Can the Party in Power Systematically Win a Majority in Close Legislative Elections? Evidence from U.S. State Assemblies

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March 3, 2020
First Version: June 20, 2016

Abstract

We study whether ruling parties can systematically win a slender majority of seats in close legislative elections, a phenomenon called "precise control." We test for discontinuities in two outcomes that, in the absence of precise control, should be smooth at the 50% cutoff: the probability density of the share of seats won, and the identity of the party that previously held a majority. We find robust evidence of precise control, but only in high-stakes state elections that determine which party controls Congressional redistricting. Its absence in other elections suggests precise control is a strategic option used at the ruling party's discretion. It shifts its strategy in high-stakes elections from seat maximization to majority-seeking, winning fewer seats but raising the chance it retains its majority. These tactics are disproportionately effective for the party defending a majority. It is 4 times more likely to win than to lose a close election.

Keywords: close elections, sorting, state legislature, electoral competition, redistricting

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‡We are grateful to the editor and 3 anonymous referees for their excellent suggestions. We thank George Bulman, Carlos Dobkin, Laura Giuliano, Justin Marion, Jon Robinson, Alan Spearot, Todd Makse, and participants at seminars at U.C. Santa Cruz, Santa Clara University, Calpoly San Luiz Obispo, and the University of Michigan for helpful suggestions.

In the era of patronage politics, a state's ruling party, even in very close legislative elections, had a suspiciously high probability of barely retaining its majority (Folke et al., 2011). With every election it would mobilize its political machine to guarantee its losses were just small enough to retain a majority. Folke et al. (2011) and others have noted (in passing) that even after civil service reform the ruling party wins a slightly disproportionate share of close legislative elections. But this pattern has long been assumed an artifact, possibly arising because a discrete variable—number of seats won—might inevitably have kinks in the distribution of outcomes.[1]

We give evidence that the systematic tendency for majority parties to barely retain their majorities—a phenomenon sometimes called "precise control"—is not an artifact but a strategic ability that the majority party chooses, at some cost, to exercise. In essence the majority party is able to identify a promising set of districts that comprise a bare majority and, at least in a subset of elections, ensure it wins each district with near certainty. Consistently winning just enough seats to hold the majority induces a discontinuity at 50% in the probability density of the share of seats won by the majority party. We show that these discontinuities arise only in high-stakes elections where it is disproportionately important for the majority party to retain its majority: elections where control of Congressional redistricting is at stake. The absence of a discontinuity in other elections suggests it is not an artifact. Parties actively choose to retain the precise number of seats they need only in elections where holding a bare majority is of especially high value.

The mechanism by which parties exert precise control also explains why they only do so in high-stakes elections. We appeal to the theoretical work of Snyder (1989), who shows that a party seeking to maximize how many seats it wins will optimally choose a different strategy than one seeking to maximize the probability of retaining a majority. This latter strategy, sometimes called a defensive or majority-seeking strategy, becomes optimal when the newly elected legislature must make a key procedural decision, like redistricting, where it is easy to maintain perfect party discipline. We show that in high-stakes elections parties change their spending to be consistent with majority-seeking tactics. Parties spend more; they concentrate their spending in key races; and they discourage incumbents from retiring. Since these tactics are inherently defensive they are disproportionately effective for the party that already holds a majority, potentially explaining why the majority party can exert precise control despite the opposition's countermeasures. Though it is impossible to prove that this shift in tactics by itself enables precise control, it is unlikely to be a coincidence.

[1] See, for example, Feigenbaum et al. (2017); Kirkland and Phillips (2018); Fiva et al. (2018).

While it is not surprising that the majority party would shift its tactics in high-stakes elections, it is surprising that these tactics are so effective. Our results suggest the majority party is 4 times as likely to win than to lose a close election, far beyond what could arise through chance.

Relation to Literature

Substantively our paper is related to the literature in political science on the electoral tactics of political parties. Most relevant is the work of Makse (2014) who shows that parties are more likely to switch to defensive (or "majority-seeking") behavior when redistricting becomes imminent. Jacobson (1985), Gierzynski (1992), Herrnson (1989), Clucas (1992), Thompson et al. (1994), and Stonecash (1988) likewise explore what circumstances cause parties to pursue defensive tactics. Our contribution is to show that the change in tactics is so effective that it induces a discontinuity in the probability distribution of outcomes. This discontinuity implies the party in power can, with uncanny likelihood, ensure it retains just enough seats to hold its majority.

Our work unites this political science literature on electoral competition with the vast literature in economics on precise control and sorting (Dillender, 2016; Einav et al., 2017; Ito, 2014, are just a few examples). The literature has universally focused on cases where it is clear the agent has control over the outcome—for example, a teacher awarding test grades that put students just above the passing threshold. We study a context where the very fact that parties have such precise control is surprising.

In drawing this connection we follow the approach of the recent literature in political science on whether the outcomes of close elections are as good as random. Several papers have found evidence of sorting in close races for the U.S. House (Snyder, 2005; Caughey and Sekhon, 2011; Grimmer et al., 2012). But other work has disputed their conclusions or shown that they are not a general feature of close races in other contexts (Eggers et al., 2015; de la Cuesta and Imai, 2016). Our work is distinct in two ways. First, the papers cited largely focus on the methodological question of whether the regression discontinuity approach first used by Lee et al. (2004) is valid. They are less concerned with the broader question of how political parties can exert precise control over outcomes. Their focus on methodology is in part because of the second distinction: they focus on the outcomes of individual <u>races</u> between candidates rather than the aggregate outcomes of <u>elections</u>. The outcome of one race may have little impact on the composition of the legislature. By contrast, we test whether the incumbent party can edge out victory to remain in control of the legislature. Though some studies have documented

imbalance in aggregate election outcomes (e.g. Feigenbaum et al., 2017), to our knowledge we are the first to exploit variation in the stakes of the election to show that the imbalance is a consequence of the strategic decisions of parties.

Finally, our work extends the vast empirical literature on partisan redistricting in the U.S. (for example, Gelman and King, 1990, 1994a,b; Engstrom, 2006; Glazer et al., 1987; McCarty et al., 2009; Chen and Rodden, 2013; Chen and Cottrell, 2016; Brunell and Grofman, 2005; Hetherington et al., 2003; Grainger, 2010; Ansolabehere and Snyder Jr, 2012; Carson et al., 2007; McCarty et al., 2009; Lo, 2013). The literature remains divided on whether partisan redistricting has any meaningful effect on outcomes. Our results suggest that, at least in the eyes of national political parties, it is vital to deny the opposing side control of redistricting.

Statistical Tests

Suppose a legislature has 99 seats. The probability that the party with a current majority wins exactly 50 seats depends on any number of factors. But it should be close to the probability of winning 49 seats because there is uncertainty in the outcomes of at least some of the underlying races. For example, if the majority party wins each seat with 55 percent probability it would win 50 seats with 5.4 percent probability, similar to the 4.4 percent probability of winning 49 seats. Even if it channeled its resources towards winning only the most promising 55 seats, each with 90 percent probability, it would have an 18 percent chance of winning 50 seats and a 16.5 percent chance of winning 49 seats.[2]

If the probability of winning 50 seats—a bare majority—is drastically higher than the probability of winning 49 seats, it suggests the party can systematically limit its losses to just retain its majority. The party must rank all races and focus its resources on the 50 most promising, tilting the odds in each race until it is all but guaranteed the seat is retained. As the 55-seat example shows, precise control is not possible if the probability of winning each seat is merely very high—it must be close to 1. Precise control is unsettling because its presence implies there is almost no chance the majority party will lose any of the seats it needs to win.

Precise control is distinct from the well-known "incumbency advantage," the tendency for a candidate or party to win more seats if, all else equal, it is the incumbent.

[2]These binomial calculations in fact overstate the difference in probabilities because we assume the outcome of each race is independent. If we allowed aggregate uncertainty the distribution of outcomes would be even smoother.

The distinction is clear in the first example given above. The majority party is expected to win roughly 54 seats (0.55×99), but it does not exert precise control. We can make the distinction formal by defining $X_{i,t}$ as the share of seats won by Democrats in election t. Normalize $X_{i,t}$ to be 0 when Democrats have 50% of the seats. Let $M_{i,t}$ be a dummy for whether Democrats win a majority in election t. Then

Definition 1 (Incumbency Advantage) *There is an incumbency advantage if*

$$\mathbb{E}[X_{i,t} \mid M_{i,t-1} = 1; X_{i,t-1}] - \mathbb{E}[X_{i,t} \mid M_{i,t-1} = 0; X_{i,t-1}] > 0,$$

meaning Democrats win more seats if they held a majority in the previous election.

To formalize precise control it is helpful to define $\tilde{X}_{i,t}$ as the share of seats won by whichever party held a majority in the previous election (again, normalized to be 0 at 50%). Let $h(\tilde{X}_{i,t})$ be the probability density function of the seat share of the party that previously won a majority. Then

Definition 2 (Precise Control: Density Test) *The majority party is able to exert precise control if*

$$\lim_{\varepsilon \to 0} \Big\{ h(\varepsilon) - h(-\varepsilon) \Big\} > 0,$$

meaning there is a discontinuity in the probability density at the cutoff that determines control of the chamber. This definition implies a test for precise control: applying the Density Test of McCrary (2008) to the seat share won by the majority party. This test is based on the almost mandatory check for a discontinuity in the density of the running variable in a regression discontinuity design.

The literature on regression discontinuity also contributes a second test based on testing for discontinuities in pre-determined outcomes. Adapting a test proposed by Lee (2008), we test whether the winner of the previous election changes discontinuously at the cutoff where the seat share in the current election exceeds 50%. Since the outcome of the previous election cannot be changed by the outcome of the current election, any difference at the cutoff implies that Democrat-controlled assemblies have been "sorted" to put the outcome of the current election on the side of the cutoff where Democrats retain their majority. Define

Definition 3 (Precise Control: Sorting Test) *The majority party is able to exert precise control if*

$$\lim_{\varepsilon \to 0} \Big\{ \mathbb{E}[M_{i,t-1} \mid X_{i,t} = \varepsilon] - \mathbb{E}[M_{i,t-1} \mid X_{i,t} = -\varepsilon] \Big\} > 0.$$

Though on first glance it looks similar to the Incumbency Advantage, the Sorting Test takes the dummy for whether Democrats won a majority in the previous election as the outcome in a regression discontinuity design using the seat share won by Democrats in the current election as the running variable.

Though implemented differently, both tests measure whether the party that held a majority before the election is systematically more likely to barely win than to barely lose. They are different ways to visualize the same empirical phenomenon. Of the two, the Sorting Test relies on fewer tuning parameters and thus it is our primary formal test.

Research Design

The conventional view is that there are discontinuities in the distribution of seat shares because the outcome is too discrete. Since the outcome is equally discrete across all elections, the conventional view implies such discontinuities should arise regardless of how valuable it is for the majority party to retain its majority. But if the discontinuity appears only in elections where holding a bare majority is especially valuable—what we call "high-stakes elections"—it is likely not mechanical but the result of conscious effort by political parties.

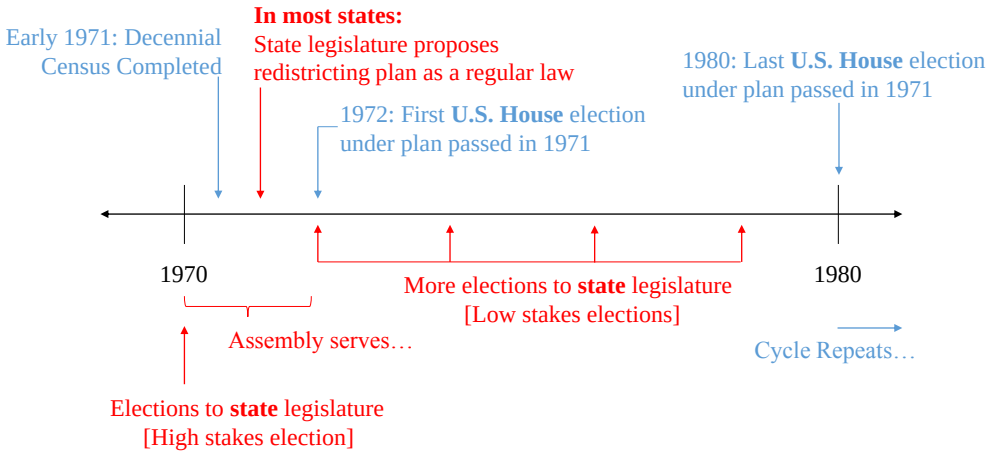
High-Stakes Elections

High-stakes elections arise through a natural experiment created by the opportunity to control Congressional redistricting, which allows the party in power to draw boundaries favorable to its own Congressional candidates. Thanks to the rules of redistricting the plan ultimately adopted depends on which party controls the legislature. Most states pass new redistricting plans as regular legislation. Control of the lower house of the state legislature grants a measure of control—at least a veto—over redistricting.[3] Control switches discontinuously away from Republicans when Democrats win at least 50 percent of seats. Though Democrats must also control the upper house and the governorship to enact their ideal plan, control of the lower house is sufficient to prevent any unfavorable redistricting plan.[4] As we show in Appendix A.1 (p. 3) there is extraordinary party unity when voting on a redistricting bill. Controlling at least half the seats in the lower house is tantamount to having a veto over any unfavorable plan. That makes it

[3] We focus on the lower house because the number of upper house seats up for election in any year is small, aggravating the problem of a non-smooth running variable. But we show in Online Appendix A.7 that a similar result holds for the upper house.

[4] It is crucial to control a branch even if parties expect they will collude on a gerrymander that protects all incumbents, as the opposing party has no incentive to offer a deal unless one's own party controls at least one branch of government.

Figure 1
Redistricting Cycle



Note: The figure shows the redistricting cycle for a typical state (i.e. a state with lower house elections in even years).

critical to have a majority in the lower house in years when the opportunity to redistrict arrives.

That opportunity arrives every ten years with the decennial census. Aside from making it possible to create districts with equal populations, the census helps the party in power gerrymander on demographics. As shown in Figure 1, the census is completed in years ending in 1.[5] Whichever party wins the election to the state legislature just before this year has the opportunity to pass its own redistricting plan.[6]

This accident of timing raises the stakes of these elections. Jeong and Shenoy (2018) show that partisan control of redistricting brings immediate benefits to Congressional candidates of the party in power.[7] That implies national parties and out-of-state donors will muster far more resources for these elections. Statements from national party officials show that they are well aware of the stakes:

[5]The redistricting bill may not be successfully passed in the year ending in 1 if, for example, the legislature is divided and the bill is particularly contentious. As a result, the date of passage is both unpredictable and endogenous to our outcome of interest. Instead we focus on the opportunity to redistrict, which comes with the completion of the census. It is more likely that this opportunity, which is known and exogenous, is what drives the decisions of parties before the election. For similar reasons we ignore mid-cycle redistricting. These redistricting are usually either mandated by courts (and thus unanticipated at the time of the prior election), or a consequence of a favorable election (e.g. the 2003 redistricting in Texas) and thus endogenous. Elections before these events are treated as low-stakes.

[6]In many states the election is in years ending in 0, but a few states are irregular. We define the most recent election before a year ending in 1 as a high-stakes election.

[7]They find that the party that in control of the state house during redistricting is 11 percentage points more likely to win Congressional races just after redistricting.

> "It's pretty clear that we're well ahead of them [the Republicans]," said Michael Sargeant, executive director of the Democratic Legislative Campaign Committee (DLCC). He notes the party has been building an infrastructure to handle this redistricting effort for more than six years. (D'Aprile, The Hill, 2010)

Aside from increasing the prominence of the election, the chance to control redistricting also may change a party's objective. As we describe below in our discussion of mechanisms, it is unwise for a party to seek a bare majority if its aim is to pass substantive legislation.[8] But on an issue whose sole aim is to improve the electoral prospects of one party at the expense of another, defections are rare and there is extraordinary party unity when legislators vote on a redistricting bill.

