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with research support from
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Assessing California's Redistricting Commission

Effects on Partisan Fairness and Competitiveness

SUMMARY

CONTENTS

Technical appendices to this paper are available on the PPIC website.

The creation of the Citizen Redistricting Commission (CRC) in 2008 was a radical departure from California's previous redistricting process, which had been directed by the legislature with little public input and no official rationale. Many hoped that, in addition to meeting legally mandated representational and geographic goals, the CRC would produce electoral maps that were fair to the two major parties and more competitive than the maps that had been drawn by the legislature.

This report evaluates election outcomes under the CRC plan using two new measures of partisan gerrymandering, as well as established metrics of competitiveness. It also compares these outcomes to results under the previous plan and places them in a national context. The analysis leads to the following conclusions:

- The CRC largely satisfied expectations that it would produce plans that are fair to each major party and that increase electoral competitiveness.

- While Democrats have a greater advantage under the CRC plans than they did under the plans drawn by the legislature, this advantage is very small. For the state legislature, the advantage falls within the nationwide range. For Congress, the advantage is by some measures at the high end of Democratic advantage nationwide.

- The size and direction of the advantage under the CRC plan varies over time. The typical election year has featured a small advantage under both the CRC and legislative plans.

- The CRC maps are somewhat more competitive than the maps drawn by the legislature. Competitiveness under the CRC state legislative plan remains low compared to plans in other states, while the CRC congressional plan is one of the most competitive in the country.

- Evidence of greater competitiveness is consistent over time. Every year under the CRC maps has been more competitive than all but one year under the legislative maps.

- Overall, the CRC plans have moved California in the opposite direction from the rest of the country: other state plans are on average more favorable to Republicans and less competitive than plans from the last round of redistricting.

The report concludes that future CRCs should use partisan data to help them produce competitive and fair maps. If they do, they should identify measures and standards for using this information before holding hearings or drawing district lines. Moreover, the CRC should use measures that are appropriate for states like California, in which one party (the Democrats)

holds a clear statewide majority. There are also sophisticated methods for automatically drawing redistricting plans that could prove useful to the CRC in future drawing efforts.

This is an especially good time to consider the partisan consequences of the commission's work. The independent commission model is still rare, but many states have considered or are considering adopting something like it—particularly in light of two US Supreme Court cases, *Gill v. Whitford* and *Benisek v. Lamone*, which could establish a new legal standard for partisan gerrymandering. For California and for other states considering redistricting reform, fairness and competitiveness should be important aims.

Introduction

When California drew its representational districts in 2011, it used an independent commission process for the first time. Until 2008, constitutional responsibility for drawing the lines rested with the state legislature. After the legislature drew a set of lines in 2001 that protected incumbents and ignored calls for more representation for people of color (McGhee 2015), reform advocates qualified an initiative for the November 2008 ballot that created the independent commission to draw state legislative and Board of Equalization districts. That initiative passed, and a later initiative added congressional districts to the commission's purview.

This new Citizen Redistricting Commission (CRC) is a radical departure from the legislative redistricting process (see text box). Legislators are members of the political establishment; commissioners must be independent of that establishment. Legislators had some legal constraints; the CRC has those same constraints plus a set of goals ranked by priority. The legislature held few public hearings and offered no official explanation for the lines it drew; the 2011 CRC held numerous public hearings, broadcast all its meetings on the Internet, and produced a report explaining its decisions, as mandated by law. The legislature could pass a redistricting plan with any partisan coalition it wanted; the CRC needed to have a balanced partisan membership and required at least a few commissioners from each party to support the plan.

California's Citizen Redistricting Commission

The Citizen Redistricting Commission was created in reaction to the plan drawn in 2001 by the state legislature. The legislature's plan was passed with bipartisan support, but it largely protected incumbents and avoided opportunities for additional minority representation.

The new commission law sought to produce different results by separating the commission from the state legislature as much as possible and specifying a clear process. The law includes five important provisions:

- **Selection process.** The CRC membership is selected through a long, complex process managed by the independent state auditor. State legislative leaders have a chance to strike names from consideration, but the membership is otherwise outside their control. The 14 commission seats are divided almost evenly between registered Democrats, Republicans, and Independents.

- **Independence.** Participation in the CRC is forbidden for those with clear connections to the political establishment, including former staffers and large donors. Members cannot run for office for 10 years after serving on the commission. The legislature has no direct say in the maps that are adopted.

- **Transparency.** The CRC is required to make its deliberations as public as possible and to produce a detailed report documenting how the lines were drawn.

- **Prioritized criteria.** The CRC was given a list of goals, in order of priority. It must produce districts that are (1) equal in population; (2) compliant with the federal Voting Rights Act; (3) contiguous; (4) respectful of traditional geographic representation; (5) compact; and (6) nested (two state assembly districts in each state senate district).

The law also prohibits the commission from considering the location of any incumbent or candidate's home, or from drawing the lines to benefit any incumbent, candidate, or party.

Supporters of the CRC hoped this approach would produce a better plan than the previous plan drawn by the legislature in 2001. At a minimum, it seemed reasonable to expect movement toward the goals the CRC was legally required to prioritize: ensuring representation for people of color and respecting geographic criteria such as compactness and keeping entire cities and counties within individual districts. Existing evidence suggests the plans drawn by the CRC have, in fact, done better than the last legislative plan in meeting these goals (Kogan and McGhee 2012).

Many observers also see partisan fairness and competitiveness as important goals of commission-style reform. It is often said that traditional legislative systems allow legislators to choose their voters, rather than the other way around. If so, then legislators are likely to choose voters who either improve their own chances of reelection or help their party win more seats. Either one could affect the fairness or competitiveness of the plan.

This report looks at the redistricting commission's impact on both partisan balance, or fairness, and the competitiveness of elections. The report uses two measures of fairness that are appropriate for California and other states dominated by one party. The *efficiency gap* metric captures a standard tactic in a partisan gerrymander: a redistricting party "packs" its opposition into a handful of districts that will be won handily and "cracks" the remainder across a larger number of districts it will lose by relatively narrow margins. The *declination* metric examines the extent to which a redistricting plan seems to treat the 50 percent threshold for victory as unusually important. To measure competitiveness, the report uses the share of seats that were won by less than 10 percentage points: that is, the share of races in which each party's vote share was between 45 and 55 percent.

Assessing the partisan consequences of the CRC plan is especially important now. A number of states are considering moving to a commission-style system, motivated at least in part by a desire to promote fairness and competitiveness. Also, the US Supreme Court is considering two cases, *Gill v. Whitford* and *Benisek v. Lamone*, which might establish a nationwide standard of partisan gerrymandering. Such a standard could require California's commission to adopt a more aggressive approach to partisan outcomes.

