}\{i < \Delta_{rcv,e,R} + k\}\\ &\times \mathbb{1}\{h(|-i+k|) + \lambda \ge h(0)\}\\ &+ \mathbb{1}\{i \ge \Delta_{rcv,e,R} + k\}\\ &\times \mathbb{1}\{h(|-i+k|) + \lambda \ge h(|\Delta_{rcv,e,R} - i + k|)\}\\ &+ \mathbb{1}\{i \ge \Delta_{rcv,e,R} + k\}\\ &\times \mathbb{1}\{h(|-i+k|) + \lambda < h(|\Delta_{rcv,e,R} - i + k|)\}\Big]\Bigg) < 2n+1. \end{aligned}$$

and the RHS of equation (5.21) is positive. Therefore, it follows that

$$\frac{\partial}{\partial\lambda}\Delta^*_{rcv,e,L}(k;\gamma,\lambda) > 0$$
$$\frac{\partial}{\partial\lambda}\Delta^*_{rcv,e,R}(k;\gamma,\lambda) < 0.$$

Finally, I do comparative statics on the degree of party similarity, $k(s)$. Again, by the implicit function theorem, it is

$$\frac{\partial}{\partial k}\Delta^*_{rcv,e,L}(k;\gamma,\lambda) = -\frac{\frac{\partial}{\partial k}G_{rcv,e,L}(k;\gamma,\lambda)}{\frac{\partial}{\partial\Delta_{rcv,e,L}}G_{rcv,e,L}(k;\gamma,\lambda)}$$
$$\frac{\partial}{\partial k}\Delta^*_{rcv,e,R}(k;\gamma,\lambda) = -\frac{\frac{\partial}{\partial k}G_{rcv,e,R}(k;\gamma,\lambda)}{\frac{\partial}{\partial\Delta_{rcv,e,R}}G_{rcv,e,R}(k;\gamma,\lambda)},$$

where $\frac{\partial}{\partial\Delta_{rcv,e,L}}G_{rcv,e,L}(k;\gamma,\lambda)$ is given in (5.18), $\frac{\partial}{\partial\Delta_{rcv,e,R}}G_{rcv,e,R}(k;\gamma,\lambda)$ is given in (5.19), and

$$\begin{aligned}
&\frac{\partial}{\partial k}G_{rcv,e,L}(k;\gamma,\lambda) = \frac{\partial}{\partial k}G_{rcv,e,R}(k;\gamma,\lambda)\\
&= \frac{1-\gamma}{2n+1}\Bigg(\sum_{i=-n}^{0}\Bigg[\mathbb{1}\{i > -\Delta_{rcv,e,L}-k\}\mathbb{1}\{i\le -k\}h'(|i+k|)\left(\frac{i+k}{|i+k|}\right)\\
&\qquad + \mathbb{1}\{i > -k\}\mathbb{1}\{i < \Delta_{rcv,e,R}-k\}\mathbb{1}\{h(|-i-k|)+\lambda < h(0)\}\\
&\qquad \times h'(|i+k|)\left(\frac{i+k}{|i+k|}\right)\Bigg]\\
&\quad + \sum_{i=1}^{n}\Bigg[\mathbb{1}\{i > -\Delta_{rcv,e,L}+k\}\mathbb{1}\{i\le k\}h'(|i-k|)\left(\frac{i-k}{|i-k|}\right)(-1)\\
&\qquad + \mathbb{1}\{i > k\}\mathbb{1}\{i < \Delta_{rcv,e,R}+k\}\mathbb{1}\{h(|-i+k|)+\lambda < h(0)\}\\
&\qquad \times h'(|i-k|)\left(\frac{i-k}{|i-k|}\right)(-1)\Bigg]\Bigg).
\end{aligned} \tag{5.22}$$

The RHS of equation (5.22) is nonnegative. To see this, note that $h'(|i+k|)\left(\frac{i+k}{|i+k|}\right)$ is positive and the indicator functions $\mathbb{1}\{i > -\Delta_{rcv,e,L}-k\}$ and $\mathbb{1}\{i\le -k\}$ select all $i\in A$ with ideal points $-\Delta_{rcv,e,L} < \xi_i(s)\le 0$, whereas $h'(|i-k|)\left(\frac{i-k}{|i-k|}\right)(-1)$ is negative and the indicator functions $\mathbb{1}\{i > -\Delta_{rcv,e,L}+k\}$ and $\mathbb{1}\{i\le k\}$ select all $i\in B$ with ideal points $-\Delta_{rcv,e,L} < \xi_i(s)\le 0$. Similarly, $h'(|i-k|)\left(\frac{i-k}{|i-k|}\right)(-1)$ is positive and the indicator functions $\mathbb{1}\{i > k\}$ and $\mathbb{1}\{i < \Delta_{rcv,e,R}+k\}$ select all $i\in B$ with ideal points $0 < \xi_i(s) < \Delta_{rcv,e,R}$, whereas $h'(|i+k|)\left(\frac{i+k}{|i+k|}\right)$ is negative and the indicator functions $\mathbb{1}\{i > -k\}$ and $\mathbb{1}\{i < \Delta_{rcv,e,R}-k\}$ select all $i\in A$ with ideal points $0 < \xi_i(s) < \Delta_{rcv,e,R}$. Because there are at least as many $i\in A$ with ideal points $-\Delta_{rcv,e,L} < \xi_i(s)\le 0$ as there are $i\in B$ and because there are at least as

