# *The Forum*

# Forecasting Control of State Governments and Redistricting Authority After the 2010 Elections

**Carl Klarner,** *Indiana State University*

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## Abstract

This article makes forecasts for the 2010 state legislative and gubernatorial elections. These forecasts indicate the Republicans will add control of 15 legislative chambers and nine governor's offices, leaving them with 51 chambers and 32 governorships. Forecasts about the extent of redistricting authority by the Democratic and Republican parties indicate the Republicans will have authority over 125 U.S. House seats, while the Democrats will have authority over 62. In a chamber level analysis of 2,141 legislative and a state level analysis of 758 gubernatorial elections, four national forces are used in predicting election outcomes from 1950 to present: presidential approval, change in per capita income, midterm loss, and the percentage of respondents who say they will vote for a Democrat for the U.S. House. The differential effect of these forces in states with the straight-ticket option is also taken into account. Monte Carlo simulation that takes into account states' different rules regarding redistricting authority is then utilized to assess how many U.S. House seats the Democratic and Republican parties will control.

**KEYWORDS:** state legislative elections, gubernatorial elections, redistricting

This article presents forecasts for the 2010 state legislative and gubernatorial elections.[1] Simultaneously, it forecasts the number of U.S. House seats over which the Democratic and Republican parties will have control in the subsequent redistricting process.   Overall, these forecasts indicate that Republicans will add control of 15 legislative chambers and nine governor's offices, leaving the Grand Old Party with control of 51 state legislative chambers and 32 governor's offices after the election. The forecasts also estimate that the Republicans will have redistricting authority over a total of 125 U.S. House seats, while the Democrats will have such authority over 62.   This Republican advantage is in marked contrast to the past four redistricting cycles for each of which the Democrats held at least a two-to-one advantage.  Similar to the four last redistrictings, bipartisan or nonpartisan redistricting processes are predicted to be the most common outcome.

The first section of this paper outlines the model developed to forecast state legislative elections, and assesses how well the model would have done in 2004, 2006, and 2008.  The second section outlines the gubernatorial forecasting model utilized and assesses its prior accuracy as well.  Next, the forecasts for the 2010 elections are presented, along with a comparison to forecasts from the same author done on July 22nd.  A fourth section forecasts how many U.S. House seats the Democrats and Republicans will directly control during the 2011 redistricting.

**Some Background to the Election**

In the upcoming election, state legislative elections will be held for 87 chambers in 45 states, while gubernatorial elections will be held in 37 states.[2]   The Democrats are in a fairly good position going into the 2010 elections.  They gained control of sixteen state legislative chambers in the 2006, 2007, and 2008 elections, while the Republicans gained only three.  Democrats currently control both legislative chambers in 27 states, while the Republicans control both

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[1] These forecasts were made on September 18, 2010, and supplement the state legislative forecasts made on July 22, 2010, in Klarner (2010), using a much different methodology.

[2] Louisiana, Mississippi, New Jersey and Virginia have odd-year state election cycles, and so will have no elections to state government.  Kentucky has odd-year elections for governor, but even-year elections for the state legislature.  Kansas, New Mexico and South Carolina do not have state senate elections this year.  Delaware, Indiana, Missouri, Montana, North Carolina, North Dakota, Utah, Washington, and Wyoming normally have gubernatorial elections during presidential election years, although Utah will conduct one in 2010.  Although the Nebraska legislature will have elections this year, forecasts were not made for that institution because it is non-partisan.

chambers in only 14.[3]   However, Democrats are not as strong in their control of governors' offices, holding 27 out of 50.[4]

All signs point to large Democratic losses this year.  Historically, the tendency of the party of the president to lose U.S. House and Senate seats in midterm elections has extended to state legislatures (Campbell 1986). Presidential approval is also fairly low, with 46.0 percent of respondents approving of the job of the president in the latest Gallup poll (September 9th to 11th, 2010) compared to a post-World War II average of 52.6 percent at this time in the election cycle.  The state of the economy likewise does not bode well for Democratic candidates, with the change in quarterly real per capita income over the last year at -0.34 percent.  The post-World War II average for this point in the biennium is +2.1 percent.[5]   Furthermore, Gallup's generic ballot question, which has asked respondents who they will vote for in the upcoming U.S. House elections, witnessed the least favorable results for the Democratic Party in the history of the poll when asked in late August (the 23rd to 29th).  Fifty-one percent of registered respondents said they would vote for a Republican, in comparison to 41 percent for the Democrat (Newport 2010).  The Democrats have rebounded somewhat from that low point (September 6th to 12th), to the wrong end of a 48 to 43 percent split which favored the Republicans (Saad 2010).  Although the generic ballot question has only trended toward one party or the other eight out of 30 times in a statistically significant sense since 1950, Republican support has crept up during 2010.[6]

Although historically there is no poll question that asks a national sample of adults how they will vote in state legislative elections, Alan Abramowitz (2010a) has found a strong correlation between the change in the proportion of U.S. House seats won by the Democrats and that same partisan proportional change for state legislatures.  He has also found that Gallup's generic ballot question does a good job of predicting state legislative and gubernatorial seat changes (2010b) at the national level, although the impact is weaker for the latter. Together with the generic ballot's correlation with U.S. Senate outcomes (Klarner and Buchanan 2006), the generic ballot can be conceived of as an overall summary of the electorate's support for the Democrats or Republicans across the board.

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[3] Democrats control both legislative chambers in three out of four of the states with no state legislative elections (and split control of the fourth).  Of the other three state senates not holding elections, Democrats are in control of one.

[4] Of the 13 states with no gubernatorial races, Democrats hold 8 of those governorships.

[5] This figure is a weighted average of change in the last four quarters, and is described below.

[6] Since the question started being asked in 1950, the years 1950, 1954, 1958, 1968, 1972, and 1984 have seen pro-Republican shifts in voter sentiment over time.  The years 1996 and 2002 saw pro-Democratic shifts.

This article expands on Abramowitz's work by utilizing the generic ballot to predict state legislative and gubernatorial elections at the chamber and state level, instead of nationally. The nation's disposition to vote for one party or the other will result in different configurations of party control, depending on how the strength of the parties is distributed across the states. This distribution will also influence the number of chambers and governorships that the Republicans will capture this year. A forecasting model that utilizes the state election as the unit of analysis instead of the national election has the added bonus of being able to make forecasts about each specific state. When making additional forecasts about how many U.S. House seats over which Democrats and Republicans will have redistricting authority, this kind of specificity is essential, especially because the rules granting control of the redistricting process vary from state to state.

This article also highlights a potentially important electoral institution that is often overlooked: the straight-ticket ballot option (SPO). When examining the impact of national forces on state elections, it is natural to wonder what role this device plays in voting decisions. Today only 15 states give their citizens the option to pull the party lever, down from 27 states at the end of World War II. But as of 2010, 98 million people live in one of those states, 31.6 percent of the population. Evidence will be presented that the straight-ticket option has a large impact on how national forces are translated into state legislative seats.

In thinking about how many seats the Democrats might lose in 2010, it is useful to examine how many seats have historically shifted hands. Figure 1 displays a box-and-whiskers diagram of the absolute value of change in the Democratic percentage of state legislative seats between 1935 and 2009, by decade. Visually striking are the high levels of volatility in the 1930s and 1960s. The former was caused by the stress of the Great Depression, while the later was the result of the reapportionment revolution in the wake of *Baker* v *Carr* (1962).

Otherwise, Figure 1 reveals a marked tendency for the percentage of state legislative seats that change hands to have gone down over time.[7] This is the case even when elections in the old "Solid South" and elections during the volatile era of redistricting after *Baker* are excluded. In the 1930s, 11.7 percent of seats changed hands between parties, on average. The state elections of the 1940s, 1950s, and 1960s displayed similar levels of volatility to each other, averaging 8.1 percent. The 1970s saw a 6.7 percent change, the 1980s a 5.0 percent, the 1990s 5.1 percent, and the first decade of the 21$^{st}$ Century a mere 4.0 percent change. This finding parallels Campbell's (2003) observation that the propensity for seats to change hands in the U.S. House has declined over time.

