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## Mapping the Consequences of Electoral Reform

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### Abstract

A number of incremental electoral reforms have not measurably improved government performance in California. In this research note, we simulate and map electoral outcomes under a simple form of proportional representation: 16 five-seat districts for the 80-seat California Assembly. In addition to eliminating the institutional advantage that the largest party receives under the current system, our simulation suggests that PR would diversify the composition of both major parties, and provide limited opportunities for minor parties to effectively compete throughout the state. We demonstrate the usefulness of applying electoral systems theory as a test of claims about the consequences of reform.

**Keywords:** elections, parties, reform, proportional representation, partisanship, polarization

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## Introduction

Californians have been tinkering with their electoral system in hopes of improving the quality of partisan representation for decades. A Citizens Redistricting Commission established through Proposition 11 in 2008, and adoption of “top two” primaries in 2010 are just the latest in a long series of incremental reforms. Proponents argue that they will make elections more competitive, improve representative accountability, and possibly reduce the partisan polarization that now characterizes the California Legislature (Jarvis, 2009; Milligan, 2010).

However, none of these reforms address more fundamental constraints imposed by the single-member districts that we use to elect representatives. When a constituency elects a single representative, the principle of competition must be balanced against the principle of effective representation. Compared to partisan districts that produce lopsided victories, competitive races result in more “wasted” votes: shares of votes not being converted into shares of seats. In the absence of perfectly partisan districts, a disproportionate translation of votes to seats usually results in the largest party being overrepresented, even without gerrymandering (Taagepera and Shugart, 1989).

The major alternative to address this well-known property of First-Past-The-Post (FPTP) systems is proportional representation (PR), which utilizes multimember districts. Using proportional formulas to translate votes into seats yields greater proportionality in the share of seats that parties receive relative to their vote shares. Removing the “winner take all” constraint of single-member districts also allows

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smaller parties to compete and survive, even in the presence of dominant parties, such that PR systems are usually associated with more fragmented, multiparty systems (Taagepera and Shugart, 1989; Taagepera, 2007).

In this research note, we apply electoral systems theory to answer specific questions about how multimember districts would likely function in California: How would representation of the increasingly “blue” coastal and “red” inland regions change under PR? Just how many parties would effectively compete under a specified PR system, and what would these parties look like?

Predicting aggregate electoral results under alternative institutional constraints is difficult because voter incentives change with context, but simulations using existing electoral data can establish baseline expectations about how specific electoral rules function in a given electoral landscape. We conduct a series of simulations using 16 hypothetical California Assembly districts, each containing five seats. In the first analysis section, we hold voter behavior constant using previous election results to estimate how a more permissive electoral system would change the allocation of Democratic and Republican seat shares in the Assembly. In the second, we assess how multimember redistricting would affect strategic incentives for political parties and likely supporters using data on ideological cleavages within our hypothetical multimember districts.

## **Background**

It has long been recognized that *district magnitude*, or the number of seats in an electoral district, is among the most important factors that shape competition between political parties (Duverger, 1972; Rae, 1972). In a single-member district, only one party will win 100% of the representation, with possibly just a plurality of vote share. The more seats there are to win, the higher the probability that multiple parties will win seats. District magnitude can range from one to the total number of seats in a legislative chamber. Comparative empirical studies have consistently demonstrated that the number of significant or “effective” parties is correlated with the average district magnitude of a country’s electoral system (Taagepera and Shugart, 1989; Cox, 1997). At one end of the spectrum, countries that use single-member districts (U.S., Canada, U.K., Australia) tend to sustain two dominant parties, with considerable disproportionality between district-level vote and seat shares. By contrast, in pure PR systems (Israel, Netherlands) four or five parties regularly win a substantial number of seats in legislative assemblies, requiring multiparty governing coalitions. And because all votes counts equally toward seat shares, parties have incentives to provide broad geographic representation (Latner and McGann, 2005).

The Democratic Party in California has dominated the legislature in recent election cycles. In addition to their statewide majority support, Democrats are rewarded by the electoral system. In 2010, Democratic candidates received 57% of statewide Assembly votes statewide, but won approximately 65% of Assembly seats. They regularly receive about four more seats in the State Assembly than vote share alone would predict. In principle, it would be possible to reduce this disproportionality by drawing perfectly partisan districts, but such a cure might be worse than the solution. Partisan polarization may result in part from the overrepresentation of partisan voters and geo-political differences magnified through gerrymandering. The California Legislature is already among the most polarized in the country (Kousser, 2010; Shor, 2010).

Given these conditions, it seems worthwhile to explore alternatives to redistricting and other electoral reforms that retain these basic institutional features. Of course, adopting a new electoral system comes with its own risks. Critics of PR argue that parties may not be held accountable if they can retain power without majority support, and fears of hyper-fragmentation, or a splintering of the party system into multiple factions, should be of genuine concern to a state as diverse as California (Lardeyret, 1991). While we can only speculate as to how electoral reform would impact overall governance, our simulations do provide the best assessment of how fragmented our party system would be under PR, and what that party system would look like ideologically.