many $i \in B$ with ideal points $0 < \xi_i(s) < \Delta_{rcv,e,R}$ as there are $i \in A$, the RHS of equation (5.22) must be nonnegative. Therefore, it follows that $\Delta^*_{rcv,e,L}(k;\gamma,\lambda)$ and $\Delta^*_{rcv,e,R}(k;\gamma,\lambda)$ are monotonically decreasing (i.e., non-increasing) in $k(s)$:

$$\frac{\partial}{\partial k}\Delta^*_{rcv,e,L}(k;\gamma,\lambda) \leq 0$$
$$\frac{\partial}{\partial k}\Delta^*_{rcv,e,R}(k;\gamma,\lambda) \leq 0.$$

□

Proof of Proposition 3. The proof is equivalent to the proof of Proposition 2. □

5.B Proof of the Proposition for the Organizational Stage

Proof of Proposition 4. Ex ante, the members of a party are strategically equal and, therefore, have the same preferences over voting procedures. Because voting procedures are chosen by majority rule and party A controls a majority in the legislature, it suffices to analyze the equilibrium behavior of the members of party A. In the organizational stage, legislators are uncertain about which policy issue $s \in S$ will arise in the policymaking stage. Therefore, the ideal point of a legislator $i \in A$ can be any $\xi_i(s) \in \{-n+k, -n+k+1, \ldots, k\}$. For each member of party A in the organizational stage, the expected payoff from a signal vote on a completely polarized issue is

$$\begin{aligned} E_A[U_{sig}(i, P^*_{sig})|k=0] = \frac{1}{n+1}\sum_{i=-n}^{0}\Bigg(\frac{1}{2n+1}\sum_{j=-n}^{0}\Big[\mathbb{1}\{j \leq -\Delta^*_{sig}\}h(|-\Delta^*_{sig}-i|) \\ + \mathbb{1}\{j > -\Delta^*_{sig}\}h(|j-i|)\Big] \\ + \frac{1}{2n+1}\sum_{j=1}^{n}\Big[\mathbb{1}\{j \geq \Delta^*_{sig}\}h(|\Delta^*_{sig}-i|) \\ + \mathbb{1}\{j < \Delta^*_{sig}\}h(|j-i|)\Big]\Bigg) \\ + 0.5\lambda \end{aligned}$$

and the expected payoff from a signal vote on a not completely polarized issue is

$$
\begin{aligned}
E_A[U_{sig}(i, P^*_{sig})|k=\kappa] = \frac{1}{n+1}\sum_{i=-n}^{0}\Bigg(\frac{1}{2n+1}\sum_{j=-n}^{0}\Big[\,&\mathbb{1}\{j \le -\Delta^*_{sig}-\kappa\}\\
&\times h(|-\Delta^*_{sig}-i-\kappa|)\\
&+\mathbb{1}\{j > -\Delta^*_{sig}-\kappa\}\mathbb{1}\{j \ge \Delta^*_{sig}-\kappa\}\\
&\times h(|\Delta^*_{sig}-i-\kappa|)\\
&+\mathbb{1}\{j > -\Delta^*_{sig}-\kappa\}\mathbb{1}\{j < \Delta^*_{sig}-\kappa\}\\
&\times h(|j-i|)\Big]\\
+\frac{1}{2n+1}\sum_{j=1}^{n}\Big[\,&\mathbb{1}\{j \ge \Delta^*_{sig}+\kappa\}h(|\Delta^*_{sig}-i-\kappa|)\\
&+\mathbb{1}\{j < \Delta^*_{sig}+\kappa\}\mathbb{1}\{j \le -\Delta^*_{sig}+\kappa\}\\
&\times h(|-\Delta^*_{sig}-i-\kappa|)\\
&+\mathbb{1}\{j < \Delta^*_{sig}+\kappa\}\mathbb{1}\{j > -\Delta^*_{sig}+\kappa\}\\
&\times h(|j-i-2\kappa|)\Big]\Bigg)\\
+0.5\lambda.&
\end{aligned}
$$

Note that because all completely polarized issues are equally likely and all not completely polarized issues are equally likely, legislator $i \in A$ expects with probability $\frac{1}{n+1}$ that her ideal point will be located at $-n+k, -n+k+1, \ldots, k$. Moreover, legislator i expects that after an issue has been taken up, the agenda setter will propose the policy $p \in [-\Delta^*_{sig}, \Delta^*_{sig}]$ that is closest to her ideal point.

