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How Does Party Discipline Affect Legislative Behavior? Evidence from Within-Session Variation in Lame Duck Status

Abstract

How important are political parties in motivating and disciplining elected officials? Using a difference-in-discontinuity design, we study how shocks to incumbents' re-election probabilities affect legislative behavior in a setting where parties fully control candidate selection. We find that within-session variation in lame-duck status has a strong negative effect on the probability of showing up in parliament to vote. We find, however, no clear evidence that lame-duck status affects the extent to which legislators deviate from the party line. Our findings align well with the citizen-candidate framework, where candidates have fixed ideological positions that do not vary based on electoral incentives.

JEL-Codes: D720.

Keywords: political parties, party discipline, roll-call votes, legislative speech, difference-in-discontinuity design.

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1. Introduction

The vast capabilities of the modern state allow elected officials to exert wide-ranging positive — and negative — influence over the economic and social well-being of its citizens. A key question in institutional design concerns how to discipline elected officials and make sure that they act in the best interest of the public (Besley, 2006). Canonical political economy models focus on elections as the key politician control device (Barro, 1973; Ferejohn, 1986). Voters are, however, not the only principal that discipline elected officials. In all modern democracies, political parties have a crucial responsibility for selecting and incentivizing politicians. To succeed, a political party needs a disciplined organization that allows them to build a cohesive brand name, commit to policy platforms, and facilitate efforts to negotiate coalition governments (Cox and McCubbins, 2007; Sieberer, 2006; Snyder Jr and Ting, 2002).[1] Several scholars have convincingly documented that politician behavior and effort respond to election incentives (e.g., Dal Bó and Rossi, 2011; Ferraz and Finan, 2008; Titiunik, 2016). Less is known about the role of parties as disciplinarians in various electoral settings (Hollyer, Klašnja and Titiunik, 2022; Jenkins and Nokken, 2008). We aim to contribute to filling this gap in the literature.

We consider an empirical setting – Norway – where party leaders draw up lists of candidates that cannot be altered by voters (*closed-list elections*).[2] In such a setting the responsiveness of legislators to party leaders' carrots and sticks is expected to be particularly strong (Carey, 2007).[3] Norway is ideal for our purposes because the absence of the personal vote, strong party brands, and low levels of private campaign financing create a setting where the party organizations fully orchestrate political selection. We

[1] In his seminal contribution, Anthony Downs conceptualized political parties as teams of candidates "seeking to control the governing apparatus by gaining office in a duly constituted election" (Downs, 1957, p. 25).

[2] Closed-list elections are also used in many other Western European countries, e.g., Portugal and Spain, and many Latin American countries, e.g., Argentina and Uruguay.

[3] Party leaders can enforce rank-and-file's cooperation in contributing to the collective legislative good in a number of ways, e.g. by promises of future safe nominations (Cirone, Cox and Fiva, 2021), by assignment to key policy committees (Cox and McCubbins, 2007), and by controlling the legislative agenda (Carey, 2007).

study how the behavior of legislators changes when they suddenly learn that they will not get renominated by the party (*lame ducks*). By minimizing the number of competing principals (Carey and Shugart, 1995; Buisseret and Prato, 2022), the Norwegian case allows us to rule out changes in legislative behavior that are triggered by incumbents trying to mobilize voters. Instead, our case allows us to quantify how legislators react to one key principal: their legislative party leadership.

When incumbents become lame ducks, the principal-agent relationship between legislators and party leadership changes dramatically. The party leadership loses their grip around the future careers of their rank-and-file members and can no longer discipline them by making promises of future appointment to coveted positions (e.g., as committee chair). In other words, we expect party leaders to be less able to "turn the screws" on lame ducks, as they are no longer beholden to the party (Jenkins and Nokken, 2008). We therefore ask two related research questions. First, how does lame ducks status then affect legislative effort? Second, how does lame duck status affect policy positioning? On the one hand, we might expect politicians who become lame ducks to advocate policies closer to their own preferences (Smart and Sturm, 2013). On the other hand, if the commitment issues highlighted by Alesina (1988) are important, a negative re-election shock is unlikely to have a substantial impact on legislators' policy positioning. According to citizen-candidate models (Besley and Coate, 1997; Osborne and Slivinski, 1996), candidates have fixed ideological positions that do not vary based on electoral incentives. If this is a reasonable description of the world, legislators will advocate for their preferred policies both before and after they have become lame ducks (Fouirnaies and Hall, 2022).

Our data cover seven election periods in the Norwegian parliament (1993–2021), where general elections are held every fourth year. Our empirical strategy uses the fact that about 10 months before the next general election, regional party organizations hold their nomination meetings. At these meetings, most incumbents tend to be renominated in safe spots without any competition (Cirone, Cox and Fiva, 2021). However, about 10 percent of incumbents are involved in fights over nomination spots. These fights are typically

decided by a handful of votes from dues-paying party members. Incumbents that lose these re-nomination battles exit politics and never return to the national political arena (in our sample period).[4]

The gist of our research design is as follows: We compare changes in the behavior of incumbents that lose nomination fights ("losers"), to changes in the behavior of uncontested incumbents.[5] Because we have collected data about the dates for each nomination meeting, we can compare changes in behavior in a small time window bracketing the nomination meeting using a regression discontinuity (RD) design for each type of incumbent, essentially a difference-in-discontinuity design. Leveraging fine-grained data varying at the politician-day level, we study both the quantitative and qualitative aspects of legislative behavior using roll-call votes and legislative speech. To study ideological deviations vis-a-vis the party leadership we propose a novel measure that allows us to identify ideological positioning in the speech space using a semi-supervised word embedding technique (Watanabe, 2021).

Our main results can be summarized as follows: We find that "losers", relative to uncontested incumbents, are about thirteen percentage points less likely to show up in parliament after the nomination meeting. This suggests that legislators put in less legislative effort when they know they cannot be re-elected. We find, however, no evidence that "losers" shift their ideological platforms following the nomination meeting. We observe no clear changes in legislative dissent in roll-call votes and no clear changes in legislative speech.

Our paper is closely related to the literature that uses term limits to measure the effects of electoral incentives (e.g., Alt, Bueno De Mesquita and Rose, 2011; Besley and Case, 1995; Ferraz and Finan, 2011; Lopes da Fonseca, 2020). Most of these studies compare incumbents who are allowed to run for re-election to incumbents who are termed out

[4]Some of the losing incumbents feature on future local or national election lists, but with one exception, they never return as full-time politicians on any governmental tier. The exception is former MP Espen Johnsen, who became a mayor in Lillehammer, a municipality with about 27,000 inhabitants.

[5]We will also provide results for incumbents that win nomination fights ("winners") and retiring incumbents.

and thus face lower electoral incentives (i.e., cross-individual research designs). Fouirnaies and Hall (2022), however, compare the final-term behavior of termed-out legislators *to their behavior in previous terms*, relative to counterfactual trends among other legislators in the same legislature (i.e. a within-individual across-terms research design).[6] The research design that we propose compares individuals to their *own behavior in the same term* before they receive the negative re-election shock (i.e. within-individual within-terms research design).

2. Empirical case: Norway 1993-2021

2.1 *A party-centered electoral environment*

Elections for the Norwegian parliament (*Storting*) are held every fourth year in September. Votes are allocated to parties in each electoral district using closed-list proportional representation.[7] This implies that citizens vote for parties rather than candidates, and candidates are elected in the order in which parties have decided. This electoral rule, which was adopted a century ago (in 1919), gives political parties the upper hand in Norwegian politics. This manifests itself in strong party discipline in parliament and a substantial incumbency advantage for Members of Parliament (MPs), who tend to get re-nominated in safe spots on the lists.

Norway is carved into 19 electoral districts, with district magnitudes ranging from 3 to 18 seats, depending on population size.[8] Seats are allocated in two tiers. In the first tier,

[6] Geys and Mause (2016) also rely on a within-individual across-terms research design using data from the United Kingdom (which does not have term limits). They find that legislators who decide to retreat from politics have higher absenteeism rates during parliamentary votes, pose fewer written questions, and participate less often in parliamentary debates during their last term. Concurrently, they seem to increase their extra-parliamentary efforts.

[7] Voters are technically allowed to make changes to party lists, but such changes only matter if the majority of a party's voters alter the list in exactly the same way. This has never happened, so the system is effectively a closed-list system.

[8] In our sample period, the parliament consisted of 165-169 seats. It is the duty (*ombudsplikt*) of anyone elected as a member of parliament to accept such election (The Norwegian Constitution §63). Incumbents are not allowed to resign their seats in parliament, but it has happened that incumbents have been granted a leave of absence. For example, previous prime minister Jens Stoltenberg was granted a leave of absence to serve as the secretary general of NATO in 2014.

seats are allocated proportionally to parties within each electoral district based on party vote shares in the district (*Modified Sainte-Laguë method*). In the second tier, adjustment seats are given to parties that are under-represented at the national level once the first-tier seats have been allocated, provided that those parties reach an electoral threshold of four percent of the national vote.

We limit our analysis to the seven main parties that dominate Norwegian politics. Ordered from "left" to "right", these are the Socialist Left Party, Labor Party, Center Party, Liberal Party, Christian Democrats, Conservative Party, and Progress Party.[9]

2.2 *Legislative behavior*

Roll-call votes

In Norway, like in most other parliamentary systems, intraparty cohesiveness in roll-call voting is extremely high. Political parties typically decide in advance of parliamentary meetings how individual legislators should vote. Generally, parties only allow legislators to break the party line on issues of strong constituency interest (e.g., infrastructure investments) or moral beliefs (e.g., abortion), and only when they do not threaten the standing of the government (Rasch, 1999).

Appendix Figure A.1 plots the fraction of legislators breaking the party-line by party and parliamentary session.[10] On average, the fraction of legislators that break with the party line when the party is in government is extremely low, around 3 percent. It is somewhat higher when the party is not part of government, around 6 percent, on average.[11]

The party whips (*innpisker*) play a central role in orchestrating roll-call votes using the so-called *exchange system* (*utbyttingssystemet*). Using this trust-based system whips coordinate across party lines to make sure that the strength of the political parties is

[9] In the 1993–2021 period, only 8 out of 1171 seats were held by other lists (0.6 percent).

[10] Appendix Table A.1 gives an overview of Norway's government in our sample period.

[11] Our data includes roll call votes recorded by the electronic voting device of the *Storting*, and therefore excludes unanimous and some near-unanimous decisions.

maintained even when turnout is well below 100 percent. Typically, turnout is around 50–70 percent (see Appendix Figure A.2).[12]

Legislative speech

Legislative speech is restricted by the parliamentary rules of the *Storting*: All speeches must be addressed to the parliamentary president, the tone should be formal, and speech length is strictly regulated. Although some types of speeches will be prepared well in advance (e.g., the first speech of an ordinary debate (*Debattinnlegg*)), other speeches are more spontaneous. In the *Oral Question Hour* (*Muntlig spørretime*), for example, legislators may pose short oral questions for cabinet members to answer on the fly. Legislators tend to participate more actively in the debate when they are in the opposition (see Appendix Figure A.3).

Despite the closed list system creating strong incentives to follow the party line, parliamentary speeches are habitually used to signal disagreement with bargaining outcomes and voice individual policy concerns.[13] Fiva, Nedregård and Øien (2021) demonstrate how politicians with different background characteristics speak differently in parliament, even when controlling for political bloc and policy committee. This suggests that, compared to roll call votes, legislators have substantial discretion in floor speeches. There is, however, no clear evidence that legislators deviate more (or less) from the party line depending on the government status of their party (see Appendix Figure A.4).

[12]By law, 50 percent of all legislators are required to be present at ordinary roll-call votes. Constitutional amendments require that two-thirds of all legislators are present. We drop votations with a turnout above 100 percent (1.2 percent of the sample) and below 50 percent (0.04 percent of the sample) to eliminate clear error registrations.

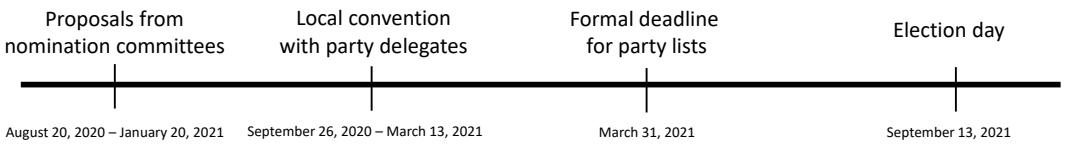
[13]One example is a speech by Heidi Nordby Lunde (Conservative MP) on February 27th, 2014. After the ruling coalition having agreed to put forward a bill that would secure medical doctors the right to reserve themselves against referring women to abortions, Lunde signaled her disagreement with her party's position by stating: "Our collaborators should know that when we have entered an agreement, we stand by it, even when it is hard. Even when it is desperately hard."

2.3 *Nomination meetings and the classifications of incumbents*

In all political parties, nominations and list order are determined by local conventions attended by party delegates. Prior to the local convention, a local nomination committee announce a proposal for the party lists. At the local convention, individual candidates can "fight" for spots on the list. If a challenger successfully defeats a person suggested by the nomination committee, this only has a direct consequence for that spot on the list (lower-ranked candidates are not pushed down). A candidate can, however, be involved in multiple fights.

Cirone, Cox and Fiva (2021) have collected data on the competition for nomination spots in the 2017 Norwegian election. They document that when a fight over a spot occurs, it typically involves two contestants who have similar experiences with holding elective office. All in all, 15 percent of winnable spots were contested in the 2017 election. Using newspaper coverage of the nomination meetings and information from local party organizations, we extend this data set to cover seven election periods (1993–2021). To be able to study how shocks to MPs' renomination probabilities affect legislative behavior, we include detailed information about the date of the nomination meetings and the votes that determined an intra-party fight. For the most recent election, we also collect information about the dates when the local nomination committees announced their proposal. Figure 1 illustrates the timeline of the 2021 nomination process.

Figure 1: Time line for the nomination process



Note: This figure illustrates the time line of the nomination process. The dates below the time line refers to the 2021 election, but are similar in other years. The deadline for finalizing electoral lists are always March 31 of the election year. The election is always held on the second Monday of September.

In our full sample, the median nomination meeting is held 10 months before the next

election (see Appendix Figure A.5). Based on data for the 2021 election, the nomination committees typically announce their proposals one to three months before the convention (the average time gap is 47 days; the standard deviation is 25 days). Prior to the 2021 election, the maximum number of days between the announcement by the committee and the local party convention is 102 days. To avoid that our estimates are contaminated by "anticipation effects", we exclude from our analysis the 100 days leading up to each nomination meeting. In a sensitivity check, we vary this cut-off from 0 to 200 days.

We divide incumbents into four categories:

1. "Losers" lost a re-nomination fight for a winnable spot on the list
2. "Winners" won a re-nomination fight for a winnable spot on the list
3. "Uncontested incumbents" did not face any competition at the nomination meeting
4. "Retiring incumbents" are not running again in the next election

Table 1 provides descriptive statistics for these four categories by election period. In addition, we include a residual category "unclear", which captures incumbents that are involved in multiple fights, a category for minor party MPs, and a category for MPs that serve as cabinet members during an election period.[14] These three categories are excluded from our analysis below.[15]

Table 1 shows that most incumbents tend to get re-nominated without any competition. In this group, 74 percent ultimately get re-elected.[16] Table 1 shows that many incumbents leave politics without any outright fight at the nomination meeting.

[14]Kari Kjønaas Kjos (Progress Party) is an example of an incumbent that we classify as "unclear" for the 2017 election. At the nomination meeting, she first lost a battle over the second-ranked position on the list (losing 33–56 to Himanshu Gulati), but continued to fight over the third-ranked position on the list. She won this position on the list with a single vote (45–44 against Ib Thomson), and ultimately got re-elected.

