

How Divisive Primaries Hurt Parties: Evidence From Near-Runoffs*

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Abstract

In many democracies, parties use primary elections to nominate candidates. Primaries may help parties select quality candidates, but they can also expose flaws and offend losing candidates' supporters. Do divisive primaries help or harm parties in the general election? Existing research is mixed, likely because of issues of selection and omitted variables. We address these issues by using U.S. states with runoff primaries—second-round elections which, when triggered, create more divisive primaries. Using a regression discontinuity design, we estimate that going to a runoff decreases the party's general-election vote share in the House and Senate by 6–9 percentage points and decreases the party's win probability by 21 percentage points, on average. Opposing results in state legislatures suggest that divisive primaries are damaging when salience is high but beneficial when it is low, a pattern we argue is driven by the competing effects of information in high vs. low salience primaries.

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1 Introduction

The 2016 presidential primaries were bruising affairs, marked by bitter partisan infighting. These campaigns have brought the idea of divisive primaries back to the fore, with many speculating about whether or not such primaries affect political outcomes. The *Washington Post*, to pick one example, reports that “The prospect of a long and fractious Republican presidential primary, so far dominated by the divisive rhetoric of front-runner Donald Trump, is benefiting only one person, political strategists say: Hillary Clinton.”¹ The professional prognosticator Nate Silver, to choose another example, declares that “divisive nominations have consequences.”² Others disagree. Writing for “The Upshot,” the *The New York Times* data-driven political blog, Brendan Nyhan says: “Republicans Have Little to Fear From a Divisive Primary.” The article continues, “In reality, winning a nomination fight elevates the stature of the victor.”³ Academically, divisive primaries—generally defined as any primary election with a high degree of competition between at least two candidates—are both an object of direct interest and an important tool with which to learn about the effects of campaigns, electoral competition, and information more broadly. Despite this value, and despite the many papers written on divisive primaries, the academic literature on the topic is just as divided as are the pundits, at turns finding that divisive primaries hurt, help, or do not affect parties’ general-election performance.⁴ What are the actual effects of divisive primaries? And why have we not been able to answer this important question?

Studying the effects of long-fought, competitive primaries is made difficult by a clear issue of selection bias. Times and places where a party experiences such a primary may be the same times and places where the party is already expected to do worse—precisely because of pre-existing divisions among the party’s electorate. The claim that parties who experience divisive primaries tend to do worse in the general election, even if empirically true, may simply be a reflection of these pre-existing issues, rather than evidence that divisive primaries *per se* hurt the party. On the other

¹<http://www.washingtontimes.com/news/2015/dec/9/hillary-clinton-lone-beneficiary-of-donald-trumps-/?page=all>

²<http://fivethirtyeight.com/features/dont-assume-conservatives-will-rally-behind-trump/>

³http://www.nytimes.com/2015/03/28/upshot/repUBLICANS-have-little-to-fear-from-a-divisive-primary.html?_r=0

⁴Some scholars find evidence for the damaging effects of divisive primaries (Abramowitz 1988; Bernstein 1977; Born 1981; Haerberle 1993; Kenney and Rice 1984, 1987; Lengle 1980; Lengle, Owen, and Sonner 1995; Makse and Sokhey 2010; Romero 2003; Segura and Nicholson 1995); others find no effect or mixed evidence (Hacker 1965; Johnson, Petersheim, and Wasson 2010; Kenney 1988; Lazarus 2005; Smith and Piereson 1975); finally, some find positive effects (Alvarez, Canon, and Sellers 1995; Carlson 1989; Herrnson 2000; Hogan 2003).

hand, since more and higher quality candidates may be most likely to enter primaries when they expect the general election to favor their party, divisive primaries might also take place precisely when the party’s expected fortunes are highest—creating a bias that could instead make divisive primaries look beneficial to parties. Existing attempts to study divisive primaries are unable to address these clear problems of selection, which may help explain why they come to differing and inconsistent conclusions.

In this paper, we address these problems of selection bias directly. To do so, we follow a large recent literature employing the regression discontinuity design in electoral contexts (e.g., Anagol and Fujiwara N.d.; de Benedictis-Kessner and Warshaw N.d.; Brollo and Troiano 2015; Broockman 2009; Caughey, Warshaw, and Xu 2016; Ferreira and Gyourko 2014; Folke and Snyder 2012; Fourinaies and Hall 2014).⁵ In particular, we focus on close first-round primary elections for the U.S. Senate and U.S. House that occur in times and places where runoff primaries—which by definition create highly competitive extensions of primary elections—are used. A runoff primary only occurs when the top vote-getting primary candidate’s vote share is below a certain threshold (usually, but not always, 50%), allowing us to obtain quasi-random variation in how long and how contested the primary campaign is. When the top vote-getting primary candidate is just below the threshold, the party experiences a longer, more divisive primary; when the top vote-getting candidate is just above the threshold, the primary ends and the party can begin to prepare for the general armed with a “consensus” nominee. The quasi-random variation that comes from these close runoffs acts as a natural experiment that ensures, under reasonable and testable assumptions, that the resulting estimated effects of divisive primaries are not contaminated by the usual sources of bias. In particular, because in our design parties either have longer or shorter primaries “as-if” randomly, the *ex ante* expected performance of the parties in the general election is held constant.

Using this design, we find substantial negative effects of divisive primaries. In House and Senate elections, the “as-if” random assignment of a runoff primary produces roughly a 21 percentage-point reduction in the probability the party holding the primary wins the general election, on average. Divisive primaries appear to be extremely damaging to parties, overall.

⁵For reviews and methodological discussions related to the use of the RD in electoral settings, see Caughey and Sekhon (2011); de la Cuesta and Imai (2016); Eggers et al. (2015); Skovron and Titiunik (2015).

Why do divisive primaries seem to have such large, negative effects? To try to understand the underlying mechanisms, we also study the effects of divisive primaries in lower-salience contexts. Specifically, we collected a new dataset on state legislative primaries in runoff states. Using this data, we find that runoffs in state legislatures produce either null or, in competitive contexts, *positive* effects on parties' general-election fortunes. Because of the obvious differences between state legislative races and federal races, this suggests that divisive primaries may be harmful only in more salient contexts. In support of this hypothesis, we also find that the effects of divisive primaries become systematically more negative as salience increases. Effects are most positive—i.e., beneficial to parties in the general election—in state lower houses and senates, the least salient elections in our sample; they are noticeably negative in U.S. House races, and massively negative in U.S. Senate races.

To try to explain these patterns, we put forward an argument based on the differences in the value of competitive primaries in low vs. high information settings. In low information settings, we suspect, divisive primaries help voters select higher quality candidates by increasing the visibility of the race and uncovering at least some small amount of information about the quality of the candidates. This makes divisive primaries have a positive effect, since they tend to select candidates who are higher quality, on average, than those selected in primaries without runoffs. Moreover, in these environments, the costs of a divisive primary are mitigated by the fact that most people are unaware of whether the primary election was bitter or not. In higher information settings, in contrast, elites and voters know more about the quality of candidates, rendering the helpful effects of competitive primaries on candidate selection less useful. At the same time, the costs of the party's failure to coordinate on a candidate early are more damaging in these settings, where news coverage of the divisive primary is, potentially, much more visible.

The remainder of the paper is organized as follows. In the next section, we review the literature on divisive primaries, focusing on the possible mechanisms that scholars have theorized might explain why they are helpful or harmful to parties, and we lay out arguments for why the effects of divisive primaries may vary based on the level of electoral salience. Following that, we discuss the empirical strategy and data we employ to separate out the causal effects of divisive primaries, and we consider the degree to which runoff primaries are a fitting proxy for divisive primaries more generally. Subsequently, we present our main empirical results on federal elections, documenting a

substantial penalty to parties in the general election who have quasi-randomly experienced divisive primaries. Next, we show that no such penalty exists in the state legislatures. The next three sections probe possible mechanisms underlying the penalty, including voter information, the length of time added to the primary campaign, and the degree of ideological divergence between the runoff candidates. Finally, we conclude with general thoughts on what our findings imply for the divisive primaries literature and the study of campaigns and elections more broadly.