Implementing the Tests

Define the number of seats won by Democrats in election t as a percentage relative to the 50 percent threshold:[9]

$$X_{i,t} = \frac{[Democrats\ elected]_{i,t} - \frac{1}{2}[Total\ Assembly\ Members]_{i,t}}{[Total\ Assembly\ Members]_{i,t}} \times 100\% \tag{1}$$

If there is an uneven number of seats in the assembly we round $\frac{1}{2}[Total\ Assembly\ Members]_{i,t}$ up to the next integer to ensure $X_{i,t} = 0$ implies winning at least 50%.[10] To apply the Sorting Test we estimate a regression discontinuity using a local linear regression with a rectangular kernel, as proposed in Lee and Lemieux (2010).[11] As we discuss in Appendix A.2 (p. 14), different methods for choosing an "optimal bandwidth" disagree on the optimum. Since our aim is mainly to test for robust evidence of precise control, we use as our baseline a bandwidth of 18, which lies between the optima of the different methods, and show that the main results are similar at any reasonable bandwidth. Following the notation of the prior section, let $M_{i,t}$ be a dummy for whether the seats won

[8] A recent and very prominent example comes from the U.S. Senate. Despite holding a slim majority, Republicans in the Senate were unable to repeal the individual mandate of the Affordable Care Act because 3 of their 52 senators defected.

[9] Throughout the text we define a candidate's party affiliation as that held at the time of the election, as post-election party-switching or retirement may be endogenous to the outcome if candidates are induced to switch after close elections.

[10] In states where there is an even number of seats, a value of zero implies neither party holds an absolute majority. Since the lower house generally does not award the lieutenant governor a tie-breaking vote (unlike the upper house), neither party can pass legislation on its own. Democrats effectively have a veto over redistricting. The most prominent recent example of an evenly divided lower house was in Washington after the 2000 election. The two parties elected co-speakers and assigned each committee co-chairs from the two parties, ensuring both parties would have some say in the redistricting plan ultimately passed out of the chamber. We also confirm in Online Appendix A.1.7 that dropping evenly divided outcomes does not change the main results.

[11] Online Appendix A.1.8 shows that the results are similar using a triangular kernel.

by Democrats $X_{i,t}$ is greater than or equal to 0. The estimating equation is

$$M_{i,t-1} = \gamma_0 + \gamma_1 X_{i,t} + \gamma_2 X_{i,t} M_{i,t} + \beta M_{i,t} + [Error]_{i,t} \tag{2}$$

which we estimate separately for high-stakes and low-stakes elections. The coefficient $\hat{\beta}$ gives the estimated difference between the right and left limit of $\mathbb{E}[M_{i,t-1} \mid X_{i,t} = x]$. We cluster the standard errors by state-redistricting cycle. If we reject the null $\hat{\beta} = 0$ it is evidence that the majority party can exert precise control over the outcome.

We apply the Density Test by running a standard McCrary Test (2008) on $\tilde{X}_{i,t}$, the seats won by whichever party held a majority before the election. To make the interpretation of $\tilde{X}_{i,t}$ as clear as possible we discard cases in which independent legislators (neither Democrats nor Republicans) win seats in either the current or the previous election. Restricting the sample ensures the share of seats won by the minority is just 1 minus the share won by the majority.[12] We define

$$\tilde{X}_{i,t} = \begin{cases} \frac{[Democrats\ elected]_{i,t} - \frac{1}{2}[Total\ Assembly\ Members]_{i,t}}{[Total\ Assembly\ Members]_{i,t}} \times 100\% & \text{if } M_{i,t-1} = 1 \\ \frac{[Republicans\ elected]_{i,t} - \frac{1}{2}[Total\ Assembly\ Members]_{i,t}}{[Total\ Assembly\ Members]_{i,t}} \times 100\% & \text{if } M_{i,t-1} = 0 \end{cases} \tag{3}$$

where again $\frac{1}{2}[Total\ Assembly\ Members]_{i,t}$ is rounded up to the next integer. Then $\tilde{X}_{i,t} = 0$ implies the majority party has won the smallest number of seats possible without becoming a minority. We follow McCrary's suggestion of choosing a bin size by inspection and testing the results for robustness. In the main text we use a bin size of 1 and the default bandwidth (roughly 10), and show in Appendix A.2 (p. 14) that the results are robust to different bin sizes and bandwidths.

Data

We apply the tests for precise control to data compiled by Klarner (2013b) on the number of Democrats, Republicans, and independents elected to the lower house of the state legislature. We restrict our attention to elections after 1962, when the Supreme Court ruled in *Baker v. Carr 369 (1962)* that legislatures must regularly redistrict.[13] Our sample includes elections leading up to the 1970, 1980, 1990, 2000, and 2010 redistricting cycles. We also have elections through 2015, which add to our set of low stakes elections.

In some states Congressional districts are drawn by independent or appointed commissions rather than state legislatures. In our main sample we discard all elections after

[12] The results are qualitatively unchanged if we do not drop observations with independent legislators.
[13] The results are similar if we instead use *Reynolds v. Sims (1964)* as the cutoff (Appendix A.5.1, p. 19).

a state adopts a commission (as per Levitt, 2016).[14] The results do not change when we handle these states differently (for example, excluding them entirely). We also discard states that have only a single House representative and thus do not redistrict.[15] Maine presents an unusual case because unlike other states it has occasionally redistricted in years ending in 3 rather than 1. In our main sample we treat it like the other states, but the main results do not change under any of several different assumptions. We exclude Nebraska, which has a non-partisan legislature, from our analysis.

We draw on data for campaign finances and career paths for state legislators from Bonica (2013). These data are available for state legislators in an expanding number of states starting in 1990 through 2012.[16] We compute the incumbent exit rate of state legislators using a dataset of state legislative races compiled from Klarner et al. (2013) and Klarner (2013a), which are available from 1967 to 2010.

We present descriptive statistics for our sample in Appendix A.1.2 (p. 4).

Main Results: Can Parties Exert Precise Control?

Tests for Precise Control

Figure 2 applies the Density Test, which tests for a discontinuity in the probability density of the percentage of seats won by the party that held a majority before the election. Each dot shows the density of elections in which the majority party won the number of seats given on the horizontal axis—that is, a higher dot indicates a larger number of elections had the given outcome. For example, the highest dot in the left-hand panel represents just over 30 elections, while that in the right-hand panel represents 12 elections. These high dots are not outliers, as they represent the modal outcome.

The left-hand panel of Figure 2 shows that in low-stakes elections there is a small and statistically insignificant difference in the density of outcomes around the cutoff. But as shown in the right-hand panel of Figure 2, a large and statistically significant discontinuity appears in high-stakes elections. The point estimates imply that a narrow

[14] Hawaii adopted a commission in 1968, Washington in 1982, Idaho in 1994, New Jersey in 1995, Arizona in 2000, and California in 2012.

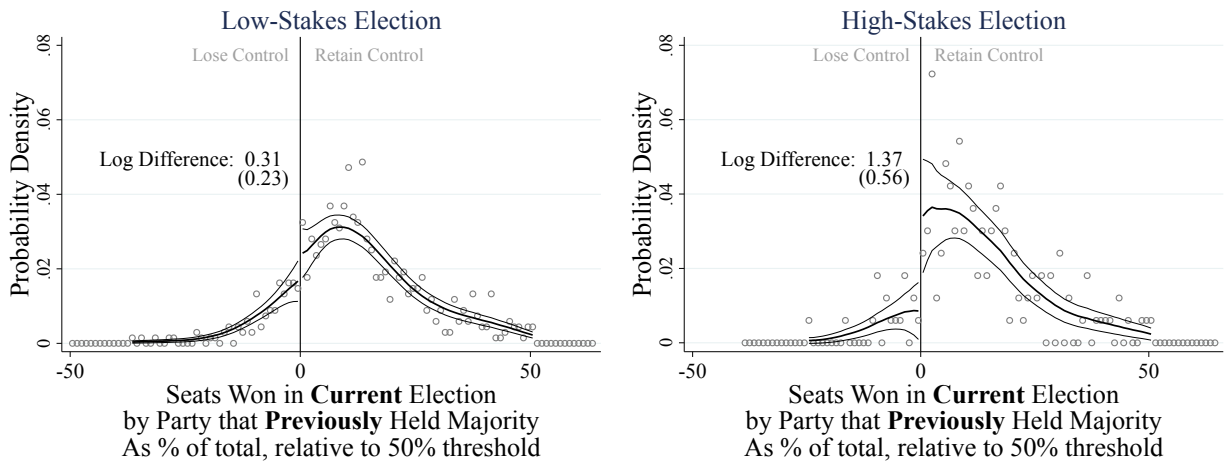
[15] Alaska, Delaware, Vermont, and Wyoming are excluded. North Dakota is excluded after the 1972 reapportionment, Montana after 1991, and South Dakota after 1981.

[16] There is some ambiguity about how states that hold their elections in odd years are assigned to federal election cycles in the data. That creates a risk that funds meant for a high-stakes election are erroneously assigned to a low-stakes election and vice-versa. In the sample used in the main text we exclude these odd-year states from the campaign finance data. In unreported results we find that including them does not much change the results.

win for the majority party is nearly 4 times as likely as a narrow defeat. We show in Appendix A.2 (p. 14) that the results are robust for different combinations of bandwidth and bin size.[17]

Figure 2

Density Test: The Majority Party is Far More Likely to Barely Win than Barely Lose a High-Stakes Election



Note: The figure gives the estimates and the visual representation of the density test. The test is implemented using the procedure of McCrary (2008), which tests for a significant difference at the cutoff in the log of the density.

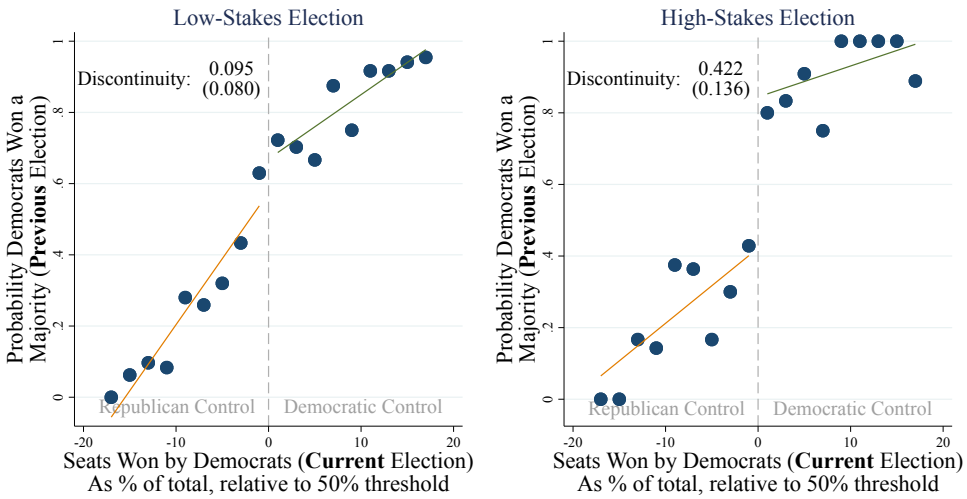
For confirmation of the result we turn to the Sorting Test, which is depicted in Figure 3. We split the running variable—the percentage of seats won by Democrats in the lower house—into bins with a width of 2 percentage points. For each bin we plot the fraction of elections in which Democrats were the majority party before the election. This fraction can be interpreted as the probability, conditional on the outcome of the current election, that Democrats held the majority before the election. We estimate Equation 2 and plot the predicted values, which appear as lines on either side of the cutoff (at zero). We report the regression discontinuity estimate (β in Equation 2) and its standard error.

In low-stakes elections we are unable to reject the null of no precise control. As expected, the conditional probability that Democrats won a majority in the previous election is increasing in the percentage of seats won in the current election. States that elect more Democrats in the current election probably elected more in the previous election, making it more likely the Democrats held a majority in the lower house. But there is no statistically significant discontinuity at the cutoff, meaning the probability is similar in

[17] Our result also cannot be driven by the phenomenon explored by Frandsen (2017), which causes the traditional McCrary test to falsely reject the null when the sample size is large and the outcome too discrete. Our sample has far more low- than high-stakes elections, yet we reject only for high-stakes elections.

Figure 3

Sorting Test: The Majority Party is Able to Precisely Sort onto the Winning Side of the Cutoff



Note: The figure depicts our estimates of Equation 2. Standard errors are clustered by state-redistricting cycle. Bin size is 2 percentage points.

elections just barely won and lost by Democrats. By contrast we find strong evidence of precise control in high-stakes elections. The conditional probability jumps by 42 percentage points at the cutoff, suggesting the majority party is able to sort itself onto the more favorable side of the discontinuity with remarkable precision.

Table 1 reports the estimates from the baseline specification and several robustness checks. Columns 1 and 2 give the same baseline estimates shown in Figure 3. The other columns show the results of robustness checks. One possible concern with the baseline estimates is that the presence of independent legislators (those unaffiliated with either major party) muddies the partisan narrative given in the research design section. Columns 3 and 4 show that dropping elections in which independents either win seats or held seats before the election makes little difference in the estimates.

Next we redo our estimates excluding the so-called pre-clearance states. These states are required to submit changes to their voting rules for pre-clearance to the U.S. Department of Justice (as per Section 5 of the 1965 Voting Rights Act).[18] Columns 5 and 6 shows that the estimate is not much changed. Columns 7 and 8 report results when we change the running variable to be the percentage of seats won by Republicans rather

[18]These are Alabama, Alaska, Arizona, Georgia, Louisiana, Mississippi, South Carolina, Texas, and Virginia.

Table 1
Sorting Test: Main Results and Robustness

	Baseline		No Ind. Leg.		Drop VRA States		Republican Seats	
	(1) Low-Stakes	(2) High-Stakes	(3) Low-Stakes	(4) High-Stakes	(5) Low-Stakes	(6) High-Stakes	(7) Low-Stakes	(8) High-Stakes
Discontinuity	0.095	0.422***	0.119	0.540***	0.072	0.419***	-0.106	-0.391***
	(0.080)	(0.136)	(0.084)	(0.136)	(0.086)	(0.145)	(0.085)	(0.136)
Observations	535	138	466	119	468	121	528	136
Clusters	178	138	163	119	154	121	176	136
Control Mean	0.48	0.35	0.46	0.27	0.48	0.31	0.71	0.88
Test: Low=High		0.06		0.02		0.06		0.09

Note: Outcome is a dummy for whether Democrats held a majority before the election (to be precise, whether they won a majority of seats in the previous election). "Baseline" is the same specification used to construct Figure 3. "No Ind. Legislators" drops elections in which independent legislators are elected in either the current or previous election. "Drop VRA States" drops states that require pre-clearance from the Justice Department for any change in election law. "Republican Margin" defines the running variable as the Republican rather than Democratic margin. The last row gives the p-value of test for the equality of the estimates for low- and high-stakes elections. The test is based on a single regression that jointly estimates both discontinuities.

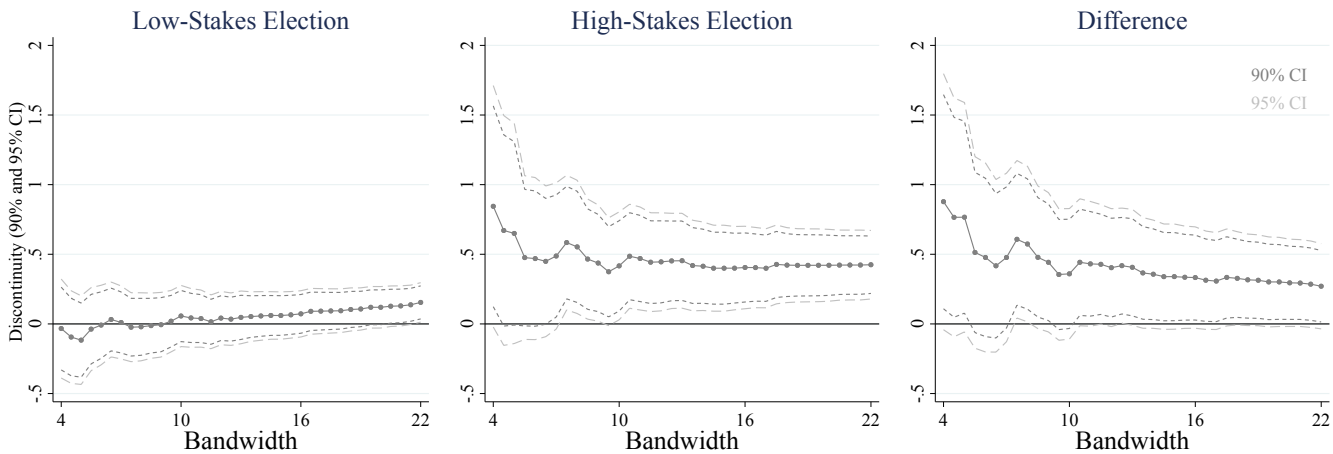
than Democrats. It is not precisely equal to the negative of the percentage won by Democrats (as there may be independents).[19] Nevertheless, the estimated discontinuity is essentially the negative of that in the baseline specification. Finally, the last row of the table gives the p-value of a joint test for the equality of the discontinuities estimated for low-stakes and high-stakes elections. In all specifications we reject equality at either the 10 percent or 5 percent level.