Such a standard might also encourage more states to switch to a redistricting commission, but only if it can help them comply with the court mandate. While 31 states currently use some form of commission to draw either legislative or congressional districts, only California and Arizona have truly independent commissions over which the legislature has limited control.[1] The rest are appointed by or composed of elected officials, give the legislature final say over the content of the plan, or both.

In some ways, the CRC is an imperfect test case. It matters that the legislative plan that preceded the CRC plan was not a partisan gerrymander—indeed, it received bipartisan support in the legislature. If anything, it was an incumbent-protection gerrymander designed to ensure that no sitting legislator or member of Congress would face a tough reelection fight. If the old plan is more likely to be uncompetitive than unfair, we should expect the CRC to have more of an impact on competitiveness than fairness.

Furthermore, the legislation that established the CRC did not require a fair and competitive plan; it barred the commissioners from trying to draw an *un*fair or *un*competitive plan. They were not allowed to consider the location of any incumbent's or candidate's place of residence, or to benefit or hurt any incumbent, candidate, or party. The commissioners concluded they could not actively use any information about the partisan tendencies of voters. This meant they could not precisely estimate the partisan effects of their plans, so they could not see whether they had produced a skewed or uncompetitive result either by accident or because outside interests had led them to one without their knowledge (Pierce and Larson 2011). Thus, this report seeks to determine whether fairness and competitiveness can emerge from such a commission process even absent express intent.

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[1] These statistics on redistricting commissions come from Justin Levitt's All About Redistricting website.

Partisan Advantage

It is important to understand whether a redistricting plan gives one party an electoral advantage over the other. Yet until recently there was no straightforward means of evaluating partisan advantage in states like California, where one party tends to win well over 50 percent of the statewide vote. A number of new metrics for partisan advantage and gerrymandering have addressed this problem. My analysis uses two of these metrics: the efficiency gap and declination.

The efficiency gap was one of the measures used in *Gill v. Whitford,* a case that was recently argued in front of the US Supreme Court. The case originated in Wisconsin, where the two parties are quite competitive statewide. For competitive states, the efficiency gap and the other measures used in *Gill v. Whitford*—especially the mean-median difference and Gelman-King bias—generate similar results (McGhee 2017). But among these measures, the efficiency gap is the only one that offers a sense of fairness for a state like California, where the Democratic Party has earned between 55 and 65 percent of the two-party vote in recent elections. Declination—which was not used in the case—also makes sense for California (Warrington 2017).

The efficiency gap focuses on "wasted" votes. Wasted votes include those in excess of the number needed to win and all those cast for a losing candidate. The party that wastes more votes wins its seats less efficiently. Partisan gerrymanders seek to foist more wasted votes on the other party. They "pack" the opposing party's supporters in a small number of districts that the party wins handily and "crack" the rest across far more districts that it narrowly loses. The result is more seats for the party drawing the gerrymander.

The efficiency gap captures this idea by totaling the wasted votes for each party, taking the difference between them, and dividing that difference by the number of votes cast. The math of this approach identifies a very specific relationship between a party's statewide share of votes and the share of seats it wins: each party should win 50 percent of the seats if it wins 50 percent of the votes, but for every additional percent of the vote it should win an additional 2 percent of the seats (Stephanopoulos and McGhee 2015). When this relationship holds, the efficiency gap is zero. The efficiency gap could theoretically range between -50 and 50, but the most extreme values tend to fall between about 10 and 20 in either direction. Values closer to zero are considered fairer, while large negative or positive values are unfair.
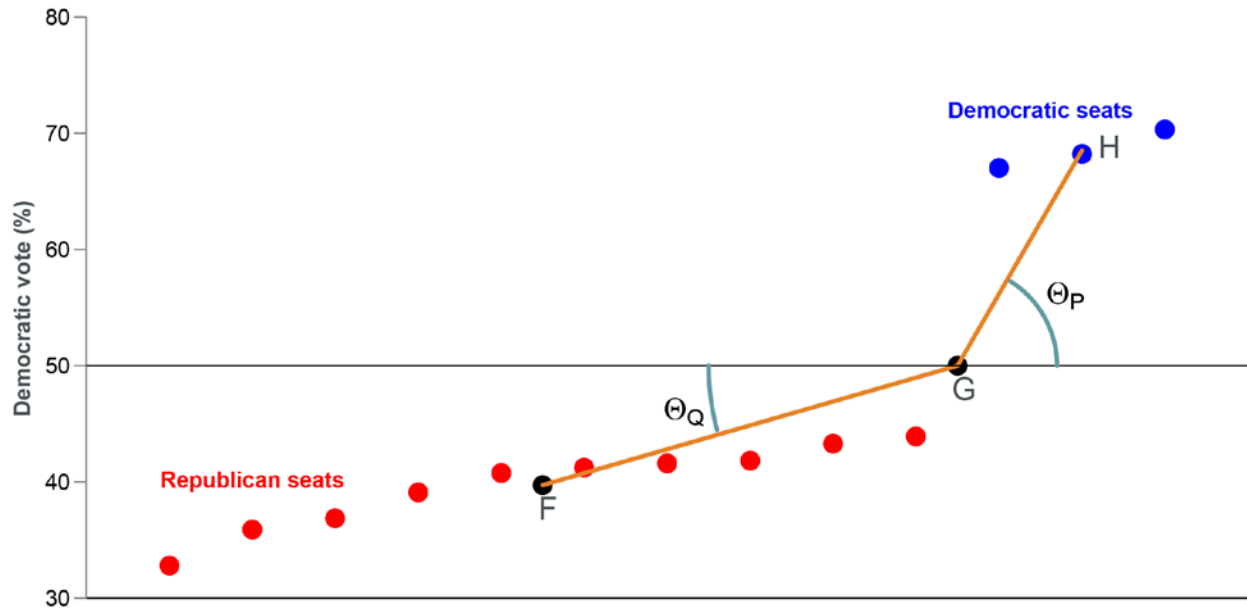
Because the efficiency gap captures the seat advantage that results from winning a particular share of the vote, it can vary—sometimes quite a lot—as seat shares and vote shares rise and fall. No single value is important by itself; what matters is the tendency for values to be large *and* to persist over time. Because we have data from all five elections under the plans drawn in 2001 and from three of the five since the CRC's plans were drawn in 2011, we can measure not just the advantage in any given year but the durability of that advantage over time.