2 Divisive Primaries: Theories and Mechanisms

In a wide variety of democracies, parties choose their nominees through primary elections. In the U.S., primaries arose as a progressive reform of the early 20th century and are now used to select nominees for a variety of offices, ranging from the presidency to state legislatures and beyond. Releasing their control over the nomination process brought many difficulties for parties in the U.S., not the least of which was the risk that voters would ignore parties' wishes and nominate candidates the parties did not like.

Separate from these fundamental issues about parties and voters, the creation of primary campaigns also brought the risk that the extra election, itself, could damage parties' chances in the general election. Before primaries, parties might be able to quietly select a single candidate, avoiding any appearance of dissent and presenting a unified front to general-election voters. With primaries, candidates in the same party might divert too much effort to bloodying each other in competitive contests for the nomination, exposing weaknesses and preventing the party from preparing for the general. Discussing the full range of primary elections, from legislative and gubernatorial to presidential, Hacker (1965: 105) starts from—and then offers evidence against—“the conventional view that the party whose candidate is obliged to fight a hard primary campaign has an important strike against it upon entering the general election.” We follow Hacker in thinking of divisive primaries as being, first and foremost, any primary in which at least two candidates compete fiercely for the nomination. Specifically, Hacker defines a divisive primary as any primary election in which the winning candidate received no more than 65% of the vote. The candidates in such primaries may or may not differ starkly in terms of ideology, backgrounds, etc—what defines a primary as divisive is simply the fact that it is closely contested.

The precise mechanisms by which such divisive primaries might hurt party nominees are various. Hacker, for his part, lays out two main and not mutually exclusive explanations for a possible penalty for divisive primaries. First, a divisive primary can split the party's supporters, deterring some part of them from supporting the nominee. Hacker writes, "The supposition also arises that those who backed the primary loser in the Spring may be less than enthusiastic about aiding his vanquisher in the Fall." Second, a divisive primary might turn off voters outside the party who would have otherwise considered supporting its nominee in the general election: "there is reason to believe that voters who are committed to neither party may wonder whether the party that needed to go to the polls to resolve its own leadership problems is fit to hold public office."

These potential mechanisms, and many others related to them, implicitly rely on information about the primary campaign reaching voters. As Hogan (2003) points out, if voters are not even aware that a party experienced a divisive primary, they cannot be turned off by it. Thus, these particular mechanisms, which we might call "direct" mechanisms—because they rely on voters directly observing the divisive primary and inferring that the party is not worth supporting—should be a factor only in higher information settings.

Other mechanisms may be at work across all levels of information. For example, divisive primaries also surely redirect the finite resources of parties—both financial and otherwise—away from the general election. Candidates can raise only so much money, they can only convince volunteers to knock on so many doors, and so forth. Suffering through a more difficult primary may force them to run a leaner general election campaign, a cost that may be present regardless of whether voters have high or low levels of information.

Finally, other potential mechanisms may be more active only at lower levels of information. In high information places, primary voters face an easier problem in selecting candidates for the general election. Candidates may have longer track records and may be vetted more by interest groups, local elites, and newspapers. In low information places, on the other hand, voters have almost nothing to go by. In such settings, a divisive primary might actually help voters to figure out whom to nominate, both by stimulating a small amount of news coverage and also by forcing the competing candidates to campaign more and thus to provide voters with more information about them. Thus, by improving the expected quality of the nominee, divisive primaries might be beneficial to parties in low information environments.

Having laid out the theoretical perspectives on divisive primaries, we now turn to the empirical design we use to study their effects. Our first goal will be simply to document the overall effects of divisive primaries in U.S. House and Senate elections. In keeping with the theoretical discussion in this section, we will then assess possible variation in the effects of divisive primaries across electoral settings where voters have more or less information.

3 Empirical Approach: Regression Discontinuity in Near-Runoff Primaries

Are parties helped or hurt when they experience more divisive primaries? To answer this question empirically, we must overcome a fundamental problem of causal inference. In particular, parties do not “randomly” experience more or less competitive primaries. In the U.S., primaries are often more competitive in times and places where the party is expected to perform better in the general election (e.g, Hall 2015), which could lead to a spurious, positive correlation between how divisive the primary is and how well the party does in the general election. Cutting the other way, primaries may be inherently more divisive when the party itself is weak—leading to a spurious negative correlation between how divisive the primary is and the party’s general-election performance. Problems of omitted variables and reverse causation like this make cross-sectional comparisons of elections where parties do and do not experience divisive primaries unlikely to extract plausible estimates of the actual effect of divisive primaries on election outcomes. We must look for alternative sources of evidence.

To do so, we take advantage of states that use runoff primaries. In runoffs, if no primary candidate receives above a pre-specified vote share in the first round (typically but not always 50%), there is a second-round election between the two candidates with the top vote shares from the first round. This runoff election creates a hyper-competitive campaign between the two candidates from the first round.

We build on a large recent literature that exploits the quasi-random results of close elections to simulate an electoral experiment. For our case, we focus on close primary elections with three or

more candidates that either barely do go, or do not go, to a runoff.⁶ The resulting quasi-random variation creates a natural experiment that allows us to assess the causal effects of divisive primaries. When a party in a congressional district barely faces a runoff primary to select its nominee, does it do better or worse in the general election than when it barely misses having a runoff primary? This is the key empirical question we will answer.

Are runoffs an appropriate proxy for “divisive primaries” more generally? This is a key question for thinking about how to interpret the estimates we present below. First and foremost, runoffs clearly *do* make the primary more divisive. Using the definition of divisive primary from Hacker (1965), namely, any primary where the winning candidate’s vote share is less than 65%, every runoff is by definition a divisive primary.⁷ But the main issue is that runoff primaries do not only make the primary more divisive, in the sense of increasing and prolonging close competition between candidates, but they also make it last longer. This is slightly different from divisive primaries, which do not technically alter the official end date of the primary election the way runoffs do. However, many divisive primaries, especially for president, do actually extend the length of the *de facto* campaign. Though the official end date of the primary does not change, divisive primaries prolong the period during which the eventual nominee is still unknown. In this way, the runoff’s increased length is a good approximation for a divisive primary. Nevertheless, in subsequent sections we will attempt to unpack the various mechanisms by which runoffs affect general-election outcomes, and our evidence will suggest that it is more the divisiveness, itself, rather than the added length of the campaign that drives the effects.

An additional question of interpretation concerns legislative vs. presidential primaries. The divisive primaries literature began in the context of both legislative and executive primaries. Hacker (1965), for example, explicitly studied both U.S. Senate and gubernatorial primaries. Clearly, congressional primaries are themselves a worthy object of study. As one of the three branches of the federal government, the House and Senate play a key role in the policy process, and primaries for the House and especially for the Senate are important and well-scrutinized affairs. That being said, we would of course like our results to speak to presidential primaries, too. Although there

⁶Although most electoral RDs have focused on general elections, using RD for settings like primary elections and runoffs is becoming more common. See for example Anagol and Fujiwara (N.d.) and Hall (2015).

⁷To be clear, it is possible that the winning candidate in the runoff wins more than 65% of the vote; but the entire runoff campaign is conducted in the context of a first-round election in which no candidate won more than 50% of the vote (and in some states, less than 40% or even 35%).

are inevitable differences between legislative and presidential primaries, we suspect that studying Congressional primaries will shed significant light on the presidential process. By comparing our results across levels of salience, we will attempt to extrapolate the findings to the presidential level, though caveats will always apply.

3.1 Data and Historical Background

Runoff primaries are an artifact of the U.S. south. The nine states that operate runoff primaries today are all in the south.⁸ For much of their history, these states saw little or no meaningful two-party competition. As Key (1949: 416) explains, “The direct primary method of nomination...was an inevitable consequence of the one-party system in the South.” The runoff was in part a means to ensure that Democratic primaries, which were in effect the general election, selected the “right” candidates. According to Glaser (2006: 776), for example, the electoral rule was adopted to “require candidates to generate majority support in the nomination process and stimulate competition within the Democratic Party (thus keeping the Republican Party irrelevant).” Today, two-party competition is more common in the south than it used to be, but the institution of the runoff persists.