As noted in the research design section, bandwidth is always a concern when estimating discontinuities (especially, as argued by Kolesár and Rothe, 2018, when clustering standard errors). Figure 4 shows that our results are not driven by the choice of bandwidth. We re-estimate Equation 2 for every bandwidth $h = \{4, 4.5, \ldots, 21.5, 22\}$. We plot the regression discontinuity estimate and the 90 and 95 percent confidence interval against the bandwidth. The left-hand panel confirms that for any but the widest choice of bandwidth, there is no discontinuity in low-stakes elections. By contrast, the center panel shows that there is always a large discontinuity in high-stakes elections, though the estimates grow large and noisy when the bandwidth falls below 10. The right-hand panel confirms that the difference between these estimates remains large at any bandwidth, though it is noisier than either individual estimate.

[19]This is why the number of observations is not quite the same as in the baseline specifications. A different running variable implies a different set of elections will fall within the bandwidth of the local linear regression.

Figure 4

Sorting Test: The Results are Robust to the Choice of Bandwidth



Note: Figure plots the estimate and confidence intervals (both 90% and 95%) for the discontinuity using every bandwidth $h = \{4, 4.5, \ldots, 21.5, 22\}$. The "Difference" refers to the difference in the estimates for low- versus high-stakes elections. Standard errors are clustered by state-redistricting cycle.

Additional Robustness

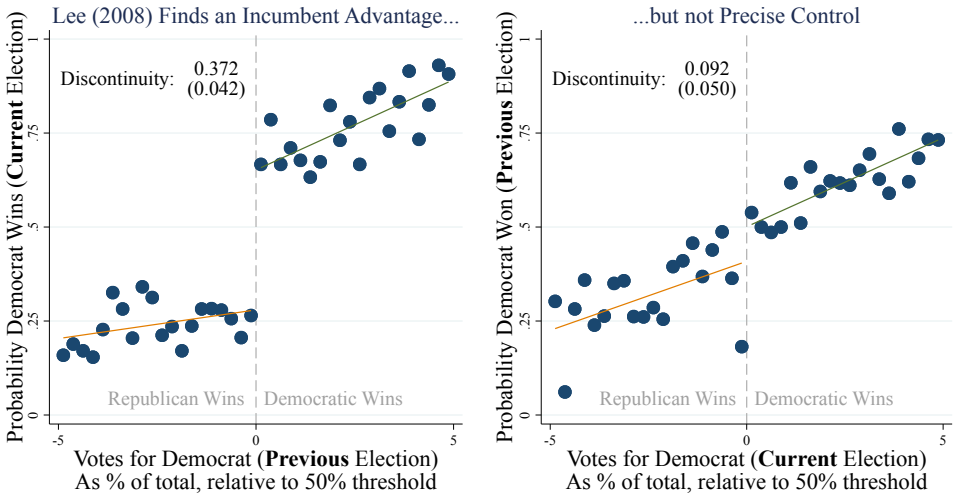
Small Sample Bias (Appendix A.3, p. 18): We verify that the difference between low- and high-stakes elections is not an artifact of having a smaller sample of high-stakes elections. We rerun the Sorting Test on subsamples of the low-stakes elections, keeping each subsample the same size as our full sample of high-stakes elections. We show that less than 1 percent of the point estimates are as large as that of the high-stakes elections.

Nonlinear Conditional Expectation (Appendix A.4, p. 19) : We confirm that estimating the Sorting Test using local quadratic regression instead of local linear regressions does not change the result, suggesting it is not driven by sharp nonlinearity in the neighborhood of the cutoff.

Consistency of Estimates Over Time (Appendix A.1.9, p. 10): We show that Sorting Test still does not reject in low-stakes elections when they are disaggregated by time, e.g. 1 election prior to high-stakes, 2 elections prior, and so on. We show using rolling regressions that the estimate of (2) in high-stakes elections is reasonably consistent over time (there is some slight evidence it may have grown smaller in recent years).

Interpretation: We show that Sorting Test does not reject in elections preceding the decennial census in the years before *Baker v. Carr 369 (1962)* made redistricting mandatory (Appendix A.1.9, p. 10). We show that after disaggregating by whether Republicans versus Democrats are the majority party there is a discontinuity in the conditional den-

Figure 5
Comparison to the Results of Lee (2008)



Note: Each dot represents the average outcome within a bin of width 0.25 percentage points.

sity of seats won by Democrats (Appendix A.1.9, p. 10). We verify that the results are robust to an alternative running variable, the level rather than percentage of seats (Appendix A.1.6). Finally, we show that the party of the Secretary of State is not driving the results (Appendix A.6).

There is Precise Control but No Incumbency Advantage

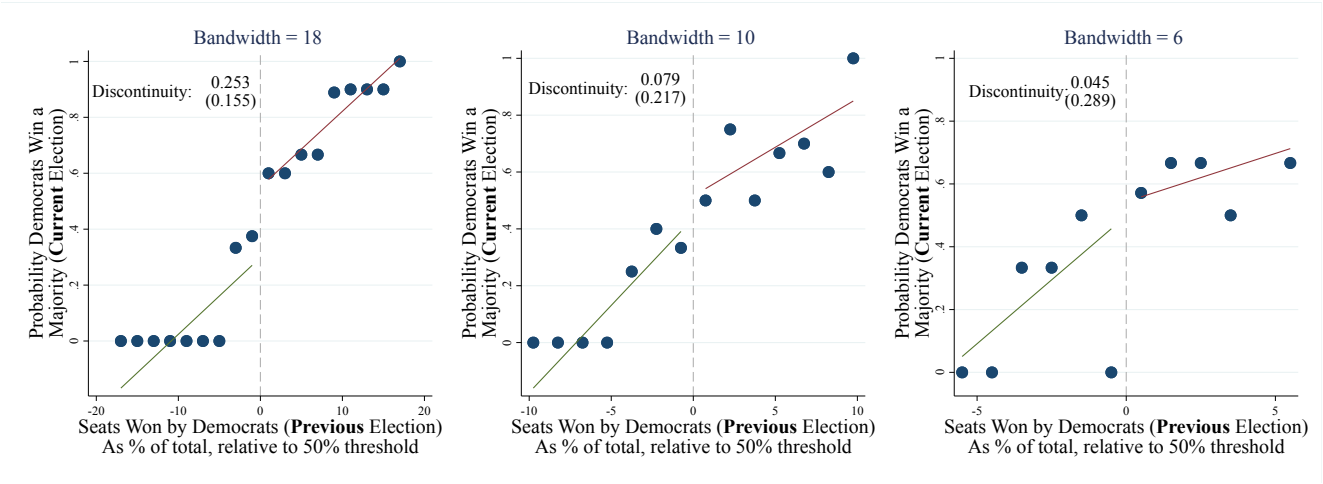
As noted above there is a difference between precise control (Definitions 2 and 3) and the oft-studied Incumbency Advantage (Definition 1). Figure 5 uses data on U.S. House races to illustrate the difference in the context of the well-known study of Lee (2008). The left-hand panel plots the average probability the Democrat wins the current election as a function of the Democrat's vote share (relative to the 50 percent threshold) in the previous election. When the share in the previous election crosses zero the Democrat discontinuously switches to contesting this election as the incumbent.[20] At the threshold, the probability the Democrat wins the current election jumps from 0.25 to 0.65. This is the incumbent advantage.

By contrast, the right-hand panel plots the average probability the Democrat won the previous election as a function of the Democrat's vote share in the current election.

[20]Technically the Democrats become the incumbent party. The candidate is the incumbent assuming she seeks re-election.

Figure 6

There is No Evidence of an Incumbent Party Advantage in High-Stakes Elections



Note: These plots are the direct analog of the left-hand panel of Figure 5 when applied to high-stakes elections in our sample. We take the seats won by Democrats in the previous election as the running variable and test for a discontinuity at the cutoff in the probability Democrats win the current election. Bin sizes are (from left to right): 2, 1.5, 1.

This is the analog to Figure 3, the Sorting Test, applied to individual House races. At the threshold, the Democrat switches from barely losing to barely winning this election. There is nothing like the large discontinuity visible in the left-hand panel. Democrats who barely win are not statistically more likely to be the incumbent than Democrats who barely lose.[21] In other words, individual incumbents are not able to sort themselves onto the winning side of the threshold. That is not surprising, as the mechanism proposed in the next section makes sense only in the context of an election that determines the number of seats won, not an individual race to determine which candidate wins.

We make the distinction clear in our context by estimating the direct analog of the left-hand panel of Figure 5 in our sample. Using the seats won by Democrats in the previous election as the running variable, we test for a discontinuity at the cutoff in the probability Democrats win a majority in the current election. Figure 6 shows the estimate for several choices of bandwidth (we decrease the bin size as the bandwidth shrinks to better display the raw data). At no choice of bandwidth is the estimate statistically significant, and it shrinks as the bandwidth narrows. This result stands in stark contrast to Figures 3 and 4, which show a large discontinuity at almost any choice of bandwidth.

[21] The null cannot be rejected using this specification and this bandwidth, though Caughey and Sekhon (2011) find that they can reject the null of no sorting in other specifications. Eggers et al. (2015) run a similar test on the outcomes of close races from a wide ranges of democracies, including state legislatures in the U.S., and find that only in post-1945 U.S. House races can the null be rejected.

These results imply that holding a bare majority does not help a party win a bare majority (or any majority) in future elections. Aside from showing the distinction between an incumbent party advantage and precise control, this result is suggestive about the mechanism for precise control. Simply having the Speaker's gavel does not suffice.This is another major difference between our results and those of Folke et al. (2011), who find stronger evidence of an incumbent party effect than of precise control. That is not surprising, as in their context the mechanism for both is that control of government gives a party the power of patronage. In the pre-civil service reform elections they study, machine politics is a plausible mechanism for precise control.

That cannot be the mechanism in our post-reform sample. As we discuss in the next section, the key to precise control in our sample is that holding more (ideally many more) seats than the opposition enables the majority party to switch to defensive tactics. It sacrifices the chance of greatly expanding its majority in order to maximize the chance of retaining it. The absence of an incumbent party advantage also suggests why, as we show in Online Appendix A.1 (p. 3), there is no evidence of precise control in the election before the high-stakes election. Figure 6 suggests winning a bare majority would be useless in helping subsequently contest the high-stakes election. In fact, the mechanism for precise control proposed in the next section implies the optimal strategy is to win as many seats as possible in the election prior to the high-stakes election. The larger its pool of incumbent legislators, the bigger its advantage in leveraging a majority-seeking strategy in the high-stakes election.

Mechanism: How Does the Majority Party Exert Precise Control, and Why Only in High-Stakes Elections?

At first glance the results of the prior section are hard to reconcile. The party that holds a majority—or rather, the party that has more seats—is somehow able to exert precise control. But it only chooses to do so in high-stakes elections—there is no evidence of precise control in low-stakes elections. And even in high-stakes elections there is no evidence that holding a bare majority confers some sort of "incumbent party advantage" in winning seats or winning a majority.

But as we show, theory—in particular, the model of Snyder (1989)—can reconcile these results. The model makes counter-intuitive predictions about how parties behave in a high-stakes election. We show that the patterns in the data are consistent with these predictions, at least for the Democratic party.

The Consequences of a Switch to Majority-Seeking Tactics

The first step to understanding our results is to understand how the chance to control Congressional redistricting changes the incentives of political parties. Clearly it increases the prominence of an election—what would otherwise be a state contest now has national implications—but it also raises the benefit of winning even a bare majority. That may seem puzzling, as a majority is all that is needed to pass—or at least block—any law. Why not seek a bare majority in every election?

The key is that on issues of substance, a bare majority in the assembly need not translate to a bare majority for a vital piece of legislation. On tax policy, for example, legislators within a party may differ in their ideology about the size of government. Using measures of ideology from Bonica (2014) we find that in about half of state assembly elections, some elected Democrats were more conservative than at least 5 percent of elected Republicans. Such a Democrat may not side with her party on a substantive issue, making it unwise for party leadership to aim for retaining a bare majority.

But on a purely partisan issue—whether to enact a redistricting bill favorable to Democrats versus Republicans—party discipline is strong (see Online Appendix A.1, p. 3). Since defections are less likely, parties may find it worthwhile to maximize their chance of winning even a bare majority. This difference in objectives is the crucial distinction between what we call high-stakes and low-stakes elections.

When parties switch their goal from maximizing the number of seats won to maximizing the chance of holding a majority, both the optimal strategy and the outcome are drastically different. This is the key insight behind Snyder's (1989) model of legislative elections, which predicts much of what we see in the data. When maximizing the number of seats won, parties will direct their resources to districts where they are naturally the weakest (against an enemy incumbent, for example). Using money to compensate for other disadvantages equalizes the marginal return of each dollar, maximizing the average probability of winning any seat.

But when maximizing the probability of holding a majority, parties channel their funds to pivotal districts most likely to put them over the 50 percent threshold. Snyder (1989) shows what this strategy implies in the case where there are three types of districts: those relatively and uniformly safe for one party (which, in our application, would be districts contested by that party's incumbents), those safe for the other party, and those where each party has an equal chance of winning (open districts). For the party that holds a majority before the election, and thus contests the election with more incumbents, the pivotal districts are actually those where its own incumbents are run-

ning. The party sends relatively little money to districts where it is challenging an opponent's incumbent. Though an extra dollar would have a bigger impact in these districts, they are unlikely to be part of the party's winning majority. To summarize, the majority party does exactly the opposite of what it would do if it were maximizing the number of seats won.

As a result, choosing this majority-seeking strategy comes at a cost. The party gives up the chance to win large numbers of seats, and may even lose seats. The party would have likely used a seat-maximizing strategy in the previous election (because, as noted above, holding a bare majority is usually not useful in passing legislation). Switching to a majority-seeking strategy might cause its majority to shrink, even though the chance it shrinks below 50 percent may be low. The trade-off can be phrased as one of risk versus reward; seat-maximization is a risk-neutral strategy while majority-seeking is a risk-averse strategy.

The impact of this change in strategy can be stark. Snyder (1989) calculates the relative probability of holding a majority under a functional form assumption that makes the problem tractable. He finds that if the majority party contests a 65-district state with 30 incumbents against 20 opposition incumbents, it can retain its majority with 92 percent probability.[22] The size of the difference in the number of incumbents is crucial. If the majority party contests with a bare majority—say, 30 incumbents versus 29 for the opposition in a 65-district state—it retains its majority with only 56 percent probability. That is little different from the 50-50 chance of winning a majority when both parties are equally matched. Holding a bare majority does not confer any discontinuous "incumbent party advantage."

This chain of reasoning reconciles precise control in high-stakes elections with the absence of an incumbent party advantage. By switching to a majority-seeking strategy, the majority party can drastically reduce the chance it loses its majority. It only chooses to do so in a high-stakes election because these are the elections in which winning only a bare majority pays off. But it can only effectively pursue these strategies as long as it contests the election with a sizable majority. The model assumes no electoral benefit from simply being the ruling party. As a result there is no discontinuous increase in the chance of winning a majority in a future election when a party wins a bare majority in the current election.

[22]The simple version of the model solved fully in Snyder (1989) may not imply a discontinuity in the distribution of outcomes (because all incumbent seats are equally safe and thus equally likely to be pivotal). But in Online Appendix B we sketch a model and show simulations that suggest a more complex setup can produce a discontinuity.