This decreased propensity for seats to change hands is also consistent with the decline in "marginal" seats over time. In the 1970s, 20.0 percent of state

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[7] This conclusion and these statistics were based on the sample of chambers that excluded cases with the same decision rule used for the analyzed sample of cases described below.

legislative seats that were up for election were won by ten percent or less.  In the 1980s 15.9 percent were won by ten percent or less.  The percentage in the 1990s was 15.5 percent, and from 2000 to 2008, only 13.7 percent.[8]

**Figure 1:  Absolute Value of Change in Democratic Percent of State Legislature**
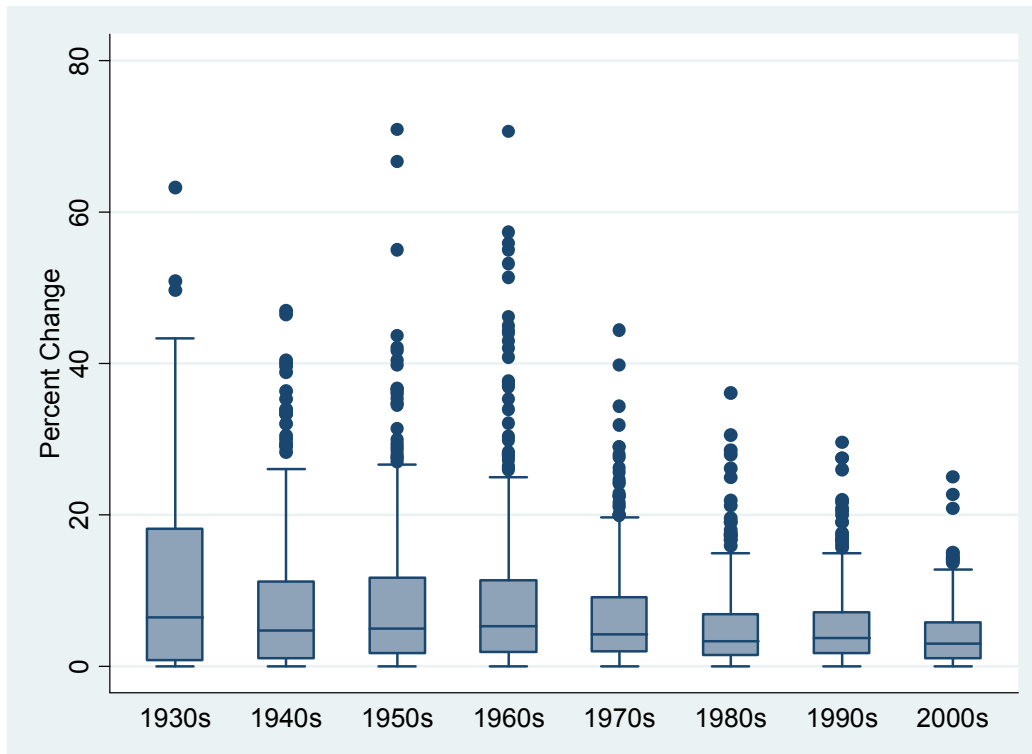


**Modeling State Legislative Elections**

A quantitative model to forecast the outcome of the 2010 state legislative elections was developed, with the percentage of seats in a legislative chamber

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[8] These figures are from the dataset used by Klarner (2010).  For the years 1967 to 2003 these data were from ICPSR dataset #21480, which can be downloaded at http://www.unc.edu/ ~carsey/index.htm (Carsey, Niemi, Berry, Powell and Snyder 2008), and was supplemented from numerous sources.  Data for the years 2004, 2005 and 2006 were from Jonathan Backer, Richard Niemi and Lynda Powell.  The years after 2006 were obtained from state Web sites. For margins of twenty percent or less, the figures are 37.0 (1970s), 29.3 (1980s), 30.1 (1990s), and 27.7 percent (2000 to 2008).

controlled by the Democrats as the dependent variable.[9] The forecasts made here differ from those made in Klarner (2010), in that the unit of analysis there was the state legislative district-election year. Appendix A reviews some of the costs and benefits of the two approaches. Quite apart from the relative costs and benefits of either method, it is useful to compare forecasts based on two markedly different methodologies.

The model used for the forecasts here included 2,141 state legislative elections conducted between 1950 and 2008. Decision rules used to exclude some cases are outlined in Appendix A. Most of the predictor variables utilized in the model are routinely used in forecasting models, and closely mirror the variables utilized in Klarner (2010). However, the district-level variables utilized in Klarner (2010) were not appropriate for a chamber-level model, and the use of the legislative chamber as the unit of analysis allowed vote returns from other offices, only available at the state level, to be utilized.

Partisan trends in voting patterns were measured utilizing prior state-level returns for four different types of elections. The first variable simply measured the percentage of Democrats in the legislative chamber in the last election. This percentage was also utilized for presidential and U.S. House elections, measured as deviations from the national mean. The percentage of seats the Democrats controlled in the other state legislative chamber prior to the election was also utilized.

Four national-level variables were utilized to capture shifts in voter sentiment. The first was the percentage of respondents who approved of the job of the president in the Gallup survey conducted closest to September 10th, the last time the survey was conducted before forecasts were made.[10] That figure was multiplied by "-1" when the president was Republican. Accordingly, a variable coded "1" when the president was a Democrat and "-1" when the president was a Republican was also included. How well the economy was doing was measured by the weighted average of the percentage change in real personal income

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[9] Data on the partisan balance of state legislatures is from Dubin (2007) for years before 1959 and Klarner (2003) for later years. Data on gubernatorial election returns is from the CQ Elections and Voting Behavior Collection.

[10] To be precise, results of the Gallup survey that was conducted as close as possible to 53 days before the election in prior years were used.

between the five quarters ending in the second quarter of the election year.[11]  This variable was again multiplied by "-1" if a Republican president was in office.[12]

A variable labeled "National Midterm Penalty" was coded "1" in midterm election years with a Democratic president, "-1" in Republican midterm years, and "0" for years in which the president was up for election.  Last, the percentage of respondents in a national sample who said they would vote for a Democratic candidate in Gallup's generic ballot question for Congress (in the survey asked as close as possible to September 9th, the last time this question was asked before forecasts were made) was included.[13]  All four of these variables are commonly used in models forecasting elections to the U.S. House. (See for example, Abramowitz [2006], Bafumi, Erikson and Wlezien [2010], Cambell [2010], Cuzan [2010], Lewis-Beck and Tien [2010]).

As all of these national factors were posited to "trickle down" the ballot in a coattail effect to state elections, it was also posited that such effects might be greater in states with a straight-ticket ballot option.  The difference between allowing voters to deliberately indicate a wish to vote for every member of a party for every office repeatedly versus allowing them to indicate just once a vote for all party candidates may seem trivial.  However, it may still influence the behavior of voters who are less committed to the political process.  If so, it should cause voters to be more likely to select state legislators of the same party as the presidential or Congressional candidates for whom they vote, and thus magnify the impact of national-level forces.  Accordingly, a dummy variable which

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[11] The nearest change to the election was given a weight of "4," the second to last change a weight of "3," the third to last change a weight of "2," and the first change in time a weight of "1."  This modeling decision is based on the assumption that voters put more weight on the state of the economy in the recent past.

[12] These data were from http://www.bea.gov/, Table 2.1 (Personal Income and Its Disposition), line 38, accessed August 28th, 2010.

