

# LONG-TERM CONSEQUENCES OF ELECTION RESULTS

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## Abstract

Voters in U.S. legislative elections receive markedly different representation depending on which party's candidate they elect, and because of the incumbency advantage, the effects of this choice can persist for many years. What are the long-term consequences of these two phenomena? Combining electoral and legislative roll-call data in a dynamic regression-discontinuity design, we find that a “coin-flip” election in a moderate electorate significantly influences representation for more than a decade. Across the U.S. House, the U.S. Senate, and state legislatures, the effects of one election persist for at least a decade in all settings and as much as three decades in some settings. Further results suggest that elected officials do not adapt their roll-call voting to their districts' preferences over time, and voters do not systematically respond by replacing incumbents.

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The behavior of elected officials often diverges from the preferences of the electorate (e.g., Ansolabehere, Snyder, and Stewart 2001; Bafumi and Herron 2010; McCarty, Poole, and Rosenthal 2009)<sup>2</sup> and political polarization in legislatures is near all-time highs (McCarty, Poole, and Rosenthal 2006). At the same time, incumbents enjoy a large electoral advantage (e.g., Erikson 1978; Gelman and King 1990), winning reelection in 9 out of every 10 attempts (Jacobson 2009). When combined, these phenomena suggest that election results may have long-term consequences for voters. If incumbents do not alter their roll-call behavior over time (e.g., Poole and Rosenthal 2000), then the election of a Democrat or a Republican today may influence not only the representation voters receive today but the representation they receive in the future as well. On the other hand, voters display a systematic preference for moderate roll-call voting (Ansolabehere, Snyder, and Stewart 2001; Burden 2004; Canes-Wrone, Brady, and Cogan 2002; Erikson and Wright 2000), which should dampen any long-term consequences by forcing incumbents to alter their roll-call behavior or by replacing them with more responsive candidates. The literature has not yet addressed these conflicting expectations or, more importantly, quantified the degree to which elections influence representation over long periods of time.

Do election results have long-term consequences for representation? If so, how long do these consequences persist, and what factors determine the duration of these effects? The study of representation and polarization typically focuses on immediate effects or effects in the aggregate.<sup>3</sup> Likewise, the incumbency advantage literature focuses on near-term effects, i.e., the effect of

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<sup>2</sup> The empirical and theoretical literatures on convergence are too vast to review here. Since Downs postulated that two office-motivated candidates will converge to the preferences of the median voter (1957), scholars have collected a wealth of evidence contradicting this famous prediction and developed new theories to explain this lack of convergence.

<sup>3</sup> For example, Ansolabehere, Snyder, and Stewart (2001) and Bafumi and Herron (2010) compare voters and roll-call voting within a given election cycle, and McCarty, Poole, and Rosenthal (2006) investigate aggregate polarization within the legislature.

incumbency in the next election cycle.<sup>4</sup> In this paper, we connect these literatures and estimate the long-term consequences of election results, which are surprisingly persistent. Incumbents do not appear to adapt their roll-call votes over time, and voters do not appear to punish them for this behavior. Indeed, we find that the an election result today produces discernible and divergent changes in roll-call voting behavior for more than a decade in the U.S. House and upper chambers of state legislatures and for more than two decades in the U.S. Senate and lower chambers of state legislatures.

First, we quantify the effects of elections for policy representation by incorporating the analysis of legislative roll-call data into a regression discontinuity (RD) design. For Congress and state legislatures, the election of a Republican instead of a Democrat increases the probability of conservative roll-call votes by approximately 40 percentage points. Next, we assess the long-term effects of one election on subsequent elections. The results of one election influence the results of subsequent elections at least a decade later. That is to say, a district that randomly receives a representative from one party rather than the other in an election today is more likely than not to still be represented by that party a decade later. In the case of the Senate and lower chambers of state legislatures, this is still the case three decades after the initial election. Finally, we combine these two strands of evidence to assess the long-term consequences of elections on public policy and political representation. A single “coin-flip” election in a moderate district will change the policy and roll-call representation of that district for the same time span.

We also uncover several interesting sources of variation. The long-term consequences of election results are smaller in state legislatures with term limits and greater in open seat races, where

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<sup>4</sup> Major incumbency advantage papers that focus on near-term effects include Erikson (1978), Gelman and King (1990), and Cox and Katz (1996). While these studies may compare the advantage over time, they do not compare the effect of incumbency at time  $t$  on outcomes at time  $t+k$ .

candidates are typically younger and have longer time horizons. This evidence suggests that the effects we observe result primarily from individual incumbents seeking reelection over long periods of time—a personal and non-partisan phenomenon. In addition, we find that even highly partisan districts display long-term “mismatches” in representation. When a highly partisan district happens to elect a representative from the opposite party in a coin-flip election, the mismatched representative is expected to stay in office for several terms. Finally, we find that the effects of one election result on subsequent election results and on subsequent roll-call representation match one another in near-perfect proportion, suggesting that legislators do not adapt or moderate over time—even long periods of time—in the way that they represent their constituents.

The evidence in this paper supports a new model of *divergent* and *persistent* representation in American legislatures. Representation is divergent because legislators do not converge to the preferences of the district, i.e., Democratic and Republican legislators differ significantly in the way that they represent the same district at the same time. Representation is persistent—at both the district and the aggregate level—because it can remain consistent over many electoral cycles even when the preferences of voters are far from their elected representatives.

## Data

We draw upon several data sources to assess the long-term consequences of election results. First, we employ election data for the U.S. House and Senate from 1946 to 2010 and state legislatures from 1972 to 2010.<sup>5</sup> We also employ Congressional roll-call data from 1947 to 2012 and state legislative roll-call data from 1999, 2000, 2011, and 2012. The Congressional roll-call data is

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<sup>5</sup> We utilize an extended version of the data set collected and analyzed by Ansolabehere and Snyder (2002). Most of the data was collected directly from state secretaries’ offices.

from Keith Poole’s “Voteview” website,<sup>6</sup> and the state legislative data is made publicly available by Gerald Wright (1999-2000)<sup>7</sup> and Project Vote Smart (2011-2012).<sup>8</sup>

## **Elections Matter**

According to the median voter theorem, two office-motivated candidates will converge to the preferences of the median voter under weak assumptions (Downs 1957). In the context of American elections, however, Democrats and Republicans take different positions and enact different policies even when representing the same electorate. As a result, elections strongly influence public policy and the type of representation an electorate receives.

Most evidence for the near-term effects of elections comes from the U.S. House of Representatives, where Congressional roll-call votes provide a readily observable measure of public policy and representation. Republican members of Congress are much more likely to vote conservatively than Democratic members even after controlling for district ideology (Ansolabehere, Snyder, Stewart 2001; Bafumi and Herron 2010; McCarty, Poole, and Rosenthal 2009; Tausanovitch and Warshaw 2012). The strength of such findings is consistent across different measures of roll-call voting (e.g. DW-NOMINATE, Heckman-Snyder scores, Bayesian IRT Ideal Points, ADA Scores) and different measures of district ideology (e.g. presidential vote, demographic characteristics, and survey responses). While a significant portion of representation is not observable—occurring through committees, backroom bargains, and constituency service—roll-call votes reliably capture an important component of representation in legislatures.

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<sup>6</sup> Poole, Keith. *Vote View*. <<http://voteview.com/downloads.asp>>.

<sup>7</sup> Wright, Gerald. 2004. Representation in America’s Legislatures. Indiana University. National Science Foundation Grant. <[http://www.indiana.edu/~ral/data\\_9900.html](http://www.indiana.edu/~ral/data_9900.html)>.

<sup>8</sup> See <<http://api.votesmart.org/docs/Votes.html>>.

Despite the strength of existing evidence, two difficulties remain. First, even after controlling for various measures of district ideology, districts that elect Republicans may be systematically different than those who elect Democrats, potentially biasing estimates of the effect of elections. Second, previously used measures of roll-call votes provide little information about the substantive size of the relevant effect, presenting estimates on a latent dimension rather than a substantively interpretable measure of roll-call voting. In the present context, the substantive magnitude is especially important. We overcome the first problem by implementing a regression discontinuity (RD) design (Imbens and Lemieux 2008; Thistlewaite and Campbell 1960), and we address the second problem by employing a more interpretable measure of roll-call voting.<sup>9</sup>

Using a regression discontinuity design, we compare districts where a Republican barely won to those where a Republican barely lost. This design accounts for heterogeneity across different districts and legislative agendas and isolates the direct effect of election results on political representation. Close elections provide a quasi-experiment where the representative for certain districts is “as if” randomly assigned (see Imbens and Leieux (2008) for more details on RD designs, and see Lee (2008) for their application in electoral settings). Our design most closely mirrors Lee, Moretti, and Butler (2004) who employ an RD design to assess the effect of an election result on the ADA score of a district’s representative. Several recent papers criticize the use of RD in electoral settings (Caughey and Sekhon 2011; Grimmer et al. 2012; Snyder 2005) and raise the possibility that strategic sorting biases RD estimates, but readers should also see Eggers et al. (2013) for a defense of RD in electoral settings and for evidence that unusual patterns detected in the U.S. House are not present in other settings including the Senate and state legislatures. We are sensitive to these critiques, and we conduct numerous tests to address these concerns. The inclusion of covariates,

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<sup>9</sup> We are careful to show that our results are robust to the use of other roll-call scaling techniques. For example, the Appendix provides replications of all Congressional results using DW-NOMINATE.

alternative specifications, and the implementation of “donut” RD designs (Almond and Doyle 2011; Barreca et al. 2011; Barreca, Lindo, and Waddell 2011) suggest that strategic sorting does not pose a threat to our subsequent findings. See the Appendix for more details.

Our measure of roll-call behavior, Conservative Vote Probability (CVP), provides readily interpretable effect sizes. CVP indicates the probability that a particular legislator will vote conservatively relative to the median member of the legislature (or any other member of the legislature). For example, if legislator A has a CVP of 0.2 and legislator B has a CVP of  $-0.2$ , then legislator A is, on average, 40 percentage points more likely to vote conservatively than legislator B. For more details on CVP, see Fowler and Hall (2012a). As we demonstrate in the Appendix, none of the subsequent results of this study change if we use DW-NOMINATE (Poole and Rosenthal 1985), Heckman-Snyder scores (Heckman and Snyder 1997), or Bayesian ideal point estimates (Clinton, Jackman, and Rivers 2004), because CVP correlates very highly with other measures and other measures correlate very highly with one another (Burden, Caldeira, and Groseclose 2000). The advantage of CVP for the purposes of this paper is substantive interpretability. CVP allows us to assess the extent to which election results change the probability that a district’s representative votes conservatively.

We estimate the immediate consequences of election results by employing an OLS regression of the following form:

$$(1) \quad CVP_{it} = a + \beta * RepublicanVictory_{it} + \gamma * f(RepublicanVoteShare_{it}) + \delta_i + \varepsilon_{it}.$$

When analyzing the U.S. House, each observation is a district-congress. We include all congressional sessions between the 80th and 112th Congresses which followed the 1946 and 2010 elections, respectively. For example, California’s 1st district in the 112th Congress is one observation in the data set.  $CVP_{it}$  represents the probability that a district’s representative votes conservatively (relative to the median member of Congress) for that particular two-year congressional session. In cases

where multiple legislators represented the same district in the same session, we pool the votes from each representative to generate a single roll-call score for each district-congress.  $\text{RepublicanVictory}_{it}$  is a dummy variable indicating whether the district elected a Republican or Democrat for that particular session. We only include observations where a Democrat and Republican ran against one another. The model also includes  $f(\text{RepublicanVoteShare}_{it})$ , a high order polynomial function of the Republican two-party vote share, and time fixed effects. For our main analyses, we present results for a fourth-order polynomial and include all observations where the two-party vote share fell between 20 and 80 percent, but as we show in the Appendix, the results are unchanged for other specifications. To be clear, our analysis does not assume that all elections from 20 to 80 percent are “as if” randomly assigned. Even though the analysis includes many elections, the inferences are driven by very close elections. In this model,  $\beta$  represents the causal effect of election results on representation. Specifically, it indicates how much more conservatively a barely-elected Republican will vote in Congress relative to a barely-elected Democrat. If legislators perfectly match their roll-call votes the preferences of the median voter in their districts,  $\beta$  should be zero. However, given previous empirical work, we expect to see a large discontinuity between barely elected Republicans and Democrats.

To illustrate the meaning of this test, Figure 1 presents two hypothetical results that we could obtain from this analysis. In a world of “convergent” representation where legislators converge to the median voter in the district, we would expect the roll-call votes of the legislator to be strongly correlated with the voting behavior and partisanship of the district. More importantly, we would expect to see no discontinuity or sudden jump in roll-call representation as we move from districts which barely elected a Democrat to those that barely elected a Republican. Conversely, in a world of divergent representation, where legislators do not converge to the district median, we might expect little association between roll-call behavior and voting behavior on either side of the



electoral threshold and a significant jump as a district switches from barely electing a Democrat to barely electing a Republican.