### **Research Design**

A transition to greater proportionality in California's electoral system would probably not involve a move straight to multidistrict PR. Hybrid systems like those in Germany or New Zealand are more likely alternatives, because they retain single-member constituencies (Paul and Weinberg, 2009). However, as electoral systems grow more complex, their consequences become more difficult to predict. We simulate the consequences of reforming State Assembly elections with 16 five-member districts using a simple proportional allocation formula.

These sorts of analyses have previously been conducted to estimate the impact of electoral systems on public opinion, party competition, and governability (Ndegwa, 1997; Yuval, 2011). Estimating the impact of even a simple electoral system involves a number of crucial assumptions. The most significant concerns the way that districts are divided. While less relevant than single-member district boundaries, the composition of the population in multimember districts still impacts statewide electoral results. Five-seat districts are chosen because this is the lowest magnitude that yields fairly high proportionality. Previous simulations have

also been conducted with 16 “super districts” in California with similar overall results derived for the two party vote (Fairvote.org, 2004).

Five adjacent Assembly districts are combined to create each of the 16 hypothetical constituencies using 2010 boundaries (the 2001 redistricting plan). As a result, the weird shapes characteristic of SMD are still reflected, though they would probably be smoothed out, or better integrated with county or municipal boundaries, under an actual plan. We attempted to create districts that were as compact as possible, while still representing distinct constituencies of interest. Our 16 districts meet these criteria relatively well, as described below. Results from hypothetical elections using aggregated party vote shares from the 2008 and 2010 Assembly races are then analyzed in the first analysis section to estimate changes in seat shares and geographic representation between the two parties under PR.

Another assumption when using aggregated data for election simulations is that changing boundaries and magnitude will not alter voting patterns. However, altering the rules also changes voter incentives for supporting particular parties. To predict how a specific party system is likely to evolve, it is necessary to get beneath the “mechanical” constraints of district magnitude, and examine potential voter support for multiparty competition. We accomplish this through an analysis of statewide ballot propositions that reveals two distinct ideological dimensions along which parties would likely compete.

California’s regular use of statewide initiatives provides a measure of the ideological landscape that is not just a reflection of existing party competition. This is not an ideal measure, as the initiative qualification process is biased in favor of groups with greater resources, and party and candidate backing influence support for initiatives (Gerber, 1998; Hanjal and Zouch, 2001). In addition, the “winner take all” nature of initiatives masks multimodal intensities of preference that parties might cluster around. Even with these limitations, however, initiative results provide a good measure of the dimensionality of political conflict in California across issues ranging from education, civil rights and abortion, to environmental protection and government contracting.

Data obtained from the Secretary of State website for 77 ballot propositions held between 2000-2008 are aggregated for all cities and unincorporated places (Bowen, 2011). The percentage of “yes” voters was used to estimate underlying dimensions of electoral conflict using factor (principal components) analysis. Tests of the robustness of the ideological dimensions incorporated into the analysis are summarized in an appendix.

This analysis confirms that most electoral conflict in California plays out along two distinct ideological dimensions, which we label Left-Right and Authoritarian-Libertarian. Next, we calculate the strength and direction of the dimensions in each of the 16 hypothetical districts, establishing a baseline of potential support for

challenges to the major parties. Working our way back up through the hypothetical electoral system, we then apply Taagepera's (2007) Seat Product equations to predict the electoral success of parties with varying ideological positions under the constraints of a five-seat PR system. The underlying logic and derivation of Seat Product equations are also summarized in the appendix. Finally, the number of seats for all parties is aggregated to estimate a new statewide "effective" number of parties under proportional representation.

### **From Votes to Seats**

Hypothetical districts are identified by geographic location, running from North to South. The geographically largest "new" districts are northern California (1,2,3,4,5) and Sierra (25,29,30,32,34), with the most densely populated regions near San Francisco and Los Angeles broken into three or four districts each. Coastal and inland constituencies are kept together to reflect their distinct political cultures. Actual and simulated seat allocations from these districts are summarized in Table 1.

Each party's regional strongholds are well reflected in our hypothetical districts. The Democratic Party exclusively represents the six districts that make up the San Francisco Bay Area and the greater Los Angeles basin. Similarly, the only party representing constituents in the Sierra and Orange districts is the GOP. Together, these one-party fiefdoms account for half of the seats in the Assembly. Minority party supporters in these districts currently lack representation, though they makeup anywhere from 10% to 35% of the hypothetical district-level electorates.

Both parties currently hold at least one seat in the remaining eight hypothetical districts, though the results are in many cases far from proportional. In the San Joaquin and Central Coast districts, for example, the Republican Party holds only one seat, despite receiving about 40% of vote share. Overall, however, our 16 hypothetical districts would be far more competitive than the 80 districts they are created from. The average majority party advantage in our hypothetical districts is 18 points, compared to nearly 30 points in actual 2008 and 2010 elections.