[13] Specifically, as the middle day of that survey was 54 days before the 2010 election (the survey was conducted between September 6th and September 12th), surveys asked as close as possible to 54 days before elections in prior years were utilized.  Available data on the generic ballot (505 surveys) were inconsistent as far as what sample was reported.  Most reported a national sample of voters (436), many reported registrants (315), and a minority reported "likely voters" (79).  Five of the surveys fitting the criteria for use described in the text only reported the breakdown for registered voters, and not the breakdown for a national sample.  Fortunately, the percentage of the national sample who indicated they would vote for a Democrat is highly correlated to the percentage of registrants who indicated this.  For the 247 cases for which both samples are reported, when the national sample is regressed on registrants, R-squared was .94 and the standard error of the estimate was 1.39 percent.  The five missing cases were estimated with the above regression plus a battery of year dummy variables, as well as a battery of year dummy variables interacted with a variable measuring the Julian day of the year.

measured whether a state had the straight-ticket option was included in the analysis (labeled "STO") and was interacted with all national-level variables.[14]

Prior work (Bailey and Fullmer [2008], Klarner [2010]) has found that the party of the governor loses seats in the state legislature when governors themselves are not up for reelection, suggesting that voters may be engaged in an effort to balance government ideologically. A state-level midterm-penalty variable coded "1" during the terms of a Democratic governor when there was no gubernatorial election in that year, and coded "-1" when the governor was a Republican, and "0" for gubernatorial election years was also included. A variable coded "1" for Democratic governors and "-1" for Republican governors was therefore also included.

One challenge for a chamber-level model is that many state senates have only half of their seats up in election years, which would presumably result in less partisan change than chambers in which all legislators are up (see Appendix A). As a result, a dummy variable that was coded "1" when a chamber had two-thirds or less of its seats up for election was included, labeled "Not All Seats Up," and interacted with all independent variables.

As all state legislative elections across the nation may be influenced by one national tide, not all of which may be taken into account by the independent variables, hierarchical linear modeling was utilized (Raudenbush and Bryk 2002). A third-level error term was included for years, and a second-level error term was included for state-years.

Table 1 presents the estimated impact of the independent variables on Democratic success in state legislatures. Overall, the model performed well, with almost all of the independent variables behaving as expected. The coefficients in column two represent the impact of the independent variables on the percentage of Democrats in legislative chambers where all the seats are up for election. The four lagged measures of prior voting disposition are all statistically significant ($p<.001$). The coefficient associated with "National Midterm Penalty" indicated that in states without the straight-ticket option, the party of the president usually lost 3.6 percent of seats in midterm elections and was statistically significant ($p<.001$). Most interesting is that the loss of seats for the president's party is 1.7 percent greater in states with the straight-ticket option, for a total impact of 5.3 percent ($p<.02$).

Percent change in per capita real disposable income was not associated with Democratic seat gains in states without the straight-ticket option. However, states with the straight-ticket option saw a markedly greater impact of the national

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[14] Data on whether states had the straight ticket ballot option or not were culled from numerous sources, including Albright (1942), CQ Press (1964), Council of State Governments (1974, 1976, 1978, 1980, 1982) and the National Council of State Legislatures, http://www.ncsl.org/default.aspx?tabid=16597, accessed August 25th, 2010.

economy on state legislative election outcomes (p<.01). In such states, every additional one percent of growth translated into .95 percent more seats in the legislature (.193+.753). Presidential approval and Democratic vote intention also were associated with state legislative outcomes in a statistically significant sense, although these effects were not greater in states with the straight-ticket option.

## Table 1: Determinants of the Percent of Legislators Democratic

|  | *Coefficients* | *Standard Errors* | *Coefficients for "Not All Seats Up" Interactions* | *Standard Errors for "Not All Seats Up" Interactions* |
|---|---|---|---|---|
| Lagged Vote | .742* | .0260 | .0387 | .0326 |
| Prior % Dem, Other Chamber | .0546* | .0153 | .120* | .0338 |
| Prior % Dem, President | .254* | .0303 | -.0581 | .0481 |
| Prior % Dem, U.S. House | .0617* | .0193 | .0418 | .0299 |
| Straight-Ticket Option (STO) | 1.975 | 3.806 | 1.736 | 5.783 |
| Governor's Party | -.0953 | .240 | -.562 | .380 |
| State Midterm Penalty | -.684* | .369 | .694 | .541 |
| President's Party | -5.255* | 2.204 | 1.760 | 1.747 |
| President's Party*STO | -1.430 | 1.777 | 1.351 | 2.667 |
| National Midterm Penalty | -3.569* | .953 | 2.206* | .770 |
| National Midterm Penalty*STO | -1.670* | .754 | 3.429* | 1.135 |
| % Change in Real Disposable Income | .193 | .289 | .141 | .253 |
| % Change in Real Disposable Income*STO | .753* | .241 | -.466 | .360 |
| % Presidential Approval | .0842* | .0418 | -.0565 | .0354 |
| % Presidential Approval*STO | .0181 | .0352 | -.0477 | .0526 |
| % Democratic Vote Intention | .299* | .0833 | -.0377 | .0688 |
| % Democratic Vote Intention*STO | -.0321 | .0669 | -.0472 | .101 |
| Not All Seats Up | -2.071 | 3.886 | | |
| Constant | -7.965 | 4.769 | | |
| Year-Level Error Term | 2.183* | .354 | | |
| State-Year Level Error Term | 3.862* | .177 | | |
| Chamber-Year Error Term | 4.987* | .112 | | |
| Log-Likelihood | -6936.140 | | | |

Note: This table reports the results of one hierarchical linear regression model. The coefficients reported in column four are those associated with interactions between the dummy variable "Not All Seats Up" and each independent variable.
*=statistically significant at the p<.05 level, one-tailed test.
Number of groups = 42, number of subgroups = 1141, number of observations = 2141.

Column four of Table 1 displays the coefficients from the interactions between the "Not All Seats Up" dummy variable and the other independent variables. Generally, these coefficients indicate that the impact of the independent variables is muted in these chambers compared to chambers where all the seats are up for re-election, although only three of the interactions are statistically significant.

The analysis was rerun for three subsets of years (1950 to 2002, 1950 to 2004, and 1950 to 2006) in order to make out-of-sample forecasts for 2004, 2006, and 2008. The model did reasonably well, being 3.6 percent off on average for the 251 chambers having elections. Furthermore, 231 out of 251 chambers were called correctly (92.0 percent). An accuracy of ninety-two percent may sound impressive, but by itself, it should not. One useful standard of comparison is the "naïve model" in which chambers are simply predicted not to change party control. Such a model would have resulted in 30 errors, as opposed to 20. In other words, the model utilized here reduced error by one-third. The out-of-sample forecasts also correctly predicted fifteen out of the thirty switches in party control.

## Modeling Gubernatorial Elections

A model of gubernatorial elections, which utilized 758 elections from the years 1950 to 2009, was also conducted, with the Democratic percentage of the two-party vote as the dependent variable in the analysis. All of the national-level variables that were utilized in the state legislative model were used. The number of total variables in this model was more manageable than in the state legislative model, so lagged variables for all non-national-level variables were included. Hierarchical linear modeling was utilized in this model also. But here, only two levels of error terms were used, the second at the year level.

Whether governors were incumbents was taken into account by a variable coded "1" if the Democratic candidate was an incumbent, "-1" if the Republican candidate was an incumbent, and "0" otherwise. Another similarly coded variable was included if an incumbent was an unelected one, to take into account the fact that such incumbents received less of a bonus from incumbency than elected counterparts. A last candidate-level variable for gubernatorial candidates measured whether non-incumbents held prior elective offices. It was labeled "Prior Office-Holding Experience," and took on values between "-5" and "5." (See Appendix B for details.)

