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Author(s): Corbett A. Grainger

Source: *Journal of Law and Economics*, Vol. 53, No. 3 (August 2010), pp. 545-567

Published by: [The University of Chicago Press](#)

Stable URL: <http://www.jstor.org/stable/10.1086/605724>

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# Redistricting and Polarization: Who Draws the Lines in California?

Corbett A. Grainger *University of Wisconsin—Madison*

## Abstract

In the United States, the process of drawing election districts is left to individual states, and critics of legislative redistricting often argue for independent panels to take control of the process. A common claim is that legislative redistricting has been a major contributor to polarization in the American political system. Previous attempts to test for a relationship between redistricting and polarization have generally relied on cross-state comparisons of redistricting methods and examinations of behavior in the House of Representatives. In this paper, I exploit the alternation between legislatively drawn and panel-drawn districts in California since the mid-1960s. Using data at the state legislature level, I find evidence that legislatively drawn districts have been, on average, less competitive than panel-drawn districts. Moreover, as districts become “safer,” legislators tend to take more extreme voting positions. Finally, I find evidence that legislative redistricting (compared with panel-drawn redistricting) is associated with increased polarization.

## 1. Introduction

Throughout the United States, there has been considerable debate surrounding legislative redistricting, or gerrymandering, the process whereby a state legislature draws election districts. The redistricting process mandated by the Supreme Court’s “one person, one vote” ruling (*Baker v. Carr*, 369 U.S. 186 [1962]; *Reynolds v. Sims*, 377 U.S. 533 [1964]) requires that election districts be adjusted to changes in population after every decennial census so that populations across districts within a state will be approximately equal, but the process of redistricting is left to the individual states. In most states, the redistricting process is conducted

I gratefully acknowledge fellowship support from the National Science Foundation (grant 0114437). This work was completed as a doctoral student at the University of California, Santa Barbara. For helpful comments, I would like to thank Sarah Anderson, Robert Deacon, Olivier Deschênes, Charles Kolstad, and Doug Steigerwald; the Econometrics Lab Group at the University of California, Santa Barbara; conference participants; and an anonymous referee. Any errors are my own.

[*Journal of Law and Economics*, vol. 53 (August 2010)]

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by the state legislature, but in some cases districts are drawn by independent panels.<sup>1</sup> A common argument against legislative redistricting is that it has been a major cause of the much-documented polarization of the political system over the past several decades.<sup>2</sup> According to this argument, allowing the state legislature to draw election districts leads to “safe” districts for some legislators, which favors incumbents and makes it difficult for seats to change parties. These “safe” districts allow legislators to shift to more extreme ideological positions in their roll call votes, which has led to increased polarization in Congress and state legislatures. The state legislature in California offers a quasi-natural experiment with which to test this hypothesis; in the 1970s and 1990s, district lines were drawn by independent panels of judges, whereas in the 1960s, 1980s, and 2000s, redistricting was done legislatively. In this paper, I exploit this fact by using roll call voting data, election returns, and voter registration in California to test the polarization hypothesis.

After every federal census, the California constitution requires that election districts be drawn by committees in the state senate and assembly, to reflect changes in population. This has been a contentious issue in California for years, and several attempts have been made to change redistricting laws.<sup>3</sup> Since the passage of Proposition 11 in November 2008, redistrictings are conducted by a 14-member, bipartisan commission of citizens. Interestingly, two of the past four redistricting plans in California were drawn by retired judges, so-called special masters, because in those decades the state legislature and governor reached an impasse on how the lines should be redrawn. This allows a unique opportunity to estimate the effect of different types of redistricting on legislative behavior.

The effects of redistricting are difficult to quantify, and the end result depends on the goals of those drawing the lines as well as the composition and distribution of voters in a state (Cain 1985). Political scientists have researched the effects of legislative redistricting, and much research focuses on the number of seats changing parties and the overall balance of power (either in the state or in the U.S. House of Representatives).<sup>4</sup> Partisan redistricting plans are generally associated with net gains in seats, but as Cain and Campagna (1987) discuss, other goals may be just as important to those drawing the lines (hereafter, the gerrymanderer). Retaining seats for influential legislators, displacing incumbents

<sup>1</sup> There currently are 20 states in which panels draw district lines (Garrett 2005). For a review of the history of redistricting and the major laws, see Mann and Cain (2005). The process in California is discussed in more detail in Section 2.

<sup>2</sup> Clearly, redistricting is not the only factor driving polarization. For a recent discussion of some of the theories related to trends in polarization in the House of Representatives, see Roberts and Smith (2003). The relationship between political polarization and economic inequality has been discussed at length in McCarty, Poole, and Rosenthal (2006). Peltzman (1985) suggests that as constituencies converge economically, Congress becomes more polarized.

<sup>3</sup> For example, a common sentiment about the system in California was summed up as follows: “California’s districts are so shamelessly gerrymandered that hardly any races are competitive. . . . The result is a political system in which moderation is punished, both by voters and by other politicians” (*Economist* 2007, pp. 30–32).

<sup>4</sup> In addition, several authors focus on racial gerrymandering (see, for example, Tate 2003).

from opposing parties, and maximizing the number of “safe” districts for one’s own party can all be goals for the gerrymanderer.

When districts are drawn legislatively, the majority party can aim for political goals. However, legal constraints on contiguity, compactness, and dilution of minority group influences place limits on the types of districts that can be drawn. Friedman and Holden (2008) discuss optimal strategies for gerrymandering from a microeconomic perspective, and their work calls into question conventional beliefs about redistricting. They show that the practice of packing the minority party into few concentrated districts and creating narrow majorities (“cracking”) for one’s own party is not optimal in the face of uncertainty and other fairly general conditions. Consistent with their model, and important for this study, a risk-averse gerrymanderer in the state legislature may instead opt for some seats that are considered safe for his own party as well as for the opposition.

Because redistricting affects election outcomes, it has an indirect effect on legislative outcomes at the state and federal levels. Moreover, some research has argued that districting matters for fiscal performance (Crain 1999) and the amount of government activity (Baqir 2002). Finally, Gerber and Lewis (2004) show that, although legislators often deviate from their district’s median voter, legislators in homogeneous districts are more constrained by the median voter’s preferences than are legislators in heterogeneous districts. On the basis of this finding, one could argue that the type of redistricting should matter for legislative polarization.

There has been some work examining the link between redistricting and polarization. Friedman and Holden (2009) argue that the high rate of reelection of incumbents in the U.S. Congress cannot be attributed to redistricting. They find that, all else equal, the reelection rate has decreased over time, which they attribute to increased legal scrutiny. In addition, two recent papers explicitly test for links between redistricting and legislative polarization. McCarty, Poole, and Rosenthal (2007) argue that much polarization in the U.S. Congress cannot be attributed to redistricting because Democrats and Republicans can both represent the same district between redistrictings in very different ways. This finding cannot be explained by changes in district composition. They conduct simulations of “neutral” districtings that do not yield polarization that is significantly different from what has actually been observed. McCarty, Poole, and Rosenthal (2006) argue that congressional polarization is largely due to increasing income inequality. Masket, Winburn, and Wright (2006) argue that the effect of redistricting on polarization is modest by using a cross section of state legislatures with different redistricting methods. They find that legislatures in states with partisan redistricting schemes are roughly as polarized as those in states with more neutral redistricting methods. However, because their analysis is largely cross-sectional and they do not control for state fixed effects, their results may be biased. They also argue that state and federal legislatures have polarized between redistrictings as well as during redistricting, a finding that is consistent with the current study.