If policy proposals are voted on by roll call, then the expected payoff of legislator i depends not only on the policy outcome, but also on whether the voting behavior of i reflects the constituents' preferences. If constituents are of the left-wing type, then the expected payoff of party A members from a roll call vote on a completely polarized issue is

$$
\begin{aligned}
E_A[U_{rcv,e}(i, P^*_{rcv,e})|k=0] = \frac{1}{n+1}\sum_{i=-n}^{0}\Bigg(\frac{1}{2n+1}\sum_{j=-n}^{0}\Big[\ & \mathbb{1}\{j \le -\Delta^*_{rcv,e,L}\} \\
& \times \Big(h(|-\Delta^*_{rcv,e,L} - i|) + \lambda\Big) \\
& + \mathbb{1}\{j > -\Delta^*_{rcv,e,L}\} \\
& \times \Big(h(|j-i|) + \lambda\Big)\Big] \\
+ \frac{1}{2n+1}\sum_{j=1}^{n}\Big[\ & \mathbb{1}\{j \ge \Delta^*_{rcv,e,R}\} \\
& \times \mathbb{1}\{h(j) + \lambda \ge h(|\Delta^*_{rcv,e,R} - j|)\} \\
& \times \Big(h(|i|) + \lambda\Big) \\
& + \mathbb{1}\{j \ge \Delta^*_{rcv,e,R}\} \\
& \times \mathbb{1}\{h(j) + \lambda < h(|\Delta^*_{rcv,e,R} - j|)\} \\
& \times \Big(h(|\Delta^*_{rcv,e,R} - i|) + (n/n+1)\lambda\Big) \\
& + \mathbb{1}\{j < \Delta^*_{rcv,e,R}\} \\
& \times \mathbb{1}\{h(j) + \lambda \ge h(0)\}\Big(h(|i|) + \lambda\Big) \\
& + \mathbb{1}\{j < \Delta^*_{rcv,e,R}\} \\
& \times \mathbb{1}\{h(j) + \lambda < h(0)\} \\
& \times \mathbb{1}\{\Delta^{i,*}_{rcv,e,R} < j\}\Big(h(|j-i|) + \lambda\Big) \\
& + \mathbb{1}\{j < \Delta^*_{rcv,e,R}\} \\
& \times \mathbb{1}\{h(j) + \lambda < h(0)\} \\
& \times \mathbb{1}\{\Delta^{i,*}_{rcv,e,R} \ge j\}h(|j-i|)\Big]\Bigg)
\end{aligned}
$$

and the expected payoff from a roll call vote on a not completely polarized issue is

