



Presidential coattails versus the median voter: Senator selection in US elections [☆]



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ABSTRACT

We show that senators elected in presidential elections are more ideologically extreme than senators elected in midterm elections. This finding is in contrast to the literature suggesting that voters in presidential elections are more ideologically moderate than voters in midterm elections. To explain this incongruence, we propose a theory of spillover effects in which party labels enable voters to update their beliefs about candidates across contemporaneous races for office: unexpected support for a candidate in one race carries marginal candidates from the same party in other races. Our theory implies that presidential coattails may skew representative government away from the median-voter ideal.

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1. Introduction

Elections are most effective when voters have accurate beliefs (Downs, 1957; Becker, 1958). In particular, the Median Voter Theorem (Black, 1948) hinges on the premise that voters are well-informed about their choices. In this paper, we document a new finding on the selection of United States senators that presents a challenge to the Median Voter Theorem, and explore how this finding is linked to the participation of uninformed voters in elections.

US senators are elected during presidential-election years ('presidential elections'), in races held contemporaneously with the presidential race for office, or during midterm-election years ('midterm elections'). Typically, one third of the seats in the Senate are contested every election. We find that midterm and presidential elections produce different types of outcomes: senators who take office in presidential elections are more ideologically extreme than senators who take office in midterm elections. Conversely, senators who are ousted, die or voluntarily depart without facing reelection in presidential elections are more ideologically moderate than senators who leave office in midterm elections.

To offer an explanation for our empirical findings, we propose a theory of spillover effects in elections with contemporaneous races for office. In particular, extreme outcomes can be the result of spillover effects, which can occur when uninformed voters make inferences about one race using information gleaned from another, contemporaneous race. To illustrate our theory, suppose that the Democratic and Republican presidential candidates take more conservative positions than voters expect. All else being equal, this results in more support for the Democratic presidential candidate because he appeals to a broader range of voters than expected (in particular, right-leaning voters who initially favored the Republican). Using the Democrat's success as a signal of the desirable attributes of Democrats, uninformed voters may update their beliefs about candidates in senatorial races using party labels (Caillaud and Tirole, 2002; Snyder and Ting, 2002). This updating produces a built-in advantage for other Democratic candidates running for office. As a result, more ideologically extreme (in this case, more liberal) candidates, who are typically less electorally viable, can win.

Using panel data from 1968 to 2006 on US elections, we find that senators first elected in presidential elections are about one fifth more ideologically polarized than senators first elected in midterm elections. We compute this estimate by using the average difference in ideology between Democrats and Republicans in the Senate as a measure of ideological polarization. Furthermore, we show that senators who exit in presidential elections are about one quarter less ideologically polarized than those who exit in midterm elections. We address the robustness of our results by employing a variety of specifications and controls and present further evidence in support of our mechanism.

Our primary contribution to the literature is empirical. Our findings on senator selection are new and surprising. A large literature documents

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the strong correlation between voter turnout and voter ideology (for example, Palfrey and Poole, 1987; Osborne et al., 2000; Leighley and Nagler, 2007). Specifically, citizens that participate in elections tend to be more ideologically extreme than citizens who abstain. Since the average turnout rate in presidential elections exceeds that in midterm elections by a factor of 1.4, there are individuals who vote in presidential elections but abstain in midterm elections.¹ These individuals are likely to be more moderate in their views relative to people who vote in both elections and we corroborate this conjecture directly using panel survey data. As such, in midterm elections, more variability in the median voter alone should result in more ideologically extreme senators (even if the expected median voter remains the same). Our findings call into question whether the median voter is doing his part.²

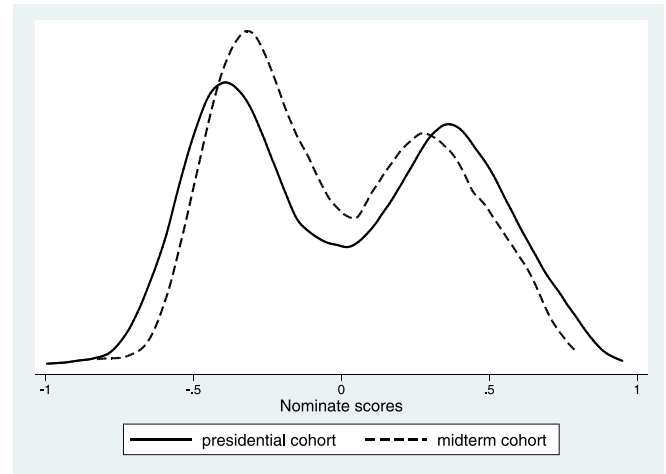
More broadly, there is a growing body of literature on the interactions between voter information, election outcomes and policy. Recent work has looked at the effects of information on elections in developing countries (Ferraz and Finan, 2008; Banerjee et al., 2010; Casey, 2010; Fujiwara, 2011; Pande, 2011). Other work has isolated the effect of media on beliefs and voter behavior (Gerber et al., 2009; Gentzkow, 2006; DellaVigna and Kaplan, 2007; Chiang and Knight, 2011) and on electoral outcomes and policy (Durante and Knight, 2012; Gentzkow et al., 2011; Strömberg, 2004a, b; Snyder and Strömberg, 2010). Our paper contributes to this strand of the literature by documenting the ways in which supplying citizens with political information may have unintended consequences. Relatedly, an extensive literature focuses on political polarization. Recent contributions include Glaeser and Ward (2006), McCarty et al. (2008) and Campante and Hojman (2013), and our work offers insights as to how voter information and institutional design may play a role in increasing polarization.

The paper proceeds as follows. We next present preliminary evidence on selection effects in Senate races. In Section 3, we develop our theory and discuss the related literature. In Section 4, we describe the data we use to test the predictions of the theory, followed by our empirical strategy, and in Section 6 we discuss the estimation results. Section 7 summarizes the evidence on voter knowledge and ideology in midterm and presidential elections. We discuss several key concerns and extensions in Section 8. Section 9 concludes.

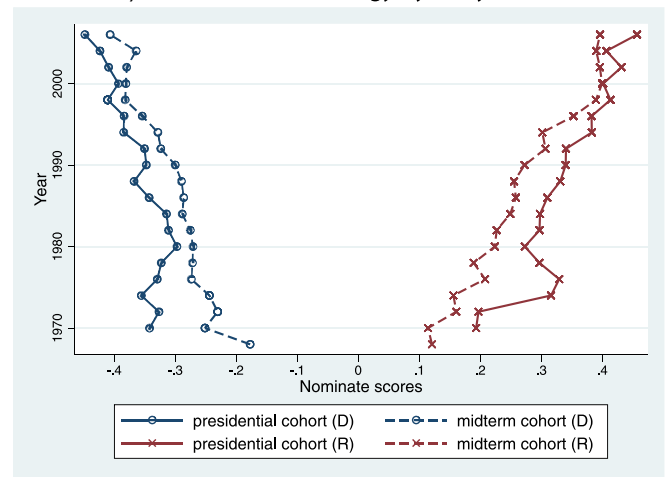
2. Preliminary evidence on selection of senators

We are motivated to examine whether the presidential race influences the selection of senators to Congress.

Using data on senators' voting behavior in Congress from 1968 to 2006, Fig. 1a shows that the distribution over policy of senators who got elected in presidential elections has the same mean but is of higher variance than the distribution of those who first took office in midterm elections. This means that a larger proportion of ideologically extreme senators enter in presidential elections. To emphasize the regularity of this result, in Fig. 1b, we plot the average ideologies of senators across time. In each congress, the voting behavior of midterm entrants is more moderate (i.e., more conservative for Democrats and liberal for Republicans) than of presidential entrants.³ Turning to exit, in Fig. 2 we show that more ideologically extreme senators exit in midterm elections than in presidential elections.⁴ Together, the evidence suggests



a) Distribution of Ideology by Entry Election



b) Average Ideology by Entry Election

Fig. 1. Senator ideology and entry election 1968–2006. Notes: ‘midterm cohort’ refers to senators who first ran for office in a midterm election; ‘presidential cohort’ refers to senators who first ran for office in a presidential election. In panel a, we plot Epanechnikov kernel density estimation results of Poole and Rosenthal’s Nominat scores. In panel b, each point corresponds to the average Nominat scores in a given congressional session for one of the four possible groups of senators, where (D) and (R) indicate Democrat and Republican cohorts respectively. The data include senators who took office between 1968 and 2006. There are 221 entrants, resulting in 1430 senator-year observations for entry. See the Data subsection for more details on the data.

that more ideologically extreme senators enter in presidential elections and are likely to leave in midterm elections.