[15]Right-wing incumbents are somewhat overrepresented among "losers", but they are otherwise comparable to "winners", "uncontested", and "retirees" when it comes to the number of terms served and background characteristics (Appendix Table A.2).

[16]The vast majority of uncontested incumbents are re-nominated in winnable or safe positions on the lists, but there are a few exceptions. For example, Ketil Solvik-Olsen, top-ranked in 2009, featured only in the ninth spot on the list of the Progress Party in Rogaland district in 2013 when deciding to take a break from politics in the 2013-2017 parliamentary period. In the end, he ended up serving as deputy number six from Rogaland.

When incumbents are involved in fights for re-nomination they often win or lose by a slim margin.[17] Our research design exploits within-session variation in re-election probabilities, where MPs involved in nomination fights only learn about their re-election probabilities after the nomination meetings. Our study focuses on the "losers" (3 percent of the total sample) of these nomination fights. These lame ducks have an observationally zero probability of being re-elected into parliament; all the lame ducks exit the parliament after the next election (although two of them serve as deputies). None of them ever wins a future seat in parliament, as of 2021.

Table 1: Number of observations by year and incumbent type

Upcoming election year	Losers	Winners	Uncontested	Retirees	Unclear	Minor party MPs	Cabinet	Total
1997	5	5	92	34	12	2	15	165
2001	2	13	89	34	1	1	25	165
2005	6	6	96	32	2	4	19	165
2009	4	6	96	39	1	0	23	169
2013	3	11	89	42	2	2	20	169
2017	6	10	93	43	3	1	13	169
2021	10	8	83	42	4	2	20	169
Total	36	59	638	266	25	12	135	1171

Note: This table shows the number of MPs in our sample by MP type and upcoming election. Before 2013 there were 165 MPs elected in the Storting, but this was increased to 169 in the subsequent election periods. Losers are MPs who lost a re-nomination fight, while winners won a fight. Uncontested incumbents were re-nominated without any competition. Retiring incumbents are legislators who do not run again in the following election. Unclear MPs are MPs that are involved in both losing and winning nomination fights. Minor party MPs represent parties who fail to meet the national electoral threshold of four percent to qualify for adjustment seats in the relevant election period. The cabinet category includes MPs that served as cabinet members during an election period.

3. Estimation strategy and outcome variables

3.1 *Difference-in-discontinuity research design*

We are interested in quantifying how the nomination meeting result impacts "losers" parliamentary activity. While "loser's" lame duck status changes abruptly around the nomination meeting date, the "uncontested" incumbents face no re-election shock. They

[17] The median win margin is 19 votes, and the median turnout is 73 (Appendix Figure A.6).

therefore constitute a natural comparison group useful for netting out secular trends in parliamentary activity.[18]

Our main sample is based on "losers" and "uncontested incumbents" in office in the seven election periods from 1993–2021 (765 politician-period observations). We estimate local linear regressions of the form:

$$Y_{ide} = \beta_0 + \beta_1 Post_{p(i)de} + \beta_2 Days_{p(i)de} + \beta_3 Days_{p(i)de} \times Post_{p(i)de} + \beta_4 Post_{p(i)de} \times Loser_{ide} + \beta_5 Days_{p(i)de} \times Loser_{ide} + \beta_6 Days_{p(i)de} \times Post_{p(i)de} \times Loser_{ide} + \xi_{ide}, \quad (1)$$

where *Days* measures the number of days (d) from the nomination meeting of party-district p where incumbent i belongs in election period e.[19] $Post_{p(i)de}$ is a dummy equal to one for incumbent i after the nomination meeting in the party-district (p) where he/she belongs has been held, and zero otherwise. Y_{ide} represents different outcome variables based on incumbents speech and voting behavior in parliament (explained below).

The parameter of interest, β_4, captures changes in the behavior of "losers" relative to "uncontested incumbents" in response to the nomination meeting result. We do not expect "uncontested incumbents" to change their behavior around the nomination meeting, but the inclusion of this incumbent group allows us to net out any other factors that coincide with the nomination meeting and are common to both types of incumbents. This effect is captured by β_1.

Equation 1 allows the slope of the regression line to differ on either side of the nomination day cut-off by including interaction terms between *Days*, *Post* and *Loser*. ξ_{ide} is an error term. We cluster standard errors at the politician-period level.

[18] Because there is a strong renomination norm in Norwegian politics (Cirone, Cox and Fiva, 2021), the vast majority of "uncontested incumbents" know that they will not be facing competition in the nomination meeting. However, it may be that some of them worry that they *might* face competition, even if they ultimately did not. If so, they get a positive re-election shock and should act accordingly. In the Appendix, we provide results for "winners", which are on the "equilibrium path" by winning re-nomination, but still get a moderate positive re-election shock, and "retirees".

[19] Appendix Figure A.7 plots the frequency of observations by *Days* and incumbent type.

3.2 *Outcome measures I: Roll-call votes*

Attendance

Our first measure of legislative behavior is a dummy variable equal to one if incumbent i votes in parliament on day d in election period e. To avoid that our results are contaminated by the frequency of votations, we only consider days where votations were held in parliament. This leaves us with a data set of 168,960 MP-day observations (9,155 *losers* and 159,805 *uncontested*).

Legislative dissent

In addition to studying attendance, we examine to what extent parliamentarians toe the party line in roll-call votes. To quantify dissent in votes we consider whether incumbent i votes against the majority of his/her party in any vote at day d in election period e, conditional on having attended a parliamentary voting (101,492 MP-day observations; 5,669 *losers* and 95,823 *uncontested*).

3.3 *Outcome measures II: Speeches*

Speaking in parliament

Several previous papers have used floor speech to measure legislator effort (e.g., Dal Bó and Rossi, 2011; Fouirnaies and Hall, 2022; Geys and Mause, 2016). Following this literature, we use a dummy variable equal to one if incumbent i speaks in parliament on a given day d in election period e to measure the extent to which politicians are engaged in the legislative process. We eliminate days when the parliament was closed, e.g., weekends and summer months, and only keep days where at least one speech was delivered in parliament. This leaves us with 281,230 MP-day observations (15,054 *losers* and 266,176 *uncontested*).

Speaking against the party line

To study whether negative renomination shocks increase legislators' tendency to deviate from the party line in speeches, we use the semi-supervised text analysis technique known as Latent Semantic Scaling (LSS) (Watanabe, 2021). This method allows us to identify dimensions in the speech space using word embeddings (word vectors) together with a small number of seed words. The seed words are treated as polarities in the speech space, and by calculating distances between the words in the vocabulary and the seed words we can scale the text documents on a political left-right scale. Words that are located closely to the seed words in the speech space are considered as more polarized than words that are located further away.

LSS is useful for our purposes for several reasons. First, since the method relies on word vectors, it allows us to identify polarities without having to specify an exhaustive list of words. Second, the semi-supervised nature of LSS allows us to pin down interpretable dimensions in the speech space (as opposed to unsupervised methods), without having to manually code documents (as in purely supervised algorithms). Third, since there are two spoken languages in the Norwegian parliament (*Nynorsk* and *Bokmål*), we need a method that enables us to analyze documents in different languages in parallel. The LSS algorithm enables us to do so as long as the semantic structure of the speech space is similar across the languages.[20]

The political left-right dimension we are studying is identified using seed words to construct poles in the word embedding space. As seed words, we rely on Fiva, Nedregård and Øien (2021)'s 100 most predictive words of MPs' bloc affiliation (200 in total), which are identified using penalized logistic regression (Gentzkow, Shapiro and Taddy, 2019). Since the political blocs in Norway are highly stable clusters of left-leaning social democrats and right-leaning conservatives, the most predictive words of political blocs allow us to position legislators on a left-right axis. The LSS algorithm delivers consistent results even

[20]The cultural and geographic proximity of *Nynorsk* and *Bokmål* speakers entail that this assumption is satisfied.

when reducing the number of seed words substantively (Watanabe, 2021), but we use 100 words for each pole to maximize statistical precision.

To identify the left-right polarity scores of legislators' speeches we proceed as follows. First, we split the speeches into sentences and implement some common data cleaning steps (Gentzkow, Kelly and Taddy, 2019).[21] We then apply the LSS algorithm to create word vectors in the vocabulary, where each word is weighted based on their semantic proximity to the seed words, which define the poles of the left-right dimension $D \in [-1, 1]$.[22] Lastly, we use the word vectors to predict polarity scores for all speeches given by a legislator on a day.

Our measure of divergence from the party line is given by:

$$Y_{igds} = \mid LSS_{igds} - \overline{LSS_{gs}^{Leader}} \mid \tag{2}$$

where LSS_{igds} represents the left-right polarity score of all speech given by MP i from party g on a given day d within parliamentary session s.[23] $\overline{LSS_{gs}^{Leader}}$ is the session-average position of party leader (or parliamentary leader if the party leader is in government) from party g.[24] To facilitate interpretation, we standardize Y_{igds} to have a mean of zero and a standard deviation of one. A high score represents a low degree of alignment with the party line.

As with the other outcome measures, we keep only days where the parliament is open and remove summer months. In addition, we drop parliamentary leaders and a handful of speeches that are too short for the algorithm to be able to predict polarity scores. After

[21] We lemmatize speeches using the Oslo-Bergen tagger (Johannessen et al., 2012). We remove names, punctuation, numbers, symbols, stopwords (from `http://snowball.tartarus.org/`), and rare words that occur less than 40 times in the corpus.

[22] While the most polarizing words used in Fiva, Nedregård and Øien (2021) are identified using committee fixed effects, we use the corresponding words without committee fixed effects, as we are interested in overall differences between political blocs and not variation within committees. The rankings of the seed words hence differ somewhat from what is reported in Fiva, Nedregård and Øien (2021). Appendix Table A.3 provides the full list of seed words used in our analyses.

[23] Each four-year election period, denoted e in Equation 1, consists of four parliamentary sessions.

[24] The party leader is usually also the parliamentary leader. The exception is if the party leader is in government – then a new parliamentary leader is appointed as a substitute.

aggregating to daily observations, we are left with 46,916 MP-day observations (2,266 *losers* and 44,650 *uncontested*).

3.4 *Validation*

We conduct several checks to test the validity of the left-right polarity scores. First, we verify that the words with the highest (lowest) polarity scores are words that we tend to associate with the two political poles. Figure 2 shows that this is indeed the case. The most characterizing non-seed words on the left include *inequality-inducing*, *redistribution* and *workers*, while the corresponding right-leaning words include *taxpayer*, *savings* and *health queues*.[25]

We also examine how the average left-right polarity scores obtained using LSS correspond with parties' left-right position as measured in surveys of local politicians (Appendix Figure A.9). The strong positive correlation of 0.97 shows that the polarity scores are valid measures of party positions.[26]

Lastly, Appendix Table A.4 summarizes standard evaluation metrics when varying the number of seed words. We find that our model based on 100 seed words on each pole outperforms the models with fewer seed words. However, even a model based on two seed words on each pole (*people* and *woman* versus *company* and *challenge*) is substantially better at classifying MPs based on their speeches than a random draw.

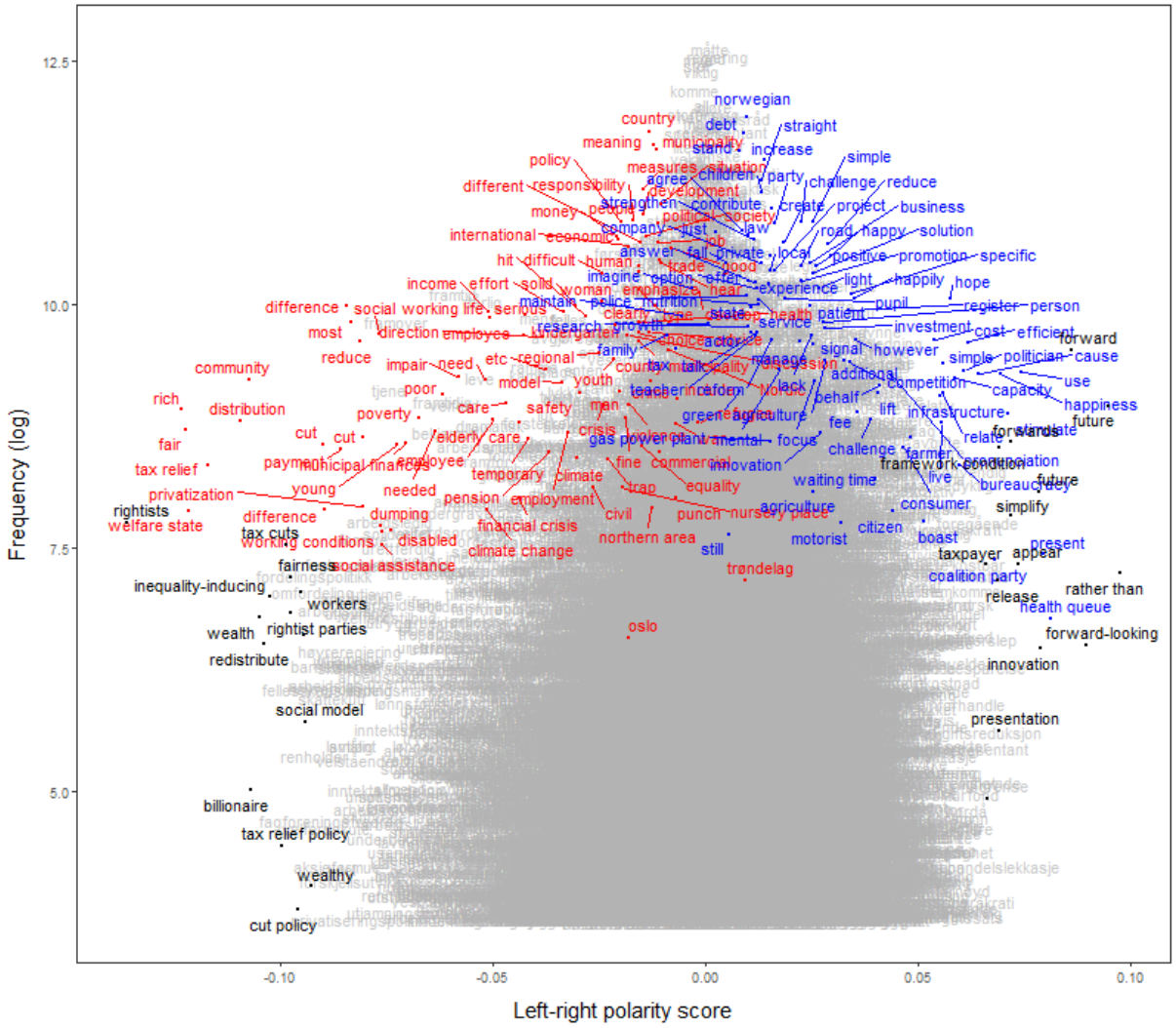
4. Results

In this section, we present our main results. For each outcome measure, we first present graphic evidence separately for *losers* and *uncontested* before we present the regression estimates of β_1 and β_4 from Equation 1. In all of the following figures, we plot local

[25] Appendix Figure A.8 is the corresponding figure in Norwegian.

[26] Appendix Figure A.10 shows the density of sessional averages of LSS estimates at the *individual* level. As one should expect, we observe that parliamentary leaders are located close to the center of the distribution. One exception is the Labor Party, where the mean polarity score of parliamentary leaders is slightly left of the mode.

Figure 2: Frequency of features by polarity score



Note: This figure shows the frequency of words in our sample by their estimated left-right polarity scores as identified by the LSS algorithm. To identify the linguistic dimension, we use the hundred most polarizing words for each political bloc, as identified by the method used in Fiva, Nedregård and Øien (2021). The left-wing seed words are in red, while the right-wing seed words are in blue. The twenty most extreme words of each side of the dimension are in black. All other words are in gray. If an extreme word is also a seed word, we depict it as a seed word (red/blue). The seed words tend to be high-frequency words, as the estimator used in Fiva, Nedregård and Øien (2021) penalizes rare features.

averages of the outcome variables calculated within twenty bins and fit separate regression lines on each side of the discontinuity using the full bandwidth of *Days*. The black vertical line at zero represents the date of the nomination meeting. We indicate with a gray vertical line, 100 days before the nomination meeting. As mentioned above, we exclude observations falling in this time window to avoid anticipation effects.