The idea of the runoff is simple. If the winning primary candidate receives below a certain threshold in vote share, a second round election between the top two candidates from the first round is held some weeks later, with the winner of this two-candidate contest declared the nominee. In almost all cases, this threshold is 50%, meaning that a candidate must get a majority, and not just a plurality, in the first round in order to avoid a runoff. Only one of the nine states in our sample have ever used a cutoff rule other than 50%:⁹ North Carolina, which switched the threshold to 40% in 1990.¹⁰

To study the effects of divisive primaries, we combine two datasets on primary elections, primary election runoffs, and general-election outcomes. The first dataset covers all elections for the U.S.

⁸Technically, South Dakota also employs runoff primaries (and, despite its name, is not located in the south!). However, the threshold for a runoff in South Dakota is so low that runoffs rarely, if ever, occur. See footnote 9 below.

⁹South Dakota uses a runoff threshold of 35%, however, because this cutoff is so low, we do not have a single runoff case from South Dakota in our sample. Likewise, Vermont uses runoffs but only in the case of exact ties, which never occur in our sample. Finally, Louisiana also uses a runoff system, but because of its unique electoral setup, in which members of the same party can compete against each other in the general election, we omit it from our sample.

¹⁰<http://www.ncsl.org/research/elections-and-campaigns/primary-runoffs.aspx>

Table 1 – Dataset on U.S. Legislative Election Primary Elections and Runoffs. The table presents the number of primary elections with three or more candidates and the percent of these races that go to runoffs.

State	Years	House and Senate		State Legislatures	
		N	% Runoff	N	% Runoff
AL	1914–2012	112	0.42	317	0.61
AR	1940–2012	49	0.53	194	0.75
FL	1910–2000	129	0.53	347	0.69
GA	1962–2012	102	0.55	475	0.59
MS	1910–2012	108	0.34	249	0.72
NC	1932–2012	149	0.26	54	0.19
OK	1930–2012	220	0.42	392	0.62
SC	1896–2012	107	0.48	90	0.50
TX	1916–2012	329	0.39	446	0.51
Total	1896–2012	1,305	0.42	2,564	0.61

House and U.S. Senate from 1896-2012, and was collected from primary sources for a series of projects by Ansolabehere et al. (2010). The second dataset covers all primaries, runoffs, and general elections for U.S. state legislatures that have runoff primaries in place. For this latter dataset, we collected the information on primary and runoff elections ourselves from primary sources, and then merged this data with the Klarner et al. (2013) data on state legislative general elections.

Table 1 presents an overview of the assembled data. The table lays out the 9 states which have runoff primaries for legislative elections. By definition, a runoff can only occur in a primary with at least three candidates (otherwise, one of the two candidates must receive above 50% of the vote). Thus, the table reflects the total number of primaries with more than three candidates that we observe in our dataset. Finally, the table reveals the percent of all primary races with three or more candidates which go to a runoff. As the table shows, a substantial fraction go to runoffs at both the federal and state levels.

No doubt, many fundamental differences between congressional elections in the south and in the rest of the country remain, and we must be clear that we can only study the effects of runoffs, and thus of divisive primaries, in the south. But the basic dynamics of campaigns and elections are the same across the United States. Southern states may lean Republican, today, but, as we will show in the analyses below, we have a large number of instances of runoffs in areas with marked two-party

competition. Though we must always take care in extrapolating effects beyond the sample in which we study them—and though we are well aware of the deep historical differences of the south and other regions of the country—we see no obvious reason why effects documented in the south do not teach us about divisive primaries more generally.

4 Electoral Penalties From Runoff Primaries in Federal Elections

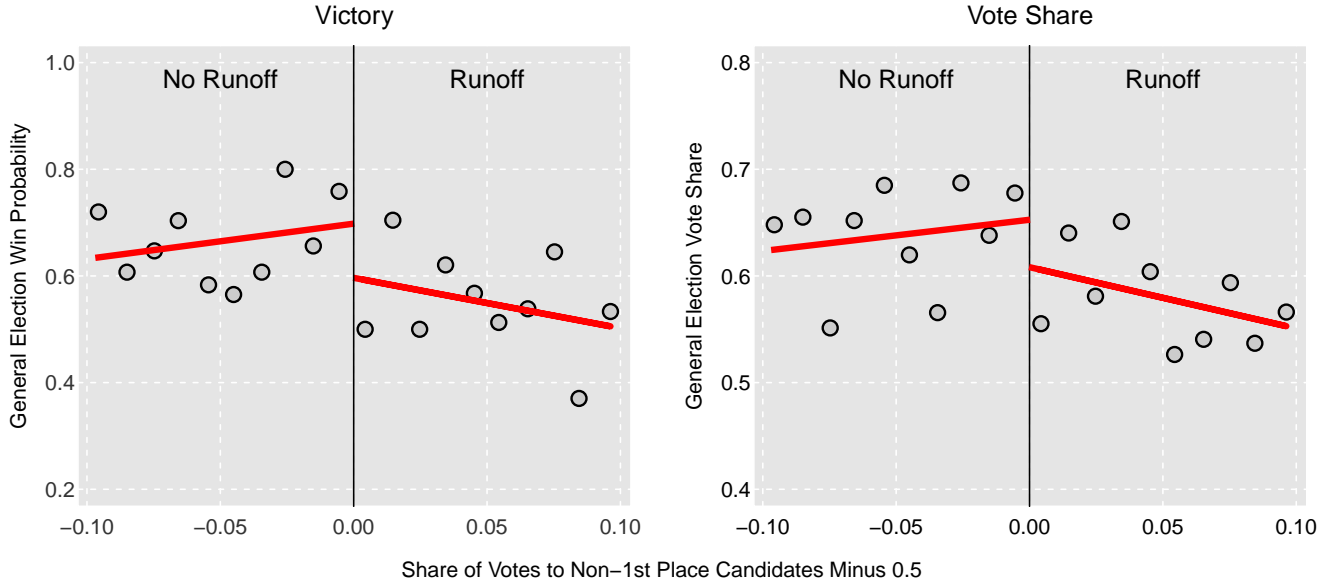
In this section, we apply the regression discontinuity design to estimate the effects of runoff primaries on general-election outcomes. To do so, we first consider graphical evidence. Figure 1 presents standard regression discontinuity graphs for U.S. House and Senate elections on two outcome variables: an indicator variable for whether the party in a given district wins the general election (left panel), and the party’s vote share in a given district in the general election (right panel). The horizontal axis in the plots measures the “running variable” in the RD; that is, the variable that determines whether the party goes to a runoff or not in a given district. This variable is defined as

$$S_{ipt} = \max_j V_{jipt} - c_{it}, \tag{1}$$

where V_{jipt} is the primary vote share for each candidate j in party p ’s primary election in district i at time t , and c_{it} is the cutoff rule used to determine whether there is a runoff or not in district i ’s state at time t . In most, but not all, cases, $c_{it} = 0.5$. As defined here, when $S_{it} > 0$, the top vote-getting candidate is above the cutoff and there is no runoff. When $S_{it} < 0$, no candidate has received enough votes and the election goes to a runoff. For convenience, we will actually use the negative of this score, so that being above 0 indicates that the election is going to a runoff (this is more convenient for graphical purposes).

Each point on each plot reflects the average of the outcome variable within a one percentage-point bin of the running variable. Lines plotted to each side of the discontinuity are simple OLS fitted to the underlying data. Consider the left panel, focusing on the rate at which parties win general elections. The plot shows a pronounced jump down at the discontinuity; when parties go from barely *not* having a runoff to barely having a runoff, there appears to be a substantial decrease in the probability that they win the general election. A similar pattern is seen in the right column, in terms of vote share.

Figure 1 – The Effect of Primary Runoffs on Vote Share, Federal Elections. Barely going to a runoff primary appears to harm parties’ performance in the general election significantly.



Note: Points are averages of the outcome variable in one-percentage-point bins of the running variable. Lines are OLS fits estimated separately on each side of the discontinuity.

More formally, we begin by estimating regressions of the form

$$Y_{ipt} = \beta_0 + \beta_1 1\{S_{ipt} > 0\} + f(S_{ipt}) + \epsilon_{ipt}, \quad (2)$$

where Y_{ipt} is an outcome of district i at time t —typically, it will be either party p ’s vote share or an indicator for its victory in the election in district i at time t . S_{ipt} is defined as above and $f(S_{ipt})$ is a flexible specification of the running variable. We consider two main specifications standard in the RD literature: the first is a “local linear” specification in which we use OLS within a small bandwidth around the discontinuity, and we allow the slope of the line to vary on each side of the discontinuity. The second is a kernel-based estimate computed using an algorithmically determined bandwidth (Calonico, Cattaneo, and Titiunik 2014).

