

# Forecasting the Presidential Vote in the States, 1948-2004: An Update, Revision, and Extension of a State-Level Presidential Forecasting Model

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**SUMMARY.** This research updates, revises, and extends a forecasting equation of the presidential vote in the states. The original equation was composed of sixteen predictors available well before the election and estimated with data from 531 state elections from 1948 to 1988. The equation was empirically strong, based on objective predictors, and more parsimonious than previous equations. Reexamining the equation with 200 additional state elections from 1992, 1996, 2000, and 2004 indicates that the equation remains well supported, but suggests several opportunities for improvement. A revised equation has a mean absolute error of 3.2 percentage points and correctly predicts 87 percent of all electoral votes. The extension of the analysis adapts the forecast equation to predict electoral vote winners, conducting a logit analysis that takes into account both the size of the state and the closeness of its previous election. This produces more accurate forecasts of both electoral vote winners in the states and the division of the aggregate national electoral vote. [Article copies available for a fee from The Haworth Document Delivery Service: 1-800-HAWORTH. E-mail address: <docdelivery@haworthpress.com> Website: <<http://www.HaworthPress.com>> © 2006 by The Haworth Press, Inc. All rights reserved.]

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If recent elections have demonstrated anything, it is that the distribution of the votes in the *states* is critical in presidential elections. The election of George W. Bush over Al Gore in 2000 hinged on his razor-thin victory in Florida (along with popular vote pluralities in 29 other states). Four years later, President Bush's reelection over John Kerry hinged on the electoral votes in Ohio. With the results of both the 2000 and 2004 elections not-so-gently reminding election forecasters of the importance of the state distribution of the presidential vote, it is an appropriate time to revisit a model designed to forecast the presidential vote in the states.

Before revisiting the state forecasting model, it is important to clarify the assumptions about campaign effects that underlie election forecasting models in general. Since these models offer their predictions in advance of the campaign, it is often assumed that they suppose that campaigns do not matter. This is *not* the case. Forecasting models assume that campaigns *do* matter, though their net effects are constrained by partisanship and other reasons for voters deciding how they will vote

before the campaign begins and the general effect of campaigns can themselves be anticipated. The fundamentals in place before the campaign are helpful in predicting elections because they are the raw materials (e.g., the economy, incumbency) that largely influence how the campaign shapes up. Forecasting models also admit that they are imperfect, that unanticipated events in the campaign will alter the vote from what otherwise might have been expected. This said, it is the ambition of forecasting models to identify as accurately as possible what should be expected in an election.

### ***PREVIOUS STATE MODELS***

The first forecasting equation of the presidential vote in the states was devised by Steven Rosenstone (1983). His equation included 25 predictor variables and an additional 49 state dummy variables and was estimated over 343 presidential elections in the states from 1948 to 1972. The equation accounted for 93 percent of the variance in the presidential vote, leaving a standard error of just 4.5 percentage points of the vote (Rosenstone 1983, table 4.1). The equation's mean absolute error was just 2.9 percentage points of the state vote and compared quite favorably to forecasts from the polls and the pundits. The equation was, however, open to several criticisms. It contained a large number of independent variables (74) relative to the number of observations (343). With so many variables, a good deal of variation might be accounted for by chance and the equation might not perform so well in future elections. The highly subjective nature of some variables (the estimation of candidate positions by experts sometimes decades after the election), the ad hoc inclusion of other variables (e.g., Kennedy's Catholicism in 1960 and a "mismanagement of wars" variable), and the inclusion of some variables whose values are unknown until after the election (economic growth) also could be considered vulnerabilities of the equation (Campbell 1992, 387-8).

An alternative equation constructed by Campbell (1992) addressed these concerns and integrated a state level model with a national vote forecasting model based on the candidates' standings in the pre-campaign preference polls and the state of the economy at the start of the campaign (Campbell and Wink 1990; Campbell 2000a, 2000b). The equation used predictor variables that were fewer in number, more objective, and available well before the election being forecast. The equation predicted the state two-party popular vote for the Democratic

Party's candidate based on 16 predictors. Three of the variables were at the national level: the Democratic presidential candidate's two-party share of Gallup's national trial-heat poll before Labor Day, the second quarter change in the real gross national product (reoriented based on whether the Democrats were the in-party), and whether the incumbent president was running (+1 if a Democratic president was running, -1 if a Republican president was running, and 0 if an incumbent was not running). Several national forecasting models explicitly recognize the impact of presidential incumbency (Norpoth 2000; Abramowitz 1988, 2000; Fair 1988, 1996) and other equations oriented in terms of the vote for the in-party candidate implicitly allow for an in-party effect (Campbell 2000c, 178-181). The equation also included seven state-level variables.<sup>1</sup> Included were the deviations of the state's presidential vote from the national vote in the two previous elections, dummy variables for home state advantages for the presidential and vice presidential candidates (Garand 1988; Lewis-Beck and Rice 1983), the percentage of the lower chamber of the state legislature after the midterm election who were Democrats, a standardized measure of economic growth in the state in the first quarter of the election year, and an index of the state's ideological orientation based on the ADA and ACA ratings of its congressional delegation (Holbrook and Poe 1987).<sup>2</sup> A set of six regional variables completed the equation. The first of these was a variable reflecting the regional advantage traditionally accorded southern Democratic candidates. The remaining five regional variables reflected the regional realignment that occurred in the 1960s and 1970s. Regional partisan shifts began in the early 1960s, initially with northeastern states moving toward the Democrats (Carmines and Stimson 1989) and with southern states moving away from them (Bullock 1988; Bullock, Gaddie and Hoffman 2002; Petrocik 1987; Stanley 1988). The regional realignment was later felt in northern central states moving in the Democratic Party's direction and mountain west states moving in the Republican direction (Bullock 1988; Bullock, Gaddie and Hoffman 2002; Campbell 2003). The set of five variables was included to recognize the aberrations from normal politics of these one or two election jolts to the state vote.

The sixteen variable equation was estimated over 531 presidential elections in the states from 1948 to 1988. The equation accounted for approximately 85 percent of the variance in the state presidential vote with a standard error of 3.9 percentage points. The mean absolute error in the state predictions was just slightly more than three percentage points. While the summary statistics for the accuracy of this model were

a bit weaker than Rosenstone's model, the fact that the equation was based on many more cases (about 50 percent more) with substantially fewer and more objective variables (all available at least two months before the election) made it preferable (Gelman and King 1993, 414-5). The elimination of the 49 state dummy variables made the equation much more parsimonious and less dependent on unspecified state effects.

