

THE IMPACT OF VOTING BY MAIL ON VOTER BEHAVIOR

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Most of the studies of voter behavior have dealt with voter turnout, but few have looked at other aspects of voting behavior that could be linked to balloting method. A reasonable amount of information has now accumulated about the impact of the shift from polling place elections to voting by mail on turnout, rolloff, drop-off, differences in voting for partisan offices and referenda, and differences in straight-ticket voting. This article analyzes recent time series of voting data in Oregon to assess the impact of the shift in voting method on these issues. The analysis includes data at the state, county, precinct, and individual levels, including individual ballots. The results suggest new criteria for evaluating shifts from one voting method to another that may be applied to other electoral reforms, such as those that will result from the Help America Vote Act.

Keywords: vote by mail; rolloff; split-ticket voting; electoral reform

The results of the 2000 presidential election in Florida have renewed interest in the impact of election administration reform on the outcome of elections. Although there is a history of assessing the impact of some administrative reforms such as election-day registration (EDR) or “motor voter” on such politically relevant factors as turnout and the composition of the electorate, there has been relatively little attention devoted to their consequences for other forms of voting behavior such as how individual ballots are marked (residual vote), patterns of completeness across the ballot (rolloff), patterns of parti-

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san participation across the ballot (straight- and split-ticket voting), and movement of voters across elections (drop-off).

We are entering a period of significant electoral reform including changes in laws, procedures, and technology. The Help America Vote Act of 2002 (HAVA) will insure wholesale change in voting devices by the 2006 election. The avowed purpose of previous reforms, such as EDR and motor voter, was to increase turnout and make the electorate more representative of the population. But we do not know very much about whether and how electoral reform might affect other aspects of voting behavior, which will become more important with the fiasco of the 2000 presidential election and the implementation of HAVA.

The research reported here presents an attempt to rectify that situation through the use of different data sources as well as new analysis techniques to assess the impact of a particular reform, the switch to voting by mail (VBM) in Oregon. Although Oregon experimented with VBM beginning in 1981, statewide implementation for all elections went into effect for 2000. We analyze data from 1992, before the implementation of VBM, through 2000, the first presidential election held entirely with VBM. In a pre-post interrupted time series analysis we look for differences in turnout, rolloff, drop-off, and straight- and split-ticket voting, as well as the residual vote. This analysis is accomplished by looking at individual ballots and aggregated returns at the precinct, county, and state levels, using ecological analysis techniques where appropriate.

We look at voters' responses to the implementation of a new voting system in Oregon and its impact on patterns of voting behavior. Because all registered voters receive a ballot in the mail, a voter pamphlet to review while voting, and have a longer period of time to consider their voting decisions under VBM in Oregon—up to 20 days—the new system might produce more split-ticket voting than polling place elections. It might reduce rolloff across the ballot as well. The purpose of this analysis is not to assess whether changes are long term or short term or to infer whether citizens in other states would respond like those in Oregon to a change in ballot method. Rather, we investigate whether change like that in Oregon has an effect on other forms of voter behavior than turnout. We are also interested in whether a generalizable methodology can be used to assess equivalent behav-

ioral changes for a range of administrative and technological procedures in any jurisdiction, such as those that might be produced by the implementation of the HAVA reforms.

BACKGROUND

Political scientists have long had an interest in the impact of the various conditions under which elections are held on important characteristics of the electorate. Most of this attention has focused on two consequences: how many citizens vote and how the characteristics of the participants differ either from those who are eligible but do not vote or from the entire population eligible to participate. This emphasis received considerable impetus from Downs (1957), who theorized about how the costs of voting affect who participates. These costs included those associated with becoming informed about the candidates and issues at stake, as well as the effort required to register and cast a ballot.

In the American political system, getting to cast a ballot involves two distinct steps—getting registered and then getting to the polls (Kelley, Ayres, & Bowen, 1967). Contemporary reformers have focused a considerable amount of effort on reducing the registration barrier, culminating in the passage of the National Voter Registration Act (NVRA) of 1993, usually referred to as the motor voter bill. Other procedural changes have included registration on election day to facilitate participation by those who may make up their minds late in the campaign (see Traugott, *in press*, for a review of the literature).

For the act of voting itself, a number of procedures have been implemented to give voters a longer period of time to cast their votes as well as greater convenience in receiving a ballot.¹ VBM is a procedure whereby the entire election is held with ballots mailed to every registrant's home almost 3 weeks before they are tabulated. Most of the research on VBM has focused on its immediate impact. Questions have been raised about whether the impact of some reforms such as VBM are initially larger than they eventually turn out to be (Magleby, 1987), and an extended analysis is necessary to sort out whether and to what extent that might be true in Oregon. It is also important to distinguish between effects observed the first time a reform is implemented

and the learning that takes place in the electorate through successive experiences with it.