Table 2 presents the main results. The first two columns suggest that going to a runoff primary causes parties a substantial vote share penalty of between 7 and 9 percentage points in the general election, though these estimates are not quite precise enough to reach traditional thresholds of statistical significance. The next two columns reveal a very large and statistically significant penalty

Table 2 – Runoff Primaries and General Election Outcomes, Federal Legislatures: Regression Discontinuity Results.

	Subsequent Electoral Outcome				Lag Electoral Outcome (Placebo)			
	$Vote_t$	$Vote_t$	Win_t	Win_t	$Vote_{t-1}$	$Vote_{t-1}$	Win_{t-1}	Win_{t-1}
Runoff Threshold	-0.09 (0.05)	-0.06 (0.05)	-0.21 (0.10)	-0.21 (0.10)	-0.06 (0.07)	-0.00 (0.07)	0.01 (0.12)	0.06 (0.11)
N	333	622	333	483	249	465	249	458
Bandwidth Specification	OLS	CCT	OLS	CCT	OLS	CCT	OLS	CCT

Columns labeled OLS estimated with linear specification of running variable and running variable interacted with treatment. OLS specifications report robust standard errors clustered by election. Columns labeled CCT report optimal bandwidth bias-corrected estimates from `rdrobust` implemented in Stata.

when considered in terms of the probability of victory. In both specifications, the as-if random assignment of a runoff primary causes a 21 percentage point decrease in parties’ average probability of winning the general election.

The final four columns replicate the specifications from the first four columns but using *previous* vote shares and electoral victories to test the validity of the RD design. As the estimates show, we see no major differences between primary elections that barely do or do not go to runoffs in terms of the general-election performance of the parties holding the primaries two years prior. Thus, these results strongly suggest the validity of the design. In addition to these balance tests, in the Appendix we also plot our local linear RD estimate across bandwidths to show that the results in the OLS columns are not driven by our specific choice of bandwidth. Given that the kernel estimates, which use an algorithmically chosen bandwidth, are similar to the OLS estimates, it is not surprising that we find stability in our estimates across bandwidths.

So far, we have focused on *sharp* RD effects, simply comparing primaries where the top vote-getting candidates exceeds the runoff threshold and those where the top vote-getting candidate does not. In reality, however, candidates do not *have* to participate in the runoff. Most commonly, the second-place candidate may choose not to pursue the runoff. This places the design in a situation of one-sided non-compliance; if the primary is assigned to the treatment “runoff,” it may or may not actually have a runoff. On the other hand, if the primary is assigned to the control condition “no runoff,” it will never have a runoff. The reduced-form estimates above, which are easiest to

Table 3 – Runoff Primaries and General Election Outcomes, Federal Legislatures: Fuzzy RD.

	Subsequent Electoral Outcome				First Stage	
	$Vote_t$	$Vote_t$	Win_t	Win_t	Runoff	Runoff
Runoff	-0.11 (0.07)	-0.07 (0.06)	-0.27 (0.13)	-0.26 (0.12)		
Runoff Threshold					0.79 (0.05)	0.82 (0.05)
N	333	622	333	483	333	732
Bandwidth	0.05	0.10	0.05	0.07	0.05	0.12
Specification	2SLS	CCT	2SLS	CCT	OLS	CCT

Columns labeled 2SLS or OLS estimated with linear specification of running variable and running variable interacted with treatment. 2SLS specifications report robust standard errors clustered by election. Columns labeled CCT report optimal bandwidth bias-corrected estimates from `rdrobust` implemented in Stata.

understand, will likely underestimate the effect if there are many treated observations where no runoff actually occurs.¹¹

Accordingly, we next turn to fuzzy RD estimates where passing the runoff threshold is used as an instrument for actually having a runoff election. We use the same four specifications from Table 2, omitting the balance tests since they are identical to the ones before. Table 3 presents the results. Again, we find extremely large and negative effects of runoff primaries on general-election outcomes. The final two columns show the first-stage effect of crossing the runoff threshold on the probability of having a runoff. Not surprisingly, we find very strong first-stage effects. At the discontinuity, there is approximately a 79–82 percentage-point increase in the probability of a runoff (from a 0 percent chance).

In sum, we have documented substantial penalties related to runoff primaries in federal elections. If we were to flip a coin to force a party to extend a close primary election with three or more candidates into a runoff—which lasts as long as nine weeks and features fierce competition between the two remaining candidates—our estimates suggest that the party should expect its chance to win the general election to decrease by 26–27 percentage points.

¹¹Of course, it is possible that the very fact of having a possible runoff exerts its own effects on electoral outcomes separate from whether or not the candidates go to the runoff or not. Perhaps, for example, just knowing that the winning candidate did not do well enough to beat the runoff threshold could influence voters’ opinions. We think this is relatively unlikely, but it is important to acknowledge.

Table 4 – Runoff Primaries and General Election Outcomes, Federal Legislatures: Difference-in-Differences.

	Subsequent Electoral Outcome			
	OLS $Vote_t$	IV $Vote_t$	OLS Win_t	IV Win_t
Runoff	-0.05 (0.01)	-0.06 (0.01)	-0.12 (0.03)	-0.14 (0.03)
N	1,256	1,256	1,256	1,256
District-Party Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes

Robust standard errors clustered by district in parentheses.

These results are “local” in two important ways. First, runoffs occur only in southern states. We discussed this issue above when laying out the dataset, and we explained why the southern states offer a useful opportunity to study broader political phenomena. In addition, though, the results focus exclusively on *close* primary elections featuring at least three candidates; that is, they are local to competitive primaries. Since competitive primaries occur in a variety of districts,¹² this problem does not seem particularly severe, but nevertheless we can investigate it to some extent by employing a second identification strategy. Specifically, we estimate equations of the form

$$Y_{ipt} = \beta_1 1\{S_{it} > 0\} + \gamma_{ip} + \delta_t + \epsilon_{ipt}, \quad (3)$$

where variables are defined as before and γ_{ip} and δ_t stand in for district-party and year fixed effects, respectively. The equation thus represents a difference-in-differences in which within-district switches in whether party p has a runoff primary or not are used to assess the degree to which party p ’s electoral fortunes change. Instead of focusing only on super close primaries, the difference-in-differences design broadens the sample and considers more primaries, at the cost of a stronger identifying assumption. This alternative assumption is the “parallel trends” assumption—namely, that in districts that switch to having a runoffs (or switch from having a runoff), the parties holding the primaries would have seen the same changes in their electoral outcomes as the non-switching districts, had they not switched.

¹²Unlike general-election RDs, which by necessity can only study districts where both parties are competitive, close primary elections occur in both competitive but also safe districts. See Hall (2015) for discussion of this.

Table 4 presents the estimated results. The first and third column represent the reduced-form estimates; the second and fourth mirror the “fuzzy” RD and use whether the primary passes the runoff threshold as an instrument for the runoff taking place. As the table shows, we again find large negative effects of runoffs on party fortunes in the general election. The point estimates are a bit smaller in magnitude—an 11 to 14 percentage-point decrease in the probability of victory as opposed to a 21 percentage-point decrease in the RD—but they are much more precise. Combined with the RD results, the difference-in-differences estimates further reinforce the idea that runoffs are extremely damaging to parties. Moreover, the fact that the estimates are similar in the difference-in-differences suggests that the locality of the RD estimate is not overly problematic for making more general inferences from the data.

