How Do Legislators Adapt to New Electorates?

Evidence from Redistricting in Congress and American State Legislatures

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Abstract

A central question about democracy is whether elected officials adapt their policy-making as their constituents' preferences change. Existing research, however, focuses exclusively on incumbents who remain in office following constituency change. This paper leverages redistricting in the U.S. House (1980-2024) and all ninety-eight partisan state legislatures (1990-2024) to provide a comprehensive account of how legislative representation changes when electorates are redrawn. Pairing a continuous-treatment difference-in-differences design with roll-call- and interest-group-based measures of representation, I show that reelected incumbents adapt to their new electorates, but these within-legislator adjustments are modest relative to the representational shift associated with electing a new legislator. Instead, studying a new dataset of legislators' home addresses, I find that incumbents facing newly unfavorable electorates regularly decline to seek reelection and, conditional on running, are more likely to be voted out of office. Taken together, these results suggest that American legislative elections function less as a continuous incentive for policy convergence and more as a mechanism for filtering representatives.

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1 Introduction

A cornerstone of democratic theory is that politicians represent their electorate's preferences, and, when these views change, they adapt their policymaking. This idea forms the foundation of the median voter theorem, which predicts that electoral incentives in two-party races generate convergence to the median voter (Black, 1958; Downs, 1957; Hotelling, 1929). Subsequent theoretical work, however, casts doubt on the Downsian convergence hypothesis, citing factors including policy-motivated candidates (Alesina, 1988; Besley and Coate, 1997; Osborne and Slivinski, 1996), party discipline (Lee, 2009), voter abstention (Adams and Merrill, 2003), and the multi-stage nature of American elections (Bernhardt and Ingberman, 1985), among others. Do elected officials adapt to their constituents' preferences in office? A small set of influential studies exploits redistricting-induced constituency change to isolate how constituency change affects legislative representation (Albouy, 2011; Bertelli and Carson, 2011; Glazer and Robbins, 1985; Leveaux-Sharpe, 2001; Stratmann, 2000) and communication (Kaslovsky and Kistner, 2025). While foundational, as I detail below, data and design limitations prevent these studies from fully characterizing how legislators adapt to their constituents' preferences, because they focus exclusively on incumbents who remain in office following constituency change.

To address these challenges, I combine new and existing data on constituency change and legislators' home addresses with a continuous-treatment difference-in-differences design to systematically evaluate how representation changes following redistricting. This approach allows me to distinguish within-legislator ideological adaptation from changes driven by legislator replacement, and to analyze both incumbents' decisions to seek reelection as well as voters' decisions to reelect incumbents conditional on running. By incorporating all ninety-eight partisan state legislatures (1990-2024), in addition to the U.S. House (1980-2024), I also greatly expand the power of my analysis and am able to assess whether classical theories of electoral responsiveness generalize to increasingly-consequential—yet often overlooked—down-ballot legislatures.

Consistent with classic theories of democratic responsiveness, I find clear evidence that reelected legislators adapt their representation in the direction of their new electorates. This pattern holds across multiple measures of ideology, including roll-call voting—which allows me to account for anticipation effects before district maps are enacted (Boatright, 2004)—and special interest groups' ratings—which help bridge roll-call voting across legislative sessions. However, these within-legislator adaptation effects are small in comparison to the change in representation that occurs when an incumbent is replaced by a new legislator, even after accounting for the well-documented divergence in how the two parties represent the same district. I estimate that within-legislator adaptation is one-tenth to one-fifth as large as the representational shift associated with legislator replacement.

Having shown that legislative replacement, rather than within-legislator adaptation, accounts for the majority of representational change following constituency change, the second half of the paper examines how incumbents are replaced. I focus on two mechanisms: strategic retirement and electoral selection. Using a new dataset of legislators' home addresses compiled from voter files, campaign finance records, and administrative sources, I show that incumbents are significantly less likely to seek reelection when their prospective electorate becomes less favorable (strategic retirement), and that those who do run are less likely to prevail (electoral selection). The retirement response is estimated to be substantially larger than the effect of constituency change on electoral defeat, and both effects are amplified in legislatures with strict residency requirements, where incumbents cannot readily sort across district lines after redistricting and must, instead, confront an unfavorable electorate or exit office.

Taken together, these results suggest that incumbents' positions are relatively stable, and that changes in representation occur primarily when incumbents do not seek reelection or are voted out of office. In this sense, elections function less as a continuous incentive for policy convergence and more as a mechanism for filtering representatives.

These results are particularly salient amid the recent wave of mid-decade redistricting.

As of December, 2025, six states have adopted new non-decennial district maps, with seven others poised to follow suit.[1] My results suggest that, rather than compelling incumbents to moderate toward newly-drawn constituencies, these new district maps will primarily shift legislative representation by prompting strategic exits and electoral defeats among misaligned legislators.

The remainder of the paper is organized as follows. Section two situates my analysis in previous studies of legislative representation and explains why new data and designs are necessary. Section three then introduces my empirical strategy, including two measures of legislators' ideological representation and new data on district partisanship. Following that, section four examines how redistricting-initiated constituency change affects legislators' ideological representation and distinguishes within-legislator adaptation from between-legislator replacement. Next, section five analyzes how strategic retirement and electoral selection shape whether incumbents are replaced after redistricting. Finally, section six discusses key implications and concludes.

2 Using Redistricting to Study Legislative Adaptation

A rich empirical literature investigates the extent to which legislators represent the preferences of their electorate. Beginning with the seminal work of Miller and Stokes (1963), scholars have long relied on surveys of voters to gauge whether politicians' positions correspond to the preferences of their electorate. While subsequent studies debate the magnitude of this relationship (Achen, 1978; Erikson, 1978), the results largely suggest a correspondence between legislators' policymaking and their constituents' preferences.[2]

While these studies are foundational, they provide a static snapshot of legislative repre-

[1] For current information on mid-decade redistricting efforts, see the National Conference of State Legislatures (`https://www.ncsl.org/redistricting-and-census/changing-the-maps-tracking-mid-decade-redistricting`).

[2] Later aggregate-level work also compares district presidential vote shares to the ideal points of elected representatives and the policies they enact, reporting evidence of a positive relationship between voters preferences and legislators' representation (Ansolabehere, Snyder, and Stewart, 2001; Canes-Wrone, Brady, and Cogan, 2002; Clinton, 2006; Erikson, Wright, and McIver, 1993).

sentation, and, hence, are unable to evaluate whether legislators adapt to *changes* in their electorates. Studying whether legislators adapt to their electorates' preferences is crucial, because public opinion evolves over time (Zaller, 2006), and the results indicate how responsive American legislatures are to changing circumstances and public opinion. From a theoretical perspective, studying within-legislator adaptation also indicates whether elections serve as a one-time filter or a continuous incentive for responsiveness, particularly as incumbents' reelection rates remain remarkably high (Friedman and Holden, 2009).