The efficiency gap measures only the partisan advantage gained by winning seats more efficiently. It does not say much by itself about the redistricting authority's intent. This is where the second metric, declination, comes in. Declination attempts to capture discrepancies in district outcomes that suggest the redistricting authority was especially concerned about the 50 percent threshold and how seats were situated in relation to it.

To understand how declination works, imagine a graph that plots all the districts in a redistricting system. On the far left is the least Democratic seat and on the far right is the most Democratic. (This order could be reversed; it is the fact that the districts are ordered that matters.) The vertical axis plots the Democratic share of each district's two-party vote. For example, Figure 1 shows data from the 2016 congressional elections in North Carolina.

FIGURE 1

Example of a vote distribution with an unfair declination

NOTE: Graph shows an unfair distribution of votes, where the points below the 0.5 vote share line are much closer to that line and show signs of deliberately avoiding that line to ensure more wins for that party.

If districts have been drawn without reference to each party's wins and losses, the line connecting the districts should run straight from the least to the most Democratic outcome. If instead this line has a kink in it around 50 percent—as it does in Figure 1—it suggests the redistricting authority may have considered wins and losses to be of special significance and designed the plan to extract more seats for itself than it would otherwise receive. The line for that party would be close to the 50 percent threshold (an indication of fewer wasted votes) but would not cross that threshold, which would mean turning seats over to the other party.

Declination is the difference between the angles created by these lines (θ_Q and θ_P in Figure 1). This measure is highly correlated with the efficiency gap's measure of wasted votes. But declination is a more direct test of how the 50 percent threshold is treated in a redistricting plan, while the efficiency gap says more about the precise advantage a party obtains in terms of seat share.

Like the efficiency gap, declination can yield either positive or negative values, and values closer to 0 are fairer than values at the extremes. Declination values range between -1 and 1 and the units are not as intuitive: they are expressed as fractions of 90 degrees. Thus, declination can give a good sense of a plan's intended advantage and the strength of that intent, while the efficiency gap can measure the magnitude of the actual advantage.

The first election under a plan is likely the best indicator of the plan's design: we want to know how the plan behaves in the election when intent is most clearly manifest. Declination is best used in these first elections. Because declination does not tell us whether a party has earned a larger seat share than its vote share would indicate, it is somewhat less useful for identifying the enduring advantage a party receives from a redistricting plan. To measure this advantage, I rely on the efficiency gap.

A redistricting plan is drawn as a whole, which means that the design of each district is affected by decisions about the designs of other districts. So it is important to understand how the *entire* plan might perform at any point in time—including seats that are not contested. The estimates provided here include best guesses as to how the vote *would have* turned out if those uncontested seats had been contested. In other words, my estimates of partisan advantage (and later, competitiveness) do not exactly reflect the actual outcomes but instead show what might have happened if every seat in the plan had been contested in that election cycle. This is particularly significant for upper legislative chambers in California and nationally, since they often have staggered terms. I treat staggered seats that are not on the ballot as uncontested and so fill in estimates as if these seats had actually hosted contests. (For more details, see Technical Appendix B.)

I also treat the same-party races that occur under California's "top two" primary system as uncontested. The top two allows voters to choose candidates of any party and advances the top-two vote getters, also regardless of party, into the general election. Same-party races have been far from rare, occurring in almost one in five contests. These same-party races create a problem for an analysis of gerrymandering. They do not give an accurate sense of the wasted votes in the same way that a cross-party race does because they do not provide voters with a partisan choice. For this reason, I fill in a best guess as to how the race would have turned out if it had been a cross-party contest.

For Congress, I report efficiency gaps in terms of both seat shares and raw seats. Raw seats—the number of additional seats a party wins—are important in the congressional context because any extra seat matters for control of the House of Representatives regardless how many seats a state has otherwise.[2] Seat shares—the number of seats a party wins as a percentage of all the seats in the redistricting plan—place partisan advantage in the context of California's large number of congressional seats. Raw seats are not as meaningful in the state legislature, where the goal is to gain leverage within the legislative body itself. Presenting the efficiency gap in terms of extra seat share for state legislatures offers a more consistent measure of the additional power the partisan advantage provides.

Table 1 contains the efficiency gap and declination values for both the 2001 and 2011 plans in California and the rest of the United States. As noted earlier, values close to 0 in either measure indicate smaller partisan advantage. Negative values indicate Republican advantage and positive values indicate Democratic advantage.

The table shows that the CRC's plan is more favorable to Democrats (more positive) than the 2001 plan across all three legislative bodies, while the average of all other states has generally become more favorable to Republicans (more negative). The one exception to this pattern is the declination for upper legislative chambers, which indicates that the CRC plan slightly favored Republicans in the first election while the rest of the country slightly favored Democrats.

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[2] For example, if Republicans held 218 seats in the House of Representatives and Democrats held 217 seats, an additional Democratic seat would flip control of the chamber whether it came from a large state like California (53 seats) or a small one like Rhode Island (2 seats). But it is clearly easier to gerrymander extra seats in a state like California, so the potential for politically consequential mischief is higher in larger states.

TABLE 1
California's commission plan tilts slightly Democratic compared to the old plan

	Congress		Lower legislative chamber		Upper legislative chamber	
	California	Rest of US	California	Rest of US	California	Rest of US
Efficiency gap in seat share (%)						
2001 districts	-0.37%	-0.10%	0.89%	-0.60%	2.60%	-1.04%
2011 districts	2.28%	-3.34%	1.72%	-1.68%	5.34%	-2.58%
Efficiency gap in seats						
2001 districts	-0.20	-0.10	--	--	--	--
2011 districts	1.21	-0.42	--	--	--	--
Declination (first election)						
2001 districts	0.13	-0.03	0.04	-0.05	0.19	-0.05
2011 districts	0.06	-0.20	0.01	-0.16	0.12	0.02

SOURCES: Steven Rogers, University of St. Louis (presidential vote by state legislative district, 2004 and 2008); Carl Klarner, University of Florida (state legislative vote 2002–16); Daily Kos (presidential vote by state legislative district, 2012 and 2016); Polidata (presidential vote by congressional district 2002–16); Congressional Quarterly Voting and Elections Collection (congressional vote 2002–16).

NOTES: Positive values favor Democrats; negative values favor Republicans. Values closer to 0 indicate fairer outcomes.