Research on the effects of electoral reforms in other jurisdictions has been facilitated by the availability of appropriate data at both the aggregate and the individual level. Many analyses used county- and state-level ecological aggregations of registration and turnout data to assess their impacts. Others used individual survey responses in conjunction with contextual information about how registration and election procedures were administered where the respondents lived. And a very few others have used individual ballot images to investigate whether within-ballot voting behavior has changed. One interesting aspect of this research has been how relatively modest the impacts of reforms have been in terms of their ability to produce changes in turnout and the composition of the electorate. The explanation for this seems to be that rather than mobilizing new voters, the reforms produce most of their effect on people who generally vote but might have a problem participating in any particular election (Berinsky, Burns, & Traugott, 2001).

Some studies of ballot type have involved extensive historical research. Rusk (1970) looked at the introduction of the Australian (secret) ballot across the period from 1876 to 1908 in 23 states and concluded that this produced increases in split-ticket voting, especially as the previous party balloting system was not secret. Furthermore, the level of split-ticket voting was related to the actual form of the ballot (party column vs. office block). Overall, he concluded, "Institutional properties of the electoral system, considered either as an entity or as a network of component parts, have played and continue to play a crucial role in influencing and shaping voting behavior" (p. 1237). Walker (1966) replicated this finding for office block ballots, using aggregate as well as survey data.

Research on rolloff has been directed primarily to referenda voting and nonpartisan judicial contests and the lower turnout commonly observed there compared to partisan races. Judicial retention elections are nonpartisan and usually appear at the "bottom" of the ballot. Therefore, they are subject to low turnout and considerable rolloff compared to races that head the ticket. There is even significant rolloff

observed within the group of similar elections on any particular ballot. An analysis of a 30-year time series of judicial election data (Aspin, Hall, & Bax, 2000; Hall & Aspin, 1987) suggested that rolloff has declined over time, and a previously observed general decline in the affirmative vote for retention of judges has bottomed out. These patterns differ across states and judicial districts without any explanation, however, suggesting that other factors in the election system could be at work.

The research on the causes of rolloff has focused on three different explanations: ballot confusion, the salience or visibility of the races at stake, and voter fatigue across a large number of contests on the ballot. Bullock and Dunn (1996) tested for the relative effect of these factors in Atlanta municipal elections in 1993 and found that although rolloff could occur anywhere on the ballot, there was no evidence for confusion. However, they did find some support for saliency and fatigue as explanations. Rolloff has also been linked to ballot form (Walker, 1966) as well as to the type of voting device (Nichols & Strizek, 1995). For example, White (1960) found that rolloff was greater for voting machines than paper ballots in a 1958 Michigan referendum, and Mather (1964) found the same in Iowa. These studies moved beyond the analysis of ecological aggregate returns to individual ballot images for which patterns of participation across the ballot were observed (Mueller, 1969).

As a result of the 2000 presidential election in Florida, a number of panels and commissions were formed with the support of a wide variety of foundations for the purpose of reviewing voting procedures in the United States. Now HAVA is paving the way for a set of reforms proposed to alter the ways citizens cast their ballots, given that they choose to. These include a review of devices used to record and tabulate ballots, as well as new ballot forms that these devices will accommodate or require. These kinds of reform are much less well studied, because the appropriate data resources have generally not been available. Our analysis suggests appropriate data sources and statistical approaches that would facilitate studies of HAVA's impact on behaviors such as straight- and split-ticket voting, rolloff, and drop-off.

DATA AND METHODS

Recent research on VBM has resulted in the most extensive and diverse data collection yet for the analysis of the impact of this kind of reform on voting behavior and patterns. Previous work utilized survey results combined with individual vote histories (Berinsky et al., 2001), as well as the assembly of county- and state-level aggregated election returns (Karp & Banducci, 2000; Southwell & Burchett, 2000a, 2000b). To assess the impact of voting by mail on rolloff and straight- and split-ticket voting, however, it would be desirable to have information on the behavior of individual voters when they completed their ballots, preferably across elections. With such data available, it would be possible to look at such things as the patterns or rates of straight- and split-ticket voting for partisan offices in the 2000 election, the first presidential election to be held entirely by mail in Oregon, compared to 1996 and 1992. Such an analysis could also investigate the rolloff across the ballot from the partisan races to the referenda, drop-off, and whether these have changed over time as well.