Redistricting offers a unique opportunity to study how legislators adapt to changing electorates. In most settings, shifts in constituency preferences occur alongside broader political forces—such as national tides, party realignment, or changes in issue agendas—making it difficult to isolate whether legislators are adapting to their voters or to these concurrent shocks. Redistricting, by contrast, reshapes constituencies quasi-exogenously by redrawing district boundaries, often producing abrupt changes in the composition of legislators' electorates. This feature allows researchers to observe how legislators respond when their constituencies change while holding many broader political trends constant.

An important strand of prior research exploits redistricting-induced constituency change to assess whether members of the U.S. House who serve both before and after redistricting adapt to their new electorates, often reaching sharply conflicting conclusions. Some studies document substantial convergence toward new constituencies (Glazer and Robbins, 1985; Leveaux-Sharpe, 2001; Stratmann, 2000), while others find little or no evidence of within-legislator adaptation (Albouy, 2011; Bertelli and Carson, 2011; Poole and Rosenthal, 2006; Poole, 2007).

These studies, however, face two fundamental challenges. First, existing work focuses exclusively on legislators who were reelected following redistricting and, therefore, cannot examine how representation changes when incumbents retire or are defeated. Because legislators who experience larger changes in their prospective constituencies may be more likely to exit office, prior studies may have systematically missed cases in which the effects of

constituency change are largest.[3] To address this limitation, I match distinct legislative electorates across redistricting cycles, enabling comparisons of representation under both reelection and replacement. In addition, I assemble a new dataset of legislators' home addresses to infer the districts retiring incumbents would plausibly have faced.

A second challenge is that previous studies typically examine only a single redistricting cycle in the U.S. House. This narrow empirical scope limits statistical power and may help explain the conflicting findings in the literature. A central contribution of this paper is to assemble data on redistricting in all ninety-eight partisan state legislatures, in addition to the U.S. House, over an extended timeframe. This expanded dataset substantially increases statistical power while extending the analysis to numerous substantively important policy-making arenas. Because state legislatures often operate in lower-information environments with weaker media coverage (Carey et al., 2006; Myers, 2025; Rogers, 2023), they also provide a more demanding test of theories of legislative adaptation.

In this section, I have motivated my study of legislative adaptation and outlined the limitations of existing approaches. I now transition to introducing the data and empirical framework used to evaluate how legislators respond to constituency change.

3 Measuring Redistricting-Initiated Constituency Change and Ideological Representation

Understanding how legislators adapt to their electorates following redistricting requires three elements: a measure of constituency change, data on legislative representation, and information on distinct legislative constituencies across redistricting cycles. This section introduces the data and measurement strategies used to construct each component.

Throughout the paper, I study redistricting in the U.S. House (1980-2024) and all ninety-

[3]Moreover, analyzing replaced legislators, alongside reelected incumbents, provides a natural benchmark for assessing within-legislator adaptation without placing legislators and voters on the same scale (Achen, 1978).

eight partisan state legislatures (1990-2024).[4] The resulting dataset captures the near universe of redistricting over this period, including decennial plans enacted in 1982, 1992, 2002, 2012, and 2022, as well as the vast majority of all non-decennial redistricting plans. In total, my analysis dataset includes 501 sets of distinct maps covering 17,010 legislators.[5]

3.1 Measuring District Partisanship

I begin by measuring how redistricting alters the partisan composition of legislators' constituencies. While an electorate's preferences vary along many dimensions, I measure constituency change using districts' two-party presidential vote share, a metric that is widely available and, crucially, highly visible to legislators themselves following redistricting.[6]

To isolate the change in an electorate's preferences induced by boundary shifts, rather than secular trends in political identification, I reallocate the same precinct-level presidential election returns to pre- and post-redistricting district boundaries. This approach captures the mechanical effect of redistricting itself while removing variation driven by local or national electoral swings.

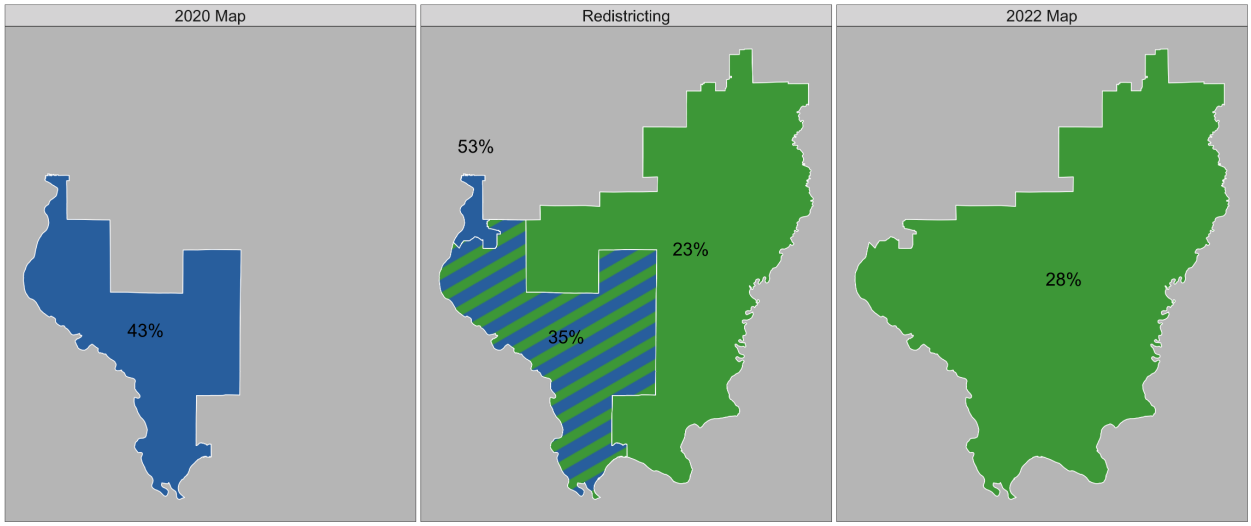
Figure 1 illustrates this process using Illinois Representative Mike Bost as an example. Before redistricting in 2022, the left panel of Figure 1 shows that the Democratic presidential candidate's (i.e., Joseph R. Biden's) two-party vote share was 43% in 2020. Using the same 2020 presidential election returns, the middle panel of Figure 1 shows how redistricting reshaped the district: Bost gained a Republican-heavy area (solid green), retained a core constituency (striped green and blue), and lost a Democratic stronghold (solid blue). As the right panel shows, following redistricting, the two-party Democratic presidential vote share in Bost's district was 28%. The change in presidential vote share in Bost's district calculated

[4] I exclude Nebraska's non-partisan unicameral legislature from my analysis.

[5] This number includes 182 congressional maps (4 decennial redistricting cycles $\times$ 43 states without at-large House districts plus 10 non-decennial maps) and 319 state legislative maps (3 decennial redistricting cycles $\times$ 98 legislative chambers plus 36 non-decennial maps minus 10 legislatures with missing data in 2010).

[6] Previous work suggests that presidential vote share provides a useful summary of constituency preferences (Brady, Canes-Wrone, and Cogan, 2000; Jacobson, 2000). Other studies that use district presidential vote share to measure voter preferences include Ansolabehere, Snyder, and Stewart (2001), Canes-Wrone, Brady, and Cogan (2002), Erikson (1978), Erikson and Wright (1980, 1997), and Schwarz and Fenmore (1977).