[Figure 1]

Figure 2 shows the results of this analysis graphically for four different settings: the U.S. House of Representatives, the U.S. Senate, lower chambers of state legislatures, and upper chambers of state legislatures. In every case, the figures mirror the model of divergent representation. As the Republican Party's vote share in a district crosses the threshold of 0.5, the district's representation changes dramatically. For the U.S. House (shown in the top left panel of Figure 2), we estimate a discontinuity of .391 with a standard error of .006 ( $t > 60$ ,  $p < 10^{-18}$ , district-clustered). This indicates that a barely-elected Republican is 39.1 percentage points more likely to vote conservatively, on average, than a Democrat barely elected from the same moderate district.<sup>10</sup> The near-term consequences of elections are massive. Close elections produce drastically different policy and representational outcomes based solely on the vagaries of chance—the coin flip that determines the winning candidate.

[Figure 2]

The top-right panel of Figure 2 presents the analogous test in the U.S. Senate. The smaller number of legislators in the Senate (100 versus 435) and the infrequency of elections (every 6 years instead of every 2) mean that our estimates in the Senate are slightly less precise for those in the House. Again, our analysis includes all elections between 1946 and 2010. As a Republican candidate's vote share crosses the 50% threshold, the voters' representation in the Senate becomes significantly more conservative. Specifically, we estimate an effect of .426 with a standard error of

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<sup>10</sup> We do not assume that this quantity is constant across districts or across time. We simply estimate an average effect across the subset of close elections in our sample. In the Appendix, we analyze variation in this effect over time. While some interesting variation exists (e.g., this effect has increased slightly over time), the effect is substantively large and statistically significant for all years in our analysis.

.019 ( $t > 21$ ,  $p < 10^{-12}$ , state-clustered). A Republican senator is 42.6 percentage points more likely to vote conservatively, on average, than a Democrat elected by the same state at the same time.

The consequences of elections extend beyond Congress. In the bottom panels of Figure 2, we assess the near term consequences of elections in state legislatures. We replicate the previous analyses for lower and upper houses, respectively, including state-chamber-year fixed effects for efficiency. The sample only includes those chambers with single-member districts. Because roll-call data is only available for two, two-year periods—1999-2000 and 2011-2012—we only include the elections leading directly into these periods. The election of a Republican in lower houses leads to a 37.6 percentage point increase in conservative roll-call behavior (standard error = 1.1 percentage points;  $t > 34$ ;  $p < 10^{-14}$ ; district-clustered). This effect is 41.0 percentage points (standard error = 1.8 percentage points;  $t > 22$ ;  $p < 10^{-12}$ ; district clustered) in upper houses. As in Congress, the result of a coin-flip election in a moderate district dramatically influences the roll-call representation received by that district in the near term. In each setting, Republicans vote more conservatively than Democrats representing the same electorate on approximately 4 out of 10 bills.

Across American legislatures, elected representatives do not converge to the median voter in their constituents. If they did, there would be no difference in the roll-call behavior of Democrats and Republicans representing the same electorate. The wide gulf between the parties means that elections have immediate consequences for representation. At any snapshot in time, legislators' representation of constituents varies systematically based on the party elected to office, holding the district's underlying preferences constant. In the next sections, we assess the effects of election results over longer periods of time and show that these consequences persist well into the future.

## Long-Term Effects of One Election Result on Subsequent Election Results

Decades of research have demonstrated the electoral value of incumbency (e.g., Ansolabehere and Snyder 2002; Erikson 1971; Gelman and King 1990). In short, political candidates appear to benefit electorally simply by virtue of being the incumbent. Lee (2008) employs an RD design in the U.S. House to demonstrate that a Republican victory in a close election dramatically increases the chances of a Republican victory in the next election cycle, relative to the counterfactual scenario in which the Democratic candidate barely wins instead. Here, we expand upon Lee's analysis to explore the effects of one election not just on the next election but on many elections downstream. A single election for a House, Senate, or state legislative seat can influence the results of future elections for many terms. Because of the large and accumulating returns to incumbency, elections have long-term consequences for future elections.

In order to assess the long-term effects of one election, we employ another regression discontinuity design like that in the previous section:

$$(2) \text{ RepublicanVictory}(t+k)_{ii} = a + \beta * \text{RepublicanVictory}(t)_{ii} + \gamma * f(\text{RepublicanVoteShare}_{ii}) + \delta_i + \varepsilon_{it}$$

The only difference here is that the dependent variable has been replaced with a dummy variable indicating a Republican victory at time  $t + k$ . As a result,  $\beta$  indicates the effect of a Republican victory in one election on the probability of Republican victory in another election  $k$  terms later. For  $k = 0$ ,  $\beta$  is equal to 1 by convention. The present election perfectly predicts the party of the elected official. For  $k = 1$ , we know that  $\beta$  is large and positive for the U.S. House from Lee (2008). The result of one election significantly influences the result of the next election. Across all offices studied, we find that the result of one election affects many further elections downstream. In other words, partisan representation is strongly persistent.

Figure 3 shows the results of this analysis for all four settings: the House, Senate, and lower and upper chambers of state legislatures. We plot the estimated effect of elections,  $\beta$ , along with its

estimated 95% confidence interval across the number of elections downstream,  $k$ . As before, the sample for Congress includes all elections between 1946 and 2010. For  $k = 1$ , our results are consistent with Lee (2008). If the Republican Party wins a coin-flip election in the U.S. House, it will be 49 percentage points more likely to win the next election as well. The causal effect of a Republican victory two elections downstream is 34 percentage points. Three elections downstream, the effect is 24 percentage points. Even in 5 elections downstream, the effect is 9 percentage points and strongly statistically significant ( $p = .001$ ). This finding bears repeating. The election of a Republican in a House district *today* makes the district 9 percentage points more likely to elect a Republican 10 years from now and therefore be represented by a Republican 12 years from now.

The results are even more striking in the other settings. In the Senate with six-year terms, we detect a statistically significant effect in elections 5 terms downstream. For lower chambers of state legislatures, which typically have two-year terms, we detect effects through 12 elections downstream. For upper chambers, which typically have four-year terms, we detect effects through four elections downstream. In other words, a single election influences the party representing an electorate for 36 years in the Senate, 26 years in lower chambers, and 20 years in upper chambers.

[Figure 3]

Not only are the findings in Figure 3 significantly larger than zero, they are significantly larger than would be predicted by a static incumbency advantage. Although previous studies of the returns to incumbency have focused exclusively on the effects of one election on the next election, a clear implication of this research is that the next election at time  $t+1$  also exhibits an effect on the election at  $t+2$  and so on. We can model these elections as a Markov chain where the party of the incumbent is randomly chosen in each period according to probability weights determined by a

known, constant incumbency advantage.<sup>11</sup> For example, if the Republicans win the election at time 1 with probability  $p$ , then we would expect them to win the election at time 2 with probability  $p \cdot p$  or  $p^2$ . Since the literature suggests that  $p$  is large, we would expect to see long-term effects of one election on future elections in this Markov chain model. However, the effects that we find here are larger than would be predicted even by this model.

Figure 4 presents the same results shown in the top-left panel of Figure 3 in conjunction with the hypothetical effects predicted by a Markov-chain model. For example, the model predicts an effect of 24 percentage points two terms downstream, but we observe a 34 percentage-point effect. This is consistent with the hypothesis that the returns to incumbency increase with seniority (e.g., Hibbing 1991), but it is distinct from analyses of how re-election rates or vote shares vary with terms of service. Our analysis speaks to the causal advantage incumbency delivers downstream, removing other differences between senior and junior incumbents that affect their electoral performance. Because the returns to incumbency appear to accumulate, the downstream effects of elections are greater than expected.

[Figure 4]

The findings in Figures 3 and 4 are particularly striking in light of several factors that should mitigate the long-term returns to incumbency. Over the course of multiple terms, national partisan tides can rise and fall. The fact that some election years greatly benefit Republicans (e.g. 1994) and others benefit Democrats (e.g. 2006) should mitigate the persistent effects that we detect (Jacobson 1987). Similarly, trends and changes in the partisan preferences of districts over time should make it even harder for the same party to win reelection repeatedly. Similarly, the demographic characteristics of a district can change dramatically over the course of a decade (Elis, Malhotra, and

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<sup>11</sup> We can set this probability according to our estimated effect at  $k = 1$ . For example, our effect of .49 in the U.S. House means that the incumbent party is 49 percentage points more likely to win the next election, implying a retention probability of .745.

Meredith 2009), which should further reduce the long-term consequences of elections. Finally, House districts are re-drawn every ten years, further altering the composition of districts.<sup>12</sup> Even though a district's composition and preference will change, and even though the political climate will certainly be different, an election today will influence many election results held in the distant future.

Previous research suggests that incumbent candidates receive a significant electoral benefit simply by virtue of being the incumbent but the incumbent party receives no separate benefit (Fowler and Hall 2012b). As a result, we suspect our results are explained by individual incumbents seeking reelection over a long period of time and not by parties themselves receiving long-term electoral benefits. This hypothesis leads to several testable predictions in our data. First, we should see greater long-term effects in states legislatures without term limits compared to those with term limits. Term limits exogenously prevent individual incumbents from running for reelection (Ansolabehere and Snyder 2004), thereby eliminating the personal effects of incumbency in certain elections while preserving any advantage the party receives for having held the seat (Fowler and Hall 2012b). If the long-term effects we have documented stem from personal incumbency status, then this reduction in the frequency of incumbents running for re-election should curtail the long-term effects. Figure 5 tests this hypothesis explicitly by plotting the long-term effects of elections separately for state legislative settings with and without term limits. As expected, the effects of election results diminish much more quickly in state legislatures with term limits. When term limits force incumbents to retire, the persistent effects of election results vanish with them.

[Figure 5]

A second testable hypothesis is that the persistent effects of election results should be greater when candidates are young. Younger candidates have longer time horizons and therefore

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<sup>12</sup> Redistricting does not appear to influence the long-term effects of elections in either direction. If we focus on samples where no redistricting took place, our results are virtually identical. See the Appendix for more details and specific tests.

more opportunities to seek reelection in the future. To test this hypothesis, Figure 6 replicates the U.S. House analysis separately for open-seat races, where candidates are likely to be younger,<sup>13</sup> and those where an incumbent sought reelection. For open-seat races, we see that the shadow of the current election extends even farther forward in time. The results from both Figures 5 and 6 are consistent with previous research and suggest that the long-term consequences of election results are a personal phenomenon, driven by individual incumbents who gain popularity with voters and continue to seek reelection over long periods of time.

[Figure 6]

We can also explore variation in the persistent effects of election results across district partisanship. We might only expect to find long-term consequences of elections in moderate districts, which are evenly split between the parties, because partisan districts should revert to their normal partisan leanings even if they happen to elect a representative from the other party once. To test this hypothesis, we subset Congressional districts according to their normal partisan voting in presidential elections and replicate the analysis from the top-left panel of Figure 3 on each subset.<sup>14</sup> Results are shown in Figure 7. As expected, the effects of elections are most persistent in moderate districts. However, even in highly partisan districts, close elections have large and persistent consequences for the next three or four elections. If a partisan district happens to elect a representative from the other party in an unusually close election, it may not correct this mismatch

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<sup>13</sup> This is to be expected since incumbents age in office. To confirm this intuition, we compared the average age of candidates in open seats and in incumbent-contested races for 1996 U.S. House races, using the dataset compiled by Magee and Wolaver (2005). We find that open-seat candidates are 2.9 years younger, on average, and 10 percentage points more likely to be under the age of 55 than candidates in incumbent-contested races.

<sup>14</sup> For each redistricting cycle, we average the two-party vote shares for each district across the presidential elections occurring in that cycle. We then sort the districts according to this “normal vote” and divide the districts into three groups—the most Democratic quarter of districts, the most Republican quarter, and the moderate half of districts in the middle.

for years. Even a fluke election in a highly partisan electorate influences the party representing the district for the next 8 years.

[Figure 7]

### Long-Term Consequences of Elections for Public Policy and Representation

To assess the long-term consequences of election results for policy and representation, we repeat our previous identification strategy, using the Conservative Vote Probability of a district's representative  $k$  terms downstream from the initial election.

$$(3) \quad CVP(t+k)_{it} = a + \beta * RepublicanVictory(t)_{it} + \gamma * f(RepublicanVoteShare_{it}) + \delta_t + \varepsilon_{it}$$

We have already shown that elections have large consequences on representation for  $k = 0$ . In this section, we show that these effects persist for many terms.

Figure 8 plots the results of this analysis for Congress and state legislatures with the top-left panel focusing on the U.S. House. Figure 2 already shows these results for  $k = 0$ ; the election of a Republican in a coin flip election in the U.S. House causes the district's representative to vote conservatively 39.1 percentage points more often. In the next term, the effect is 16.7 percentage points, then 11.1 percentage points, then 8.2 percentage points. Even 5 terms downstream, we see a statistically significant 2.8 percentage point effect. In the U.S. House, The result of one coin-flip election influences the representation received by the electorate for at least the next 12 years. Keep in mind that  $k = 0$  applies to the first two years after the election,  $k = 1$  applies to the third and fourth years, etc., so a statistically significant effect at  $k = 5$  means that an election result influences the way the district is represented in years 11 and 12.

[Figure 8]

The top-right panel of Figure 8 presents a similar analysis for the U.S. Senate. Instead of analyzing six-year terms, we analyze two-year Congresses. For  $k = 0$ , we focus on the two year



period immediately following an election. As we saw in Figure 2, a single election corresponds to a 42.6 percentage point change in roll-call voting. Due to the long careers of senators, we detect a statistically significant effect of 8.4 percentage points even 15 sessions downstream, more than three decades after the election.