3. Theory

We develop a parsimonious model that captures well-known facts about US federal elections and makes new predictions about how the presidential race influences the ideology of senators elected to Congress.

Our theory focuses on selection effects that stem from voter behavior.⁵ The theory rests on the sole assumption that voters in a Senate race that is held during presidential elections are less informed about the candidates than voters in a Senate race that is held during midterm elections.⁶ As a result, the most basic insight of our theory is

⁵ Given our empirical objectives, we present a simple version of our theory here. A more elaborate and robust framework that includes voter microfoundations is available in the Online Appendix.

⁶ In Section 7, we discuss how this assumption is implied by the existing literature. We also use survey panel data to test this assumption directly.

¹ Estimate is based on turnout data from 1960 to 2012 reported by the United States Elections Project.

² Even if one does not find this result surprising, this paper is the first to show that midterm and presidential elections produce ideologically distinct outcomes. Furthermore, our findings suggest that holding contemporaneous races for office is not outcome neutral.

³ Another pattern that emerges in Fig. 1b is well documented in the literature: over the past 40 years, Democrats have become relatively more liberal and Republicans more conservative, the overall effect being increasing ideological polarization in Congress. See McCarty et al. (2008) for more on this literature.

⁴ We do not distinguish between incumbents who choose to retire at the end of a term and those who compete in elections and are subsequently ousted from office. See Diermeier et al. (2005) for an empirical investigation of strategic retirement decisions in Congress, which suggests that retirees are forward-looking in terms of electoral prospects.

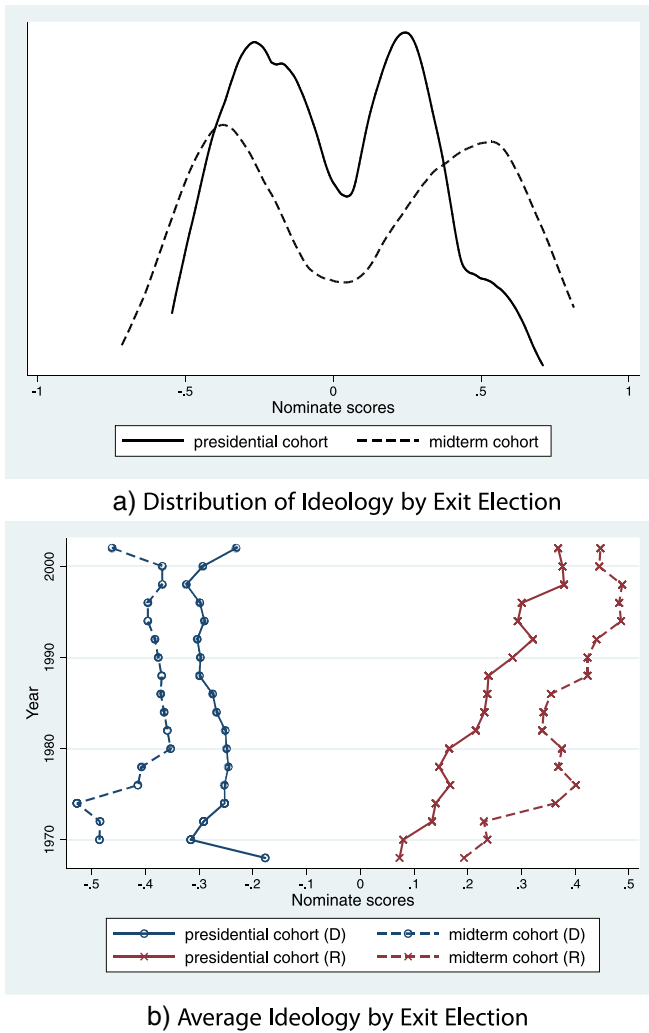


Fig. 2. Senator ideology and exit election 1968–2006. Notes: ‘midterm cohort’ refers to senators who ended their service in a midterm election; ‘presidential cohort’ refers to senators who ended their service in a presidential election. In panel a, we plot Epanechnikov kernel density estimation results of Poole and Rosenthal’s Nominat scores. In panel b, each point corresponds to the average Nominat scores in a given congressional session for one of the four possible groups of senators, where (D) and (R) indicate Democrat and Republican cohorts respectively. The data include senators who took office between 1968 and 2006. There are 137 incumbents who exit, resulting in 754 senator-year observations for exit. See the [Data](#) subsection for more details on the data.

that midterm elections aggregate preferences as one would expect: the candidate whose ideological position is closest to the preferred position of the median voter wins office. In presidential elections, by contrast, voter uncertainty introduces errors and occasionally the wrong candidate—one who is farther away from the median voter’s preferred position—is elected. Thus, in expectation, outcomes generated in presidential elections are more ideologically extreme than outcomes generated in midterm elections.

Suppose there are only two races for office, presidential and senatorial, and that each office is contested by two parties, Democratic (D) and Republican (R). In presidential elections, both offices are contested, while in midterm elections only the senatorial office is contested.⁷

⁷ Depending on the election cycle, there are one, two or three federal races for office; in each election, all the seats in the House are contested and there is at most one senatorial race in each state.

For simplicity, we assume that the selection of candidates in each race is independent from one another, and denote the senatorial candidates y_D and y_R . We assume that Democratic candidates are drawn uniformly from -1 to 0 , and Republican candidates are drawn uniformly from 0 to 1 , taking more conservative positions than Democrats. Citizens’ preferences are drawn uniformly from -1 to 1 . Conditional on voting, a citizen votes for the candidate whose position is closest to his own preferred position. In particular, if a citizen’s preferred position is to the left of $\frac{y_D + y_R}{2}$ he votes for the Democratic candidate; otherwise, he votes for the Republican candidate.

To model different levels of knowledge, we assume that there are two types of citizens: those who observe all candidate positions (‘informed’) and those who observe candidate positions only in the presidential race (‘uninformed’). These uninformed voters constitute a proportion $\delta > 0$ of the population. Since knowledgeable citizens are more likely to vote, we assume that the informed citizens vote in both elections. On the other hand, uninformed citizens turn out in presidential elections but abstain in midterm elections. In presidential elections, we model information spillovers by assuming that an uninformed citizen votes for his preferred candidate in the presidential race, and votes for the same party in the senatorial race.

In midterm elections, a Democratic candidate for the Senate with policy position y_D wins office if and only if

$$\frac{y_D + y_R}{2} > 0.$$

In words, the Democratic party wins if the midpoint between both candidate positions is to the right of the median voter’s preference.⁸

In presidential elections, the winner in the senatorial race will also depend on the presidential race. Let π be the proportion of uninformed citizens who vote for the Democrat in the presidential race. Then the Democratic candidate for the Senate wins if and only if

$$\frac{y_D + y_R}{2} > (1 - 2\pi) \frac{\delta}{1 - \delta}, \tag{1}$$

where the right-hand side of the inequality is decreasing in π . Thus, in presidential elections, a senatorial candidate is more likely to win than not if a majority votes for his party in the presidential race.⁹

Turning to the expected ideologies of winning candidates, in a midterm election the expected position of a Democratic entrant, $E_m[y_D|win]$, is equal to the median Democrat, $-\frac{y_R}{2}$; whereas in a presidential election, $E_p[y_D|win]$ is equal to $-\frac{y_R}{2} + (1 - 2\pi) \frac{\delta}{1 - \delta}$, which is decreasing in π (i.e., more liberal). Thus, greater support for a party in the presidential race results in more extreme outcomes in the senatorial race.

