A Theory of Coattails with Voter Learning

Our theory focuses entirely on selection effects that stem from voter behavior, taking exogenously parties and their candidates.[31] The most basic insight of our theory is 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.

We begin by noting that less informed citizens are more likely to abstain, and because a substantial number of citizens vote in presidential elections but abstain in midterm elections, the typical voter in presidential elections is likely to be less informed about senatorial candidates (the 'down-ticket' race). Party labels in presidential elections enable these voters to form informational linkages across the presidential and senatorial contemporaneous races, introducing bias to their voting behavior and the resulting electoral outcomes. A mainstream candidate in the up-ticket race can support a marginal candidate from the same party in a down-ticket race.

A.1 Parties and Candidates

Suppose there are only two races for office, presidential (p) and senatorial (s), and that each office is contested by two parties, Democratic (D) and Republican (R). There are two election cycles: midterm and presidential. In presidential elections, both offices are contested, while in midterm elections only the senatorial office is contested.[32]

[31] Given our empirical objectives, we present a simple version of our theory here. A more elaborate and robust framework that includes voter microfoundations, formal proofs and a discussion of our modeling assumptions and related theoretical literature is available upon request.

[32] 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 of one another. We let candidate positions in each race be given by two independent draws from a normal distribution. We label the draws of both candidates y_D^r and y_R^r (where $r \in \{p,s\}$), such that the more liberal draw in each race is the Democrat (i.e., $y_D^r < y_R^r$). To allow for commonality across races, we propose the following additive model of candidate midpoints:[33]

$$\underbrace{M^p}_{\substack{\text{presidential race}\\ \text{midpoint}}} = \underbrace{\Omega}_{\substack{\text{party}\\ \text{midpoint}}} + \underbrace{\varepsilon^p}_{\substack{\text{presidential race}\\ \text{idiosyncratic effect}}} \tag{3}$$

and

$$\underbrace{M^s}_{\substack{\text{senatorial race}\\ \text{midpoint}}} = \underbrace{\Omega}_{\substack{\text{party}\\ \text{midpoint}}} + \underbrace{\Theta^s}_{\substack{\text{state}\\ \text{fixed effect}}} + \underbrace{\varepsilon^s}_{\substack{\text{senatorial race}\\ \text{idiosyncratic effect}}}, \tag{4}$$

where $M^r \equiv \frac{y_D^r + y_R^r}{2}$, Ω is fixed but unknown, Θ^s is some constant allowing for variation in candidate selection at the local level (e.g., $\Theta^s > 0$ denotes a relatively conservative state), and ε^p and ε^s are independent draws from a normal distribution with mean zero and variance σ_ε^2. We denote the expected midpoints of candidates by μ_p in the presidential race and by μ_s in the senatorial race. Note that the ideological midpoints of candidates in both races are independent of one another even though they share the same party midpoint (Ω). This factor plays an important role in how voting decisions by the uninformed are independent of the realized positions of senatorial candidates.

A.2 Voters

We allow voters to have heterogenous preferences over policy. Specifically, we assume that ideal positions of voters in state s are distributed symmetrically and unimodally with full support around the median preference, μ_s. Conditional on voting, each person votes for the candidate whose position is closest (in expectation)

[33] We do not model parties or their candidate selection process directly. For examples of such models, see Snyder and Ting (2002) and Caillaud and Tirole (2002).

to her own preferred position. In particular, if a voter's preferred position is to the left of M^r, she votes for the Democratic candidate; otherwise, she votes for the Republican candidate in race r.

To incorporate variation in voter information, we assume that there are two types of voters: those who observe the positions of presidential and senatorial candidates ('informed') and those who observe only the positions of presidential candidates ('uninformed'). We let the uninformed voters constitute a proportion $\delta > 0$ of the population. Informed voters always turn out and vote; uninformed voters turn out in presidential elections but abstain in midterm elections.[34] In presidential elections, the uninformed vote for their preferred presidential candidate, and use their updated beliefs to vote in the senatorial race. To keep things simple, we represent voters' beliefs about the unknown party midpoint (Ω) by a normal distribution with mean Ω and variance σ^2_ω.[35]

A.3 Results

In midterm elections, a Democrat wins the senatorial race if and only if[36]

$$M^s > \mu_s.$$

That is, if the midpoint of candidate positions is to the right of the median voter's preferred position, then the Democrat obtains more than half the votes and wins

[34] We assume heavier turnout and a less informed electorate in presidential elections, both of which are consistent with the data. In the next section, we provide citizen microfoundations that endogenously generate these and additional phenomena, such as the relative moderation of the electorate in presidential elections as well as roll-off.