The bottom panels of Figure 8 demonstrate the long-term representational consequences of elections in lower and upper chambers of state legislatures, respectively. Because we only have roll-call data for state legislators for two periods (1999-2000 and 2011-2012), the dependent variable remains the same across different values of  $k$ , but the proximity of the election from this time period increases as  $k$  increases. For lower houses, we detect a significant effect as far as 11 terms downstream. For upper houses, we detect a statistically significant effect three terms downstream. Because lower chamber terms typically last 2 years and upper chamber terms typically last 4 years, the consequences of elections persist for at least 24 years in lower chambers and 12 years in upper chambers. These results are consistent with observations that state legislators—especially those in lower chambers—are often career politicians (e.g., Squire 1988). Even when they enter the legislature by barely winning a coin-flip election, they can remain in power for decades.

In all legislative settings analyzed, we find that elections have large and immediate consequences for public policy and representation, consistent with the literature on the effects of parties and the extent to which Democratic and Republican candidates diverge from one another. We further find that this phenomenon persists over long periods of time. Across the House, Senate, and state legislatures, a single close election that arbitrarily selects a Democrat or Republican changes the district's representation for decades.

Combining our analyses of both election results and roll-call voting, we can also test whether legislators moderate or adapt their roll-call votes to the district over time. Perhaps one way that legislators keep themselves in power for long periods of time is by learning the district's positions

and adjusting accordingly. If legislators improve or moderate over time, then we should see the long-term consequences of election results for roll-call representation decay more quickly than the long-term consequences of election results for subsequent election results and partisan representation. We would expect this because Democratic and Republican legislators would represent the same districts more similarly over time, lessening the consequences of election results for roll-call representation. In other words, legislative improvement over time would mean that Figures 3 and 8 would look different—with the point estimates in Figure 8 falling to zero more quickly. Figure 9 essentially overlays the results from these two figures for the U.S. House after stretching them so that they start at the same point in the first period.<sup>15</sup> The long-term consequences of election results for partisan representation and roll-call representation decay in almost exact proportion to one another suggesting that legislators do not, on average, improve over time. Even when a legislator fails to closely match her district and even when the district continues to reelect her over the course of many terms, the legislator continues to cast roll-call votes in the same way without moderating to the positions of the district.

[Figure 9]

Taken together, these results paint a picture of divergent and persistent representation in American legislatures. At the district level, a single election result can change the way that the district is represented in the legislature for decades. Moreover, this representational inertia at the district level leads to representational inertia in the aggregate level as well. Divergent and persistent representation at the district level means that there will be long stretches of time where the median

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<sup>15</sup> The first two periods of this figure, terms 0 and 1, essentially mirror the analysis of Lee, Moretti, and Butler (2004). They hypothesize that the electoral effect should decay more quickly than the roll-call effects, because representatives should respond to positive shocks in their electoral security by becoming more extreme. Here, looking over a longer time horizon, we find no evidence that representatives adapt to their district over time or become systematically more extreme. Like Lee, Moretti, and Butler (2004), we can interpret this to mean that voters can elect but not affect policy.

member of the legislature is consistently to the left or right of the median voter across all districts (or the median voter in the median district). Therefore, the long-term consequences of election results can help us to understand why American history has witnessed long stretches of congressional rule by one party, even when the public has been relatively evenly divided between two parties.

The divergence of Democratic and Republican candidates means that many electorates are unable to choose representatives that match their preferences and must choose between one extreme or the other (Bafumi and Herron 2010), even though the typical electorate appears to prefer moderate representatives (Canes-Wrone, Brady, and Cogan 2002). What is more, the election of one extremist will rarely be counteracted in the next term through incumbent replacement or through the adaptation of roll-call voting to district preferences. When a moderate electorate happens to elect one partisan, even in a coin flip election, it will continue elect the same party and receive the same kind of representation for a long period of time.

### **Why do American Voters Reelect their Incumbents?**

The results of this study leave us with an interesting puzzle about American voting behavior. Why do American voters reelect their incumbents at such high rates and over such long periods of time, even with their representatives do not closely represent their preferences or converge to their preferences over time? We pose this question without offering a definitive answer. Surely money, challenger scare off, constituency service, and other institutional factors play important roles. Here, we briefly discuss and test several other potential explanations, still leaving much to future investigation.

One potential explanation for the long run success of incumbents is that some citizens are demobilized by mismatched representation. When a Democratic candidate wins a coin flip election,

Republicans in the district may be less likely to turn out to vote in future elections, making it easier for the Democrat to win reelection. Our own preliminary analysis of turnout of party registrants following close elections suggests that the magnitude of this effect is not nearly large enough to explain the patterns observed in this paper. Voter turnout may be a part of the explanation, but it can be only a small part.

Another explanation is that coin-flip election results change the partisan composition of the district by either changing the attitudes of those living in the district (see for example Lenz 2013) or by changing the composition of citizens moving in and out of the district. We look for these possibilities by testing whether coin flip election results influence the results of subsequent elections for other offices. For example, do the results of coin flip U.S. House elections influence the voting behavior of the district in future Presidential elections? Does the result of a coin flip Senate election influence the voting behavior of the same state in its other Senate seat 2 or 4 years later? A battery of these and similar tests finds no evidence that one legislative election result alters the voting behavior of the district (through either changing attitudes or changing composition) in other races in the future.

Because these coin flip elections do not systematically alter the partisan composition of the district and because they do not dramatically alter the composition of the electorate by influence participation patterns, we must conclude that a significant proportion of citizens actively change their vote choices depending on the identity of the incumbent. Following a close Democratic victory in a particular district, there must be a significant share of citizens who will vote for the Democrat in her reelection bid but would have also voted for the Republican in her reelection bid in the counterfactual world where the Republican had won the close election instead. What explains this behavior?

Another possibility, for which we offer no direct evidence, is that voters use incumbency and seniority as informational shortcuts. In a world of low and decreasing levels of political knowledge (e.g. Delli Carpini and Keeter 1997), voters may increasingly look to crude indicators like incumbency to signal competence and quality. Some studies find that in low-information elections, vote choices are influenced by incumbency *per se* (e.g. Kahn 1993; Kam and Zechmeister 2013) but other studies find no such effect (e.g. Jacobson 2009; Klein and Baum 2001). Relatedly, voters may care deeply about the way that their legislators cast roll-call votes (e.g. Ansolabehere and Jones 2010) but they may not know enough about their behavior to hold them accountable. We suspect that these informational stories play a crucial role in explaining long-term consequences of election results, and we hope that future investigation will further our understanding of these phenomena. Future analyses and theories of incumbent advantages must grapple with these facts: the consequences of election results are greater than previously thought, span more than a decade, and are consistent across different legislative in the U.S.

## **Conclusion**

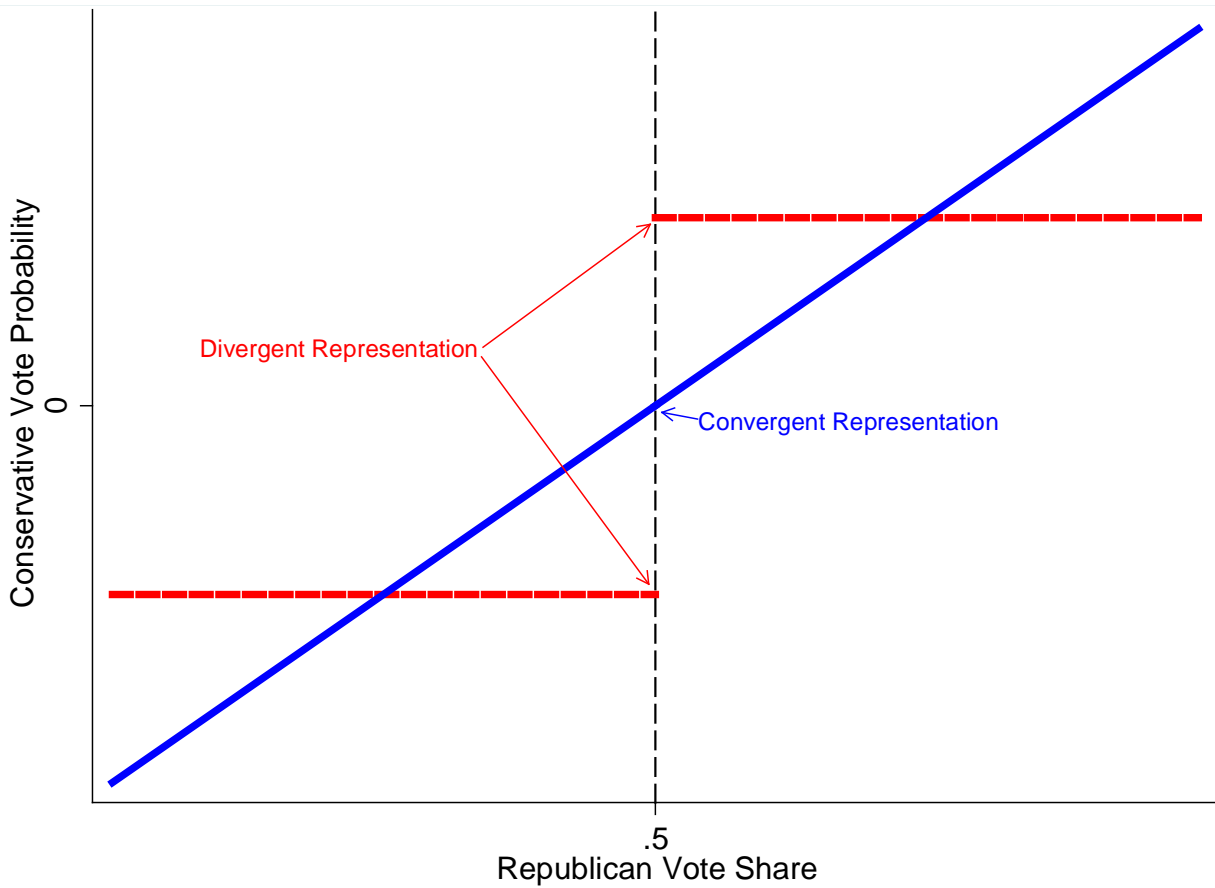
Most studies of political representation focus on brief periods of time, but inefficiencies in political representation persist through many elections. The consequences of a single election for public policy and political representation are greater than previously thought and persist for many more years than expected. This phenomenon represents a marked inefficiency in the way that public preferences are translated into public policy. A small number of votes can change the course of representation in an electorate for decades.

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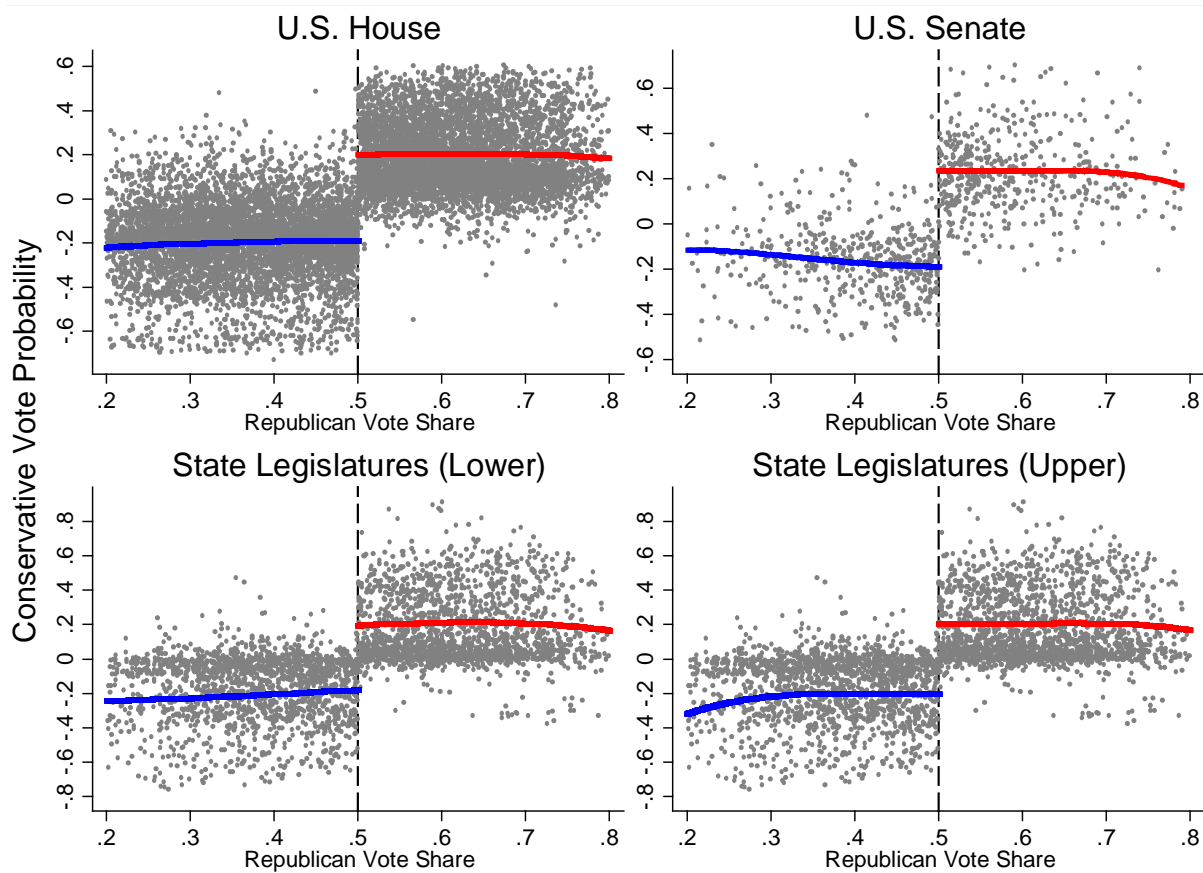
Figure 1. Convergent vs. Divergent Representation



The figure illustrates the observational differences between divergent and convergent representation by plotting two hypothetical relationships between roll-call behavior of legislators and their electoral support in the previous election. In a world of convergent representation where legislators closely respond to the preferences of the median voter in their district, we might expect a strong correlation between the voting behavior of the district and the voting behavior of the legislator, but we should see no discontinuous jump in roll-call representation as a district switches from barely electing a Democrat to barely electing a Republican. Alternatively, in a world of divergent representation, we might find little correlation between roll-call behavior and voting behavior on either sides of the 50% threshold, which determines the party of the representative, but we would expect a significant jump as a district switches from barely electing a Democrat to barely electing a Republican.