Finally, we compare expected winning positions in midterm and presidential elections directly. In a presidential election, we can rewrite $E_p[y_D|win]$ as the weighted average

$$E_p[y_D|win, \pi > 1/2] Prob(\pi > 1/2|win) + E_p[y_D|win, \pi \leq 1/2] Prob(\pi \leq 1/2|win).$$

Eq. (1) implies that $Prob(\pi > 1/2|win) > \frac{1}{2}$, and since outcomes are more extreme with presidential support than without it, $E_p[y_D|win]$ will lie to the left of the median Democrat, $-\frac{y_R}{2}$. This key result is summarized in the proposition below.¹⁰

Proposition. *Candidates elected to the Senate in presidential elections are more ideologically extreme than candidates to the elected to the Senate in*

⁸ For any given draw of y_R , the probability that the Democrat wins is y_R ; the unconditional probability of a Democrat winning is one half.

⁹ For any given draw of y_R , the probability that the Democratic party wins is $\min\{y_R - (1 - 2\pi) \frac{\delta}{1 - \delta}, 1\}$. For any given δ and y_R , the conditional probability that the Democratic candidate wins the Senate race when $\pi > \frac{1}{2}$ is $\min\{y_R + \frac{2\delta}{3(1 - \delta)}, 1\}$.

¹⁰ Given our assumptions, for interior solutions $E_p[y_D|win, \pi > 1/2] = -\frac{y_R}{2} - \frac{\delta}{3(1 - \delta)}$; $E_p[y_D|win, \pi \leq 1/2] = -\frac{y_R}{2} + \frac{\delta}{3(1 - \delta)}$ and $Prob(\pi > 1/2|win) = \frac{1}{2} + \frac{\delta}{3(1 - \delta)y_R}$.

midterm elections; conversely, senatorial candidates who lose the race for office in presidential elections are more moderate than senatorial candidates who lose the race for office in midterm elections. Specifically, for winners,

$$E_p[y_D|win] < E_m[y_D|win] \quad \text{and} \quad E_p[y_R|win] > E_m[y_R|win],$$

and for losers,

$$E_p[y_D|lose] > E_m[y_D|lose] \quad \text{and} \quad E_p[y_R|lose] < E_m[y_R|lose].$$

Our model implies that information asymmetries in presidential elections induce uninformed voters to externalize their biased decisions. These decisions, collectively, have spillover effects in the form of electing more ideologically extreme senators to office.¹¹

We provide extensions to this theory in the Online Appendix. We model the Bayesian learning process of uninformed voters and, in particular, the mechanism that forces the spillovers. We also endogenize voters' decisions by providing microfoundations, which are an adaptation of the regret utility framework used in Degan and Merlo (2011). This framework was successfully tested by the authors using US election data. It also generates the relative moderation of the electorate in presidential elections, a phenomenon that the model we presented does not deliver.¹² We also account for additional phenomena, such as *roll-off*, and show how party labels, and information in general, influence voting decisions of moderate voters more than of ideologically extreme voters, consistent with recent field experiment results (Jesse, 2009, 2010).¹³

3.1. Related literature

Our economic model of spillover effects sheds important light on electoral institutions. First, our theory shares insights with the literature in marketing and industrial organization that examine information asymmetries in markets for horizontally differentiated goods. For example, Hendricks and Sorensen (2009) find analogous coattail-like effects across sales for a given artist's music albums: the release of a new album, particularly if the album is a hit, spikes sales for older albums, thereby generating backward (rather than down-ticket) spillovers. As with markets, information about one race for office can affect beliefs about another. Second, in the context of learning in elections, our work is most closely related to papers by Knight and Schiff (2010) and Chiang and Knight (2011). Both show how voters rationally respond to signals: the latter focuses on biased signals using learning from newspaper endorsements before elections whereas the former focuses on unbiased public signals using learning about candidates in the sequential presidential primaries. In contrast, we examine how voters respond to unbiased public signals using learning about candidates by observing other candidates in contemporaneous races.

¹¹ The mechanism suggested in our model is that uninformed voters use party labels to update their beliefs about the positions of candidates. In our formal model, we relax the assumption of straight-ticket voting among uninformed voters and provide a more rational and robust framework for parties and voter behavior. In particular, we focus on a mechanism that enables rational information contagion across races for office where voters have spatial preferences over policy. This model also generates more turnout and a less informed electorate in presidential elections endogenously, and accounts for presidential surge and decline.

¹² Indeed, we used this observation to motivate our inquiry; however, since this phenomenon is independent of the information channel we present and because the qualitative predictions on senator ideology remain the same, we decided to refer the interested reader to the Online Appendix.

¹³ Roll-off refers to the dropping rate at which voters cast their votes in down-ticket races in a given election. For example, many voters choose to vote for a presidential candidate (the up-ticket race), but abstain from voting for candidates in senatorial, house or other non-presidential races (the down-ticket races). This phenomenon presents a puzzle for many models of voting, however, our theory predicts behavior that is consistent with roll-off evidence.

The existing literature on presidential coattails focuses on the relationship between a party's presidential vote share and its subsequent share of congressional seats (Besley and Preston, 2007; Campbell, 1986; Campbell and Sumners, 1990; Coate and Knight, 2007), but not on the types of candidates elected as a result. We fill this gap. Relatedly, the literature on presidential surge and midterm decline studies the regular oscillation in support for the president's party in congressional elections: congressional seat gains in presidential elections and losses in midterms. This phenomenon has motivated a variety of theories (Campbell, 1960, 1991, 1997; Tuft, 1975; Kernell, 1977; Erikson, 1988; Folke and Snyder, 2012) and our results connect to and inform those theories.

The sparse theoretical literature on contemporaneous races suggests that voter behavior and electoral outcomes might differ between midterm and presidential elections because of strategic concerns or changes in the information structure voters face. Papers by Alesina and Rosenthal (1989, 1995, 1996) have focused on the effect of such electoral environments on split-ticket voting, where a voter's objective is to obtain a divided government—a state in which the executive and legislative branches are not controlled by the same party. These papers offer an alternative explanation for our main findings: voters in presidential elections may support ideologically extreme congressional candidates as a counter-weight to their support for an ideologically extreme presidential candidate. More recent work examines positive properties of simultaneous races with respect to voter information. Ahn and Oliveros (2010) show that where voters have common values, contemporaneous races for office aggregate information effectively if and only if each race does so independently, in the absence of other races; however, when voters are heterogeneous, holding multiple races simultaneously can generate inefficiencies (Ahn and Oliveros, 2012). Our theory speaks to the latter.

Finally, our theory suggests that when information asymmetries arise, contemporaneous races may lead to inefficient outcomes. This theory is in contrast to that of Feddersen and Pesendorfer (1996, 1997), where a best response for *uninformed* voters is to abstain. This way, they rely on like-minded *informed* citizens to induce their common preferred outcome; however, we cannot reconcile this prediction with the data, at least in the context of presidential elections. Indeed, information may be inefficiently aggregated for alternative rational Ahn and Oliveros (2012) or behavioral or reasons.

4. Data

Our data on presidential election returns along with senators' entry and exit election years come from the Congressional Quarterly Electronic Library and the Almanac of American Politics. The data consist of senators who took office between 1968 and 2006.

4.1. Data sources and variation

Of the 221 senatorial entrants, 122 were first elected to office in a presidential election.¹⁴ During the same time period, 137 of these entrants left the Senate, with 76 leaving in presidential election years. Our panel data amount to 1329 senator-year observations for entry and 754 senator-year observations for exit.¹⁵

¹⁴ For senators who fill a vacancy mid-election cycle, we code the timing of senator entry by the first regularly scheduled federal election she faces. For example, if a senator took office in March 2008 and faced a November election for the first time in 2010 at midterms, then she is coded as a midterm entrant. One Independent senator and four senators that were appointed off-cycle and did not subsequently face a November election were omitted from the analysis.

¹⁵ Note that our data on exits include only those senators who took office during the sample time frame; as a result, our analysis on exits relies on a smaller number of observations than our analysis on entries.

Table 1 shows the state-level frequency of entries (exits) in presidential and midterm elections from each party.¹⁶ The number of entries and exits per state is quite small: from 1968 to 2006, the median number of entries is 4 and of exits 2. At least one-third of states lack the full representation of senators from presidential and midterm elections. An even larger number of states have just one presidential or midterm entrant, which means that within-state variation in our data is quite limited. Fig. 3 provides information on the cross-sectional variation in our data. There is no evident spatial correlation in the number of entries or exits across states, which is in contrast to the presence of regional spatial correlation in state ideology (e.g., South). More detailed information on the number of entries (and exits) of each type of senator in every state is given in Table A1.