Figure 1 – Example of Presidential Vote Share Composition Calculation. For each redistricting plan, presidential vote share is calculated by reallocating the precinct-level election returns from the same election to pre- and post-redistricting district boundaries. The figure below depicts this process for Illinois Representative Mike Bost during the 2022 decennial redistricting. Democratic presidential vote shares in 2020 are reported in black, pre-redistricting boundaries are colored blue while post-redistricting boundaries are colored green.



using the same 2020 presidential election returns is therefore 15 percentage points (43% - 28%).

I repeat the process depicted in Figure 1—reallocating the same presidential election returns to "old" and "new" district boundaries—for every set of district maps in my dataset. Table 1 reports the presidential election used for each redistricting cycle along with the underlying data sources. Data on the 1988 presidential vote comes from various editions of *Politics in America*, the 2000 presidential vote was provided by Bertelli and Carson (2011), geo-located data for the 2008 election is from the Harvard Election Data Archive, and geo-located data for the 2020 election is from the U.S. Elections Project and supplemented by the author from the various secretaries of state websites.[7,8]

[7]Geo-located data for a small number (10) of state legislatures were not available in 2010 and are excluded from my analysis.

[8]As a robustness check, I also construct a measure of district partisanship for 2020 using a 100% sample of voter files from the commercial data vendor L2. Specifically, I geocode the address of every registered voter in the country as of August 2022 and allocate the same voters to pre- and post-reapportionment districts. Since party registration is imputed by L2 for the 31 states that do not report partisan affiliation, I prefer

Table 1 – Presidential Vote Reference Years. This table reports the year of the presidential vote used to calculate district partisanship for each decennial redistricting cycle included in the analysis along with the data sources. I use the vote share from the most-recent prior presidential election in cases of court-initiated redistricting.

Redistricting Cycle	Presidential Vote Reference Year	Data Source(s)
1990	1988	*Politics in America 1990 & 1996.*
2000	2000	Bertelli & Carson (2011); Ansolabehere & Snyder (2011).
2010	2008	Harvard Election Data Archive.
2020	2020	U.S. Elections Project; various secretaries of state websites.

3.2 Matching Constituencies Across Redistricting Cycles

When incumbents run for reelection, pre- and post-redistricting constituencies are directly observable. When incumbents choose to not seek reelection, however, the corresponding post-redistricting constituencies are not readily observable.[9] To study how representation changes following redistricting—regardless of whether the incumbent remains in office—it is therefore necessary to map constituencies across redistricting cycles.

To do so, I match pre- and post-redistricting constituencies using population-weighted census-tract overlap. Using this method, a pair of electorates is classified as the same constituency when each district selects the other as its highest-overlap counterpart.[10] This process produces a unique match for every pair of pre- and post-redistricting maps. Throughout the paper, I refer to a "constituency" as a distinct pairing of electorates in a given redistricting cycle.

For validation, I apply the same matching procedure to cases where incumbents stand for reelection. In over 99% of cases, this approach correctly pairs the same districts as

the presidential election vote measure of partisanship. However, my substantive results remain unchanged when using the voter file-based measure of partisanship for the most recent redistricting cycle.

[9]This is because districts are not always labeled the same following redistricting, or they may not exist at all.

[10]More precisely, using census tract-level population data, I calculate the population-weighted overlap between the set of pre- and post-redistricting districts in a given state. I then record a given pair of districts as the same "constituency" if both districts have the maximum overlap with the other relative to all other possible districts.

reelected incumbents ultimately represent. Hence, the unit of analysis throughout the paper is the legislative constituency. For reelected incumbents, the constituency is defined by the districts they represent; for replaced incumbents, it is defined by the population-weighted overlap match described above.[11]

3.3 Measuring Legislator Ideological Representation

Finally, I require a measure of legislators' ideological representation in office. I employ two complementary measures, each designed to address a distinct empirical challenge.

3.3.1 Allowing for Anticipatory Effects Using Roll-Call Votes

A central methodological challenge for this present study is that legislators learn the composition of their future electorate before the post-redistricting session begins. If legislators begin adjusting their representation during this interim period, simple pre/post comparisons based on legislative session start/end dates will likely underestimate the true extent of adaptation.[12] There is good reason to expect such anticipatory behavior: Boatright (2004), for instance, documents that incumbents in North Carolina altered their representation in anticipation of changes to their electorate in the 1990s.

To address this concern, I construct a measure of legislators' ideological representation using roll-call voting, allowing me to precisely control which periods of legislators' representation are classified as pre- and post-redistricting. I begin by collecting the dates that all 501 redistricting plans in my sample became law.[13] Appendix Figure A.1 visualizes when states finalized their 2022 decennial redistricting plans. Across my sample, the final set of district maps was signed into law an average of 191 days before the start of the next legislative session, suggesting that accounting for anticipatory effects may be meaningful.

[11]Results are highly similar if overlap-based seat matches are used for reelected legislators as well.

[12]This is because, if incumbents adapt to their electorate in the period between the date their new electorates are finalized and the beginning of the next legislative session, that adaptation would make their pre-redistricting representation look closer to their post-redistricting adaptation.

[13]Roughly 65% of this data comes from All About Redistricting (`https://redistricting.lls.edu/`). I collect data on the remaining 35% of maps from governmental and journalistic sources.

I assemble roll-call data from Vote View (for Congress) and Legiscan and Fouirnaies and Hall (2022) (for state legislatures), respectively. I then generate measures of candidates' roll-call representation using the Conservative Vote Probability (CVP) methodology from Fowler and Hall (2012). CVP scores measure the probability that a legislator votes in the conservative direction on any given bill relative to the chamber's median legislator. These scalings run from -1 (most liberal) to 1 (most conservative) and have been previously employed in similar empirical settings (Fowler and Fu, 2024; Fowler and Hall, 2017, 2016). While I prefer CVP scores because they are easy to interpret, my conclusions are similar when employing the literature-standard W-NOMINATE algorithm from Carroll et al. (2009) and Poole and Rosenthal (1985) to scale candidates.[14]

3.3.2 Ideological Interest Group Ratings

While CVP-based scalings are easy to interpret, they rely on important assumptions about agenda stability and chamber polarization. Previous work, for instance, suggests that changes in the underlying agenda of a legislature or swings in partisan control may limit comparisons of standard roll-call based measures of ideology over time (Bateman, Clinton, and Lapinski, 2017; Handan-Nader, 2023; Tausanovitch and Warshaw, 2017). To relax these assumptions, I analyze interest groups' ratings of legislators' issue-specific roll-call voting records. By selecting a subset of bills and scoring legislators based on their votes on them, special interest groups help generate a stable issue agenda and bridge legislators' ideology across legislative sessions.[15] I compile a dataset containing 70,000 ratings of members of

[14]Note that I do not study common-space NOMINATE or DW-NOMINATE scalings because the former are static over a legislator's career while the latter are constrained to evolve linearly (or according to some other smooth function) over a legislator's career. The Nokken-Poole period-specific NOMINATE scaling takes a hybrid approach, first estimating roll-call locations via a constant ideal point model to estimate session-specific legislator ideal points. Unfortunately, Nokken-Poole period-specific NOMINATE scalings are not readily available for state legislatures. My results are, however, very similar when using Nokken-Poole period-specific NOMINATE scalings for Congress throughout this paper.