[35] We considered the case that there is no interaction among contemporaneous races in presidential elections. Our model predicts that in such a case uninformed voters would roll-off, resulting in the same outcomes as in midterm elections, which does not reconcile with our finding. It is possible that once participation costs are incurred in presidential elections, uninformed voters follow their voting rule (which is separable from their turnout rule) in a race on which they know little about rather than abstain. Indeed, abstention rates in senatorial races in presidential elections are far lower than in midterms. Since information about senatorial candidates is not as widespread in presidential elections relative to midterms, uninformed voters are unlikely to have more knowledge about senatorial candidates in presidential elections than in midterm elections. In this case, more noise is introduced to the Senate race producing more extreme outcomes.

[36] We break ties in favor of Republicans.

office.

In presidential election years, the winner in the senatorial race depends on conditions in the presidential race. For uninformed voters, the observed positions in the presidential race are used as signals to update beliefs about the party midpoint, and, consequently, the senatorial race midpoint. Suppose the draw of candidates in the presidential race is observed to be m^p. Then, the expected midpoint in the senatorial race may no longer be the median (μ_s). Rather,

$$E\left(M^s | M^p = m^p\right) = \mu_s + \Delta\eta, \tag{5}$$

where $\Delta \equiv m^p - \mu_p$ corresponds to so-called presidential coattails–the difference between the realized and expected draw of presidential candidates–and $\eta \equiv \frac{\sigma_\omega}{\sigma_\varepsilon}\rho_{\omega,\varepsilon}$ is a voter's updating coefficient, which is increasing in the correlation between the signal (m_p) and unknown party midpoint (Ω), but decreasing in the relative noise of the signal (σ_ε) to initial uncertainty (σ_ω).[37] Thus, a Democrat wins the senatorial race in presidential elections if and only if

$$\underbrace{(1-\delta)\underbrace{F_s\left(M^s\right)}}_{\substack{\text{share of informed voters}\\ \text{who vote Democrat}}} + \underbrace{\delta\underbrace{F_s\left(\mu_s+\Delta\eta\right)}}_{\substack{\text{share of uninformed voters}\\ \text{who vote Democrat}}} > \frac{1}{2}, \tag{6}$$

where F_s is the cumulative distribution function of preferences in state s. Since $F_s\left(\mu_s+\Delta\eta\right)$ is strictly increasing in Δ, the likelihood that Democrats win office rises in coattails. Intuitively, unexpected support for the Democratic presidential candidate results in better prospects for Democrats in the down-ticket race. When positions of presidential candidates meet expectations ($\Delta = 0$) the condition above becomes $M^s > \mu_s$, the same as in midterm elections.

We next derive the key prediction regarding senator ideology: expected electoral outcomes in presidential elections are more ideologically extreme than in midterms. We begin by noting that Democrats and Republicans are equally likely to win the senatorial office, both in midterms and in presidential elections. In midterms, a Democrat may only win when the senatorial midpoint is to the right of the median

[37] Notice that $\eta > 0$ is implied since $\rho_{\omega,\varepsilon} = \frac{\sigma_\omega}{\sqrt{\sigma_\omega^2+\sigma_\varepsilon^2}}$.

voter. Thus, we can express the expected position of a Democrat who wins in midterms as

$$E_m\left[y_D^s|win\right] = E_m\left[y_D^s|win, M^s > \mu_s\right], \tag{7}$$

where *win* indicates a win in the senatorial race. In presidential elections, by contrast, if a Democrat wins the senatorial race, the ideological midpoint of candidates may lie leftward of the median's preference ($m^s < \mu_s$) when coattails are positive ($\Delta > 0$), an event that occurs with probability one half. In other words, Democrats can prevail with more liberal positions unattainable in midterms at the cost of failing to win office with certainty when $M^s > \mu_s$. As a result, $E_p\left[y_D^s|win\right]$ is a weighted average of $E_p\left[y_D^s|win, M^s > \mu_s\right]$ and $E_p\left[y_D^s|win, M^s < \mu_s\right]$. Because positions in the presidential race are independent of those in the senatorial race, we conclude:[38]

$$E_p\left[y_D^s|win, M^s < \mu_s\right] < E_p\left[y_D^s|win, M^s > \mu_s\right]. \tag{8}$$

That is, if the Senate race winner is a Democrat, then she is likely to be more liberal as the midpoint between the Democrat and Republican is more liberal. In particular, the Democrat is more liberal when the midpoint is to the left of the median voter ($M^s < \mu_s$) relative to when the midpoint is to the right of the median voter ($M^s > \mu_s$). And, since the distribution of senatorial candidates in midterm and presidential elections are identical, equations (7) and (8) deliver the key prediction of our model.