$$
\begin{aligned}
E_A[U_{rcv,e}(i, P^*_{rcv,e})|k=\kappa] \quad = \\
\frac{1}{n+1}\sum_{i=-n}^{0}\Bigg(\frac{1}{2n+1}\sum_{j=-n}^{0}\Big[\,&\mathbb{1}\{j\le -\Delta^*_{rcv,e,L}-\kappa\}\Big(h(|-\Delta^*_{rcv,e,L}-i-\kappa|)+\lambda\Big)\\
&+\mathbb{1}\{j>-\Delta^*_{rcv,e,L}-\kappa\}\mathbb{1}\{j\le-\kappa\}\Big(h(|j-i|)+\lambda\Big)\\
&+\mathbb{1}\{j>-\kappa\}\mathbb{1}\{j<\Delta^*_{rcv,e,R}-\kappa\}\\
&\times\mathbb{1}\{h(|-j-\kappa|)+\lambda\ge h(0)\}\Big(h(|-i-\kappa|)+\lambda\Big)\\
&+\mathbb{1}\{j>-\kappa\}\mathbb{1}\{j<\Delta^*_{rcv,e,R}-\kappa\}\mathbb{1}\{h(|-j-\kappa|)+\lambda\\
&\quad<h(0)\}\mathbb{1}\{\Delta^{i,*}_{rcv,e,R}<j+\kappa\}\Big(h(|j-i|)+\lambda\Big)\\
&+\mathbb{1}\{j>-\kappa\}\mathbb{1}\{j<\Delta^*_{rcv,e,R}-\kappa\}\mathbb{1}\{h(|-j-\kappa|)+\lambda\\
&\quad<h(0)\}\mathbb{1}\{\Delta^{i,*}_{rcv,e,R}\ge j+\kappa\}h(|j-i|)\\
&+\mathbb{1}\{j\ge\Delta^*_{rcv,e,R}-\kappa\}\mathbb{1}\{h(|-j-\kappa|)+\lambda\\
&\quad\ge h(|\Delta^*_{rcv,e,R}-j-\kappa|)\}\Big(h(|-i-\kappa|)+\lambda\Big)\\
&+\mathbb{1}\{j\ge\Delta^*_{rcv,e,R}-\kappa\}\mathbb{1}\{h(|-j-\kappa|)+\lambda\\
&\quad<h(|\Delta^*_{rcv,e,R}-j-\kappa|)\}\mathbb{1}\{\Delta^{i,*}_{rcv,e,R}<\Delta^*_{rcv,e,R}\}\\
&\times\Big(h(|\Delta^*_{rcv,e,R}-i-\kappa|)+\lambda\Big)\\
&+\mathbb{1}\{j\ge\Delta^*_{rcv,e,R}-\kappa\}\mathbb{1}\{h(|-j-\kappa|)+\lambda\\
&\quad<h(|\Delta^*_{rcv,e,R}-j-\kappa|)\}\mathbb{1}\{\Delta^{i,*}_{rcv,e,R}\ge\Delta^*_{rcv,e,R}\}\\
&\times h(|\Delta^*_{rcv,e,R}-i-\kappa|)\Big]\\
+\frac{1}{2n+1}\sum_{j=1}^{n}\Big[\,&\mathbb{1}\{j\le-\Delta^*_{rcv,e,L}+\kappa\}\Big(h(|-\Delta^*_{rcv,e,L}-i-\kappa|)+\lambda\Big)\\
&+\mathbb{1}\{j>-\Delta^*_{rcv,e,L}+\kappa\}\mathbb{1}\{j\le\kappa\}\Big(h(|j-i-2\kappa|)+\lambda\Big)\\
&+\mathbb{1}\{j>\kappa\}\mathbb{1}\{j<\Delta^*_{rcv,e,R}+\kappa\}\mathbb{1}\{h(|-j+\kappa|)+\lambda\\
&\quad\ge h(0)\}\Big(h(|-i-\kappa|)+\lambda\Big)\\
&+\mathbb{1}\{j>\kappa\}\mathbb{1}\{j<\Delta^*_{rcv,e,R}+\kappa\}\mathbb{1}\{h(|-j+\kappa|)+\lambda\\
&\quad<h(0)\}\mathbb{1}\{\Delta^{i,*}_{rcv,e,R}<j-\kappa\}\Big(h(|j-i-2\kappa|)+\lambda\Big)\\
&+\mathbb{1}\{j>\kappa\}\mathbb{1}\{j<\Delta^*_{rcv,e,R}+\kappa\}\mathbb{1}\{h(|-j+\kappa|)+\lambda\\
&\quad<h(0)\}\mathbb{1}\{\Delta^{i,*}_{rcv,e,R}\ge j-\kappa\}h(|j-i-2\kappa|)\\
&+\mathbb{1}\{j\ge\Delta^*_{rcv,e,R}+\kappa\}\mathbb{1}\{h(|-j+\kappa|)+\lambda\\
&\quad\ge h(|\Delta^*_{rcv,e,R}-j+\kappa|)\}\Big(h(|-i-\kappa|)+\lambda\Big)\\
&+\mathbb{1}\{j\ge\Delta^*_{rcv,e,R}+\kappa\}\mathbb{1}\{h(|-j+\kappa|)+\lambda<h(|\Delta^*_{rcv,e,R}-j\\
&\quad+\kappa|)\}\mathbb{1}\{\Delta^{i,*}_{rcv,e,R}<\Delta^*_{rcv,e,R}\}\Big(h(|\Delta^*_{rcv,e,R}-i-\kappa|)+\lambda\Big)\\
&+\mathbb{1}\{j\ge\Delta^*_{rcv,e,R}+\kappa\}\mathbb{1}\{h(|-j+\kappa|)+\lambda<h(|\Delta^*_{rcv,e,R}-j\\
&\quad+\kappa|)\}\mathbb{1}\{\Delta^{i,*}_{rcv,e,R}\ge\Delta^*_{rcv,e,R}\}h(|\Delta^*_{rcv,e,R}-i-\kappa|)\Big]\Bigg),
\end{aligned}
$$

where $\Delta^{i,*}_{rcv,e,R}$ is the maximal equilibrium policy deviation to the right that legislator i is willing to tolerate in a roll call vote with left-wing constituents.