[15]Previous research suggests that interest groups carefully select the bills they include in their ratings with an eye towards continuity over time (e.g., Fowler, 1982). Prior work that uses interest group ratings to measure legislators' ideology includes Berry et al. (1998), Canes-Wrone, Brady, and Cogan (2002), Fouirnaies and Hall (2022), Holkrook-Provow and Poe (1987), and Lee, Moretti, and Butler (2004).

Congress and state legislatures made by special interest groups from Project Vote Smart and supplemented by data from the various groups' websites.

Because interest group ratings are produced relative to each group's agenda, rather than anchored to a left-right scale like CVP scores, raw interest group ratings are not inherently comparable across groups. I therefore implement two complementary strategies to standardize these scalings' polarity. First, I focus on the subset of interest groups that are explicitly ideological, relying on groups that Project Vote Smart classifies as "Liberal" or "Conservative." For these groups, polarity is clear by construction, and I recode all scores onto a common 0 (most liberal) to 100 (most conservative) scale using the rule:

$$Interest\ Group\ Rating_{igt} = \begin{cases} 100 - Raw\ Rating_{igt} & \text{if } g \text{ is labeled Liberal} \\ Raw\ Rating_{igt} & \text{if } g \text{ is labeled Conservative,} \end{cases} \quad (1)$$

where $Raw\ Rating_{igt}$ is the unadjusted rating assigned by interest group g to legislator i in session t. Hence, $Interest\ Group\ Rating_{igt}$ runs from 0 (most liberal) to 100 (most conservative) for every interest group.[16]

To expand my coverage, I then extend this approach to all interest groups in my sample by inferring polarity from the distribution of their ratings. Specifically, for each group, I compare the average rating assigned to Democratic versus Republican legislators, and classify the group as liberal or conservative when the mean score for one party is at least twice that of the other.[17] I then use Equation 1 to set the polarity of these groups' ratings.

[16]Interest groups' ratings may not be immediately comparable across time due to shifts and stretches in scales (Groseclose, Levitt, and Snyder, 1999). For example, an interest group's rating may shift by 25 points for all members in a given year, or the distance between ratings may stretch by a common factor. By including interest group-by-session fixed effects, my design differences out shifts in scales. Unfortunately, fixed effects will not remedy concerns about stretched scales, although changes of this nature should be small over the two-period comparisons I examine. As a robustness check, in Appendix Table B.1, I replicate my main analysis after applying the correction procedure outlined by Groseclose, Levitt, and Snyder (1999). My results are very similar. Because the Groseclose, Levitt, and Snyder correction constrains the way legislators' ratings change across time, I prefer the unadjusted ratings, matching Canes-Wrone, Brady, and Cogan (2002).

[17]To ensure I am making meaningful comparisons, I omit interest groups where the inter-party rating differential is less than this threshold. The results are robust to a variety of cutoff values.

This section has laid out the empirical foundations of the analysis, introducing new measures of constituency change, legislative seats, and ideological representation that allow adaptation and replacement to be identified separately. By combining these components, the design makes it possible to evaluate how representation responds to redistricting both within legislators who remain in office and across legislators when seats change hands. I now turn to estimating these effects and assessing the relative importance of adaptation and replacement following constituency change.

4 Replacement Effects Dominate Adaptation Effects Following Constituency Change

Building on the data and measures introduced in Section 3, this section studies how legislative representation changes when electorates are redrawn. Theoretically, constituency change may alter legislative representation through two channels. First, incumbents who remain in office may adapt their representation to their new electorate (within-legislator adaptation). And second, representation may shift because voters elect a new legislator (between-legislator replacement). The analyses that follow estimate the contribution of each channel to post-redistricting ideological representation.

4.1 Evidence from Conservative Vote Probabilities

I begin by analyzing the roll-call-based CVP score. To estimate how legislators adapt when their constituency changes, I implement a continuous-treatment difference-in-differences design that relates shifts in the partisan composition of a constituency to changes in roll-call representation. Specifically, I estimate OLS regressions of the form

$$Ideology_{ct} = \beta Dem\ Pres\ Vote\ Share_{ct} + \alpha_c + \delta_{ht} + \varepsilon_{ct}, \tag{2}$$

Table 2 – Reelected Members of Congress and State Legislators Adapt their Roll-Call Voting to their New Electorate Following Redistricting. Reelected legislators whose districts become more liberal (conservative) vote more liberally (conservatively) in the subsequent legislative session, but this effect is small in comparison to the change in roll-call representation when the incumbent is replaced.

	Reelected Legislators		Replaced Legislators	
	Congress	State Leg.	Congress	State Leg.
	(1)	(2)	(3)	(4)
Democratic Pres. Vote Share	-0.12	-0.13	-0.84	-0.73
	(0.03)	(0.08)	(0.19)	(0.16)
Democrat			-0.62	-1.20
			(0.02)	(0.02)
N	1,850	7,470	444	3,182
Seat-Redistricting FEs	Y	Y	Y	Y
Chamber-Session FEs	Y	Y	Y	Y

Note: Robust standard errors are clustered by constituency in parentheses. In all columns, the outcome is a legislator's CVP scaling and is scaled to run from -1 (most liberal) to 1 (most conservative) in each chamber. The unit of analysis is the constituency-redistricting-session. Sample restrictions in headers indicate whether the same legisaltor was in office before and after redistricting (columns one and two), or a different legislator was elected following redistricting (columns three and four).

where $Ideology_{ct}$ is the CVP score for the legislator representing constituency c in legislative session t, and $Dem\ Pres\ Vote\ Share_{ct}$ is the Democratic candidate's two-party vote share in constituency c in session t. Constituency fixed effects, α_c, absorb all time-invariant confounders across seats, while chamber-session fixed effects, δ_{ht}, capture common shocks across chambers and election cycles. Identification therefore comes from comparing differences in pre/post outcomes across units that experience larger versus smaller shifts in their electorate's composition.

Table 2 reports estimates of the effect of constituency change on legislators' roll-call representation, measured using CVP scores. As described in Section 3.3.1, CVP scores measure the probability that a legislator votes in the conservative direction on a given bill relative to the chamber median, with higher (lower) values representing more conservative (liberal) voting records.

First, columns one and two restrict my sample to constituencies where the incumbent is

reelected following redistricting, isolating within-legislator adaptation. I find clear evidence that both members of the U.S. House and state legislatures adjust their roll-call voting in the direction of their new electorate. The negative coefficients on *Dem Pres Vote Share* indicate that, as an incumbent's constituency becomes more Democratic (Republican), they vote more liberally (conservatively) in office. Substantively, a 10 percentage point increase in Democratic presidential vote share is associated with an .12- and .13-percentage point increase in the probability of casting a liberal roll-call vote, relative to the chamber median, in the U.S. House and state legislatures, respectively.