Using a proportional formula, seat allocation would differ considerably. Under the formula popularly known as Sainte-Lague (named after the French mathematician) or Webster (after the American statesman who invented it for allocation of seats to the U.S. House) seats are allocated using an electoral quotient ( $Q$ ):

$$Q = v/(2s+1)$$

Table 1: Comparing actual and hypothetical seat allocations in 5-seat Assembly districts

District	Average vote share (D/R)	Actual seat ratio (D/R)	Sainte-Lague ratio (D/R)	Difference (D→R)
1 NorCal	.42/.56	1.5/3.5	2/3	-0.5
2 North Bay/Delta	.64/.32	5/0	3/2	+2
3 San Francisco/East Bay	.83/.17	5/0	4/1	+1
4 South Bay/Penninsula	.71/.27	5/0	4/1	+1
5 San Joaquin	.59/.41	4/1	3/2	+1
6 Sierra	.35/.65	0/5	2/3	-2
7 Central Coast	.60/.38	4/1	3/2	+1
8 Buena Ventura	.56/.42	3/2	3/2	-
9 San Fernando	.74/.25	5/0	4/1	+1
10 Los Angeles	.88/.10	5/0	4/1	+1
11 San Gabriel	.68/.32	5/0	3/2	+2
12 South Coast	.52/.46	3/2	3/2	-
13 Orange	.34/.63	0/5	2/3	-2
14 W Inland Empire	.51/.49	2/3	3/2	-1
15 E Inland Empire	.42/.57	2/3	2/3	-
16 San Diego	.51/.47	3/2	3/2	-
Mean/Totals	.58/.40	52.5/27.5	48/32	+4.5

where  $v$  is the votes received by a party, and  $s$  is the number of seats it has received, initially 0. After each seat is allocated, quotients are recalculated for each party, and the party with the largest quotient is allocated the next seat, until all seats are calculated. Sainte-Lague was chosen out of the numerous proportional formulas because empirically it appears to be the most neutral (no advantage to larger or smaller parties) and thus fair, electoral formula (Taagepera, 2007).

Under these rules, each party captures at least one seat in each of the hypothetical districts. Republicans make gains in all of the Democratic strongholds, winning a total of 10 additional seats in constituencies where they are currently underrepresented. Democrats take two seats each in Sierra and Orange, where they currently hold none. In most circumstances they would also hold two seats in northern California and the western Inland Empire, where Democratic voters are currently underrepresented. Holding voting patterns constant, the Democratic Party would retain a strong majority in the Assembly under proportional representation. However, Republicans would gain four or five seats on average by eliminating the advantage that Democrats receive due to the current electoral system.

In addition to greatly improving the proportionality of results, multimember districts would shift the geographic basis of party representation. Most districts,



even in partisan regions of the state, would have two representatives from each party, with the fifth seat determining the district majority party. It is unlikely that either party would be completely excluded from any region, which now occurs partially as a function of the electoral system.

Of course, opening up competition for multiple seats also creates opportunities for new players. Half a dozen minor parties are now qualified to run candidates across the state, and independent candidates frequently run for State Assembly. Under the current system, minor parties have little hope of establishing and sustaining representation. The only successful minor party candidate to have recently won an Assembly race was Green member Audie Bock, who won a special election in 1999 under odd circumstances before re-registering as an independent. In five-seat districts, however, it is almost certain that minor parties would be able to pick off some seats where there is sufficient ideological support.

### **From Seats to Votes**

We can apply electoral systems theory to simulate how the Californian party system would evolve under constraints of the proportional electoral system analyzed above. Instead of holding voting patterns constant, we now hold the electoral system constant and predict changes in party support.

Depending on how permissive the electoral system is, new parties can emerge by dividing supporters of existing parties along a new “entry” dimension, so that we generally expect the number of parties effectively competing ( $N$ ) to approximate the following:

$$N = I + 1$$

where  $I$  is the number of issue dimensions in the electoral landscape, and  $N$  is measured empirically using the Laakso-Taagepera Index (Laakso and Taagepera, 1979):

$$N = 1/\Sigma p^2$$

where  $p$  is the percentage of vote or seat share for each party.

Stable democracies exhibit a tight linkage between cultural cleavages that divide populations and the parties that represent distinct positions along those issue dimensions (Lipset and Rokkan, 1967; Lijphart, 1999). Taagepera and Grofman (1985) and Taagepera (1999) have explored the conceptual linkages between issue dimensions, district magnitude, and effective parties in detail, demonstrating that they are three interdependent components of representation; with good information



on two of the components, we can make better inferences about the properties of the third. Comparing Lijphart's data on issue dimensions with district magnitude, Taagepera (1999) found that the best empirical model that fit the three components was around  $N = I^6 M^{15}$ , though this equation underestimates the number of parties for single-member districts.