Evidence of a Switch to Majority-Seeking Tactics

The Majority Party Limits Losses Just Enough to Retain Control

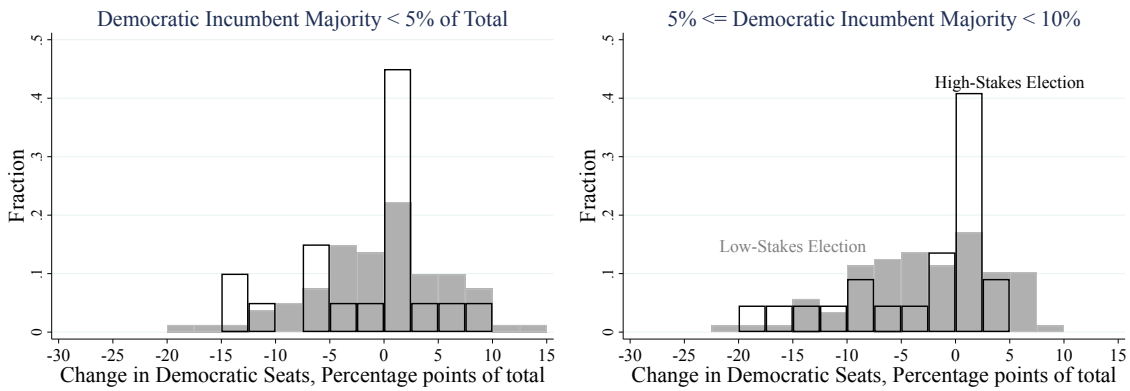
Winning a majority does not necessarily imply winning more seats. We show in Appendix A.1.3 (p. 5) that the majority party retains control by either holding steady or even suffering some losses. The key prediction of the model is that there should be an asymmetrically low chance that these losses push the party's returns below the cutoff for defeat. In a low-stakes election there should be a roughly equal chance that its losses are just small enough to retain the majority versus barely pushing it into the minority. But in a high-stakes election it will ensure these slightly larger losses are far less likely.

We look for evidence of this asymmetry by calculating the change in the seats won by Democrats compared to the election prior to the high-stakes election. It is essentially the seats gained by the Democrats. Figure 7 plots the histogram of the change within states where Democrats initially held the majority. The left-hand panel restricts the sample to states where the Democrats contest the high-stakes election with an incumbent majority of less than 5 percent (meaning they won between 50 percent and 55 percent of the seats in the previous election). The right-hand panel restricts to elections where their majority is between 5 and 10 percent. The gray histogram shows the fraction of observations among low-stakes elections, while the black outline shows high-stakes elections.

The left-hand panel shows that although the modal low-stakes election features either no change or a slight (less than 2.5 percent) gain for the Democrats, there is a similar probability mass at nearby outcomes. There is a reasonable chance they will lose seats equal to between 0 and 5 percent of total seats, possibly costing them control of the legislature. But there is also a reasonable chance they will gain seats equal to between 2.5 and 10 percent of the legislature. By contrast, about half of high-stakes elections feature little or no change. The chance of losing a small (0-5 percent) number of seats is very small. But compared to low-stakes elections, they are also unlikely to win many seats (which is exactly what we find in Appendix A.1.3). Likewise, although their chance of a small loss is relatively low, their chance of a large loss is somewhat higher than in low-stakes elections. That suggests that when their defensive strategy fails (say, because of an unfavorable statewide shock) it tends to fail in many seats all at once.

The right-hand panel is even more striking. As when they contest with a narrower majority, Democrats are most likely in high-stakes elections to see little or no change. But now the probability of a small loss (less than 2.5 percent of seats) is somewhat higher. Though the sample is admittedly small, this pattern is consistent with the theory

Figure 7
Democrats Hold Just Enough Seats to Retain Control



Note: We plot histograms of the percentage point change in the seats won by Democrats from the previous election to the current election ($X_{i,t} - X_{i,t-1}$), conditional on the size of their incumbent majority (the seats won in the previous election $X_{i,t-1}$). We restrict attention to observations that lie within the bandwidth used for Figure 3 to keep the histogram legible. The left-hand figure shows the histogram conditional on Democrats holding a majority of less than 5 percent of the assembly. The right-hand figure shows cases where their majority is slightly larger (5 to 10 percent).

that parties lose just few enough seats not to lose control. With an incumbent majority of 5 to 10 percent of seats, Democrats can afford to lose a few seats without losing control. But their chances of slightly larger losses that might put them just below the 50 percent cutoff remain low, as do the chances of substantial gains. The majority party is able to precisely limit its losses to ensure it remains in the majority.

The consequences of this precision are stark. The probability the lower house switches hands between elections falls from over 30 percent in low-stakes elections to less than 20 percent in high-stakes elections. Despite losing seats the majority party is much less likely to lose control.

Incumbents Are Less Likely to Retire in a High-Stakes Election

According to the theory, the strategy that achieves precise control relies heavily on having many incumbent legislators. A majority-seeking party should thus take special care to ensure these incumbents run for re-election. On average about 22 percent of lower house incumbents do not seek re-election. In part that is because many politicians see the lower house of the state assembly as a stepping stone to higher office. Among lower house members who won office in 2002, roughly 15 percent sought higher office over the next 10 years. Nearly 80 percent of them ran for the upper house of the state legislature, and over 10 percent ran for the U.S. House. Can such legislators be convinced to

delay their ambitions for two more years?

Additional funding for state legislators may be enough to convince incumbents to run for re-election. An incumbent who knows she need not spend as much effort fundraising may be more willing to seek re-election. We show in the next section that total campaign receipts to state assembly candidates spike in closely-contested high-stakes elections. Alternatively, an incumbent may decide that her ambitions are best served by staying in office. If her plan is to run for the U.S. House, she may believe her run would be more successful after her party draws favorable Congressional boundaries.[23] Alternatively, state and national political parties may pressure incumbents to delay seeking higher office. If running for higher office is easier with the support of the party, it may hold considerable leverage over an ambitious legislator.

Whatever the cause, we find a decrease in the incumbent exit rate in high-stakes elections, especially in those expected to be close. Define the percentage of Democratic incumbents as the percentage of seats won by Democrats in the previous election relative to the 50 percent threshold ($X_{i,t-1}$ in the notation of the research design section). When this percentage is close to zero, both parties contest with a similar number of incumbent legislators. These are cases where the outcome of the election may be particularly uncertain and thus heavily contested.

Figure 8 plots a moving local linear regression of the exit rate of incumbents against the percentage of Democratic incumbents.[24] The rate of incumbent exit is lowest in high-stakes elections where neither party has a big advantage in the number of incumbents. Among Republicans the exit rate not only falls but falls almost one-for-one as their majority diminishes. This pattern suggests the number of legislators who choose to retire before a high-stakes election in part depends on the number of seats their party can afford to lose.

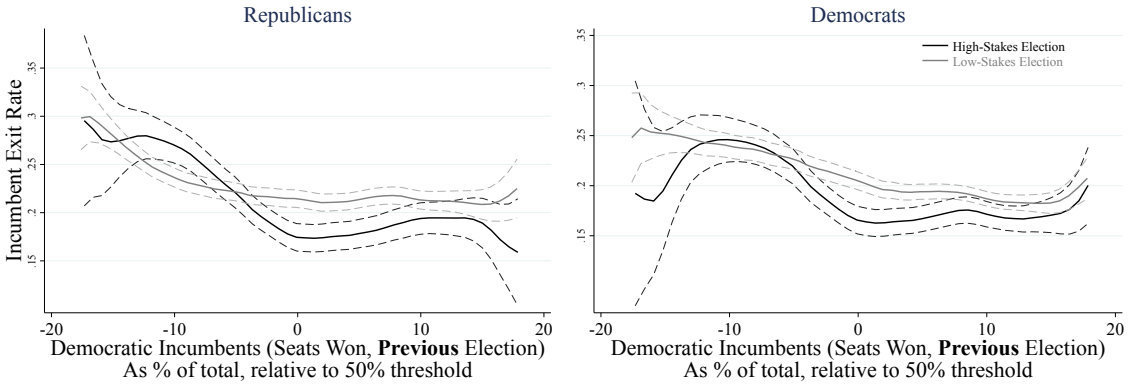
Parties Spend More to Win High-Stakes Elections

Most any model of electoral competition predicts that when the returns from winning increase, candidates and parties will spend more to win. Gerber (2004) and Gerber et al. (2011) report that randomized campaign mailings and television ads, two of the most common uses for campaign spending, can have substantial effects on vote totals. A basic test of the hypothesis is to confirm that when an election is very competitive and its outcome has high stakes, parties spend more in the hopes of winning.

[23] For example, The Economist (2002) reports that after the 2000 Census the chairman of North Carolina's redistricting commission stood for office in a Congressional district he himself created.

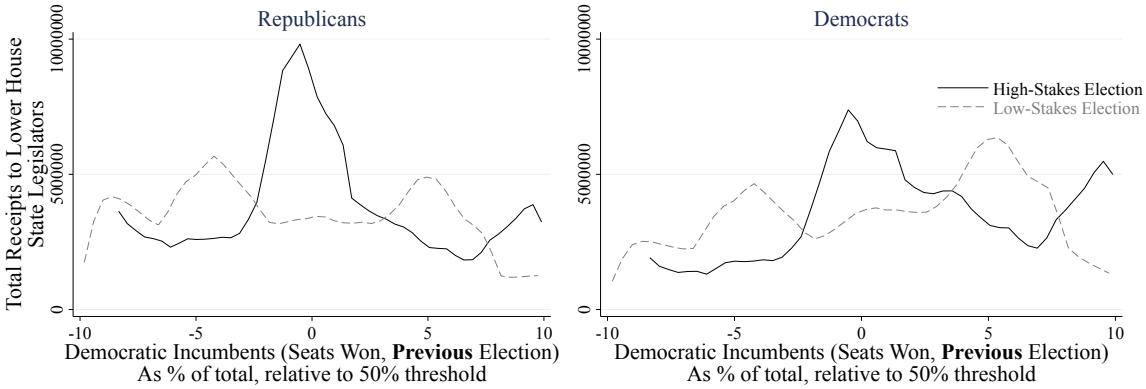
[24] See Online Appendix A.1.4 (p. 6) for a slightly more rigorous check.

Figure 8
The Incumbent Exit Rate Falls in High-Stakes Elections



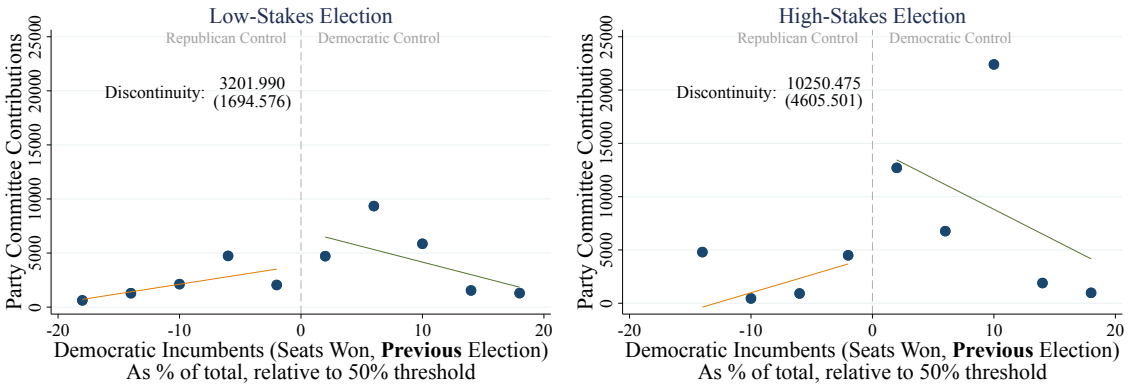
Note: We plot a moving local linear regression of the incumbent exit rate against the number of Democratic incumbents as a percentage of the total—to be precise, the percentage of seats won by Democrats in the previous election. The dashed lines give 95 percent confidence intervals.

Figure 9
Campaign Contributions to Lower House
Candidates Rise in High-Stakes Elections



Note: We plot a moving local linear regression of total state-level campaign receipts for lower house members against the number of Democratic incumbents as a percentage of the total—to be precise, the percentage of seats won by Democrats in the previous election.

Figure 10
Democrats Channel Funds to Incumbents
in States Where they Hold a Majority



Note: Outcome is contributions to Democratic incumbents from Democratic party committees. Standard errors are clustered by state-redistricting cycle.

Figure 9 plots a moving local linear regression of the total campaign contributions (by state) received by candidates for the lower house of the state assembly. Though this state-level sample is too small to make formal tests informative, the patterns are at least consistent with the theory. In high-stakes elections there is a spike in the total contributions to candidates in states where neither party has a large majority of incumbents. There is no similar spike in low-stakes elections. The spike is especially pronounced among Republicans. In states where they enter the high-stakes elections with a small majority of incumbents, their receipts among all candidates in the state spikes at roughly 10 million (in 1983 dollars). In low-stakes elections their receipts are only 3.5 million dollars.

When in the Majority, Democrats Direct Funds to Incumbents

The most interesting theoretical predictions, however, are about how parties change the targeting of their campaign spending. As explained above, when the majority party aims to maximize its chances of retaining a majority it should redirect funds to support incumbents. These seats are are more likely to be in the set of districts that put the party over the 50% cutoff.

That is exactly what Democrats at least seem to do. Figure 10 plots the average contributions to Democratic incumbents from party committees as a function of the num-

ber of incumbents.[25] It suggests these contributions are higher in high-stakes elections in states where Democrats already hold a majority. There is even some evidence that contributions are discontinuously higher, though this result should be treated with caution (recall that the sample of elections for which we have campaign finance data is small). Regardless of whether there is an actual discontinuity (which the model does not require), the figure suggests Democrats are more likely to focus on protecting incumbents in states where they hold a majority—exactly as predicted. And as we show in Appendix A.1.5 (p. 8) party committees are more likely to concentrate their giving during high-stakes elections. That suggests they are concentrating on the bare subset of incumbents needed to hold power.

In unreported results we find that Republicans take a different approach to defending their majority, one outside Snyder's model. They take the fight to the enemy, channeling funds to challengers in states controlled by Democrats. This asymmetry in strategies is not discussed in Snyder (1989), who restricts the discussion to symmetric strategy equilibria. The difference between the parties' responses may be an asymmetric equilibrium of the model. It may also be beyond the model, which considers a single election in isolation, while in reality the parties must contest elections across many states simultaneously. The Republican approach may force the Democrats' coordinating committees to pull funds from Democratic challengers in Republican-controlled states. These unfunded challengers may find it impossible to beat Republican incumbents, making it possible for the Republican party to retain control by simply keeping the incumbents running for re-election (as Figure 8 suggests they do). Why Republicans are able to pursue this strategy while Democrats do not is beyond the scope of any formal model we are aware of, though it may arise from the difference in the funding structures of the two parties.[26]

Conclusion

Our results suggest the majority party is consistently able to win the precise number of seats needed to retain its majority. It manages this not through fraud but by targeting campaign spending to reinforce the already overwhelming strength of incumbents.

[25] We focus in this section on the party committees because they are most likely to distribute campaign funds strategically. As noted in the research design section, the Democratic Legislative Campaign Committee had been preparing for 6 years to hold control during the 2010/2011 redistricting.

[26] Jacobson (1985) writes that Republicans have a higher "organization capacity." Aside from being able to raise more money the Republicans also have "a more centralized and strategically efficient resource distribution system" that ensures challengers get the money they need.

These tactics reduce the number of seats it can expect to win while raising the probability it holds its majority.

But precise control may increasingly have implications for policy as well. In the past, parties could not expect to pass substantive legislation with only a bare majority. But as state parties grow ever more ideologically polarized, party-line votes may become common. Eventually a bare majority may suffice to pass bills on taxes or health care, making precise control increasingly attractive and of immediate relevance to policy.

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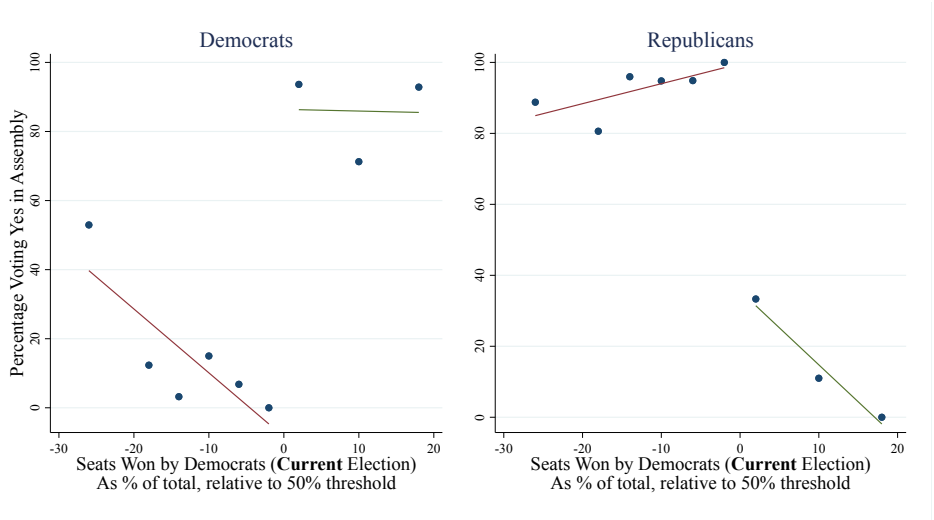
Appendices

Appendix Table of Contents

Figure A1
Lower House Members Vote
Along Party Lines on Redistricting Bills



A Empirical Appendix (For Online Publication)

This appendix shows additional figures and tables referenced in the main text.