None of the efficiency gap values for California would merit closer scrutiny under the legal test suggested by Stephanopoulos and McGhee (2015), which has heavily influenced the standards suggested to the Supreme Court in *Whitford*. Stephanopoulos and McGhee suggest an efficiency gap threshold of 8 percent for state legislative plans and two raw seats for congressional plans. Plans that exceeded these thresholds would be subject to further scrutiny to determine if the gap was likely to persist over time, and whether it could be justified in terms of other state goals.
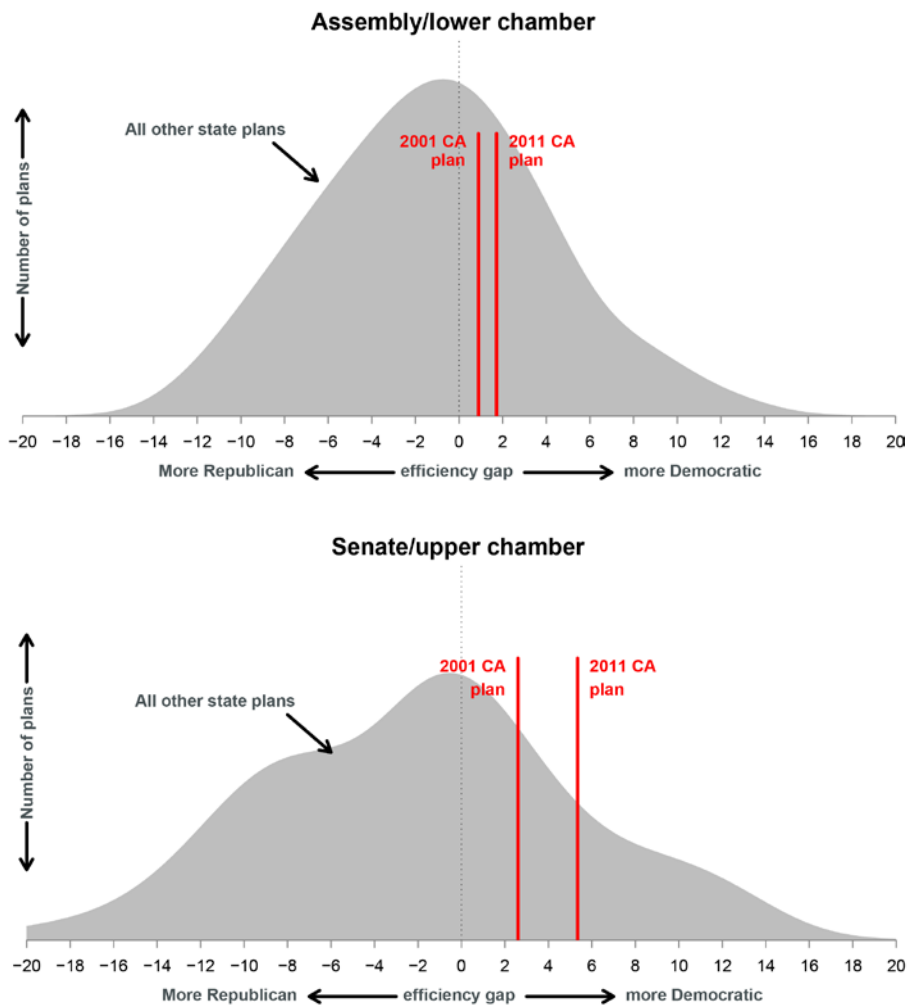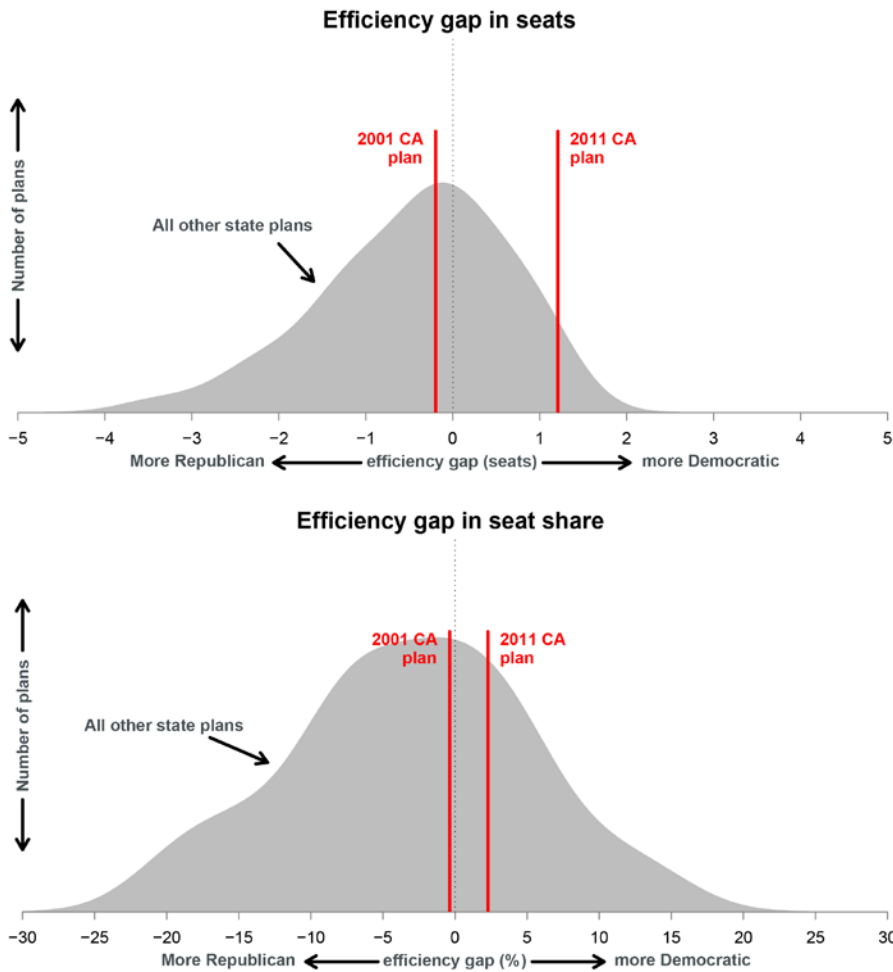
The declination values offer even less reason to be concerned about the partisan imbalance of the CRC plans. In each case, the first election under the CRC plan actually had a declination closer to 0 than the first election under the legislative plan: 0.06 vs. 0.13 for Congress, 0.01 vs. 0.04 for the state assembly, and 0.12 vs. 0.19 for the state senate. The congressional and state assembly plans moved in the opposite direction from the rest of the country.

Figures 2 and 3 place the efficiency gap values for the CRC plans in the national range of plans. The grey shapes in each graph show the distribution of redistricting plans outside California. Plans that produce a Republican advantage are to the left of the 0, while plans that produce a Democratic advantage are to the right. I have placed two red lines in each graph indicating where each of the last California plans lie.