This paper has three missions. The first is to update Campbell's 1992 equation to determine how well it survived the four intervening presidential elections. The addition of 200 new observations represents a substantial increase (38 percent) in the number used to estimate the equation. Their inclusion offers a real test of the accuracy and robustness of the equation, two qualities of central importance to forecasting equations. Some critics deride forecast models as "data fitting" exercises (though virtually all non-forecasting research could be subject to this same criticism). This charge of a post hoc model cannot apply when data only become available after the fact of the equation. It is impossible for information from the added elections to have influenced the specification of the equation. Moreover, Greene (1993, 19) criticized the original equation's specification for including the set of regional realignment variables. He suggested that their inclusion may have inflated the fit of the model, raising doubts about its robustness.<sup>3</sup> Since none of the 200 new cases are affected by these regional realignment variables, their addition offers a particularly strong test of the equation as well as of Greene's critique. The second goal is to determine in what ways the model might be improved. The additional information and research accumulated over the last fourteen years may suggest where the model could be strengthened. The third goal is to adapt the forecasting model to predict the election's outcome. The original estimation, like that of Rosenstone's equation, sought to minimize the forecasting error in the states, regardless of the state's size or importance to the election. This is the conventional and, for some purposes, the appropriate criteria. However, in using the state forecasts to aggregate to a national electoral vote forecast, treating the states equally makes little sense. We should care more about minimizing errors in the large states than in the small states. A percentage point error in predicting the California vote is a bigger mistake than the same percentage point error in predicting the Montana vote. Similarly, from the standpoint of helping to predict state votes in the states that may matter the most to an election's outcome, we should care a great deal more about minimizing prediction errors in large electoral vote, swing states than in small electoral

vote, safe states. Ultimately, we should care more about predicting the winner (rather than the vote percentage) in large electoral vote, swing states more than in small electoral vote, safe states. Thus, we will offer estimates of the revised equation suitable for predicting electoral votes.

### ***THE STATE FORECAST EQUATION REPLICATED AND UPDATED***

The first equation in Table 1 presents a replication of the 1992 model estimated for the 531 state elections between 1948 and 1988. The equation is not a perfect replication of the 1992 model because of a required change in the general indicator of the election year economy. Because the Bureau of Economic Analysis changed its featured economic indicator from the gross national product (GNP) to the gross domestic product (GDP), because we are using wherever possible the August release of this statistic (the one that would be actually available to generate a forecast in a year), and because we are using unrounded vote percentages, the equation's estimates differ slightly from the original.<sup>4</sup> Still, the near replication of the equation has coefficients very close to those of the original and the overall goodness-of-fit measures are also very near to the original, accounting for about 83 percent of the variance with a standard error of about four percentage points and a mean absolute error of about 3.2 percentage points.

The equation can also be evaluated by examining out-of-sample forecasts for the elections held since 1988. Estimated coefficients were obtained for elections through 1988 to generate out-of-sample forecasts for 1992, through 1992 to generate out-of-sample forecasts through 1996, through 1996 to generate forecasts for 2000, and through 2000 to generate forecasts for 2004. As would be expected the mean absolute, the mean out-of-sample error of 4.8 percentage points (a median of 4.2 percentage points) was higher than the in-sample errors. The errors were largest in 1996 (a mean absolute error of 5.9 percentage points)<sup>5</sup> and lowest in 1992 (a mean absolute error of 3.9 percentage points). Overall, the out-of-sample estimates correctly indicated the candidate receiving a state's plurality in 75 percent of the cases. With almost half of the states decided by votes within the 55 to 45 percent range in elections since 1992 (45 percent), this is not a bad record, but perhaps one that could still be improved upon.

The second equation in Table 1 presents the updated estimates of the model, the identical specification as the first equation but now estimated

TABLE 1. The Forecasting Equation of the Two-Party Presidential Popular Vote Percentage in the States, 1948-2004

Dependent variable: Democratic two-party state presidential vote%						
Independent variables	Replication, 1948-1988			Updated, 1948-2004		
	B	(SE)	beta	B	(SE)	beta
Constant	23.438	(1.314)	--	21.471	(1.254)	--
<b>NATIONAL VARIABLES</b>						
Democratic Trial-Heat Percentage	.468	(.027)	.426	.509	(.023)	.462
2nd Qtr. GDP Growth $\times$ Incumbent Party	2.081	(.173)	.263	1.421	(.165)	.178
Elected Incumbent Seeking Reelection	2.113	(.326)	.160	.956	(.259)	.078
<b>STATE VARIABLES</b>						
Prior State Vote Deviation from National Vote (t-4) [adjusted]	.320	(.035)	.263	.391	(.034)	.337
Prior State Vote Deviation from National Vote (t-8) [adjusted]	.287	(.029)	.266	.272	(.030)	.246
Presidential Home State Advantage	6.884	(1.045)	.123	6.551	(.926)	.125
Vice-Presidential Home State Advantage	2.571	(.990)	.048	2.822	(.904)	.054
State Legislature Party Division (t-2)	.036	(.011)	.089	.033	(.010)	.079
Standardized 1st Qtr. State Economic Growth $\times$ Incumbent Party	.652	(.182)	.066	.296	(.169)	.031
State Liberalism Index (ADA & ACA)	.003	(.006)	.118	.031	(.005)	.114
<b>REGIONAL VARIABLES</b>						
Pres. Home Region (Southern) Advantage	7.046	(1.049)	.144	3.296	(.739)	.092
Southern State (1964)	-8.568	(1.802)	-.114	-7.116	(1.930)	-.083
Deep Southern State (1964)	-17.118	(2.888)	-.132	-18.012	(3.154)	-.121
New England State (1960 & 1964)	7.168	(1.257)	.110	8.127	(1.339)	.109
Rocky Mountain West State (1976 & 1980)	-7.504	(1.026)	-.143	-7.784	(1.104)	-.131
North Central State (1972)	4.536	(1.413)	.060	3.341	(1.531)	.039
Number of Cases	531			731		
R <sup>2</sup> (Adjusted R <sup>2</sup> )	.832	(.827)		.787	(.782)	
Standard Error of Estimate	4.053			4.435		
Mean Absolute Error	3.159			3.468		
Median Absolute Error	2.659			2.874		
Percent States Predicted Correctly	88.9			84.7		
Percent Electoral Votes Predicted Correctly	87.2			83.6		