PROPOSITION 1: *Candidates elected to the Senate in presidential elections are more ideologically extreme than candidates elected to the Senate in 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,*

$$E_p\left[y_D^s|win\right] < E_m\left[y_D^s|win\right] \text{ and } E_p\left[y_R^s|win\right] > E_m\left[y_R^s|win\right],$$

[38] Moreover, since coattails (Δ) are distributed symmetrically with mean zero, the reduction in the probability that a Democrat wins when an arbitrary midpoint, m^s, exceeds the median is recovered by a symmetric gain in the probability of winning a more liberal position equidistant from the median ($2\mu_s - m^s$).

and for losers,

$$E_p\left[y_D^s|lose\right] > E_m\left[y_D^s|lose\right] \text{ and } E_p\left[y_R^s|lose\right] < E_m\left[y_R^s|lose\right].$$

One way to understand this result is to realize that, without information contagion, expected outcomes in midterms and presidential elections would be identical. However, this is not the case in our model, as information in the presidential race is valuable for decision-making in the senatorial race. Instead, positive coattails ($\Delta > 0$) enable relatively more liberal Democrats to win office, and because it is more likely than not that positive coattails carry Democrats (as opposed to 'negative coattails'), a Democrat who wins office in a presidential election is likely to be more liberal than one who wins in midterms.

We leave unmodeled extensions addressing the possibility of heterogenous uncertainty about the state fixed effect, Θ_s, or dynamic learning about the party position, Ω. To the extent that the signal value of party labels decreases, our model predicts that contagion across races will be limited. Second, we characterize candidates in a unidimensional ideological space with symmetric uncertainty; however, voter uncertainty is likely uneven and selection occurs on other dimensions as well, such as political experience and education.

B Endogenous Turnout

In this section, we imbed our model within a utility framework that gives rise to endogenous turnout decisions. The purpose of this exercise is to propose an explanation for three stylized facts related to midterm and presidential elections: (a) that uninformed citizens are less likely to vote in midterm elections than in presidential elections, (b) that these moderate citizens are less likely to vote in midterm elections than in presidential elections and (c) that citizens who abstain in midterm elections but not in presidential elections, are likely to be more moderate and less informed than the typical voter in presidential elections.

To illustrate how voter preferences and information interact with turnout decisions, we develop a simple utility framework inspired by Degan and Merlo (2011).

In particular, a citizen benefits from voting in a given race; however, when uncertain about which candidate best represents his preferences he may choose to abstain to avoid regret.

In the presidential race, there is no risk of making an erroneous voting decision since all citizens are fully informed about the candidates. For simplicity, we focus on the Senate race only. Suppose each citizen that votes in the Senate race receives a benefit $b \in \left(0, \frac{1}{2}\right)$ for voting and incurs a cost associated with the probability of making a mistake. Specifically, let citizen i's ideal position be y^i, then the cost of voting for the Democratic candidate is $Prob\left(M^s < y^i\right)$, which occurs when the Republican candidate takes a closer position to citizen i than the Democratic candidate. Given this, citizen i casts a ballot in the Senate race if and only if the benefit from voting exceeds the cost:

$$\left\{Prob\left(M^s < y^i\right), Prob\left(M^s > y^i\right)\right\} < b.$$

And, in particular, the Democrat is citizen i's preferred candidate whenever:

$$Prob\left(M^s < y^i\right) \leq \frac{1}{2}.$$

Implicitly, informed citizens cast a vote in every race, collect a benefit b and never make mistakes. On the other hand, uninformed citizens choose to abstain when uncertainty about the positions candidates take in a given race makes voting too costly. Importantly, the cost of voting is highest for citizens whose ideal point is closest to the expected midpoint of candidate positions (μ_s). By construction, these are assumed to be moderates. The cost is declining symmetrically away from the expected midpoint, with ideologically extreme citizens facing the lowest costs. Intuitively, the Democrat is always the right choice for extreme liberals; likewise, extreme conservatives always prefer the Republican over the Democrat, irrespective of the precise positions the candidates take.

Finally, consider the range of ideologies associated with citizens who choose to abstain in midterm elections because of exceedingly high costs of voting. These are ideal points that fall in the range $[\mu_s - \nu_m, \mu_s + \nu_m]$, where $\nu_m \equiv -\Phi^{-1}(b)\sqrt{\sigma_\varepsilon^2 + \sigma_\omega^2}$.

The effect of observing the positions that presidential candidates take in the

subsequent election is two-fold: (a) the range of abstainers is reduced from $2v_m$ to $2v_p$, where $v_p \equiv -\Phi^{-1}(b)\sqrt{\sigma_\varepsilon^2 + \sigma_\omega^2\left(1-\rho_{\omega,\varepsilon}^2\right)}$, and (b), depending on the specific draw of presidential candidates, shifts by $\Delta\eta$. The overall effect, however, is that turnout increases in the Senate race as a result of obtaining information in the presidential race.