We calculated dimensions of ideological conflict in California through a factor (principle components) analysis of statewide ballot propositions held between 2000-2008. Election results were aggregated at the level of municipalities/unincorporated areas in order to provide a detailed estimate of ideology across geographies. Using the percentage of "yes" voters in each city, we found that a single, dominant dimension accounted for 47% of the observed variance in support across 77 initiatives. Table 2 illustrates how this dimension corresponds to the traditional left-right spectrum in U.S. politics, which emphasizes economic differences and questions about the proper scale of government.

Looking across initiatives, the left-right dimension is clearly associated with support for (opposition to) public works projects, assistance, and most public finance. In addition, one of the clearest distinctions between places on the left-right dimension is support for Proposition 54 in 2003, which would have eliminated most government classification of people by race, ethnicity, color or national origin. Proponents argued that since racial discrimination is illegal, there is no need to classify or collect data based on race. Opponents successfully claimed that a lack of data would hinder state capacity to address racial and ethnic disparities in public health, education, and civil rights. The tight linkage between racial and economic politics in California is reflected in this dimension.

The second strongest dimension reveals distinct authoritarian-libertarian voting tendencies. It reflects divisions over abortion policy, same-sex marriage, treatment for drug addicts and sex offenders, and similar cultural controversies. There is some overlap observed between the two dimensions. The (varimax rotated) factor loadings show that authoritarian-leaning cities also tended to oppose drug treatment diversion. However, support for public works are largely unrelated to the authoritarian-libertarian dimension, just as support for restrictions on sex offender residency and abortion is not part of the traditional left-right dimension. Additional minor dimensions, often centered on single issues, emerged from the factor analysis, but these top two would be the most salient dimensions in multi-party competition.

The left-right dimension closely tracks partisan voter registration patterns. Strongly "leftist" cities in California include places like Santa Cruz, Lynwood, and Coachella, all Democratic strongholds. At the other end of the spectrum we find Republican cities like Bishop, Red Bluff, and the birthplace of Richard Nixon, Yorba Linda. Authoritarianism cuts across current party lines however, with authoritarian cities spanning across California from the L.A. basin to the Sierra Nevada. Berkeley

Table 2: Statewide support and factor loadings for ten ballot propositions that identify top two ideological dimensions

Ballot label	statewide%	std. dev.	Left-Right	Authoritarian-
				Libertarian
Drinking Water (2000)	64.7%	10%	0.92	-0.24
Public Education Facilities Bond (2006)	56.9%	9%	0.91	-0.12
Parks and Water (2000)	63.2%	11%	0.90	-0.31
Classification by Race, ... Color or Origin (2003)	36.1%	9%	-0.76	0.17
Govt Acquisition Regulation of Private Property (2006)	47.6%	7%	-0.60	0.55
Drug Treatment Diversion (2000)	60.8%	9%	0.49	-0.68
Political Campaign Public Financing (2006)	25.5%	9%	0.44	-0.73
Limit On Marriage (2000)	61.4%	13%	-0.40	0.85
Sex offender Residence Restrictions Monitoring (2006)	70.5%	8%	0.03	0.90
Waiting Period Parental Notification (2006)	46.0%	12%	-0.19	0.94

stands out as the most socially libertarian city in California, but we also find high levels of authoritarianism in Democrat-centric cities like El Centro and Imperial.

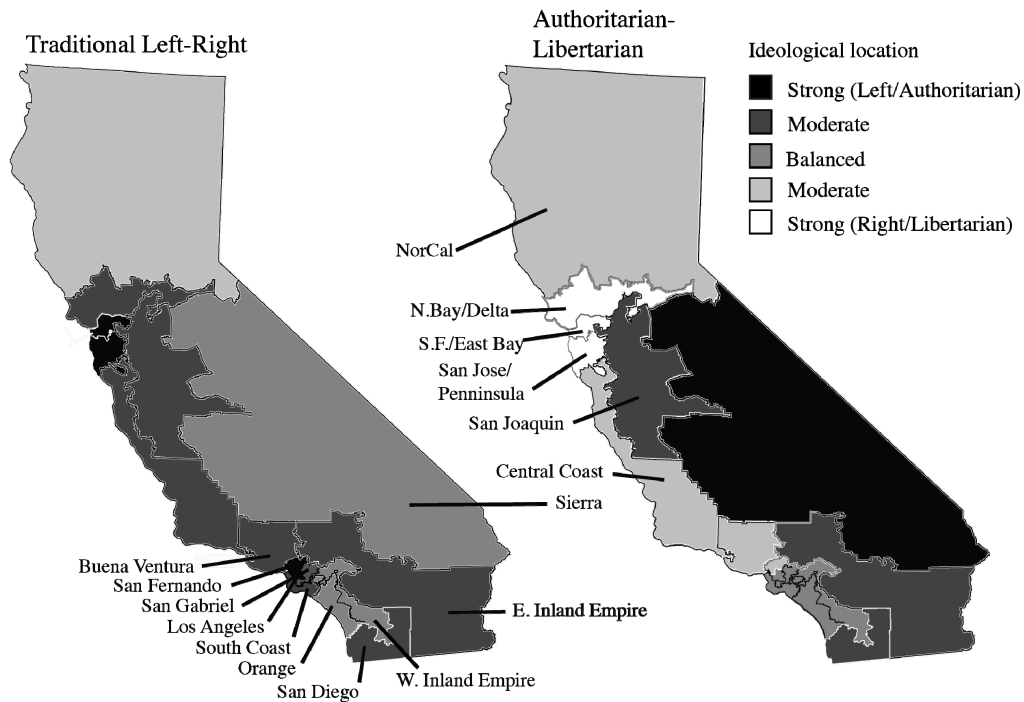
Figure 1 displays this ideological landscape across our 16 hypothetical districts. Municipal factor scores (weighted by average voting population) were used to calculate average support levels for each district. Balanced districts are within half a standard deviation on either side of the statewide mean score. Districts more than one standard deviation above/below the mean are identified as reflecting “strong” tendencies toward one end of either spectrum.