In this paper, I exploit the fact that the redistricting process in California has alternated between legislatively drawn and panel-drawn districts for several decades. I first show some anecdotal evidence that elections are, on average, less competitive under legislatively drawn districts. Then, using panel data from 1968 to 2006, I estimate the relationship between who draws election districts and polarization in the state legislature. I, too, find that there has been a time trend in polarization, much of which cannot be attributed to redistricting. However, I find evidence that legislative behavior changes after each redistricting, and these changes are consistent with the polarization argument. Specifically, drawing districts legislatively (as opposed to having them drawn by panels of retired judges) is associated with increased polarization in the state legislature.

The paper is organized as follows. Section 2 reviews the process of redistricting in California. Section 3 describes the data and provides some preliminary evidence regarding the competitiveness of seats between districts. Section 4 presents empirical evidence and tests implications of the polarization hypothesis. Section 5 provides a discussion and concludes.

## 2. Redistricting in California

Following *Baker v. Carr* (1962) and *Reynolds v. Sims* (1964), California was forced to redraw district lines for an election in 1966, to equate (approximately) district populations to adhere to the “one person, one vote” ruling. Before this ruling, districts in California had populations that were anything but equal; urban districts were heavily populated, whereas some rural districts, which were given equal representation in the state legislature and Congress, had very small populations.<sup>5</sup> California’s constitution calls on the state assembly and senate to draw district lines, so following the ruling districts needed to be adjusted legislatively to comply with the “one person, one vote” standard. The redistricting of 1966 has been historically referred to as a bipartisan gerrymander.<sup>6</sup> A few years later, after the 1970 census, the Democratic majority and Republican governor Ronald Reagan reached an impasse regarding the proposed redistricting plan, and the task of drawing district lines was given to the special masters, three retired judges appointed by the California State Supreme Court. The new districts were accepted in late 1973 and were in place for the elections of 1974.

The story in the following decade was remarkably different. By the end of 1981, with a Democratic majority and governor, the Democrats produced election districts that were in place for the elections of 1982. To many observers, this redistricting heavily favored Democratic incumbents. A decade later, the 1991 redistricting plan was drawn by special masters after another dispute over the

<sup>5</sup> Los Angeles County, with a population of approximately 6 million people, had one representative in the state senate, whereas some rural counties had equal representation for as few as 14,000 people.

<sup>6</sup> I am not aware of a formal definition of “bipartisan gerrymander,” but according to Cain (1985), the goal of a bipartisan gerrymander is to protect incumbents of both parties, whereas a partisan gerrymander seeks to provide advantage to one party.

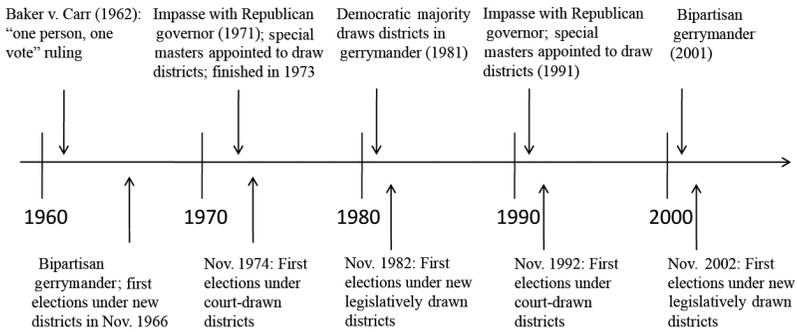


Figure 1. Timeline of redistricting in California

proposed redistricting plan, and in 2001 the district lines were drawn in a high-profile bipartisan gerrymander.<sup>7</sup> In the 2002 election, not one legislative seat in California changed party hands; this fact is often cited as an argument against the redistricting system in California. Figure 1 provides a timeline of the most important events in California redistricting in recent history. It should be emphasized that the various legislative redistrictings that occurred in this period were conducted under a Democratic majority; the effects of a gerrymander under divided government may be different.

In this paper, I rely on the alternation of redistricting types to identify the relationship between redistricting type and polarization in the legislature. Districts were drawn by panels of special masters in the 1970s and 1990s because in both cases the legislature (and its Democratic majority) and the Republican governor came to an impasse about how districts should be drawn. Therefore, there may be concern that the effects of panel-drawn districts on legislative behavior are correlated with the party of the sitting governor. Although Republican governors were in power when districts were drawn by panels, the relationship between the type of districts in place between districtings and the governor's party is not systematic. A Democratic governor was in power when the panel-drawn districts of the 1970s were in effect, and a Republican governor was in power for most of the 1990s. In fact, since 1967, there has been a Republican governor in office in California in all years except 1975–82 (when Jerry Brown, a Democrat, was governor) and 1999–2003 (when Gray Davis, a Democrat, was governor). Pat Brown, a Democrat, was in office during the legislative redistricting that occurred before the elections in 1966, but Ronald Reagan took his oath of office in January 1967.

When districts are drawn legislatively, certain criteria must be met to satisfy legal requirements, which places constraints on the manipulations that can be

<sup>7</sup> Democrats had a clear majority in the 2001 legislative session, but concessions were made in an agreement with Republicans to maintain the status quo balance of power.

made to district maps. A thorough discussion of these constraints is beyond the scope of this paper, but the main guidelines include population equality across districts, contiguity, and geographical compactness of districts. Redistricting plans that do not meet these specifications, or those that disproportionately disadvantage minority groups, are subject to court challenges by opponents. Still, there remains much leeway in the gerrymanderer's ability to draw district maps, and research has been devoted to the optimal strategy (Sherstyuk 1998; Friedman and Holden 2008).

The special masters charged with drawing district lines in the 1970s and 1990s used criteria determined by the courts. The objectives of special masters are not partisan in nature; instead, a set of guidelines was developed to produce maps that adhere to a set of ideals determined by the courts in *Legislature v. Reinecke* (10 Cal. 3d 396 [1973]). The general guidelines include avoiding the dilution of minority influence; maintaining population equality within 1 percent of the ideal population, contiguity, geographical integrity, and county and city integrity; nesting (combining two assembly districts to create each state senate district); and maintaining "communities of interest."

The objectives of legislators and courts when creating district maps are strikingly different. The constraints that legislators face when drawing districts are not trivial, but influential legislators can exercise considerable choice in determining the composition of districts. In a sense, the panel-drawn districts of the 1970s and 1990s serve as a control group to test the effect of legislatively drawn districts on polarization.

In theory, the polarization hypothesis could be consistent with the optimal gerrymandering model in Friedman and Holden (2008). Suppose that the gerrymanderers (the Democratic leadership) in the state legislature during the 1960s, 1980s, or 2000s were risk averse. Depending on the precision of the Democratic leadership's beliefs about the distribution of voters, they may wish to secure some safe seats for their own party, while packing some districts with constituents of the opposition. If Democratic legislators respond to more liberal districts by voting for more liberal issues, legislative redistricting could lead to increased polarization. On the other hand, in the case of panel-drawn districts, incumbent legislators must run for reelection in districts with constituencies determined outside their control, and once in office, the composition of districts, on average, may be less favorable to members of both parties. This unique alternation between panel-drawn and legislatively drawn districts in California allows me to test for differences in behavior after new district lines are drawn.