C Presidential Coattails versus Divided Government

We saw that the Democratic threshold for winning the Senate race decreases with Democratic coattails. Specifically, Democratic coattails enable Democrats to win with more liberal positions. Thus, we obtain a second key prediction of our model.

PROPOSITION 2: *In presidential elections, ideological extremism of winning and losing senatorial candidates increases in presidential coattails. Specifically, if* $\Delta^1 > \Delta^0$, *then for Democrats*

$$E_p\left[y_D^s|win,\Delta^1\right] < E_p\left[y_D^s|win,\Delta^0\right] \text{ and } E_p\left[y_D^s|lose,\Delta^1\right] < E_p\left[y_D^s|lose,\Delta^0\right];$$

likewise, for Republicans,

$$E_p\left[y_R^s|win,\Delta^1\right] < E_p\left[y_R^s|win,\Delta^0\right] \text{ and } E_p\left[y_D^s|lose,\Delta^1\right] < E_p\left[y_D^s|lose,\Delta^0\right].$$

Intuitively, as a party's coattails increase, uninformed voters provide a greater built-in advantage for their candidates (independent of their realized positions) in down-ticket races. As a result, relatively marginal (and more ideologically extreme) candidates can win. Moreover, if a candidate loses despite her riding on relatively positive presidential coattails, then she must be too ideologically extreme to carry. This prediction is in contrast to what a theory of divided government would suggest. In particular, unexpected support for one presidential candidate should be countered by increasing support for candidates (and, thus, enabling more ideologically extreme candidates to win) from the opposing party.

To shed light on these conflicting predictions we gather data on state-level re-

turns in the presidential race to construct a measure for presidential coattails and merge this measure to senators by their entry (exit) election year. Specifically, in the regressions that follow we use, for each party, the difference between its voteshare in a presidential race and unweighted average voteshare in four preceding presidential races to proxy for unexpected support. We provide more details on the construction of this measure in the following appendix. The standard deviation of the measure of coattails we use is approximately 0.1 (with mean zero). We then merge this measure to each senator who entered (exited) in a presidential election by party and election year. For example, Barack Obama was elected to the Senate in Illinois in the 2004 presidential election on the coattails of Democratic presidential candidate John Kerry. A measure of coattails for Obama is Kerry's voteshare in Illinois net of the average Illinois voteshares of the four preceding Democratic presidential candidates: Al Gore, Bill Clinton (two elections) and Michael Dukakis.

Having constructed a measure of presidential coattails, we next estimate regressions of the form:

$$y_{it} = \beta_1 Coattails_i + \beta_2 Coattails_i \times Democrat_i + \beta_3 Democrat_i + \mathbf{x}'_{it}\gamma + \varepsilon_{it}, \quad (9)$$

where $Coattails_i$ is a measure of senator *i's* presidential coattails described above and the remaining notation follows from equation (2). The estimation equation applies symmetrically to entry and exit, where $Coattails_i$ is the time invariant measure of a party's state-level unexpected presidential support at the time of senator i's entry (exit). Our theory of coattails indicates that ideological extremism of senators increases with coattails, both for entry and for exit. Thus, Republicans are more conservative ($\beta_1 > 0$) and Democrats are more liberal ($\beta_1 + \beta_2 < 0$).

We present regression results in Table A4. The relationship is statistically significant in the regressions for entry, but not in those for exit. Specifically, ideological extremism is positively correlated with the coattails senators experience upon entry to the Senate; however, we do not find similar support for the relationship between ideological extremism and exit coattails. Overall, the effect of coattails on senator voting in Congress appears to fade off over time. In column (1) we present

results for entry using only senators' first term in office. The coefficient estimates for β_1 and β_2 are statistically significant. To get a sense of the magnitudes, a one standard deviation increase in Republican presidential coattails is associated with more liberal voting behavior of Republican entrants in the range of 10 percent of the ideological distance between Democrats and Republicans (approximately 0.6 as measured by DW-Nominate); likewise, more liberal positions are taken by Democratic entrants as a result of Democratic presidential coattails; the magnitude is slightly greater than 10 percent for a 0.1 unit change in coattails. We present in column (2) similar results using the first dimension of W-Nominate scores. Significance levels remain at the 1 percent level. In columns (3) and (4), we run the same specifications for the full sample (i.e., all terms in office). Significance levels drop using both types of ideology scores. This may suggest that coattails have a diminishing effect over time as more current events shape senator behavior. The one-sided test for Republicans ($\beta_1 < 0$) is rejected at the 5 percent level, whereas a similar test for Democrats ($\beta_1 + \beta_2 > 0$) is not rejected.