Note: Partisan divisions (e.g., presidential vote %) involve only the two major parties. Except for regional trends, positive values on each variable are hypothesized to favor Democratic presidential candidates. Regional trends are dummy variables (1 for states in the region for the specified year(s) and 0 otherwise). The adjustment to the prior presidential vote deviations include the temporary prior state and regional (southern) presidential and vice-presidential advantages.

with data added from the 1992, 1996, 2000, and 2004 elections. The updated estimates are based on a total of 731 state elections. The addition of the 200 new observations, cases that could not have affected the equation's specification in any way and cases that could not have been overfitted by any of the five regional realignment variables, leaves the equation's overall fit fairly well intact.<sup>6</sup> The equation accounts for approximately 79 percent of the variance (a drop of 4.5 percentage points from the 1948-88 replication) with a standard error of 4.44 percentage points (an increase of four-tenths of a percentage point) and a mean absolute error of about 3.5 percentage points.<sup>7</sup> The fact that the equation held up so well testifies to its robustness.

There are, however, several important differences that emerge when comparing the replication and updated estimates of the equation. These suggest where the equation might be revised and strengthened. Four coefficients declined in absolute magnitude by more than thirty percent from their original (replicated) estimates.<sup>8</sup> The first two of these were the second quarter change in the economy (GDP) and presidential incumbency. According to the original estimates, the in-party candidate's vote was expected to increase by about two percentage points for every one percentage point increase (non-annualized) in the second quarter economy. The updated estimate indicates an expected vote increase of less than one and a half points from a one point boost in the economy. The expected effect of an incumbent running also dropped from a bit over two points to only one point. It is quite plausible that these two changes are linked. As the national forecast models suggest (Campbell 2001a, 2001b; Lewis-Beck and Tien 2001) and as individual-level voter research has found (Nadeau and Lewis-Beck 2001, 175-6), the effects of incumbency and the rewards or punishments for economic performance may be interactive. Incumbents may receive full credit or blame for the economy, but successor candidates of the in-party (in-party candidates who are not the current president) may receive only partial credit or blame. This interactive effect of incumbency and economic growth will be included in revising the equation. Additionally, the national forecasting model (Campbell 2000) suggests that much of the personal incumbency advantage is already incorporated into the model though the trial-heat and the economic growth variables. Since some variables (e.g., the national and state economic variables) are reoriented (or interacted with) to the in-party, an in-party variable will be substituted for the personal incumbency variable to adjust the constant for these interactions.

A third variable whose coefficient declined noticeably was the impact of the first quarter growth in the state economy. The coefficient for the states' economic growth dropped from .65 to .30. This variable exerted only a very minor influence on the state vote prediction by the original estimates and its impact in the updated estimation is even smaller. In exploring several explanations for this decline, it appears that the decision to standardize state economic growth within an election year may have discarded useful information.<sup>9</sup> The unstandardized variable will be included in the revised equation.

The fourth variable that declined in impact was the southern home regional advantage of Democratic presidential candidates. This could be expected. The south is not the Democratic bastion that it once was and there is no reason to expect that southern voters will look as fondly on southern Democratic candidates as they once did. The southern regional advantage dropped from about seven to about four percentage points. In the out-of-sample forecasts of the original equation for 1992, 1996, and 2000 (each having a Southern Democrat heading the ticket), the expected Democratic vote (with the home region advantage) was less than the actual Democratic vote in 31 of the 33 elections in southern states. The southern regional advantage will be specified in the revised equation as having expired in elections since 1984.

Although not suggested by a comparison of the replicated and updated equation, there is good reason to attempt to improve upon the state ideology measure used in the original estimation. That measure is a constant for each state across the 56-year span of elections. This would seem to be implausible. Although there was virtually no change in the strength of the variable in the updated estimation, it is likely that the fixed state ideology variable would increasingly weaken the equation over an even longer span of elections. Anticipating this possibility, we will replace the static indicator of a state's ideological tilt with one that is more contemporary to the election year of the forecast.

### ***THE STATE FORECAST EQUATION REVISED***

A review of the updated estimation of the state forecast equation suggests six changes that might improve the equation. Most of the changes are relatively minor and collectively they leave the overall predictive strength of the equation about where it was; nevertheless, there are sound reasons to make each change. The revised equation with the six changes is the first equation in Table 2.

TABLE 2. The Revised State Vote Forecasting Equation, 1948-2004

Dependent variable: Democratic two-party state presidential vote %						
Independent variables	Revised Model, 1948-2004					
	Replication, 1948-1988			Updated, 1948-2004		
	B	(SE)	beta	B	(SE)	beta
<b>NATIONAL VARIABLES</b>						
Democratic Trial-Heat Percentage	.506	(.023)	.460	.495	(.022)	.466
2nd Qtr. GDP Growth × Incumbent Party	.794	(.328)	.100	.426	(.317)	.056
2nd Qtr. GDP × Incumbent Running	1.060	(.405)	.110	1.333	(.387)	.144
Incumbent Party (+1 Dem., -1 Rep.)	-.753	(.230)	-.079	-.530	(.223)	-.058
<b>STATE VARIABLES</b>						
Prior State Vote Deviation from National Vote (t-4) [adjusted]	.439	(.032)	.362	.557	(.036)	.436
Prior State Vote Deviation from National Vote (t-8) [adjusted]	.263	(.028)	.233	.175	(.035)	.139
Presidential Home State Advantage	5.962	(.854)	.114	5.582	(.827)	.110
Vice-Presidential Home State Advantage	2.270	(.837)	.044	2.066	(.795)	.042
State Legislature Party Division (t-2)	.015	(.009)	.034	.016	(.009)	.038
4th Qtr. to 1st Qtr. State Economic Growth × Incumbent Party	.391	(.048)	.173	.364	(.047)	.163
Recent State Liberalism Index (ADA)	.035	(.006)	.101	.029	(.006)	.086
<b>REGIONAL VARIABLES</b>						
Pres. Home Region (Southern) Advantage (up to 1980)	8.783	(1.036)	.158	7.571	(1.113)	.127
Southern State (1964)	-5.917	(1.769)	-.069	-5.486	(1.685)	-.067
Deep Southern State (1964)	-18.060	(2.903)	-.122	-18.475	(2.756)	-.131
New England State (1960 & 1964)	9.517	(1.216)	.128	9.490	(1.115)	.134
Rocky Mountain West State (1976 & 1980)	-5.941	(1.035)	-.100	-6.042	(.983)	-.107
North Central State (1972)	3.004	(1.408)	.035	3.174	(1.335)	.039
Number of Cases	731			710		
R <sup>2</sup> (Adjusted R <sup>2</sup> )	.819	(.815)		.825	(.820)	
Standard Error of Estimate	4.082			3.870		
Mean Absolute Error	3.225			3.082		
Median Absolute Error	2.722			2.564		
Percent States Predicted Correctly	87.4			88.0		
Percent Electoral Votes Predicted Correctly	86.9			87.5		