5 No Penalty For Divisive Primaries in State Legislatures

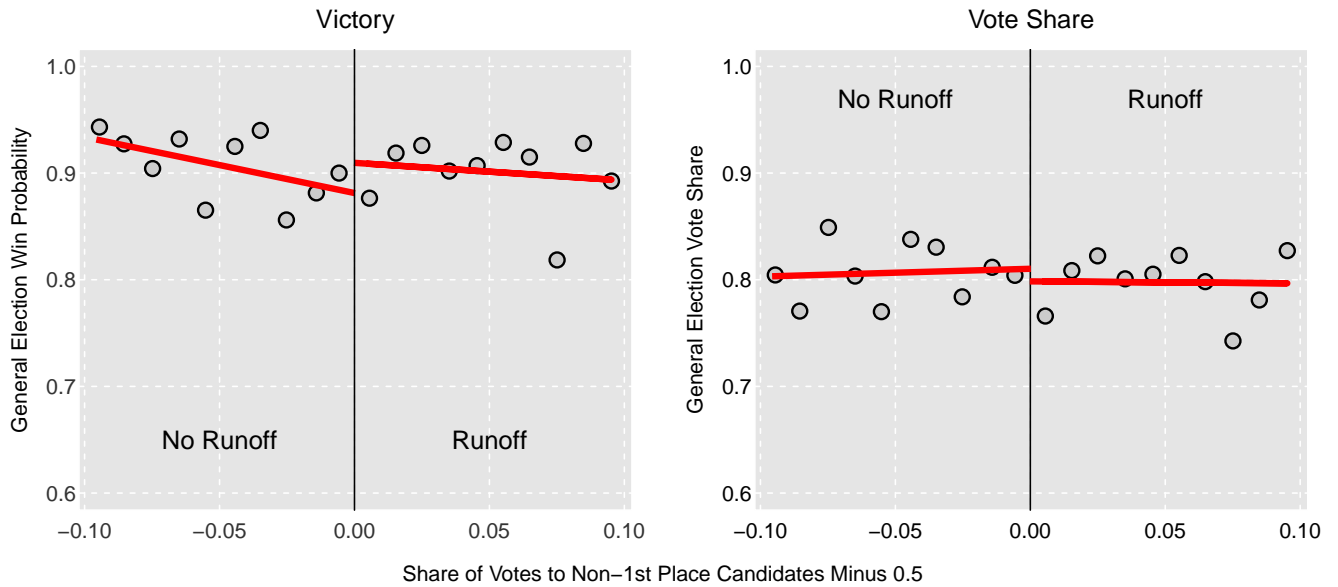
To better understand why runoff primaries hurt parties in the general elections at the federal level, we now investigate the effect of runoff primaries in another legislative context: the U.S. state legislatures. If runoff primaries systematically hurt parties—if, for example, they systematically advantage less electable candidates—then we should observe the same types of negative effects in the state legislatures. On the other hand, if the reason runoffs hurt parties has to do with an increase in the negative attention paid to divisive primary campaigns, then we might expect dampened effects in state legislatures where even the most salient elections are barely noticed.

To perform this test, we collected data on the candidates, vote shares, and outcomes of all primary elections in state legislatures with runoff primaries from 1968–2010. To our knowledge, this is the first time this data has been systematically collected and digitized. Armed with this data, we can re-estimate our RD design, using the same specifications as before.¹³

First, in Figure 2 we again plot the discontinuities. Unlike at the federal level, no obvious, major discontinuities are seen in the state legislative data. If anything, we see a slight increase in the probability a party wins the general election when its primary barely goes to a runoff (left panel), but this jump is much more modest than at the federal level. No obvious discontinuity in

¹³In comparing estimates across the two contexts, we should keep in mind that the time frames are not the same. To make sure the below comparisons are not driven by the differences in years, we have also re-estimated the federal RD using only the years 1968–2010. Results are similar—if anything, we find even larger electoral penalties at the federal level using this year range.

Figure 2 – The Effect of Primary Runoffs on Vote Share, State Legislative Elections.



vote share is present. One thing apparent in the figures is that the average vote share and win frequency of the parties holding primaries in the state legislative sample is substantially higher than in the federal case. This is the result of the one-party dominance of the Democratic party in southern state legislatures in the middle of the 20th century, an issue we return to in detail below.

Tables 5 and 6 present the formal results, mirroring the presentation of the federal results. First, in Table 5 we examine the reduced-form sharp RD results. On average, considering the whole time period and all contexts, there appear to be no meaningful effects of runoff primaries on parties' vote shares or probability of victory in the general election. These point estimates are not just statistically insignificant; they are extremely small in magnitude. Consider for example the third column's estimate on win probability. Even the upper bound of the 95% confidence interval, which would be roughly 0.08, is well below the estimated effect at the federal level (0.25 in the sharp RD). Table 6 echoes these findings when we look instead at the fuzzy RD results that take into account the fact that not all elections where the runoff threshold is not met go to a runoff.¹⁴

¹⁴Interestingly, the first-stage effects of passing the runoff threshold on the probability of having a runoff appear quite similar in state legislative elections, as compared to federal elections.

Table 5 – Runoff Primaries and General Election Outcomes, State Legislatures: Regression Discontinuity Results.

	Subsequent Electoral Outcome				Lag Electoral Outcome (Placebo)			
	$Vote_t$	$Vote_t$	Win_t	Win_t	$Vote_{t-1}$	$Vote_{t-1}$	Win_{t-1}	Win_{t-1}
Runoff Threshold	-0.01 (0.03)	-0.02 (0.03)	0.02 (0.05)	-0.01 (0.05)	-0.07 (0.04)	-0.09 (0.05)	-0.05 (0.06)	-0.09 (0.07)
N	782	1,235	782	1,024	704	979	704	971
Bandwidth Specification	OLS	CCT	OLS	CCT	OLS	CCT	OLS	CCT

Columns labeled OLS estimated with linear specification of running variable and running variable interacted with treatment. OLS specifications report robust standard errors clustered by election. Columns labeled CCT report optimal bandwidth bias-corrected estimates from `rdrobust` implemented in Stata.

These null results suggest, at first glance, that whatever factors drive the large penalty at the federal level must be absent at the state legislative level. It is tempting to conclude, therefore, that the penalty to divisive primaries depends on the salience of the elections. However, we must first consider an alternative explanation concerning the state legislative data.

Historically, the southern U.S. states were dominated by the Democratic party. This was true at both the state and federal level, but it was especially true in the state legislatures. It is possible that the null results we observe merely reflect the one-party dominance of much of our sample. If the Democratic party simply always wins elections, then there is no way to observe any potential penalty of a runoff. Hacker (1965: 105) discusses this very issue, writing: “If a single party dominates the election for state offices then the occurrence of a divisive primary within the already weak second party will hardly be the efficient cause of its going down to defeat in the November election. In such states the opposition party has little or no chance of winning either the governorship or a Senate seat anyway, so a primary fight within its own meager ranks makes little difference.”

To address this issue, we do two things. First, we now throw out data before 1980, excluding from the sample the decades in the dataset when the Democratic dominance of southern state legislatures was at its peak, and we re-estimate the RD. Second, we re-estimate results separately for three sets of primary elections: those where the party holding the primary is in a safe seat; those where the party holding the primary is in a seat that is safe for the opposing party; and those where the seat is competitive. To define “safe” and “competitive,” we calculate the Democratic normal vote as the mean vote share for all state legislative candidates in the district within the redistricting

Table 6 – Runoff Primaries and General Election Outcomes, State Legislatures: Fuzzy RD.

	Subsequent Electoral Outcome				First Stage	
	$Vote_t$	$Vote_t$	Win_t	Win_t	Runoff	Runoff
Runoff	-0.01 (0.04)	-0.02 (0.04)	0.02 (0.05)	-0.01 (0.06)		
Runoff Threshold					0.86 (0.03)	0.87 (0.03)
N	782	1,235	782	1,024	782	1,423
Bandwidth	0.05	0.08	0.05	0.07	0.05	0.10
Specification	2SLS	CCT	2SLS	CCT	OLS	CCT