A variable which measured the percent of respondents who said that they would vote for the Democratic candidate in state-level polls was also utilized for 1990 and afterwards, when such data were available. This variable was coded "0"

**Table 2: Determinants of Democratic Percent of Gubernatorial Vote**

| Independent Variable | Coefficient | Standard Error |
|---|---|---|
| Lagged Vote | .304* | .0309 |
| Prior % Dem, State Legislature | .00641 | .0358 |
| Prior % Dem, State Legislature, Lag | .0765* | .0322 |
| Prior % Dem, President | .327* | .0639 |
| Prior % Dem, President, Lag | -.291* | .0661 |
| Prior % Dem, U.S. House | .00179 | .0344 |
| Prior % Dem, U.S. House, Lag | .0451 | .0342 |
| Straight-Ticket Option (STO) | -2.730 | 6.585 |
| President's Party | -1.184 | 2.775 |
| President's Party*STO | 1.600 | 3.103 |
| National Midterm Penalty | -1.431 | 1.147 |
| National Midterm Penalty*STO | -.714 | 1.230 |
| % Change in Real Disposable Income | -.124 | .328 |
| % Change in Real Disposable Income*STO | .818* | .377 |
| % Presidential Approval | .000360 | .0493 |
| % Presidential Approval*STO | -.0441 | .0544 |
| % Democratic Vote Intention | .277* | .108 |
| % Democratic Vote Intention*STO | .0320 | .114 |
| Incumbency | 5.891* | .738 |
| Incumbency, Lag | -2.116* | .729 |
| Unelected Incumbent | .904 | 1.947 |
| Unelected Incumbent, Lag | .879 | 1.830 |
| Previous Office Holder | -.380 | .325 |
| Previous Office Holder, Lag | .179 | .314 |
| Trial Heat Poll | .0703* | .0180 |
| Missing Poll Code | 10.588* | 1.508 |
| Constant | 13.421* | 6.473 |
| Year-Level Error Term | 1.839* | .484 |
| Race-Level Error Term | 7.520* | .199 |
| Log-Likelihood | -2618.789 | |

*=statistically significant at the p<.05 level, one-tailed test.
Number of groups = 47, number of observations = 758

when no poll was available.[15]  A variable coded "-1" when the race was safely Republican, and "1" when the race was safely Democratic was included and was labeled "Missing Poll Code."  The model used to forecast the 2010 gubernatorial

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[15] Only 27 out of 249 races in 1990 and after were missing polls.

elections is displayed in Table 2.  Overall, prior vote history and national level forces had less impact on gubernatorial elections than they did on state legislative elections.

Although it was found that gubernatorial candidates of the same party as the president received fewer votes during midterm elections, this effect could have been the result of chance.  It was also found that governors in states with the straight-ticket option experienced a greater midterm penalty than governors outside such states.  However, this differential impact, too, was found not to be statistically significant.  It should be noted that when the interaction between "National Midterm Penalty" and "Straight-Ticket Option" was dropped, "National Midterm Penalty" does become statistically significant.

Percent change in per-capita real disposable income was not associated with gubernatorial election outcomes in states that did not have the straight-ticket option.  However, as with state legislative elections, the impact of the national economy was substantially greater, as well as large in an absolute sense, in states with the straight-ticket option ($p<.05$). The two presidential approval variables were not statistically significant, while the coefficient associated with Democratic vote intention was statistically significant and was estimated to have a substantial impact on gubernatorial elections.  For every one-percent more respondents who said that they would vote for a Democrat in the U.S. House elections, .28 percent more voted for the Democratic gubernatorial candidate, almost the same impact as for state legislatures.  This effect was not found to be greater in states with the straight-ticket option.

The results in Table 2 also indicated that incumbents received 5.9 percent more of the vote than they did last time if they were a new incumbent ($p<.01$). Unelected incumbents fared just as well as elected incumbents, and candidates with prior office-holding experience did not do better than those who did not. Trial heat polls were also related to how well candidates did in a statistically significant sense.  When out-of-sample predictions are made for 2004, 2006, and 2008, the error rate was eight out of 54 elections (85.2 percent accuracy), a reasonable percentage correct.  The naïve model for these years misses twelve out of 54 elections, so again the model utilized here reduced error over the naïve model by one-third.

### Forecasts for the 2010 Elections

A Monte Carlo simulation was used to predict the percent chance that the Democrats would control a legislative chamber or governor's office. Random variables were generated for each of the random effect's coefficients. (Three different levels were generated in the state legislative model, and two in the gubernatorial model). For each of the 2,000 iterations of the simulation, the

random effect for year was constant across cases. Furthermore, the level-2 random effects for state legislatures were constant in each state-election. The uncertainty associated with the impact of each independent variable on the dependent variables was also taken into account by generating random variables for each independent variable and multiplying them by their standard errors and then adding these quantities to the coefficients (Beck 2000). The standard error of the estimate is only accurate within the sample at hand, not for out-of-sample forecasts (Beck 2000).

**Table 3: Forecasts for the 2010 State Legislative and Gubernatorial Elections, as of September 17, 2010**

| State | Column two | Column three | Column four | Column five | Column six | Column seven | Column eight | Column nine |
|---|---|---|---|---|---|---|---|---|
| | Forecast Democratic Share of Seats | | Forecast Chance of Democratic Control | | Forecast Change in Seats | | Forecast Democratic Share of Votes | Forecast Chance of Democratic Control |
| | State Senates | State Houses | State Senates | State Houses | State Senates | State Houses | Governor | Governor |
| Alabama | 49.99* | 45* | 49.6 | 31 | 16 | 14 | 41 | 27 |
| Alaska | 41* | 36 | 22 | 8 | 9 | 9 | 43 | 29 |
| Arizona | 33 | 33 | 4 | 5 | 7 | 7 | 46 | 37 |
| Arkansas | 67 | 60 | 92 | 82 | 10 | 12 | 56 | 66 |
| California | 61 | 58 | 83 | 79 | 3 | 6 | 47 | 39 |
| Colorado | 54 | 51 | 64 | 55 | 6 | 7 | 52 | 55 |
| Connecticut | 61 | 68 | 87 | 96 | 6 | 8 | 46 | 38 |
| Delaware | 66 | 53 | 92 | 62 | 11 | 6 | D | NA |
| Florida | 31 | 32 | 5 | 3 | 4 | 5 | 44 | 29 |
| Georgia | 33 | 34 | 4 | 5 | 6 | 6 | 43 | 29 |
| Hawaii | 90 | 83 | 100 | 100 | 2 | 6 | 51* | 54 |
| Idaho | 14 | 18 | 0 | 0 | 6 | 7 | 42 | 26 |
| Illinois | 58 | 55 | 76 | 69 | 4 | 5 | 55 | 64 |
| Indiana | 34 | 42* | 14 | 25 | 0 | 10 | R | NA |
| Iowa | 56 | 47* | 66 | 41 | 8 | 9 | 52 | 53 |
| Kansas | 23 | 30 | NA | 2 | NA | 9 | 44* | 30 |
| Kentucky | 38 | 49* | 22 | 45 | 4 | 16 | D | NA |
| Louisiana | 62 | 51 | NA | NA | NA | NA | R | NA |
| Maine | 52 | 56 | 58 | 74 | 5 | 7 | 47* | 40 |
| Maryland | 64 | 68 | 92 | 95 | 6 | 7 | 57 | 73 |
| Massachusetts | 80 | 82 | 100 | 100 | 8 | 8 | 61 | 78 |
| Michigan | 39 | 51 | 16 | 53 | 6 | 10 | 44* | 35 |
| Minnesota | 58 | 57 | 78 | 76 | 8 | 8 | 47 | 42 |
| Mississippi | 51 | 61 | NA | NA | NA | NA | R | NA |
| Missouri | 30 | 38 | 3 | 10 | 3 | 8 | D | NA |
| Montana | 39 | 40* | 15 | 17 | 7 | 10 | D | NA |