4.1 *Roll-call votes – attendance*

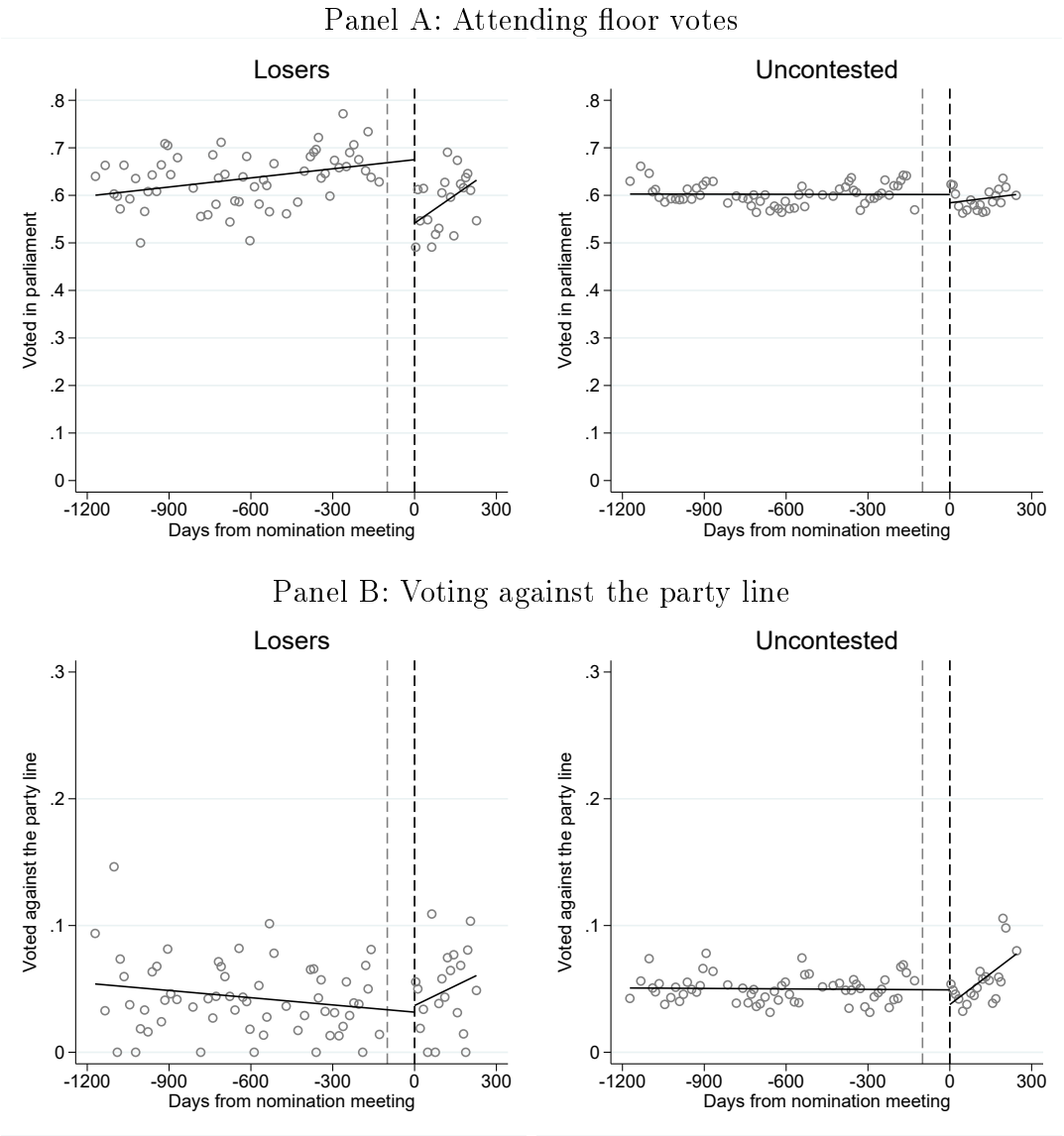
Panel A of Figure 3 plots the fraction of *losers* (left) and *uncontested* (right) that show up to vote in Parliament over time. For *losers*, the probability of turning up to vote appears to drop more than ten percentage points at the cut-off that separates dates before and after the nomination meeting. For *uncontested* incumbents, there is no clear evidence that their behavior change around the cut-off.[27] The bin-to-bin variation is considerably smaller in the plot to the right than in the plot to the left. This reflects that we have many more *uncontested* than *losing* incumbents in our sample (see Table 1).

Panel A of Table 2 provides the regression results. Column (1), which uses a full bandwidth and a linear control function, essentially reproduces the jumps at the cut-off from Panel A of Figure 3. The regression estimates of β_1 ("Post") reflects the small negative jump for *uncontested* incumbents, while the regression estimates of β_4 ("PostXLoser") captures the additional effect for losers. We find that the probability of attending roll-call votes falls with eleven percentage points for *losers* compared to *uncontested* incumbents. For comparison, Fouirnaies and Hall (2022) finds that termed-out US legislators become three percentage points more likely to be absent on floor votes in their final term.[28] In the United Kingdom, where the role of parties is much more important than in the United States, Besley and Larcinese (2011) find that retiring MPs are four percentage points less likely to vote in parliament. Using a within-MP research design, Geys and Mause (2016) find somewhat stronger effects. Taken as a whole, our findings reported in Ta-

[27] The same is observed for the two remaining types of incumbents (Appendix Figure A.11).

[28] Fouirnaies and Hall (2022) also find that termed-out legislators are about six percent less likely to sponsor bills. We find no clear evidence that lame duck status impacts this bill sponsorship in our context (Appendix Figures A.12 - A.13 and Appendix Table A.5).

Figure 3: Votes



Note: The figures show RD plots for the probability of showing up to vote in Parliament and voting against the party line (conditional on attending a votation). Panel A: Losers (n=8456) and uncontested (n=149884). Panel B: Losers(n=5348 and uncontested (n=89936). We remove 100 days proceeding the nominations shock to account for anticipation effects.

ble 2 aligns well with existing evidence from both candidate-centered and party-centered environments.

Column (2)-(4) of Table 2 tests the sensitivity of our baseline finding. In column (2) of Table 2, we add a more flexible second-order control function on each side of the cut-off (separately for *losers* and *uncontested*). In column (3), we add government fixed effects to take into account that legislative behavior may change when parties' government status changes (see Appendix Figures A.1-A.4). In column (4), we add MP-election fixed effect, which ensures that we are studying changes in voting behavior for the same legislator over time. In all specifications, estimates of the parameter of interest, β_4, are negative and statistically significant at all conventional levels.[29] Statistical precision is highest in the most demanding specification which includes both government and MP-election fixed effects. We therefore consider column (4) to be our preferred estimate. In this specification, the estimated probability of attending roll-call votes falls with thirteen percentage points for *losers* compared to *uncontested* incumbents.[30]

4.2 *Roll-call votes – legislative dissent*

Panel B of Figure 3 plots the fraction of *losers* (left) and *uncontested* (right) that vote against the majority of his/her party over time. On average, only five percent of legislators dissent in this way. There is no clear visible jump at the cut-off for any of the two incumbent types (nor for "winners" or retirees, see Appendix Figure A.11). Panel B of Table 2 shows the corresponding regression results. We observe a negative effect of about a percentage point for *uncontested* incumbents, which serves as the control group, but no statistically significant effect for *losers*.

Interestingly, there is an increase in the probability of legislative dissent towards the

[29] In Appendix Figures A.14 we provide RD plots when including the 100 days anticipation window in the analysis. There appear to be some anticipation effects that kick in before the nomination meeting. However, our main conclusions are unaltered if we include these observations in our estimation sample (Appendix Figure A.15). Our results are also inherently unaffected if we narrow the estimation window (see Appendix Figure A.16).

[30] Appendix Figure A.11 shows that "winners", who get a moderate positive re-election shock, are somewhat more likely to attend roll-call votes after the nomination meeting.

end of election periods for both incumbent types. This pattern could reflect that party elites schedule controversial votes closer to elections. The discourse surrounding such votes could attract attention to parties' policy positions and be used strategically to mobilize voters in the upcoming election.[31]

Table 2: Parliamentary votes - Difference-in-discontinuity estimates

Panel A: Voted in Parliament

	(1)	(2)	(3)	(4)
Post	-0.017*	-0.042***	-0.017*	-0.013
	(0.009)	(0.012)	(0.009)	(0.008)
PostXLoser	-0.115***	-0.151***	-0.116***	-0.131***
	(0.037)	(0.056)	(0.037)	(0.036)
N	158463	158463	158463	158463
Mean dep. var	0.603	0.603	0.603	0.603
Std. deviation	0.489	0.489	0.489	0.489

Panel B: Voting against the party line

	(1)	(2)	(3)	(4)
Post	-0.012***	-0.015***	-0.010***	-0.009***
	(0.004)	(0.006)	(0.004)	(0.003)
PostXLoser	0.017	0.012	0.018	0.018
	(0.014)	(0.021)	(0.013)	(0.013)
N	95284	95284	95284	95284
Mean dep. var	0.051	0.051	0.051	0.051
Std. deviation	0.220	0.220	0.220	0.220
Polynomial	First	Second	First	First
Government FE	No	No	Yes	Yes
MP-Election FE	No	No	No	Yes

Note: This table shows the difference-in-discontinuity estimates for the probability of showing up to vote Parliament and voting against the party line (conditional on attending). We remove 100 days proceeding the nominations shock to account for anticipation effects. Standard errors clustered at the MP level are in parentheses. ***p<0.01, **p<0.05, *p<0.1

4.3 *Legislative speech - speaking in parliament*

Panel A of Figure 4 plots the fraction of *losers* (left) and *uncontested* (right) that speak in Parliament over time. On average, both groups of incumbents speak about 17 percent

[31]The notion that roll-call votes are characterized by a selection bias and may be used strategically is supported by Carrubba et al. (2006), who find that roll-call votes typically tend to be used for more controversial issues.

of the days the parliament is open. For *losers*, there is some indication that the probability of speaking drops at the cut-off that separates dates before and after the nomination meeting. However, the effect is much less clear than for the first measure of legislative effort (Panel A of Figure 3). There is also a small negative jump for *uncontested* incumbents.[32]

Panel A of Table 3 provides the regression results. Even though the difference-in-discontinuity estimate ("PostXLoser") is consistently negative in all specifications, as expected, it is never statistically significant. While *losers* are much less likely to turn up to vote in parliament, we find no clear evidence that they adjust their speech propensity accordingly.[33] In the next sub-section we investigate if *losers* adjust *how* they speak.

4.4 *Legislative speech - speaking against the party line*

Panel B of Figure 4 plots the polarity scores of *losers* (left) and *uncontested* (right) over time. The vertical axes denote standardized absolute deviations from the party line. The higher the score, the more legislators are deviating from the party line.

On average, *losers* tend to deviate somewhat *less* from the party line when compared to *uncontested* incumbents. *Losers* have an average polarity score of about -0.09, while *uncontested* incumbents have an average polarity score of 0.04. Following the renomination shock there is some evidence for *losers* deviating more from the party line in speeches.[34] The same pattern cannot be seen for the *uncontested* incumbents.

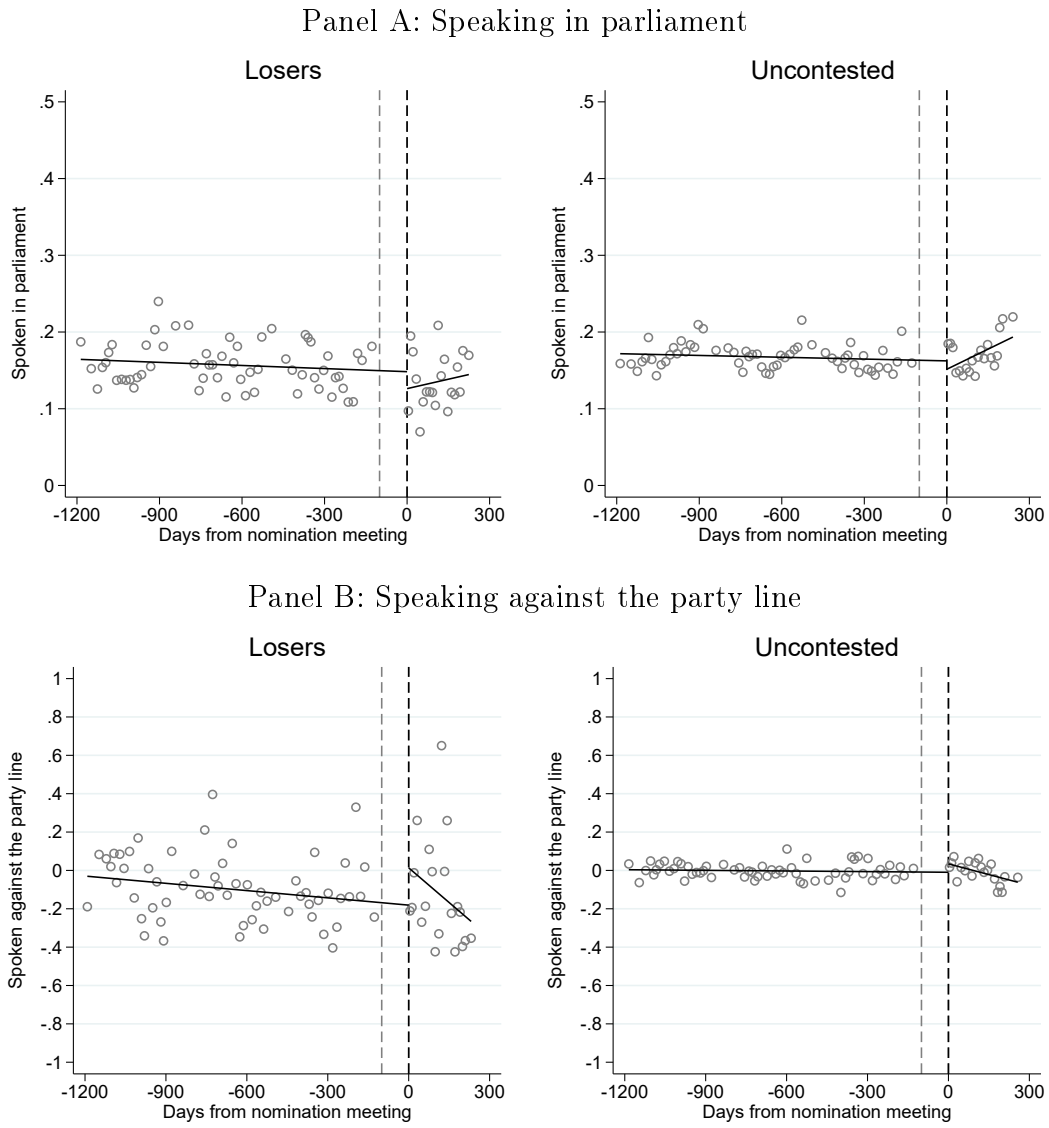
The regression results provided in column (1) of Panel B of Table 4 show that losers *losers* speak about 0.2 standard deviations more against the party line following the negative renomination shock, compared to the control group. However, the estimated effect is only statistically significant at the ten percent level, and it is sensitive to the functional form chosen for the control function. When using a second-order polynomial,

[32]Appendix Figure A.17 provides the results when including the anticipation window. Panel A of Appendix Figure A.18 shows the results for winners and retirees.

[33]If we alternatively use the number of words as an outcome variable, we find similar results.