We also gather information on senator characteristics, electoral-race conditions and constituent demographics, described in more detail below. Data on Nominat scores, our measure of senator ideology, come from Poole and Rosenthal's Voteview website.¹⁷ Data on state and senator characteristics are taken from Aldrich et al. (2008). The source for the state demographics is the US Census and Bureau of Economic Analysis. These data are linearly interpolated between decennial censuses. Detailed electoral race characteristics are provided by the Congressional Biographical Directory.

Much of these data are used in our regressions as standard controls.¹⁸ Senator and electoral-race covariates include age, tenure, dummy variables for whether a senator is a freshman or belongs to the majority party, a dummy variable for whether an open seat is contested. We also employ a measure of how close the race was, defined as 0.5 (the threshold for winning the race) minus the share of votes obtained by the winning candidate. State characteristics include the share of the population over age 65, that is black, who are farmers, who work in finance, government or manufacturing (each considered separately), who are foreign born, and who live in urban areas. We also include per capita income (logged) and population per square mile. Descriptive information on each set of variables is available in Table 2.

4.2. Correlates of senator entry and exit election

In this subsection, we examine whether senator entry (exit) in midterm or presidential elections is correlated with a latent state or senator characteristic and address the possibility that our findings are spurious. If, for example, more ideologically extreme states are more likely to elect freshmen senators in presidential elections, then this would bias our results. In Table 3, we present summary statistics of covariates we use in the analysis. For each such covariate, we report the mean and standard deviation separately for those associated with senators who enter (exit) in presidential elections and those who enter (exit) in midterm elections. Given that most of these covariates do not vary much overtime, we take data on a cross-section of senators serving in a year when we observe the highest number of senators. For entry, we use the year 2000 with 95 of the 100 senators in our sample, and for exit, 1984, with 69 senators.¹⁹

In panel A, we report the statistics on state covariates. All the covariates are statistically insignificantly distinguishable from each other. This is true both for entry and exit. A measure of population density

¹⁶ To address several instances in which a senator switched parties while in office, for the analysis on senator entry, we code senators by the party affiliation they had at the time of entry; whereas, for exit, we code senators by the party affiliation they had at the time of exit. Our results are robust to the exclusion of this set of senators from analysis.

¹⁷ These scores are widely-used and robust measures of legislator ideology. We use the first dimension of Nominat scores, which most closely corresponds to the liberal (left)–conservative (right) ideology space; during the period of our study, the first dimension accounts for approximately 90% of the variation in senators' roll-call voting behavior in Congress. For details on the estimation procedure and construction of this measure see Poole and Rosenthal (2000).

¹⁸ For example, see Aldrich et al. (2008) and Snyder and Strömberg (2010).

¹⁹ Missing senators are senators who were elected before 1968, off-cycle or, in the case of exit, were still in office in 1984.

Table 1
Flow of senator entry and exit.

Distribution of senator entry per state				
Number of entries	Presidential entrants		Midterm entrants	
	Democrats	Republicans	Democrats	Republicans
0	16	12	17	16
1	18	21	27	20
2	10	9	1	8
3	5	5	3	4
4	0	3	2	2
5	1	0	0	0
Total	50	50	50	50

Distribution of senator exit per state				
Number of exits	Presidential exits		Midterm exits	
	Democrats	Republicans	Democrats	Republicans
0	30	25	30	19
1	12	25	15	22
2	7	0	5	8
3	1	0	0	1
Total	50	50	50	50

Notes: This table tabulates our data into the number of states with a given number of senator entries (exits) by party and election type, midterm or presidential. For example, the first column in the tabulation for entry indicates the number of states with a given number of Democratic entrants in presidential elections: 16 states have none, 18 states have one, 10 states have two, 5 states have three, there are no states with four, and one state has five Democratic presidential entrants.

obtains the highest *t*-statistic of 1.408 in a mean equality test with turnover in presidential elections more likely to occur in densely populated states. Importantly, we do not find that a senator's entry (exit) election is correlated with the degree to which his state is ideologically extreme. Specifically, we do not find a relationship between state ideology and the likelihood of entry or exit in presidential elections.²⁰

Another plausible set of correlates of selection in midterm or presidential elections is candidates' characteristics. For example, are senators elected in midterms inherently different from those elected in presidential elections? In panel B, we report identical statistics to those reported in panel A above. The covariates are whether the selected senator (for entry or exit) is a Democrat, the senator's age and whether he belongs to the majority party. Electoral-race covariates are whether the race that the senator most recently faced was close or had an incumbent seeking reelection. The only statistically significant difference in this panel is the covariate measuring the closeness of the entry race: midterm entrants appear to compete in less contested races ($t = 2.914$). The average entrant in presidential elections wins the Senate race with a 5% vote-margin, whereas a midterm entrant wins by 8%. We do not find this electoral distinction among senators who exit. Finally, there are more Democrats elected (ousted) in presidential elections than Republicans but not statistically significantly so. No other differences are economically or statistically significant.

5. Empirical strategy

We estimate equations of the form:

$$y_{it} = \beta_1 \text{Presidential}_i + \beta_2 \text{Presidential}_i \times \text{Democrat}_i + \beta_3 \text{Democrat}_i + \mathbf{x}_{it}' \boldsymbol{\gamma} + \varepsilon_{it}, \quad (2)$$

where y_{it} is the ideology score of senator i in year t , Presidential_i is an indicator variable equal to one if senator i first took office during a presidential election (or, in the case of our exit regressions, whether she left office in a presidential election year) and Democrat_i is an indicator equal to one

²⁰ For further inspection, we also correlated the proportion of entries (exits) in presidential elections (as opposed to midterm elections) in our panel with our measure of state partisanship and found it to be insignificant.

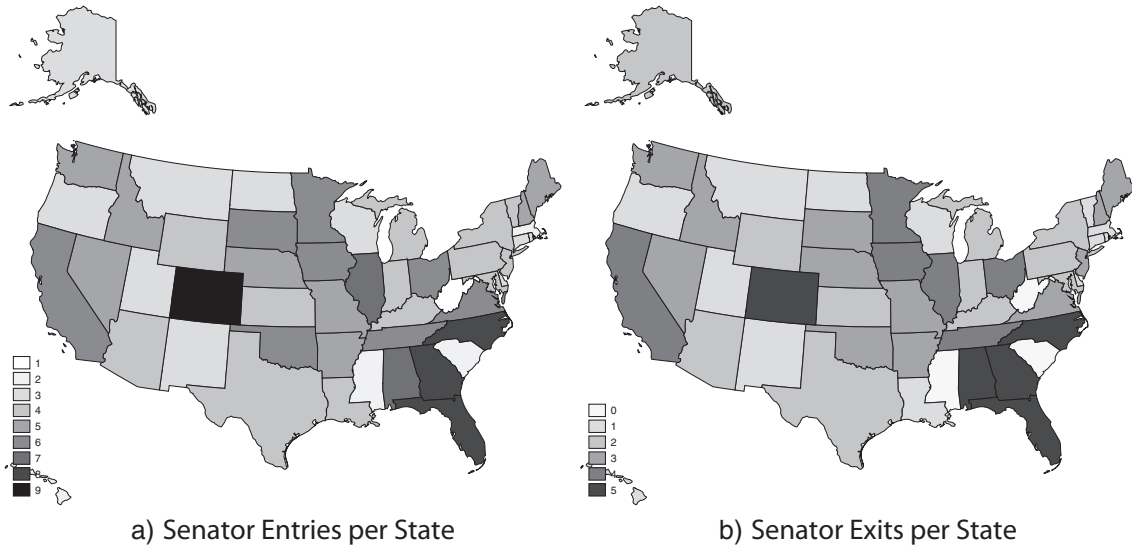


Fig. 3. Senator entries and exits 1968–2006. Notes: These figures illustrate the cross-sectional variation in the number of senator entries (exits) in our data. A darker color indicates a greater number of senator entries (exits) in a given state.

if senator i is a Democrat. Based on the results in Fig. 1, for entrants we expect $\beta_1 > 0$ (Republicans first elected during a presidential election are more conservative) and $\beta_1 + \beta_2 < 0$ (Democrats elected in a presidential election are more liberal). The opposite inequalities are expected for senator exits. To examine the sensitivity of our estimates and to explore heterogeneous selection effects, we include a vector \mathbf{x}_{it} of controls described in the Data section.