Turning to exit, in columns (5) and (6), we use only data on a senator's last term in office (which leaves us with 167 senator-year observations). With the exception of the one-sided test for Democrats, the results are statistically insignificant and remain so in columns (7) and (8), where we include the full sample. Overall, we take these results to suggest that unexpected presidential support is more likely to enable the selection of ideologically extreme senators from the same party (as predicted by our model) rather than from the opposing party, as implied by the theory of divided government.

D Coattails Measurement

To derive the observable analog for presidential coattails, we denote the expected Democratic presidential voteshare in state s by $\bar{\pi} \equiv F_s(\mu_p)$, and the realized one, $F_s(m^p)$, by π. Democratic coattails can then be rewritten as

$$\Delta = F_s^{-1}(\pi) - F_s^{-1}(\bar{\pi}). \tag{10}$$

Equation (10) establishes a mapping between candidate positions in the presidential race and the corresponding observable voteshares in state s. Thus, our empirical analogue for presidential coattails is:

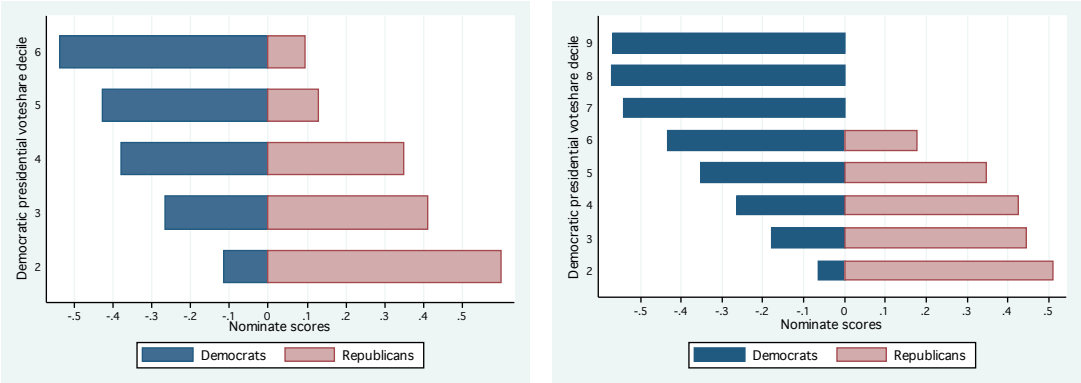
$$Coattails_{s\tau} = \begin{cases} \frac{1}{4}\sum_{j=1}^{4}\left(\pi_{s\tau} - \pi_{s\tau-j}\right) & \text{if Democrat} \\ \frac{1}{4}\sum_{j=1}^{4}\left(\pi_{s\tau-j} - \pi_{s\tau}\right) & \text{if Republican} \end{cases}, \tag{11}$$

where $\pi_{s\tau}$ is the Democratic presidential voteshare in presidential election τ in state s. By construction, *Coattails* can take values between -1 and 1. For example, voters facing the presidential election in 2012 use information from previous presidential elections dating back to Clinton versus Dole in 1996 to form expectations about party positions (Ω).

To emphasize the novelty of employing our measure of coattails, we make the following point: our model indicates that support in the presidential race affects selection in contemporaneous senatorial races. In Figure A1, we restrict our attention to legislators who enter during a presidential-election cycle, and plot the average Nominate scores of legislators in both chambers of Congress by the Democratic presidential vote-decile in their constituency at the time of entry. In both the Senate and the House, support for a party's presidential candidate is associated with more extreme voting behavior by its legislators. Although this is evidence in support of our model's prediction, the ideological preferences of voters in a given locality may account for much of this phenomenon. For example, a Democratic presidential candidate is likely to generate more support in a liberal-leaning state, which in turn is likely to elect more liberal legislators. Our measure of coattails partially addresses this concern and is a more accurate representation of its theoretical counterpart–an increasing function of the difference between $\bar{\pi}$ and π.

To contrast our measure of coattails with voteshares, in Figure A2, we map presidential wins and coattails in the 1992 and 2000 presidential elections to states. In 1992, when George H.W. Bush ran against Bill Clinton, Bush obtained a plurality in 19 states. However, this statistic underrepresents the overwhelming victory by Clinton: in all but two states, Clinton's coattails were realized. On the other hand, in the 2000 election, the presidential candidates were more evenly matched. George