Columns three and four examine a second channel of representational change—replacement. When an incumbent does not continue to represent a seat after redistricting, representation may change because voters select a new legislator with different policy positions. To probe this possibility, columns three and four of Table 2 focus on seats in which the incumbent is replaced following redistricting. In addition to *Dem Pres Vote Share*, I include an indicator for whether the legislator is a Democrat to account for the well-documented differences in how Democrats and Republicans represent the same constituency.

Looking at the results, the coefficients on *Democrat* are negative and significant, indicating that, on average, Democratic legislators represent the same constituency with more liberal roll-call voting than Republicans. Specifically, Democratic members of Congress and state legislators are at least 62 percentage points more likely to cast a liberal roll-call vote than their Republican counterparts. This finding matches previous work documenting divergence in the ideological representation of each party (Lee, Moretti, and Butler, 2004; Fowler and Hall, 2016). More important for this study are the coefficients on *Dem Pres Vote Share*, which capture the change in roll-call representation that accompanies constituency change, after accounting for the different representation provided by Democratic and Republican legislators. The coefficients are -.84 and -.73 in Congress and state legislatures, respectively. These estimates imply that, if a seat became 10 percentage points more liberal, the succeeding legislator would be 8.4 and 7.3 percentage points more likely to vote in the liberal

direction.

By comparing estimates across the two sets of columns, we can evaluate the extent to which changes in representation following constituency change are driven by within-legislator adaptation and between-legislator replacement. For Congress, the within-legislator adaptation effect is 14% of the between-legislator adaptation effect ($-.12/-.84 \approx .14$). For state legislatures, the within-legislator adaptation effect is 18% of the between-legislator adaptation effect ($-.13/-.73 = .18$).

Taken together, these results suggest that, while incumbents adapt their roll-call representation in the direction of their new electorate, these effects are dwarfed by the change in representation accompanying the replacement of the sitting incumbent.

4.2 Evidence from Interest Group Ratings

The roll-call analysis above suggests that incumbents adapt their roll-call voting to their electorates, but that this within-legislator adaptation is modest relative to the change in representation that occurs when seats change hands. Although CVP scores allow me to account for anticipatory effects, previous work suggests that shifts in legislative agendas or partisan control may limit comparisons of roll-call based ideology over time. To address this concern, I complement the roll-call analysis with interest group ratings, which are designed to capture stable ideological priorities across legislative sessions and chambers (Fowler, 1982).

Because each legislator typically receives multiple ratings from different interest groups, I restructure the data so that each observation corresponds to an individual rating assigned by group g to the legislator in constituency c serving in session t. I then estimate OLS equations of the form

$$Interest\ Group\ Rating_{gct} = \beta Dem\ Pres\ Vote\ Share_{ct} + \alpha_{gc} + \gamma_{ght} + \varepsilon_{gct}, \qquad (3)$$

where $Interest\ Group\ Rating_{gct}$ is the polarity-adjusted rating given by group g to the legis-

lator in constituency c and session t, $Dem\ Pres\ Vote\ Share_{ct}$ is the Democratic candidate's two-party vote share in seat c during session t, α_{gc} denotes constituency-by-interest group fixed effects, and γ_{gch} stands in for interest group-by-chamber-by-session fixed effects. This specification makes within-interest group comparisons of an incumbent's ideology over time, after accounting for each interest groups' average ratings of legislators in the same chamber and session.

Table 3 – Effect of Constituency Change on Ideological Interest Group Ratings. Reelected legislators whose districts become more liberal (conservative) receive more liberal (conservative) interest group ratings in the subsequent legislative session, but this effect is small in comparison to changes in representation stemming from legislative replacement.

	Reelected Legislators		Replaced Legislators	
	Congress	State Leg.	Congress	State Leg.
	(1)	(2)	(3)	(4)
Democratic Pres. Vote Share	-9.14	-14.64	-72.80	-70.43
	(3.13)	(5.87)	(13.80)	(19.39)
Democrat			-56.86	-44.20
			(1.21)	(1.96)
N	23,442	8,596	3,670	2,128
Seat-Redistricting FEs	Y	Y	Y	Y
Chamber-Session FEs	Y	Y	Y	Y

Note: Robust standard errors are clustered by constituency in parentheses. In all columns, the outcome is a legislator's interest group rating and is scaled to run from 0 (most liberal) to 100 (most conservative). The unit of analysis is the group-constituency. Sample restrictions in headers indicate whether the same legisaltor was in office before and after redistricting (columns one and two), or a different legislator was elected following redistricting (columns three and four).

Table 3 presents the results using only ratings from ideological interest groups. Columns one and two examine legislators who were in office both before and after redistricting. The estimates indicate that incumbents whose districts become more Democratic (Republican) receive more liberal (conservative) ratings from ideological interest groups following redistricting. Substantively, I estimate that a 10 percentage point increase in Democratic presidential support is associated with a .914-point (U.S. House) and 1.464-point (state legislatures) liberal shift in interest group ratings. In Appendix C.1, I show that these results hold when I expand my analysis to a broader set of interest groups that disproportionately favor one

party over the other.

Columns three and four focus on seats where the incumbent is replaced following redistricting. In these cases, the effect of constituency change is substantially larger. A 10 point liberal shift in district composition predicts a 7.28-point liberal shift in interest group ratings in the U.S. House a 7.043 point shift in state legislatures. These models also report clear evidence partisan divergence: Democratic legislators provide systematically more liberal representation than Republicans holding the same seat.

Comparing the magnitudes of within-legislator adaptation (columns one and two) and between-legislator adaptation (columns three and four), I again find that the vast majority of change in representation following redistricting flows from changes in *who* represents a district, rather than *how* that district is represented. In Congress, within-legislator adaptation is approximately 12% ($-9.14/-72.80 = .12$) of the replacement effect; in state legislatures, it is about 20% ($-14.64/70.43 = .20$).

Taken together, the estimates from roll-call voting records and interest group ratings tell the same story. Incumbents who are reelected following constituency change do move in the direction of their new electorate, but these adjustments are small relative to the shift in representation that accompanies the election of a new representative. Across both measures of ideology, within-legislator adaptation represents roughly one-tenth to one-fifth of the total change in representation. Whether the incumbent is reelected is thus the most important feature in shaping subsequent ideological representation.

5 Strategic Retirement and Electoral Selection

The analysis so far indicates that most representational change following redistricting occurs when seats change hands, rather than when sitting incumbents adapt in office. Understanding replacement is therefore essential for explaining how constituency change translates into representational change. In particular, how does constituency change affect whether incum-

bents run for reelection, and, conditional on running, whether they maintain their seats?

In this section, I separate these two margins. First, I examine how shifts in district partisanship affect legislators' decisions to seek reelection (i.e., strategic retirement). And second, conditional on running for office, I study how these same shifts affect incumbents' probability of winning (i.e., electoral selection).