As might be expected, the San Francisco Bay Area is the leftist-libertarian stronghold of the state. The political diversity of the state is well reflected. Northern California can be described as the most consistently libertarian region of the state, being moderately opposed to government intervention on either dimension. The coastal town of Point Arena has the lowest overall scores of any city in California. In the San Diego district, voters are moderately supportive of both government intervention and authoritarian policies.

Los Angeles voters tend to be to the left of the left-right average, but more supportive of authoritarian policies compared to the Bay Area. These distinctions were dramatically illustrated in November of 2008, when both regions overwhelmingly supported Barak Obama’s presidential candidacy, but black and Latino voters, concentrated in the Los Angeles region, strongly supported a prohibition on same-sex marriage. We can only speculate as to how well multiple parties can do under these ideological conditions, but by applying our knowledge of institutional constraints to this voting data, it is possible to narrow the range of expected outcomes.

The average effective number of parties for an electoral system can be modeled as a function of average district magnitude ( $M$ ) and the size of the elected assembly ( $S$ ), what Taagepera (2007) refers to as the seat product ( $MS$ ). For any given assembly size or district magnitude, there are logical boundaries for the minimum and maximum number of parties ( $1 \leq M, S$ ) that can win seats. Taagepera (2007) discov-

Figure 1: Distribution of ideological voting across sixteen hypothetical 5-seat electoral districts



Data Sources: Election data provided by CA Secretary of State, [http://www.sos.ca.gov/elections/elections\\_elections.htm](http://www.sos.ca.gov/elections/elections_elections.htm). Municipal-level results collected for 77 California statewide initiatives, 2000-2008.

ered that the sixth root of the Seat Product yields an estimate of effective legislative parties that is consistent with restricted values of  $N$  and respects empirical patterns of party fragmentation in national legislatures:

$$N = (MS)^{1/6} \quad (4)$$

The logical derivation of this model is summarized in the appendix. Other specifications for a few directly linked rules (electoral formula, etc.) should also be accounted for when modeling actual systems. Figure 2 displays a number of actual and predicted values of  $N$  for the California Assembly, as well as recent electoral outcomes for the German and New Zealand systems as points of comparison. The actual effective number of parties, calculated using legislative seat shares, demonstrates the empirical accuracy of the predictive model. While designed to reflect

averages over many elections, even single elections are within one party for all the elections plotted. The model predicts the effective number of parties in California almost perfectly. Actual values of 1.86 for 2008 and 1.92 for the 2002-2006 elections are just slightly under the predicted value of 2.07 when  $M=1$  and  $S=80$ .