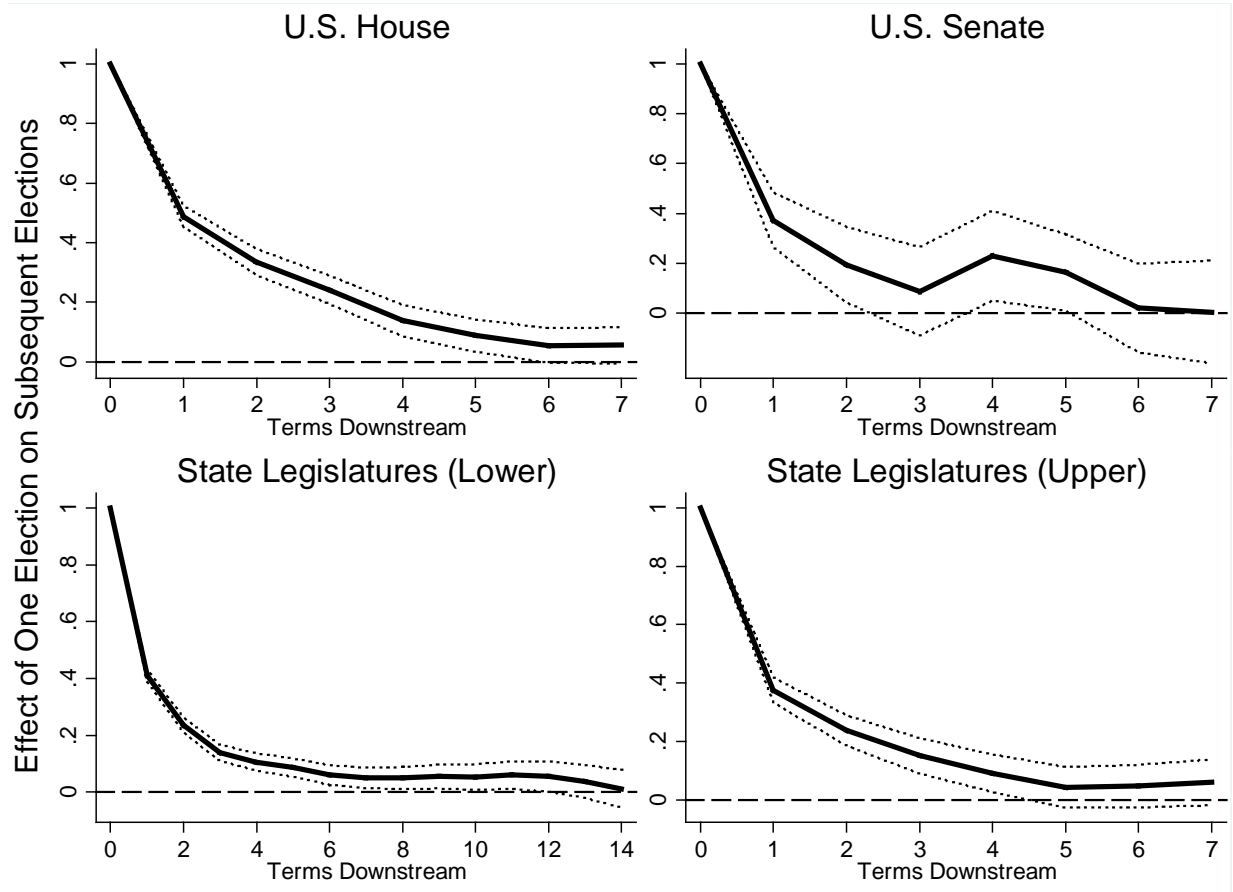


Figure 2. Short Term Consequences of Elections



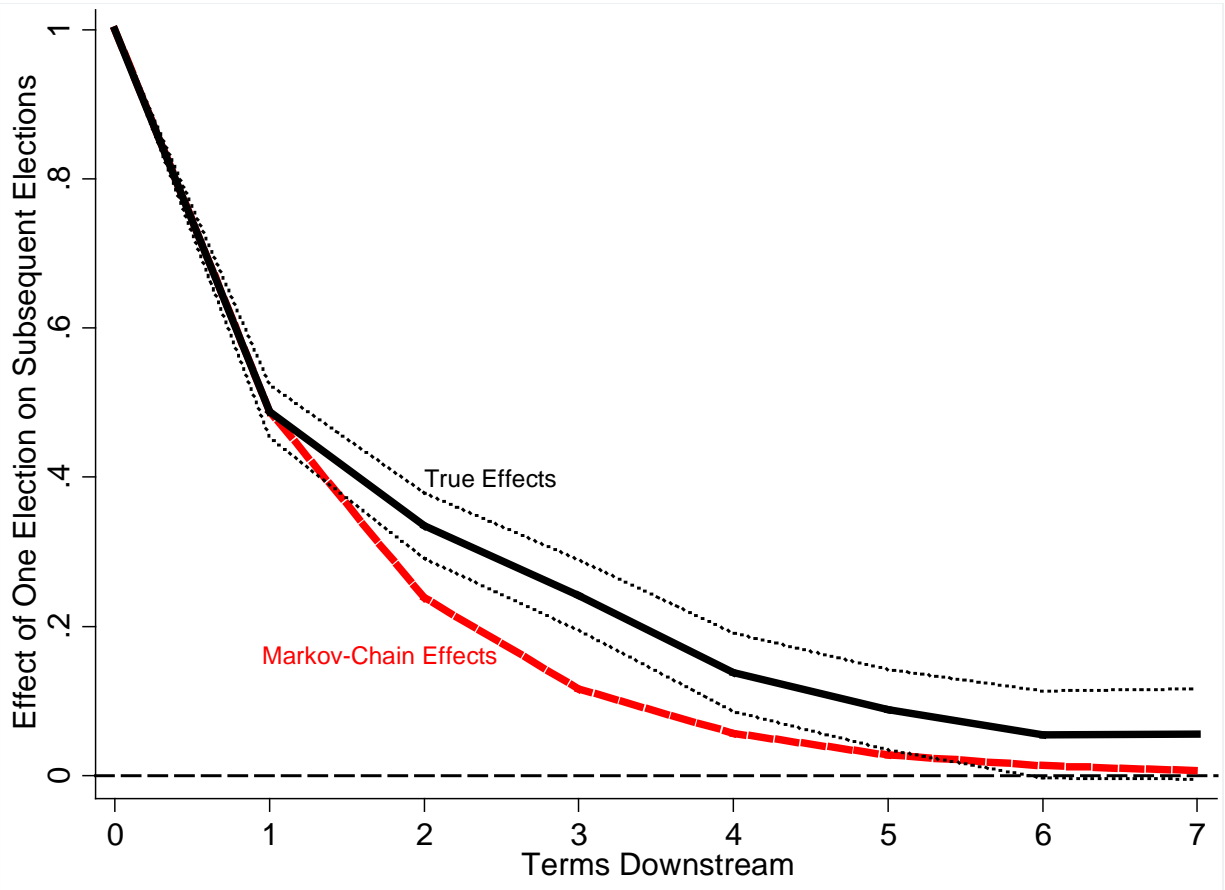
The figure plots the results of regression discontinuity estimates of the effects of legislative elections on district-level representation in four different settings. The dependent variable is the Conservative Vote Probability of a district's representative in the immediate term after an election. In the case of the U.S. Senate, the dependent variable is the combined Conservative Vote Probability of both Senators representing the state. The analyses of Congressional elections include all elections from 1946 to 2010 and those of state legislative elections include only elections leading directly into the legislative sessions of 1999-2000 and 2011-2012. In every case, the result a coin flip election significantly changes the way that the district is represented in the next legislative session. The discontinuities of .391, .426, .376, and .410 at the 50% thresholds indicate that a Republican victory causes a district's representative(s) to be 39.1, 42.6, 37.6, and 41.0 percentage points more likely to vote conservatively, on average, in the U.S. House, the U.S. Senate, lower chambers of state legislatures, and upper chambers of state legislatures, respectively. In each case, the standard errors (clustered by district) associated with these estimates are so small (.006, .019, .011, and .018, respectively) that they cannot be shown graphically on the plot. The p-values resulting from tests of the null hypothesis of no discontinuity are all astronomically low ( $p < 10^{-18}$ ,  $p < 10^{-12}$ ,  $p < 10^{-14}$ , and  $p < 10^{-12}$ , respectively). Republicans represent the same districts very differently than Democrats do, voting more conservatively on approximately 4 out of 10 bills. Therefore, elections have large, immediate consequences for representation.

Figure 3. Effect of One Election on Subsequent Elections



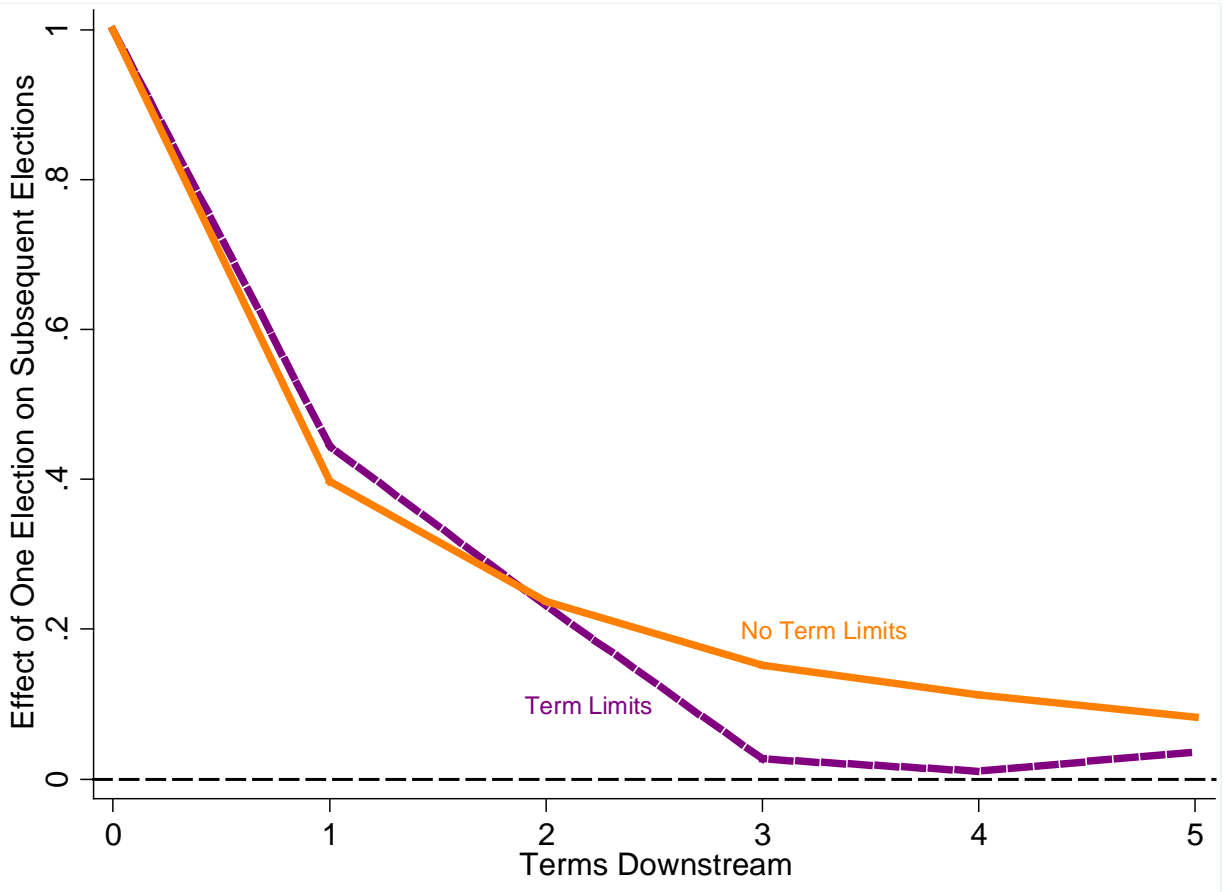
The figure shows the long-term consequences of one election for subsequent election results in four different settings. Dotted lines indicate 95% confidence intervals (standard errors are clustered by state for the Senate and by district for the other three settings). Each data point on the graphs represents a separate regression discontinuity estimate of the effect of one election on some downstream election. The estimate of .49 at the second term for the U.S. House shows that a Republican victory in one election increases the probability of a Republican victory in the next election by 47 percentage points. Across all four settings, we see that the effects of one election persist for long periods of time. The election of a Republican or Democrat in one election exhibits a statistically significant effect on 5 terms downstream in the U.S. House, 5 terms downstream in the U.S. Senate, 12 terms downstream in the lower chambers of state legislatures and 4 terms downstream in the upper chambers. For Congress, we include all elections between 1948 and 2010, and for state legislatures, we include all elections from 1972 to 2010. U.S. House terms are 2 years, Senate terms are 6 years, most lower chamber terms are 2 years, and most upper chamber terms are 4 years. Therefore, the result of a single coin flip election influences the party representing a particular electorate for the next 12 years in the U.S. House, 36 years in the U.S. Senate, 36 years in lower chambers, and 20 years in upper chambers.