A long-running literature predicts that incumbents' decisions to seek reelection are sensitive to their electoral prospects (Jacobson and Kernell, 1981). As their prospective electorates become less favorable, incumbents are therefore expected to be less likely to stand for reelection. Direct evidence linking constituency change to retirement decisions, however, remains limited. Jacobson and Kernell (1981) show that aggregate retirement rates track national swings in congressional support, while later work using individual-level data documents patterns consistent with strategic exit (Stone et al., 2010; Highton, 2017). The strongest existing test comes from Groseclose and Krehbiel (1994), who examine redistricting-induced constituency change during the House banking scandal; however, because their design focuses on changes in absolute rather than directional partisanship, it cannot distinguish between favorable and unfavorable shifts. As a result, we still lack direct evidence on whether—and how—directional constituency change shapes incumbents' decisions to run for reelection and their electoral survival conditional on running.

I address this gap by combining newly assembled data on legislators' home addresses with the continuous-treatment difference-in-differences framework introduced above. This design allows me to observe the counterfactual electorates retiring incumbents would have faced, estimate the effect of constituency change on the decision to run, and, conditional on running, evaluate how these changes affect win probability.

5.1 Observing Counterfactual Electorates Using Legislators' Home Addresses

A central challenge for studying legislative replacement is that, using standard data, we cannot observe the counterfactual districts that incumbents would have represented were they to seek reelection. To address this gap, I collect new data on most legislators' home addresses, allowing me to infer the post-redistricting district in which they would have competed were they to run for reelection.

I assemble data on legislators' home addresses using three sources. My primary source is the official voter registration files for all fifty states.[18] Using the R package *reclin2*, I built a machine learning algorithm that probabilistically matches the candidates from my elections returns dataset to the appropriate state's voter file.[19] To minimize the possibility of false matches, I block on state, last name, and district (i.e., state house, state senate, or U.S. House district) and drop matches with less than a 95% match probability.

When I cannot confidently match a legislator to the voter file, I use the addresses collected by the commercial data vendor Know Who, which records the home addresses of many American legislators. In remaining cases, I obtain legislators' addresses from the FEC (for members of Congress) and secretary of states' disclosure forms (for state legislators).

After geocoding this database of addresses, I use GIS software and shapefiles from the Census Bureau to identify the post-redistricting district that retiring legislators would plausibly have represented were they to seek reelection from their current residence.

Not all candidates for American legislative office are legally required to reside in the district they would represent, however. Table 4 summarizes the minimum residency requirements imposed by states and the federal government prior to filing, election day, or swearing-in. As columns one and four of Table 4 show, all forty-nine partisan state legislatures require residency in a candidate's prospective district at some point while running for

[18] Voter file data are from the commercial data vendor L2.

[19] When missing from official election returns, data on candidates' middle names were supplemented by their Wikipedia page wherever possible.

Table 4 – Residency Requirements in American Legislatures. This table reports the minimum length candidates must reside in their prospective district prior to election, filing, or swearing-in (columns one and four) and whether they must live in their districts while in office (columns two and five). Columns three and six indicate whether the combination of prospective and contemporaneous requirements prevents legislators from strategically selecting the district they represent following redistricting.

Legislature	(1) Req. During Candidacy	(2) Req. During Tenure	(3) Limits Strategic Selection	Legislature	(4) Req. During Candidacy	(5) Req. During Tenure	(6) Limits Strategic Selection
AL	1 Year†	Yes	Yes	MT	6 Months†	No	No
AK	1 Year*	Yes	Yes	NV	1 Year†	Yes	Yes
AZ	1 Year†	No	No	NH	On Elec. Date	Yes	Yes
AR	1 Year†	Yes	Yes	NJ	1 Year†	Yes	Yes
CA	1 Year$^{\dagger\%}$	No	No	NM	On Swear-In	Yes	Yes
CO	1 Year†	No	No	NY	1 Year$^{\dagger\$}$	No	No
CT	On Elec. Date	Yes	Yes	NC	1 Year†	Yes	Yes
DE	1 Year†	Yes	Yes	ND	On Swear-In	Yes	Yes
FL	2 Years†	Yes	Yes	OH	1 Year$^{\dagger\#}$	Yes	Yes
GA	1 Year†	Yes	Yes	OK	On Swear-In	No	No
HI	3 Years$^{\dagger\#}$	Yes	Yes	OR	1 Year†‡	Yes	Yes
ID	1 Year†	Yes	Yes	PA	1 Year†	Yes	Yes
IL	2 Years†§	No	No	RI	30 Days†	No	No
IN	1 Year†	No	No	SC	When Filing	No	No
IA	60 Days†	Yes	Yes	SD	When Filing	Yes	Yes
KS	When Filing	Yes	Yes	TN	1 Year†	Yes	Yes
KY	1 Year†	Yes	Yes	TX	1 Year†	Yes	Yes
LA	1 Year*§	Yes	Yes	UT	6 Months†	Yes	Yes
ME	3 Months†	Yes	Yes	VT	1 Year†	No	No
MD	6 Months†	Yes	Yes	VA	On Elec. Date	Yes	Yes
MA	5/1 Year H/S†	No	No	WA	When Filing	Yes	Yes
MI	30 Days†	Yes	Yes	WV	1 Year†	Yes	Yes
MN	6 Months†	No	No	WI	1 Year†	Yes	Yes
MS	2 Years†	Yes	Yes	WY	1 Year†	Yes	Yes
MO	1 Year†	Yes	Yes	Congress	No Req.	No	No

† Relative to general-election date.
* Relative to filing date.
§ Redistricting exception: New district covers any portion of old district.
‡ Redistricting exception: Resident since January 1st.
$^{\#}$ Redistricting exception: May move outside of represented district after redistricting.
$^{\$}$ Redistricting exception: Live in county containing new district.
$^{\%}$ Redistricting exception: No residency requirement following redistricting.

office. Candidates for the U.S. House, by contrast, must only reside within their prospective state.

In addition to requirements over residency before entering office, some state legislatures require legislators to maintain residence in their district while in office, as columns two and five of Table 4 report. In states with continuous residency requirements, legislators must maintain residence in their district throughout their term or leave office, effectively fixing the district in which they can seek reelection to the post-redistricting district that contains their current residence.[20] In states without explicit continuous residency requirements (including the U.S. House), legislators may relocate after redistricting without vacating their seat, generating the possibility of strategic district selection. Columns three and six of Table 4 identify states where legislators could, in principle, change districts following redistricting without abandoning their pre-redistricting office. Below, I explore whether these institutional residency requirements make legislators more likely to retire following an unfavorable change in their constituency.

5.2 Unfavorable Constituency Change Reduces Incumbents' Willingness to Seek Reelection and Increases Electoral Defeat

Having introduced my strategy for identifying the counterfactual districts that retiring legislators would represent, I now turn to estimating how redistricting-induced constituency change affects incumbents' decisions to seek reelection and, conditional on running, their electoral success.

In this section, I estimate equations of the form

$$Election\ Outcome_{i,t+1} = \beta[Pres\ Party\ VS_{i,t+1} - Pres\ Party\ VS_{i,t}] + \delta_{ht} + \varepsilon_{it}, \quad (4)$$

where $Election\ Outcome_{i,t+1}$ is an indicator for whether legislator i either i) ran for office or ii) won office in $t+1$ (i.e., the "after" period). The term $[Pres\ Party\ VS_{i,t+1} - Pres\ Party\ VS_{i,t}]$ measures the change in the two-party vote share that candidate i's co-

[20] One theoretical exception is resigning early to reestablish residency elsewhere.