A.1 Additional Tables and Figures Referenced in the Text

A.1.1 Party Unity in Votes on Redistricting Plans

We show using data from the 2011 redistricting cycle that legislators switch discontinuously from opposition to support of the redistricting bill when control of the lower house passes to their party.[27] Figure A1 shows the fraction of Democrats and Republicans who support the redistricting bill as a function of the percentage of seats won by Democrats. When it switches from negative to positive the Democrats win control of the assembly. At this point they switch from near universal opposition to near universal support for the redistricting bill. The response of the Republicans, though slightly less extreme, is similar. The reversal in support suggests not only that the bill favors the party in power, but that party discipline is almost perfect. That makes it critical to win a majority in the lower house in years when the opportunity to redistrict arrives.

[27] These data were constructed from Vote Smart (2016), which has roll call votes on 51 bills from 21 states for the most recent redistricting cycle. Consistent roll call votes are only available for the 2011 cycle.

A.1.2 Descriptive Statistics

Table A1
Descriptive Statistics

	Low-Stakes Elections	High-Stakes Elections
Democrats win	0.66	0.63
Democrats held prior majority	0.66	0.69
Seats Won by Democrats*	7.69	7.66
Democrats Remain Majority	0.88	0.88
Democrats Remain Minority	0.77	0.90
Incumbent Re-Election Rate**	0.94	0.93
Total Receipts**	36564	36951
Party Committee Contributions***	4785	5531
Presidential Election	0.48	0.34
Elections	796	201
State-Redistricting-Cycles	242	201

*As a percentage of the total seats in the assembly, relative to the 50 percent threshold
**Based on elections from 1967 to 2010
***Based on elections after 1990 (mostly from 2000–2012), excluding odd-year election states

Note: Each cell gives the mean among either low- or high-stakes elections in the sample. "Democrats win" refers to their winning at least 50% of seats in the current election, while "Democrats held prior majority" refers to their having done so in the previous election. The margin is defined as the percentage of seats held by Democrats beyond the minimum number needed to give them at least 50% of the seats. "Democrats Remain Majority" is the fraction of elections in which Democrats win the current election conditional on having won the previous election. "Democrats Remain Minority" is the fraction in which they lose the current election conditional on having lost the previous election.

Table A1 reports several summary statistics. At first glance low- and high-stakes elections seem similar in many respects. As our later results show, the aggregate statistics mask how parties change their tactics when a low-stakes versus a high-stakes election is expected to be close. But even the sample means show a few key differences that foreshadow our later results. First, conditional on Democrats being in the minority, the probability that they remain so rises from 77 percent in low-stakes elections to 90 percent in high stakes elections. Second, although average total campaign receipts to lower house legislators are broadly similar, contributions from party committees rise by roughly 16 percent in high-stakes elections. Party committees, which might be expected to give more strategically than regular donors, are increasing their involvement in these critical elections.

The last row of the table shows what fraction of high- and low-stakes elections coincide with presidential elections. One might worry that high-stakes elections are all presidential elections, and that the results have little to do with control of redistricting. In fact neither low nor high-stakes elections are dominated by presidential elections, and

in our sample high-stakes elections are slightly less likely to be presidential elections.[28]

Finally, the incumbent re-election rate, though similar across high- and low-stakes elections, is crucial to understanding how a majority party exerts precise control. The average incumbent re-election rate (conditional on the incumbent seeking re-election) is over 93 percent. This number, comparable to what Friedman and Holden (2009) find for U.S. House races, is extraordinary. It suggests the majority party has an enormous advantage in contesting elections if it simply convinces its incumbents to seek re-election.

A.1.3 The Majority Party Wins Its Majority Without Winning Additional Seats

The model predicts that switching from a seat-maximizing strategy to a majority-seeking strategy reduces the chance that the majority party will make major gains. It retains its majority by either holding steady or even by sustaining losses that are just small enough not to lose the majority.

Figure A2 illustrates this point. It plots the outcome of the election against the manner in which it was achieved. Like Figure 3, it divides all election outcomes into bins based on the number of seats won by Democrats (plotted on the horizontal axis). Aside from widening the bins to make the result more clear, the horizontal axis is exactly the same as Figure 3. The height of each bar gives the fraction of cases where the election outcome arose because the Democrats gained a number of seats greater than or equal to 5 percent of the total seats in the legislature. For example, the bar labeled "[0,5)" in the left-hand panel shows that of all low-stakes elections in which Democrats win a majority of between 0 and 5 percent, a fraction 0.18 were won by increasing their number of seats by at least 5 percentage points (of the total legislature).

In low-stakes elections there are two clear patterns. First, a sizable fraction of elections where Democrats win a majority arose because Democrats gained many seats. Compared to the elections they lose, the elections they win are if anything more likely to have been won by making big gains. Second, a comparable fraction of elections barely won and barely lost by Democrats arose through big Democratic gains—there is no evidence of a sharp change at the cutoff.

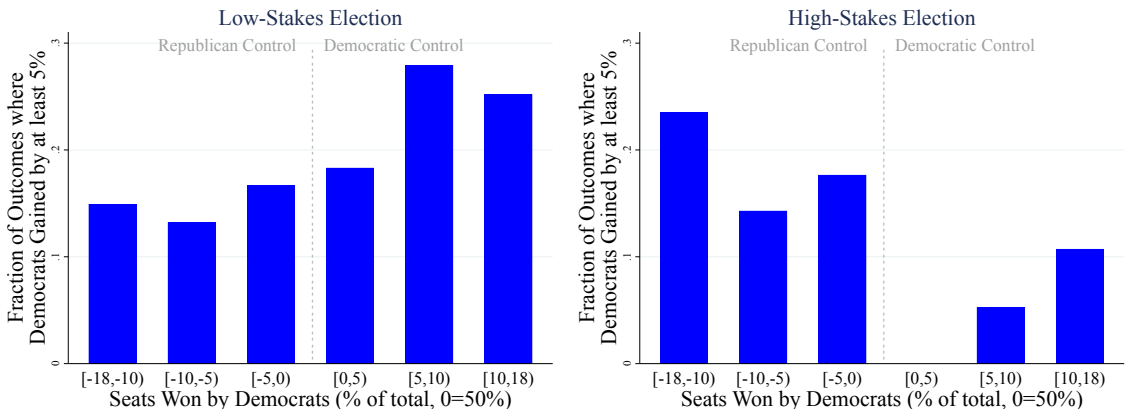
Both patterns are reversed in high-stakes elections. Elections where Democrats win a majority are very unlikely to have been won because Democrats made big gains. In

[28] In unreported regressions we find that the distinction between presidential and midterm elections is not what drives the results (results available upon request). The fraction of low- and high-stakes presidential elections are less than 0.5 because some states have assembly elections in odd years. The fraction is especially low for high-stakes elections by sheer chance; our first set of high-stakes elections lies roughly within 1969-1970, and our last set lies within 2009-2010.

Figure A2

Democrats Do Not Win High-Stakes Elections by Winning Many More Seats

Fraction of Outcomes Achieved through Large Democratic Gains



Note: Conditional on the outcome of the current election —the percentage of seats won by Democrats—we plot the fraction of elections in which they increased their number of seats compared to the previous election by more than 5 percentage points (elections in which $X_{i,t} - X_{i,t-1} > 5$). This figure restricts the sample to cases where no independents won seats, which lets us interpret Democratic gains as Republicans losses.
Test for equality: A test for whether the heights of the [0,5),[5,10),[10,18) bars in high-stakes elections jointly equal those in low-stakes elections rejects with a p-value of 0.000. An analogous test for the [-18,-10),[-10,-5),[-5,0) bars fails to reject with a p-value of 0.874.

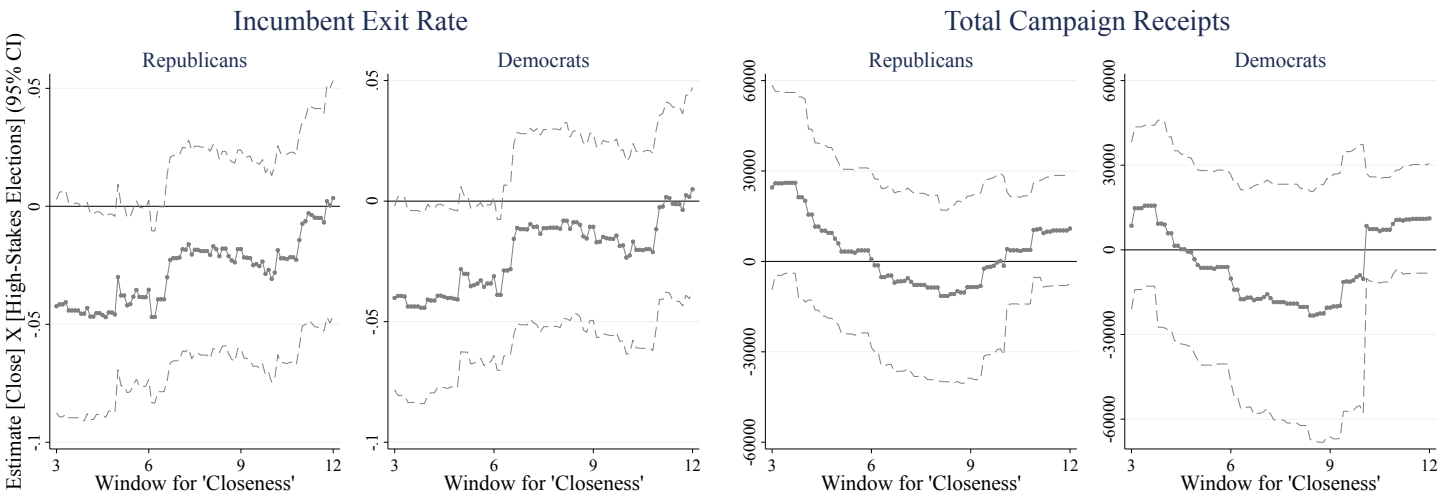
high-stakes elections Democrats win a majority by either losing seats to Republicans (though not enough to lose their majority) or because neither party makes big gains. The most extreme example is the set of elections where Democrats win a slim majority of less than 5 percent of seats, which never arise through Democratic gains. That implies Democrats never win a slim majority by winning a large number of seats that barely flips the chamber from Republican control. By contrast nearly 20 percent of elections barely lost by Democrats arose because Democrats made gains, creating a large discontinuity in the graph. This discontinuity implies that although Democrats do make gains in states where Republicans hold a majority, these gains are rarely large enough to let them take control.

A.1.4 Formal Tests of the Patterns in the Mechanism Section

This appendix presents some slightly more formal evidence of two patterns reported in the mechanism section. We define a dummy for whether there is a "close" relative number of incumbents, meaning whichever party won more seats in the previous election had narrow win. The current election would then likely be competitive. We regress the incumbent exit rate and total campaign receipts on this dummy for closeness, a dummy

Figure A3

Estimated Interaction Effect: [Close Margin of Incumbency] × [High-Stakes Election]



Note: For different definitions of what counts as a "close" incumbent majority, we regress the incumbent exit rate and total campaign receipts (at the candidate-level) on a dummy for a close margin, a dummy for being a high-stakes election, and their interaction. We plot the estimated interaction and 95 percent confidence interval against the cutoff for what counts as a close margin. Standard errors are clustered by state-redistricting cycle.

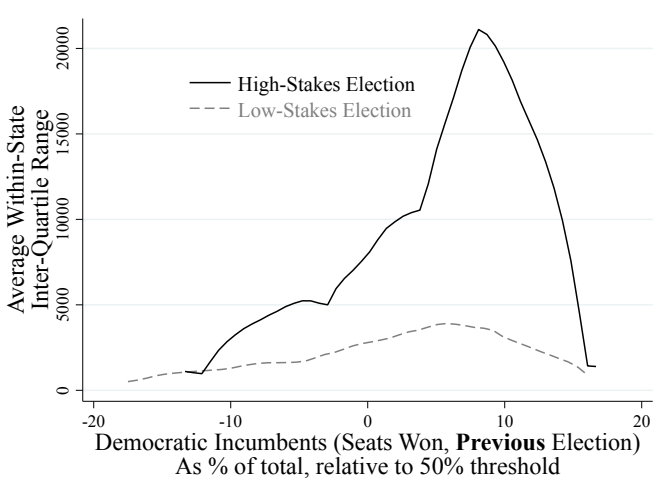
for being a high-stakes election, and their interaction. To be precise, for candidate c contesting an election in state i during election year t we estimate

$$\begin{aligned}[Outcome]_{c,i,t} = \pi_0 + \pi_1 \mathbb{I}(|X_{i,t-1}| < h) + \pi_2 \mathbb{I}(\text{High-Stakes}) \\ + \omega \mathbb{I}(|X_{i,t-1}| < h) \times \mathbb{I}(\text{High-Stakes}) + [Error]_{c,i,t} \\ \text{for } h = 12, 11.9, 11.8, \ldots, 3\end{aligned}$$

where $\mathbb{I}$ is the indicator function. The coefficient ω on the interaction measures the extent that parties make greater efforts to win close elections when the stakes are high. We vary the window within which the incumbent majority is defined to be close (h), starting with a wide definition and narrowing it. We re-estimate our specification at each of these definitions. The change in the estimated coefficient as the window narrows shows how much more the parties exert themselves in the most competitive elections.

Figure A3 confirms the patterns in Figures 9 and 8. When the election is competitive the incumbent exit rate is especially low and campaign contributions to state assembly members are especially high during high-stakes elections. Though the estimates for campaign finance are somewhat noisy (recall we have campaign finance data for relatively few elections), the pattern is clear.

Figure A4
The Inter-Quartile Range in Contributions to Democratic Incumbents
Rises in High-Stakes Elections where they Hold a Majority



Note: Outcome is the within-state inter-quartile range of contributions to Democratic incumbents from Democratic party committees.

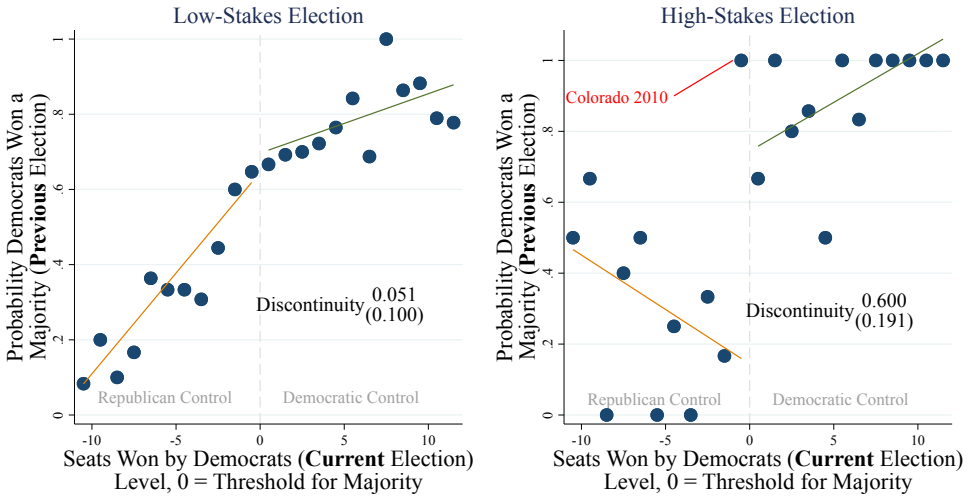
A.1.5 Parties Do Not Protect All Incumbents Equally

As noted in the results section, Democrats channel disproportionate funds to protecting incumbents in high-stakes elections. Equally striking is that they do not protect all incumbents equally, but concentrate their resources on protecting a few. We compute the within-state inter-quartile range in contributions from Democratic party committees to their incumbents. Figure A4 plots the local average of the inter-quartile range against the number of Democratic incumbents. The figure suggests that Democrats choose some of their incumbents to defend at all costs while leaving others to fend for themselves. Given that we also find they often lose seats in high-stakes elections (as shown in the results section), this result suggests they concentrate on protecting only as many incumbents as are needed to retain their majority. If their objective is only to retain control of the legislature, it is optimal to pursue such a purely defensive strategy.