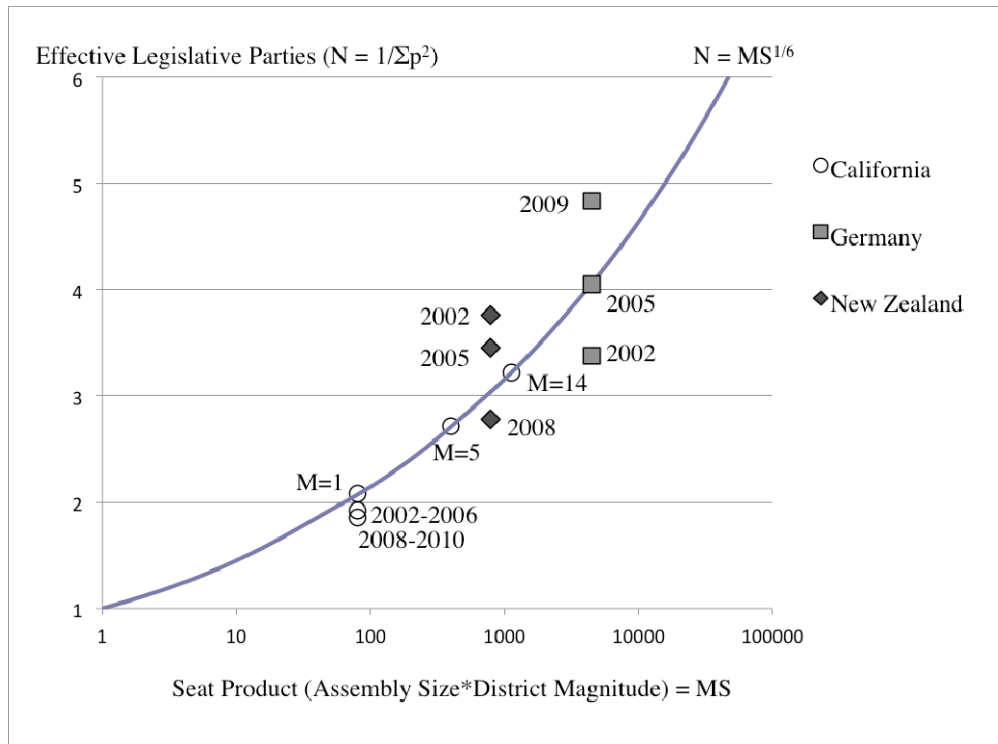
The predicted number of parties using five-seat districts with no statewide threshold is 2.71. A value under three parties is likely under a system still dominated by two parties. For example, we get 2.7 effective parties if four actual parties held Assembly seat shares of 47%, 35%, 12%, and 6%. Even under the purest form of PR, with all 80 Assembly seats allocated in a single electoral district using a 5% threshold ( $M=14$ ), the model predicts only 3.22 effective parties still below the actual number of parties represented in Germany under their MMP system. Fears of hyper-fragmentation (numerous small parties that inhibit governance) under this form of PR in California are thus inflated.

To simulate what a 2.7 party system might actually look like in California, we allocate seats to minor parties that would have the most ideological support within our hypothetical districts. In any single election, a party could emerge with a majority of seats, or disappear, so this simulation is designed to reflect averages over multiple elections. We estimate four actual parties winning seats across the state, but this is unlikely in a single five-seat district. Indeed, the threshold of inclusion, or vote share that a fourth party would need to win a seat in a five-seat district, is around 13%, which would require quite low vote shares for the major parties.

Table 3 summarizes the simulated distribution of party seats by district. Actual contenders for authoritarian parties might include the evangelical American Independent Party, the Minutemen, or similar right wing organizations. On the other end of the spectrum, the Libertarian Party currently fields more candidates for office than any other minor party, but current party leaders advance positions closer to the nationwide Tea Party movement, including strong “Birther” overtones. A libertarian party in northern California might integrate green politics with more classical libertarianism, while in the Bay Area we would likely find a green-socialist alliance competing for seats.

Based on the analysis of issue dimensions, we reallocated the five seats in each district so that the statewide totals would approximate 2.7 effective legislative parties in the Assembly. For example, one of the two seats that Democrats might gain under PR in the 1st district would probably go to either Green or Libertarian supporters. It looks as though the only place where a major party might become a minor party is in the San Francisco/East Bay district. There, high percentages of voters registered with third parties and “decline to state” (over 30% in Assembly member Ammiano’s San Francisco district) who currently vote Democratic provide considerable support for a socially libertarian coalition to gain two seats.

**Figure 2: Effective number of parties in assemblies (lower chamber)**



Overall, authoritarian parties have greater statewide potential compared to others, winning seats in seven of the 16 districts. Many authoritarian seats come from places where Democrats are currently underrepresented, and nearly all Libertarian or Green seats would come from Democratic regions. As a result, proportional representation of political parties comes primarily at the expense of the Democratic Party. But because both parties would lose seats to minor parties under PR, Democrats remain the largest party in the Assembly in our simulation, and would likely retain control over government formation.

### **Discussion: Multiparty Politics in an Antiparty State**

This simulation yields 2.7 effective parties as predicted by the seat product model, but of course this is only one scenario. Under these electoral rules, the likelihood of a change in Assembly control is higher. Our simulation deviates somewhat from real world averages, where minor party seat shares taper off faster (Taagepera,

**Table 3: Simulated seat allocation in the California Assembly under 5-seat PR**

District	Democratic	Republican	Authoritarian	Lib/Green	Eff. Parties
1 NorCal	1	3	0	1	2.27
2 North Bay/Delta	3	1	1	0	2.27
3 San Francisco/East Bay	2	1	0	2	2.78
4 South Bay/Penninsula	3	1	0	1	2.27
5 San Joaquin	2	2	1	0	2.78
6 Sierra	1	3	1	0	2.27
7 Central Coast	3	2	0	0	1.92
8 Buena Ventura	3	2	0	0	1.92
9 San Fernando	3	1	0	1	2.27
10 Los Angeles	3	1	0	1	2.27
11 San Gabriel	3	2	0	0	1.92
12 South Coast	3	2	0	0	1.92
13 Orange	2	2	1	0	2.78
14 W Inland Empire	2	2	1	0	2.78
15 E Inland Empire	2	2	1	0	2.78
16 San Diego	2	2	1	0	2.78
Totals	38	29	7	6	2.70

2007). If either of the major parties was able to hold onto an additional seat in districts where they are advantaged, it could drastically alter the fate of minor parties.