[34]Panel B of Appendix Figure A.18 shows the corresponding results for winners and retirees.

Figure 4: Speeches



Note: The figures show RD plots for the probability of speaking in Parliament and speaking against the party line (conditional on having spoken). Panel A: Losers (n=14045) and uncontested (n=248868). Panel B: Losers (n=2018) and uncontested (n=38694). We remove 100 days proceeding the nominations shock to account for anticipation effects.

the difference-in-discontinuity estimate is close to zero (column (2)).[35] We conclude that there is no clear evidence that lame duck status affects the extent to which legislators deviate from the party line.

These findings align well with existing evidence from candidate-centered electoral environments. In an influential study, Lee, Moretti and Butler (2004) document that the degree of electoral strength has no effect on a legislator's voting behavior in the United States Congress. This suggests that voters do not *affect* politicians' choices during elections; instead, they appear to merely *elect* policies through choosing a legislator.[36] Fouirnaies and Hall (2022) find that US state legislators who can no longer seek reelection tend to put in less legislative effort. Like us, they find no clear evidence that lame ducks systematically *shift* their ideological platforms.[37] Taken together with studies of the contemporary United States, our results shows that electoral incentives are important for legislative effort but matters less for ideological positioning vis-a-vis principals.

[35] The estimated effect is also sensitive to the bandwidth chosen (see Appendix Figure A.16).

[36] Other empirical work from the United States also find that modern era legislators tend to adopt a consistent ideological position and maintain it over time (see, e.g., Fowler and Hall, 2017; Hall, 2019; Poole, 2007). Historically, US legislators appear to have been more ideologically flexible (Jenkins and Nokken, 2008).

[37] As mentioned in Section 2.3, lame ducks leave national politics after their election period has ended. However, it is likely that some of the exiting politicians are aiming for a future career outside politics (the average age when exiting is 56 years; see Appendix Table A.2). For these legislators the post-politics labor market may also contribute to party discipline. Private firms may look for politicians who can be team players instead of those who promote dissent (Egerod and Tran, 2021).

Table 3: Parliamentary speeches - Difference-in-discontinuity estimates

Panel A: Speaking in Parliament

	(1)	(2)	(3)	(4)
Post	-0.011**	0.022***	-0.011**	-0.009**
	(0.005)	(0.006)	(0.005)	(0.004)
PostXLoser	-0.011	-0.015	-0.015	-0.023
	(0.017)	(0.022)	(0.017)	(0.016)
N	262913	262913	262913	262913
Mean dep. var	0.168	0.168	0.168	0.168
Std. deviation	0.374	0.374	0.374	0.374

Panel B: Speaking against the party line

	(1)	(2)	(3)	(4)
Post	0.006	0.011	-0.006	-0.009
	(0.020)	(0.039)	(0.022)	(0.021)
PostXLoser	0.188*	-0.031	0.184	0.199*
	(0.111)	(0.215)	(0.112)	(0.110)
N	40712	40712	40712	40712
Mean dep. var	-0.010	-0.010	-0.010	-0.010
Std. deviation	0.981	0.981	0.981	0.981
Polynomial	First	Second	First	First
Government FE	No	No	Yes	Yes
MP-Election FE	No	No	No	Yes

Note: This table shows the difference-in-discontinuity estimates for the probability of giving speeches in Parliament and speaking against the party line. Speaking against the party line is measured as the absolute deviation from the party line in speeches along a political left-right scale. A low value indicates alignment with the party leader, while a high value implies a high degree of linguistic deviation. The party line is defined as the mean left-right polarity of speeches delivered by parliamentary leaders and party leaders in an election period. Document positions are measured using Latent Semantic Scaling. We remove 100 days proceeding the nominations shock to account for anticipation effects. Standard errors clustered at the MP level are in parentheses. ***p<0.01, **p<0.05, *p<0.1

5. Conclusion

In representative democracies, the delegation from voters to legislators is almost always mediated by political parties. Legislators' responsiveness to different principals – voters versus party leaders – depends on the institutional context in which they operate. We study a closed-list electoral setting where the responsiveness of rank-and-file members to party leaders is expected to be particularly strong. The Norwegian proportional representation system was, indeed, adopted a century ago partly because it allowed party leaders' control over nominations, thereby enabling them to discipline their followers and build more cohesive parties (Cox, Fiva and Smith, 2019).

Using a within-individual within-terms research design, we study the extent to which rank-and-file members change their legislative behavior when they experience a dramatic negative re-election shock. Our difference-in-discontinuity estimates show that attendance in roll-call voting drops substantially for incumbents that become lame ducks. Similarly, there is some evidence that legislators are less likely to speak in parliament, but the effect is not statistically significant. However, for the outcome variables that reflect deviations from the party line, we have null findings. There is no evidence that legislators that experience a negative shock are more likely to deviate from the party line in voting or floor speech. These results indicate that 'carrots and sticks' are important for legislative effort, while 'political selection' ensures that incumbents toe the party line.

The ideological permanence we identify stands in contrast to settings where parties' control over nominees is relatively weak. For example, Jenkins and Nokken (2008) find that exiting United States congress members historically exhibited greater movement away from the median party position during "lame duck sessions" than did returning legislators. Our study hence is an important piece of evidence demonstrating how institutional context shapes legislative outcomes through political parties' legislative endowments. We hope that future studies will continue to investigate the role of parties as disciplinarians in different electoral settings.

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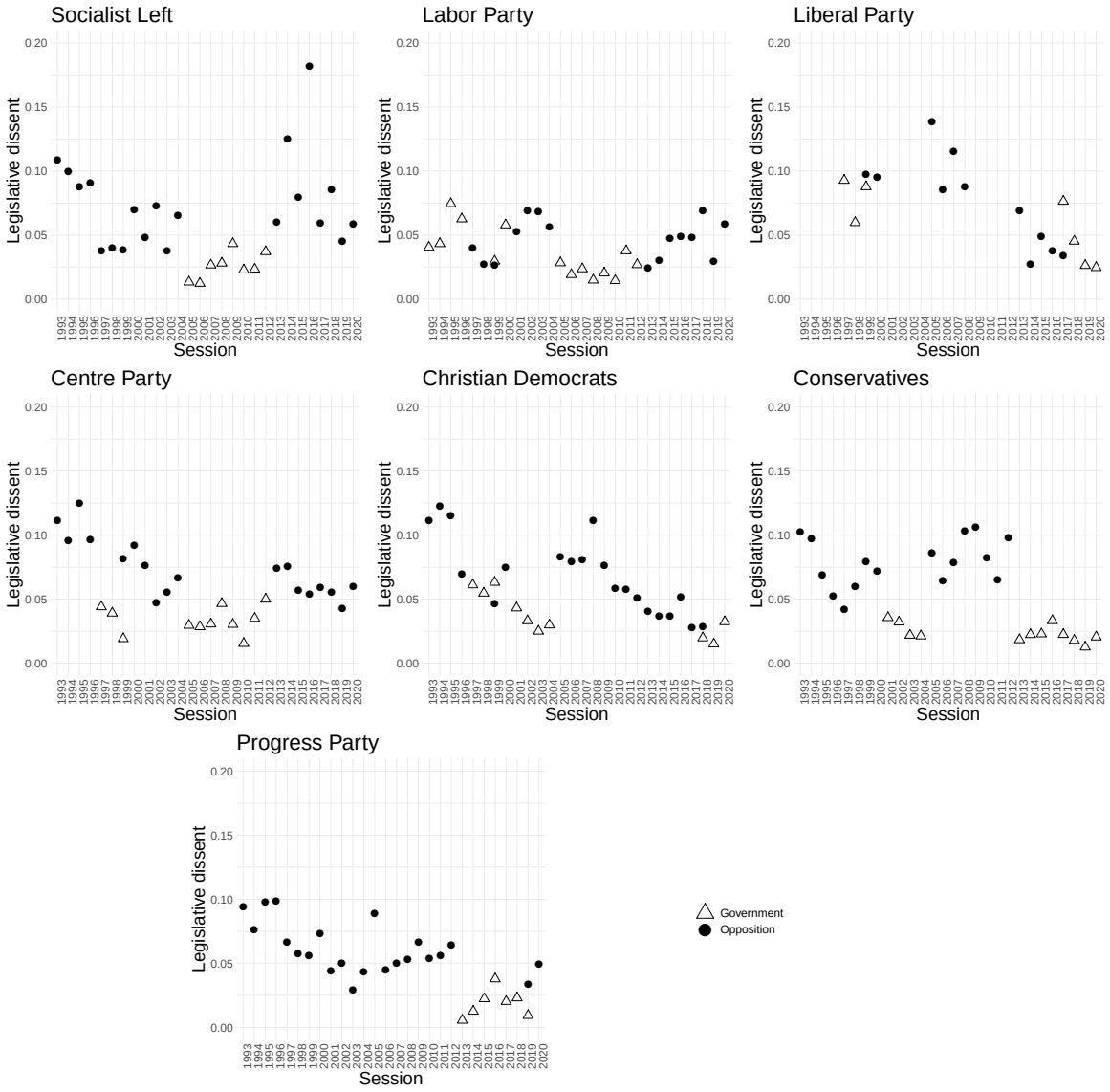
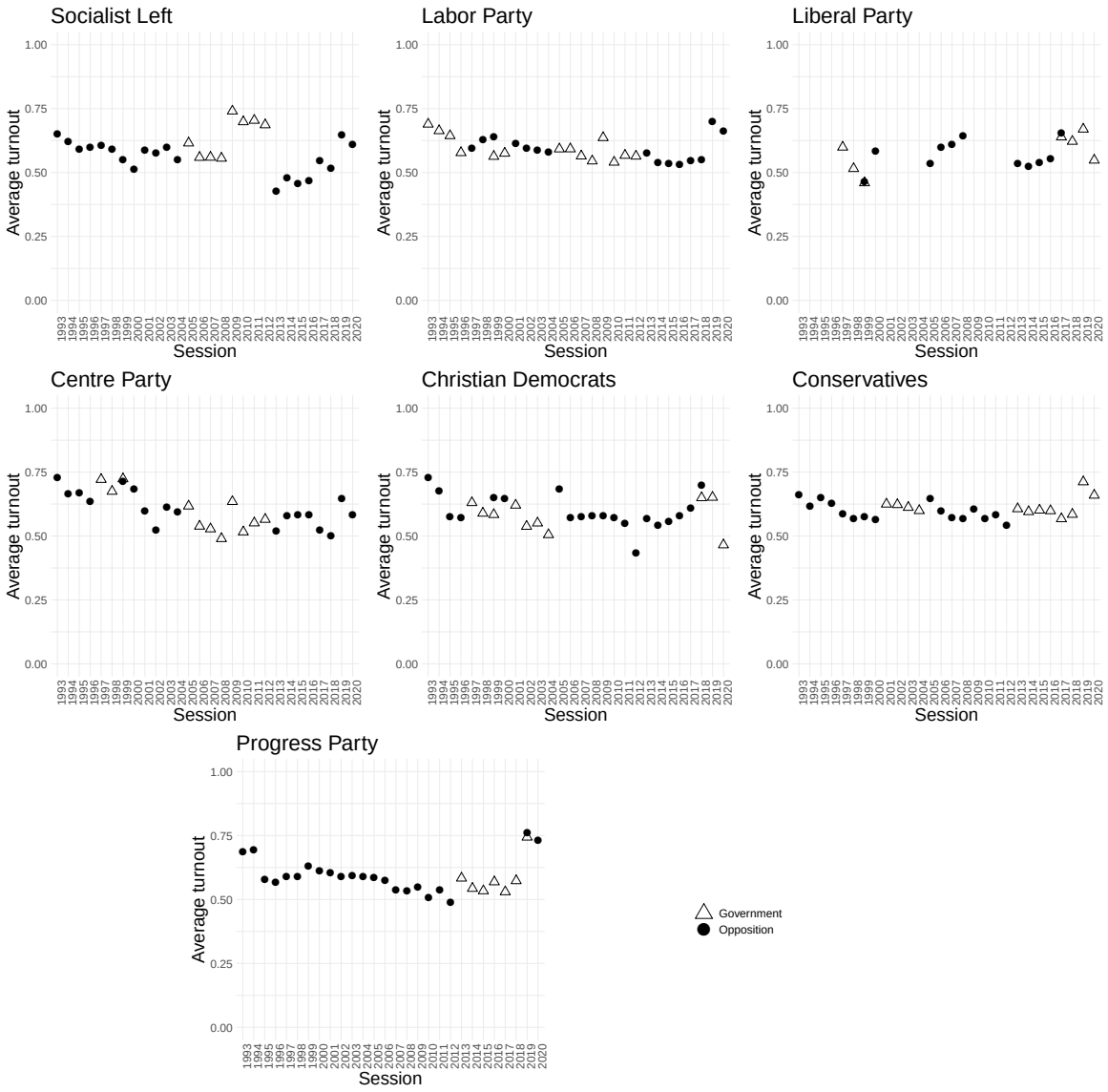
Appendix A: Supplementary figures and tables

Figure A.1: Legislative dissent over time by party and government status



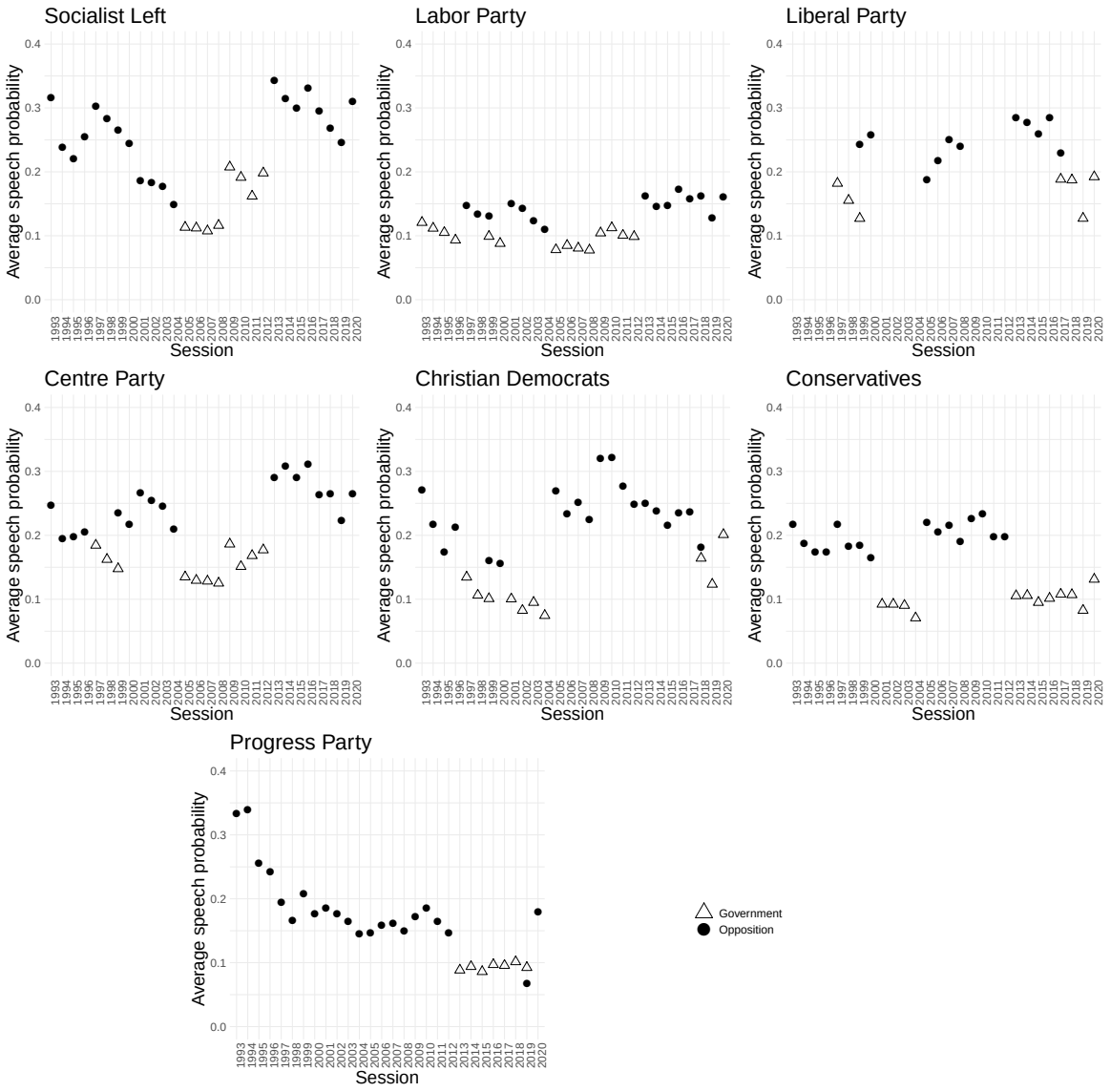
Note: This figure shows the average fraction of legislators that break the party line in floor votes by parliamentary session. The sample includes all parties who reach the national threshold of four percent which makes the party eligible for adjustment seats. Legislative dissent is measured by a dummy taking the value one if the MP votes against the party's majority opinion. When a party's government status changes within a session (see Appendix Table A.1), we report two within-session means. Short transition periods (less than eight weeks) between governments following general elections are excluded.