The first revision is the most important. It adds a seventeenth predictor to the equation. Based on the weakening of the national economic and incumbency variables in the update, recent experience with the national forecasting equations, and findings regarding reduced levels of retrospective voting when the incumbent is not personally running in the election, an interaction term of national economic growth and whether the in-party candidate was the incumbent (rather than a successor in-party candidate) was included. Both the additive and interaction economic variables are statistically significant. The additive and interaction economic terms indicate that a one percentage point increase in the second quarter GDP can be expected to increase an incumbent's vote by 1.9 percentage points in each state, but can be expected to increase a successor candidate's vote by only about .8 of a percentage point in each state. That is, as recent research suggests (Nadeau and Lewis-Beck 2001; Lewis-Beck and Tien 2001; Campbell 2001b), the vote for successor candidates reflects the economic record, but successor candidates receive much less credit or blame than incumbents.

The second change pertains to the state deviations in the last two elections and is minor. The deviations of the state votes from national vote in the previous two elections are adjusted to take into account any home state and southern regional advantages that the candidates may have had. The point is to obtain a measure of relative state partisanship in presidential voting uncontaminated by "friends and neighbors voting" that do not reflect the basic partisan disposition of the state. These adjustments have been refined with the new estimates afforded by the added elections in this analysis.<sup>10</sup>

The third change is in the state economy indicator. The original estimation of the equation used the state economic growth measured by the first quarter's standardized growth rate in a state's personal income reported by the Bureau of Economic Analysis in August (the sign oriented according to which party held the presidency). The change examined was from the fourth quarter of the preceding year to the first quarter of the election year. This variable's coefficient declined in absolute magnitude by more than half from the original to updated estimations. In response, we no longer standardize the measure within the year. This allows the variable to capture whether a state was experiencing stronger or weak growth compared to past years and not just compared to other states—as was previously the case. As a comparison of the standardized indicators suggest, this revision substantially increases the impact of this variable on the forecasts.

The fourth change is to the state ideology measure. The original measure was based on the ADA and ACA ratings of a state's congressional delegation and was constant for a state over time. This is clearly unsatisfactory. The revision is based on the average ADA ratings of a state's two senators over the first two years since the last presidential election. For example, the two U.S. Senators from Alabama each had ADA ratings of zero and 5 in the 1997 and 1998 sessions of Congress. This is an average ADA rating for the state of 2.5. This measure has the virtue of using the same number of multiple observations from different representatives for each state (except when vacancies caused missing data) and allowing each state's ideological position to change over the years. Despite these advantages, the revised indicator did not strengthen the equation. However, its long-term advantages favor its inclusion.

The fifth change is in the southern Democratic home region advantage. The coefficient for this predictor declined by more than fifty percent in the update. This fact along with the now obvious partisan realignment that ended Democratic dominance in southern states dictates that this variable be revised to acknowledge the end of a southern Democratic regional advantage after 1980. Since Democrats did not run a southerner at the head of the ticket in either 1984 (Mondale from Minnesota) or 1988 (Dukakis from Massachusetts), there is not an issue of exactly when the southern regional advantage ended. As a comparison of the coefficients for the updated and revised equations indicate, the change in the southern regional advantage is supported by the data. In dropping the southern regional advantage after 1980, the coefficient more than doubles in magnitude and the standardized coefficient increases from .09 to .16.

The final change replaces the personal incumbency variable with a party incumbency (or in-party) variable. This is scored +1 when a Democrat is president and -1 when a Republican is president. The rationale for the in-party variable is that the economic growth variables are interacted with the in-party variable to reorient them so that good economies boost the Democratic vote when the Democrats are the in-party and reduce the Democratic vote when Republicans are the in-party (and vice versa when the economy is sluggish). Since there is no natural neutral point for economic growth (voters expect some minimum threshold of growth), the constant should be different when Democrats are the in-party (benefiting from average economic growth) and when Republicans are the in-party. The negative coefficient for the in-party variable makes this adjustment. If we wanted to gauge the actual impact of being the in-party, we would need to calculate the impact of the interaction

terms as well as the additive term. Assuming the party's incumbent is running and plugging in the average national and state economic growth rates under each party, the estimates indicate that in-party status and incumbency boost the average state vote by 1.4 percentage points for the Democrats and 1.6 percentage points for Republicans. Without an incumbent in the race (again assuming average economies), in-party status boosts the expected vote by .8 of a point for Democrats and .7 for Republicans.

The second equation in Table 2 estimates the revised equation on state elections from 1948 to 2004 after setting aside state elections in which a third-party presidential candidate carried the state or had carried the state in either of the two previous election years (because of the equation's use of the state's prior vote deviations). State elections won by third-party or independent candidates are abnormal cases that may not help in predicting the normal two-candidate presidential contest. Twenty-one cases are culled from the data set using these conditions. All of the dropped cases are southern states before the 1980 election. The 1948 victories of Strom Thurmond and the 1968 victories of George Wallace in southern states account for most of these set aside cases.<sup>11</sup> As one would expect, the estimated model with these trimmed cases marginally improves the fit of the equation. In general, the equation is strong.<sup>12</sup> The mean absolute error of the expected vote was about 3.1 percentage points (a median error of 2.6 points). The absolute error was less than five percentage points in 81 percent of the cases (578 of 710 state elections). As a basis for comparison, a naive prediction of a 50 percent vote for each party would have produced a mean absolute error of 7.9 percentage points (a median error of 6.6 points).<sup>13</sup> The absolute error of the fifty-fifty naive forecast would have been less than five percentage points in fewer than 40 percent of the cases. The equation predicted the correct winner of the state vote in 87 percent of the cases (639 of 710) and also 87 percent of electoral votes (6872 of 7912), not including the easily predicted District of Columbia.