We believe that our main threat to identification in Eq. (2) is that an unobserved fixed state-characteristic might be correlated with the

selection of candidates, in particular the *Presidential* indicator variable. That is, our estimates would be biased if presidential entrants came disproportionately from more ideologically extreme states (that is, states that are very liberal or very conservative). Ideally, to control for the unique, invariant, political characteristics of each state, we could include state fixed effects; however, as described earlier, the number of entries and exits per state is small and if we only use the time variation in our data then we cannot make robust inferences. To partially address this concern, we include in some regressions regional fixed effects. By

Table 2
Senate descriptive statistics.

(a) Senator and electoral race data					
	Mean	Standard Deviation	Minimum	Maximum	Observations
Age	56.11	9.061	32	82	1430
Freshman	0.155	0.362	0	1	1430
Number of sessions in Congress	3.83	3.342	0	16	1430
Democrat	0.485	0.5	0	1	1399
Member of majority party	0.541	0.498	0	1	1430
Nominate scores (Democrat)	-0.351	0.154	-0.995	0.174	679
Nominate scores (Republican)	0.338	0.214	-0.2	0.95	720
Entry in presidential election	0.546	0.498	0	1	1430
Exit in presidential election	0.613	0.487	0	1	754
Vote share margin in preceding race ^a	0.064	0.062	0.001	0.349	1414
Open seat in preceding race	0.624	0.484	0	1	1430
(b) State demographic data					
	Mean	Standard Deviation	Minimum	Maximum	Observations
Population (square mile)	155,503	213,786	0.474	1134,416	1334
Urban population (share)	0.598	0.186	0.154	0.922	1334
Per capita income (logged)	10.196	0.207	8.274	10.74	1334
Black population (share)	0.093	0.087	0.002	0.363	1334
Farmers (share)	0.017	0.014	0.001	0.087	1334
Foreign born (share)	0.049	0.044	0.005	0.262	1334
Work in manufacturing (share)	0.077	0.031	0.008	0.15	1334
Work in finance (share)	0.028	0.007	0.004	0.056	1334
Government workers (share)	0.071	0.017	0	0.137	1334
Age 65 or above (share)	0.117	0.022	0.023	0.183	1334

Notes: Data on state demographics and senator characteristics are taken from Aldrich et al. (2008). Senators' Nominate scores are from Poole and Rosenthal's Voteview website. Information on senator entry and exit years come from the Congressional Quarterly Electronic Library and the Almanac of American Politics, with detailed electoral race characteristics provided by the Congressional Biographical Directory. The data include senators who took office between 1968 and 2006. There are 221 entrants of which 137 incumbents exit, resulting in 1430 senator-year observations for entry and 754 senator-year observations for exit.

^a Among contested races.

Table 3
Senator election timing and selection on observables.

	Standard		Standard		<u>t-Statistic</u>	Standard		Standard		<u>t-Statistic</u>
	Mean	Deviation	Mean	Deviation	Mean equality	Mean	Deviation	Mean	Deviation	Mean equality
Panel A	State covariates					State covariates				
	Midterm entry		Presidential entry			Midterm exit		Presidential exit		
State partisanship	0.061	0.007	0.069	0.006	0.843	0.0870	0.011	0.089	0.014	0.116
Age 65 or above	0.126	0.014	0.124	0.021	0.600	0.110	0.023	0.112	0.020	0.520
Black population	0.093	0.087	0.095	0.095	0.130	0.081	0.076	0.086	0.087	0.251
Farmers	0.016	0.014	0.016	0.014	0.104	0.017	0.013	0.018	0.015	0.237
Work in finance	0.028	0.006	0.030	0.007	1.040	0.024	0.005	0.025	0.005	0.467
Foreign born	0.059	0.046	0.067	0.055	0.802	0.042	0.036	0.049	0.040	0.762
Government workers	0.065	0.018	0.068	0.018	0.786	0.076	0.015	0.075	0.009	0.313
Work in manufacturing	0.066	0.025	0.066	0.023	0.023	0.086	0.035	0.087	0.033	0.119
Urban population	0.539	0.202	0.570	0.208	0.731	0.681	0.130	0.675	0.154	0.155
Population (square mile)	164.5	226.3	200.2	276.3	0.682	117.4	161.4	192.9	281.7	1.408
Per capita income (logged)	10.34	0.146	10.37	0.167	0.669	10.11	0.157	10.11	0.151	0.056
Observations	44		51			40		29		
Panel B	Senator and electoral-race covariates					Senator and electoral-race covariates				
	Midterm entry		Presidential entry			Midterm exit		Presidential exit		
Democrat	0.440	0.498	0.491	0.502	0.746	0.393	0.492	0.518	0.504	1.364
Age	49.45	8.254	49.79	7.441	0.316	60.72	8.828	58.65	9.479	1.246
Majority party	0.650	0.479	0.596	0.492	0.802	0.573	0.498	0.500	0.504	0.805
Close senate race	-0.079	0.090	-0.051	0.050	2.914	-0.068	0.069	-0.079	0.108	0.729
Open seat	0.660	0.476	0.570	0.497	1.345	0.588	0.495	0.574	0.499	0.156
Observations	100		114			68		54		

Notes: This table reports means and standard deviations of selected state, senator and electoral-race covariates by senator entry (exit) election. *State partisanship* is measured by the vote share margin of victory in the presidential race and is linearly interpolated for midterm years. State demographics for entry (exit) are computed for the year 2000 (1984), the year with the largest number of senators in our entry (exit) sample—96 (69) in total; statistics on electoral-race and senator covariates are computed using senators' year of entry (exit). For more details on the variables see Table 2 and the Data subsection. Absolute values of *t*-statistics reported from midterm and presidential mean equality tests assuming equal variances.

eliminating regional variation we should get a sense of how our results would change if we removed cross-sectional variation entirely, particularly because the US Census regions correspond quite well with the spatial distribution of ideology in the US.²¹ Finally, given our findings in the preceding subsection on correlates of senator entry and exit, we do not consider the omission of state fixed-effects as a serious threat to our results.

6. Results

We present regression results of estimating Eq. (2) using Poole and Rosenthal's first dimension of DW-Nominate scores to proxy for senator ideology. Overall, the estimates corroborate our findings in Fig. 1. For entry, the coefficient estimates on *Presidential*, the indicator capturing the ideological difference between Republicans elected (ousted) in presidential and midterm elections, are positive, meaning Republicans elected in presidential elections are more conservative than Republicans elected in midterms. Similarly, the sum of coefficient estimates on *Presidential* and the interaction term between *Presidential* and *Democrat*, which measures the ideological difference between Democrats elected in presidential and midterm elections, are negative, meaning Democrats elected in presidential elections are more liberal than Democrats elected in midterms. In general, the estimates are significant at the 5% level; differences in ideology between Democrats elected in midterm and presidential elections are slightly more robust and less variable than the differences among Republicans. Likewise, the analogous coefficients for senator exits are more precisely estimated than the coefficients for senator entries.

For clarity, in each regression table, we present in the top two rows estimates for *Presidential* and the interaction term between *Presidential*

and *Democrat*. Below these, we provide four useful statistical entries. The following are the items with respect to senator entries:

1. the *p*-value from a one-sided statistical test for presidential elections resulting in more moderate (i.e., liberal) Republicans ($\beta_1 < 0$),
2. the point estimate for the difference between Democrats elected in presidential and midterm elections ($\beta_1 + \beta_2$),
3. the *p*-value from a one-sided statistical test for presidential elections resulting in more moderate (i.e., conservative) Democrats ($\beta_1 + \beta_2 > 0$) and
4. the point estimate for the difference between Democrats and Republicans elected in midterm elections (β_3).