The Democratic Caucus currently draws 42% of its membership from outside the San Francisco and Los Angeles districts. Under our simulation, that expands to 54%. Potentially more transformative would be a Republican Caucus with a quarter of its members coming from San Francisco or Los Angeles districts, as compared to none today. Republicans in these regions are more socially, racially, and environmentally libertarian than their inland counterparts (Douzet, 2008). As a result, we would expect more moderate Republican candidates to be successful there if those regions were to become competitive.

GOP coastal gains would be partially offset by authoritarian party success in the most conservative regions of the state. The socially conservative faction within the Republican Party would have more options, though the battles that currently take place in Republican primaries would likely be replicated in multiseat contests. While Democrats are currently more united statewide, liberal Democrats might be less successful inland under PR, where a combination of economic populism and social conservatism could yield a coalition of Democratic Latinos and blue-collar, white Republicans. Our simulations suggest that a PR system could work to attenuate the coastal-inland divide by diversifying the composition of both of the major party caucuses.

The likely emergence of multiparty coalitions also increases the political space for moderate legislation and deal making; when majority coalitions are easier to



break, it is riskier for any group to make extreme demands for its support. Centrist legislators, once elected, may be more moderate than their constituents in multi-party systems, as they position themselves to gain on similarly centrist opponents (Warwick, 2009).

Of course, an electoral system does not operate in isolation of other institutions, and there are components of our policymaking institutions that could work against centrism under PR. The influence of initiatives and referendums on party system evolution is especially difficult to predict. The initiative process is already used to weaken party strength (opening up primaries, term limits, etc.), and contributes to the general antiparty culture that has characterized California politics for generations. One could imagine a proliferation of independent candidates and single-issue factions under PR, mobilizing supporters who are less interested in conventional party politics (Wattenberg, 2000).

Alternatively, we might see greater coordination at the regional level among parties using the winner-take-all initiative process to mobilize statewide coalitions. Incentives for coordination could also run both ways, as they appears to in Switzerland (Lutz, 2006). On average, heavier initiative use in Swiss cantons is associated with more legislative parties, but there are also more parties that participate in government through oversize governing coalitions. “Local” party systems seem to stabilize around a set of issues frequently reflected in the initiative process. Californians have already seen an increase in the extent to which parties, and especially governors, use the initiative process to advance their agendas, and this could expand under multiple parties.

At any rate, direct democracy is compatible with strong, stable, multiparty systems, and their combination may reflect a further evolution of the democratic process (Scarrow, 1999; Strom, 2000). More formal integration of direct and representative legislative practices, such as greater party control over ballot qualification, opportunities for legislative review and reconciliation would almost certainly improve legislative coherence (Baldassare and Katz, 2007). But even without formal reforms, multiple parties would encourage debate as they prod each other to take positions on controversial topics. Initiatives will continue to allow multiple competing parties to avoid contentious issues on occasion, but it could also make abstention more costly, raising the level of public discourse and improving voter information.

The stabilization of any of these features would occur slowly, as the persistence of winner-take-all statewide elections (California’s plural executive, Senate, and presidential contests) would continue to provide an incentive for two party blocs (Shugart, 2001). Perhaps more importantly, privatized campaign finance and dependence on media advertising means that the existing parties are likely to retain a strong advantage in fundraising and statewide organization (Lowi and Romance,



1998). Highly fragmented party systems have been linked to strategic use of state subsidies (Hooghe, Maddens, and Noppe, 2005).

### **Conclusion**

If Californians are serious about reforming what is widely viewed as a sclerotic government, they need to consider the full range of options available to them. During a redistricting cycle, there are a variety of electoral reforms to consider, and electoral systems are among the best-studied and understood institutions in all of political science. Proportional representation with multimember electoral districts is one of the most widely used electoral systems in the world. In this study, we have provided evidence that California's political geography is not only compatible with a PR electoral system, but that the worse case scenarios of PR are not likely to arise here. Indeed, all things considered, things would not change dramatically, but they would likely change in the direction that many existing reform efforts are trying to go.

California has a number of unique qualities that warrant caution when making comparative observations. Altering institutions in established political systems is analogous to replacing car parts while driving down the freeway; it ought to be done with caution, and one should not change too much at once. But when piecemeal efforts have failed to improve our course, and may have helped steer us toward the cliff, it is high time to start taking substantial reforms more seriously.

## **Appendix**

### **Factor Analysis**

The two dimensions analyzed in our research note were estimated through an exploratory factor analysis that initially revealed eight dimensions with Eigenvalues greater than one. Table A1 displays the unrotated correlation matrix for the initiatives summarized in Table 3, for the top four components. As with the final results, there is a single, dominant dimension that accounts for 49% of observed variance (Eigenvalue 35.7), followed by a second dimension that accounts for 14% of observed variance. The strength of the loadings on these dimensions are similar to the final results, and the additional factors tended to be single-issue items with high levels of covariance.