On the other hand, if constituents are of the conservative type, then the expected payoff of party A members from a roll call vote on a completely polarized issue is

$$
\begin{aligned}
E_A[U_{rcv,o}(i, P^*_{rcv,o})|k=0] = \frac{1}{n+1}\sum_{i=-n}^{0}\Bigg(\frac{1}{2n+1}\sum_{j=-n}^{0}\Big[\,&\mathbb{1}\{j \le -\Delta^*_{rcv,o,L}\}\\
&\times \mathbb{1}\{h(|j|)+\lambda\\
&\qquad \ge h(|-\Delta^*_{rcv,o,L}-j|)\}\\
&\times \Big(h(|i|)+\lambda\Big)\\
&+ \mathbb{1}\{j \le -\Delta^*_{rcv,o,L}\}\\
&\times \mathbb{1}\{h(|j|)+\lambda\\
&\qquad < h(|-\Delta^*_{rcv,o,L}-j|)\}\\
&\times h(|-\Delta^*_{rcv,o,L}-i|)\\
&+ \mathbb{1}\{j > -\Delta^*_{rcv,o,L}\}\\
&\times \mathbb{1}\{h(|j|)+\lambda \ge h(0)\}\\
&\times \Big(h(|i|)+\lambda\Big)\\
&+ \mathbb{1}\{j > -\Delta^*_{rcv,o,L}\}\\
&\times \mathbb{1}\{h(|j|)+\lambda < h(0)\}h(|j-i|)\Big]\\
+\frac{1}{2n+1}\sum_{j=1}^{n}\Big[\,&\mathbb{1}\{j \ge \Delta^*_{rcv,o,R}\}\\
&\times \Big(h(|\Delta^*_{rcv,o,R}-i|)+\lambda\Big)\\
&+ \mathbb{1}\{j < \Delta^*_{rcv,o,R}\}\\
&\times \Big(h(|j-i|)+\lambda\Big)\Big]\Bigg)
\end{aligned}
$$

and the expected payoff from a roll call vote on a not completely polarized issue is

$$
\begin{aligned}
E_A[U_{rcv,o}(i, P^*_{rcv,o})|k=\kappa] \quad = \\
\frac{1}{n+1}\sum_{i=-n}^{0}\Bigg(\frac{1}{2n+1}\sum_{j=-n}^{0}\Big[\,&\mathbb{1}\{j \le -\Delta^*_{rcv,o,L}-\kappa\}\mathbb{1}\{h(|-j-\kappa|)+\lambda \\
&\qquad \ge h(|-\Delta^*_{rcv,o,L}-j-\kappa|)\}\Big(h(|-i-\kappa|)+\lambda\Big) \\
&+\mathbb{1}\{j \le -\Delta^*_{rcv,o,L}-\kappa\}\mathbb{1}\{h(|-j-\kappa|)+\lambda \\
&\qquad < h(|-\Delta^*_{rcv,o,L}-j-\kappa|)\}\mathbb{1}\{-\Delta^{i,*}_{rcv,o,L} > -\Delta^*_{rcv,o,L}\} \\
&\times\Big(h(|-\Delta^*_{rcv,o,L}-i-\kappa|)+\lambda\Big) \\
&+\mathbb{1}\{j \le -\Delta^*_{rcv,o,L}-\kappa\}\mathbb{1}\{h(|-j-\kappa|)+\lambda \\
&\qquad < h(|-\Delta^*_{rcv,o,L}-j-\kappa|)\}\mathbb{1}\{-\Delta^{i,*}_{rcv,o,L} \le -\Delta^*_{rcv,o,L}\} \\
&\times h(|-\Delta^*_{rcv,o,L}-i-\kappa|)+\mathbb{1}\{j > -\Delta^*_{rcv,o,L}-\kappa\}\mathbb{1}\{j<-\kappa\} \\
&\times\mathbb{1}\{h(|-j-\kappa|)+\lambda \ge h(0)\}\Big(h(|-i-\kappa|)+\lambda\Big) \\
&+\mathbb{1}\{j > -\Delta^*_{rcv,o,L}-\kappa\}\mathbb{1}\{j<-\kappa\}\mathbb{1}\{h(|-j-\kappa|)+\lambda \\
&\qquad < h(0)\}\mathbb{1}\{-\Delta^{i,*}_{rcv,o,L} > j+\kappa\}\Big(h(|j-i|)+\lambda\Big) \\
&+\mathbb{1}\{j > -\Delta^*_{rcv,o,L}-\kappa\}\mathbb{1}\{j<-\kappa\}\mathbb{1}\{h(|-j-\kappa|)+\lambda \\
&\qquad < h(0)\}\mathbb{1}\{-\Delta^{i,*}_{rcv,o,L} \le j+\kappa\}h(|j-i|) \\
&+\mathbb{1}\{j \ge -\kappa\}\mathbb{1}\{j < \Delta^*_{rcv,o,R}-\kappa\}\Big(h(|j-i|)+\lambda\Big) \\
&+\mathbb{1}\{j \ge \Delta^*_{rcv,o,R}-\kappa\}\Big(h(|\Delta^*_{rcv,o,R}-i-\kappa|)+\lambda\Big)\Big] \\
+\frac{1}{2n+1}\sum_{j=1}^{n}\Big[\,&\mathbb{1}\{j \le -\Delta^*_{rcv,o,L}+\kappa\}\mathbb{1}\{h(|-j+\kappa|)+\lambda \\
&\qquad \ge h(|-\Delta^*_{rcv,o,L}-j+\kappa|)\}\Big(h(|-i-\kappa|)+\lambda\Big) \\
&+\mathbb{1}\{j \le -\Delta^*_{rcv,o,L}+\kappa\}\mathbb{1}\{h(|-j+\kappa|)+\lambda \\
&\qquad < h(|-\Delta^*_{rcv,o,L}-j+\kappa|)\}\mathbb{1}\{-\Delta^{i,*}_{rcv,o,L} > -\Delta^*_{rcv,o,L}\} \\
&\times\Big(h(|-\Delta^*_{rcv,o,L}-i-\kappa|)+\lambda\Big) \\
&+\mathbb{1}\{j \le -\Delta^*_{rcv,o,L}+\kappa\}\mathbb{1}\{h(|-j+\kappa|)+\lambda \\
&\qquad < h(|-\Delta^*_{rcv,o,L}-j+\kappa|)\}\mathbb{1}\{-\Delta^{i,*}_{rcv,o,L} \le -\Delta^*_{rcv,o,L}\} \\
&\times h(|-\Delta^*_{rcv,o,L}-i-\kappa|)+\mathbb{1}\{j > -\Delta^*_{rcv,o,L}+\kappa\}\mathbb{1}\{j<\kappa\} \\
&\times\mathbb{1}\{h(|-j+\kappa|)+\lambda \ge h(0)\}\Big(h(|-i-\kappa|)+\lambda\Big) \\
&+\mathbb{1}\{j > -\Delta^*_{rcv,o,L}+\kappa\}\mathbb{1}\{j<\kappa\}\mathbb{1}\{h(|-j+\kappa|)+\lambda \\
&\qquad < h(0)\}\mathbb{1}\{-\Delta^{i,*}_{rcv,o,L} > j-\kappa\}\Big(h(|j-i-2\kappa|)+\lambda\Big) \\
&+\mathbb{1}\{j > -\Delta^*_{rcv,o,L}+\kappa\}\mathbb{1}\{j<\kappa\}\mathbb{1}\{h(|-j+\kappa|)+\lambda \\
&\qquad < h(0)\}\mathbb{1}\{-\Delta^{i,*}_{rcv,o,L} \le j-\kappa\}h(|j-i-2\kappa|) \\
&+\mathbb{1}\{j \ge \kappa\}\mathbb{1}\{j < \Delta^*_{rcv,o,R}+\kappa\}\Big(h(|j-i-2\kappa|)+\lambda\Big) \\
&+\mathbb{1}\{j \ge \Delta^*_{rcv,o,R}+\kappa\}\Big(h(|\Delta^*_{rcv,o,R}-i-\kappa|)+\lambda\Big)\Big]\Bigg),
\end{aligned}
$$