The *p*-values associated with these one-sided tests are useful to infer the direction in which outcomes vary across the election cycle. For exit, the one-sided tests have the opposite inequalities: in entries 1 and 3, we report the *p*-values from one-sided tests of whether Republicans and Democrats ousted in presidential elections are more ideologically extreme than senators ousted in midterms ($\beta_1 > 0$ and $\beta_1 + \beta_2 < 0$, respectively).

The results for senator entry are presented in Table 4. In the first specification excluding controls and fixed effects (column (1)), the point estimate for β_1 is 0.043 and for β_2 is -0.103. This implies a point estimate of -0.059 for the ideological difference between Democrats who take office in presidential and midterm elections ($\beta_1 + \beta_2$). In percent terms, inter-party polarization among senators elected in presidential elections is 17% greater than among senators elected in midterms ($= \beta_2/\beta_3$). The inclusion of year dummies (column (2)) does not influence the estimates, leaving them at 0.045 and -0.106 for β_1 and β_2 , respectively. In the remaining specifications (columns (3)–(6)), we gradually include electoral-race, senator and state covariates and regional fixed effects. Among Republicans, the estimated difference between those who enter in presidential and midterm elections increases in magnitude significantly with the inclusion of electoral-race covariates in column (3) and continues to grow with the inclusion

²¹ For example, regional fixed effects absorb 26% of cross-state variation in the party that won the presidential race in 2012.

Table 4
The senate regression results.

(a) Senator ideology and entry election						
Dependent variable: DW-Nominate scores (first dimension)						
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Presidential</i> ^{β_1}	0.0431 (0.0462)	0.0458 (0.0457)	0.0763* (0.0458)	0.0816* (0.0443)	0.0801** (0.0370)	0.0676** (0.0335)
<i>Presidential</i> × <i>Democrat</i> ^{β_2}	−0.103* (0.0570)	−0.106* (0.0572)	−0.130** (0.0564)	−0.136** (0.0552)	−0.135*** (0.0469)	−0.113** (0.0435)
Year dummies		x	x	x	x	x
Electoral-race covariates			x	x	x	x
Senator covariates				x	x	x
State demographics					x	x
Regional dummies						x
R ²	0.742	0.743	0.760	0.764	0.825	0.840
Observations	1329	1329	1329	1329	1329	1329
1. <i>p</i> -Value, test $\beta_1 < 0$	0.176	0.159	0.0487	0.0335	0.0157	0.0225
2. Point estimate $\beta_1 + \beta_2$	−0.0598	−0.0602	−0.0536	−0.0540	−0.0546	−0.0455
3. <i>p</i> -Value, test $\beta_1 + \beta_2 > 0$	0.0376	0.0399	0.0504	0.0513	0.0241	0.0458
4. Point estimate <i>Democrat</i> (β_3)	−0.604	−0.603	−0.591	−0.587	−0.577	−0.585
(b) Senator ideology and exit election						
Dependent variable: DW-Nominate scores (first dimension)						
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Presidential</i> ^{β_1}	−0.188*** (0.0667)	−0.187*** (0.0662)	−0.178*** (0.0640)	−0.174*** (0.0657)	−0.126** (0.0566)	−0.124** (0.0524)
<i>Presidential</i> × <i>Democrat</i> ^{β_2}	0.286*** (0.0570)	0.287*** (0.0572)	0.260*** (0.0748)	0.254*** (0.0552)	0.222*** (0.0469)	0.217*** (0.0435)
Year dummies		x	x	x	x	x
Electoral-race covariates			x	x	x	x
Senator covariates				x	x	x
State demographics					x	x
Regional dummies						x
R ²	0.729	0.734	0.753	0.754	0.823	0.838
Observations	754	754	754	754	754	754
1. <i>p</i> -Value, test $\beta_1 > 0$	0.00275	0.00272	0.00318	0.00459	0.0142	0.00975
2. Point estimate $\beta_1 + \beta_2$	0.0972	0.0992	0.0827	0.0798	0.0963	0.0930
3. <i>p</i> -Value, test $\beta_1 + \beta_2 < 0$	0.00985	0.0102	0.0210	0.0277	0.0117	0.0116
4. Point estimate <i>Democrat</i> (β_3)	−0.793	−0.792	−0.797	−0.794	−0.785	−0.771

Notes: This table presents OLS estimates for β_1 and β_2 from Eq. (1). The unit of observation is senator by congressional session. Dependent variable is first dimension of Nominate scores (DW), where a higher value reflects more conservative voting on roll-calls. *Presidential* is an indicator variable equal to one if senator enters (exits) in presidential elections and to zero if in midterms; *Democrat* is a dummy variable equal to one if senator is a Democrat. Electoral-race covariates are a dummy variable for whether an open seat is contested and a measure of the closeness of a race, defined as the negative vote share margin of victory; senator covariates are age, tenure and dummy variables for whether a senator is a freshman or belongs to the majority party. Demographic covariates are the share of the state's population that is above age 65, that is black, who are farmers, who work in finance, government or manufacturing (each considered separately), and who are foreign born, as well as the state's urban population, per capita income (logged) and population (per square mile). Regional dummies are Midwest, South and West; Northeast is the omitted category. Standard errors are adjusted for clustering at the senator level.

- *** Significant at the 1% level.
- ** Significant at the 5% level.
- * Significant at the 10% level.

of senator covariates in column (4). In contrast, differences among Democrats do not vary much with the inclusion of covariates. Using the estimates from column (6), the most complete specification in which we include regional fixed effects, implies that the ideological gap between Democrats and Republicans elected in presidential elections is about 19% greater than among senators first elected in midterms ($=\beta_2/\beta_3$). Since much of the variation in senator ideology is captured by factors other than the timing of elections, the coefficient estimates are more precisely estimated with the inclusion of controls. In general, β_1 is more precisely estimated than β_2 . In the two specifications without controls (columns (1)–(2)) the estimate for β_1 is insignificant and the one-sided test of $\beta_1 < 0$ cannot be rejected. In the remaining specifications, the estimates are statistically significant at least at the 10 percent level and most at the 5 percent level.

Turning to the analysis of senator exits, we present regression results of estimating Eq. (2) in Table 4. As reflected in Fig. 1, the magnitudes of the coefficient estimates are larger than those for entry and, despite the smaller sample size, more precisely estimated. Specifically, in each of the six specifications, the coefficient estimates are statistically significant at least at the 5 percent level. In column (1), the specification without controls and fixed effects, the estimate for β_1 is −0.188 and for β_2 is 0.286. The difference between Democrats and Republicans ousted in

midterms is 0.793 (β_3). This implies that polarization between Democratic and Republican senators who exit in presidential elections is about 36% narrower than that of senators who exit in midterms ($=\beta_2/\beta_3$). Unlike our results for entry, the inclusion of covariates in the exit regressions absorbs a fraction of the coefficients' magnitudes. For Republicans, the largest change occurs when the set of state covariates are included. The estimate for β_1 shrinks from −0.174 in column (4) to −0.126 in column (5). On the other hand, for Democrats, the estimate for $\beta_1 + \beta_2$ is much less variable. At the same time, for both Democrats and Republicans, the inclusion of regional dummies in column (6) does not affect the magnitudes or statistical significance of the coefficient estimates. Using estimates from this specification implies that inter-party polarization among senators who exit in midterm elections is approximately 39% greater than among senators who exit in presidential elections ($=\beta_3/(\beta_2 + \beta_3)$).

7. Voters in midterm and presidential elections

There are two main assertions we made about how voters in midterm elections are different from those in presidential elections. The first relates to voter information and the other to voter ideology. Both of these are connected to the empirical regularity that turnout consistently varies

Table 5
Knowledge and ideology of 2012 senate race voters.