For example, the third factor (8% of variance) almost exclusively emphasized support for public works, infrastructure and public employees unions. The fourth was a cluster of 2005 special election initiatives concerning public schools. These components folded into the first dimension when extraction was limited to the top two dimensions.

A difficulty that arises when using initiative results to explore dimensionality is the frequency of bond initiatives and other propositions that ask more or less the same question several times over the decade. The high covariance of these items results in their being selected as distinct components. In order to avoid mistaking these artifacts for stable issue dimensions, we ran a number of analyses using a selective sample of initiatives. Table A2 summarizes the first selective run, demonstrating that among the top controversial initiatives, racial and religious/moral differences are reflected in the top two dimensions, which account for 65% of observed variance (51% and 14%, respectively).

Revenue proposals for a wide variety of issues (tobacco taxes, public campaign finance, stem cell research) load together, with the rotated matrix (not shown) placing them on the first component, and religious/moral issues loading on the second, as in the final analysis. As additional bond measures are entered into factor analysis, they also tend to load high on the first component.

Next, we ran the analysis using county-level results, in order to test for the possibility that the level of aggregation was driving our findings. The results were almost identical, with class-related items loading on a first component, which accounted for 49% of variance, and religious/morality-based items loading on the second (and accounted for 15% of variance). Finally, we ran the results excluding cities with populations under 10,000, as extreme outliers (90% + opposition or support for series of initiatives) could also drive results even though they account for a tiny share of voters. Again, the results were nearly identical with previous runs,

demonstrating that the Left-Right and Authoritarian-Libertarian labels accurately describe the ideological dimensions of electoral conflict in California over the last decade.

### Seat Product Equations

Taagepera's Seat Product equation is derived from the logic of bounds, and then extended to a probabilistic model of the effective number of parties. For any given assembly size or district magnitude, there are logical boundaries for the minimum and maximum number of parties ( $1 \rightarrow M, S$ ) that can win representation. For a given effective number of parties, there are also bounds for the seat share of the largest party (1) and average shares ( $1/M$ ) for additional parties. In the absence of other information, using the geometric means of these boundaries provides a purely institutional model of party fragmentation.

The average *number of seat-winning parties* ( $p$ ) in a district with magnitude  $M$  is then expected to be

$$p = M^{1/2}$$

and the same approach can be used to predict the average number of seat-winning parties in a legislature, incorporating the constraints of both district magnitude and assembly size:

$$N_0 = (MS)^{1/4}$$

The largest share won by a seat-winning party places further constraints on the effective number of legislative parties (recall it is measured empirically as a function of seat shares  $= 1/\Sigma(s_i)^2$ ), with the best average fit approximating the sixth root of the Seat Product, which is our measure of system permissiveness:

$$N = (MS)^{1/6}$$

**Table A1. Unrotated Matrix for Top Four Components (Table 3 initiatives)**

	1	2	3	4
Drinking Water	0.82	0.10	0.45	-0.17
Public Education Facilities Bond 2006	0.89	0.27	0.26	-0.09
Parks and Water	0.85	0.04	0.43	-0.14
Classification by Race, ... Color or Origin	-0.88	-0.25	-0.05	0.23
Govt Acquisition Regulation of Private Property	-0.86	0.20	0.04	0.13
Drug Treatment Diversion	0.74	-0.37	0.20	0.05
Political Campaign Public Financing	0.84	-0.41	-0.09	0.10
Limit On Marriage	-0.75	0.61	-0.04	-0.06
Sex offender Residence Restrictions Monitoring	-0.43	0.77	0.30	-0.04
Waiting Period Parental Notification	-0.62	0.73	0.08	-0.13

**Table A2. Unrotated Matrix of Selective Initiatives**

	1	2
Classification by Race, . . . Color or Origin	-0.84	0.17
School Vouchers	-0.74	0.36
DNA Samples. Collection. Database. Funding	-0.72	0.31
Redistricting	-0.70	0.05
Termination of Minor's Pregnancy. Waiting Period.	-0.51	0.75
Limit on Marriage	-0.48	0.82
Waiting Period Parental Notification	-0.33	0.88
Repeal Tobacco Tax	-0.33	0.77
Sex Offender Residence Restrictions Monitoring	-0.10	0.87
Congressional Terms Limits	0.00	0.76
None of the Above	0.01	0.40
Elections. Primaries	0.30	0.42
Campaign Finance	0.36	-0.28
Campaign Contributions	0.44	0.45
Campaign Contributions	0.50	0.46
Election Rights of Political Parties	0.55	-0.01
Drug Treatment Diversion	0.60	-0.60
Political Campaign Public Financing	0.64	-0.69
Cigarette Tax Initiative	0.69	-0.52
Stem Cell Research. Funding. Bonds	0.74	-0.49
Limitations on "Three Strikes" Law	0.80	-0.29
Limits on Legislators' Terms in Office.	0.84	0.20
Local Majority Vote	0.85	-0.09

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