Table 5 – Effect of Constituency Change on Incumbents' Retirement and Win Probabilities. Legislators whose districts become less friendly are less likely to win reelection, run for office, and win conditional on running for office.

	$Pr(Reelected_{t+1})$		$Pr(Run_{t+1})$		$Pr(Reelected_{t+1}\|Run_{t+1})$	
	Binding Residency Requirement	Non-Binding Residency Requirement	Binding Residency Requirement	Non-Binding Residency Requirement	Binding Residency Requirement	Non-Binding Residency Requirement
	(1)	(2)	(3)	(4)	(5)	(6)
Δ Party Pres. Vote Share	0.96	0.74	0.82	0.53	0.30	0.29
	(0.19)	(0.22)	(0.19)	(0.21)	(0.16)	(0.14)
N	2,483	2,084	2,483	2,084	1,790	1,680
Chamber-Redistricting FEs	Y	Y	Y	Y	Y	Y

Note: Robust standard errors are clustered by legislator in parentheses. Δ *Party Pres. Vote Share* is the change in a candidate's copartisan presidential vote share induced by redistricting between election t and $t+1$. *Party Pres. Vote Share*$_{t+1}$ is imputed using legislators' home addresses for legislators who do not seek reelection in time $t+1$.

partisan presidential candidate received between the district maps in session t and $t+1$. Finally, δ_{ht} is a chamber-by-redistricting cycle fixed effect. Intuitively, this design makes within-chamber-redistricting cycle comparisons of probabilities of running and/or winning across incumbents facing smaller and larger constituency change.

My estimates of Equation 4 are reported in Table 5. I begin in the first two columns by estimating the overall probability that a legislator wins reelection following redistricting. In legislatures where residency requirements prevent strategic district selection, column one reports large and relatively precise effects of constituency change on reelection rates. Specifically, I estimate that, if a legislator's prospective district becomes 10 percentage points less friendly, their probability of winning reelection in the next election declines by 9.6 percentage points. In legislatures where residency requirements do not bind (including the U.S. House), the effect of constituency change on reelection probability is a slightly smaller 7.4 percentage point decline for every 10 percentage points decline in copartisan presidential vote share.

The effects identified in columns one and two of Table 5, however, mask two underlying mechanisms. First, facing a new and less-friendly constituency, legislators may choose to not run for office at all. And second, conditional on running for office, legislators may fail to win reelection because they are voted out of office by their new constituency.

The third and fourth columns of Table 5 investigate the first possibility. In these columns,

I study the probability that legislators run for reelection. In both states with binding and non-binding residency requirements, I find evidence that legislators' decisions to seek reelection are sensitive to the composition of their prospective electorate, but this effect is substantially larger in legislatures with binding residency requirements. For every 10 percentage points a legislator's prospective district becomes less favorable, I estimate their probability of standing for reelection declines by 8.2 (5.3) percentage points in legislatures with binding (non-binding) residency requirements.

Finally, columns five and six evaluate whether voters systematically evict remaining legislators who seek reelection despite unfavorable changes in their district's composition. To do so, I restrict the sample from columns one and two to legislators who choose to stand for reelection, isolating the electoral selection margin. Across both institutional settings, I find clear evidence that incumbents that run in districts that become less favorable are more likely to lose. In legislatures with binding residency requirements, a 10 percentage point decline in copartisan presidential vote share reduces the probability of winning conditional on running by 3.0 percentage points. A similar 2.9 percentage point decline is observed in legislatures where residency requirements do not bind. While the direction of this effect may be unsurprising, it is important to note that this electoral selection effect is substantially smaller than the effect of constituency change on strategic retirement.

Taken together, the results in Table 5 indicate that constituency change affects legislative representation through two distinct channels. Legislators facing newly unfavorable electorates are both more likely to withdraw from electoral competition and—when they seek office—more likely to be voted out of office. Notably, the estimated effects of constituency change are more than two times larger on the strategic retirement margin than on electoral selection, implying that replacement is driven primarily by incumbents' decisions to exit rather than by defeat at the hands of voters.

6 Discussion

A central question about democracy is whether elected officials adapt their policy positions as their constituents' preferences change. Despite its importance, previous work is unable to fully characterize how constituency change alters legislative representation because it focuses on legislators who are reelected. Leveraging extensive new data on redistricting in the U.S. House and all ninety-eight partisan state legislatures, this paper shows that the central driver of representational change following constituency change is legislative replacement, rather than within-legislator adaptation.

Across multiple measures of ideology—including roll-call voting and special interest group ratings—I find consistent evidence that incumbents who are reelected modestly adjust their representation in the direction of their new electorate. However, these within-legislator adaptation effects are small in comparison to the change in representation associated with electing a new legislator, amounting to roughly one-tenth to one-fifth of the representational shift generated by replacement. As a result, the overwhelming share of representational change following redistricting is driven by replacement, rather than adaptation.

The second half of the paper investigates how legislative replacement plays such a large role in representational change. Leveraging a new dataset on legislators' home addresses, I document that incumbents facing newly unfavorable electorates are much less likely to seek reelection, and that those who do run are more likely to be defeated. Importantly, the effect of constituency change on strategic retirement is more than twice as large as its effect on electoral defeat conditional on running. These patterns are particularly pronounced in legislatures with binding residency requirements, where incumbents have limited ability to avoid an unfavorable post-redistricting district.

These results have implications for longstanding debates about political responsiveness. While classic Downsian models emphasize adaptation to the median voter (Downs, 1957; Hotelling, 1929; Black, 1958), the evidence here suggests that incumbents' ideological positions are relatively stable, matching citizen-candidate-type models (Osborne and Slivinski,

1996; Besley and Coate, 1997; Alesina, 1988). Electoral accountability instead operates mainly through selection: legislators who become mismatched with their constituencies are more likely to exit, and voters replace those who persist. In this sense, elections function less as a continuous incentive for policy convergence and more as a mechanism for filtering representatives.

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Online Appendix:

How Do Legislators Adapt to New Electorates?