Figure 4. Hypothetical versus Actual Returns to Incumbency



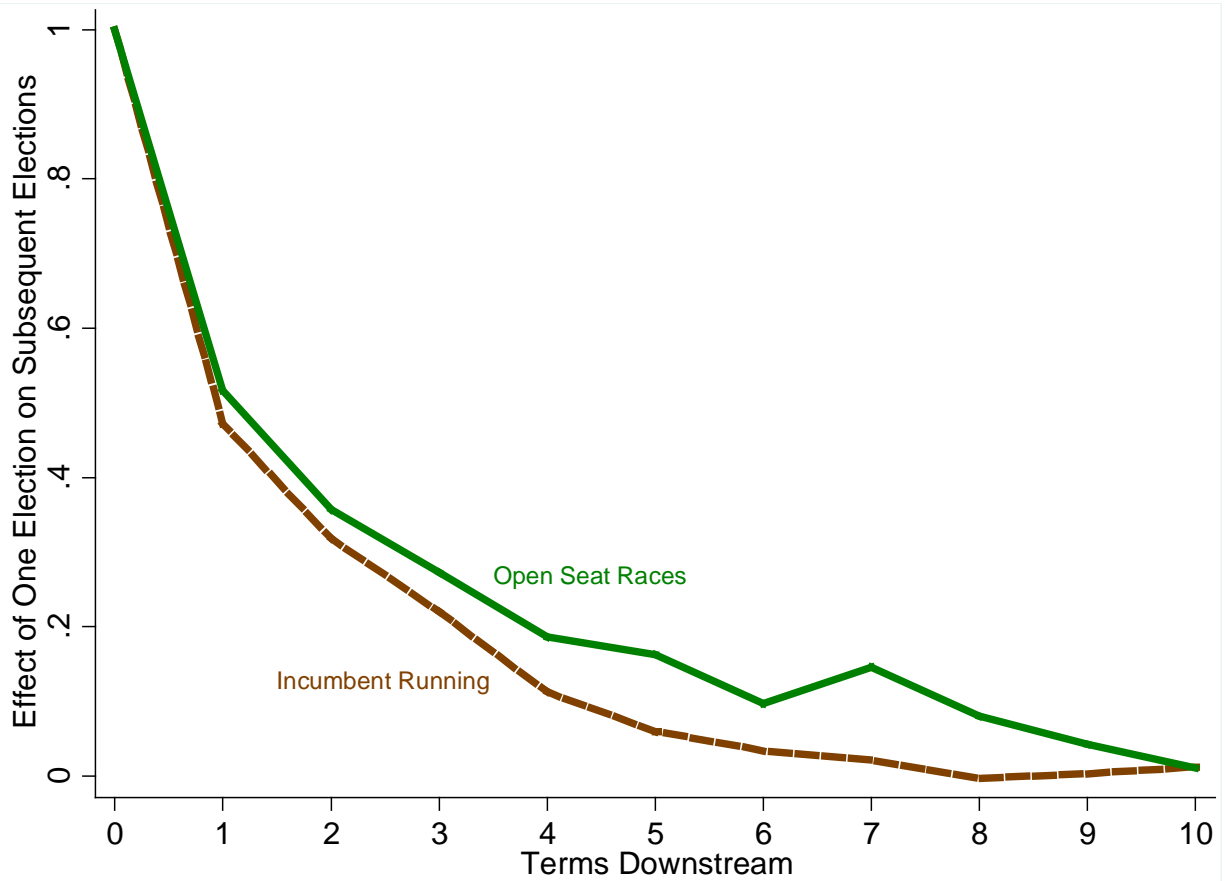
The black curve is identical to that in the top left panel of Figure 3, showing the downstream effects of one election result on subsequent elections results in the U.S. House. Long-term effects of elections are expected simply because one election influences the next election. However, the duration of effects that we observe is even greater than we would expect from a simple markov-chain model. The red curve shows the hypothetical effects that we would expect to observe in a markov-chain model. The actual downstream effects of one election are even larger than we would have expected from a simple incumbency advantage model, showing that multiple terms of incumbency exhibit a larger effect on subsequent elections than just one term of incumbency.

Figure 5. Effects are Less Persistent in State Legislatures with Term Limits



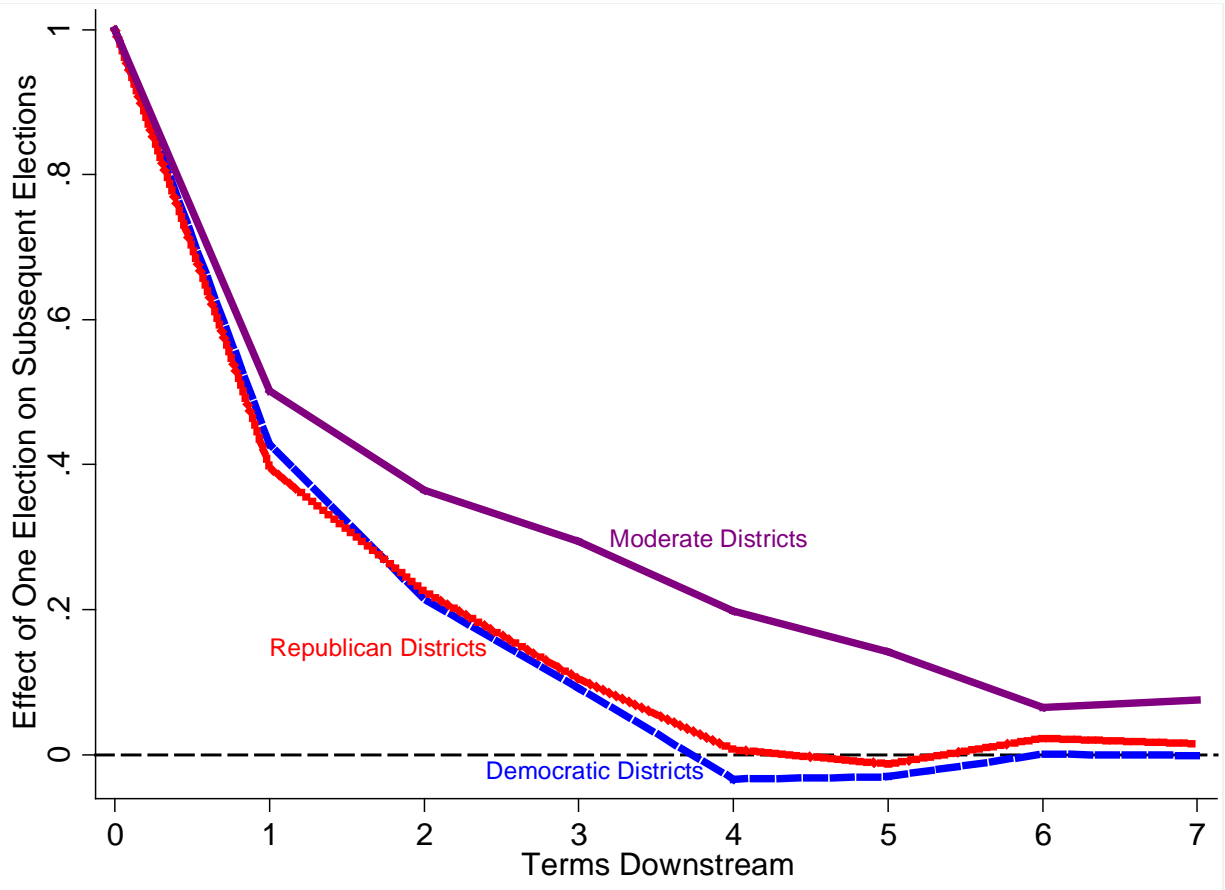
*This figure tests whether the effects of election results over time are driven primarily by individual incumbents who continue to seek reelection over long periods of time by examining state legislative elections with and without term limits. In settings with term limits, the effects of election results are much less persistent than they are in settings without term limits, suggesting that the persistence observed in this study is driven primarily by personal incumbency advantages. Individual legislators continue to win reelection over long periods of time, even when they initially won in a coin flip. When term limits for incumbents to retire, the persistent effects of elections results diminish quickly.*

Figure 6. Effects are More Persistent in Open Seat Races



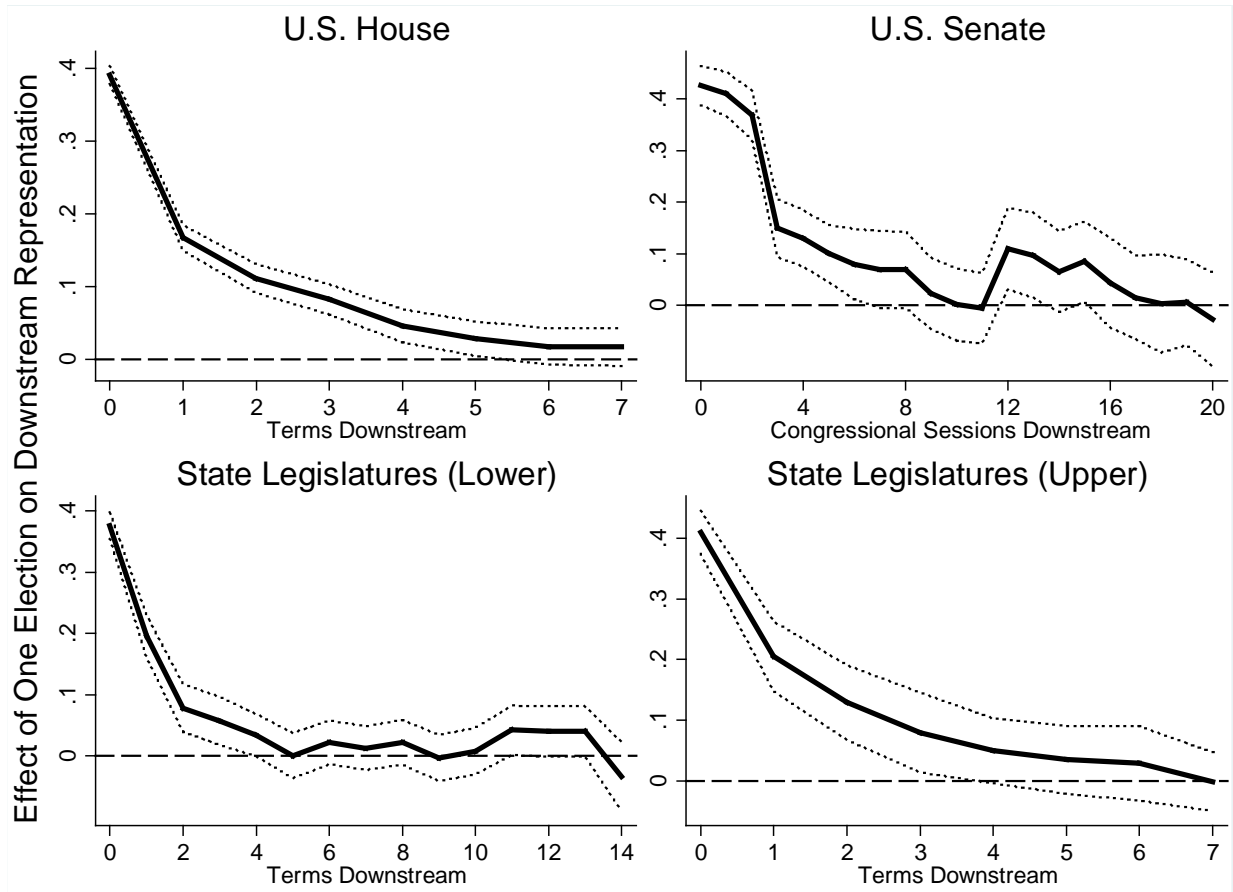
The figure separates open-seat U.S. House races from those where an incumbent seeks reelection at time 1. The curves show the downstream effects of one election result on subsequent elections for each set of elections. In the case of these open seat races where the candidates are typically younger and have longer time horizons, the effects of election results persist for 9-10 terms downstream, influencing the party of the district's representative for the next 20 years, while the effects of elections results where an incumbent seeks reelections persist for only 6 or 7 terms, on average. This analysis further suggests that the long-term returns to incumbency arise from large personal incumbency advantages and the career goals of individual legislators.