Tables 3 and 4 present an analysis of the forecast errors (more accurately, postdiction errors since these are computed after the election) for the revised model estimated with third-party victory cases excluded. Table 3 presents the mean errors for the equation for each election year, and Table 4 presents the mean errors for each state. The distribution of errors across the years indicates positive attributes for the equation. First, there are no especially large or especially small error years. All of the election mean errors are between 2.6 and 3.8 percentage points. In the original analysis, three of the eleven elections (27%) had mean ab-

TABLE 3. Mean Forecast Error by Election Year, 1948-2004

Election	Mean Absolute Vote Percentage Error
1948	3.12
1952	3.80
1956	3.18
1960	3.57
1964	2.88
1968	2.69
1972	3.14
1976	3.51
1980	2.75
1984	2.83
1988	2.64
1992	2.70
1996	3.73
2000	3.03
2004	2.79
Total	3.08

Note: The errors are from expected vote values from the second equation in Table 2 (excluding third-party cases). Each mean for elections from 1980 to 2004 is based in 50 state elections. Because of third-party victories and the predating of the admission of Alaska and Hawaii as states, the means of election years before 1980 are based on fewer cases. The number of cases for each of these earlier elections is as follows: 1964 (46), 1960 (47), 1956 (44), 1952 (44), and 1948 (44).

solute errors of 3.4 percentage points or greater. In the revised equation, four of the fifteen elections (also 27%) have mean errors of that magnitude. Finally, if there is any discernible pattern in the election year errors at all it is that elections in more recent years have been more predictable. Only two elections since 1980 produced mean errors of more than three percentage points, and this is after dropping the problematic third-party state elections in the earlier years.

The errors in the states are also well distributed. While ten states in the original analysis had mean absolute errors in excess of four percentage points, the revised equation produced errors of this magnitude in only seven states. Much of this more even distribution of errors seems to be related to setting aside the problematic third-party cases. With the revised estimation, three southern states improved their error rankings considerably. In both relative and absolute terms, forecasts for Georgia, Louisiana, and Mississippi were improved substantially in the revised forecasting equation. The mean error in each case was reduced by more than a full percentage point. There is also no evident pattern of greater or smaller errors by region. Though there were several large electoral

vote states with errors (California, New York, and Texas), in general forecasts were unrelated to a state's size or even a bit smaller in the large states. The correlation between the absolute error of the postdicted vote and a state's size (as reflected by its number of electoral votes) was weakly negative ( $r = -.13$ ). The accuracy rate in predicting the winner of the state was equally high in large and in small electoral vote states (88.2 percent right in states with 15 or more electoral votes and 88.0 percent right in states with fewer than 15 electoral votes).

### ***EXTENDING THE REVISED FORECASTING EQUATION***

The estimation of both the original and revised forecasting equations was based on minimizing the vote division errors in all states, regardless of the size of the state or the closeness of the vote. All state elections were treated equally in the estimation. However, all state elections are not equal or, at least, there is good reason not to treat all state elections equally. If we are interested in the impact of state votes on an election's outcome we should be much more concerned about getting the large electoral vote states right. Getting California right is much more important than getting Montana right and the estimation criteria should reflect this concern. We should also be more concerned about the forecast accuracy in the swing states, those that we might expect to have a near even division of the vote. Getting a swing state like Florida right should be of greater concern than getting rock solid Democratic states like Rhode Island and Massachusetts or bedrock Republican states like Utah and Wyoming right. Moreover, though interest in the vote division in a state is understandable for some purposes, ultimately it is the question of predicting who wins or loses the state that affects the electoral vote counts that determine who wins the presidency. So rather than simply predict the popular vote division for all states, we can extend the model to address these different concerns by estimating a logit equation to predict the winner of the state's electoral vote (rather than the state's vote division), weighted to make it more sensitive to large electoral vote and closely divided states.

Table 5 presents the revised forecasting model predicting state winners estimated after weighting the state election data for both the size of the state and the closeness of the state's vote in the previous election. Since the importance of a state to the election's outcome is disproportional to its electoral vote because of the winner-take-all provision used by all but two states (Maine and Nebraska), the importance of size

TABLE 4. Mean Forecast Error by State, 1948-2004

Rank	State	Mean Absolute Error	Rank	State	Mean Absolute Error
1.	Indiana	1.41	26.	New Hampshire	3.05
2.	North Carolina	1.77	27.	Nevada	3.07
3.	Ohio	1.96	28.	Colorado	3.10
3.	Michigan	1.96	29.	Idaho	3.12
5.	Arizona	2.12	30.	Kansas	3.17
6.	Alabama	2.20	31.	Oregon	3.20
7.	Connecticut	2.25	32.	Utah	3.21
8.	Pennsylvania	2.35	33.	California	3.32
9.	Illinois	2.38	34.	Kentucky	3.37
10.	Minnesota	2.40	35.	New York	3.37
11.	Delaware	2.41	36.	Alaska	3.38
12.	Virginia	2.54	37.	Nebraska	3.51
13.	Washington	2.57	38.	Arkansas	3.53
14.	Missouri	2.59	39.	West Virginia	3.61
15.	New Mexico	2.72	40.	Iowa	3.75
16.	Mississippi	2.75	41.	South Carolina	3.75
16.	Wisconsin	2.75	42.	Hawaii	3.82
18.	Wyoming	2.80	43.	Vermont	3.91
19.	Montana	2.84	44.	Rhode Island	4.02
20.	Louisiana	2.85	45.	Massachusetts	4.12
21.	Maryland	2.86	46.	South Dakota	4.20
22.	New Jersey	2.88	47.	Texas	4.31
23.	Georgia	2.95	48.	Maine	4.43
24.	Florida	2.97	49.	North Dakota	4.57
24.	Tennessee	2.97	50.	Oklahoma	4.83