where $-\Delta^{i,*}_{rcv,o,L}$ is the maximal equilibrium policy deviation to the left that legislator i is willing to tolerate in a roll call vote with conservative constituents.

Consequently, in the organizational stage, the expected payoff of each member of party A is given by

$$\begin{aligned} E_A[U(i,P^*)] \;=\; & (1-x)\Big(E_A[U_{sig}(i,P^*_{sig})|k=0]\pi \\ & \qquad + E_A[U_{sig}(i,P^*_{sig})|k=\kappa](1-\pi)\Big) \\ & + x\Big(E_A[U_{rcv,e}(i,P^*_{rcv,e})|k=0]\pi\rho \\ & \quad + E_A[U_{rcv,e}(i,P^*_{rcv,e})|k=\kappa](1-\pi)\rho \\ & \quad + E_A[U_{rcv,o}(i,P^*_{rcv,o})|k=0]\pi(1-\rho) \\ & \quad + E_A[U_{rcv,o}(i,P^*_{rcv,o})|k=\kappa](1-\pi)(1-\rho)\Big). \end{aligned}$$

Differentiating with respect to x yields

$$\begin{aligned} \frac{\partial}{\partial x}E_A[U(i,P^*)] = & E_A[U_{rcv,e}(i,P^*_{rcv,e})|k=0]\pi\rho \\ & + E_A[U_{rcv,e}(i,P^*_{rcv,e})|k=\kappa](1-\pi)\rho \\ & + E_A[U_{rcv,o}(i,P^*_{rcv,o})|k=0]\pi(1-\rho) \\ & + E_A[U_{rcv,o}(i,P^*_{rcv,o})|k=\kappa](1-\pi)(1-\rho) \\ & - E_A[U_{sig}(i,P^*_{sig})|k=0]\pi \\ & - E_A[U_{sig}(i,P^*_{sig})|k=\kappa](1-\pi). \end{aligned}$$