Figure 7. Effects are Even Persistent (but less so) in Highly Partisan Districts



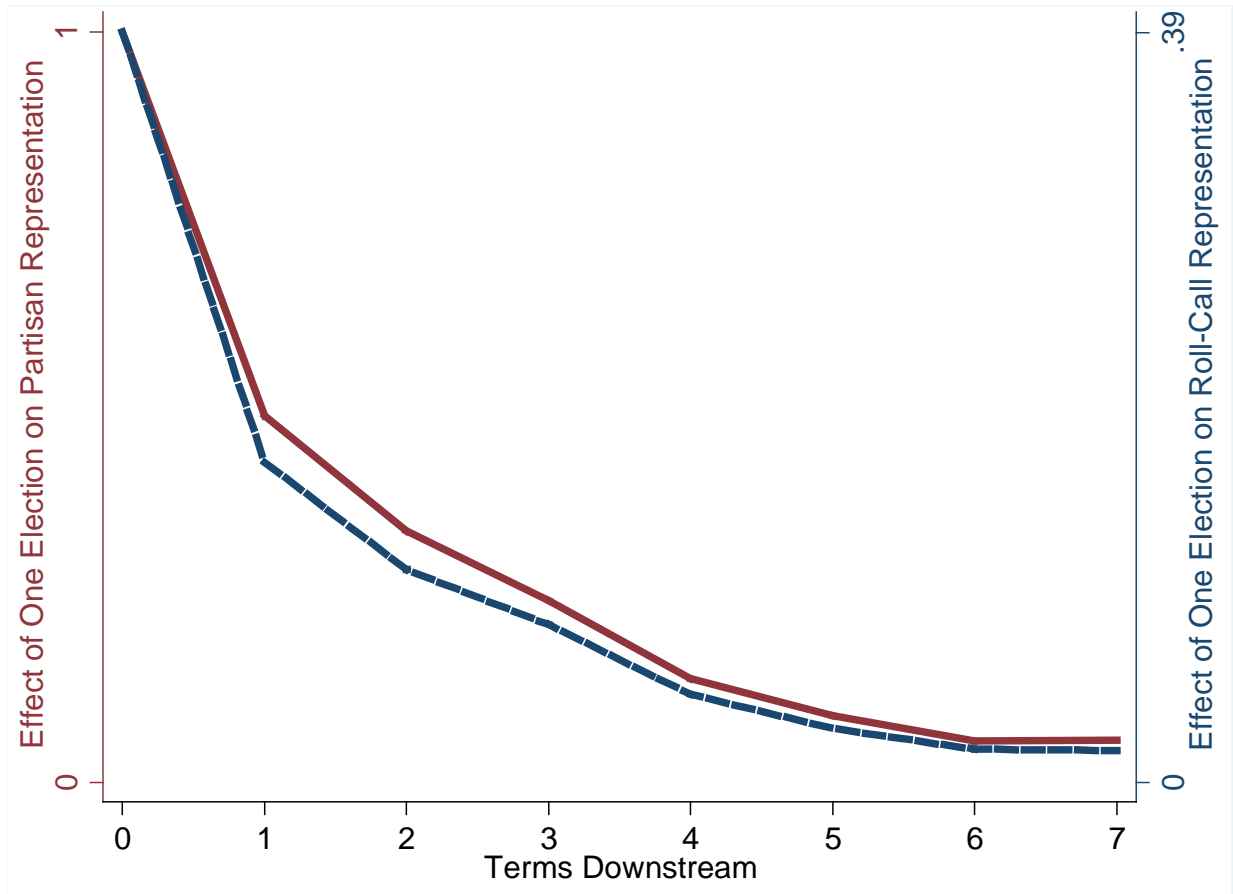
The figure extends the U.S. House results from Figure 3 by subsetting Congressional districts by partisanship. While the effects of elections are most persistent for moderate districts (as indicated by their normal presidential vote), we still see these effects in the most Democratic quarter and the most Republican quarter of districts. Even in these highly partisan districts, a single close election influences subsequent elections 3 terms downstream. This is evidence of significant ideological mismatches between legislators and constituents. When Republican districts happen to elect Democratic representative by chance, they continue to reelect them for several terms.

Figure 8. Long-Term Consequences of Election Results for Legislative Representation



The figure demonstrates the effect of coin-flip elections on the voting behavior of a district's representative for many years downstream in four different settings. Each data point represents a separate regression discontinuity estimate. Dotted lines indicate 95% confidence intervals (standard errors are clustered by state in the case of the Senate and district for all other settings). For example, for the U.S. House in the top left panel, we see that in the first term, close election results influence a district's roll-call representation by 39.0 percentage points. Over the course of the next 7 terms, this effect gradually decreases to 16.7, 11.1, 8.2, 4.6, 2.8, 1.7, and 1.7 percentage points. The effect of a single election persists for at least 5 terms downstream, meaning that a coin flip election now will influence public policy for the next 12 years, on average. We see similar patterns in upper chambers of state legislatures and even longer-term effects in the U.S. Senate and lower chambers of state legislatures. In the case of the Senate, we plot these effects across two-year congressional sessions, rather than six-year Senate terms. Keep in mind that state legislative terms are typically four years for upper chambers and two years for lower chambers, meaning that the result of a single coin flip election influences the way the district is represented in the legislature for well over a decade in all four settings.

Figure 9. Do Legislators Improve with Time?



By essentially overlaying figures 3 and 8, this figure tests whether legislators improve or moderate over time. Can the ability of legislators to learn about their districts and adapt over time explain the persistent effects of one election on subsequent elections? If legislators improve over time in adapting their roll-call behavior to the preferences of their districts, we should see the blue/dashed curve (the persistent effect of one election on roll-call representation) decreasing faster than the red/solid curve (the persistent effect of one election on partisan representation). These two curves track one another in nearly perfect proportion, suggesting that legislators do not keep themselves in power by adapting their roll-call behavior to the district's preferences. Instead, legislators continue to vote in the same way, on average, as when they were originally elected.



## Appendix

### **Does Strategic Sorting Bias our Estimates?**

Several recent papers criticize the use of RD designs in electoral settings (Snyder 2005; Caughey and Sekhon 2011; Grimmer et al. 2012) and raise the possibility that strategic sorting biases RD estimates. The specific concern is that electoral fraud and strategic campaign effort could cause certain high-quality candidates to win extremely close elections more often than expected. We are sensitive to this concern, because this type of strategic sorting could bias our estimates and lead us to overestimate the long term consequences of elections. After conducting a number of robustness tests, we are confident that strategic sorting does not pose a problem for our estimates. Figure A1 presents some of these robustness tests for the U.S. House. The blue line replicates the result previously presented in Figure 8. Each point represents the effect of an election result on the CVP of a district's representative for a particular number of terms downstream.

The red and green lines represent two sets of robustness tests of whether strategic sorting biases our estimates. For the red line, we modify the original analysis by excluding all elections where the Republican vote share was within 0.5 percentage points of the .5 threshold. This “donut” RD estimation (Almond and Doyle 2011; Barreca et al. 2011; Barreca, Lindo, and Waddell 2011) excludes those extremely close elections where fraud and strategic sorting are a particular concern. For the green line, we add several covariates—lagged vote share and lagged incumbency—to our RD estimation to control for potential imbalances that may have arisen from strategic sorting. For both sets of robustness tests our results are completely unchanged. Even after accounting for sorting in multiple ways, we recover almost the exact same point estimates that we obtained in our original analysis. Therefore, strategic sorting does not appear to pose a problem for our estimates.

Further evidence against the sorting hypothesis comes from alternative specifications and implementations of the RD estimation. The researcher must make several choices in estimation

including the bandwidth of data included in the analysis and the order of the polynomial. Flexible model specifications (high order polynomials, small bandwidths) will rely very heavily on observations very close to the threshold, while rigid specifications (low order polynomials, large bandwidths) will be less sensitive to strategic sorting around the threshold. If many different specifications of varying flexibility yield the same results, then the researcher can be more confident in the results and the assumption that potential outcomes do not change discontinuously at the threshold. Figure A2 replicates the results from Figure 8 with many different specifications, ranging from very rigid to very flexible. Specifically, we utilize local linear regressions and vary the bandwidth from .03 to .1, third-order polynomials with bandwidths ranging from .05 to .5, and fourth-order polynomials with bandwidths ranging from .05 to .5. Results are nearly identical across all specifications.

Figure A1. Long Term Consequences of Elections – 2 Tests of Robustness

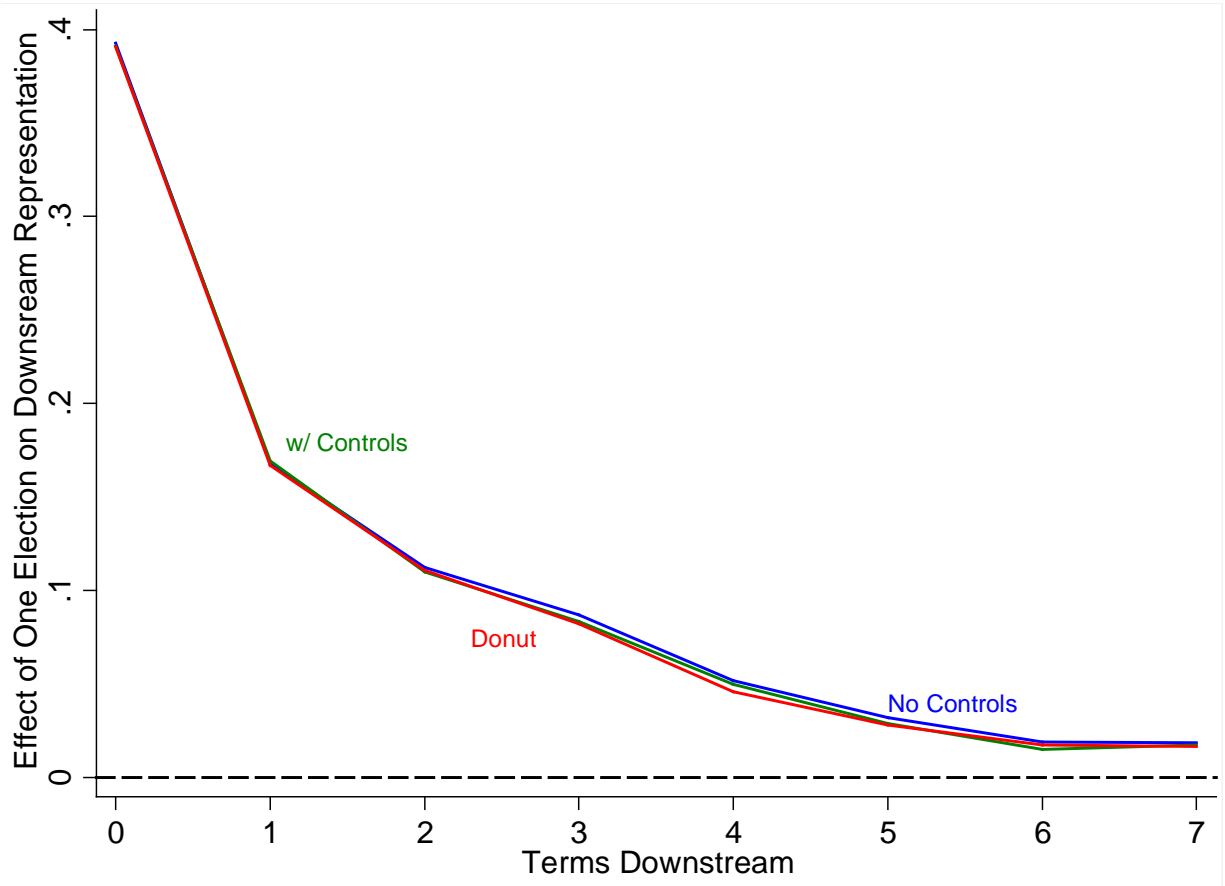
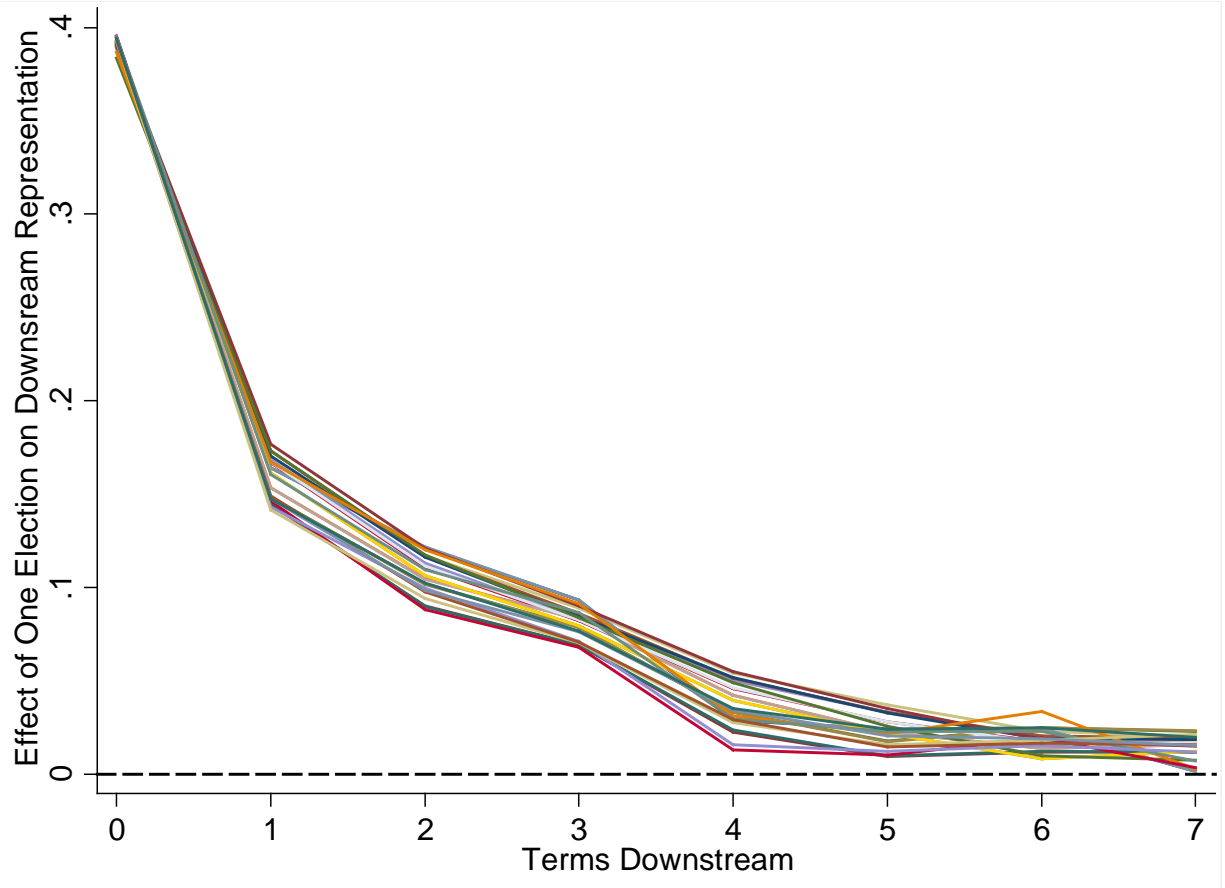