Figure A.2: Legislative turnout over time by party and government status



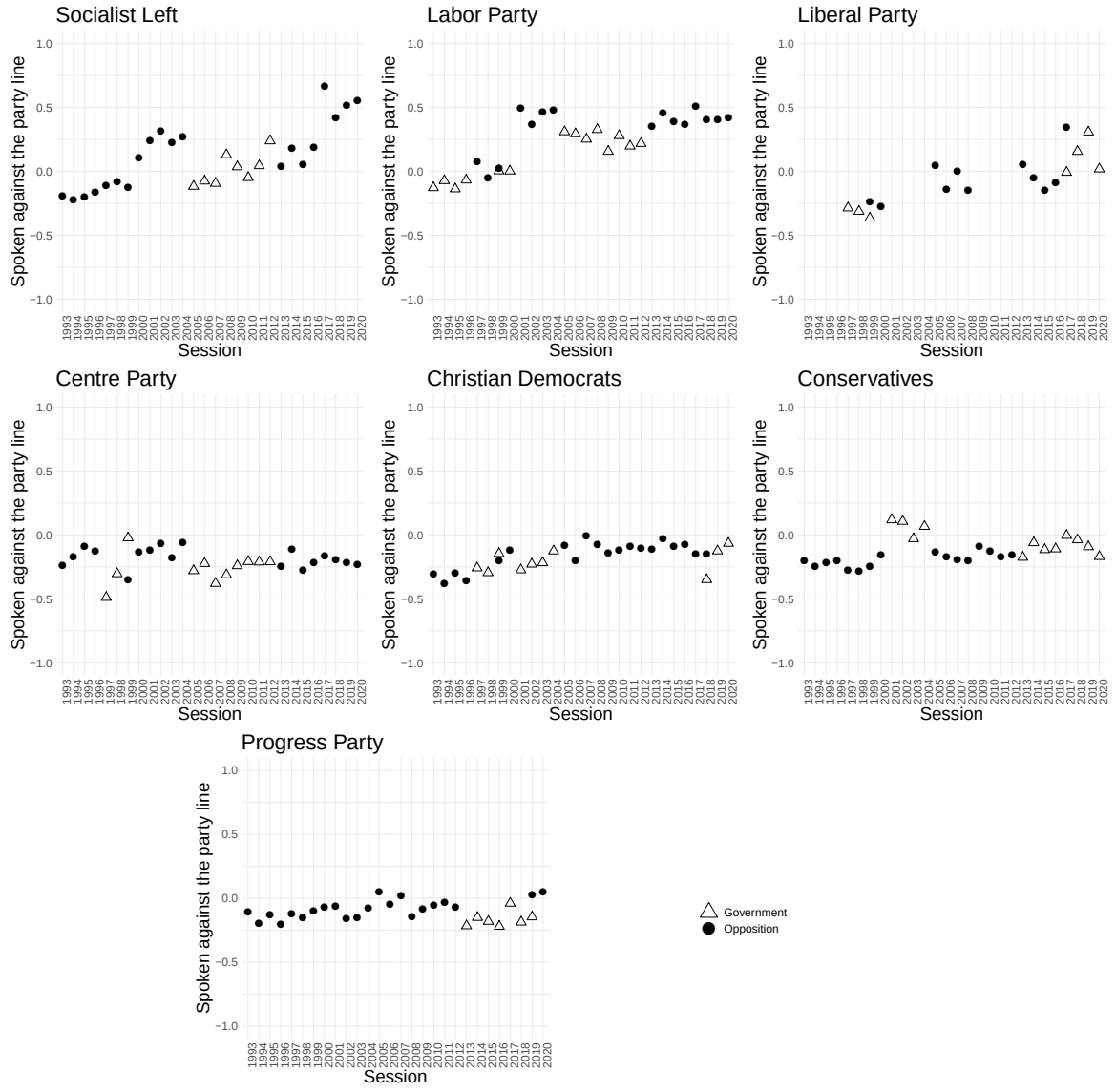
Note: This figure shows the average fraction of legislators that turn up to vote by parliamentary session. The sample includes all parties who reach the national threshold of four percent which makes the party eligible for adjustment seats. When a party's government status changes within a session (see Appendix Table A.1), we report two within-session means. Short transition periods between governments (less than eight weeks) following general elections are excluded.

Figure A.3: Averages of daily speech attendance over time by party and government status



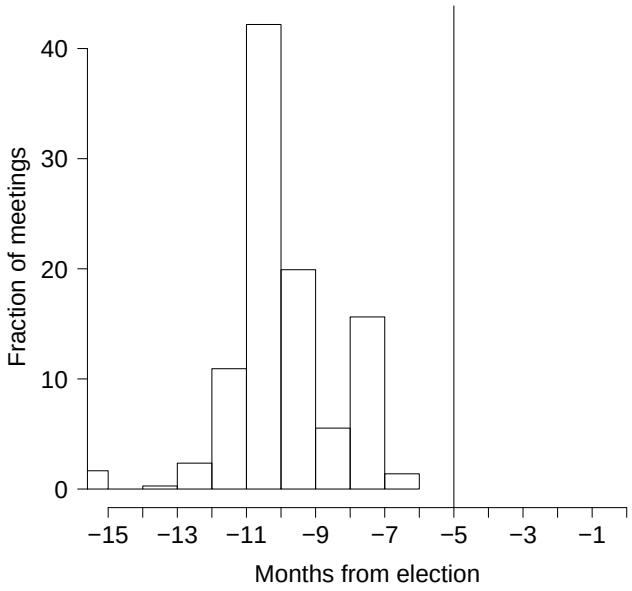
Note: This figure shows the average fraction of legislators that deliver speeches in parliament by parliamentary session. The sample includes all parties who reach the national threshold of four percent which makes the party eligible for adjustment seats. When a party's government status changes within a session (see Appendix Table A.1), we report two within-session means. Short transition periods between governments (less than eight weeks) following general elections are excluded.

Figure A.4: Distance from party leader in speech over time by party and government status



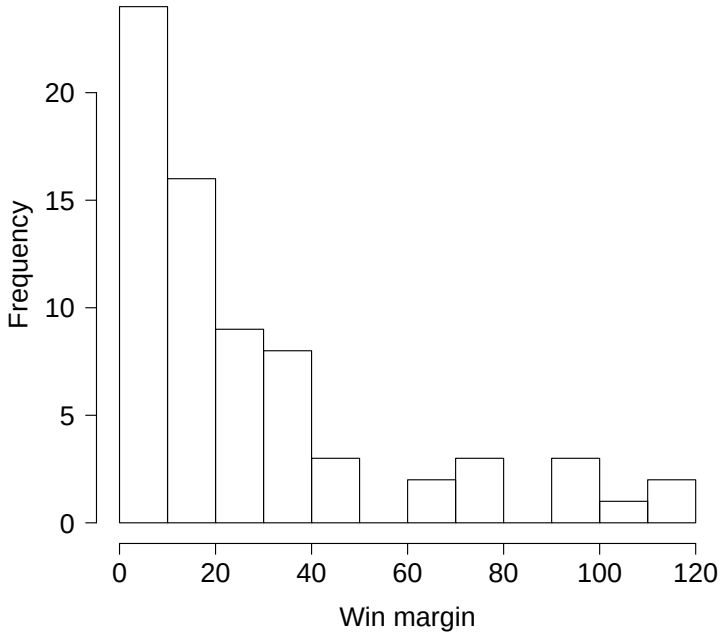
Note: This figure shows the average distance from the party line in legislative speeches along a left-right dimension by party and parliamentary session. The polarity scores are obtained using Latent Semantic Scaling. A negative (positive) value corresponds to a higher (lower) degree of deviation from the party line in speech. The measure is standardized to have a mean of 0 and a standard deviation of 1. The party line is defined as the average left-right polarity of party leaders within an election period. The sample includes all parties who reach the national threshold of four percent, which makes the party eligible for adjustment seats. When a party's government status changes within a session (see Appendix Table A.1), we report two within-session means. Short transition periods (less than eight weeks) between governments following general elections are excluded.

Figure A.5: Frequency of nomination meetings by months to the next election



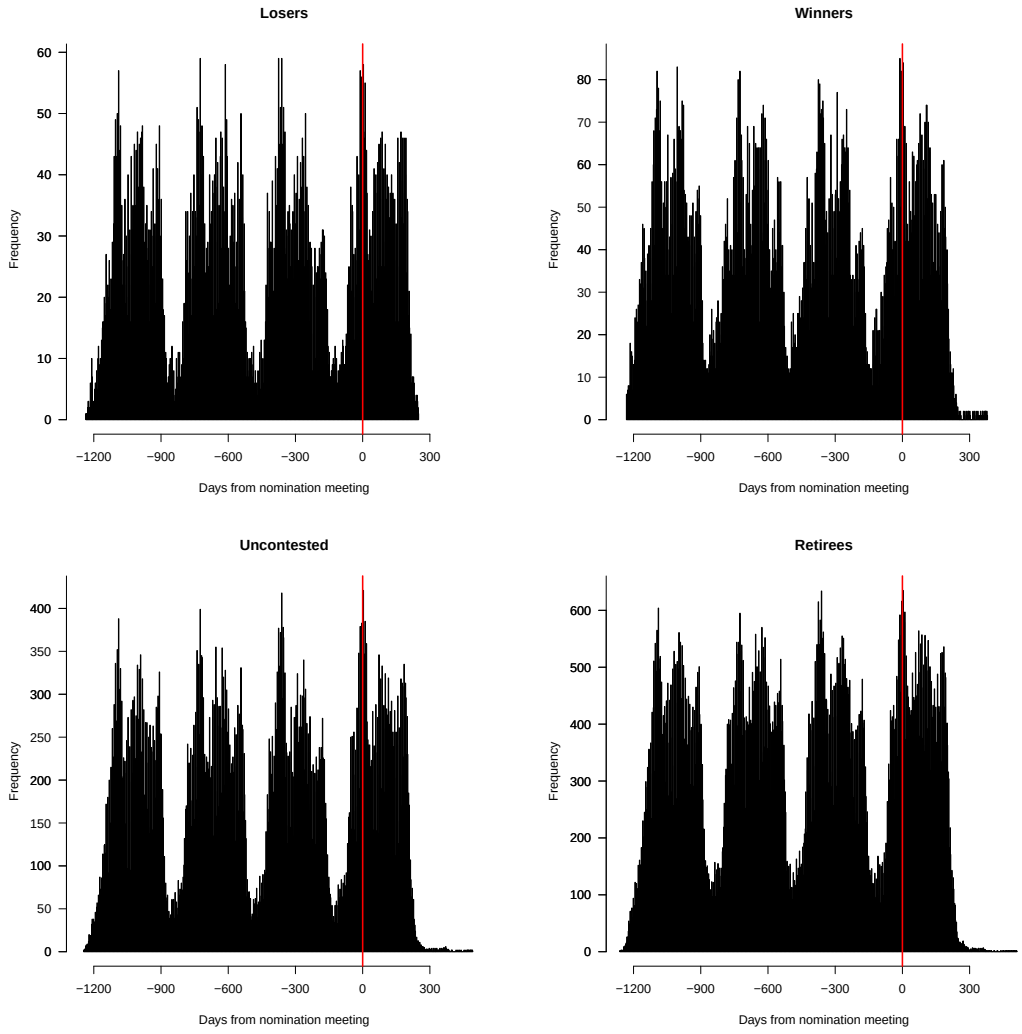
Note: This figure shows the fraction of nomination meetings by the months to the next election. The vertical line at −5 shows the deadline for when electoral lists have to be finalized (March 31 of the election year).

Figure A.6: Histogram of win margins



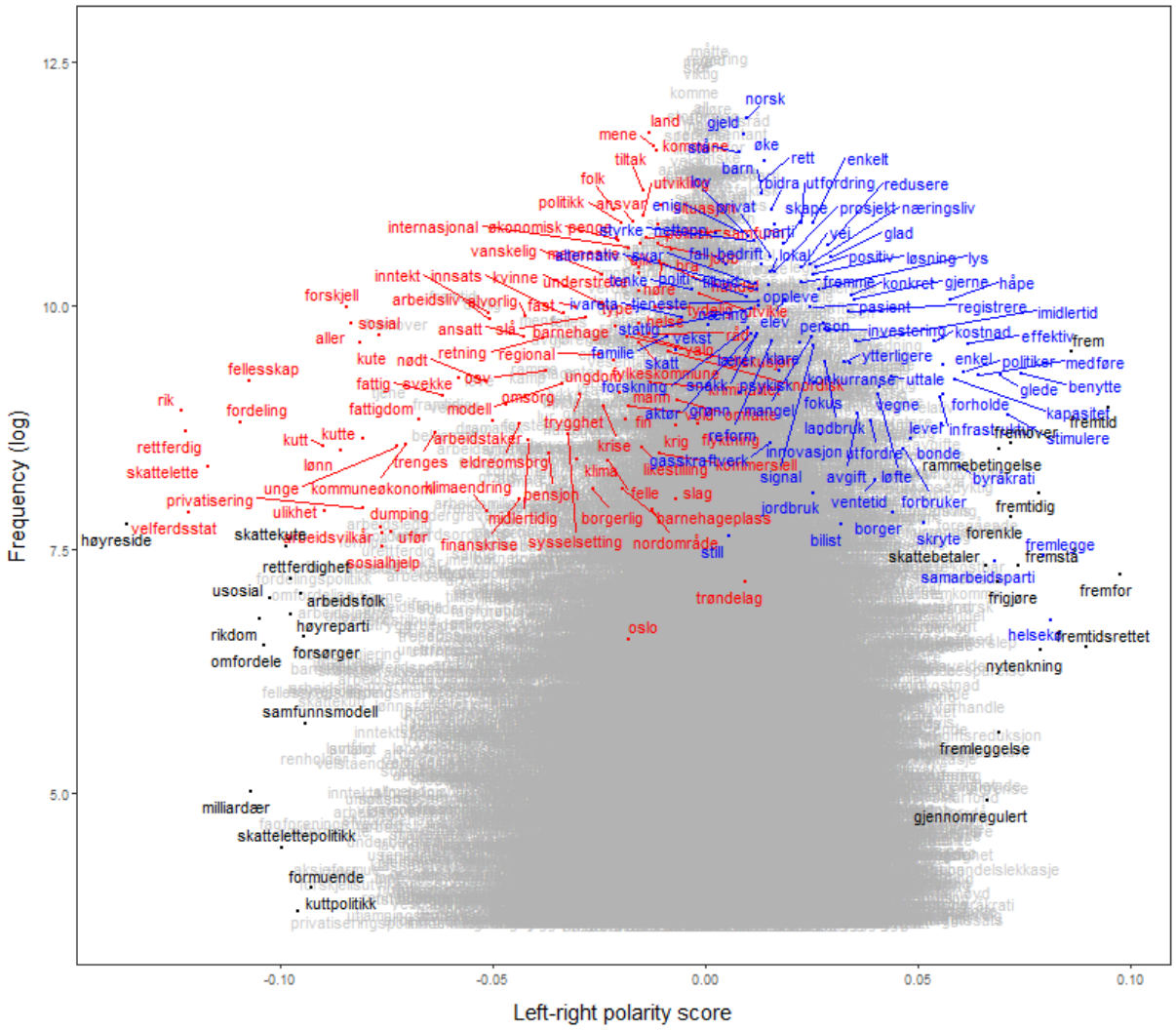
Note: This figure shows a histogram of win margins separating winners and losers of nomination fights. The win margins are calculated as the absolute value of the difference between the votes won by winners and losers. The sample includes all MPs that were involved in fights and the number of observations (n=71) hence differs somewhat from the sample used for the main analysis where we remove MPs that were involved in multiple fights.