	Voted in 2010 (‘informed’)	Abstained in 2010 (‘uninformed’)	Test of equality
<i>(A) Voter knowledge (percent)</i>			
Identified party of incumbent candidate	92.85	66.69	6.19
Estimated ideology of incumbent candidate	91.29	71.43	5.05
<i>(B) Voter ideology (percent)</i>			
Reported moderate ideology	34.49	43.87	2.23
Reported strong party identification	43.54	27.32	4.43

Notes: This table summarizes responses from the CCES 2010–2012 panel survey given in the 2012 pre-election interviews held between late September and late October 2012. *Identified party of incumbent candidate*—when asked “Please indicate whether you’ve heard of this person [their incumbent senate candidate] and if so which party he or she is affiliated with” answers correctly (excludes those who report “don’t know”, “unsure” or get the wrong party); *Estimated ideology of incumbent candidate*—when asked “How would you rate your incumbent senator candidate” does not answer “not sure”; *Reported moderate ideology*—reports personal ideology to be moderate on a 5-point scale (v. lib, lib, mod, con, v. con); *Reported strong party identification*—identifies as a strong Democrat or strong Republican on a 7-point scale (st. Dem, not v. st. Dem, lean Dem, Indep, lean Rep, not v. st. Rep, st. Rep). Absolute values of *t*-statistics reported from mean equality tests assuming unequal variances. The data include individuals who (a) reported voting in a senate race in 2012, (b) resided in a state that held a senate race in 2010 and (c) had an incumbent senator running for reelection in 2012. Of the 7056 respondents 427 abstained in the 2010 Senate election in their state. The data are weighted using sampling matching to create a nationally representative sample of US adults. See <http://projects.iq.harvard.edu/cces> for more details.

between midterm elections (low turnout) and presidential elections (high turnout). We discuss the evidence on and test the assertions directly using novel panel survey data.

First, the claim that high turnout is associated with less informed voters is supported in the literature. For example, [Bartels \(1996\)](#) documents heavier turnout and the increased presence of uninformed voters in presidential election years. Likewise, [Gentzkow \(2006\)](#) demonstrates the link between voter information and turnout by looking at the introduction of television as a shock to local information markets. Television caused a decrease in newspaper consumption and voters were less informed and less likely to turn out to vote. In midterms, when the difference in coverage between television and print media was large, turnout fell more than in presidential election-years. The link between turnout and ideology is also well-established in the literature. For example, papers by [Campbell \(1960\)](#), [Palfrey and Poole \(1987\)](#); and [Leighley and Nagler \(2007\)](#) have shown that the likelihood to vote is positively correlated with the degree to which one is ideologically extreme. Two recent papers lend further evidence by highlighting the ideological differences between voters and citizens in general. The works of [Shor \(2011\)](#) and [Bafumi and Herron \(2010\)](#) suggest that the distribution of voter preferences is more bimodal (i.e., more ideologically extreme) than the distribution of citizen preferences.

More specifically, the central assumption that we make in our theory is that the average voter in midterm elections is more informed than the average voter in presidential elections about senatorial candidates. This is because there is a mix of uninformed and informed voters in Senate races held during presidential elections, whereas only informed voters turn out in midterm elections. To directly test this assumption, we use data from the Cooperative Congressional Election Study (CCES) 2010–2012 panel survey that spans a midterm and presidential election.²² We restrict analysis to respondents that lived in states that had contested senatorial races in both 2010 and 2012, so that the only

²² This panel is the first to track respondents across two election years making it uniquely suited for our objective. To our knowledge, the CCES panel survey is the first to track individuals across multiple elections. In addition to the panel structure, these data are superior to the existing National Election Survey (NES) data in several ways, including the pre- and post-election surveys held by the CCES, voting and turnout verification as well as a richer set of policy questions.

difference between the two election years was the presence of the presidential race for office in 2012.²³ [Table 5](#) reports survey responses of individuals from these states that voted in both the 2010 and 2012 senatorial races (‘informed’) and those that only voted in a 2012 senatorial race (‘uninformed’).²⁴ The first row of panel A summarizes the percent of respondents correctly reporting the party of their incumbent senatorial candidate: 92.9% of respondents who reported voting in both election-years correctly identified the party of the candidate, whereas only 66.7% of respondents who reported voting in the presidential election but not in the preceding midterm election answered correctly.²⁵ In a similar vein, the second row reports the percent of individuals who responded when asked to estimate the candidate’s position on a 5-point ideology scale. Among individuals who abstained in the midterm election, 71.4% reported a position, while 91.2% of those who claimed to have also voted in the preceding midterm election responded with an estimate. As we assumed, those who are more habitual voters are more likely to be informed about the candidates running for office.

Turning to voter ideology, panel B of [Table 5](#) summarizes self-reported ideology and partisanship of voters in 2012. The top row compares the fraction of respondents reporting a moderate ideology when asked to describe their political viewpoint on a 5-point scale. Of those that abstained in the midterm election, 43.9% reported a moderate position, while only 34.5% did the same among those who voted both election years. Similarly, the second row reports how likely voters are to identify themselves as strong Democrats or strong Republicans, with midterm voters being more likely to report strong partisan leanings (43.5%) than non-midterm voters (27.3%).²⁶

8. Robustness and extensions

We proceed by examining the robustness of our results presented in [Table 4](#), using alternative measures of ideology and explore whether our findings hold in subsamples of the data.

In [Table 6](#), we report for both entry and exit regression results of four additional specifications. In the first (columns (1) and (5)), the unit of observation is the median congressional session a senator served in office. Thus, each senator appears only once in these specifications. The dependent variable is the average DW-Nominate score for each senator over her tenure in office. These specifications address the multiplicity of observations for each senator employed in our baseline regressions by removing within-senator variation. This specification also addresses uneven contributions of senators to the analysis as well as serial correlation in senator observations across time.²⁷ Despite the

²³ The results that follow are robust to the inclusion of all 33 states holding Senate races in 2012. Of these states, 22 had incumbents running, 19 held a Senate race in 2010 and 13 both had an incumbent running in 2012 and held a Senate race in 2010.

²⁴ Because the preferences of voters is of particular interest to researchers, the CCES survey over-samples registered voters. As a result, of the 7,056 respondents that meet the data selection criteria above, only 427 abstained in the 2010 Senate race in their state. The results we show are weighted using matching to reflect the true distribution of voters in the population, and are robust to not weighting. See <http://projects.iq.harvard.edu/cces> for more information.

²⁵ One limitation of the survey is that it seeks to gauge respondents’ knowledge about current office holders rather than running candidates. Thus, we further limit the data to states that had an incumbent senator running for reelection in 2012, where voters are effectively revealing their knowledge about candidates running for the Senate.

²⁶ We obtain similar results using responses to these questions before the 2010 election, suggesting that voter preferences are time-invariant across these two elections. We also find that those who voted in the 2010 elections participated in the 2012 primaries at a significantly higher rate than those that abstained in 2010. Further, consistent with [Jessee \(2009\)](#) and [Jessee \(2010\)](#), we also find that respondents who report to be moderate tend to be less informed about candidates than respondents who identify as ideologically conservative or liberal: partisan voters correctly identify candidates’ parties more than non-partisan voters (versus 87.7%) and report estimates of candidate positions at a higher rate (91.2% versus 86.7%).

²⁷ This specification also addresses a possible mechanical correlation, whereby senators moderate their position in anticipation of upcoming elections as established in [Albouy \(2011\)](#).

Table 6
Measure robustness and sample selection.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Entry				Exit			
<i>Presidential</i> ^[β_1]	0.0567 (0.0346)	0.111** (0.0531)	0.0359 (0.0315)	0.106** (0.0424)	−0.143** (0.0557)	−0.164** (0.0806)	−0.0935* (0.0500)	−0.165** (0.0631)
<i>Presidential</i> × <i>Democrat</i> ^[β_2]	−0.105** (0.0493)	−0.178** (0.0693)	−0.0874** (0.0438)	−0.139*** (0.0528)	0.243*** (0.0853)	0.260** (0.108)	0.194*** (0.0670)	0.251*** (0.0865)
Dependent variable	Mean DW	W-Nom.	DW-Nom.	DW-Nom.	Mean DW	W-Nom.	DW-Nom.	DW-Nom.
Time period	Median session	All terms	First term	All but first term	Median session	All terms	Last term	All but last term
R ²	0.857	0.633	0.844	0.849	0.878	0.652	0.849	0.848
Observations	216	1329	605	724	120	754	359	395
1. <i>p</i> -Value, test $\beta_1 < 0$ (" > " for exit)	0.0516	0.0188	0.128	0.00660	0.00609	0.0220	0.0320	0.00535
2. Point estimate $\beta_1 + \beta_2$	−0.0483	−0.0672	−0.0515	−0.0324	0.0998	0.0964	0.101	0.0862
3. <i>p</i> -Value, test $\beta_1 + \beta_2 > 0$ (" < " for exit)	0.0870	0.0553	0.0413	0.145	0.0782	0.0795	0.0115	0.0556
4. Point estimate <i>Democrat</i> (β_3)	−0.600	−0.604	−0.603	−0.591	−0.804	−0.587	−0.577	−0.585