### 3. Data Description and Preliminary Evidence

#### 3.1. Interest Group Scores

To test for changes in polarization due to redistricting, I first need to measure legislative behavior. I use interest group scores from the California Federation

of Labor (CFL) (1968–2006) and the California League of Conservation Voters (CLCV) (1974–2006) for both chambers.<sup>8</sup> I define polarization as the distance between the average Democrat's and Republican's roll call voting scores.<sup>9</sup> These interest groups rate members of California's state senate and assembly<sup>10</sup> on the basis of their environmental roll call voting record for the previous year. The CFL scores are based on a variety of liberal issues, including (but not limited to) labor, insurance, health, appropriations, and human services. A CFL score of 100 corresponds to a legislator voting pro-labor on every vote for which that legislator is present. Similarly, a legislator's CLCV score is simply the percentage of the time that he or she votes pro-conservation in the roll call votes selected by CLCV for that year. These scores have been published since 1974, and I obtained them directly from CLCV.<sup>11</sup> I restrict the samples to years in which scores are based on at least 10 votes, although this does not substantially change my results. Figure 2 plots the average CFL and CLCV scores for each party over time; vertical lines denote changes in election districts.<sup>12</sup> The graph shows a trend in which Democrats, on average, take more liberal stances under legislatively drawn districts than under panel-drawn districts. Examining the difference between Democrats and Republicans over time, polarization on labor issues decreased in the 1970s, increased in the 1980s, decreased again in the early 1990s, and leveled off near 90 in the 2000s. The polarization on environmental issues shows a similar pattern. The figure also underscores the fact that there are time trends present, particularly for Republicans, in which scores over time tend increasingly to the party's extreme.

For descriptive purposes, it is useful to examine average scores for each party,

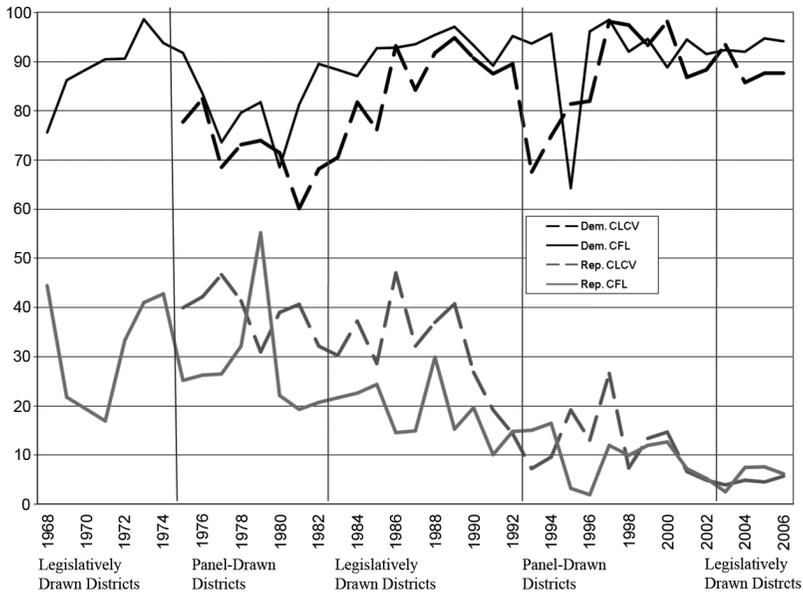
<sup>8</sup> To my knowledge, these are the only two scores available at the level of the state legislature for this period. California is unique in having a long history of interest group scores available, which makes it difficult to compare these results to redistrictings in other state legislatures over this period.

<sup>9</sup> An alternative approach that could be used with interest group scores would be to define polarization as the amount of common space, or overlap, between Democrats and Republicans. Because of the time trend in polarization, there are very few such California legislators in the past 2 decades, which suggests that this measure is not useful in this case.

<sup>10</sup> There are 40 state senators and 80 assembly members in any given year. Senate terms are 4 years, with half of the legislators being up for reelection every 2 years. Assembly terms are 2 years.

<sup>11</sup> Interest group scores are often adjusted using the procedure of Groseclose, Levitt, and Snyder (1999). This adjustment is made because in each year and chamber of the legislature, the set of roll call votes, on which scores are based, is different. I choose to use nominal scores because the adjustment procedure assumes that any movement from a legislator's ideology is idiosyncratic and unrelated to districts—that is, the adjusted scores would not be valid for my purposes because the adjustment assumes away the behavior for which I am testing. Furthermore, because I am using California League of Conservation Voters scores as the dependent variable in my regressions, any measurement error should not bias my results. An additional problem with these scores is that they are bound between 0 and 100. As a robustness check, I also estimate all regressions using a Tobit estimator and symmetrically censored least squares (Powell 1986); the results are generally robust across specifications.

<sup>12</sup> Figure 2 includes years in which the number of votes is relatively small and, therefore, measurement is noisy. For example, the large decrease in Democratic California Federation of Labor scores in 1995 was likely partially a result of the small number of votes ( $n = 6$ ) underlying the scores. The regression results presented here do not include these years, although the results are generally robust to their inclusion.



**Figure 2.** California Federation of Labor (CLF) and California League of Conservation Voters (CLCV) scores over time.

by districting period. To obtain average roll call voting scores by decade and party, I estimate the regression equation

$$\text{Score}_{it} = \alpha_0 + \alpha_1 \text{Dem}_i + \phi' \mathbf{P} + \zeta' \mathbf{P} \times \text{Dem}_i + \varepsilon_{it}, \tag{1}$$

where  $\text{Score}_{it}$  is legislator  $i$ 's roll call voting score (either CFL or CLCV) in year  $t$ ,  $\text{Dem}_i$  is a dummy if legislator  $i$  is a Democrat, and  $\mathbf{P}$  is a vector of period-specific dummy variables for the redistrictings of the 1960s, 1970s, 1980s, and 1990s. The results are shown in Table 1. The results in columns 1 and 4 show the time trend in polarization, with some evidence that Democrats became more moderate with respect to their labor-related voting records in the 1970s, compared with the 1960s and 1980s, when districts were legislatively drawn. The difference in behavior in later decades is not significantly different, a finding that reflects the fact that average scores were very close to the censoring points 0 and 100.

To obtain period averages for each party, controlling for legislator-specific characteristics, I simply modify equation (1) to include legislator fixed effects. If legislators took more polarizing positions as a result of gerrymandered districts, it would be evidence in support of the polarization hypothesis.<sup>13</sup> Because party

<sup>13</sup> Similarly, if legislators move to more moderate positions when changing from legislatively drawn to panel-drawn districts, this would be evidence in support of the polarization hypothesis.