Figure A.7: Histogram of representatives by distance from nomination meeting and incumbent type



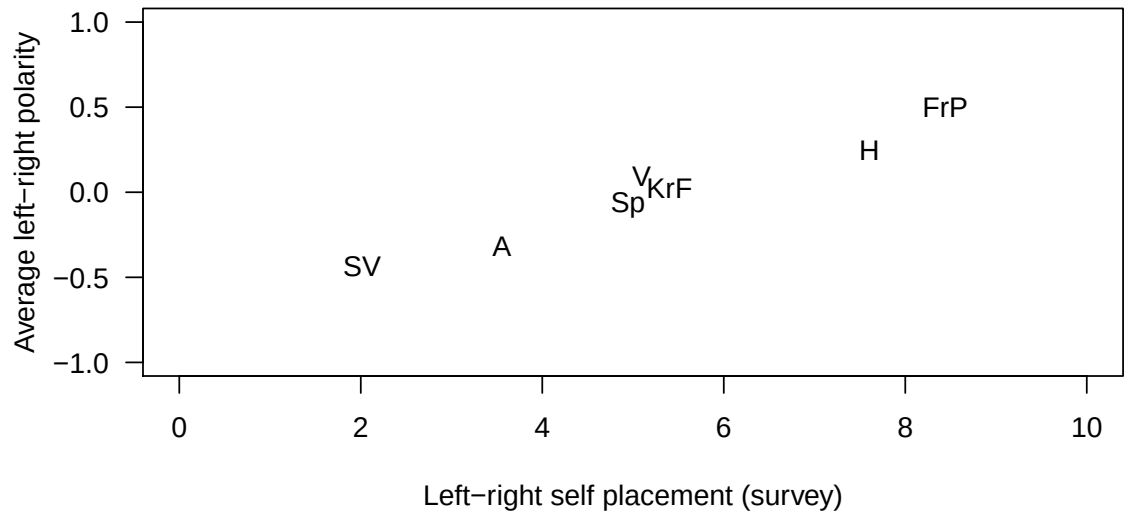
Note: This figure shows the number of representatives by the number of days to the nomination meetings.

Figure A.8: Frequency of features by polarity score (Norwegian)



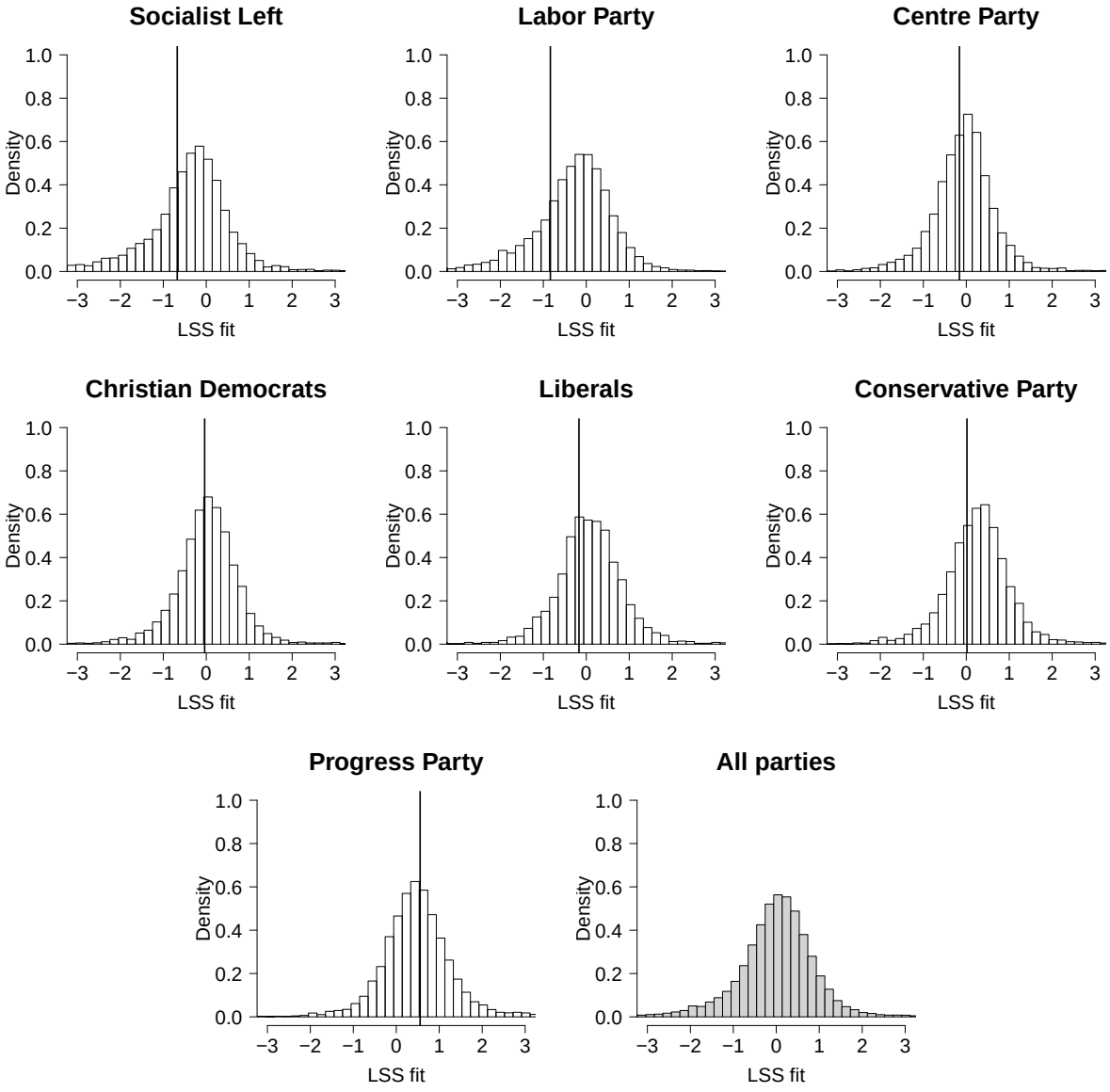
Note: This figure shows the frequency of words in our sample by their estimated left-right polarity scores as identified by the LSS algorithm. To identify the linguistic dimension, we use the hundred most polarizing words for each political bloc, as identified by the method used in Fiva, Nedregård and Øien (2021). The left-wing seed words are in red, while the right-wing seed words are in blue. The twenty most extreme non-seed words of each side of the dimension are in black. All other words are in gray. All other words are in gray. If an extreme word is also a seed word, we depict it as a seed word (red/blue). The seed words tend to be high-frequency words, as the estimator used in Fiva, Nedregård and Øien (2021) penalizes rare features.

Figure A.9: Correlation between party positions measured in surveys and party positions measured by Latent Semantic Scaling



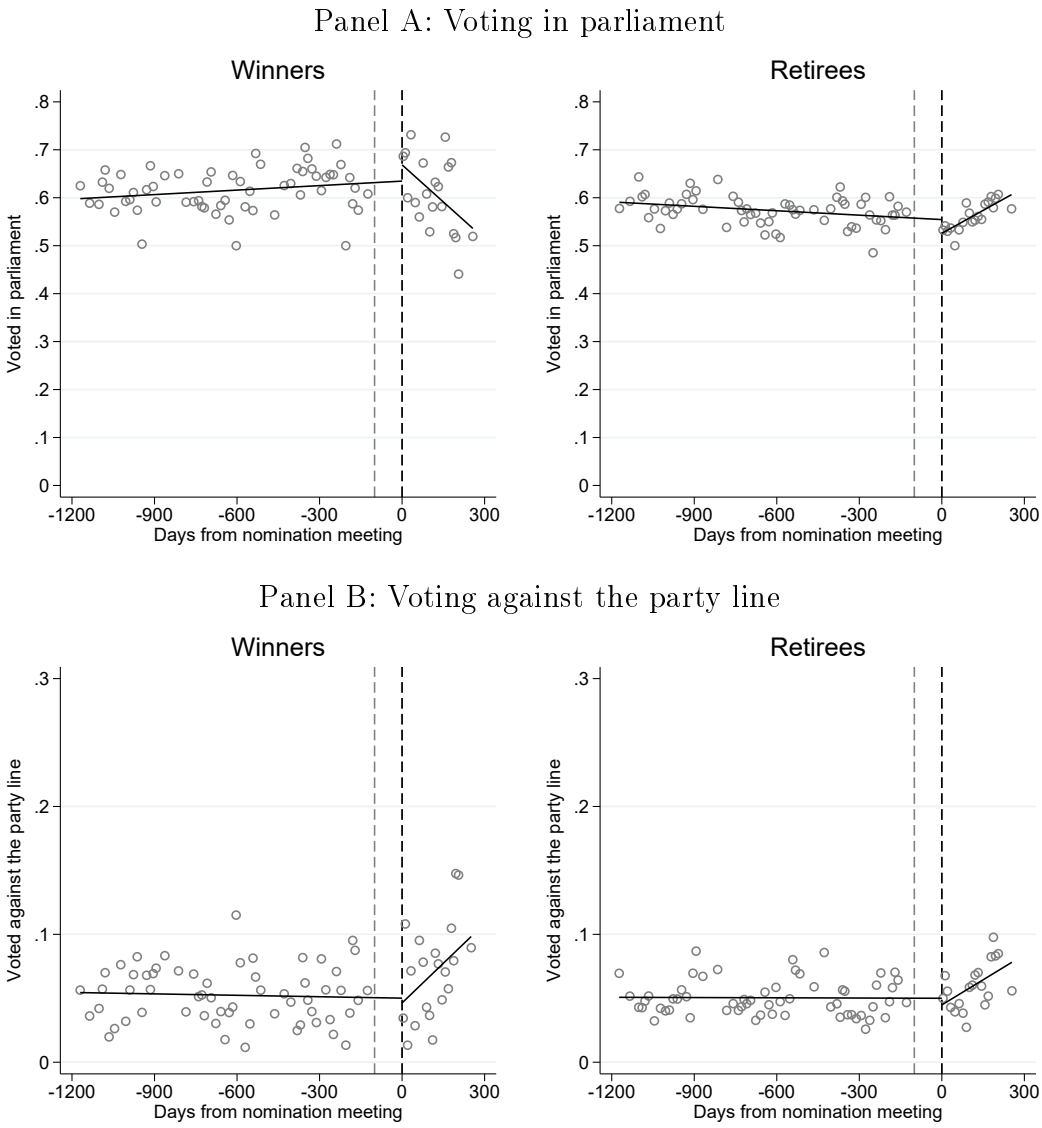
Note: This figure plots the party average left-right polarity scores against the average self-placement on the left-right axis by local politicians. The left-right polarity scores are obtained using Latent Semantic Scaling (LSS) on parliamentary speech in the 1993–2021 period. The left-right self-placement is measured using a question where respondents placed themselves on a scale from 0 (the extreme left) to 10 (the extreme right). The surveys were conducted between 1999 and 2011. Party positions are stable over time and across space (Fiva, Folke and Sørensen, 2018). The raw correlation between the two measures plotted is 0.97.

Figure A.10: Distribution of LSS estimates by party



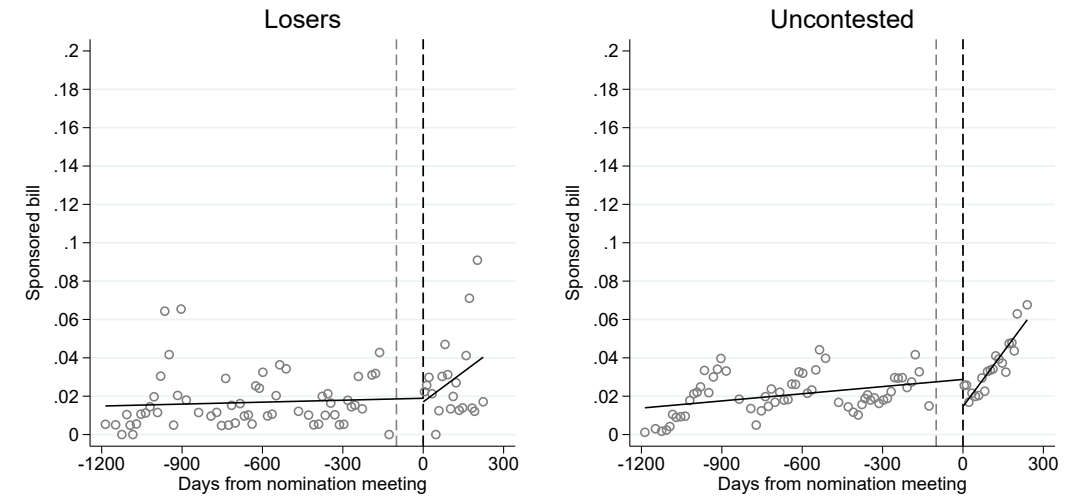
Note: This figure shows distributions of Latent Semantic Scaling estimates by party at the MP-day level in the 1993–2021 period. The solid black line represents the mean for party leaders across all years.

Figure A.11: Roll-call votes - RD plots for Winners and Retiring MPs



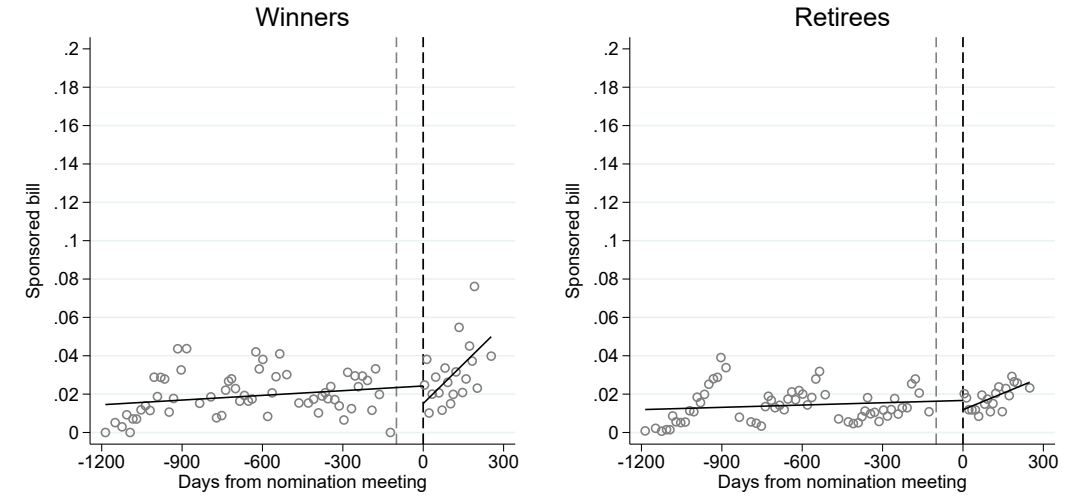
Note: The figures show RD plots for the probability of voting in Parliament and voting against the party line for winning and retiring MPs. Panel A: Winners (n=13491) and uncontested (n=62372). Panel B: Losers (n=8286) and retirees (n=35611). We remove 100 days proceeding the nominations shock to account for anticipation effects.