Figure A2. Long Term Consequences of Elections – Many Alternative Specifications



## **Does Redistricting Influence the Long-Term Consequences of Election Results?**

For our main analysis of the U.S. House and state legislatures, we track the voting behavior and roll-call representation of the same district over time, despite the fact that the composition of the district may change as a result of redistricting. This is obviously not an issue for our analysis of the U.S. Senate as state boundaries are constant. Because the time frame of our analysis could potentially span one or more redistricting cycles, we might wonder whether changes in district boundaries influence the long-term consequences of elections.

The effects of redistricting on these long term effects are ambiguous. On one hand, incumbents could use redistricting to keep themselves in power by redrawing their district to improve their electoral chances, although Ansolabehere and Snyder (2008) find that redistricting does not systematically benefit incumbents. On the other hand, incumbents could suffer from redistricting as they lose more of the “personal vote” (Ansolabehere, Snyder, and Stewart 2000) and as the preferences of their electorate change. Relatedly, redistricting could introduce attenuation bias in our analysis as the location and representative for a particular district can completely change as a result of redistricting. Here, we test for these possibilities and find that redistricting appears to have no detectable effect on our estimates in either direction.

To address these questions, we replicate our U.S. House analyses from Figures 3 and 8 using only elections that took place in redistricting years (1952, 1962, 1972, 1982, 1992, and 2002). For this subset of elections, we test for the effects of one election on subsequent elections and downstream representation through 4 terms downstream, while the composition of districts remains constant. For example, consider the election of 2002. We can estimate the effect of 2002 election results on subsequent elections from 2004 to 2010 and on roll-call voting from 2003-2012, a time period during which the composition of districts did not change. Figure A3 replicates the analysis from Figure 3 for all years (purple) and only redistricting years (green). If incumbents use redistricting to

benefit their electoral chances, the estimates for all years should be significantly greater than those for only redistricting years. Alternatively, if redistricting hurts incumbents or induces attenuation bias, the estimates for redistricting years should be significantly great. However, the estimates are virtually identical for both samples suggesting redistricting does not exhibit a meaningful effect in either direction.

Figure A4 presents the same analysis for downstream representation (a replication of Figure 8), and again we find virtually identical estimates from the entire sample and from only redistricting years. Redistricting exhibits no discernable effect in either direction on the effect of one election on downstream representation.

Unfortunately, this kind of analysis is not possible for state legislatures, because we only have state legislative roll-call data available for 1999-2000 and 2011-2012. Since state legislatures are responsible for redistricting, it could play a more important role in this setting. However, we do not detect a kink in our state legislative results from Figures 3 and 8 that we might expect if redistricting exhibits large effects in these settings. Moreover, since both of these periods of available roll-call data take place toward the end of their respective redistricting cycles, the first 8 to 10 years of our state legislative analyses are not influenced by redistricting.

Figure A3. Replication of Figure 3 for Windows with Constant Districts

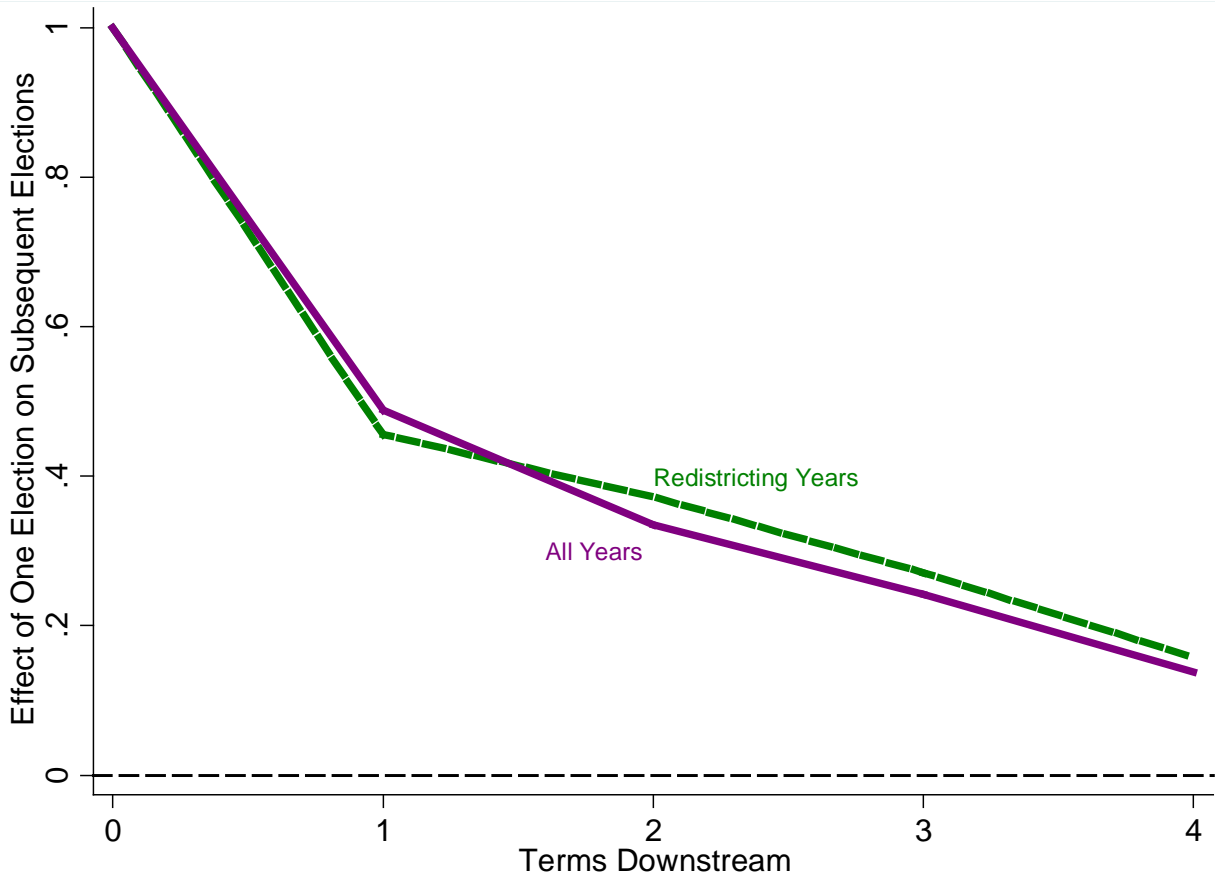
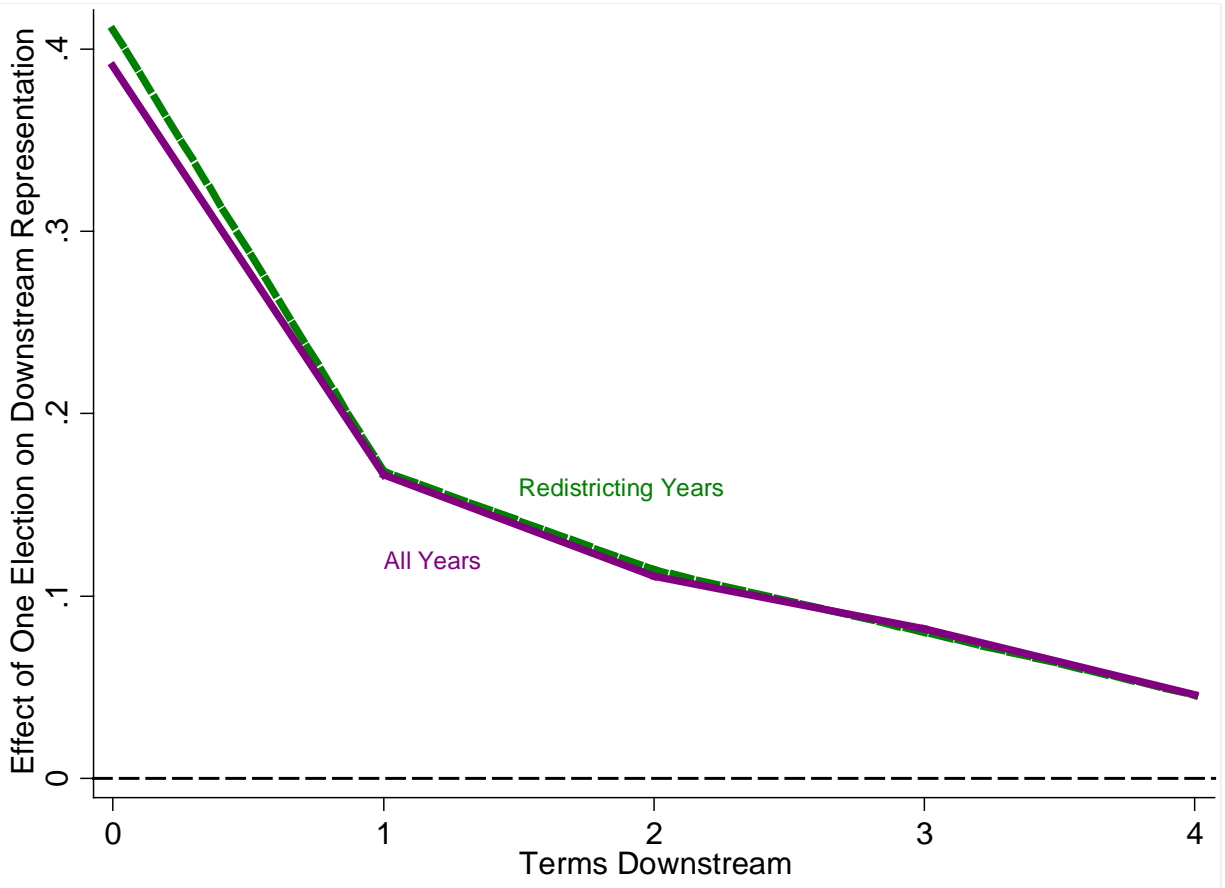


Figure A4. Replication of Figure 8 for Windows with Constant Districts





## Replications using DW-NOMINATE Instead of CVP

Here, we replicate our analyses from Figures 2 and 8 using DW-NOMINATE instead of CVP. We prefer CVP for our main analysis because of its simplicity and substantive interpretability, although we obtain the same results using DW-NOMINATE. Similarly, we would obtain nearly identical results using Heckman-Snyder scores and Bayesian IRT scores which are both highly correlated with DW-NOMINATE (see Clinton, Jackman, and Rivers 2004 for comparisons of these three measures).

One complication is that we conduct our main analyses at the district or seat level rather than at the level of individual politicians. For examples, in analyzing the U.S. House, we construct CVP estimates for every district-congress, pooling roll-call votes or multiple individuals in cases where multiple legislators represented the same district in the same term due. However, DW-NOMINATE estimates apply to individual legislators. Therefore, in the cases where multiple legislators served in the same seat and the same congressional session, we average the DW-NOMINATE scores for all legislators that served, weighting each one by the proportion of roll-call votes cast by each person.

Figures A5 and A6 replicate our analyses of the House and Senate from Figures 2 and 8, respectively, using DW-NOMINATE instead of CVP as the dependent variable. In each case, the figures look nearly identical to those using CVP. Of course, the scales and point estimates are not comparable so we cannot directly compare the point estimates, but the shapes of the figures are nearly identical. One advantage of CVP is that the point estimates can be directly interpreted in terms of probabilities of voting conservatively while the point while the point estimates using DW-NOMINATE are arbitrary and can only be interpreted relative to one another. Nonetheless, the figures demonstrate that our results are not sensitive to the specific roll-call measure that we use.