Table 1  
Average Legislative Behavior, by District Type and Party

	CFL Score			CLCV Score		
	(1)	(2)	(3)	(4)	(5)	(6)
Democrat	87.39** (1.05)			83.87** (1.82)		
Legis1960	27.71** (2.53)	13.81** (2.84)				
Panel1970	22.03** (1.87)	7.18* (2.52)		34.04** (2.06)	20.61** (2.34)	
Legis1980	12.70** (1.81)	5.08* (2.28)		26.89** (2.42)	18.89** (2.10)	
Panel1990	4.26** (.84)	2.35 (1.80)		7.82** (1.59)	4.40* (1.69)	
Legis1960 × Democrat	-31.55** (2.88)		7.31** (1.62)			
Panel1970 × Democrat	-34.02** (2.40)		-2.95* (1.46)	-50.60** (2.99)		-.19 (1.69)
Legis1980 × Democrat	-13.15** (2.15)		6.07** (1.34)	-29.72** (3.07)		11.46** (1.54)
Panel1990 × Democrat	-4.76** (1.37)		1.98* (1.04)	-9.45** (2.36)		2.01 (1.21)
Constant	5.93** (.45)	13.56** (1.85)	87.30** (1.07)	4.76** (.96)	11.43** (1.64)	78.83** (1.21)
Legislator fixed effects	No	Yes	Yes	No	Yes	Yes
Clusters	557	250	307	487	213	274
Observations	4,027	1,609	2,418	3,708	1,457	2,251

**Note.** California Federation of Labor (CFL) scores range from 0 to 100 and reflect the percentage of the time that a legislator votes pro-labor. California League of Conservation Voters (CLCV) scores reflect the percentage of the time that a legislator votes pro-conservation in the roll call votes selected by CLCV for that year. The regressions in columns 1 and 4 were run using pooled ordinary least squares estimates with standard errors clustered by legislator. Standard errors are shown in parentheses.

+ Significant at 10%.

\* Significant at 5%.

\*\* Significant at 1%.

affiliation is time invariant, I run fixed effects regressions separately for each party and interest group score. The results are shown in columns 2, 3, 5, and 6 of Table 1.

Holding legislator-specific characteristics constant, the average Democrat takes more extreme positions in both the CLCV and CFL regressions under the legislatively drawn districts than under the panel-drawn districts. The difference between Democrats' behavior in the 1990s and 2000s is not significant at the 5 percent level using either measure. This is not particularly surprising considering that the median CLCV and CFL scores for Democrats in 2000 were near 100, the censoring point. Republicans, on the other hand, show a constant tendency toward more conservative positions, even after including legislator fixed effects. This trend persists using both the CLCV and the CFL scores.

To further disaggregate the roll call score statistics, in Table 2 I present 3-year average scores (by party) for the years before and after each redistricting. As

Table 2  
Average Polarization before and after Redistricting

	CFL Score			CLCV Score		
	Democrat	Republican	Polarization	Democrat	Republican	Polarization
Pre-1970s districts	94.55** (1.00)	39.28** (4.09)	55.27** (4.21)			
Post-1970s districts	82.80** (1.29)	25.99** (2.97)	56.81** (3.24)	76.05** (1.43)	42.86** (2.66)	33.19** (3.02)
Pre-1980s districts	77.21** (1.32)	31.66** (1.69)	45.55** (2.15)	68.58** (1.94)	37.07** (2.12)	31.50** (2.88)
Post-1980s districts	90.88** (.88)	20.54** (1.90)	70.34** (2.10)	83.68** (1.15)	37.55** (2.30)	46.13** (2.57)
Pre-1990s districts	93.17** (.84)	15.10** (1.75)	78.07** (1.94)	90.97** (1.04)	29.25** (2.75)	61.73** (2.94)
Post-1990s districts	90.74** (1.29)	13.85** (1.82)	76.90** (2.23)	74.20** (2.18)	12.43** (1.14)	61.77** (2.46)
Pre-2000s districts	92.68** (.83)	10.67** (1.13)	82.01** (1.40)	92.67** (1.31)	11.66** (2.59)	81.01** (2.91)
Post-2000s districts	93.05** (1.01)	5.85** (.49)	87.20** (1.12)	88.98** (1.53)	4.43** (1.08)	84.55** (1.87)
<i>F</i> -statistics:						
1970s (Panel)	$F(1, 507) = .20$					
1980s (Legislative)	109.70			$F(1, 513) = 23.31$		
1990s (Panel)	.24			.00		
2000s (Legislative)	11.62			1.66		

**Note.** California Federation of Labor (CFL) scores range from 0 to 100 and reflect the percentage of the time that a legislator votes pro-labor. California League of Conservation Voters (CLCV) scores reflect the percentage of the time that a legislator votes pro-conservation in the roll call votes selected by CLCV for that year. In the CLCV regressions, there is only 1 year of observations for the pre-1970s districts. Coefficients are 3-year average scores, and they were obtained from a regression of CFL or CLCV scores on a set of dummy variables for 3-year periods immediately before and after redistricting (for example, pre-1980s districts = 1 for years 1980, 1981, and 1982, because the 1980s redistricting took effect in 1983), a Democrat dummy, and interactions of periods and the Democrat dummy. Standard errors are in parentheses and are clustered by legislator. *F*-tests were conducted for changes in polarization before and after each redistricting.

\*\* Significant at 1%.

measured by these roll call scores, Democratic legislators have become generally more liberal and Republicans more conservative, with some important fluctuations. The question remains as to whether these changes in polarization are correlated with redistricting type. As some preliminary evidence, Democrats' scores, as shown in Table 2, reveal a trend in which they became more liberal in legislatively drawn districts and more moderate in panel-drawn districts. Specifically, being in a panel-drawn district in the 1970s is associated with a decrease of more than 11 points in the average Democrat's CFL score. When districts were legislatively drawn in the 1980s, the average Democrat's score became more liberal by nearly 14 points. In the 1990s, average scores again decreased slightly by approximately 3 points. The CLCV scores for Democrats show a similar pattern, increasing significantly after redistricting in the 1980s and decreasing again by approximately 17 points after redistricting in the 1990s.

Important for this study are the short-run changes in polarization induced by redistricting. The difference between the average Democrats and the average

Republicans shows a striking pattern in which polarization increases significantly when districts are legislatively drawn and slows (or even decreases) when districts are drawn by panels. When polarization levels before and after redistricting are compared, the difference is significant when panel-drawn districts become legislatively drawn. It is also clear that there is a time trend present in the data, which suggests that forces other than redistricting are driving polarization. In Section 4, I use more sophisticated econometric techniques to test for a relationship between the type of redistricting and legislative polarization, controlling for these time trends.

### 3.2. District Competitiveness

As a proxy for the competitiveness of districts, I use district-level margins of victory from elections from 1968 to 2006. The data are from election returns for state senate and assembly elections from biennial publications of *Statement of Vote* from the Secretary of State in election years;<sup>14</sup> the data for 1968–88 are from Berry and Carsey (2004). In Section 4.1 I also use voter registration to capture district constituency. The registration numbers are from October or November and are the last measure of registration available from each year prior to the general elections immediately before and after new districts take effect.

The primary focus of this paper is polarization, and a full model of election competitiveness is beyond the scope of this study.<sup>15</sup> However, critical to the polarization hypothesis is the argument that legislatively drawn districts are less competitive (relative to panel-drawn districts), which allows legislators to take more extreme positions in their roll call votes. As shown in Table 3, there is evidence that the margins of victory in legislatively drawn districts have been much larger than those in panel-drawn districts in the California state legislature. The pattern revealed in Table 3 suggests that elections under panel-drawn districts are more competitive, on average, for members of both parties. For Democrats, elections under panel-drawn districts have, on average, smaller margins of victory. For Republicans, the change from the legislatively drawn districts of the 1960s to the panel-drawn districts of the 1970s decreases the average margin of victory by approximately 6 percentage points. A change back to legislatively drawn districts in the 1980s leads to an increase of approximately 11 percentage points in the average margin of victory for Republicans, and the pattern repeats itself moving forward in time.<sup>16</sup>

<sup>14</sup> See California Secretary of State, Statewide Election Results ([http://www.sos.ca.gov/elections/elections\\_elections.htm](http://www.sos.ca.gov/elections/elections_elections.htm)).