In each distribution, California's 2001 legislative plan was closer to the heart than its 2011 CRC plan. In most cases, the difference is quite small. In fact, if we ignore the direction of the advantage and consider only its magnitude, the CRC partisan advantage is below the 55th percentile in every case but one. The exception is the 1.21 efficiency gap for raw seats, which is more Democratic than essentially every other plan nationwide, with an absolute magnitude larger than 76 percent of them (top panel of Figure 3). Of course, this partly reflects the large number of seats in the congressional delegation; when the raw seat advantage is calculated as a share of seats, the advantage is much smaller and closer to the middle of the distribution (bottom panel of Figure 3).

FIGURE 2
The CRC's state legislative plan favors Democrats but is not an outlier

Assembly/lower chamber

All other state plans

2001 CA plan

2011 CA plan

Number of plans

-20 -18 -16 -14 -12 -10 -8 -6 -4 -2 0 2 4 6 8 10 12 14 16 18 20

More Republican ← efficiency gap → more Democratic

Senate/upper chamber

2001 CA plan

2011 CA plan

All other state plans

Number of plans

-20 -18 -16 -14 -12 -10 -8 -6 -4 -2 0 2 4 6 8 10 12 14 16 18 20

More Republican ← efficiency gap → more Democratic

SOURCES: Steven Rogers, University of St. Louis (presidential vote by state legislative district, 2004 and 2008); Carl Klarner, University of Florida (state legislative vote 2002– 16); Daily Kos (presidential vote by state legislative district, 2012 and 2016); Polidata (presidential vote by congressional district 2002– 16); Congressional Quarterly Voting and Elections Collection (congressional vote 2002– 16).

NOTES: Graphs show distributions of average efficiency gaps for both redistricting cycles. Red vertical lines indicate the location of the two California plans in these distributions. Values for upper chambers include all the seats in each plan; seats that were not actually contested that year have imputed values. Positive values indicate Democratic advantage; negative values indicate Republican advantage. Values closer to 0 indicate fairer outcomes.

FIGURE 3
California's congressional commission plan is an outlier in terms of raw seats

Efficiency gap in seats

2001 CA plan

2011 CA plan

All other state plans

Number of plans

More Republican ← efficiency gap (seats) → more Democratic

Efficiency gap in seat share

2001 CA plan

2011 CA plan

All other state plans

Number of plans

More Republican ← efficiency gap (%) → more Democratic

SOURCES: Steven Rogers, University of St. Louis (presidential vote by state legislative district, 2004 and 2008); Carl Klarner, University of Florida (state legislative vote 2002–16); Daily Kos (presidential vote by state legislative district, 2012 and 2016); Polidata (presidential vote by congressional district 2002–16); Congressional Quarterly Voting and Elections Collection (congressional vote 2002–16).

NOTES: Graphs show distributions of average efficiency gaps for plans in both redistricting cycles. Red vertical lines indicate the location of the two California plans in these distributions. Positive values indicate Democratic advantage; negative values indicate Republican advantage. Values closer to 0 indicate fairer outcomes.

Figure 4 disaggregates these values over time. The results are volatile, and in the case of Congress and the assembly, there appear to be two outlier years: 2008 and 2014. In 2008, Democrats won a much larger share of the vote, but because of uncompetitive districts they were unable to translate that into more seats, creating a Republican advantage. Something similar occurred in 2014, but in reverse: Republicans won more votes, but did not gain more seats. This was especially true in House races: five Democrats won with less than 52 percent of the vote, so the efficiency gap could easily have been very different.
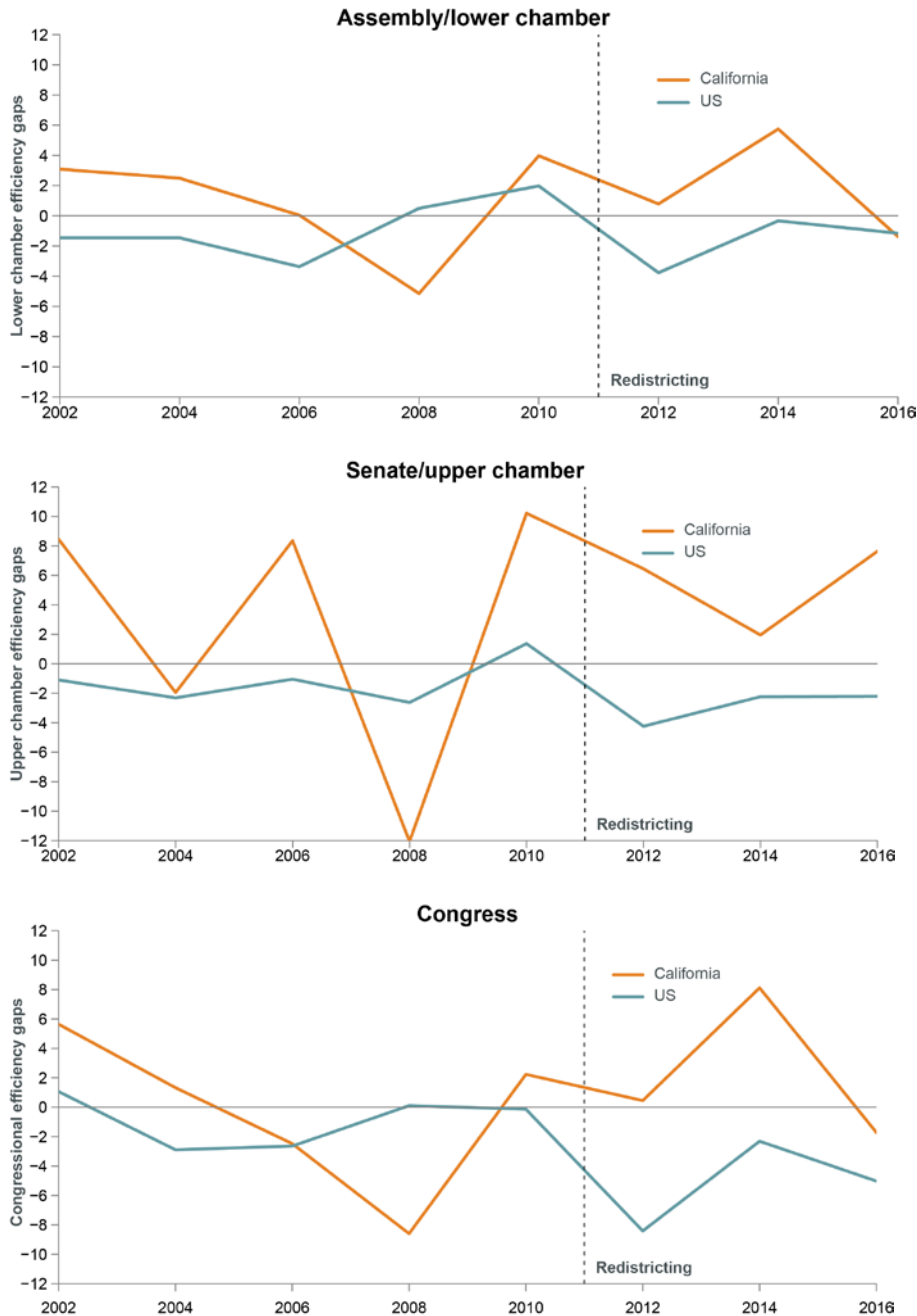
In addition, the first efficiency gap under the CRC's assembly and congressional plans is relatively small. That first value is larger for the senate, but it, too, is highly volatile, owing in part to the limited number of seats and the estimated outcomes for more than half of them. Since the first election is the one the commission can most easily predict, the small change implies a minimal partisan effect.