| State | Column two | Column three | Column four | Column five | Column six | Column seven | Column eight | Column nine |
|---|---|---|---|---|---|---|---|---|
| | Forecast Democratic Share of Seats | | Forecast Chance of Democratic Control | | Forecast Change in Seats | | Forecast Democratic Share of Votes | Forecast Chance of Democratic Control |
| | State Senates | State Houses | State Senates | State Houses | State Senates | State Houses | Governor | Governor |
| Nebraska | | | NA | NA | NA | NA | R | NA |
| Nevada | 55 | 58 | 66 | 80 | 2 | 9 | 47 | 40 |
| New Hampshire | 51 | 49.5* | 53 | 47 | 7 | 7 | 59 | 77 |
| New Jersey | 58 | 59 | NA | NA | NA | NA | R | NA |
| New Mexico | 64 | 55 | NA | 66 | NA | 9 | 49.6* | 48 |
| New York | 49.7* | 65 | 49 | 93 | 2 | 8 | 56 | 70 |
| North Carolina | 48* | 46* | 44 | 36 | 12 | 11 | D | NA |
| North Dakota | 39 | 36 | 17 | 9 | 6 | 3 | R | NA |
| Ohio | 35 | 45* | 10 | 31 | 2 | 8 | 55 | 65 |
| Oklahoma | 34 | 28 | 16 | 3 | 12 | 12 | 44* | 36 |
| Oregon | 56 | 54 | 71 | 66 | 4 | 6 | 47* | 38 |
| Pennsylvania | 39 | 43* | 24 | 27 | 3 | 8 | 45* | 37 |
| Rhode Island | 79 | 83 | 99 | 99 | 11 | 9 | 49 | 48 |
| South Carolina | 41 | 33 | NA | 7 | NA | 9 | 41 | 28 |
| South Dakota | 34 | 30 | 6 | 2 | 6 | 4 | 41 | 22 |
| Tennessee | 37 | 40 | 12 | 15 | 6 | 9 | 48* | 44 |
| Texas | 34 | 38 | 15 | 14 | 4 | 12 | 42 | 29 |
| Utah | 21 | 19 | 3 | 0 | 7 | 10 | R | NA |
| Vermont | 72 | 65 | 99 | 93 | 4 | 1 | 43 | 29 |
| Virginia | 55 | 39 | NA | NA | NA | NA | D | NA |
| Washington | 58 | 56 | 76 | 70 | 5 | 7 | D | NA |
| West Virginia | 67 | 57 | 87 | 74 | 9 | 14 | D | NA |
| Wisconsin | 49* | 45* | 47 | 34 | 6 | 8 | 43* | 32 |
| Wyoming | 17 | 22 | 0 | 0 | 7 | 9 | 47* | 38 |

Asterisks denote a forecast change in party control of a state legislative chamber or governorship. In all cases save for the Hawaii governor, this is a predicted gain for the Republicans. All percentages are rounded to the nearest percent, except when such rounding would make it unclear which party would be in control of an institution. In those instances, enough decimal places are reported to clarify which party is forecast to be in control. Gubernatorial elections will be conducted in Nebraska and Utah, but forecasts were not made for these races.

     Table 3 displays the forecasts for the 2010 state legislative and gubernatorial elections, as well as the partisan balance of chambers and governor's offices that are not currently up for election. Columns two and three of Table 3 give the percent of legislative seats Democrats are forecast to hold after the 2010 election. Asterisks in those columns identify which chambers the

Democrats are forecast to lose.  The percent of seats that Democrats control in chambers not having elections this year are also reported in these columns, although underlined.  Columns four and five report the percent probability that the Democrats will have control over a legislative chamber after the election.

Columns six and seven of Table 3 report the percentage of seats that Democrats are forecast to lose in the 2010 elections in state senates and state houses, respectively.  Overall, the model predicts that the Republicans will take control of 15 state legislative chambers, which are denoted by asterisks in the table.  These include the state senates of Alabama, Alaska (which was split going into the election), New York, North Carolina, and Wisconsin, as well as the state houses of Alabama, Indiana, Iowa, Kentucky, Montana[16], New Hampshire, North Carolina, Ohio, Pennsylvania, and Wisconsin.  The model also predicted that Republicans will gain an average of 7.2 percent of the seats in each legislative chamber, higher than the 4.0 percent average seat change experienced between 2002 and 2008 reported above.

The gubernatorial model predicted that the Republicans will sweep these offices, and are predicted to win 27 out of 37 seats.  Column eight of Table 3 reports the percent of the vote the Democratic gubernatorial candidate was expected to receive in the 2010 elections.[17]  For states without gubernatorial elections this year, a "D" or "R" is displayed in the column to indicate the party of the governor in that state.  Table 3 also identifies the ten governors' offices the Democrats are forecast to lose in 2010 with asterisks in column eight.  Only in Hawaii are Democrats forecast to gain a Republican seat, which is also denoted with an asterisk.

The median-estimate from the Monte Carlo simulation indicated that Republicans would win a total of 24 governor's offices overall, which would leave them in control of 29 total states.[18]  Democrats hold eight of the thirteen governorships not currently up, blunting the blow to their party considerably.  Column nine of Table 3 reports the percent probability that each gubernatorial race will be won by a Democrat.  Only three of these percentages see one party with less than a twenty-five-percent chance of losing.  This underscores the competitiveness of gubernatorial elections.

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[16] The Montana House currently has an equal number of Democrats and Republicans.  Although some committees have Republican chairs, the Speaker and Majority Leader are Democrats, so the chamber was coded as controlled by the Democrats going into the 2010 elections.

[17] Gubernatorial forecasts were not made for Utah due to an oversight, since its 2010 election was not a regularly scheduled one.  Forecasts were not made for Nebraska because of its non-partisan state legislature.  Both of these states are sure to elect Republican governors, though.

[18] This number is different than the number arrived at by merely calling individual seats, because it takes into account the probabilities of winning the different seats.

It is also useful to compare the forecasts from the chamber-level model, made September 17, 2010, to those of the district-level model, made July 22, 2010.  Generally, the chamber-level forecasts, based on more up-to-date national-level variables, predict greater Republican gains.   The district-level model predicts an average 4.1 percent loss of seats by the Democrats, in contrast to the 7.2 percent reported above. The prior district-level forecast did not predict that the Democrats would lose the Alabama House or Senate, the Alaska Senate (the earlier forecast predicted a tie), the Kentucky House, or the Wisconsin House.  In contrast, the district-level model predicted that the Democrats would lose control of the New Hampshire Senate, while the chamber-level model did not.   The district-level model also did not utilize the generic ballot question as one of its predictor variables, which may be why it potentially understated the extent of seat change.  On the other hand, the chamber-level model did not take into account the decline in marginal seats over time, and the implications that decline has for lower levels of seat change.