Figure A5. Replication of Figure 2 with DW-NOMINATE

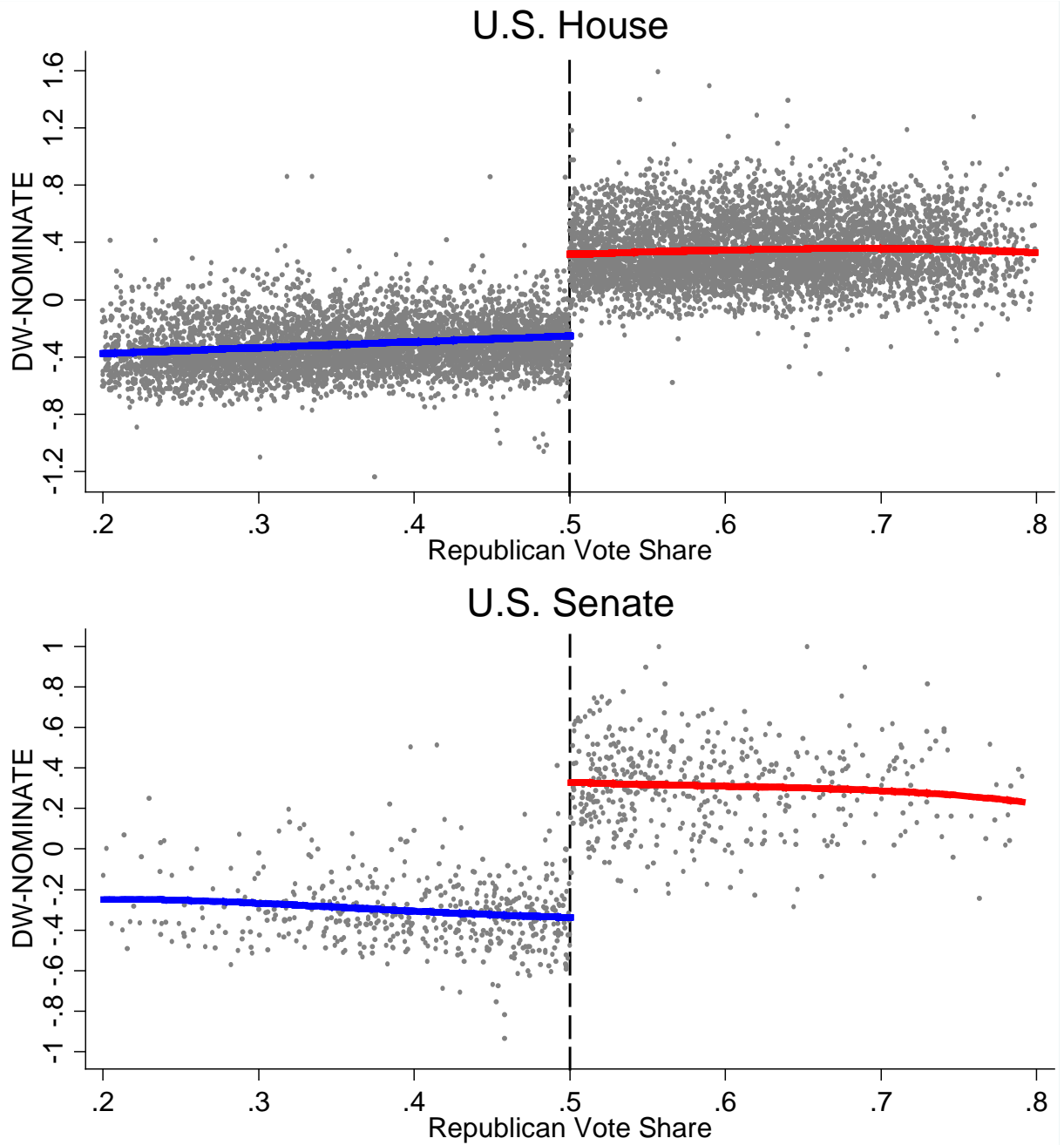
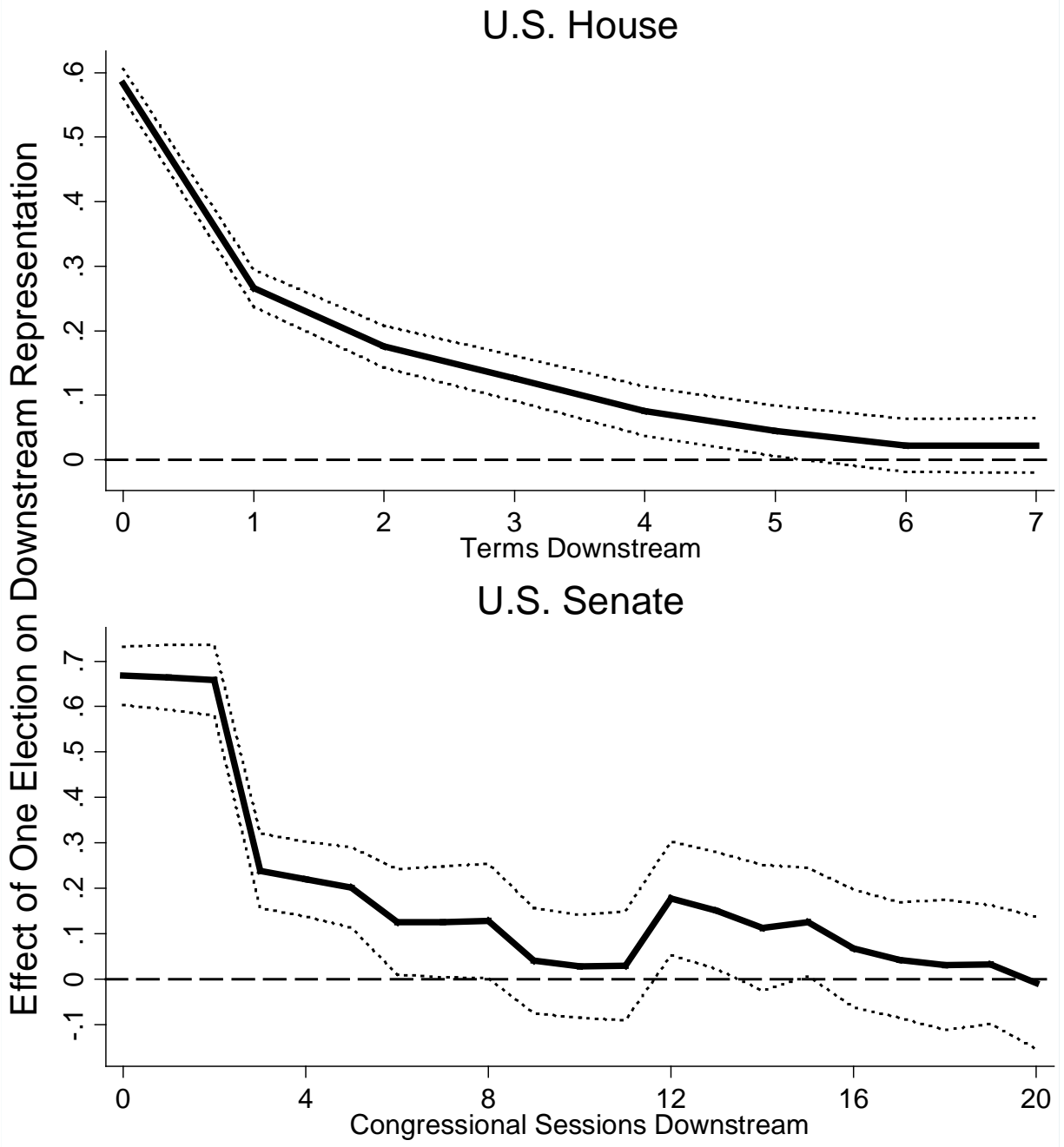


Figure A6. Replication of Figure 8 with DW-NOMINATE



## Variation in the Effects over Time

Our main analyses present average effects across a wide range of years. Even if the effects of elections have varied significantly across the period of study, our estimates still provide unbiased averages. Nonetheless, this variation is interesting in and of itself, and we explore it here. Due to sample size limitations in the Senate and data limitations for state legislatures (remember that the roll-call data is only available for 1999-2000 and 2011-2012), we focus our analysis here on the U.S. House.

Figure A7 presents variation over time on the effect of one election on subsequent elections. In principle, we could replicate our analyses for each year in our study, but these estimates would be highly imprecise due to sampling error and the small number of close elections in each year. However, we can obtain more precise estimates by examining several elections at once. Here, we analyze eight-year windows, encompassing 5 different election years. Figure A7 replicates the results from Figure 3 for all possible eight-year windows in our sample. For example, the left most points on the figure—1950—refer to the 1946, 1948, 1950, 1952, and 1954 elections, those closest in proximity to 1952. Then, for example, at 1952, we present results from 1948-1956, etc. At any given point along the horizontal axis, the graph presents RD estimates of the effect of one election result on subsequent election results 1 to 8 terms downstream. As  $k$  increases, the maximum year on the graph decreases, because we have not yet observed the relevant elections.

Partially consistent with the incumbency advantage literature, we see that the effect of one election result on subsequent elections has increased slightly over time. However, the changes have been neither drastic nor monotonic. Throughout the entire period of study, a single election result had had substantively large and statistically significant effects on subsequent elections at least 4 or 5 terms downstream, and the consistency and magnitude of these results stand out more than the variation.

Figure A8 presents the same extension for Figure 8, analyzing variation over time in the effect of one election result on downstream representation. Figure A8 presents one version of this analysis using CVP, to mirror that in Figure 8, and another using DW-NOMINATE, mirroring the analysis in Figure A6. We show results for both measures to assure readers that our results are not sensitive to the specific measure and because DW-NOMINATE scores are intended to be comparable over time while CVP scores are not (their scale can vary depending on the congressional agenda in each session). Again, we find that the effects of one election on downstream representation have increased slightly over time. However, these effects are substantively large and quite consistent across the entire period of study.

Figure A7. Variation in Figure 3 Estimates over Time

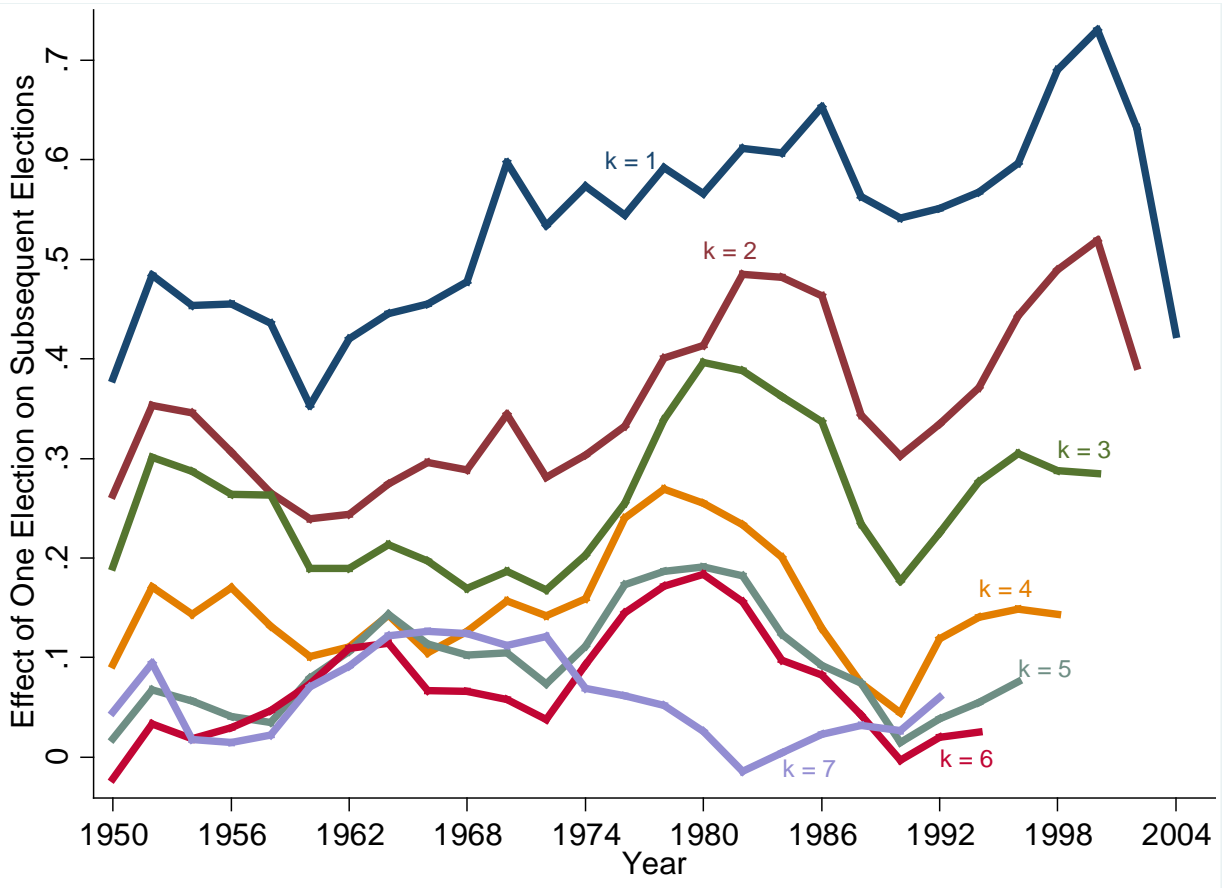


Figure A8. Variation in Figure 4 Estimates over Time