A.1.6 Verifying the Results Are Robust to Using the Number of Seats as a Running Variable

Figure A5 redoes Figure 3 using the number of seats as the running variable. The bin size is exactly 1 seat, meaning the dot at $X_{i,t} = 1$ represents elections where Democrats won exactly one more seat than was needed to retain their majority. The height of the dot

Figure A5
Sorting Test in Levels



Note: The figure replicates Figure 3 using as the running variable the number rather than the percentage of seats won relative to the threshold needed for a majority. Standard errors are clustered by state-redistricting cycle. Bin size is 1 seat.

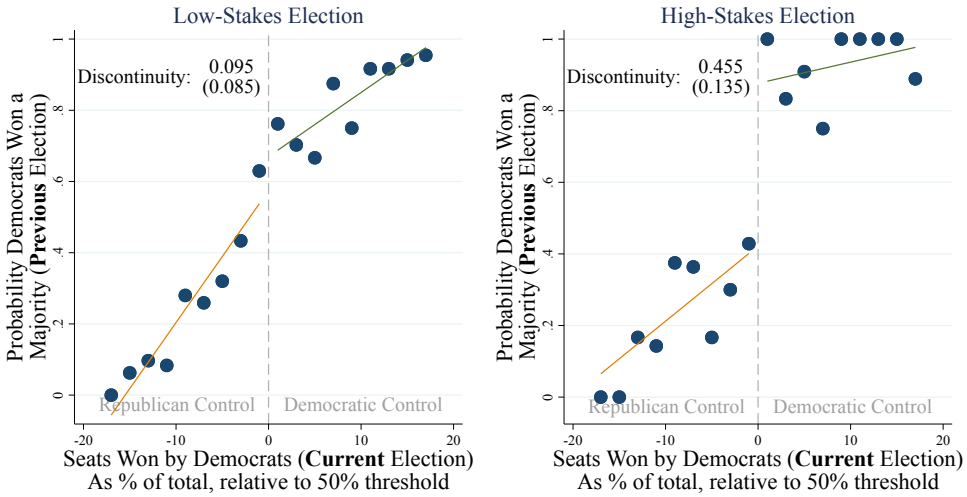
shows the fraction of elections in which Democrats held a majority before the election. The figure shows a stark difference between high- and low-stakes elections. It suggests there is a mass of states in which Democrats previously held a majority that, in high-stakes elections, were "shifted" to fall to the right of the cutoff. The one dot that seems to contradict the pattern, that immediately to the left of the cutoff, represents exactly one election (Colorado in 2010). It suggests the majority party cannot always exert precise control, but otherwise does not overturn the pattern visible in the vast majority of elections.

A.1.7 Verifying the Results Are Robust to Dropping Evenly Divided Elections

We argue in the main text that Democrats get a veto over redistricting when their share of seats is at least 50% even if their share is exactly 50%. That is because unlike in the upper house, in the lower house the executive branch (e.g. lieutenant governor) does not get a tie-breaking vote. When Democrats hold exactly 50% of votes they can still block any unfavorable redistricting plan. But Figure A6 verifies that dropping these evenly divided outcomes does not change the results.

Figure A6

The Results Are Robust to Dropping Evenly Divided Elections



Note: The figure replicates Figure 3 but drops observations where the share of seats won by Democrats is precisely 50%.

A.1.8 Verifying the Results Are Similar Using a Triangular Kernel

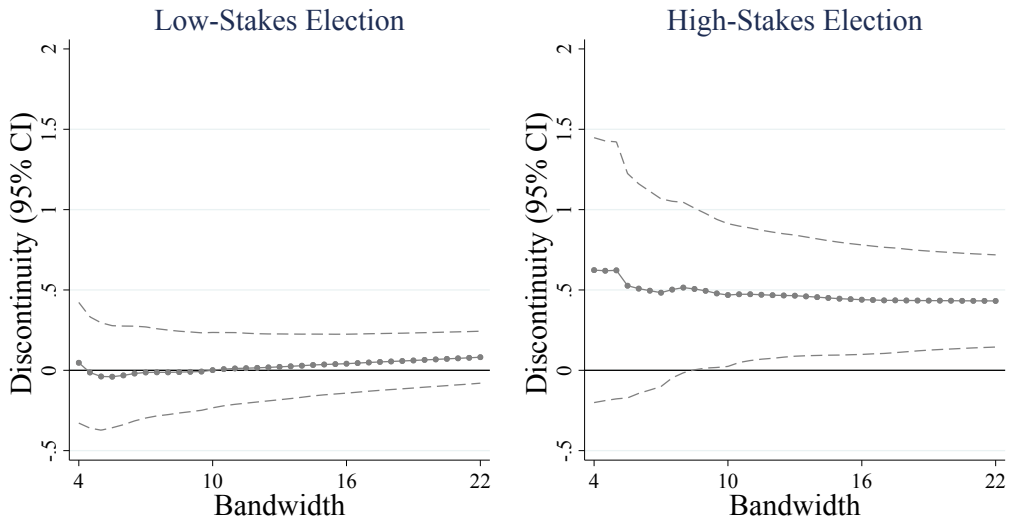
Figure A.1.2 is similar to Figure 4 except that Equation 2 is estimated using a triangular rather than a uniform kernel.

A.1.9 Additional Tables and Figures Referenced in the Results Section

Figure A8 shows that precise control creates a visible discontinuity in the conditional density of the election outcome $g(X_{i,t} \mid M_{i,t-1})$. Each panel shows a histogram for the seats won by Democrats in elections that meet the condition given in the title. Each dot plots the fraction of observations that falls within a 3-percentage point bin. Atop these dots we plot the line of best fit. The left-hand panels show the density for low-stakes elections. Regardless of which party held a majority before the election, there is no large discontinuity in the density. By contrast, the right-hand panels show that there are large discontinuities in high-stakes elections. When Republicans previously held a majority, there is far more mass just to the left of the threshold—that is, far more elections are barely won than barely lost by Republicans. The converse is true when Democrats previously held a majority.

Table A2 applies the Sorting Test to elections in our sample before *Baker v. Carr 369 (1962)* made it mandatory to redistrict after each census. Since the number of elec-

Figure A7
The Results are Similar Using a Triangular Kernel



tions is small, we use all states rather than just those that would subsequently form our estimation sample. As before, we restrict to elections just before the decennial census. There is no significant evidence of sorting. Though the coefficient seems large at a bandwidth of 18, it shrinks at a smaller bandwidth. We conclude there is little evidence of precise control in the years before redistricting was at stake.

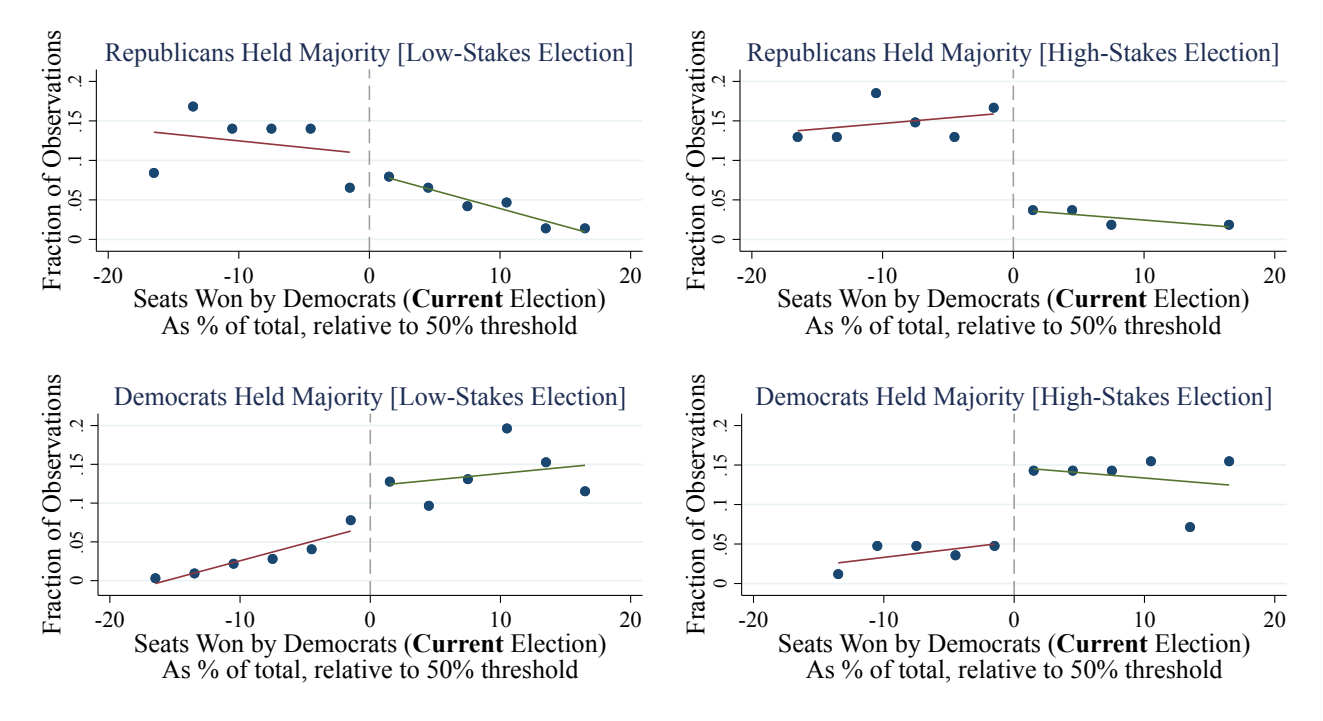
Table A3 applies the Sorting Test after disaggregating low-stakes elections based on their place in the redistricting cycle. We label the n-th election before a high-stakes election "Lead: n." The first two columns (Lead: 0) are essentially a reproduction of the Main Result from Table 1. The columns labeled "Lead: 1" apply the sorting test to the

Table A2
Interpreting Sorting Test

	Pre-Redistricting	
	(1) $BW = 18$	(2) $BW = 10$
Discontinuity	0.260	0.093
	(0.195)	(0.273)
Observations	63	41
Clusters	63	41
Control Mean	0.67	0.67

Figure A8

Conditional on the Party that Held a Majority, there is a Discontinuity in the Probability Density of High-Stakes Election Outcomes



Note: Each panel shows a histogram for the seat margin of Democrats in elections that meet the condition given in the title. The right-hand panels show the probability mass in each bin for observations in high-stakes elections, while the left-hand panels show low-stakes elections. The top panels show elections in which Republicans previously held a majority, while the bottom panels show elections in which Democrats previously held a majority.

Table A3
Disaggregating Low-Stakes Elections

	Lead: 0		Lead: 1		Lead: 2		Lead: 3	
	(1) $BW = 18$	(2) $BW = 10$	(3) $BW = 18$	(4) $BW = 10$	(5) $BW = 18$	(6) $BW = 10$	(7) $BW = 18$	(8) $BW = 10$
Discontinuity	0.422***	0.417**	0.208	-0.033	0.154	0.409	-0.051	0.239
	(0.136)	(0.195)	(0.157)	(0.226)	(0.183)	(0.246)	(0.165)	(0.233)
Observations	138	85	121	57	114	46	111	48
Clusters	138	85	121	57	114	46	111	48
Control Mean	0.35	0.35	0.41	0.50	0.38	0.12	0.62	0.64

Table A4
Discontinuity Persists Across Time

	(1) 1971-1981	(2) 1971-1991	(3) 1981-2001	(4) 1991-2011	(5) 2001-2011
Discontinuity	0.587***	0.487***	0.468**	0.211	0.319*
	(0.218)	(0.183)	(0.187)	(0.183)	(0.181)
Observations	50	79	83	88	59
Clusters	50	79	83	88	59
Control Mean	0.11	0.20	0.43	0.62	0.57

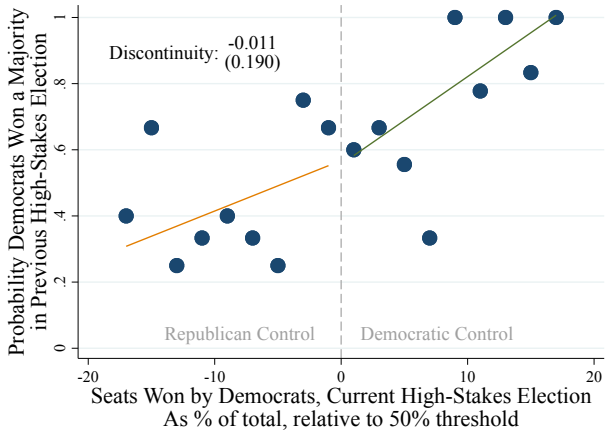
election before a high-stakes election, and so on. Only in true high-stakes elections is there robust evidence of sorting.

Table A4 applies the Sorting Test to subsets of high-stakes elections taken from rolling windows of time. We take each post-Census year 1971, 1981, ..., 2011 as the center of the window and restrict the sample to high-stakes elections within 10 years of the center. The purpose of these regressions is to reveal whether precise control is confined to some specific era in history, or if there is a trend in its prevalence. The estimated coefficients are smaller in more recent years than in earlier years. However, the samples are small enough (and the standard errors large enough) that we cannot reject that all coefficients are equal. Moreover, the apparent change in coefficients is not monotonic, suggesting the apparent decline may be driven by one or two unusual decades. We conclude that there is not much evidence that our estimates vary across time.

A.1.10 The Result is Not Driven by Prior Control of Redistricting

Given that the act of redistricting may affect a party's fortunes, it is possible that the winner of a high-stakes election uses redistricting to ensure it will remain the majority party for years to come. Could this explain our results? Suppose control of prior redistricting were what let a party exert precise control in the current high-stakes election.

Figure A9
Is Precise Control Driven by Prior Redistricting?



Note: This figure is similar to the right-hand panel of Figure 3, but the outcome is a dummy for whether the Democrats won a majority in the previous high-stakes election.

Then there would be sorting based on whether Democrats or Republicans won the previous high-stakes election. Figure A9 tests this hypothesis by running the Sorting Test as was done in the right-hand panel of Figure 3, except the outcome is now a dummy for whether Democrats won the previous high-stakes election. There is no evidence of sorting, suggesting prior redistricting cannot explain precise control.

A.2 Bandwidth

A.2.1 Optimal Bandwidth Methods

Standard methods of choosing optimal bandwidth give wildly different suggestions for the optimal bandwidth of Equation 2. The cross-validation method suggested in Ludwig et al. (2007) and Lee and Lemieux (2010) chooses a bandwidth of 22 percentage points or higher. The method of Calonico et al. (2014) suggests bandwidths closer to 10. Finally, the method of Imbens and Kalyanaraman (2011) suggests a bandwidth close to 1 (which contains very few observations). The disagreement may arise because our sample is relatively small. Even the smallest example considered in Imbens and Kalyanaraman (2011) used 500 observations, several times as many as in our sample of high-stakes elections. As noted in the text we opt instead to choose a bandwidth that gives relatively conservative estimates and show that the main results are robust to other choices.

A.2.2 Verifying the Results of Density Test are not Sensitive to Bandwidth or Bin Size

As noted in the text, the Density Test requires making a nonparametric estimate of the probability density of $\tilde{X}_{i,t}$. Any such estimate requires choosing not only a bandwidth for smoothing but the size of the bins used to form observations of the empirical density. Figures A10 and A11 show that our estimates are robust to many choices of both bandwidth and bin size.