Note: The errors are from expected vote values from the second equation in Table 2 (excluding third-party cases). Each state's mean is based on 15 elections, except when elections have been excluded because of a third-party victory in the state in the current or previous two election years or when a state had not been a state for at least two election years. The lag of including states is because of the equation's specification of each state's voting history in the prior two elections. State mean errors based on fewer than 15 elections and the number of elections used in the average are Alabama (8), Alaska (10), Arkansas (12), Georgia (12), Hawaii (10), Louisiana (9), Mississippi (7), and South Carolina (12).

weighed in as the square of the state's electoral votes. The closeness of the state was determined by whether the state vote was within the 60-40-percent range in the previous election. Since the importance of closeness also depends on the state's size, the weight attached to close states was the cube of the state's electoral votes (the weight of states that had not been close was the square of its electoral votes). As in equation 2 of Table 2, elections won by third-party candidates in that election or in either of the previous two elections in the state are excluded.

The revised specification of the equation with data weighted for both the size and political closeness of the state is estimated as a logit and presented in Table 5. With the new dependent variable of the winner of the state as well as the logit rather than OLS regression estimation, the parameters of the equation are not easily compared to the earlier forecast equation. However, it is clear that some of the variables that were helpful to predicting the vote division from the unweighted data are not so helpful in predicting state winners from the size and closeness weighted data. In particular, the home states of the vice presidential candidates, the party division of the state legislature, the southern and deep south state realignments along with the western and north central state realignments as well as (inexplicably) the deviation of the state's vote in the immediately preceding election were substantially weaker in predicting the electoral vote winners of large, closely fought states. Despite these variations in the impact of predictors, the bottom line is that this estimation was successful in significantly improving predictions in the large states. The weighted logit analysis correctly predicted the presidential winner in six fewer states than did the revised equation forecasting the vote in Table 2 (619 to 625), but the important difference is that the weighted logit had a better batting average among the large electoral vote states. While the vote equation correctly anticipated the winning candidate in 120 of 136 state elections (88.2 percent) of states with 15 or more electoral votes, the weighted logit was right in 129 of these 136 (94.9 percent) big electoral vote states.<sup>14</sup> As a result, the weighted logit estimation of the forecast equation correctly predicted a larger share of electoral votes. Of the 7,726 electoral votes in the 710 state presidential elections examined (non-major party wins excluded), the revised vote equation predicted 6,763 correctly (87.5 percent) and the revised and weighted logit outcome equation predicted 6,941 correctly (89.8 percent)—an increase of 178 correctly predicted electoral votes or about an additional 12 correctly identified electoral votes per election (the equivalent of one additional good sized state correctly predicted).

The overall accuracy of the postdictions from the weighted logit analysis in Table 5 is displayed in Figure 1. The figure plots the Democratic presidential candidates' two-party share of electoral votes and their expected share based on the logit generated probability of which party carried the state. For comparability, the electoral votes of the few states previously excluded because of third party voting are included (as correctly identified) as are District of Columbia's electoral votes in 1964 and thereafter. State electoral votes are calculated as awarded in

TABLE 5. The Electoral Vote Weighted Revised State Vote Forecasting Logit Equation, 1948-2004

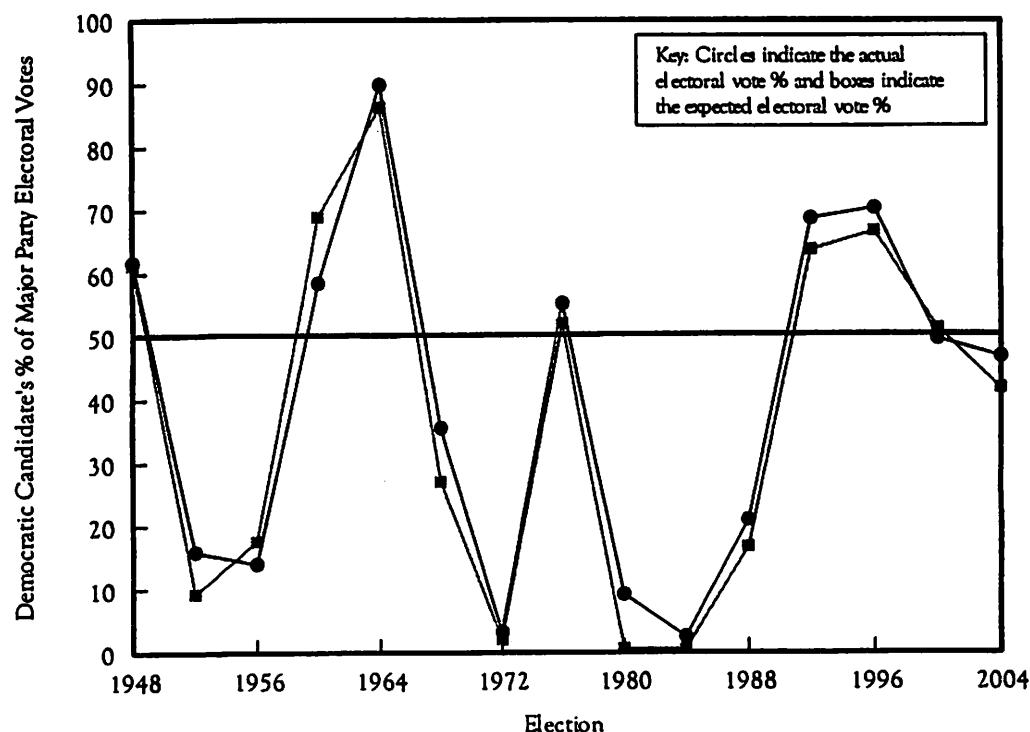
Independent variables	Estimate	(SE)	Odds-ratio
Constant	-16.447	(.029)	--
<b>NATIONAL VARIABLES</b>			
Democratic Trial-Heat Percentage	.301	(.000)	1.351
2nd Qtr. GDP Growth × Incumbent Party	3.886	(.010)	48.735
2nd Qtr. GDP × Incumbent Running	1.115	(.007)	3.048
Incumbent Party (+1 Dem., -1 Rep.)	-4.672	(.011)	.009
<b>STATE VARIABLES</b>			
Prior State Vote Deviation from National Vote (t-4) [adjusted]	.063	(.001)	1.065
Prior State Vote Deviation from National Vote (t-8) [adjusted]	.605	(.001)	1.831
Presidential Home State Advantage	8.740	(.022)	1000+
Vice-Presidential Home State Advantage	-.445	(.022)	.641
State Legislature Party Division (t-2)	-.047	(.000)	.955
4th Qtr. to 1st Qtr. State Economic Growth × Incumbent Party	.464	(.002)	1.590
Recent State Liberalism Index (ADA)	.033	(.000)	1.033
<b>REGIONAL VARIABLES</b>			
Pres. Home Region (Southern) Advantage (up to 1980)	14.086	(.376)	1000+
Southern State (1964)	13.537	(9.034)	1000+
Deep Southern State (1964)	-44.047	(66.037)	.000
New England State (1960 & 1964)	4.353	(.182)	77.704
Rocky Mountain West State (1976 & 1980)	-9.256	(46.125)	.000
North Central State (1972)	-8.405	(9.862)	.000
Number of Cases (weights)	710	(3,504,058)	
McFadden's Rho-Squared	.728		
Percent states predicted correctly	87.2		
Percent of states with 15 or more electoral votes	94.9		
Predicted Correctly			
Percent of states with 14 or fewer electoral votes	85.4		
Predicted Correctly			
Percent of Electoral Votes Predicted Correctly	89.8		