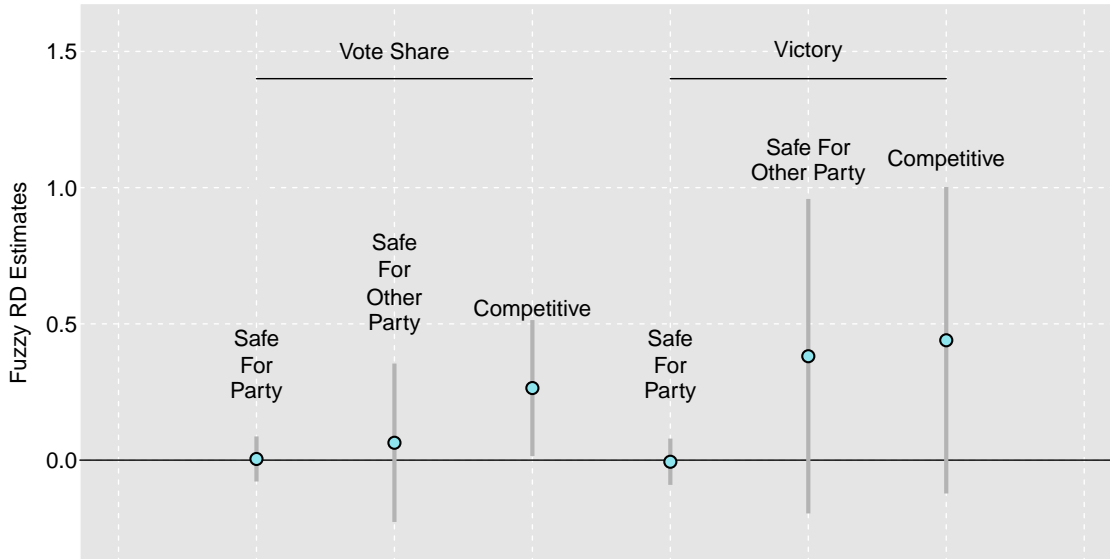
Columns labeled 2SLS or OLS estimated with linear specification of running variable and running variable interacted with treatment. 2SLS specifications report robust standard errors clustered by election. Columns labeled CCT report optimal bandwidth bias-corrected estimates from `rdrobust` implemented in Stata.

period. A primary is safe if the Democratic normal vote is above 60% and it is a Democratic primary, or if the Democratic normal vote is below 40% and it is a Republican primary. A primary is safe for the other party if the opposite is true (i.e., 60% or higher Democratic normal vote and it is a Republican primary, 40% or lower Democratic normal vote for a Democratic primary). Primaries held in districts where the Democratic normal vote is in between 40% and 60% are coded as competitive.

Given these codings, we re-run the fuzzy RD using `rdrobust` for each set of primaries, for both the vote share and victory outcome variables. Figure 3 presents the resulting estimates. We still find no evidence for divisive primaries hurting parties in the state legislatures. Indeed, instead we find evidence that runoffs can *help* parties in competitive state legislative contexts.

Consider the left three estimates on vote share. First, we see a quite precisely estimated null effect on vote share in primaries for seats that are safe for the parties holding the primaries. This makes sense; since the parties will win these seats easily, whether or not they go to runoff primaries makes no difference. Second, we see some indications of an effect, though small and noisy, for primaries for seats that are safe for the opposing party. Finally, and most importantly, the third estimate shows a large, positive average effect on vote share in competitive seats. Parties do significantly better in the general election for competitive seats in state legislatures when they have a runoff election than when they do not.

Figure 3 – The Effect of Primary Runoffs on Elections, State Legislative Elections, 1980–2010. In state legislatures, unlike federal legislatures, runoff primaries appear to boost party nominees in the general elections, in places where there is two-party competition.



This same exact pattern is reflected in the final three estimates on win probability. Indeed, the effect of going to a runoff on the probability parties win general elections is massive—just above a 50 percentage-point increase (this estimate just barely misses statistical significance, but the magnitude is extremely large). Clearly, runoffs in closely contested primaries for competitive seats in recent state legislative elections do not hurt parties.

6 Informational Mechanisms for the Effects of Divisive Primaries

How do we explain the difference in the effects of divisive primaries across federal and state elections? In races for the U.S. House and Senate we have seen evidence for a substantial general-election penalty due to runoff primaries, which drag out the primary campaign and make it more divisive. On the other hand, in state legislatures we have seen on-average null effects but with substantial gains to runoff primaries in modern-era competitive seats.

Many things differ between our federal and state legislatures, so we cannot claim to isolate any one key factor that explains the varying effects. However, we suspect that the interaction of information and news coverage with the candidate selection process is crucial. State legislative

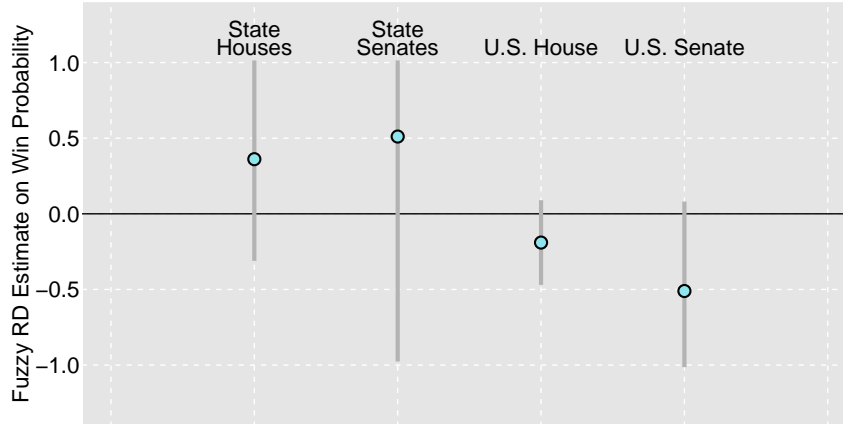
primary elections are extremely low salience affairs. Voters have very little information about candidates and, as a result, many votes are “wasted” on candidates who finish outside of the top two. Hall and Snyder (2015) finds that, on average, roughly 80% of votes in state-level primary elections with three or more candidates flow to the top two—meaning that 20% on average flow to lesser candidates. Moreover, the paper finds that this degree of vote wasting is far lower in federal races, and in general is lower in settings where media-provided information is higher.

In low information settings, like state legislative primaries, runoffs can make a big difference when there are three or more candidates. Because the degree of vote wasting is so high, primaries without runoffs are more likely than usual to make “mistakes”—that is, to nominate plurality but not majority-winning candidates who would not win a runoff and are likely to be lower quality general election candidates. Runoffs can help fend off these issues, allowing voters in low-information settings to vote again once the field has been cleared to the top two contenders. As a result, runoffs in state legislatures may boost parties’ general-election fortunes by helping to nominate better qualified candidates.

This relationship is different in federal elections, where information levels—though by no means high—are markedly higher than in state legislatures. Indeed, Hall and Snyder (2015) finds that more than 90% of votes in U.S. Senate primaries with three or more candidates go to the top two candidates. When vote wasting is already low, runoffs no longer serve as important a purpose for selecting qualified candidates. Instead, they may serve only to emphasize the differences between parties’ remaining candidates.

A more fine-grained investigation of the effects across legislatures is consistent with this hypothesis. Figure 4 plots the estimated fuzzy RD estimate on win probability (again using `rdrobust`) for each of four sub-samples of the data: state house and state senate primaries in competitive contexts, as above, and U.S. House and U.S. Senate primaries (results on vote share, which follow the same pattern, are omitted for simplicity). Undoubtedly, the point estimates are noisier when we cut the data this finely, so we should interpret the patterns cautiously. Nonetheless, the pattern of effects is highly suggestive. As the plot shows, the effect of a runoff is positive in state houses and state senates—that is, it benefits parties’ general-election outcomes. These are much lower salience settings. Moving to the U.S. House, a more salient setting, the effect becomes negative. Finally, in primaries for the U.S. Senate, by far the most salient of all legislative elections and the

Figure 4 – The Effect of Primary Runoffs on Elections Across Chambers.
 The effects of runoffs vary systematically across more and less salient contexts; runoffs exert a large penalty in more salient places but seem beneficial in the least salient settings.