W. Bush won 29 states, but his coattails reached only 26 states.

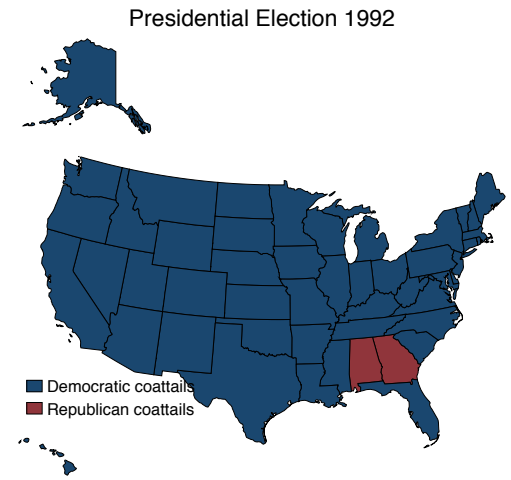


(a) The Senate

(b) The House

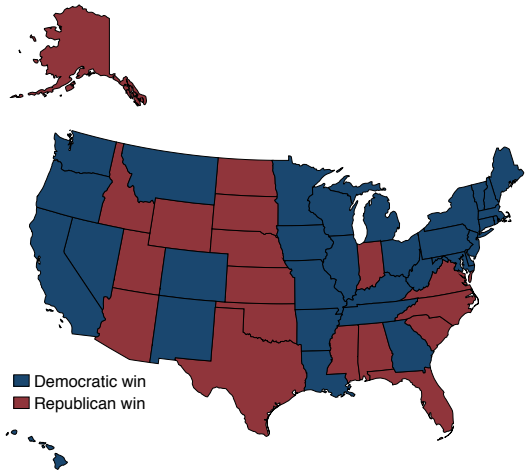
Figure A1: Roll Call Voting and Presidential Voteshares

Notes: The left (right) bound of horizontal bar representes average Nominate scores for Democrats (Republicans) in a given Democratic presidential vote decile at the time of entry. Data on the Senate is for entrants from 1968 to 2006. Data on the House is for representatives who served between 1982 to 2004.

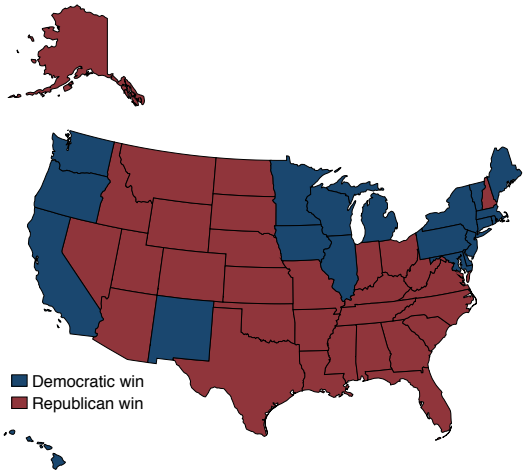


(a) Bush versus Clinton Coattails

(b) Bush versus Gore Coattails



(c) Bush versus Clinton Wins



(d) Bush versus Gore Wins

Figure A2: Presidential Coattails versus Wins 1992 and 2000

Notes: Democratic win denotes plurality vote for party's presidential candidate in given state; Democratic coattails denotes positive difference of party's presidential voteshare from unweighted average of four preceding presidential voteshares in given state.

Table A1: Senator Entries and Exits per State

	Presidential Entrants		Midterm Entrants		Presidential Exits		Midterm Exits	
	Democrats	Republicans	Democrats	Republicans	Democrats	Republicans	Democrats	Republicans
Alabama	1	2	4	0	2	0	1	2
Alaska	1	2	0	0	1	0	0	1
Arizona	1	1	0	2	0	0	1	1
Arkansas	0	1	4	0	1	0	1	1
California	3	1	1	1	2	0	0	2
Colorado	3	1	3	2	1	1	2	1
Connecticut	2	0	0	1	0	1	0	0
Delaware	2	0	0	1	0	1	0	0
Florida	1	4	3	0	2	1	0	2
Georgia	3	3	1	1	2	0	1	2
Hawaii	1	0	1	0	0	0	1	0
Idaho	0	3	0	2	0	1	0	2
Illinois	5	0	1	1	3	0	1	0
Indiana	0	3	1	0	0	0	0	2
Iowa	3	1	1	1	1	1	2	0
Kansas	0	3	0	1	0	1	0	1
Kentucky	1	1	1	1	1	0	1	0
Louisiana	2	1	1	0	1	0	0	0
Maine	1	1	1	2	0	1	2	0
Maryland	1	1	1	1	0	1	0	1
Massachusetts	1	0	1	0	1	0	0	0
Michigan	2	0	1	1	0	1	1	0
Minnesota	1	0	1	4	0	1	1	2
Mississippi	0	1	0	1	0	0	0	0
Missouri	1	1	0	3	0	1	1	1
Montana	1	1	1	0	1	0	0	0
Nebraska	3	1	1	0	2	0	1	0
Nevada	1	1	1	2	1	1	0	1
New Hampshire	0	2	0	3	0	1	0	2
New Jersey	2	0	2	0	2	0	1	0
New Mexico	0	2	1	0	0	0	0	1
New York	2	0	1	1	1	0	0	1
North Carolina	0	4	3	1	2	0	0	3
North Dakota	1	1	1	0	0	0	0	1
Ohio	1	1	1	3	0	1	2	1
Oklahoma	0	4	1	1	0	1	1	1
Oregon	0	2	1	0	0	0	0	1
Pennsylvania	0	3	0	1	0	1	0	1
Rhode Island	1	1	0	1	0	0	0	1
South Carolina	0	1	0	1	0	0	0	0
South Dakota	2	2	1	1	0	1	1	1
Tennessee	2	0	0	4	0	1	2	1
Texas	0	1	1	2	0	0	1	1
Utah	0	2	0	1	0	1	0	0
Vermont	0	0	1	3	0	1	0	0
Virginia	1	2	1	2	1	1	0	1
Washington	2	1	1	1	1	1	0	1
West Virginia	1	0	0	0	0	0	0	0
Wisconsin	2	1	0	0	0	1	0	0
Wyoming	0	2	0	2	0	1	0	1