<sup>15</sup> A more thorough analysis of the relationship between redistricting and election outcomes is beyond the scope of this paper. See Friedman and Holden (2009) for a more thorough examination of incumbents' reelection rates.

<sup>16</sup> The overall margin of victory is statistically different (at the 5 percent level) from period to period, with the exception of a comparison of the 1960s and the 1970s. I test the hypothesis by collapsing the data by year and estimating the following regression with heteroskedastic- and autocorrelation-robust standard errors:  $\text{AvgMargin}_i = \alpha + \beta_1 \text{Panel1970} + \beta_2 \text{Legis1980} + \beta_3 \text{Panel1990} + \beta_4 \text{Legis2000} + u_i$ . I then test for differences in the margin of victory across periods. Running an analogous regression

Table 3  
Average Margins of Victory and Safe Seats, by Party and Period

Period	Redistricting Type	Democrats			Republicans		
		Margin	Elected	Safe Seats	Margin	Elected	Safe Seats
1968–72	Legislative	32.91	53.67	26.67	30.39	45.33	20.33
		(20.01)	(5.13)	(10.41)	(18.06)	(4.51)	(7.51)
1974–80	Panel	35.71	65	32.25	24.43	34	9
		(23.11)	(6.16)	(4.57)	(18.91)	(5.35)	(8.21)
1982–90	Legislative	39.05	58.8	32.8	35.54	39.8	20.6
		(24.60)	(3.11)	(5.40)	(21.62)	(4.09)	(10.88)
1992–2000	Panel	37.07	56.4	27.6	24.77	42.4	9.6
		(23.50)	(5.46)	(6.99)	(18.43)	(4.34)	(4.83)
2002–6	Legislative	43.81	61	35.67	28.40	39	11.33
		(24.90)	(1.73)	(1.53)	(14.45)	(1.73)	(4.16)

**Note.** Standard deviations are in parentheses. The average margin of victory is the difference (in percentage points) between the winner in an election and the runner-up; if the election was uncontested, the margin equals 100. Values for “elected” show the average number of Democrats and Republicans elected in those years. A safe seat is defined as having a margin of victory in a general election greater than the average margin of victory (approximately 34.2 percent) in the overall sample. Periods are defined according to election districts. Every 2 years, elections are held for 80 assembly and 20 state senate seats.

On average, the overall margin of victory over the entire period is approximately 34.2 percent; a seat can be defined as safe if the margin of victory in an election is greater than this level. Table 3 also presents the average number of safe seats and the average number of Democrats and Republicans elected in the state legislature in each period. The overall number of safe election seats in the legislature from 1968 to 1972 was, on average, approximately 47, compared with 42 in the 1970s, 54 in the 1980s, 38 in the 1990s, and 47 in the 2000s.<sup>17</sup> Furthermore, these safe seats appear to have favored both parties. In the districts of the 1960s, approximately 50 percent of Democratic seats and 45 percent of Republican seats were considered safe according to this definition. In the panel-drawn districts of the 1970s, approximately 50 percent of Democratic seats remained safe, whereas the percentage of Republican seats that were safe decreased to 26 percent. In the gerrymandered districts of the 1980s, approximately 56 percent of Democratic and 52 percent of Republican seats were considered safe. In the 1990s, the corresponding percentages for Democrats and Republicans were 49 percent and 23 percent, and for the 2000s, the figures increased to 58 percent and 29 percent, respectively. Taken together, by these measures panel-

for each party separately, I find that the difference across districts within each party is significant in half of the pairwise tests.

<sup>17</sup> I test the hypothesis by collapsing the data by year and estimating the following regression with heteroskedastic- and autocorrelation-robust standard errors:  $\text{SafeSeats}_t = \alpha + \beta_1 \text{Panel1970} + \beta_2 \text{Legis1980} + \beta_3 \text{Panel1990} + \beta_4 \text{Legis2000} + u_t$ . The difference in the overall number of safe seats is significant at the 5 percent level when comparing the 1990s with the 2000s and at the 10 percent level when comparing the 1960s with the 1970s and the 1980s with the 1990s. However, the difference between the number of safe seats in the 1970s and 1980s is not statistically significant using this test ( $p = .106$ ).

drawn districts have been more competitive than legislatively drawn districts. In Section 4 I examine the effect of district competitiveness on voting behavior and test for differences in polarization induced by redistricting.

#### 4. Empirical Tests of the Polarization Hypothesis

##### 4.1. Voting Patterns and District Competitiveness

My goal is to test for a relationship between how legislative districts are drawn and polarization in the California state legislature. The underlying argument generally involves two steps: (1) legislatively drawn districts favor incumbents and create safe seats, and (2) “safe” legislators are then free to vote at their parties’ extreme, which is the root of polarization in the legislature.

The results presented in Table 3 suggest that legislative redistricting is associated with safer seats, on average, than is panel redistricting. What remains to be shown, however, is that legislators respond to changes in their constituencies by taking more polarizing stances when their districts are not competitive. To show this, I use voter registration rather than election outcomes because of concerns about endogeneity.<sup>18</sup> Let  $D_{it}$  be the number of registered Democrats and  $R_{it}$  be the number of registered Republicans in legislator  $i$ ’s district in year  $t$ . Define the adjusted Democratic registration as  $\text{AdjDemReg}_{it} = D_{it} / (D_{it} + R_{it})$ . I then estimate the following regression:

$$\text{Score}_{it} = \delta_0 + \delta_1 \text{AdjDemReg}_{i,t-1} + \delta_2 \text{Dem}_i + \delta_3 \text{Dem}_i \times \text{AdjDemReg}_{i,t-1} + \varepsilon_{it}, \quad (2)$$

where  $\text{Score}_{it}$  is legislator  $i$ ’s roll call voting score (either CFL or CLCV) in year  $t$ ,  $\text{Dem}_i$  is a dummy if legislator  $i$  is a Democrat, and  $\text{AdjDemReg}_{i,t-1}$  is the adjusted Democratic voter registration for legislator  $i$ ’s district in the election the fall before year  $t$ . This equation is also modified to include year fixed effects in some specifications. The results are shown in Table 4.

The results suggest that making a district more liberal (in terms of voter registration) leads to a more liberal voting record on labor-related issues for both parties, but Republicans are, on average, more responsive than Democrats. The coefficient on  $\text{AdjDemReg}$ ,  $\delta_1$ , is positive and significant in seven of the eight specifications. Increasing the level of adjusted Democratic registration in a Republican’s district leads to an increase of .83–1.15 points in the Republican’s CFL score. The coefficient on the interaction term  $\text{Dem} \times \text{AdjDemReg}$ ,  $\delta_3$ , is negative, and the point estimates are all smaller in magnitude. To test for the effect of an increase of 1 percentage point in adjusted Democratic registration on the average scores of Democratic legislators, the marginal effect is given by the linear combination  $\delta_1 + \delta_3$ . Across the estimates, increasing the level of ad-

<sup>18</sup> Using margins of victory yields similar results, but a legislator’s margin of victory in any election could be based on his or her past voting behavior. I use voter registration for each district in the years 1972, 1974, 1980, 1982, 1990, 1992, 2000, and 2002. These data contain the registration numbers for the last election under old districts and the first election after each redistricting in the data set.