In short, there is evidence that the CRC plan leans more Democratic than the 2001 plan drawn by the legislature, but the magnitude of the lean is small and there is no sign of a large and durable efficiency gap. However, it is

often said that Republicans in states like California have a natural advantage against Democrats (Chen and Rodden 2013): the state's most densely populated areas (such as Los Angeles and the San Francisco Bay Area) are heavily Democratic, making it difficult to avoid drawing "packed" districts in those areas. When considered in this context, the Democratic lean of the CRC's plans is somewhat more notable (Chen and Cottrell 2016).

FIGURE 4
A few outlier years account for most of the difference between the commission plan and its predecessor

SOURCES: Steven Rogers, University of St. Louis (presidential vote by state legislative district, 2004 and 2008); Carl Klarner, University of Florida (state legislative vote 2002–16); Daily Kos (presidential vote by state legislative district, 2012 and 2016); Polidata (presidential vote by congressional district 2002–16); Congressional Quarterly Voting and Elections Collection (congressional vote 2002–16).

NOTES: Time series show efficiency gaps for each election year. Values for upper chambers include all the seats in each plan; seats that were not actually contested that year have imputed values. Thus, estimates should not be interpreted as the actual outcome that election year, but the outcome that might have occurred if all the plans seats had been on the ballot. Positive values indicate Democratic advantage; negative values indicate Republican advantage. Values closer to 0 indicate fairer outcomes.

Competitiveness

Many supporters of the CRC are even more concerned about increasing competitiveness than about reducing partisan advantage. Early evidence has already suggested the commission approach produced the hoped-for result in many respects. The CRC's plans forced most incumbents to represent a lot of new territory, and many initially shared districts with other incumbents. A substantial number of incumbents either moved to a new district, ran for a different office, or retired from public life altogether (McGhee and Krimm 2012b). There is also evidence from both 2012 and 2014 that the plans featured produced more competitive races (McGhee and Krimm 2012a; Krimm and McGhee 2014). The analysis here extends the analysis to 2016 and places the results in national context.

Table 2 shows the share of races that were won by less than 10 percentage points, meaning neither party's share of the major-party (or two-party) vote fell below 45 or above 55 percent.[3] Like the measures of party advantage, this measure of competitiveness tells a consistent story. Each of the CRC plans has increased competitiveness at least a little: a larger share of the CRC plans drawn in 2011 have had competitive outcomes when compared to the legislative plans drawn in 2001. For example, just 6 percent of the congressional races under the 2001 legislative plans in California were competitive, compared with 14 percent under the CRC plans. The rest of the country has moved slightly in the opposite direction: the share of races with close results is lower than it was under the previous plans. It is down 3 percent in upper legislative chambers (21% to 18%) and 5% in lower legislative chambers (21% to 16%).

TABLE 2
California's commission plans are more competitive than their predecessors