Evidence from Redistricting in Congress and American State Legislatures

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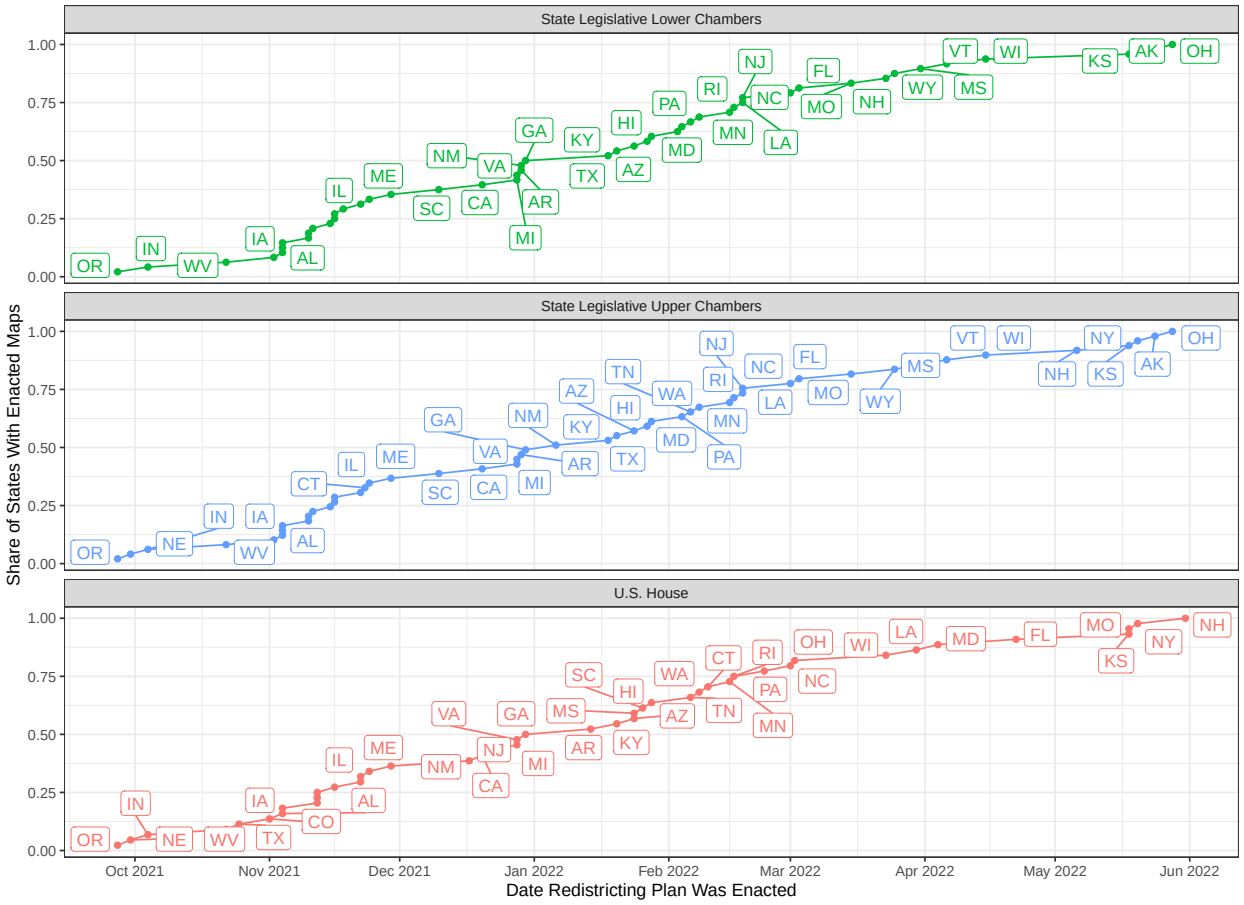
Contents

A Variation in Adoption of Decennial Redistricting Plans

As discussed in the main text, a key methodological challenge when comparing legislators' roll-call representation before and after redistricting is that reelected legislators become aware of the treatment (i.e., the new set of district maps they will represent) before the start of the post-redistricting legislative session. In my sample of redistricting cycles, the final set of district maps was signed into law an average of 191 days before the start of the next legislative session. For example, Figure A.1 plots the timing of states' map adoption during the 2020 redistricting cycle. In Section 3.3.1, I describe how to account for this possibility by measuring incumbents' ideological representation relative to the date their new districts were announced.

Figure A.1 – Share of States With Enacted Maps, 2022 Decennial Redistricting Cycle. For each set of legislative chambers, this figure plots the cumulative share of states that had enacted a new redistricting plan during the 2022 redistricting cycle.



Note: State legislative districts in Montana were finalized in February 2023 and are omitted from the figure for clarity.

B Accounting for Stretch and Shrink Factors

Groseclose, Levitt, and Snyder (1999) show that, since legislators vote on a changing set of bills across sessions, roll-call-based ideological scalings may not be immediately comparable across time due to shifts and stretches in scales. For example, an interest group's rating may shift by 25 points for all members in a given year, or the distance between ratings may stretch by a common factor. By including interest group-by-session fixed effects, my design differences out shifts in scales. Unfortunately, fixed effects will not address concerns about stretched scales, although changes of this nature should be small over the two-period comparisons I examine.

As a robustness check, Appendix Table B.1 replicates my main analyses after applying the correction procedure outlined by Groseclose, Levitt, and Snyder (1999). My results are substantively identical. Because the Groseclose, Levitt, and Snyder correction constrains the way legislators' ratings change across time, I prefer the unadjusted ratings, matching Canes-Wrone, Brady, and Cogan (2002).

Table B.1 – Effect of Constituency Change on Groseclose, Levitt, and Snyder-Adjusted Interest Group Ratings. Reelected legislators whose districts become more liberal (conservative) receive more liberal (conservative) interest group ratings in the subsequent legislative session, but this effect is small in comparison to changes in representation stemming from legislative replacement.

	Reelected Legislators		Replaced Legislators	
	Congress	State Leg.	Congress	State Leg.
	(1)	(2)	(3)	(4)
Democratic Pres. Vote Share	-9.98	-11.85	-68.23	-97.68
	(5.15)	(5.49)	(16.43)	(24.87)
Democrat			-50.34	-43.38
			(1.41)	(2.28)
N	23,380	8,582	3,668	2,128
Seat-Redistricting FEs	Y	Y	Y	Y
Chamber-Session FEs	Y	Y	Y	Y

Note: Robust standard errors are clustered by constituency in parentheses. In all columns, the outcome is a legislator's interest group rating and is scaled to run from 0 (most liberal) to 100 (most conservative). The unit of analysis is the group-constituency. Sample restrictions in headers indicate whether the same legisaltor was in office before and after redistricting (columns one and two), or a different legislator was elected following redistricting (columns three and four).

C Estimates Using All Interest Groups

Table C.1 replicates Table 3 using all available interest groups.

Table C.1 – Effect of Constituency Change on All Interest Group Ratings. Reelected legislators whose districts become more liberal (conservative) receive more liberal (conservative) interest group ratings in the subsequent legislative session, but this effect is small in comparison to changes in representation stemming from legislative replacement.

	Reelected Legislators		Replaced Legislators	
	Congress	State Leg.	Congress	State Leg.
	(1)	(2)	(3)	(4)
Democratic Pres. Vote Share	-9.27	-11.74	-72.26	-25.35
	(2.12)	(3.12)	(9.45)	(6.99)
Democrat			-57.53	-52.87
			(0.82)	(0.83)
N	72,674	34,570	10,136	12,448
Seat-Redistricting FEs	Y	Y	Y	Y
Chamber-Session FEs	Y	Y	Y	Y

Note: Robust standard errors are clustered by constituency in parentheses. In all columns, the outcome is a legislator's interest group rating and is scaled to run from 0 (most liberal) to 100 (most conservative). The unit of analysis is the group-constituency. Sample restrictions in headers indicate whether the same legisaltor was in office before and after redistricting (columns one and two), or a different legislator was elected following redistricting (columns three and four).