**Figure 2: Predicted Percent of Democratic State Legislative Seats, by Chamber from District and Chamber Level Forecasts**
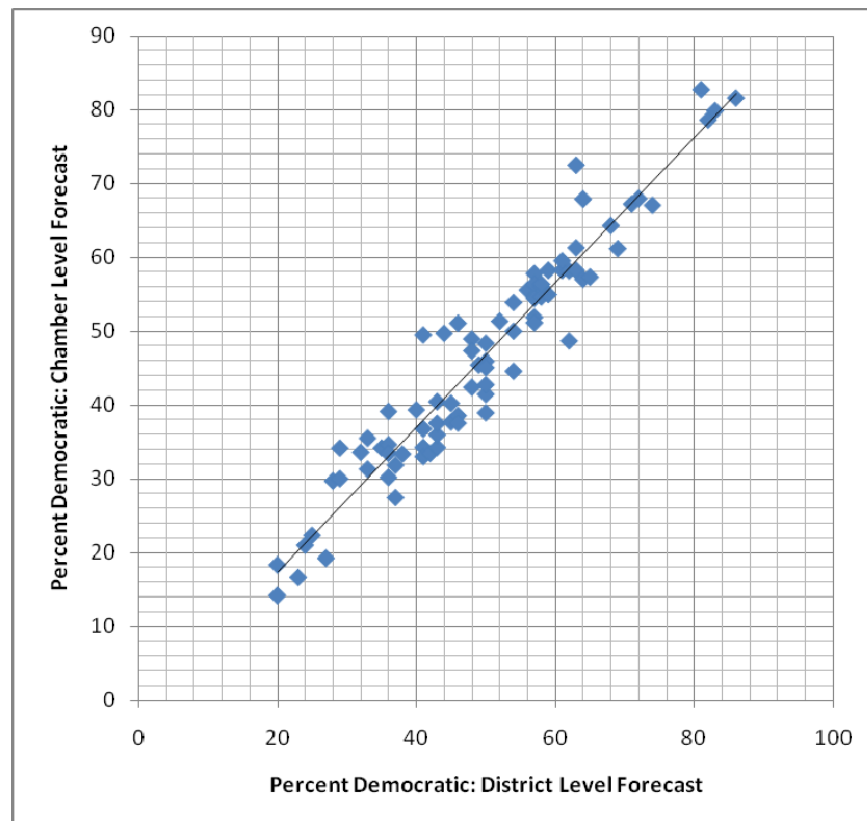
Figure 2 shows a scatterplot of the forecasts of the percentage of seats held by the Democrats made from the district- and chamber-level models, with the district-level forecasts on the horizontal axis.   The figure indicates that the forecasts are highly correlated.  When the chamber-level forecasts were regressed onto the district-level forecasts, the resulting R-squared is .92, while the standard error of the estimate was 4.3 percent.   The strong correlation between the two different forecasts is one indication that they are valid forecasting instruments.  However, the correlation between change in Democratic seats for the two models, while statistically significant ($p<.01$), is weak (R-squared of .08, SEE of 3.0).  The latter was an extremely demanding test of the models, however.  Some of the outliers are noteworthy.   Five chambers stand out with a higher predicted percentage of Democrats in the chamber-level model than one would expect from the district-level model.  Of these, three had multi-member districts (the MD, NH, and VT houses), suggesting either a problem with how the chamber-level model ignores this institutional arrangement, or how the district-level model deals with it.

## Forecasting Control over Redistricting

There is much debate over the ability of state legislatures to engage in partisan gerrymandering. (See Seabrook 2010, for example, who argues that partisan gerrymandering is limited.)  Some argue that increased constraints on redistricting brought about by the 1982 Amendments to the Voting Rights Act have reduced the ability of map-makers to engage in gerrymandering, including gerrymandering for the benefit of incumbents (Friedman and Holden 2009). This exercise in forecasting was agnostic on that issue, merely predicting the probability of the different configurations of party control in state governments.

States differ in which actors are given the power to redraw U.S. House districts.  In some states, the governor cannot veto a redistricting plan.  In others, a simple majority (fifty percent) in each legislative chamber is necessary to override any gubernatorial veto.   In still other states, super-majorities in the legislature are required to pass redistricting legislation.  A few states use a non-partisan commission to draw up their redistricting plans, so partisan control is not at issue.  Columns two and three of Table 4 give information on the relevant rules (Levitt and Foster 2008).

In order to forecast who will have control of redistricting in the different states, it is necessary to compute the joint probabilities of control of the state legislature and governor's office.  Because the same unmeasured factors might cause a party to do better in a state or in the country in a particular year, common

**Table 4: Redistricting Institutions for the U.S. House and Forecast Control over Redistricting**

| State | Redistricting Authority | Governor's Role | Estimated U.S. House Seats: 2012 | Democratic Control | Split Control | Republican Control | Bipartisan Control |
|---|---|---|---|---|---|---|---|
| Alabama | Leg Maj | 50% Override | 7 | 25 | 21 | 53 | |
| Alaska | One Seat | | 1 | | | | 100 |
| Arizona | Bipartisan | No Veto | 9.5 | | | | 100 |
| Arkansas | Leg Maj | 50% Override | 4 | 78 | 16 | 6 | |
| California | Leg Maj | | 52.67 | 31 | 59 | 10 | |
| Colorado | Leg Maj | | 7 | 30 | 53 | 18 | |
| Connecticut | Leg, 2/3s | No Veto | 5 | 55 | 44 | 1 | |
| Delaware | One Seat | 60% Override | 1 | | | | 100 |
| Florida | Leg Maj | No Veto | 26 | 3 | 8 | 88 | |
| Georgia | Leg Maj | | 14 | 3 | 28 | 69 | |
| Hawaii | Bipartisan | No Veto | 2 | | | | 100 |
| Idaho | Bipartisan | | 2 | | | | 100 |
| Illinois | Leg Maj | 60% Override | 18 | 44 | 48 | 8 | |
| Indiana | Leg Maj | 50% Override | 9 | 0 | 28 | 72 | |
| Iowa | Bipartisan | | 4 | 19 | 62 | 20 | |
| Kansas | Leg Maj | | 4 | 0 | 30 | 70 | |
| Kentucky | Leg Maj | 50% Override | 6 | 13 | 32 | 55 | |
| Louisiana | Leg Maj | | 6 | | 100 | | |
| Maine | Leg, 2/3s | | 2 | 7 | 89 | 4 | |
| Maryland | Leg Maj | No Veto | 8 | 89 | 7 | 4 | |
| Massachusetts | Leg Maj | | 9 | 82 | 18 | 0 | |
| Michigan | Leg Maj | | 14 | 9 | 55 | 37 | |
| Minnesota | Leg Maj | | 7 | 32 | 55 | 13 | |
| Mississippi | Leg Maj | | 4 | | 100 | | |
| Missouri | Leg, 70% | | 9 | 0 | 78 | 22 | |
| Montana | One Seat | | 1 | | | | 100 |
| Nebraska | Leg Maj | | 3 | NA | NA | NA | NA |
| Nevada | Leg Maj | | 4 | 27 | 60 | 13 | |
| New Hampshire | Leg Maj | | 2 | 37 | 51 | 12 | |
| New Jersey | Bipartisan | No Veto | 12 | | | | 100 |
| New Mexico | Leg Maj | | 3 | 34 | 66 | 0 | |
| New York | Leg Maj | | 28 | 37 | 58 | 5 | |
| North Carolina | Leg Maj | No Veto | 13 | 29 | 17 | 54 | |
| North Dakota | One Seat | | 1 | | | | 100 |
| Ohio | Leg Maj | 60% Override | 16 | 9 | 68 | 23 | |
| Oklahoma | Leg Maj | | 5 | 1 | 43 | 56 | |
| Oregon | Leg Maj | | 5 | 29 | 57 | 15 | |
| Pennsylvania | Leg Maj | | 18 | 6 | 51 | 44 | |
| Rhode Island | Leg Maj | 60% Override | 2 | 47 | 52 | 1 | |

| State | Redistricting Authority | Governor's Role | Estimated U.S. House Seats: 2012 | Democratic Control | Split Control | Republican Control | Bipartisan Control |
|-------|------------------------|-----------------|------|------|------|------|------|
| South Carolina | Leg Maj | | 7 | 0 | 30 | 71 | |
| South Dakota | One Seat | | 1 | | | | 100 |
| Tennessee | Leg Maj | 50% Override | 9 | 10 | 18 | 72 | |
| Texas | Leg Maj | | 35.83 | 2 | 39 | 59 | |
| Utah | Leg Maj | | 4 | 0 | 4 | 96 | |
| Vermont | One Seat | | 1 | | | | 100 |
| Virginia | Leg Maj | | 11 | | 100 | | |
| Washington | Bipartisan | | 10 | | | | 100 |
| West Virginia | Leg Maj | 50% Override | 3 | 58 | 28 | 15 | |
| Wisconsin | Leg Maj | | 8 | 8 | 56 | 36 | |
| Wyoming | One Seat | | 1 | | | | 100 |

Note: Column three is blank when the legislature does not play a role in the redistricting process or when the governor can veto redistricting plans and is faced with the standard two-thirds override requirement. Columns five through eight report the percent probability of various patterns of redistricting control. Bipartisan control of redistricting includes states with one U.S. House seat, and non-partisan commissions.

error terms for a year and for a state-year were computed by pooling the cases from the state-legislative and gubernatorial models.[19] The impact of independent variables that were shared between the models was allowed to differ in legislative versus gubernatorial elections.[20] Hierarchical linear modeling was again used to compute four levels of error terms.