Note: Cases are weighted by the square of the state's electoral votes if the previous election in the state had not been close (more than a 60% plurality) and the cube of the state's electoral votes if the previous election in the state had been close. Non-third-party victories excludes elections in which a third-party candidate won the state in the current or either of the two preceding elections.

the election and do not include the stray votes cast by the occasional "faithless elector."

As the joint plot of actual and expected electoral votes demonstrates, the aggregation of the logit postdictions tracks the actual electoral vote exceedingly closely. The mean absolute difference between the actual

FIGURE 1. Actual and Expected Democratic Candidate Share of Electoral Votes Won by Major Party Candidates, 1948-2004.<sup>1</sup>



<sup>1</sup>The expected electoral votes were generated from the logit equation estimates in Table 5. The percentages include votes from the District of Columbia in elections since 1964. States excluded from the estimations because of non-major party votes are included in both the actual and expected percentages. The percentages do not reflect deviations from votes because of "faithless electors." The actual electoral college vote percentages are calculated from Moore, Preimesberger and Tarr's *Congressional Quarterly's Guide to US Elections* (2001).

and expected percentage of electoral votes won by the Democrat was only 4.5 percentage points and the correlation between the two series was very nearly perfect ( $r = .986$ ).

The postdictions are especially interesting with respect to the two most recent and most closely decided elections. The aggregate postdictions for the 2000 election indicated that Democratic candidate Al Gore was expected to win an electoral vote majority of 276 electoral votes to George W. Bush's total of 262 votes—rather than Bush's actual 271 to 267 majority. This is the only election in which the expected and actual votes indicated a different election winner. The difference in 2000 did not involve the disputed Florida vote. The postdiction expected Bush to carry Florida in 2000 and (eventually) he did. The difference was that Bush was expected to carry Iowa (7 votes) and did not, while Gore was expected to carry both his home state of Tennessee (11

votes) as well as the perennially Democratic state of West Virginia (5 votes) and did not. This net difference of 9 electoral votes was the difference between electing Bush rather than Gore.

Unlike the 2000 election in which the postdiction expected a slightly stronger Democratic showing than what occurred, in 2004 the equation's postdictions expected a slightly larger Republican electoral vote count. The postdictions from the forecasting equation expected President Bush to defeat Senator John Kerry by an electoral vote margin of 313 to 225 votes, not the narrower actual margin of 286 to 252 votes. As in 2000, the difference between expectations and reality did not involve the election's key swing state—this time Ohio. Bush was expected to carry Ohio and did. The 27 electoral vote shortfall for Bush was that he failed to carry the expected Republican states of New Hampshire (4 votes), Oregon (7 votes), and Pennsylvania (21 votes) while Kerry only failed to carry one expected Democratic Party state, West Virginia (5 votes).

## OVERVIEW

This analysis has updated, revised, and extended a state level presidential vote forecasting model first developed in 1992. The original model was estimated with data from 531 state elections from 1948 to 1988. The addition of the four presidential elections (200 additional observations) since then provided a test for the robustness of the equation and additional information which could be used to refine it. The replication and update estimations indicated that the equation was quite robust.

The updating also pointed to particular predictor variables in the equation that required attention. In particular, the updated estimation indicated that the effects of the election year economy might be more complicated than previously specified. As examinations of both national forecasting models and individual level vote choice models also suggested, the effect of the economy is conditional on whether the in-party candidate is the incumbent or a would-be successor. Successor candidates appear to be accorded only partial credit or blame and this possibility was specified in the revised equation. The updated equation also suggested that the traditional southern regional advantage for southern Democratic candidates might be a thing of the past. As the realignment swept through the south, it appeared also to sweep away the bonus previously awarded to southern Democratic candidates. The revised equation also provided an opportunity to make other minor refinements in the predictor variables, such as including a more contemporary

state ideology measure. Overall, the revised equation involving rather modest changes was very nearly as accurate as the original estimation and was now based on a much broader platform of observations.

The analysis provides a firmer empirical foundation for the forecasting equation by both including a large number of new cases and also by excluding a small number of state elections that were greatly affected by third-party presidential candidates. A handful of elections had been won in the 1948 and 1968 elections in southern states by third-party candidates (Thurmond and Wallace). Since the model is not specified to address the sporadic vote-getting abilities of third-party candidates, these cases were set aside and the resulting equation as a result was strengthened.