Table 4  
Effect of Constituency on Roll Call Voting Behavior

	All District Types				Panel Drawn		Legislatively Drawn	
	CFL Score (1)	CLCV Score (2)	CFL Score (3)	CLCV Score (4)	CFL Score (5)	CLCV Score (6)	CFL Score (7)	CLCV Score (8)
Democrat	100.90** (8.81)	95.33** (10.11)	97.47** (8.19)	94.63** (10.46)	83.75** (9.70)	111.60** (12.77)	119.01** (16.37)	77.90** (12.87)
Adjusted Democratic Registration	.83** (.17)	.84** (.16)	.73** (.16)	.88** (.19)	.55** (.17)	1.30** (.19)	1.15** (.35)	.34 (.21)
Democrat × Adjusted Democratic Registration	-.61** (.18)	-.80** (.19)	-.53** (.17)	-.80** (.20)	-.28 (.18)	-1.25** (.23)	-.95** (.36)	-.27 (.24)
Constant	-24.26** (8.06)	-20.19* (7.61)	-22.05** (7.52)	-17.43 <sup>+</sup> (9.28)	-10.74 (8.25)	-41.80** (9.05)	-38.45* (15.76)	1.44 (9.47)
Year fixed effects	No	No	Yes	Yes	No	No	No	No
Observations	802	814	802	814	469	469	333	345

**Note.** California Federation of Labor (CFL) scores range from 0 to 100 and reflect the percentage of the time that a legislator votes pro-labor. California League of Conservation Voters (CLCV) scores reflect the percentage of the time that a legislator votes pro-conservation in the roll call votes selected by CLCV for that year. Adjusted Democratic Registration is defined as  $D / (D + R) \times 100$ , where  $D$  and  $R$  are the number of registered Democrats and Republicans in a district, respectively. Robust standard errors are in parentheses.

<sup>+</sup> Significant at 10%.

\* Significant at 5% .

\*\* Significant at 1%.

justed Democratic registration by 1 leads to an increase of approximately .25 point in CFL scores for Democrats. This is positive in all specifications but significant only in the CFL regressions, which suggests that Democrats are more responsive to changes in constituency with regard to labor-related legislation than environmental legislation.

Strikingly, the results indicate that as seats become safer, Republicans take more conservative positions and Democrats take more liberal voting positions. Similarly, as districts become more competitive (again in terms of voter registration), legislators tend to take more moderate positions. This finding, combined with evidence in Table 3, suggests that panel-drawn districts (relative to legislatively drawn districts) are more competitive and lead to more moderate voting behavior by members of both parties. In the remainder of this paper, I take a reduced-form approach, focusing on the effect of the type of redistricting on polarization in the legislature.<sup>19</sup> The redistricting regime itself can be viewed as the policy variable because policy makers can change the laws governing redistricting but do not directly control the distribution of voters in the state. As discussed later, the results presented in this section are robust to the inclusion of additional control variables for partisan control of the legislature, the governor's party, and national trends in legislative polarization.

#### 4.2. Polarization and Redistricting Regimes

By examining the results so far, there is some evidence of polarization levels being correlated with redistricting type, but there clearly is a time trend present in the scores for both Democrats and Republicans. As indicated by other studies (for example, Masket, Winburn, and Wright 2006), some polarization occurs between redistrictings, and this trend is also present in the California state legislature. Because the time trend is clearly important, I control for flexible (quartic) time trends for both parties in the remaining regression equations. Doing so allows me to examine discrete jumps in roll call voting behavior due to changes in district composition. This is essentially a regression discontinuity approach, with all years receiving equal weight. Allowing the discrete change to be different for each redistricting, I estimate the following regression equation:

$$\text{Score}_{it} = \beta_0 + \beta_1 \text{Dem}_i + \lambda' \mathbf{P} + \omega' \mathbf{P} \times \text{Dem}_i + f(t) + g(t) + \varepsilon_{it}, \quad (3)$$

where  $\text{Score}_{it}$  is legislator  $i$ 's CLCV or CFL score in year  $t$ ;  $\mathbf{P}$  is a vector of period-specific dummy variables for the districts of the 1960s, 1970s, 1980s, and 1990s redistrictings;  $f(t)$  is a quartic time trend for Democrats and the associated

<sup>19</sup> To directly test the hypothesis, one could use a two-stage approach, by instrumenting to estimate the impact of redistricting regimes on margins of victory and then the impact of margins of victory on legislative behavior. This would not be because of concerns of endogeneity but instead because the argument is often formed in two stages. I argue that the equivalent of a reduced-form regression is more interesting here because this captures the impact of the policy variable on legislative behavior.

Table 5  
Effect of Redistricting Type on Legislative Behavior: Regression  
Estimates with Quartic Party Time Trends

	CFL Score		CLCV Score	
	(1)	(2)	(3)	(4)
Democrat	54.67** (7.52)	60.68** (9.25)	40.32** (8.95)	28.65** (10.68)
Legis1960	12.64* (5.12)	19.81** (5.81)		
Panel1970	5.17 (4.22)	11.11* (4.87)	7.55+ (4.09)	8.90 (5.61)
Legis1980	2.66 (2.66)	8.13* (3.52)	11.42** (3.49)	11.15* (5.22)
Panel1990	4.68** (1.25)	9.30** (2.35)	3.97* (1.76)	7.73* (3.86)
Legis1960 × Democrat	-10.01 (6.15)	-16.56** (7.69)		
Panel1970 × Democrat	-17.78** (5.15)	-34.28** (6.51)	5.66 (5.39)	11.00 (7.30)
Legis1980 × Democrat	-2.51 (3.47)	-16.43** (5.07)	13.09** (4.89)	20.62** (7.00)
Panel1990 × Democrat	-6.65** (2.04)	-16.28** (3.50)	-3.60 (2.46)	-6.71 (5.00)
Intercept	18.12** (6.02)	10.65 (6.75)	34.61** (7.41)	38.47** (8.65)
Clusters	557		487	
Observations	4,027	4,027	3,708	3,708

**Note.** California Federation of Labor (CFL) scores range from 0 to 100 and reflect the percentage of the time that a legislator votes pro-labor. California League of Conservation Voters (CLCV) scores reflect the percentage of the time that a legislator votes pro-conservation in the roll call votes selected by CLCV for that year. The excluded category is Legis2000. Data in columns 1 and 3 were estimated using pooled ordinary least squares estimates; data in columns 2 and 4 were estimated using a Tobit estimator. Legis1960 and Legis1980 are dummy variables for periods under the districts drawn legislatively in the 1960s and 1980s, respectively. Panel1970 and Panel1990 are dummy variables corresponding to districts drawn by the special masters in the 1970s and 1990s, respectively. Standard errors (in parentheses) are clustered by legislator.

+ Significant at 10%.

\* Significant at 5%.

\*\* Significant at 1%.

coefficients; and  $g(t)$  is a quartic time trend for Republicans and the associated coefficients.<sup>20</sup> These estimates are shown in Tables 5 and 6.