Figure A.12: Bill sponsorship - RD plots for Losers and Uncontested MPs



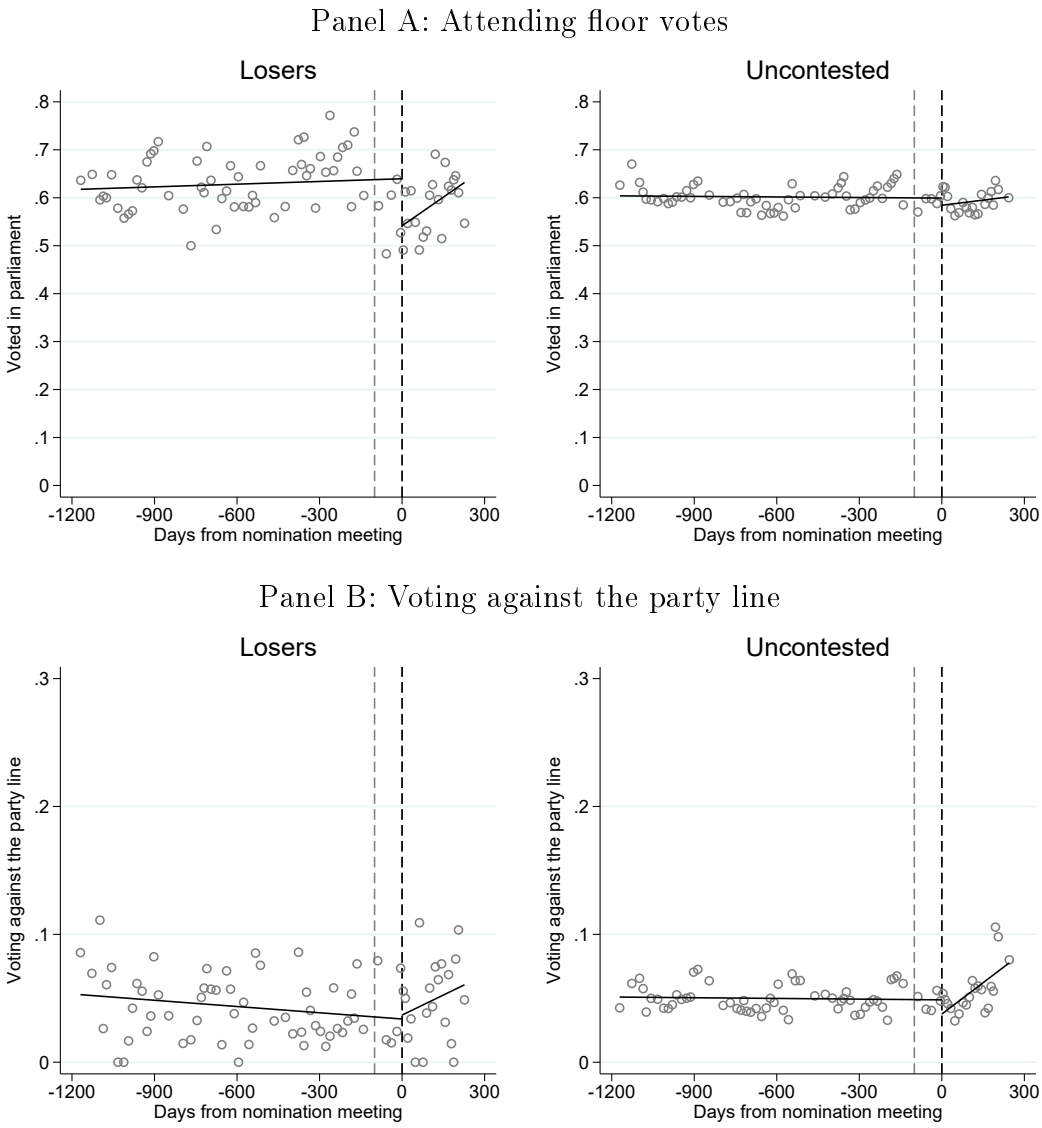
Note: The figures show RD plots for the probability of sponsoring bills in Parliament. Sponsoring probability is measured as a dummy that takes the value one if the MP has spensored a bill at a given day. Losers (n=14226) and uncontested (n=256246). We remove 100 days proceeding the nominations shock to account for anticipation effects.

Figure A.13: Bill sponsorship - RD plots for Winners and Retiring MPs



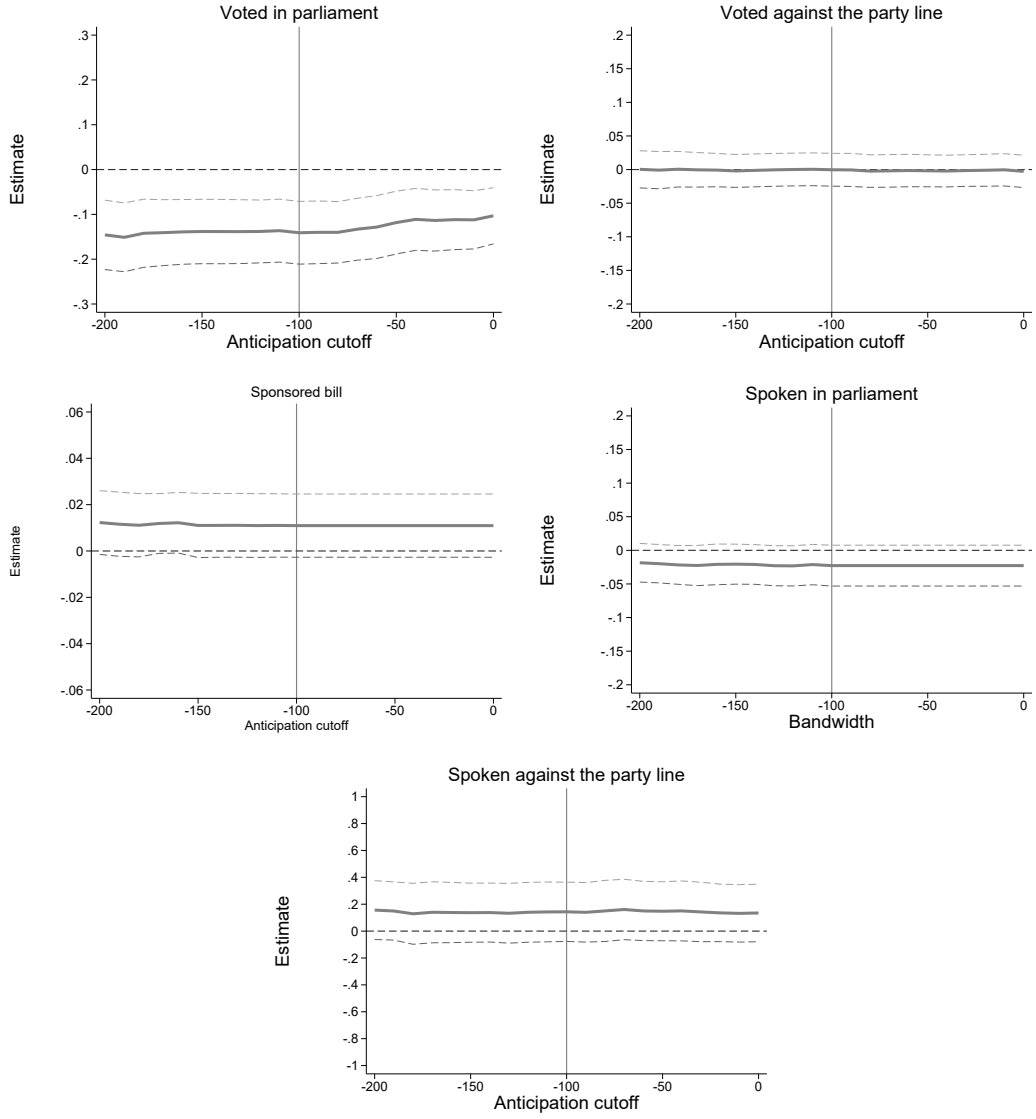
Note: The figures show RD plots for the probability of sponsoring bills in Parliament for winning and retiring MPs. Winners (n=23455) and uncontested (n=106808). We remove 100 days proceeding the nominations shock to account for anticipation effects.

Figure A.14: Roll-call votes - RD plots when anticipation window is included



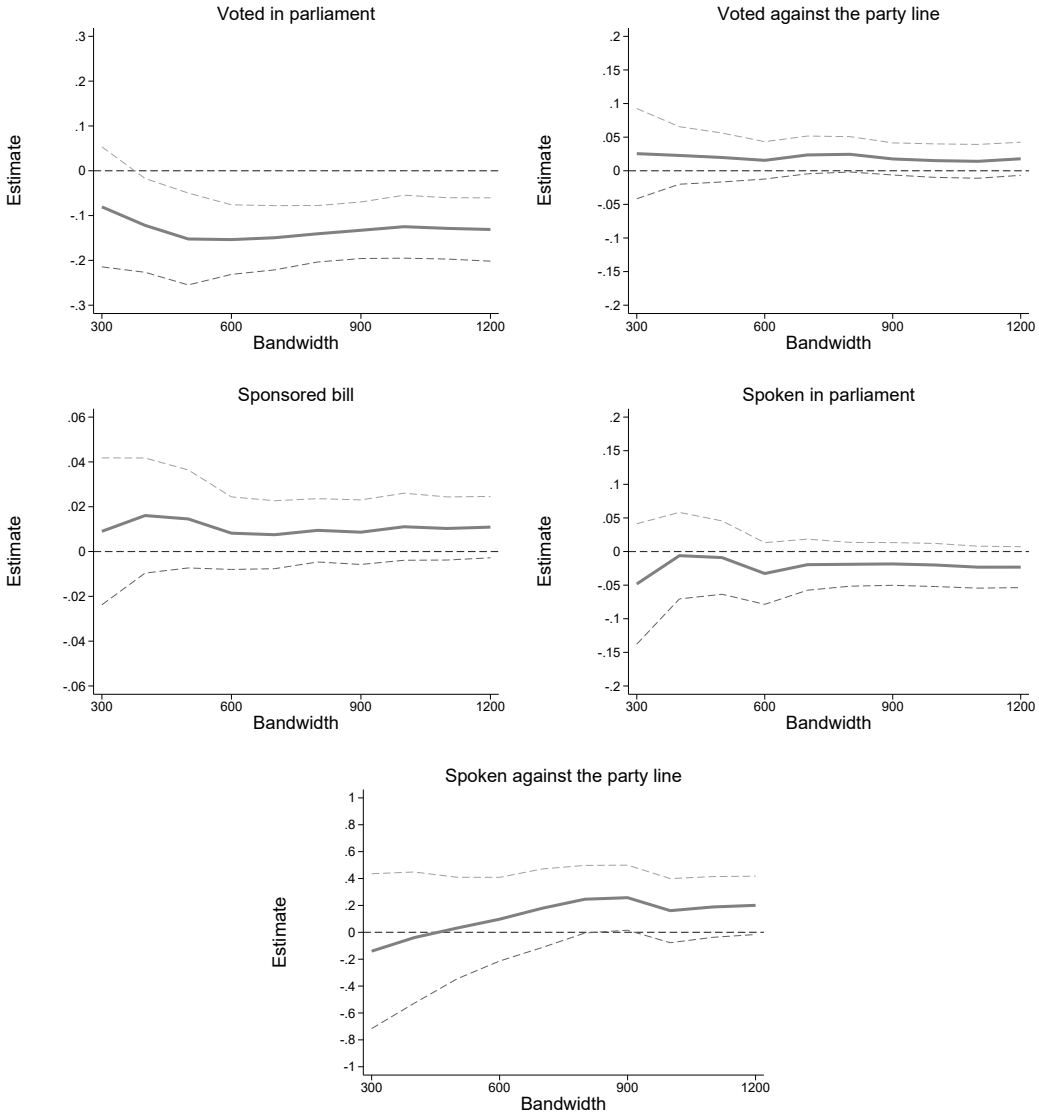
Note: The figures show RD plots using full sample (no anticipation period) for the probability of showing up to vote in Parliament and voting against the party line. Panel A: losing (n=9155) and uncontested (n=159805). Panel B: losers(n=5669) and uncontested (n=95823).

Figure A.15: Difference-in-discontinuity estimates with varying anticipation cutoffs



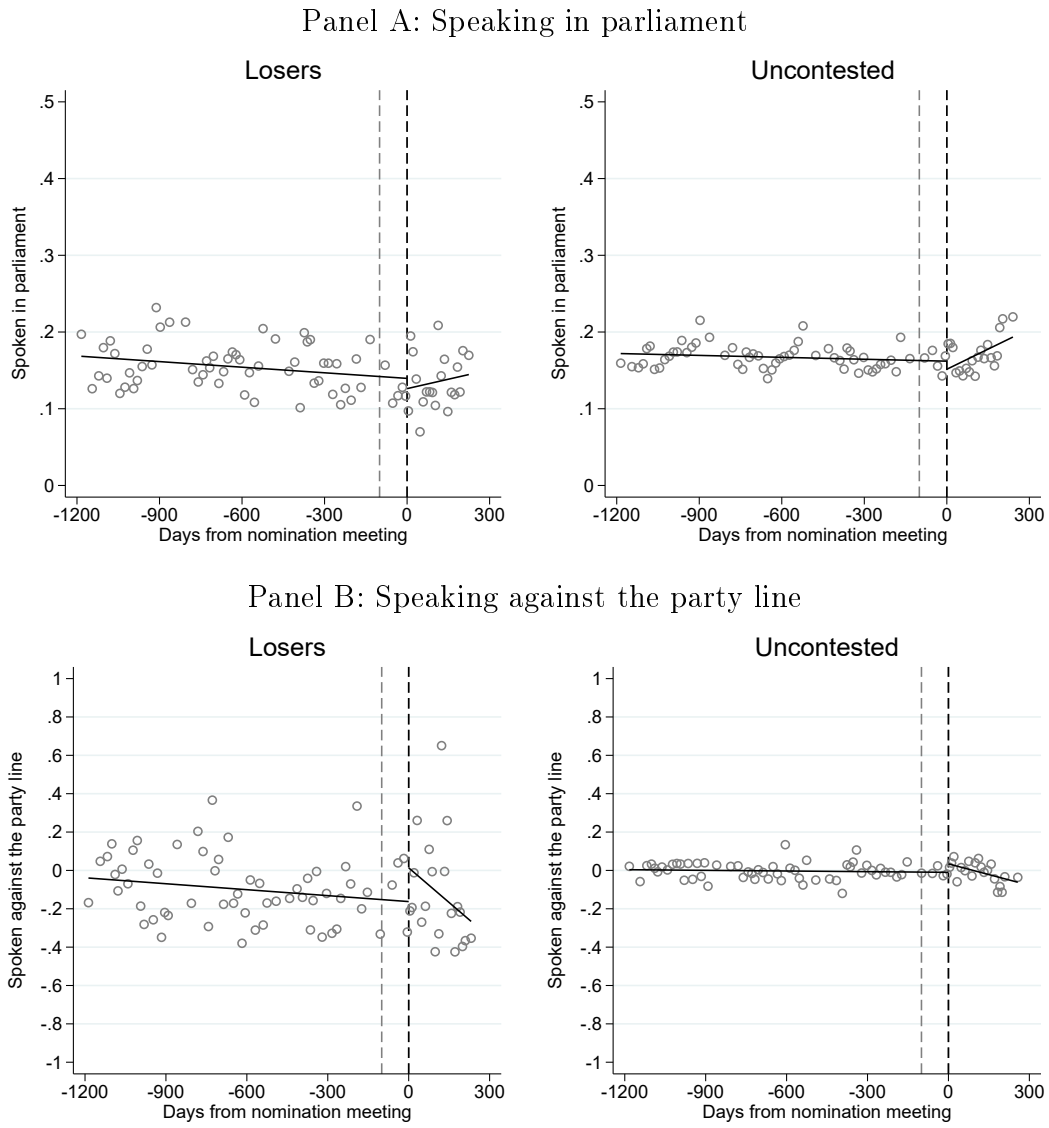
Note: This figure shows plots of treatment estimates using varying anticipation cutoffs (200 days - 0 days) for the vote and speech outcomes we study. The estimates are obtained using full bandwidth and include government and MP-election fixed effects. The vertical line represents the anticipation cutoff used in our main analyses. Standard errors are clustered at the MP level.