The final purpose of this analysis was to extend the forecast equation to address a different objective. The original estimation of the equation sought to minimize forecasting errors of the state vote division in all states. However, this is not the most important criterion from a political standpoint. In electing the president, the winner of a state's electoral votes are more important than the division of the popular vote in the state and the results in electoral-vote-rich, swing states are more important than those in small electoral vote states safely within a party's base. The extension of the revised equation to predict which party would carry individual states, especially potential swing states with large numbers of electoral votes at stake, was quite successful. The weighted logit state winner variant of the state forecasting equation correctly postdicted nearly 90 percent of all electoral votes and about 95 percent of the larger electoral vote states. The aggregate electoral vote distribution based on the weighted logit estimates corresponded very closely to the actual electoral vote division between the candidates. State electoral vote forecasting would appear to be a very promising accompaniment to state polling in determining which way particular states are likely to fall.

## NOTES

1. Holbrook (1991) also constructed a parsimonious state vote model to explain presidential voting in the states across time, though it was explicitly not intended for use as a forecasting model. Holbrook's equation contained thirteen variables to account for variation in the incumbent party's presidential vote. His analysis extended over 350 state elections held from 1960 to 1984. The equation included seven state variables (two economic indicators, two ideological variables, a partisanship index, and two home state advantage variables), two regional variables, and four national

variables (two economic variables, an incumbency variable and a measure of the president's popularity).

2. The deviation of the prior state votes from the national vote were adjusted to remove the temporary effects of prior home state presidential and vice presidential candidates and the southern regional advantage for southern Democratic presidential candidates. The adjustment was based on the estimates of these factors on the state's vote (Campbell 1992). The home state candidate advantages were scored a +1 for Democratic candidates from the state, -1 for Republican candidates from the state and 0 if neither candidate was from the state. For the large and heterogeneous states of California, Illinois, and New York, the advantages were scored as +.5 for a Democratic native and as -.5 for a Republican native. The state economy measure was the first quarter change and was standardized for the election year by subtracting the mean for that year and dividing by the standard deviation for that year. The Holbrook and Poe (1987) ideological index was constant for a state across the years.

3. The regional realignment variables as dummy variables undoubtedly do inflate the degree of fit in the original model since they capture the realignment effects plus unspecified effects on the state votes in that region in the specified elections. However, it was necessary to take the regional realignments into account to avoid potential bias in estimates of the effects of predictors in the equation that may have been correlated with the regional realignments.

4. The estimates may also be slightly different because we calculated the precise vote percentages from the actual vote counts. This made slight differences in the states' votes for both the dependent variable and the lagged deviation of the state votes from the national vote. The original analysis used percentages of the state vote percentages rounded to the first decimal place.

5. The larger than usual errors in 1996 were probably caused by two factors. First, President Clinton's trial-heat standing was probably inflated by the unusual disparity in early campaign spending by Clinton and Dole. Clinton was able to get a head-start on Dole since Clinton had no opposition for the Democratic nomination (though he raised and received matching funds for a nomination campaign) and the Democratic Party spent large sums of soft-money on Clinton's behalf while Dole was attempting to secure the Republican nomination. Second, the southern Democratic regional advantage was still estimated after 1992 at about 5.3 points for Clinton. In reality, it was probably non-existent and dropped to less than 4 points after 1996.

6. The five regional realignment variables are coded one for the election year (or two years) in which the realignment in the specified region is thought to have taken place. These all occur before 1984. The added cases from 1992 to 2004 are coded zero for all five of these variables. The pre-1976 cases may have been over-fitted in that a dummy variable will account for the impact of the realignment in the region in a specific year, but will also account for some of the otherwise unexplained vote of the region in that year—though state to state variation within a region would not be picked up by the regional variable as it would with state variables. To the extent that over-fitting took place, and it was probably fairly minor, the true fit of the model may have been inflated. The additional cases, since they are coded zero across the board on these variables, could not be over-fitted—so the real drop in the goodness-of-fit statistics from the original to updated estimations is somewhat inflated.

7. Variation in the dependent variable, the Democratic percentage of the two-party state vote, remained about the same with the addition of the new cases. The standard

deviation of the vote in the 531 cases from 1948 to 1988 was 9.735 percentage points. From 1948 to 2004, the standard deviation was 9.700 percentage points.

8. A fifth variable's coefficient, the state's vote deviation from the national vote in the immediately preceding election, increased by more than twenty percent (from .32 to .39). This may reflect a greater continuity in the state vote after the disrupting effects of the realignment.

9. Specifically, we investigated whether state economic growth should be measured over a longer time span. Since the latest state economic data available for forecasting is from the first quarter of the election year, we had to go back in time. Our analysis indicated that longer and earlier time spans did not improve the forecast.

10. In the original analysis the state vote deviation from the national vote (both two-party percentages) was adjusted weighting the prior home state advantage by 4.5 percentage points, the prior vice presidential home state advantage by 1.8 percentage points (in both cases half for the largest states, see Note 2), and the southern Democrat home regional advantage by 9 percentage points. In addition to using the revised southern Democrat home region advantage coding that ended the advantage after the 1980 election, the revised weights used are 6.0 percentage points for the presidential home state advantage, 2.1 percentage points for the vice presidential home state advantage (both halved for the largest, heterogeneous states), and 7.7 percentage points for the southern Democrat home region advantage.

11. The problem of third-party candidacies was recognized in the original analysis (Campbell 1992, 401-2). The largest errors were associated with southern states and particularly the elections of 1948, 1952, and 1956. Strom Thurmond's Dixiecrat candidacy increased 1948 forecast errors in southern states, but also reverberated to distort 1952 and 1956 errors in these states because of the lagged vote deviation variables. In the original analysis, dropping twelve third-party cases (the 1948, 1952, and 1956 cases for the four southern states carried by Thurmond in 1948), like the present analysis, reduced the mean absolute error by about a tenth of a percentage point.

12. Although a number of coefficients change slightly as a result of dropping these cases, the most notable change is in the southern home region advantage. Dropping problematic cases in southern states clarified, and reduced, the impact of the variable most sensitive to that region.

13. Using the mean vote for the null hypothesis produced a mean absolute error of 7.2 percentage points and a median error of 6.0 percentage points.

14. The seven wrongly postdicted large states, the election year, the number of state's electoral votes, and the party of the wrongly postdicted winner are Massachusetts (1948, 16, R), Texas (1968, 25, R), Ohio (1976, 25, R), California (1976, 45, D), Texas (1996, 32, D), Florida (1996, 25, R), and Pennsylvania (2004, 21, R). The logit correctly identified the winner of the two most recent pivotal states, Florida in 2000 and Ohio in 2004.

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