In column 1, the regression in equation (3) was estimated with CFL as the dependent variable. Again, Democrats alternate in their behavior, becoming relatively more liberal under legislatively drawn districts compared with panel-drawn districts. After controlling for time trends, the point estimates for Dem-

<sup>20</sup> The quartic time trend is simply constructed by taking the number of years since the first observation for that interest group score. Specifically, for Democrats,  $f(t) = \rho_1 t + \rho_2 t^2 + \rho_3 t^3 + \rho_4 t^4$ . For the California Federation of Labor regressions,  $t = 1$  corresponds to 1968,  $t = 2$  corresponds to 1969, and so on. For the California League of Conservation Voters regressions,  $t = 1$  corresponds to 1975.

Table 6  
Effect of Redistricting Type on Legislative Behavior: Implied Polarization

	CFL Score		CLCV Score	
	(1)	(2)	(3)	(4)
1960s (Legislative)	44.67** (4.08)	44.12** (4.67)		
1970s (Panel)	36.89** (6.60)	26.40** (7.62)	45.98** (6.89)	39.64** (7.58)
1980s (Legislative)	52.16** (6.72)	44.25** (7.78)	53.41** (7.82)	49.27** (8.25)
1990s (Panel)	48.02** (7.31)	44.40** (8.64)	36.72** (8.36)	21.93** (9.21)
2000s (Legislative)	54.67** (7.52)	60.68** (9.25)	40.32** (8.95)	28.65** (10.68)
Tests of the null hypothesis ( <i>F</i> -statistics):				
1960s = 1970s	3.59 <sup>+</sup>	13.72**		
1970s = 1980s	23.33**	26.90**	5.28*	7.19**
1980s = 1990s	2.07	.00	17.80**	35.26**
1990s = 2000s	10.66**	21.68***	2.14	1.80

**Note.** California Federation of Labor (CFL) scores range from 0 to 100 and reflect the percentage of the time that a legislator votes pro-labor. California League of Conservation Voters (CLCV) scores reflect the percentage of the time that a legislator votes pro-conservation in the roll call votes selected by CLCV for that year. *F*-tests were conducted for changes in polarization.

<sup>+</sup> Significant at 10%.

\* Significant at 5%.

\*\* Significant at 1%.

ocrats in the 1960s, 1970s, 1980s, 1990s, and 2000s are given by 75.4, 60.2, 72.9, 70.8, and 72.8, respectively. Republicans again become steadily more conservative, reversing the pattern only slightly during the panel-drawn districts of the 1990s.

Similarly, column 3 of Table 5 shows the ordinary least squares (OLS) estimates of equation (3) with CLCV scores as the dependent variable. The results again show a striking pattern: after controlling for party trends with a quartic time trend, the average Democrat votes more pro-environmentally in legislatively drawn districts and relatively antienvironmentally in panel-drawn districts. For the average Democrat, the difference in behavior from period to period is significant, except when the 1990s and the 2000s are compared. The pattern that emerges for Republicans is similar to that noted in the previous regressions, where it appears that a time trend dominates.

To test for increased polarization during legislatively drawn periods, I simply subtract the expected Republican score in any period from the expected Democratic score and run pairwise tests comparing this difference from decade to decade. In Table 6, changes in polarization are consistent with the polarization hypothesis. Comparing the first panel-drawn districts and the legislatively drawn districts of the 1980s, I find that polarization was significantly higher in the 1980s. In the CFL regression, the increase in polarization relative to the panel-districting case is approximately 15 points, whereas in the CLCV regression,

polarization increases by more than 7 points. Then, comparison of the 1980s and the 1990s reveals that polarization decreased; the estimated decrease in polarization in the CLCV regression is almost 17 points. Finally, polarization increased significantly in the 2000s, when districts were legislatively drawn, although we cannot reject the hypothesis that polarization in the 1990s was the same as that in the 2000s in the CLCV regression.<sup>21</sup>

For both the CLCV and CFL regressions, roughly one-quarter of the total observations lie at the censoring points (0 and 100), with the greatest share in later years in the data. The Tobit model in Table 5 provides a robustness check, and the same general pattern emerges.<sup>22</sup> The difference in decade-to-decade polarization in the CFL-censored regression is significant in three of the four tests. In the censored CLCV regression, the difference between the 1990s and 2000s remains insignificant. In both the OLS and Tobit estimates, the point estimates suggest a pattern in which polarization increases after legislatively drawn redistricting and decreases after panel-drawn redistricting.

The results in Tables 5 and 6 reinforce what was seen by examining the 3-year average interest group scores in Table 2. Polarization in the legislature increases when districts previously drawn by panels are legislatively drawn, and it decreases when those districts are later drawn by panels again. After controlling for time trends in the OLS estimates, I find that the changes in polarization were as high as 17 points between the 1980s and 1990s in the CLCV case and almost 15 points between the 1970s and 1980s in the CFL case. Democrats, who exercised considerable control during the redistrictings, changed behavior significantly depending on who drew district lines, and their behavior largely determined these changes in polarization. The results are rather robust, and although the difference is not significant between decades in every pairwise test, the point estimates suggest that the direction of change is indeed consistent with the claim that legislative redistricting causes increased polarization in the legislature.

## 5. Conclusion

A common claim in the media and by some researchers is that legislative redistricting is a major cause of polarization in the United States, and California has been at the heart of this debate. Because the process of redistricting has

<sup>21</sup> As a robustness check, I generated counterfactual periods to create four periods that overlapped redistricting periods to the midpoints on either side. I then interacted these counterfactual periods with Democrat and Republican dummies and ran regressions analogous to those in Table 5. The results did not yield a systematic pattern, which provides support to the claim that the correlations in Table 5 are indeed capturing discrete jumps in behavior because of new districts.

<sup>22</sup> Tobit models rely critically on the assumptions of normality and homoskedasticity in the underlying latent scores (or ideology), but for moderate departures from these assumptions, the estimates may be reasonable. A table with estimates of marginal effects for the Tobit regression is available from the author. In results not shown here, I also used a symmetrically censored least squares estimator (Powell 1986). The point estimates are similar to ordinary least squares estimates, but the standard errors are large in specifications with a quartic time trend.

alternated between courts and legislatively drawn districts since the 1960s in California, focusing on the state senate and assembly provides a nice quasi experiment to test for a relationship between polarization and redistricting schemes. Importantly, because the redistricting method has alternated every decade in the past 4 decades, the policy switch in this quasi experiment goes both ways and is repeated. Using roll call voting scores from the CFL (1968–2006) and the CLCV (1974–2006), I find support for the claim that the type of redistricting is, in fact, associated with changes in polarization. These findings suggest that legislative redistricting (relative to panel-drawn redistricting) increases polarization in the legislature.

Other researchers have tested the polarization hypothesis, focusing mostly on the U.S. House of Representatives. These tests, which often use only one redistricting period, rely on cross-state comparisons of redistricting methods for identification. Masket, Winburn, and Wright (2006) show that the polarization trend persists between redistrictings. I, too, find a strong time trend that cannot be explained solely by redistricting; this time trend is prevalent for both parties, but I also find discrete changes in behavior induced by the types of redistricting in place. Importantly, the increasing trend in polarization reverses itself when districts formerly drawn legislatively are drawn by panels.