A level-4 error term represented the year, a level-3 error term represented the state-year, a level-2 error term represented the legislature-year (i.e., the two chambers of the legislature might be influenced by unmeasured factors that do not influence the governor's race), and the level-1 error term represented the chamber-year or governor-year. The results from this model are not displayed due to space constraints but were nearly identical to the non-pooled models presented in Tables 1 and 2. These are available upon request.

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[19] Doing so is technically incorrect, as error is not constant in the two types of elections: it is substantially higher in gubernatorial elections. However, the forecasts for individual chambers and governors' offices that resulted from this model were almost identical to those that did not pool legislative and gubernatorial cases, indicating pooling was not problematic. The coefficients on the four levels of error terms were as follows (standard errors in parentheses): level-4: 1.92 (.32); level-3: 2.69 (.28); level-2: 3.43 (.28); and level-1: 5.13 (.12).

[20] This was done by putting in values of "0" in all gubernatorial variables for the legislative cases, and vice versa. A dummy variable for type of election was also included. When OLS was utilized, the estimated impact of all variables was identical (eight decimal places) in comparison to that in the two OLS analyses with the non-pooled data.

Monte Carlo simulation was again utilized, and 2,000 simulated year-2010 "elections" were held by generating random variables to reflect the four levels of error (one constant in each iteration, one constant within each state in each iteration, one constant for both chambers of the legislature within one state in each iteration, one unique for each case for each iteration). Sixty-two random variables were used to reflect the uncertainty associated with the impact of the independent variables on Democratic success in elections. These had means of zero, and standard deviations that reflected the relevant coefficient's standard error.

Each of these 2,000 iterations resulted in a predicted percentage of Democrats in each legislative chamber or a predicted percentage of gubernatorial votes. For each iteration, control of each redistricting institution was called. If a super-majority was necessary to pass redistricting legislation then a party had to have the requisite percent of seats in one "trial" to have them be declared in control of the redistricting process for that chamber. On the basis of control of the two legislative and governor's chambers in that iteration, control was classified as "Democratic," "Republican," or "Split." For states in which a fifty-percent majority can override a veto pertaining to redistricting, or where the governor cannot veto redistricting plans, control of the governor's office was not considered. The probability of a governor of one party opposed by veto-proof majorities in both chambers of the legislature was also taken into account, although that circumstance was never observed in any simulation.

A dummy variable representing "Democratic Redistricting Authority" and a dummy variable representing "Republican Redistricting Authority" were then created from this classification for each iteration, and multiplied by the number of U.S. House seats the state was predicted to have after the 2010 Census reapportionment.[21] These were then totaled for the nation as a whole for each iteration. This calculation resulted in a probability distribution of possible outcomes.[22] States with bipartisan approaches to redistricting were classified as such, and were not included in the above process.[23] Similarly, twenty-one U.S. House seats reside in states that will not have state elections in 2010, and so are known in advance to have divided governments. Columns five through eight of

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[21] Information on which states will gain and lose House seats was based on a report from http://www.electiondataservices.com/images/File/NR_Appor09wTables.pdf, accessed September 17, 2010. When uncertainty existed about how many seats a state would gain or lose, fractions were used (i.e., 3.5 as Texas may gain three or four).

[22] Maine does not redistrict until after the 2012 elections, but was included in the total forecast.

[23] Although Iowa is classified as "bipartisan commission" in Table 4, it is included in the Monte Carlo analysis because the legislature and governor could ignore what the commission recommends. It is worth noting that control of Iowa state government has been divided in the three redistrictings since the creation of the commission.

Table 4 report the percent probability of different configurations of control of the redistricting process in each state.  The first configuration (column five) is Democratic control, the second (column six) is split control, and the third (column seven) is Republican control.  The fourth configuration (column eight) denotes the use of a bipartisan, or of a non-partisan commission; or marks states with one U.S. House seat.  The median result from the Monte Carlo simulations of redistricting indicated that the Republicans would have redistricting authority over 125 U.S. House seats, while the Democrats would have redistricting authority over 62.  Forty-three seats will be determined by non-partisan or bipartisan commissions or are in states with only one House seat.  That leaves 205 U.S. House districts that will be drawn by state politicians under situations of divided government.

The ninety-five-percent confidence interval for the redistricting authority forecast is fairly large.  For Republicans, it is between seven and 304 seats, while for the Democrats it is between three and 229 seats.  There is a two-thirds chance that the Republicans will have redistricting authority over somewhere between 88 and 158 seats, while there is a two-thirds chance the Democrats will have redistricting authority over 32 to 101 seats.  Overall, the Republicans can expect to hold a two-to-one advantage in control over redistricting, although 248 seats or so will be determined by a redistricting process with input from either both parties or no parties.

**Conclusion**

This paper has presented one of the first attempts to forecast state legislative elections and constitutes the first attempt at forecasting redistricting authority with a quantitative model.  Forecasts for the 2010 gubernatorial elections were also presented.  The forecasts support the conclusions of Klarner's July 22nd forecasts that the Republicans will gain control of many state legislatures, although they are forecast here to make more progress than was predicted in those earlier forecasts.

The model predicted that the Republicans would acquire control of 15 legislative chambers and win nine governor's offices, giving them control of 51 state legislative chambers and 32 governor's offices total. The forecast also estimated that the Republicans will have redistricting authority over a total of 125 U.S. House seats while the Democrats will have such authority over 62.  This implies that unified "control" of redistricting will be much rarer than bipartisan, non-partisan, or split-partisan situations.

The two-to-one advantage for the Republicans in redistricting authority is markedly different than that observed after the last four Censuses, in each of which the Democrats held at least a two-to-one advantage. In contrast to the projected 125 seats the Republicans will control in comparison to the Democrats'

62, the Democrats held a 143 to 68 seat advantage going into the redistricting process after the 2000 Census. The Democrats held even larger advantages after the 1970 Census (126 to 39), the 1980 Census (171 to 54), and the 1990 Census (124 to 5). Although there is much debate about the extent to which parties can draw districts for their own advantage, to whatever extent they can, there will be a massive shift in the political landscape towards the Republicans in contrast to past redistrictings.[24]

### Appendix A: Modeling State Legislative Elections

Space constraints prevented a full explanation of some of the details that pertained to the state legislative election model. These are given here.

There are sound reasons for arguing that using the district as the unit of analysis might make for a better forecast. There are also good arguments for using the chamber-election year as a unit of analysis. A model with the district as the unit of analysis takes into account how votes for a party are distributed across seats. Consider the case in which a party receives three percent more votes than it did in the last election in all its legislative districts. In this case, a party will carry more seats if there are ten districts in which they lost by less than three percent last election, in comparison to five such districts. Taking this difference in the distribution of seats into account is also important. This is because the proportion of competitive seats has declined over time, as mentioned above. A district level model takes into account, as well, the fact that not all seats are up for election in every chamber. Finally, it accounts for which party is in control of the seats that are not up for re-election.

On the other hand, a district-level model makes the perhaps unrealistic assumption that a national tide has a uniform impact across all districts. If parties focus resources on competitive districts, national- and state-level forces may have larger impacts in these districts than others. A model that focuses on the chamber

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[24] These data are different than data regarding which parties were in actual control of the redistricting process. When prior redistricting was done by court order, the parties that would have been in control of the process had the courts not intervened were coded as having redistricting authority over those U.S. House seats. The current forecasts make no attempt to forecast which partisan plans will be overturned by the courts, which could very well reduce redistricting authority for one party more than the other. To give a sense of how many U.S. House seats might revert to a non-partisan status because of court intervention, the figures of actual Democratic versus Republican redistricting authority (i.e., excluding cases of court intervention) are as follows: 1970 (111 to 33), 1980 (113 to 54), 1990 (84 to 5) and 2000 (139 to 68). These numbers indicate that the intervention of the courts evened the playing field substantially in 1980 and 1990, but not 1970 or 2000. Data on past redistricting authority were supplied by John N. Friedman and Richard T. Holden, and were used in their article on incumbent gerrymandering (Friedman and Holden 2009).

as the unit of analysis essentially ignores how the decisions of voters in safe districts differ from those in competitive ones.  At the same time, with a chamber-level analysis, the analyst does not have to accurately identify which districts are safe or up for grabs before the election.   Changes in voting behavior in competitive districts are expressed in aggregate seat changes.