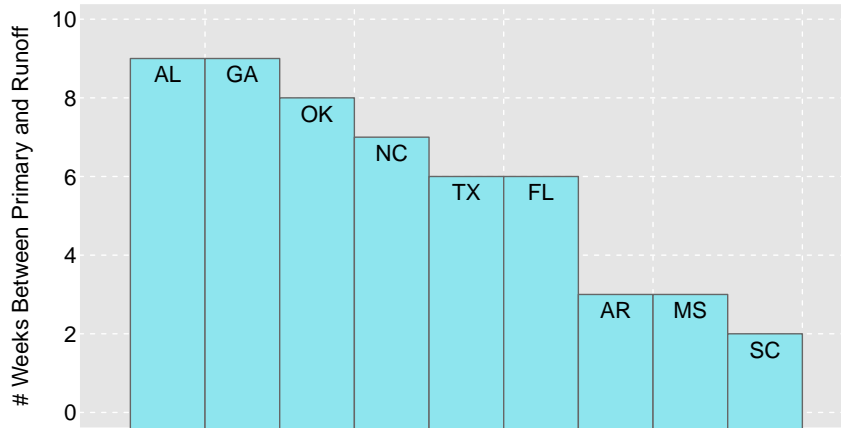
best proxy for presidential primaries, the effect is extremely large and negative. Though we stress caution given the smaller sample sizes, the results suggest that the runoff effect is positive in very low salience settings but increasingly negative as the salience of the office increases.

7 Does the Duration of the Runoff Matter?

Thus far, we have documented the substantial effects of runoff primaries, and we have suggested that these effects depend on the level of salience and/or information in a given electoral context. We motivated the paper with accounts of presidential primaries, but our evidence consists of variation in runoff primaries in U.S. legislative elections. As we discussed earlier in the paper, divisive primaries, like runoffs, often extend the length of the primary, though they do so only by delaying the announcement of the winner and not by actually changing the formal end date of the election. In this section, we assess whether the length of the election appears to be an important mechanism for the effect, .

We collected data on how long runoff primaries are in each state in our sample. These lengths are depicted in Figure 5. As the plot shows, the states vary considerably in how long the runoff, if activated, lasts. Using this information, we re-estimate the effects of runoff primaries and interact the treatment indicator with the length of time in weeks between the first-round primary and the

Figure 5 – Length of Time Between First-Round and Runoff Primary.
 The number of weeks between the first-round election and the runoff election (if needed) ranges from as few as 2 weeks, in South Carolina, to as many as 9 weeks in Alabama and Georgia.



runoff. We do this for two specifications: the sharp RD (for simplicity, since interactions are easier to discuss in the sharp RD), and the difference-in-differences. Results for both vote share and win probability, in both the federal and state legislatures, are presented in Table 7.

As the table shows, we find no evidence that the runoff penalty is higher in states where the runoff primary lasts longer. In fact, if anything, we see evidence for a small but *positive* interaction on vote share in the federal setting. However, the estimated effect is relatively small and does not appear to affect win probabilities (columns 3 and 4).

The conclusions we can draw from this exercise are inevitably limited. The length of time between the two rounds is not randomly assigned, so we cannot say that length exerts no causal effect on general-election outcomes. Nonetheless, the fact that the runoff penalty does not appear to vary meaningfully—and certainly does not appear to grow—along with the length of the gap suggests to us that the penalizing effects of runoff primaries are most likely not related to the way in which they extend the primary, temporally, but rather are likely due to the campaigning effects, in terms of both information and the identify of the eventual nominee.

Table 7 – Runoff Primaries and General Election Outcomes Across Runoff Length.

	Federal Elections				State Legislative Elections			
	$Vote_t$	$Vote_t$	Win_t	Win_t	$Vote_t$	$Vote_t$	Win_t	Win_t
Runoff Threshold	-0.33 (0.10)	-0.17 (0.04)	-0.37 (0.17)	-0.22 (0.07)	0.03 (0.05)	-0.06 (0.04)	0.09 (0.07)	0.02 (0.05)
Runoff \times Length	0.04 (0.01)	0.02 (0.01)	0.02 (0.02)	0.01 (0.01)	-0.01 (0.01)	0.00 (0.01)	-0.01 (0.01)	-0.00 (0.01)
Length	-0.04 (0.01)	0.00 (0.00)	-0.03 (0.01)	0.00 (0.00)	0.00 (0.01)	0.00 (0.00)	0.01 (0.01)	0.00 (0.00)
N	333	1,305	333	1,305	782	2,564	782	2,564
Bandwidth	0.05	–	0.05	–	0.05	–	0.05	–
District-Party Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes
Year Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes

Robust standard errors clustered by election in parentheses.

8 Are Ideological Differences Especially Divisive?

So far, we have followed the literature in defining all competitive primaries as divisive. Clearly, though, there are interesting differences among competitive primaries that might help us further understand why divisive primaries can have such large effects on general-election outcomes. If our effects really are about divisiveness, and not the other aspects of runoff primaries, then one prediction might be that runoff primaries should have larger, more negative effects when the candidates in the runoff are farther apart, ideologically. In such cases, one might suspect that the competition between them is truly more divisive, both in the sense of splitting parties’ supporters more, and in the sense of spurring more bitter rhetoric between the opponents.

To test this, we merged in data from Bonica (2014) on the ideology of primary candidates in federal races, based on the pattern of campaign contributions they received. These scalings, called CFScores, range from negative, indicating more liberal positions, to positive, indicating more conservative positions, and do a solid job of predicting the roll-call records of candidates who go on to serve in Congress. For the set of races where the top-two candidates in the first round of the primary both receive CFScores, we then calculate the absolute distance between the two candidates’ scalings. Crucially, since we focus on the top two candidates in the first round, we thus have this measure of distance for both the cases that go to runoffs and the cases that do not. Given

Table 8 – Runoff Primaries and General Election Outcomes Across Ideological Divisiveness of Top Two Candidates.

	<u>Federal Elections</u>			
	<i>Vote_t</i>	<i>Vote_t</i>	<i>Win_t</i>	<i>Win_t</i>
Runoff Threshold	-0.23 (0.09)	-0.00 (0.03)	-0.44 (0.26)	-0.01 (0.11)
Runoff × Ideo	-0.29 (0.28)	-0.31 (0.24)	-0.53 (0.81)	-0.26 (0.71)
Ideological Divisiveness	-0.25 (0.07)	0.06 (0.07)	-0.64 (0.26)	-0.01 (0.27)
N	85	326	85	326
Bandwidth	0.05	–	0.05	–
District-Party Fixed Effects	No	Yes	No	Yes
Year Fixed Effects	No	Yes	No	Yes

Robust standard errors clustered by election in parentheses.

this setup, we then ask: do the RD estimates of the effect of primary runoffs appear to change when the ideological gap between the top two candidates grows? Table 8 presents the results. In these results, the absolute distance in CFScores between the top two candidates in the first round of the primary is re-scaled to run from 0, in the instance in the data with the smallest distance, to 1, in the instance in the data where the distance is largest. The interaction coefficient is thus interpreted as the difference in the effect between a runoff in the least ideologically divided primary and in the most ideologically divided primary. For robustness, we present these results both using the RD and using the difference-in-differences, as in the previous federal elections results.

As the table shows, we find tentative, fragile evidence that the negative effects of runoff primaries are larger when candidates are farther apart, ideologically. Whether we use the RD or the difference-in-differences, the interaction between the treatment indicator and the measure of ideological distance is large and negative, indicating that the effects of runoffs are estimated to be more negative in more ideologically divided cases. That being said, the standard errors on the interaction make it clear that the estimates are noisy; in all four cases we cannot reject the null of no difference. In addition, we should be clear that ideological distance, unlike the runoff, is not varying exogenously here. For these reasons, we view this as merely interesting and suggestive

evidence that the effects of divisive primaries may depend quite heavily on ideological divisiveness, but we stress that future research will need to investigate this in more detail.

9 Conclusion

The divisive primaries literature is among the longest-running topics in American politics. Primaries play a crucial role in determining the identities of those who represent voters in government, and competitive primary elections, in particular, are thought to convey a variety of benefits to citizens and their parties. These benefits include the enhanced legitimacy that an open and competitive election confers on the party, who no longer selects its candidates in the proverbial smoke-filled room, as well as the free and open exchange of ideas that the additional campaign can offer. At the same time, the level of competition within a primary election can exert surprising effects on the manner in which the general election proceeds. As we have shown in this paper, in high-salience settings, in particular in the U.S. House and U.S. Senate, divisive primaries exert a substantial penalty on parties in the general election. The direct normative implications of this finding for voters are far from clear, but the implications for parties as strategic actors are. Parties in high salience contexts have a strong incentive to avoid publicly visible conflict among potential nominees.