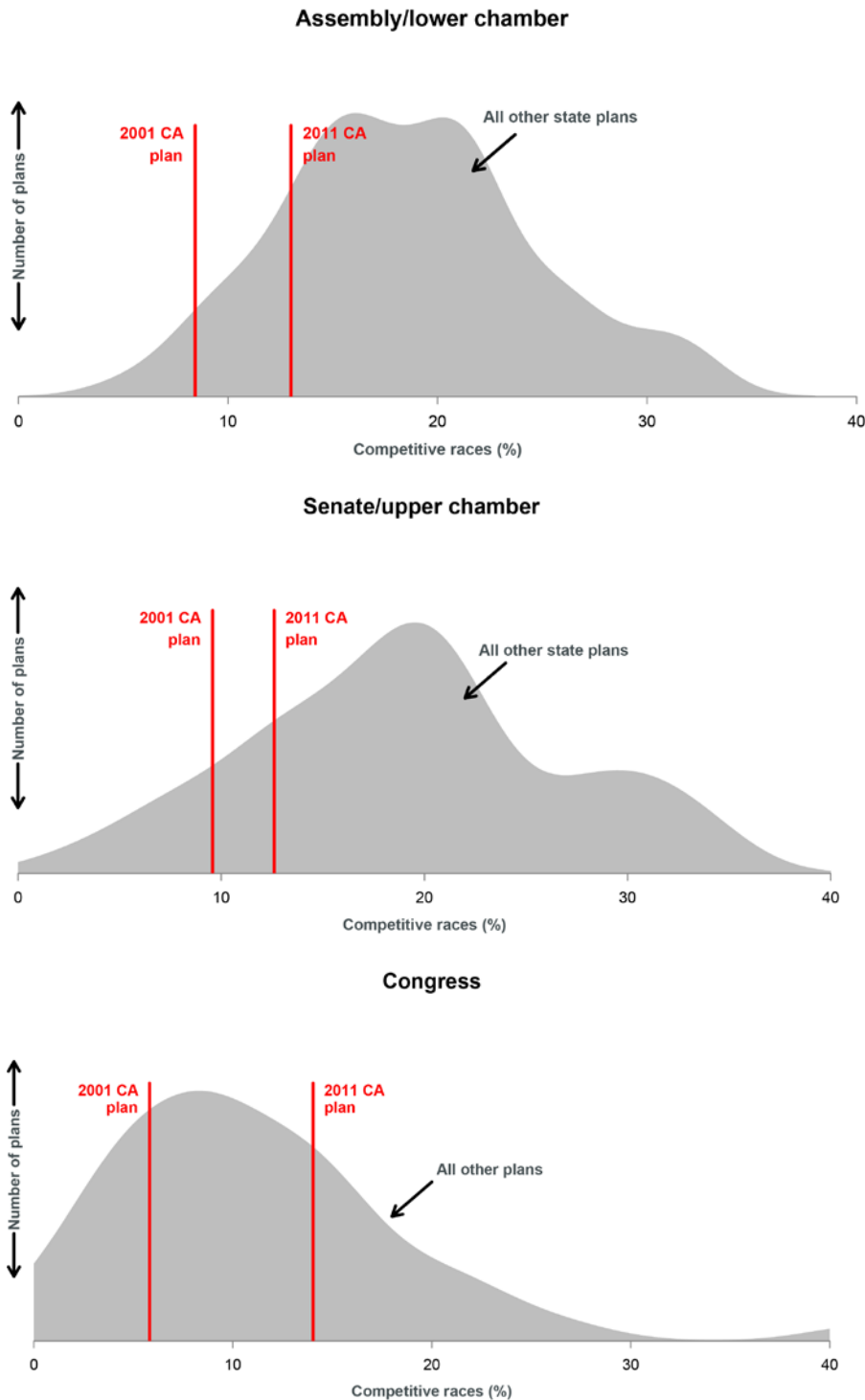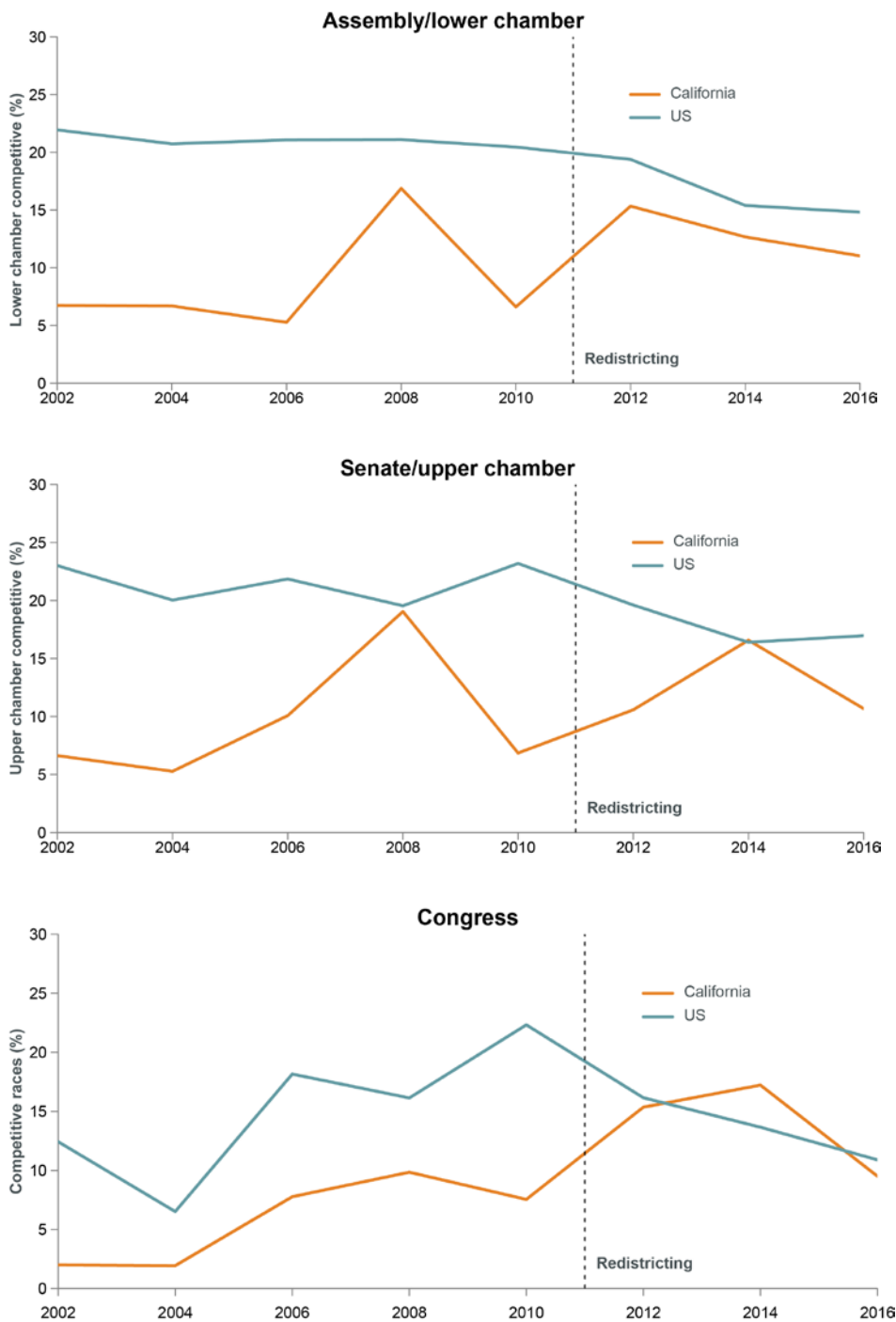|	Congress		Lower legislative chamber		Upper legislative chamber	
	California	Rest of US	California	Rest of US	California	Rest of US
2001 districts	6%	15%	8%	21%	10%	21%
2011 districts	14%	14%	13%	16%	13%	18%

SOURCES: Steven Rogers, University of St. Louis (presidential vote by state legislative district, 2004 and 2008); Carl Klarner, University of Florida (state legislative vote 2002–16); Daily Kos (presidential vote by state legislative district, 2012 and 2016); Polidata (presidential vote by congressional district 2002–16); Congressional Quarterly Voting and Elections Collection (congressional vote 2002–16).

NOTES: Competitive races are those where both candidates' shares of two-party vote fell between 45 and 55 percent.

Figure 5 places these results in the context of all other plans. It shows that while the CRC plan is clearly more competitive (further to the right in each graph) than the 2001 legislative plan, it falls on the low end of the range of competitiveness nationally. The results for Congress are quite different. Most congressional plans nationwide do not produce competitive races; the 2001 California plan was consistent with that national tendency, but the 2011 CRC plan is more competitive than about 72 percent of the plans in other states.

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[3] I also performed all the same calculations using the responsiveness of each plan. I shifted each plan's distribution to match a historically reasonable range of partisan tides and also added in stochastic district-level variance consistent with historical patterns. I then calculated the relationship between the change in votes and the change in seats for these shifts. Higher values indicate greater responsiveness. The results were substantively identical for all these calculations.