Figure A10
Robustness to Bin Size and Bandwidth: Figure 2

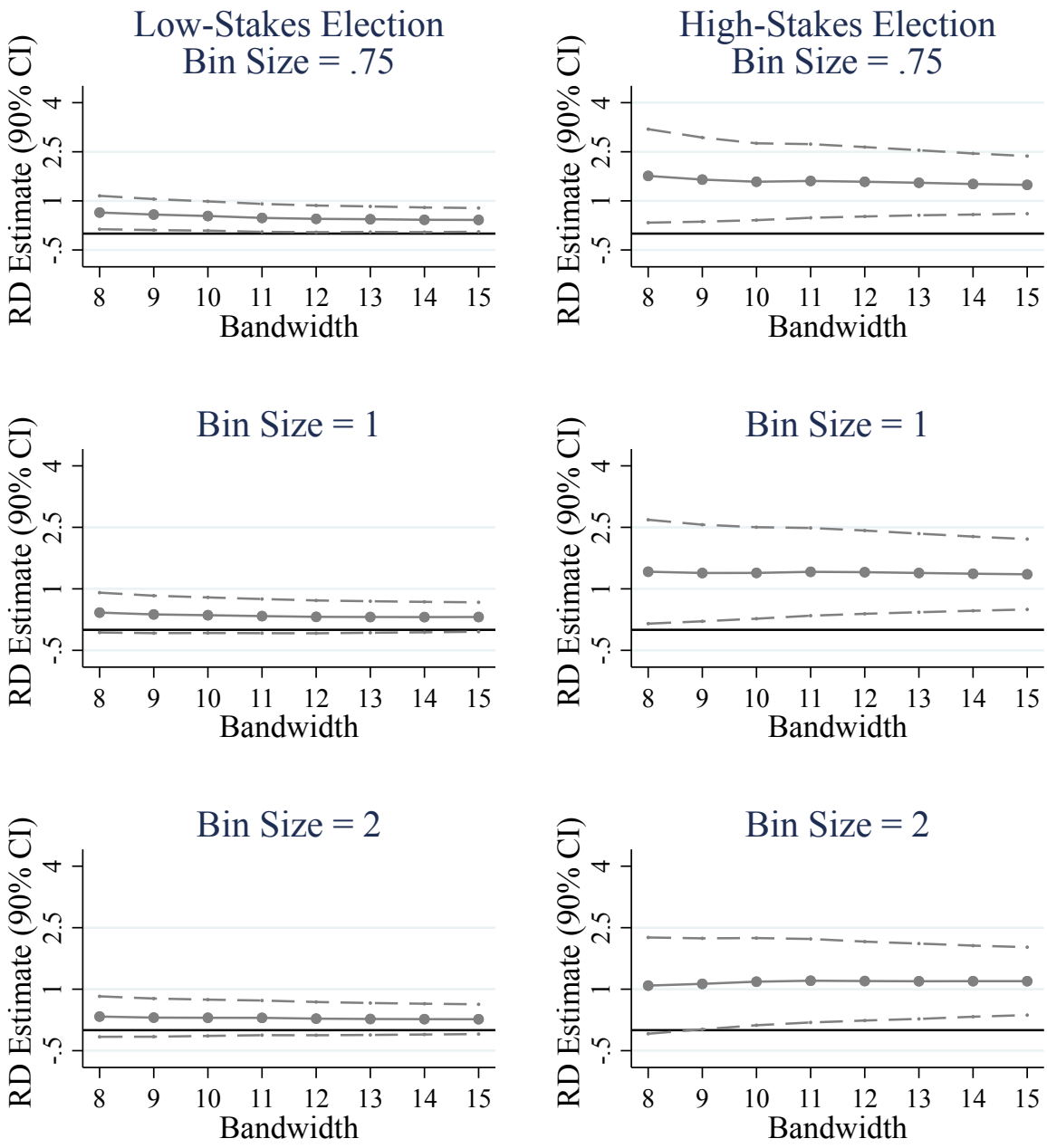


Figure A11

Robustness to Bin Size and Bandwidth: Figure 2

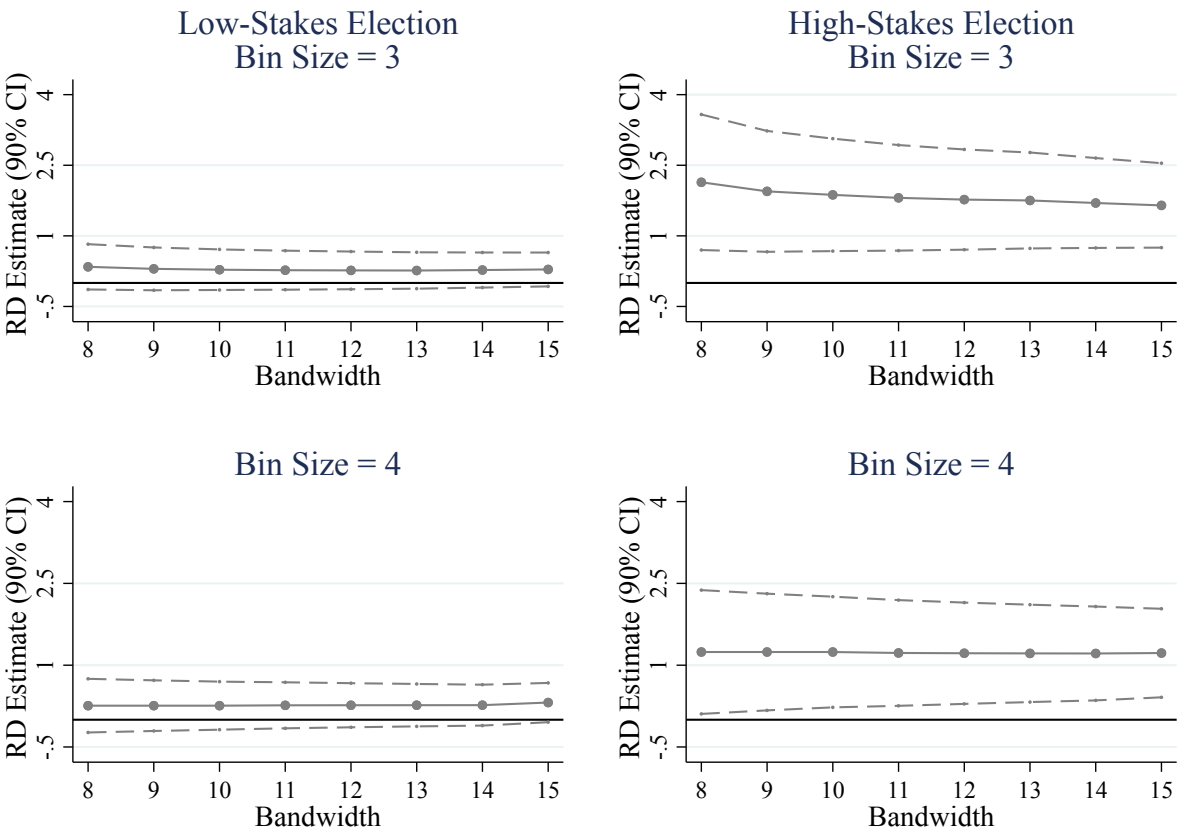
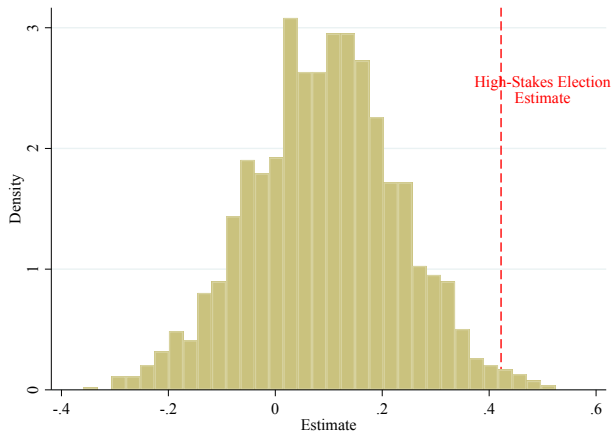


Figure A12
Subsamples of the Low-Stakes Elections Rarely Produce Discontinuities as Large as in the High-Stakes Elections



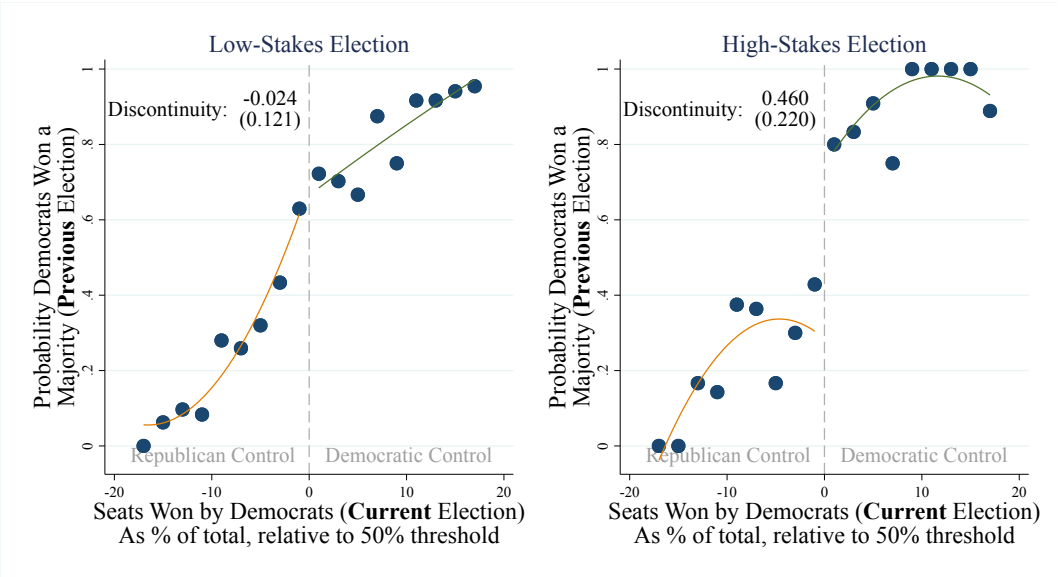
Note: See text for details.

A.3 Verifying the Results are Not Mechanical because of Small Sample Size

This appendix verifies that the main result—the estimate of Equation 2—is not driven by a small sample size. Finding a larger discontinuity in high-stakes elections might be mechanically more likely because there are fewer of them. To test this hypothesis we test for whether we can produce an equally large discontinuity by discarding some of the low-stakes elections.

To be precise, we start with the dataset of all low-stakes elections. We randomly select a subsample of these elections of the same size as the set of high-stakes elections. We then estimate Equation 2. We repeat this procedure 2000 times. Figure A12 plots the histogram of the 2000 estimates. The dashed line marks the actual estimate from the high-stakes elections. Just 19 of the 2000 estimates are larger than the actual estimate based on the sample of high-stakes elections. Only 7 (0.35 percent) have a larger absolute t-statistic. This exercise suggests it is unlikely that the high-stakes elections are drawn from the same data-generating process as the low-stakes elections.

Figure A13
Using a Second Order Polynomial Produces
Discontinuities as Large as in the Local Linear Regression



Note: See text for details.

A.4 Verifying the Results are Robust to Using a Nonlinear Conditional Expectation Function

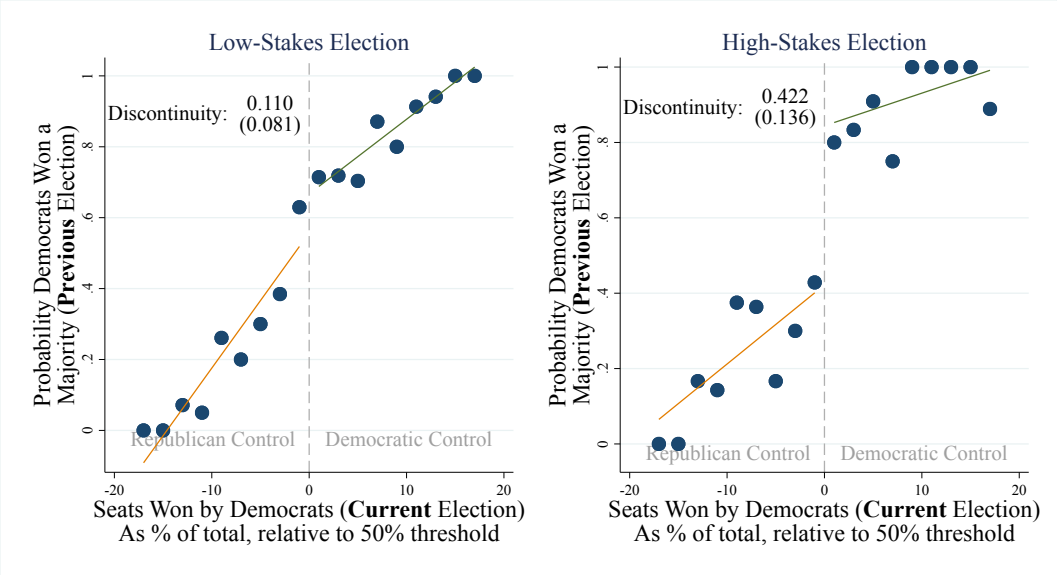
This appendix verifies that the results are not driven by substantial nonlinearity in the conditional expectation function that is not captured by a local linear regression. Figure A13 is similar to Figure 3 except we estimate the discontinuity using a local quadratic regression. The results are if anything stronger. The discontinuity in low-stakes elections shrinks further and the discontinuity in high-stakes elections grows larger.

A.5 Verifying the Results are Robust to the Definition of the Sample

A.5.1 Excluding Observations Prior to *Reynolds v. Sims (1964)*

One could argue that the modern redistricting does not begin until *Reynolds v. Sims (1964)*. Figure A14 shows that restricting the sample to elections after *Reynolds* and the unexpected redistricting triggered by it in 1966 does not change the results.

Figure A14
The Results Are Similar Using Only Elections
After the 1966 Reynolds Redistricting



Note: See text for details.

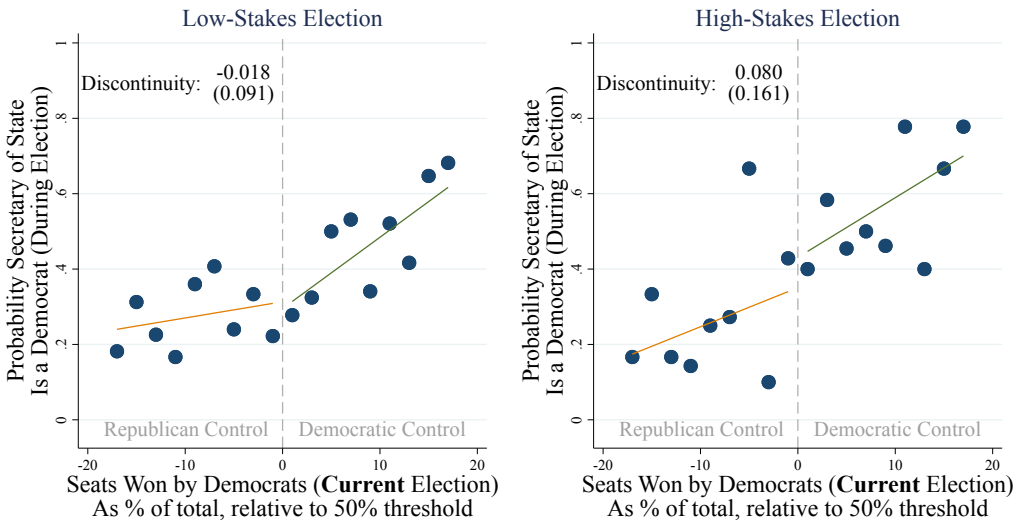
A.6 Verifying the Result is Not Driven by the Party of the Secretary of State

One alternative mechanism for precise control is that it arises not through holding a (large) majority in the assembly before the current election, but through direct intervention in the logistics of the election by the Secretary of State. If the party of the Secretary of State is strongly correlated with the party that won a majority in the prior election, Figure 3 might spuriously suggest it is the party in control of the legislature that matters.

We test this alternative mechanism by linking our dataset to the party of the Secretary of State at the time of the election.[29] We define a dummy for whether a Democrat is the Secretary of State during the election, which is analogous to our dummy for whether Democrats won a majority in the prior election. But the correlation between these dummies is only 0.3364—not trivial but far from 1. Figure A15 runs the Sorting Test on the dummy for a Democratic Secretary of State. There is no evidence of sorting in either low- or high-stakes elections, which suggests the party of the Secretary of State is not what enables precise control.

[29]These data were scraped from https://www.ourcampaigns.com/StateOfficeList.html

Figure A15
There is No Sorting on the Party of the Secretary of State



Note: See text for details.

A.7 State Senate

This section tests for whether there is precise control in the upper house of the state legislature (typically the state senate). The theoretical argument for wanting to control the state assembly—that having a veto in at least one chamber during redistricting will prevent the adoption of an unfavorable redistricting plan—applies equally to the state senate. But studying the state senate raises two complications that must be addressed:

1. State senates are generally smaller than assemblies, and most states stagger elections so that half or fewer districts are in contention during any cycle. Although that makes precise control even easier (it is easy to predict the marginal seat that determines control), it also aggravates the discreteness problem. Hence it is necessary to test carefully for robustness to bandwidth.