Notes: This table presents OLS estimates for β_1 and β_2 from Eq. (1). The unit of observation is senator by congressional session. Dependent variable is indicated under estimates in each specification. *Presidential* is an indicator variable equal to one if senator enters (exits) in presidential elections and to zero if in midterms; *Democrat* is a dummy variable equal to one if senator is a Democrat. In columns (1) and (5), the unit of observation is senator in median congressional session (rounded upward) served in office, and the dependent variable is senator's mean DW Nominate (first dimension) score over her tenure. "Time period" refers to observations included in the regression. A senatorial term consists of three congressional sessions; "First" ("Last") refers to the first (last) term senator served in office. All specifications include year and regional fixed-effects as well as the full set of covariates; see notes in Table 1 for details. Standard errors are adjusted for clustering at the senator level (heteroscedasticity consistent standard errors reported in columns (1) and (5)).

*** Significant at the 1% level.

** Significant at the 5% level.

* Significant at the 10% level.

small sample size (216 observations for entry and 120 observations for exit) and the inclusion of the full set of covariates and fixed effects, the coefficient estimates are broadly consistent with our findings in the baseline regressions, and are more precisely estimated for exit than for entry. The obtained estimates imply that inter-party polarization among presidential entrants is 17.5% greater than among midterm entrants (compared to 19% in the baseline regressions). Likewise, the gap between Democrats and Republicans is 43% greater for midterm exits than for presidential exits (compared to 39% in the baseline regressions).

We further address serial correlation by examining whether our results are driven by time-dependence in our measure of ideology. In columns (2) and (6) we use the first dimension of W-Nominate scores, the static version of Poole and Rosenthal's Nominate scores. This score is computed in each congressional session independently and allows a more flexible response to voting behavior across the election cycle. Using this measure, we find that the coefficient estimates and significance level are comparable with those we found earlier. Next, we look at the effect of election timing on voting behavior in the first (last) term in office. The results are in columns (3) and (7) for entry and exit, respectively. Similarly, in columns (4) and (8), we look at the effects of election timing on all but the first (last) term in office. Whereas the point estimates are not identical across these subsamples of the data, suggesting non-uniform effects on voting behavior with respect to time from entry or exit elections, the results are consistent with our main findings, with more ideologically extreme senators elected in presidential elections and more moderate ones ousted.²⁸ In sum, our findings on ideological differences across the election cycle in winning (and losing) candidates cannot easily be explained by a rich set of controls, and are not an artifact of differences in the political climate across regions or over time.

Next, we tested whether our results can be replicated in the House; however, with the data available we find neither support nor a rejection of our theory.²⁹ There are reasons to believe that our mechanism may be harder to detect in the House races than in the Senate races. Using the CCES survey data on voters in 2012, we present two statistics that

suggest that spillover effects in the House are weaker than in the Senate. In Table 7, panel A, we show that voters believe that (a) senators reflect party policy more than representatives and (b) the presidents are more similar to senators than to representatives. Specifically, we use voters' beliefs to calculate the median ideology represented by the Democratic and Republican parties and presidential candidates, separately. We find that both midpoints are significantly more correlated with voters' beliefs about the median ideology of senatorial candidates than of candidates for the House, suggesting a stronger link between senator and party policy in general, and presidents in particular. Taking a spatial approach to voting decisions, we corroborate these beliefs about ideological midpoints with actions. In panel B, we show that party-line voting for the Presidency and Congress is more prevalent in the Senate than in the House, consistent with the theory. Another challenge in detecting spillover effects in the House is roll-off: roll-off (or 'strategic abstention') is more prevalent in a House race than in a Senate race and is a behavior associated with uninformed voters.³⁰ Because a smaller proportion of uninformed voters cast their ballots in the House than in the Senate race, the extent of spillovers in the House may be further limited.

Turning to the literature, Ashworth and Bueno de Mesquita (2006) suggest that since representatives typically have smaller constituencies than senators, voters are able to discern additional metrics of performance, such as service provision and redistribution. In a similar vein, House members have more successfully than their Senate counterparts isolated themselves from citizen reaction to in-party economic performance, principally by establishing their roles as ombudsmen and providers of individualized services (Kuklinski and West, 1981). As such, ideological voting is more prevalent in the Senate elections than in the House elections. (Abramowitz, 1980). In sum, we believe that the data and literature suggest that our mechanism of spillovers may be less applicable to explain the outcome in the House than in the Senate.

Finally, our formal theory of voter learning suggests that unexpected support for a party's presidential candidate is positively correlated with the ideological extremism of newly-elected (or ousted) senators. To shed light on this prediction, we use state-level performance of a presidential candidate relative to past performance of his party as a measure of unexpected support ('presidential coattails'). We combine this measure with data on the voting behavior of senators newly-elected in

²⁸ For further robustness, we ran regressions using subsamples of the data with respect to senators' tenure in Congress. Likewise, we ran regressions adjusting for clustering at the state-level to address the correlation among within-state senator observations. Significance levels and coefficient estimates are comparable to those in our baseline results.

²⁹ We provide descriptive statistics and regression results in the Online Appendix.

³⁰ In the 2012 CCES survey, 1.1% of voters reported rolling off in Senate races, whereas 2.6% reported rolling off in House races.

Table 7
Voter beliefs and party-line voting in 2012.

	Candidates for the Senate	Candidates for the House	Test of equality
<i>(A) Beliefs about median ideology (correlation)</i>			
Political parties	0.601	0.455	13.03
Presidential candidates	0.566	0.439	10.78
<i>(B) Party-line voting (percent)</i>			
Voted Democrat in presidential and congressional race	86.3	79.2	19.86
Voted Republican in presidential and congressional races	87.6	82.1	17.15

Notes: This table summarizes responses from the CCES 2010–2012 panel survey given in the 2012 pre-election interviews (panel (A)) and post-election interviews (panel (B)). The data include individuals from states that held a senate race in 2012. Beliefs about ideological midpoints are computed by taking the midpoint between the average response for Democrats and Republicans to the question “How would you rate each of the following individuals and groups on a 7-point scale (1=very liberal to 7=very conservative)?”. See <http://projects.iq.harvard.edu/cces> for more details. Absolute values of z-statistics reported from tests of equality of two correlation coefficients drawn from two different samples.

presidential elections and find that as spillovers from the presidential race increase senators take more ideologically extreme positions during their first term in office. Likewise, incumbent senators ousted from office despite the popularity of their party's presidential candidate tend to take more ideologically extreme positions in their last term in office. We provide the details of this analysis in the Online Appendix (Appendices C and D).

9. Conclusion

This paper is motivated by a new finding that senators first elected during presidential-election years are more ideologically extreme than senators first elected during midterm election-years. Conversely, senators who exit in presidential elections tend to be more moderate than senators who exit in midterm elections. These findings are puzzling, given the literature suggesting that the electorate in presidential elections prefers more ideologically moderate policies than the electorate in midterm elections.

The model we presented in this paper provides a plausible explanation for our findings and is consistent with a broad set of facts from the literature. We suggest that party labels supply valuable information to voters, but also introduce a channel of contagion among simultaneous races. This contagion links observable candidate positions in one race to beliefs and outcomes in other races, thereby generating spillover effects. Our interpretation is supported by both intuition and previous research on the informational role of party labels and voter behavior under incomplete information. We hope that more direct testing of the mechanisms of our model will be an avenue for future research.

When studying electoral institutions, the temptation is to look at elections in isolation. Our results caution against that approach. Our theory suggests that when information asymmetries arise, the presence of unbiased public signals, such as party labels, facilitates information contagion. In the context of contemporaneous races for office, we suggest that information contagion may result in distortions to representation and policy outcomes.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <http://dx.doi.org/10.1016/j.jpubeco.2014.10.002>.

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