The findings also provide insight into matters beyond divisive primaries themselves. The variation in the effects we have documented suggests, as we have argued, that there is an important tradeoff between, on the one hand, solving the coordination problem of picking a nominee quickly, so as to avoid damaging conflict, and, on the other hand, having a free and open primary that ensures the selection of a higher quality candidate. In high information contexts, where finding the better candidate may already be easier, this tradeoff is such that open competition harms the party in the general. In lower information contexts, where figuring out the best candidate may be much more difficult, the tradeoff seems to go the other way; parties do better when given the chance to observe more competition and thereby, perhaps, select the best candidate, and they avoid the penalty of visible conflict since the degree of media coverage and voter attention is quite low. Investigating the interesting interactions between information and intra-party conflict will be a promising avenue for future research, based on this pattern of results.

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Online Appendix

Intended for online publication only.

OLS Estimates Across Bandwidths

Here we present simple plots showing the way the estimated RD effects vary across the RD bandwidth. Each plot presents the RD estimate from the local linear OLS as presented in the paper, but across different possible bandwidths. The plots run from a minimum bandwidth of 0.015 to a maximum bandwidth of 0.3. This maximum bandwidth asks too much of the local linear specification, while the minimum probably has too little data to be reliable. But the plots are useful for showing how much our conclusions do, or do not, depend on the choice of specification (we note again that in the paper we also use optimal bandwidth algorithms which select the bandwidth for us).

The first two figures present estimates for win probability and vote share in federal elections. As the plots show, we find similar, negative estimates for a wide range of plausible bandwidths. Even at a bandwidth of 0.1, we still find an almost 20 percentage-point penalty in terms of win probability and an almost 5 percentage-point effect on vote share. Although the estimates attenuate somewhat at wider bandwidths, this is probably due to bias in the local linear specification at such wide bandwidths. For any plausible bandwidth, we continue to find large, negative estimates.

The second two figures replicate these analyses for the state legislatures. Here, again, the conclusions from the paper appear to be stable across plausible bandwidth choices. We find null effects on vote share and win probability for all reasonable bandwidth choices. Although there do appear to be some negative point estimates on win probability, these are only at tiny bandwidths with little data. At a plausible 0.05 percent bandwidth, we find a clear zero estimate.

Figure A.1 – RD Sensitivity to Bandwidth: Win Probability in Federal Elections.

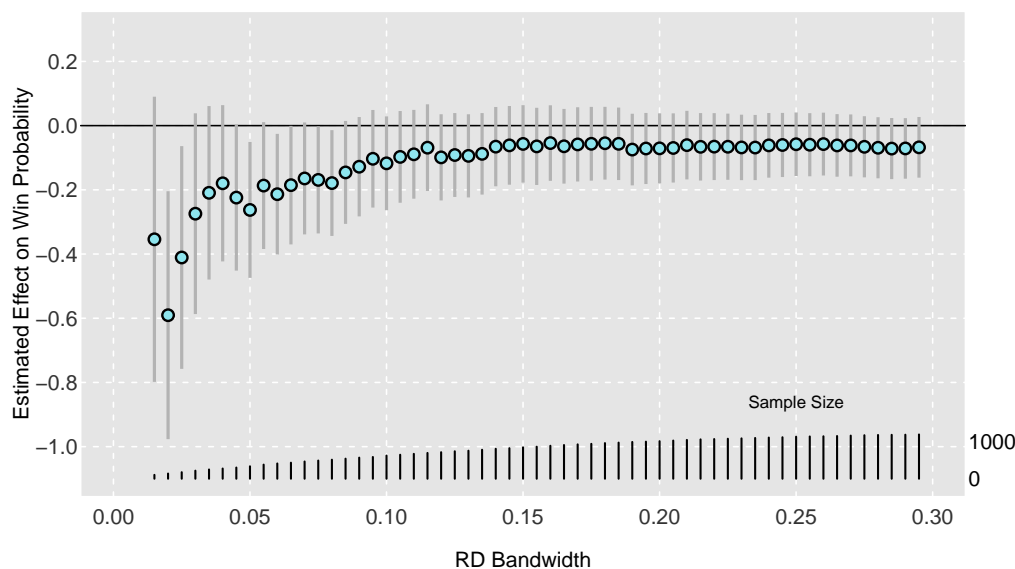


Figure A.2 – RD Sensitivity to Bandwidth: Vote Share in Federal Elections.

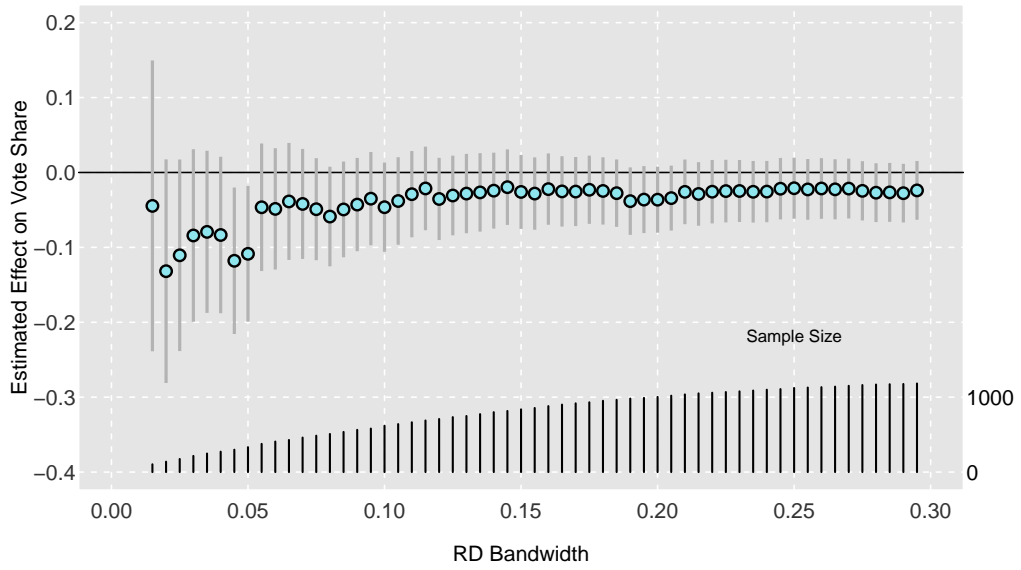


Figure A.3 – RD Sensitivity to Bandwidth: Win Probability in State Legislative Elections.

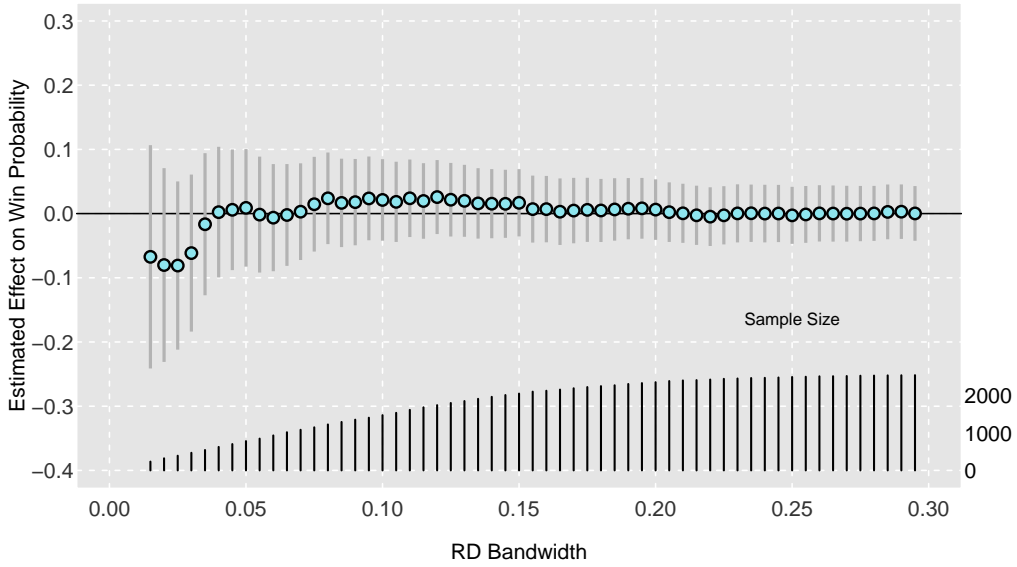


Figure A.4 – RD Sensitivity to Bandwidth: Vote Share in State Legislative Elections.