Using data from elections in the California state legislature over time, I show that the average margin of victory for both parties is higher under legislatively drawn districts (relative to panel-drawn districts). That is, elections under panel-drawn districts are more competitive for members of both parties. Then, in Table 4, regression results suggest that legislators in both parties vote differently on environmental and labor issues if their districts are more liberal, in terms of voter registration. This effect is significant and positive for Republicans in most specifications, whereas the effect is significantly positive for Democrats only in the CFL regressions.

Using roll call voting scores in regressions on indicator variables for redistricting type and party, I find evidence that the type of redistricting is correlated with polarization. There is clearly a time trend in polarization in California (and elsewhere in the United States), and determining all of the causes of this trend would be a difficult endeavor indeed. The current study shows, however, that redistricting plans have an impact on polarization. Even after controlling for that trend with a flexible (quartic) time trend for each party, there is evidence that the type of redistricting matters for the degree of polarization. Democrats tend to take more conservative stances on environmental and labor issues when they represent panel-drawn districts, and when districts are legislatively drawn, they take significantly stronger pro-environmental (or pro-labor) stances. The movement of the party, on average, as well as changes in individual legislators' voting patterns, suggests that legislative redistricting allows legislators to take more extreme positions in their roll call votes, which leads to increased polarization. These results are rather robust across specifications. Contrary to findings elsewhere in the literature, it appears that it does matter who draws the lines.

I take a reduced-form approach, and because I am looking at political data over the past 4 decades, there are many possible confounding factors. However, because the policy changes both directions, and because it does so twice, any omitted variables that could be biasing these results would need to coincide with this policy experiment. As discussed earlier, partisan control of the legislature, the governor's party, and national trends may be driving polarization in the state legislature. Tables A1 and A2 present the main regression results controlling for these factors. The results are robust to inclusion of controls for these effects.

This study has policy implications for those interested in redistricting reform. However, it is unclear whether the results generalize to the congressional environment, and the effect of redistricting on polarization for other types of legislation may be different. The effect of polarization on welfare is beyond the scope of this study (for a discussion of socially optimal districting, see Coate and Knight 2007), but further research should be conducted to determine the effect of legislative polarization on legislative outcomes and overall welfare. Previous research has indicated that political elites, such as state-level legislators, tend to take more extreme positions on issues than does the general population (Fiorina and Levendusky 2006). It appears that legislative redistricting serves as a catalyst to enable even more polarizing behavior in the state legislature.

## Appendix

### *Adding Additional Control Variables*

In California, the Democrats have had a clear majority in both chambers for almost all of the years included in this sample. One recent exception was during the Republican party's Contract with America after the midterm elections of 1994. The Republicans gained a majority in the state legislature, but their tenure was short-lived, because the Democrats took back control in the next election. Nevertheless, the extent of partisan control of the state legislature may indeed play a role in polarization, so I control for the percentage of seats held by Democrats in each chamber. Next, the governor's party could influence the type of legislation put forth and, hence, polarization. I attempt to control for these effects by including a dummy variable for years with a Republican governor as well as an interaction term with the Democratic legislator dummy variable. Finally, national trends in polarization could be influencing polarization in the state legislature, so I add controls for the average Americans for Democratic Action score for each legislator's party in that year from the U.S. Senate, which is not subject to redistricting. As shown in Tables A1 and A2, the results are robust to inclusion of these control variables.

### *Additional Data Sources*

Thanks are due to Jody Ginsberg at the California Federation of Labor and to the California League of Conservation Voters for providing archived roll call score booklets. Data on Democratic and Republican district registration were

**Table A1**  
**Effect of Redistricting Type on Legislative Behavior:**  
**Ordinary Least Squares Estimates**

	CFL Score (1)	CLCV Score (2)
Democrat	61.86** (15.79)	33.87* (17.18)
Legis1960	15.26** (5.43)	
Panel1970	4.81 (4.36)	5.89 (4.41)
Legis1980	1.73 (2.94)	9.60** (3.13)
Panel1990	4.40** (1.17)	.86 (1.56)
Legis1960 × Democrat	-10.20 (6.46)	
Panel1970 × Democrat	-10.07 <sup>+</sup> (5.37)	12.64* (5.82)
Legis1980 × Democrat	2.21 (3.69)	19.52** (4.54)
Panel1990 × Democrat	-4.34* (1.88)	2.80 (2.22)
Intercept	3.09 (14.10)	57.73** (13.71)
Clusters	557	487
Observations	4,027	3,708

**Note.** California Federation of Labor (CFL) scores range from 0 to 100 and reflect the percentage of the time that a legislator votes pro-labor. California League of Conservation Voters (CLCV) scores reflect the percentage of the time that a legislator votes pro-conservation in the roll call votes selected by CLCV for that year. Legis1960 and Legis1980 are dummy variables for periods under the districts drawn legislatively in the 1960s and 1980s, respectively. Panel1970 and Panel1990 are dummy variables corresponding to districts drawn by the special masters in the 1970s and 1990s, respectively. The excluded category is Legis2000. All regressions include quartic party time trends for each party, controls for Republican governor (and interaction with Democrat), the percentage of Democratic seats in the chamber (and interaction with Democrat), and average Americans for Democratic Action scores in the U.S. Senate for that legislator's party and year. Standard errors are in parentheses and are clustered by legislator.

- <sup>+</sup> Significant at 10%.
- \* Significant at 5%.
- \*\* Significant at 1%.

gathered from the Institute of Government Studies at the University of California, Berkeley, and the California Secretary of State's *Statement of Vote*. Fact-checking was done using Richard Burnweit's database, FRANK, at the Westmont College library and the Rose Institute. Finally, I used data on district-level election returns and outcomes from Berry and Carsey (2004) and from the California Secretary of State's Web site.<sup>23</sup> These data include the number of votes for individual

<sup>23</sup> See California Secretary of State, Statewide Election Results ([http://www.sos.ca.gov/elections/elections\\_elections.htm](http://www.sos.ca.gov/elections/elections_elections.htm)).

Table A2  
Effect of Redistricting Type on Legislative  
Behavior: Implied Polarization

	CFL Score (1)	CLCV Score (2)
1960s (Legislative)	51.66** (12.42)	
1970s (Panel)	51.78** (14.22)	46.51** (15.09)
1980s (Legislative)	64.06** (15.94)	53.39** (16.86)
1990s (Panel)	57.51** (16.09)	36.67* (17.20)
2000s (Legislative)	61.86** (15.80)	33.87* (17.18)
Tests of the null hypothesis (F-statistics):		
1960s = 1970s	.00	
1970s = 1980s	11.06**	2.85 <sup>+</sup>
1980s = 1990s	4.41*	18.98**
1990s = 2000s	5.33*	1.59

**Note.** California Federation of Labor (CFL) scores range from 0 to 100 and reflect the percentage of the time that a legislator votes pro-labor. California League of Conservation Voters (CLCV) scores reflect the percentage of the time that a legislator votes pro-conservation in the roll call votes selected by CLCV for that year. Standard errors are in parentheses and are clustered by legislator. *F*-tests were conducted for changes in polarization.

<sup>+</sup> Significant at the 10% level.

\* Significant at the 5% level.

\*\* Significant at the 1% level.

candidates and candidate characteristics in each assembly and state senate race since 1968.

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