Let $\delta_A \equiv \frac{\partial}{\partial x}E_A[U(i,P^*)]$. It follows that the greater is δ_A, the greater is the payoff a member of party A expects from voting by roll call in the policymaking stage. Consequently, party A members' preferences for roll call voting over signal voting increase in δ_A. □

Chapter 6

Conclusion

The goal of this dissertation was to examine the reasons why roll call votes are selected in democratic legislatures and how they affect the voting behavior of legislators. These two goals are related. Because voting data are observational, understanding the effect of roll call votes on legislator behavior requires that we also understand how such votes are selected in legislatures. Typically, the selection of roll call votes occurs in two steps. First, the members of a legislature decide on the rules specifying the requirements for roll call votes. The second step then is the actual choice of a voting procedure for some proposal. A particular proposal is voted on by roll call if the requirements specified in the first step are met. The analysis in this dissertation therefore proceeded in three steps. In a first step I analyzed how the roll call behavior of members of the Swiss National Council differs from their behavior in signal votes. In a second step I then examined whether roll call votes in the National Council are requested strategically in order to signal information to actors outside the legislature. Finally, I relied on a game-theoretic model to explore the conditions under which legislators have an incentive to adopt rules that facilitate the use of roll call votes rather than signal votes in the legislature.

In the following, I will briefly summarize the main findings of the dissertation in Section 6.1. I will then discuss some of the limitations of my analyses in Section 6.2 and conclude the chapter with suggestions for future research in Section 6.3.

6.1 The Main Findings of the Dissertation

Based on data from 76 parliamentary chambers in 50 democracies around the world, I have shown in Chapter 2 that the voting procedures used for final votes vary greatly across legislatures. While in some chambers all final passage votes are taken by roll call, most chambers record and publish only a subset of their final votes. These

latter chambers typically give their members the power to decide when a vote shall be taken by roll call. The literature provides two main reasons why legislators have an incentive to rely on roll call votes. First, the signaling argument suggests that roll call votes are important to legislators because they allow them to demonstrate their loyalty to actors outside the legislature. Second, the disciplining argument holds that roll call votes are important because they facilitate the ability of party leaders to monitor and discipline their members and thus help parties to overcome collective action problems. I argued in Chapter 1 and Chapter 3 that because party leaders can generally monitor the behavior of their members under both signal voting and roll call voting, they have little reason to rely on roll call votes to discipline their members. In this dissertation, I therefore focused on the signaling motivation for roll call votes.

In Chapter 4, I used voting data and information about roll call requests from the 47th legislative period of the Swiss National Council to evaluate the signaling argument empirically. Based on an extension of the "two-parameter" IRT model, I showed that the transparency brought about by roll call votes indeed matters for the voting behavior of reelection-seeking legislators, at least in a subset of votes. Especially moderate and conservative legislators, but also, although to a lesser extent, legislators with liberal ideologies were often considerably less likely to vote in favor of the proposal under roll call voting than under signal voting. In many votes reelection-seeking legislators therefore expected that outside actors would reward or punish them for their voting behavior. However, only the reelection seekers of the GPS expected in a majority of the electorally relevant roll call votes that outside actors would reward them for voting in favor of the more liberal alternative in a vote, while all other reelection seekers expected more often that voting for the more conservative rather than the more liberal alternative would be rewarded by external actors.

I also provided some evidence in Chapter 4 that legislators use their discretion over roll call votes strategically to reveal or not reveal information about their voting behavior to legislative outsiders. The data about the roll call request behavior of Swiss legislators are largely consistent with the idea that legislators tend to request roll call votes when they expect that making their voting behavior transparent will improve their chances of reelection and that they tend not to request roll call votes when they expect that voting transparency will harm their reelection prospects.

I then turned to the choice of voting procedures in Chapter 5. To explore the circumstances under which legislators choose to adopt rules that make roll call votes more likely and signal votes less likely, I developed a game-theoretic model that

contains three stages: an organizational stage, a policymaking stage, and an election stage. In the organizational stage, legislators bargain over the probability that in the policymaking stage votes are decided by roll call. In the policymaking stage, legislators then bargain over policy issues, with the probability of a roll call vote depending on the outcome of the organizational stage. Finally, after the bargaining over policy has ended, parliamentary elections take place and voters either reelect their legislators or vote them out of office. Importantly, voters can only reward or punish legislators based on their voting behavior if the votes were taken by roll call in the policymaking stage.

The comparative statics analysis of the model has shown that legislators' preference for roll call voting increases in the value legislators place on reelection and in the degree of ideological congruence between legislators and voters. These results have important implications for the empirical analysis of roll call votes. First, analyses of roll call data from legislatures where votes are not systematically taken by roll call may overestimate the degree to which legislators represent the preferences of outside actors. Second, comparisons of legislative representation across different legislatures may be complicated by the fact that roll call voting is more likely to be constrained in legislatures where members often have preferences that are different from those of outside actors.