Figure A.16: Difference-in-discontinuity estimates with varying bandwidth



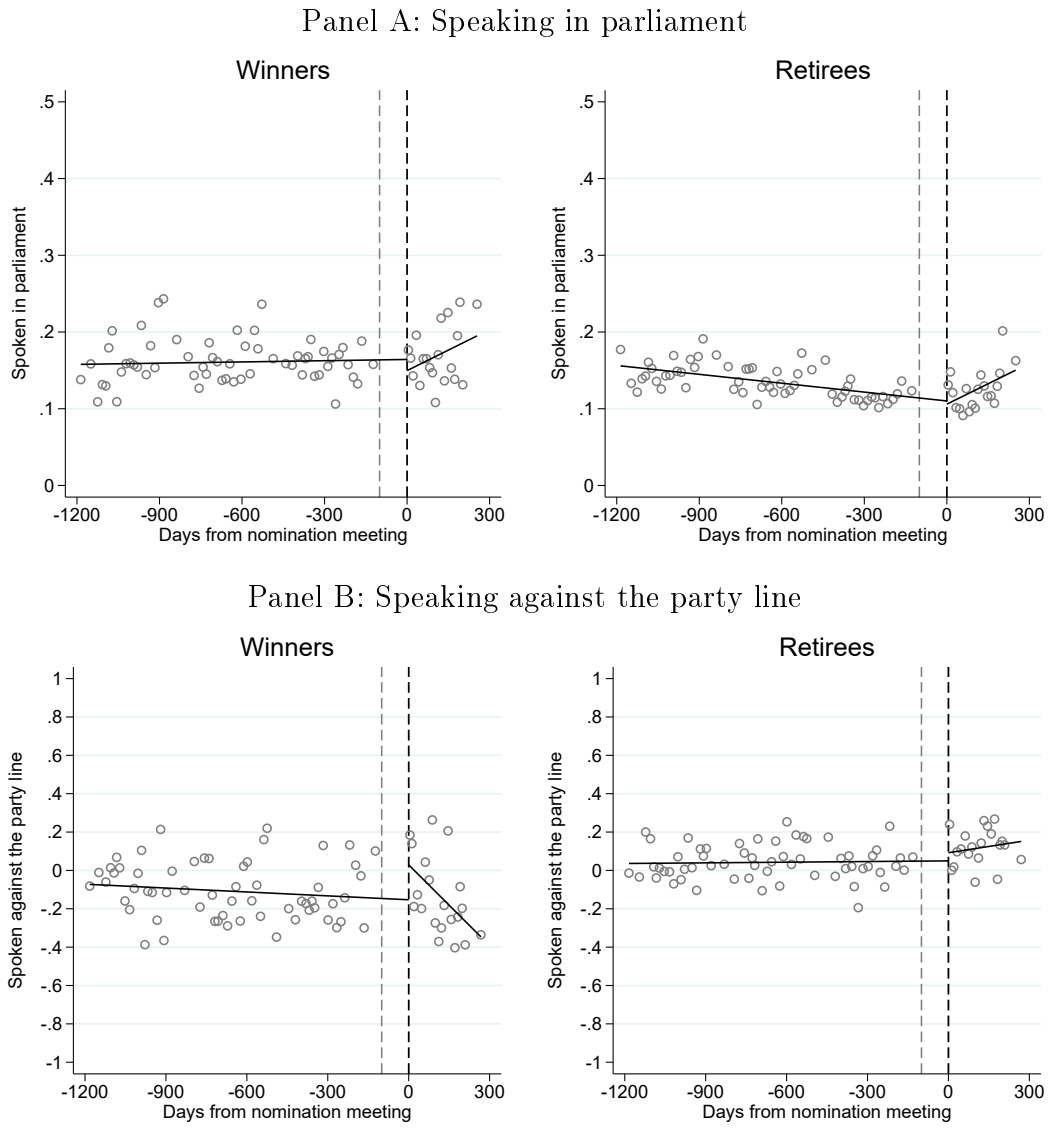
Note: This figure shows plots of difference-in-discontinuity estimates using varying bandwidth (200 days - 1500 days) for the vote and speech outcomes we study. We remove 100 days proceeding the nomination meeting to account for anticipation effects. All estimates include government and MP-election fixed effects. Standard errors are clustered at the MP level.

Figure A.17: Speaking in Parliament - RD plots when anticipation window is included



Note: The figures show RD plots using full sample (no anticipation period) for the probability of speaking in Parliament and breaking the party line in speeches. Panel A: losing (n=15054), uncontested MPs (n=266176). Panel B: losers (n=2130) and uncontested MPs (n=41228).

Figure A.18: Speeches - RD plots for Winners and Retiring MPs



Note: The figures show RD plots for the probability of speaking in Parliament and speaking against the party line for winning and retiring MPs. Panel A: Winners (n=22802) and retirees (n=103991). Panel B: Winners (n=3681) and retirees (n=13240). We remove 100 days proceeding the nominations shock to account for anticipation effects.

Table A.1: Norway's Governments 1993–2021

Time period	**Prime minister**	**Parties**	**Parl. basis**	**Appointment reason**	**Resignation reason**
Nov 1990 – Oct 1996	Gro H. Brundtland (A)	A	Minority	Government crisis	Change prime minister
Oct 1996 – Oct 1997	Thorbjørn Jagland (A)	A	Minority	Change prime minister	General elections
Oct 1997 – Mar 2000	Kjell M. Bondevik (KrF)	KrF, SP, V	Minority	General elections	Government crisis
Mar 2000 – Oct 2001	Jens Stoltenberg (A)	A	Minority	Government crisis	General elections
Oct 2001 – Oct 2005	Kjell M. Bondevik (KrF)	KrF, H, V	Minority	General elections	General elections
Oct 2005 – Oct 2013	Jens Stoltenberg (A)	A, SV, SP	Majority	General elections	General elections
Oct 2013 – Jan 2018	Erna Solberg (H)	H, FrP	Minority	General elections	-
Jan 2018 – Jan 2019	Erna Solberg (H)	H, FrP, V	Minority	Government expansion	-
Jan 2019 – Jan 2020	Erna Solberg (H)	H, FrP, V, KrF	Majority	Government expansion	-
Jan 2020 –	Erna Solberg (H)	H, V, KrF	Minority	Government reduction	-

Note: The parties are Socialist Left Party (SV), the Labour Party (A), the Centre Party (SP), the Christian Democrats (KrF), the Liberal Party (V), the Conservative Party (H), and the Progress Party (FrP). Source www.regjeringen.no.

Table A.2: Descriptive statistics for different incumbent types

	Losers	Winners	Uncontested	Retirees
Affiliated with right-wing bloc (%)	80.6	60.3	47.1	44.6
Female (%)	25.0	41.3	39.1	39.0
Age (average)	52.0	52.3	48.3	54.6
Years since first appeared on election list (average)	15.9	13.6	12.7	16.6
Terms served (average)	2.1	1.9	2.0	2.9
Residing in urban municipality (%)	47.2	49.2	50.9	49.2
White-collar occupation (%)	66.7	49.2	57.5	56.6

Note: This table displays descriptive statistics for losers (N=36), winners (N=59), uncontested (N=638) and retiring MPs (N=266) (see Table 1). "Years since first appearance on election list" is calculated at the speech level, while "age" is counted from the last election preceding the nomination meeting.

Table A.3: LSS seed words

	Left		Right	
Rank	Norwegian	English	Norwegian	English
1	folk	people	bedrift	company
2	kvinne	woman	utfordring	challenge
3	forskjell	difference	vei	road
4	land	country	næringsliv	business
5	kutte	cut	enkelt	simple
6	sosial	social	fremme	promote
7	penge	money	privat	private
8	politikk	policy	redusere	reduce
9	arbeidsliv	worklife	pasient	patient
10	internasjonal	international	håpe	hope
11	handel	trade	glad	happy
12	samfunn	society	bonde	farmer
13	fellesskap	community	prosjekt	project
14	understreke	emphasize	landbruk	agriculture
15	tiltak	measures	politi	police
16	ansatt	employee	lov	law
17	ansvar	responsibility	konkurranse	competition
18	politisk	political	svar	answer
19	rik	rich	positiv	positive
20	alvorlig	serious	gjerne	happily
21	jobb	job	elev	student
22	høre	hear	skape	create
23	Trøndelag	Trøndelag	imidlertid	however
24	mann	man	avgift	fee
25	sjøl	self	rett	straight
26	inntekt	income	bilist	motorist
27	osv	etc	medføre	entail
28	økonomisk	economic	tilbud	offer
29	bra	good	løsning	solution
30	likestilling	equality	enkel	simple
31	barnehage	kindergarten	grønn	green
32	fattig	poor	fall	fall
33	aller	most	lærer	teacher
34	slag	punch	stå	stand
35	rettferdig	fair	lever	live
36	fordeling	distribution	norsk	Norwegian
37	ulik	different	person	person
38	skattelette	tax relief	barn	children
39	regional	regional	aktør	actor
40	kommuneøkonomi	municipal finances	styrke	strength
41	felle	trap	borger	citizen
42	ungdom	youth	bidra	contribute
43	kutt	cut	ut	out
44	tydelig	clearly	stimulere	stimulate
45	utvikling	development	vegne	behalf
46	kommersiell	commercial	oppleve	experience
47	menneske	human	ivareta	maintain
48	omfatte	include	statlig	public
49	situasjon	situation	signal	signal
50	nordisk	Nordic	politiker	politician
51	trenges	necessary	løfte	lift
52	klimaendring	climate change	glede	happiness
53	dumping	dumping	infrastruktur	infrastructure

Table A.3: LSS seed words

	Left		Right	
Rank	Norwegian	English	Norwegian	English
54	svekke	impair	forholde	relate
55	retning	direction	innovasjon	innovation
56	kommune	municipality	tjeneste	service
57	finanskrise	financial crisis	benytte	use
58	råd	advice	registrere	register
59	valg	choice	øke	increase
60	unge	young	alternativ	option
61	innsats	effort	Langeland	Langeland
62	Oslo	Oslo	kapasitet	capacity
63	kutte	reduce	investering	investment
64	arbeidstaker	employee	forbruker	consumer
65	eldreomsorg	elderly care	år	year
66	vanskelig	difficult	hvilke	which
67	vold	violence	skryte	boast
68	helse	health	gasskraftverk	gas power plant
69	ulikhet	difference	tenke	think
70	krise	crisis	uttale	pronunciation
71	pensjon	pension	ventetid	waiting time
72	diskusjon	discussion	forskning	research
73	klima	climate	konkret	specific
74	fin	fine	kø	queue
75	flyktning	refugee	reform	reform
76	nødt	need	nettopp	just
77	nordområde	northern area	familie	family
78	utvikle	develop	byråkrati	bureaucracy
79	lønn	wage	effektiv	efficient
80	kriminalitet	crime	gjeld	debt
81	privatisering	privatization	lys	light
82	slå	hit	fokus	focus
83	krig	war	still	ask
84	bo	live	ytterligere	additional
85	velferdsstat	welfare state	klare	manage
86	omsorg	care	mangel	lack
87	barnehageplass	nursery place	kostnad	cost
88	fylkeskommune	county municipality	parti	party
89	borgerlig	civil	lokal	local
90	arbeidsvilkår	working conditions	snakk	talk
91	midlertidig	temporary	psykisk	mental
92	fast	solid	næring	nutrition
93	sosialhjelp	social assistance	samarbeidsparti	cooperative party
94	mene	mean	jordbruk	agriculture
95	type	type	vekst	growth
96	modell	model	skatt	tax
97	fattigdom	poverty	enig	agree
98	trygghet	safety	utfordre	challenge
99	uføre	disabled	helsekø	health queue
100	sysselsetting	employment	fremlegge	put forward

Note: This table shows the words used as seed words in the LSS algorithm. The words represent the most polarizing words along the left-right dimension, as identified by Fiva, Nedregård and Øien (2021). While the most polarizing words used in Fiva, Nedregård and Øien (2021) are identified using committee fixed effects, we use top polarizing words without committee controls, as we are interested in differences between political blocs, and not bloc-committee units. The composition of seed words hence differs slightly from what is reported in Fiva, Nedregård and Øien (2021).

Table A.4: LSS evaluation

Seed words for each pole	Correlation	Accuracy	Precision	Recall	F1
2	0.725	0.615	0.672	0.720	0.695
5	0.96	0.616	0.669	0.745	0.705
10	0.959	0.615	0.666	0.755	0.708
25	0.954	0.611	0.665	0.748	0.704
50	0.967	0.625	0.671	0.780	0.721
75	0.982	0.627	0.672	0.778	0.721
100	0.975	0.639	0.678	0.790	0.730
200	0.972	0.639	0.679	0.789	0.730

Note: This table presents five performance measures to evaluate the LSS algorithm's ability to classify speeches by political bloc (right/left) when varying the number of seed words for each pole. The first column (correlation) reports correlation between the LSS measure and MPs self-reported left-right placement in surveys. The other four columns report standard performance measures to evaluate the predictive performance of the LSS algorithm. Accuracy measures the model's ability to correctly predict observations as a fraction of total observations (TP+TN/TP+FP+FN+TN). Precision denotes the ratio of correctly predicted positives to all predicted positives (TP/TP+FP) - 'Out of all speeches that were predicted to be delivered by a right-leaning legislator, how many were truly given by a right-leaning MP?'. Recall indicates the number of true positives to all observations in the class (TP/TP+FN) - 'Of all speeches delivered by a right-leaning MP, how many did we label correctly?'. F1 measures performance by creating a weighted average of recall and precision, and hence takes into account both false positives and false negatives (2(Recall*Precision)/(Recall*Precision)). It does not have the same interpretability as the other measures, but has advantages when dealing with uneven class distributions. TP=True Positives, FP=False Positives, TN=True Negatives, FN=False Negatives.*

Table A.5: Bill sponsorship - Difference-in-discontinuity estimates

	(1)	(2)	(3)	(4)
Post	-0.014***	0.005*	-0.013***	-0.012***
	(0.003)	(0.002)	(0.003)	(0.002)
PostXLoser	0.013	0.005	0.011	0.011
	(0.008)	(0.011)	(0.008)	(0.007)
N	270689	270689	270689	270689
Mean dep. var	0.028	0.028	0.028	0.028
Std. deviation	0.166	0.166	0.166	0.166
Polynomial	First	Second	First	First
Government FE	No	No	Yes	Yes
MP-Election FE	No	No	No	Yes

Note: This table shows the difference-in-discontinuity estimates for the probability of sponsoring bills in Parliament. Bill sponsorship is measured as a dummy which takes the value one if the MP has sponsored a bill at a given day. We remove 100 days proceeding the nominations shock to account for anticipation effects. Standard errors clustered at the MP level are in parentheses. ***p<0.01, **p<0.05, *p<0.1