Notes: This table tabulates our data into the number of entries and exits per state, by party and election type (midterm or presidential). Note that exits appear in our data only for those senators who took office after 1968, and who therefore appear as entrants in our data. For example, the first row indicates that Alabama saw five Democratic entrants over the sample period (4 midterm and 1 presidential), and two Republican entrants (both in presidential elections.) Of these, three of the Democratic entrants also exited within the sample time frame (two during a presidential election and one during a midterm election), with the other two remaining in office as of 2006; both of the Republican entrants exited during a midterm election.

Table A2: House Descriptive Statistics

(a) Representative and Electoral Race Data

	Mean	Standard Deviation	Minimum	Maximum	Observations
Age	52.45	10.27	26	88	4938
Freshman	0.136	0.342	0	1	5077
Number of sessions in Congress	4.482	4.036	0	26	5072
Democrat	0.528	0.499	0	1	5083
Member of majority party	0.561	0.496	0	1	5077
Nominate scores (Democrat)	-0.355	0.178	-0.875	0.568	2681
Nominate scores (Republican)	0.402	0.196	-0.55	1	2381
Powerful committee member[†]	0.306	0.461	0	1	5077
Committee chair	0.048	0.214	0	1	5069
Committee ranking member	0.048	0.213	0	1	5069
Party leader	0.018	0.132	0	1	5077
Entry in presidential race	0.509	0.5	0	1	5083
Exit in presidential race	0.546	0.498	0	1	3417
Voteshare margin in preceing race[†]	0.156	0.092	0	0.469	4167
Open seat in preceing race	0.097	0.296	0	1	5070
Preceding race uncontested	0.178	0.383	0	1	5070

(b) District Demographic Data

	Mean	Standard Deviation	Minimum	Maximum	Observations
Population (logged square mile)	5.850	2.002	-0.351	11.209	5073
Urban population (share)	0.700	0.271	0	1	5073
Median income (logged)	-1.231	0.422	-2.473	-0.088	5073
Military workers (share)	0.007	0.014	0	0.146	5073
Farmers (share)	0.012	0.012	0	0.099	5073
Foreign born (share)	0.076	0.09	0.002	0.585	5073
Bluecollar workers (share)	0.073	0.023	0.02	0.175	5073
Age 65 or above (share)	0.148	0.048	0.041	0.438	5073

[†]Among contested races.

Notes: Data on district demographics and representative characteristics are taken from Snyder and Strömberg (2010). Representatives' Nominate scores are from Poole and Rosenthal's Voteview website. Information on representative entry and exit years come from the Congressional Quarterly Electronic Library and the Almanac of American Politics. The data include Representative who served in office between 1982 and 2004.

Table A3: The House Regression Results

(a) Representative Ideology and Entry Election

Dependent Variable: DW-Nominate Scores (First Dimension)

	(1)	(2)	(3)	(4)	(5)	(6)
$Presidential^{[\beta_1]}$	-0.0218	-0.0201	-0.0192	-0.00801	-0.00444	-0.0157
	(0.0184)	(0.0181)	(0.0182)	(0.0175)	(0.0172)	(0.0152)
$Presidential \times Democrat^{[\beta_2]}$	-0.00167	-0.00543	-0.00298	-0.000793	-0.00434	5.99e-05
	(0.0253)	(0.0254)	(0.0247)	(0.0235)	(0.0221)	(0.0200)
Year dummies		x	x	x	x	x
Electoral-race covariates			x	x	x	x
Representative covariates				x	x	x
District Demographics					x	x
State dummies						x
R^2	0.823	0.823	0.831	0.850	0.872	0.898
Observations	4,803	4,803	4,803	4,803	4,803	4,803
1. p-value, test $\beta_1 < 0$	0.882	0.867	0.853	0.677	0.602	0.848
2. point estimate $\beta_1 + \beta_2$	-0.0235	-0.0256	-0.0221	-0.00880	-0.00878	-0.0156
3. p-value, test $\beta_1 + \beta_2 > 0$	0.0898	0.0756	0.0930	0.292	0.269	0.117
4. point estimate *Democrat* (β_3)	-0.765	-0.761	-0.754	-0.755	-0.718	-0.701