Taken together, the findings of this dissertation suggest that we need to exercise caution in making inferences about the general behavior of legislators based on roll call data. The reason is that legislators tend to request roll call votes when they expect that external actors will reward them for their voting behavior and that they tend not to request roll call votes when they expect that external actors would punish them for their behavior in roll call votes. In addition, legislators tend to facilitate the use of roll call voting when they expect that their preferences are in line with those of outside actors, and they especially do so for votes that are relevant to their reelection prospects. As a consequence, analyses that are based only on roll call votes may overestimate both the congruence between legislators' revealed preferences and the preferences of relevant actors outside the legislature and the level of polarization between parties in the legislature.

6.2 Limitations of the Dissertation

In this section I will discuss a number of important limitations of the dissertation. The first limitation concerns the overview of parliamentary voting procedures shown in Chapter 2. The data I presented in this chapter are restricted to the voting

procedures legislatures use for final passage votes. Carey (2009) and Crisp and Driscoll (2012) have shown that some legislatures mandate roll call voting for final passage votes but not for votes at earlier stages in the legislative process. The number of legislative chambers that systematically vote by roll call on final passage votes (which I report in the chapter) is therefore likely to be lower than the number of chambers that systematically vote by roll call on all business. Consequently, roll call voting is likely to be less prevalent in democratic legislatures when all types of votes are considered.

Second, the IRT model I analyzed in Chapter 4 is based on the assumption that roll call votes are exclusively used to signal information about individual votes to actors outside the legislature. However, as already mentioned in Chapter 1, roll call votes may also be used also for disciplining purposes, particularly in legislatures with large party groups, nonpartisan seating arrangements, or where signal votes are cast by voice. The more often roll call votes are used for disciplining purposes in a legislature, the less applicable my model is to that legislature. In addition, it is important to note that under certain conditions the net utility parameters in my model may capture pressure from both actors outside the legislature and party leaders (or even exclusively pressure from party leaders). If party leaders can monitor their members only in roll call votes and if they control resources that are valuable to legislators' reelection, then reelection-seeking legislators may behave differently in roll call votes than in signal votes due to party discipling.

Third, in the IRT model I also assumed that all members of a party receive a common net electoral utility when voting for the proposal in a roll call vote (i.e., $\lambda_{j(i)p}$). This assumptions becomes less tenable if the outside actors to which co-partisan legislators respond have different ideologies (e.g., co-partisan legislators could come from districts with different socioeconomic characteristics).

Fourth, in the game-theoretic model developed in Chapter 5 I made the assumption that if the legislature adopts a proposal by signal vote, each legislator has a fixed probability of 0.5 of being reelected to the legislature. This assumption ignores the fact that incumbent legislators often have a so-called "incumbency advantage" over their electoral challengers. By varying the probability of reelection, it would be possible to explore how the extent of the incumbency advantage affects the preferences of legislators for roll call votes.

Fifth, I further assumed in the game-theoretic model that legislators use roll call votes exclusively to signal their own positions to outside actors. However, legislators may also have an incentive to vote by roll call in order to reveal the (unpopular) voting positions of their political opponents in parliament.

6.3 Suggestions for Further Research

In this dissertation I relied on signal vote and roll call vote data from the 47th legislative period of the Swiss National Council to examine whether legislators behave differently in roll call votes than in signal votes. Unfortunately, information about the individual voting behavior of legislators is generally not available for signal votes. Moreover, as the findings of this dissertation suggest, generalizing from legislators' behavior in roll call votes to their behavior in signal votes is fraught with difficulties. The question thus becomes how we can learn about legislator behavior in signal votes if individual voting data is not available and drawing inferences from roll call voting behavior is difficult. One possible approach would be to predict the voting behavior of legislators in signal votes by relying on machine learning techniques. Two sets of information would be necessary to make such predictions: individual voting data for the votes that were taken by roll call and the texts of both the proposals that were voted on by roll call and the proposals that were decided by signal voting.[1]

While predictions of signal votes would allow us to examine how legislators' roll call behavior differs from their behavior in signal votes, it would remain unclear whether any differences in voting behavior are the result of roll call vote effects or roll call vote selection. The findings of my dissertation suggest that the preferences of legislators for roll call votes increase in the reelection value of votes and in the ideological congruence between legislators and outside actors. An empirical analysis of my comparative static results could shed light on the extent to which these factors can explain legislators' preferences for roll call votes.

[1]Models that predict individual votes from legislative text are largely absent in the literature. To my knowledge, the only exception is Gerrish and Blei (2011), who used bill texts to predict future votes of members of the US Congress. While Gerrish and Blei (2011) relied solely on roll call data and bill texts, it would also be possible to include additional information, such as the committee responsible for a proposal.

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