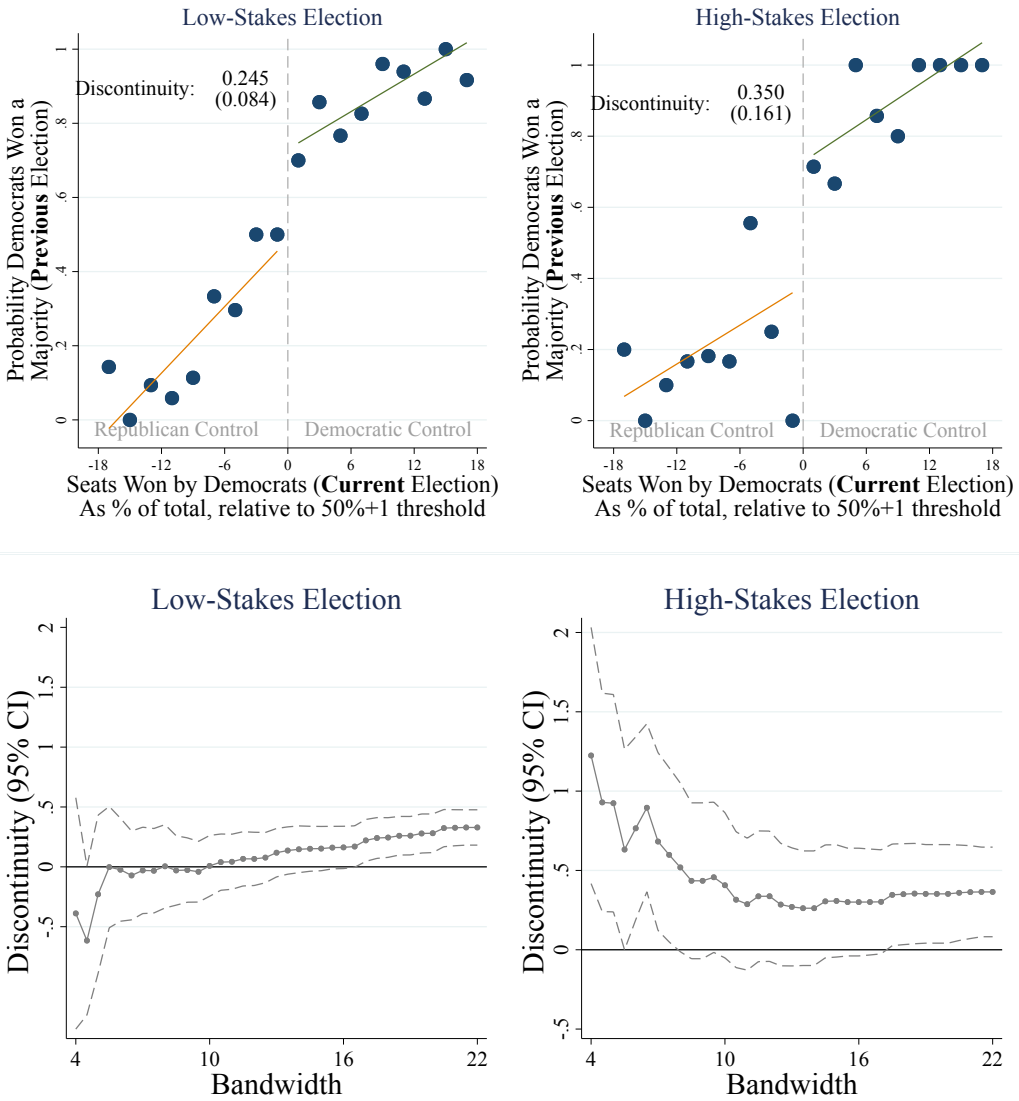
2. Most states allow the lieutenant governor to cast a tie-breaking vote when the senate is evenly divided. That means holding exactly 50% of the seats may be insufficient to block an unfavorable redistricting plan. Hence it is necessary to use a 50% + 1 cutoff in the case of the state senate.

The top panel of Figure A16 shows the Sorting Test for state senate elections. At a

bandwidth of 18% there is a clear discontinuity in High-Stakes elections, but it also appears in Low-Stakes Elections. This apparent contradiction is an artifact of the discreteness problem mentioned above. The bottom panel of Figure A16 shows the estimated coefficient for high- and low-stakes elections at all bandwidths from 4 to 22 percent (comparable to Figure 4). The estimate shrinks with the bandwidth to zero in low-stakes elections, but remains large (or even grows larger) in high-stakes elections.

Figure A16

There is Precise Control in State Senate Elections



Note: See text for details.

B The Institutional Basis for Precise Control (For Online Publication)

B.1 Strategic Intuition

As noted in the mechanism section of the main text, when a party switches to majority-seeking tactics it channels its resources towards the districts most likely to be "pivotal," meaning those most likely to be the tipping point district that gives them a bare majority. In the text we describe the special case that Snyder (1989) solves, where seats are either safe, swing, or unattainable for the majority. If the "safe" districts are those where the majority party has an incumbent, then the pivotal seat will probably be a safe seat because (by definition) the majority party has an incumbent in a ruling majority of districts. Since all safe seats are assumed equally safe, the simplified model implies all incumbents receive an increase in resources while challengers in swing districts are ignored.

In reality there will be variation in how safe an incumbent is. A district with 10 times as many registered Democrats as Republicans is very unlikely to be the pivotal seat. Hence the party would want to order its incumbents from safest to most at risk, then identify the subset close to the 50% cutoff. These incumbents would receive the bulk of the resources, and safer incumbents would receive fewer (challengers would receive little or nothing).

This framework makes it clear why precise control is easier when the majority party has a large majority and does not occur when with a bare majority. Suppose that an aggregate statewide swing determines the size of the party's prior majority and its prospects in the next election. If it holds only a bare majority, it suggests the aggregate swing was only barely in the ruling party's favor. Then the pivotal seat is probably highly competitive. Even with an incumbency advantage there is a sizable chance that the majority party will lose that seat, costing it the majority. That leaves it little scope for precise control.

But if the majority party won a large majority in the prior election, the aggregate swing must have been very favorable. Then the pivotal seat is probably relatively safe, and there are many seats are extremely safe. If the party throws resources at seats around the 50% mark it can raise the chance it holds those seats to nearly 1. It might "give up" seats that are less safe, but hold the bare majority it needs to retain control.

B.2 Predicting Probability of Victory

The strategic intuition presented above assumes the majority party can predict its chance of winning each district with reasonable accuracy. Using race-level state legislative elections data published by Klarner (2018) we estimate a naive probit model that predicts the probability the Democrat wins as a function of the party of the incumbent (if one is running), a dummy for whether the Democrat won in the previous election, the Democratic vote share in the previous election, and the interaction of the prior vote share and the dummies for incumbency and a prior Democratic win. Simple though it is, this model correctly predicts the outcome in over 92 percent of single-member district races. The model does nearly as well making out-of-sample predictions. If we estimate the model using only data from before 2010, the out-of-sample predictions for 2010 correctly call the outcome of nearly 89% of races.

Klarner (2010a) and Klarner (2010b) used a more sophisticated set of models to forecast the 2010 election on its eve. He augments the pre-2010 data with several variables beyond the naive model we estimate, notably campaign spending and the president's approval rating. His postmortem analysis finds that his race-level forecast of the Democratic seat share explains 85% of the variation in their actual seat share (though he does not report what percentage of races were correctly called). The same postmortem suggests the additional variables improved the accuracy of the forecast, implying there is room to improve on the naive model we estimate.

And yet even these forecasts are based on the relatively crude predictors available to researchers. The parties themselves raise colossal funds to contest redistricting elections, some of which is spent on private polling. The case of Pennsylvania, which was a special target of the Republican State Legislative Committee in 2010, is instructive. A search of Pennsylvania's campaign finance disclosures for that race suggest individual state representatives would spend thousands on expenses described as "polling" or "surveys," hiring firms like "SUSQUEHANNA POLLING & RESEARCH." These reports probably miss the amount of polling available to candidates and party committees because many will retain their own staff pollsters rather than hiring outside firms. This private data would almost certainly improve the forecasts possible using simple statistical models. Given that even the simple models perform reasonably well, it seems likely that parties know which districts are most likely to be pivotal in holding the majority.

B.3 Simulating the Tactic

This appendix runs simulations to test whether a shift to the tactics described in Appendix B.1 can actually induce a discontinuity in the distribution of election outcomes. These simulations cannot prove that the shift in tactics is how parties achieve precise control in reality, but they are at least a proof of concept that a majority-seeking strategy can produce figures similar to those from the main text.

Let $v_1, \ldots, v_N$ be a set of dummies for whether districts 1 through N are won by the Democrat candidate (and assume $v_n = 0$ implies n is won by the Republican candidate). Define

$a_n \in [0, 1]$	Lean of district n towards Democrats
$s_n^D, s_n^R \geq 0$	Spending of Democrats and Republicans on n
$\delta \sim U[-\frac{1}{2\psi}, \frac{1}{2\psi}]$	Aggregate shock towards Democrats

Let

$$\mathbb{P}(v_n = 1) = \frac{a_n \tau(s^D) + \delta}{a_n \tau(s^D) + (1 - a_n)\tau(s^R) + \delta}$$

where the only difference from Snyder (1989) is that we allow for an aggregate state-wide shock that uniformly raises or lowers the Democrats' probability of winning any district. We assume

$$a_n = \bar{a}(A + \varepsilon_n)$$

where A is the (stochastic) average lean of the state towards the Democrats and ε_n is the district-level deviation from the average.

Define the share of seats won by Democrats in the current election as

$$X_t = 100\% \times \frac{1}{N} \sum_{n=1}^{N} v_n$$

and assume the Democrats held a majority in the prior election if $A > 0$. This assumption creates a correlation between the outcome of the prior election and the outcome of the current election (since California leans Democratic, they held a majority in the prior election and have a heavy advantage in winning seats in the current election). It captures the intuition from Appendix B.1 that Democrats can more easily exert precise control in states that strongly lean Democratic (which would imply they won a large ma-

jority in the prior election). Then the median district will have a high value of a_n, giving Democrats a heavy advantage in holding that district and all the districts safer than it.

We assume parties follow different strategies in low- and high-stakes elections. In low stakes elections they spend equally on all districts:

$$s_n^D = 1$$
$$s_n^R = 1$$

We call this the "Uniform Strategy." This strategy is meant to serve more as a baseline than as a reflection of the optimal (seat-maximizing) strategy, which would involve targeting more resources to equalize $\partial \mathbb{P}(v_n = 1)/\partial s^D$. But the true seat-maximizing strategy might make it even less likely the majority party appears to win just 50% of the seats because the party would be targeting more resources towards competitive districts and fewer towards safe districts.

We assume that in high-stakes elections parties channel the bulk of their resources to the "median" seat that just barely gives them their majority. Define an ordering $k_1, \ldots, k_n, \ldots, k_N$ such that a_{k_n} is the n–th order statistic of the set $\{a_1, \ldots, a_N\}$. We assume

$$s_n^D = \begin{cases} \kappa\sqrt{\frac{N+1-n}{floor(N/2)}} & \text{if } n > floor(N/2) \\ \iota & \text{if } n \leq floor(N/2) \end{cases}$$
$$s_n^R = \begin{cases} \kappa\sqrt{\frac{n}{ceil(N/2)}} & \text{if } n \leq ceil(N/2) \\ \iota & \text{if } n > ceil(N/2) \end{cases}$$

This is not necessarily the optimal strategy predicted by Snyder (1989), which is potentially very complicated. It is only meant to capture the intuition that parties channel resources towards each district in proportion to the probability it will be the pivotal seat that barely maintains the majority (though there may be a different strategy that better achieves that goal).

Finally, we impose the following functional form assumptions:

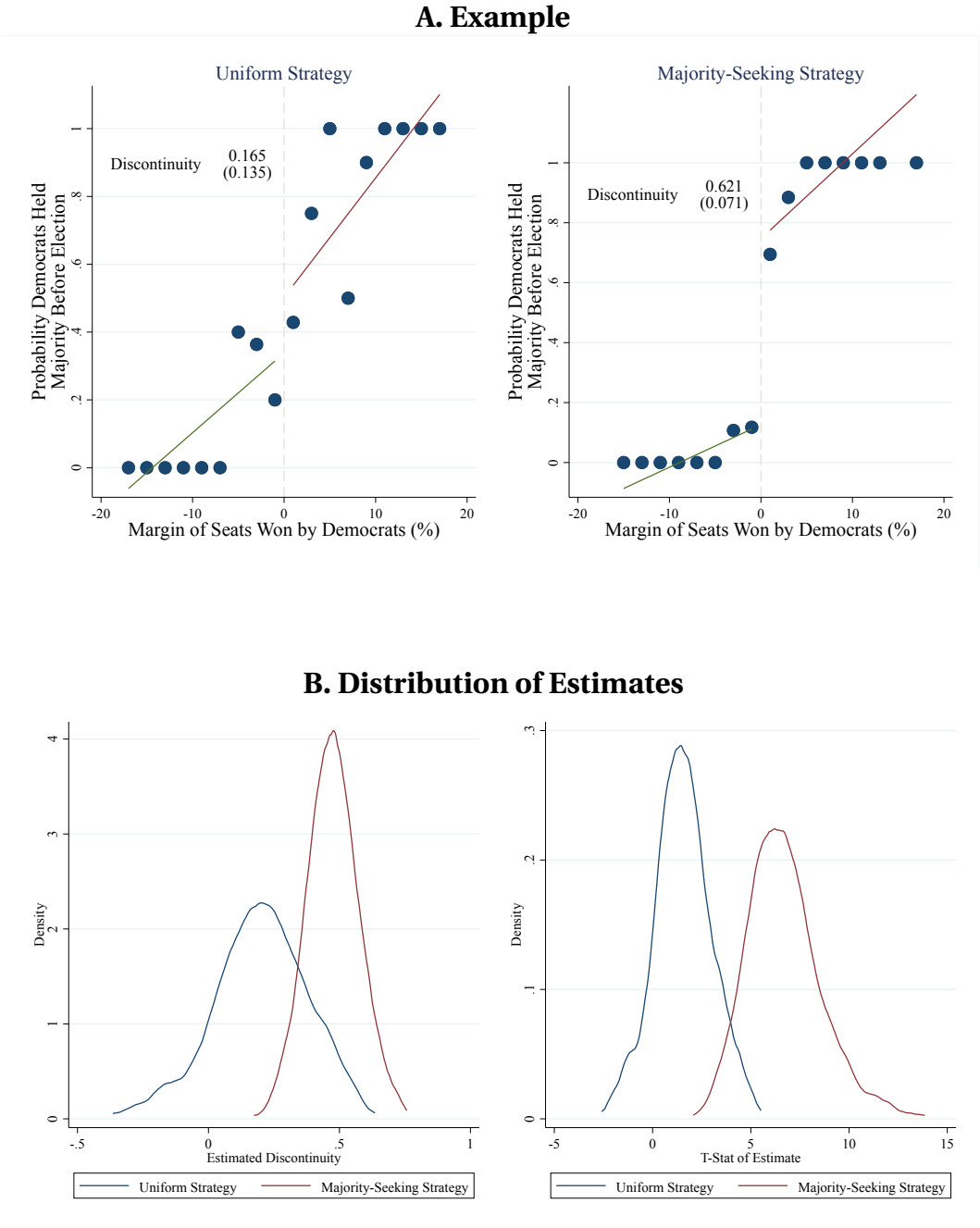
$$\tau(z) = \frac{1}{2}x^{\frac{1}{2}}$$
$$\bar{a}(z) = \Phi(z)$$
$$A \sim \mathcal{N}(0,1)$$
$$\varepsilon \sim \mathcal{N}(0,1)$$

and assume $\kappa = 30, \iota = 0.2$. These numbers may imply total spending differs in low- versus high-stakes elections, which would be consistent with Figure 9. Finally, we assume $N = 251$ and there are 200 elections in each simulated dataset. We run 500 simulations.

Panel A of Figure B1 is constructed exactly like Figure 3 from one of these 500 simulations. Though the resemblance is imperfect—in particular, the actual Republican party is far more successful winning control of Democratic state assemblies than its simulated counterpart—the simulation suggests a simple symmetric change in tactics can induce a discontinuity in the distribution of election outcomes.

Panel B shows kernel density plots from the 500 simulations. It suggests Panel B was not a fluke. The estimated discontinuity is systematically larger when parties use the majority-seeking strategy, and the t-statistic of the estimated discontinuity is larger. Again, these simulations are not proof that a shift in tactics is the (sole) mechanism behind our results, only that such a shift is capable of creating results like those we find.

Figure B1
Majority-Seeking Strategies Can Induce a Discontinuity



Note: See text for details.