(b) Representative Ideology and Exit Election

Dependent Variable: DW-Nominate Scores (First Dimension)

	(1)	(2)	(3)	(4)	(5)	(6)
$Presidential^{[\beta_1]}$	-0.00127	-0.00127	-9.35e-05	0.00186	0.0107	0.0113
	(0.0201)	(0.0201)	(0.0201)	(0.0193)	(0.0183)	(0.0152)
$Presidential \times Democrat^{[\beta_2]}$	0.0260	0.0260	0.0227	0.0153	0.00504	-0.00722
	(0.0289)	(0.0289)	(0.0284)	(0.0270)	(0.0242)	(0.0214)
Year dummies		x	x	x	x	x
Electoral-race covariates			x	x	x	x
Representative covariates				x	x	x
District Demographics					x	x
State dummies						x
R^2	0.807	0.807	0.813	0.828	0.858	0.888
Observations	3,250	3,250	3,250	3,250	3,250	3,250
1. p-value, test $\beta_1 > 0$	0.475	0.475	0.498	0.539	0.720	0.772
2. point estimate $\beta_1 + \beta_2$	0.0247	0.0247	0.0226	0.0171	0.0157	0.00413
3. p-value, test $\beta_1 + \beta_2 < 0$	0.118	0.118	0.131	0.183	0.161	0.394
4. point estimate *Democrat* (β_3)	-0.698	-0.698	-0.694	-0.714	-0.674	-0.653

Notes: *** Significant at the 1% level; ** significant at the 5% level; * significant at the 10% level. This table presents OLS estimates for β_1 and β_2 from Equation 1. The unit of observation is representative by congressional session. Dependent variable is first dimension of Nominate scores (DW). *Presidential* is an indicator variable equal to one if representative enters (exits) in presidential elections and to zero if in midterms; *Democrat* is a dummy variable equal to one if representative is a Democrat. Electoral-race covariates are dummy variables for whether the race is uncontested or whether an open seat is contested (each considered separately) and a measure of the closeness of a race, defined as the negative voteshare margin of victory; representative covariates are age, tenure and dummy variables for whether a representative is a freshman, belongs to the majority party, is a committee chair, member of the Ways and Means or Appropriations committees, is a committee ranking member or a party leader (each considered separately). Demographic covariates are the share of the district's population that is above age 65, who are bluecollar workers, farmers or military (each considered separately), and who are foreign born, as well as the state's urban population, per capita income (logged) and population (logged per square mile). Standard errors are adjusted for clustering at the representative level.

Table A4: Presidential Coattails and Senator Ideology

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Entry				Exit			
$Coattails^{[\beta_1]}$	0.639***	1.198***	0.552*	1.425***	0.119	0.383	-0.300	-0.324
	(0.235)	(0.349)	(0.316)	(0.486)	(0.353)	(0.558)	(0.498)	(0.689)
$Coattails \times Democrat^{[\beta_2]}$	-1.397***	-2.409***	-0.554	-1.853**	-1.066**	-1.239	-0.225	-0.297
	(0.441)	(0.645)	(0.484)	(0.763)	(0.512)	(0.784)	(0.641)	(0.886)
Dependent variable	DW-Nom.	W-Nom.	DW-Nom.	W-Nom.	DW-Nom.	W-Nom.	DW-Nom.	W-Nom.
Term(s) in office	First	First	All	All	Last	Last	All	All
R^2	0.883	0.750	0.870	0.731	0.895	0.709	0.877	0.710
Observations	220	220	693	693	167	167	353	353
1. p-value, test $\beta_1 < 0$	0.00356	0.000369	0.0416	0.00207	0.368	0.247	0.726	0.680
2. p-value, test $\beta_1 + \beta_2 > 0$	0.00436	0.00293	0.497	0.179	0.000269	0.0220	0.0624	0.117

Notes: *** Significant at the 1% level; ** significant at the 5% level; * significant at the 10% level. This table presents OLS estimates for β_1 and β_2 from Equation 1. The unit of observation is senator by congressional session. Dependent variable is indicated under estimates in each specification. *Coattails* is a measure of unexpeced presidential support described in the text; *Democrat* is a dummy variable equal to one if senator is a Democrat. "Term(s) in office" refers to observations included in the regression. A senatorial term consists of three congressional sessions; "First" ("Last") refers to 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.