FIGURE 5

California's commission plan is more competitive than its predecessor

Assembly/lower chamber

Senate/upper chamber

Congress

SOURCES: Steven Rogers, University of St. Louis (presidential vote by state legislative district, 2004 and 2008); Carl Klarner, University of Florida (state legislative vote 2002–2016); Daily Kos (presidential vote by state legislative district, 2012 and 2016); Polidata (presidential vote by congressional district 2002–16); Congressional Quarterly Voting and Elections Collection (congressional vote 2002–16).

NOTES: Graphs show distributions of average share of races that were competitive for plans in both redistricting cycles. Red vertical lines indicate the location of the two California plans in these distributions. Competitive races are those where both candidates' shares of the two-party vote fell between 45 and 55 percent.

FIGURE 6
The CRC plan has been more competitive than almost every election under the old plan

Assembly/lower chamber

Senate/upper chamber

Congress

SOURCES: Steven Rogers, University of St. Louis (presidential vote by state legislative district, 2004 and 2008); Carl Klarner, University of Florida (state legislative vote 2002–16); Daily Kos (presidential vote by state legislative district, 2012 and 2016); Polidata (presidential vote by congressional district 2002–16); Congressional Quarterly Voting and Elections Collection (congressional vote 2002–16).

NOTES: Time series shows the share of races that were competitive in each election year. Competitive races are those where both candidates' shares of the two-party vote fell between 45 and 55 percent. Values for upper chambers include all the seats in each plan; seats that were not actually contested that year have imputed values. Thus, these results should be interpreted not as the actual outcome that election year but as estimates of what might have occurred if all the seats had been on the ballot.

Figure 6 disaggregates these results over time and tells a very similar story. Races under the CRC plan have been at least modestly more competitive in every election since it was first adopted, even as plans in the rest of the country have shown signs of reducing competitiveness over time. The 2008 election is an outlier here, as it was in terms of partisan advantage. It featured races that were notably more competitive on average than those of other elections over this period. Aside from this election, the races under the previous plan were even less competitive than the ones under the CRC plan.

It has long been noted that Democrats and Republicans live in different parts of the state, making it particularly difficult to draw competitive districts in California (Cain et al. 2006). The CRC maps for the California State Assembly and Senate are consistent with that understanding, but the congressional maps are considerably more competitive than one might expect.

Conclusion

This evaluation of the California Redistricting Commission maps suggests that the CRC plans have been more favorable to Democrats, on average, than the plans drawn by the California Legislature in 2001. However, much of the difference appears to be driven by outlier elections. There is some inconsistency, but the typical election year features a small advantage under the CRC plans.

The CRC plans are also more competitive than the 2001 legislative plans, which were among the least competitive in the country over the last two redistricting cycles. The CRC plans have produced more competitive races across all three legislative bodies, though both chambers of the state legislature are still at the lower end of the national range of competitiveness.

The evidence presented here suggests that the CRC's decision not to examine partisan data produced a set of plans that was generally fair and competitive. However, the new maps favor Democrats more than the old ones, particularly in 2014. And, as we've seen, races for seats in the California Legislature remain significantly less competitive than those in other state legislatures.

There is no reason to believe that the commissioners intended to tilt their maps in favor of the Democrats or to limit competitiveness. But the decision not to use available data to assess either possibility made it easier for the plans to do both by accident. In fact, some observers have suggested that the tilt in favor of Democrats is at least partly attributable to Democratic operatives who presented themselves as nonpartisan community advocates and testified in favor of decisions that would have pro-Democratic effects (Pierce and Larson 2011).

It is important not to overstate the point. If advocates did try to lead the commission toward biased maps, they had limited success. The partisan advantage is small and inconsistent, and it pales in comparison to the size and durability of the bias in plans that are commonly considered gerrymanders. Also, although the California plans are not always highly competitive, they are more competitive than the plans drawn by the state legislature. It is possible that the CRC's approach, in combination with the constraints of the law, protected it from outside influence that would otherwise have steered the commission toward less desirable outcomes.

Nonetheless, there is nothing in the law that prevents the CRC from looking at partisan data. The law only prohibits commissioners from using those data to favor any incumbent or political party. They *could* use the information to avoid an unfair or uncompetitive result by accident. If they took this step, it would be important to choose a measure (or set of measures) at the beginning of the map-drawing process. That would establish an

objective benchmark and ensure that the measures were not being used to validate mapping decisions that had already been made for some other reason.

The two measures that have been used in this report—the efficiency gap and declination—are good candidates for measuring partisan advantage. They offer a sense of fairness that is appropriate for a state like California, where one major party is dominant. As we have seen, other measures are less appropriate for California because they require imagining what would happen if the two major parties were competitive statewide.

If the CRC were to use the efficiency gap to gauge the impact of its plans, it would probably want to examine a range of hypothetical election outcomes to ensure that its plan would continue to have no more than a small partisan advantage across all of them. Typically this "sensitivity testing" involves shifting the vote share in every seat by a common amount and seeing how the measure of partisan advantage changes. This would also help ensure that the plan in question would have the efficiency gap's preferred 2-to-1 seats-to-votes relationship for many different vote shares. For California, that would mean a party should win an extra congressional or state Senate seat for about every additional 2 percent in the popular vote, and an additional state assembly seat for about every 1 percent of the popular vote.

This approach to evaluating partisan advantage would have a serendipitous side effect: it would ensure a certain amount of competition, since a plan that awards 2 percent of the seats for 1 percent of the vote is modestly competitive by definition. While competition is valuable, too much competition runs the risk of empowering the views of swing voters at the expense of those with stronger partisan views. A balance between both perspectives likely makes the most sense, and the efficiency gap could provide that. In this way, the CRC could kill two birds with one stone.

Future CRCs might also take advantage of new developments in automated redistricting. There are now powerful methods of generating a wide range of redistricting plans using sampling methods combined with modern computing power (Chen and Rodden 2013; Best et al. 2017; Cain et al. 2017; Herschlag et al. 2017). The computer can be instructed to generate districts that meet a set of geographic criteria, such as equal population, compactness, and avoiding city or county splits. The CRC could then limit the set of generated plans to those that also satisfy a range of quantitative criteria for fairness or competitiveness. Once they were confident that potential plans met these criteria, they could compare the plans on other criteria that are more difficult to program into a computer (Cain et al. 2017).

On balance, the CRC's process worked fairly well: it produced a set of plans that are more competitive than the ones that came before and are only slightly more tilted toward Democrats. A similar result seems likely for the next commission. But there is room for improvement. The next commission could inoculate itself against the threat of outside interests distorting the process by using partisan data and taking advantage of new automated redistricting tools to satisfy rather than undermine the law's requirements.

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