Not all state legislative elections between 1950 and 2008 were utilized in the analysis.  The redistricting experienced by states after *Baker* v *Carr* (1962) fundamentally shifted the strength of parties in many states in a way that will not be experienced in the 2010 elections.  Similarly, the one-party South before the 1980s saw extremely small changes in the partisan balance of state governments. These conditions are not useful for making forecasts about the 2010 elections.  As a result, all state legislative chamber elections between 1963 and 1968 that involved newly created districts, and all state legislative elections that saw one party with less than ten percent of the seats in the legislature prior to the election, were excluded from the analysis.

Evidence that state legislative chambers with only half of their members up display less partisan change is as follows.  The percent of total legislative seats that changed hands should be lower in such elections than those for which all seats were up.  Legislative chambers with all of their seats up for election saw an average of 6.5 percent of seats change hands, while chambers with only half up saw 5.6 percent change.  For 2002 to 2008, the respective figures were 4.3 and 3.7 percent. Although one might expect twice as much change in chambers with twice the proportion of seats up for election, there remained a non-trivial difference in the volatility of the two types of chambers.

One useful property of the generic ballot question was that it was asked in seventeen out of 30 odd-numbered years since 1950, enabling a marked increase in variation in the national-level independent variables. The question was not asked in 1967, 1971, 1975, 1979, 1981, 1983, 1987, 1989, 1991, 1993, 1997, 2003, and 2007.

Klarner (2010) did not find that the health of the state economy influenced state legislative elections, so this variable was not included in the analysis. Furthermore, the quarterly data that would be necessary to measure the health of the state economy in a forecast was not available before 1969.

Technically, a lagged variable should have been included for each independent variable (or at least those lagged variables that attain statistical significance [De Boef and Keele 2008]) in order to capture the dynamics of the time series.  However, including lagged variables would have made the state legislative model extremely cumbersome and would have made the interpretation of the many interaction variables difficult.  Furthermore, a model that included lagged independent variables for all variables only reduced the out-of-sample forecasting errors in predicting Democratic control described in the text from 20

out of 251 to 19 out of 251.  This indicated that the inclusion of a battery of lagged independent variables had little benefit.

### Appendix B: Modeling Gubernatorial Elections

Gubernatorial election results are from the CQ Voting and Elections Collection. Cases were excluded when a non-major-party candidate won the election or garnered more than twenty percent of the vote.

A point system was used to create the variable "Prior Office-Holding Experience," matching the one utilized for U.S. Senators in Klarner (2008), based on the results of the primaries held on September 14th, 2010, and before.  If a candidate was a governor or a U.S. senator in the past, the candidate received five points.  A candidate who had served in the U.S. House received three points. Such candidates also had the proportion of the state they represented as a House member added to their score.  Candidates who had served as statewide officers (not including governors) received two points.  Former state legislators received one point.  Candidates with no prior office holding experience received no points, as did elected incumbents.  Points were multiplied by two-thirds in the case of offices not held immediately prior to the election.  Scores for Republican candidates were multiplied by "-1" and then added to the scores of Democratic candidates for a total score. Moore, Preimesberger and Tarr (2000) were the source of information about whether candidates were former governors.  The U.S. House Web site provided records on former U.S. Senate and House incumbency (http://bioguide.congress.gov/biosearch/biosearch.asp).  Information about a candidate's having held a statewide or a state legislative office in the eleven years prior to the election was from Council of State Governments (various years). Only Hawaii had not held its primary by September 14th, 2010, so it was assumed that Duke Aiona (Lieutenant Governor in 2010) would be the Republican candidate, while Neil Abercrombie (U.S. House, 2010) would be the Democratic candidate.

Not many elections from 1990 and on were missing state-level trial-heat polls, but 27 out of 249 races were missing such data.  These were, of course, not a random sample of elections.  Instead, they represented electoral contests that were too one-sided to justify an expensive poll.  To deal with this source of bias, the variable "Missing Poll Code" was added to the analysis.

The other set of elections in the United States that are perhaps most similar to gubernatorial elections are U.S. Senate elections.  Prior findings about these elections can shed light on how to best model gubernatorial elections. Comparisons of the forecasts for individual U.S. Senate races for the 2008 elections in Klarner (2008) with surveys calling these races indicated that surveys were much more accurate at predicting individual races (Klarner 2009).  The U.S.

Senate forecasting model included individual level variables such as incumbency status, roll-call liberalism of incumbent Senators measured by DW-Nominate scores, the prior office holding experience of challengers, and the prior voting history of the state. The independent variables utilized in the U.S. Senate model in question were similar to the gubernatorial model utilized here, although no measure of gubernatorial liberalism was available. Because of the highly visible Senate elections, idiosyncratic aspects of these races may cause either a surge or a decline in support for one candidate or the other. For example, facial attributes of candidates have been found to influence U.S. Senate elections (Ballew and Todorov 2007).

Gubernatorial contests are also highly salient, are even more competitive than U.S. Senate races, and may turn on idiosyncratic factors that are not easily captured by the independent variables utilized above. From 1972 to 2006, 32.2 percent of U.S. Senate elections were won by ten percent or less. In contrast, 41.0 percent of gubernatorial elections in those years were won by that amount or less. The corresponding figures for 1950 to 1972 were 40.1 and 47.2 percent, respectively. For races in which the margins were twenty percent or less, the four corresponding figures were 61.8 (U.S. Senate, 1950 to 1970), 74.9 (gubernatorial, 1950 to 1970), 53.7 (U.S. Senate, 1972 to 2006) and 66.9 (gubernatorial, 1972 to 2006) percent. These figures also highlight the fact that the competitiveness of gubernatorial elections has declined over time.

Before the gubernatorial model utilized in this paper was run, a model with the same variables--except for the state-level trial-heat variables--was run. Results of the regression are not shown due to space constraints. When this model was used to make out-of-sample predictions for races in 2004, 2006, and 2008 (only utilizing prior years), 15 out of 54 elections were called wrong, an unacceptably high error rate (72.2 percent accuracy). This is even worse than the naïve model for gubernatorial elections, reported above as 12 out of 54 elections. As reported above, when out-of-sample predictions are made for 2004, 2006, and 2008, with polls added to model, the error rate was brought down to eight out of 54 elections (85.2 percent accuracy). Although methodologically inappropriate in some ways (heteroscedasticity is introduced), this change clearly improves the ability of the model to forecast.

Table 2 reports that for gubernatorial races, the level-one standard error of the estimate of 7.5 percent reported in the second to last row of Table 2 indicated a sizeable amount of prediction error in the model. On top of this is the year-level error term of 1.8 percent. The much larger figure at the race level again underscored the importance of idiosyncratic factors in gubernatorial races. The size of the random effects is also greater than those for the U.S. House reported in Klarner (2008), of 6.4 and 1.2 percent for the district and national level error terms, respectively. Klarner (2008) also reports that these random effects are 7.3

and 1.6 percent for the U.S. Senate, comparable to those of gubernatorial elections, although no state-level polls were utilized in the U.S. Senate models.

When the analyses of gubernatorial elections were done with OLS, the R-squared and standard error of the estimate was .49 and 7.9, respectively. For state legislative elections, these figures were .86 and 6.7. This again highlighted the fact that gubernatorial elections are harder to predict than those for the state legislature.

As Democratic vote intention is "causally close" to the dependent variable, it was useful to assess how the other national-level variables perform when this variable was dropped. However, none of the national-level variables that initially failed to attain statistical significance did so.

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