A recent study conducted by researchers at the California Institute of Technology (Caltech) and the Massachusetts Institute of Technology (MIT) (2001) introduced the concept of the "residual vote" (a measure of votes not recorded) as a way to judge the performance of voting equipment. Our interest is in voting methods rather than in equipment comparisons; nevertheless, an examination of the residual vote provides insight into the relative efficacy of VBM in recording votes that citizens intended to cast compared to previous voting systems used in Oregon, as well as to voting and tabulation systems used elsewhere. Based upon available data resources, we focus our attention on the residual vote for Oregon's largest county, Multnomah, in the 2000 presidential election and provide a revised calculation of the residual vote that better fits the conditions found in VBM elections. Given a rich set of data at multiple levels of aggregation, we then turn to ecological inference to compare these patterns over time.

We were provided with a set of "A" (candidate) and "B" (state measures) ballots² that were randomly drawn from 104 of the 142 precincts in Multnomah County. For each office and measure we were able to determine which ones appeared on an individual's ballot, as

there were variations in local offices and referenda at stake in different jurisdictions even within this single county. Based upon this identification, we could also analyze (a) how the individual voted (i.e., for which candidate/in favor or against a measure); (b) whether a vote was not counted for a relevant item; and (c) if a vote was not counted, whether an undervote or overvote was registered.³ Data from the individual ballots were used for a variety of purposes. First, we analyzed undervotes and overvotes across the ballot in part to discover whether there was any association between one's choice for president and undervotes for items down the ballot, that is, was there a "partisan" pattern to either form of residual voting. Then we used the ballot data to calibrate an ecological analysis based upon precinct-level data for the county and then for the entire state. Finally, based upon these results, that approach was used to evaluate a county-level set of ecological analyses of state patterns over time. The details of the ecological analyses, using Thomsen's (1987) estimator (implemented via his ECOL software) are presented in the appendix.

We begin our analysis with the 2000 election. When equivalent data are available, similar approaches are taken to analyze 1996, an election in which there were significant numbers of ballots cast by mail because of citizens' ability to register as "permanent absentee ballot" voters, and the 1992 election that was conducted at polling places. Thus, we compare how the shifts in administrative procedures across the three-election sequence affect the voters' patterns of ballot behavior. We expect to find that VBM procedures produced a decrease in straight-ticket voting and a decrease in rolloff across the ballot⁴ because voters had more time to consider their ballots at their leisure at home. Because the last election in the sequence was administered through VBM and turnout increased slightly under that procedure, the proportion of abstainers should be lower in that election than in either of the preceding two.

Setting the baseline in the 2000 presidential election provides an opportunity to compare the results observed there with the 1996 presidential election, held under a provision by which registrants could declare themselves permanent absentee ballot voters and have a ballot mailed to their home. In fact, 48% of the ballots cast in the 1996 election were absentee ballots. In relation to 2000, then, there should be more straight-ticket voting and more rolloff across the ballot. And the

1992 election was held virtually in its entirety at polling places (only 13% of the votes were cast as absentee ballots), so turnout should be lower than in either of the next two elections, all other things equal, and rolloff and straight-ticket voting should be even higher as well.

Of course, no two election campaigns are exactly equal, and differences observed in the comparison of two successive elections may, of course, be due to other factors than the initiation of VBM in Oregon. The pairings of different candidates, the vitality and competitiveness of their campaigns, and media coverage of the campaigns might also have had an effect. For example, the contest between Clinton, Bush, and Perot in 1992 was much more interesting and intense than the 1996 race between Clinton, Dole, and Perot. The closeness of the race and the relatively strong presence of Perot in 1992 would be expected to stimulate turnout and reduce patterns of straight-ticket voting. In an ecological analysis, the impact of these factors on individual voters cannot be evaluated.

RESULTS

We begin with an analysis of the completeness of voting, followed by an examination of patterns of participation across the ballot, and conclude with an investigation of transitional rates of voting across elections. Generally, this analysis shows very little effect of the switch to VBM on the Oregon electorate. This is not surprising in light of recent research on the limited impact of many electoral reforms. But another goal of the analysis is to demonstrate that the methodological approach employed here is generalizable to other electoral settings. Its application might detect more substantial impacts for other changes in the electoral system.

THE RESIDUAL VOTE

The Caltech/MIT Voting Technology Project (2001) defines the residual vote as the sum of the number of ballots not counted for any reason (uncounted ballots), the number of ballots for a given office that do not register as being marked (undervotes), and the number of ballots with multiple marks for a given office (overvotes). The Caltech/

MIT authors note that an examination of overvotes might serve as a conservative measure of the number of votes lost due to equipment but argue that “the distinction of overvotes from other kinds of errors is a false one” (p. 21).

When one moves to analysis beyond the study of voting equipment, the need to examine the separate components of the residual vote becomes apparent. VBM in Oregon involves marking a ballot, inserting it in an unmarked “security” envelope, and inserting that in a “signature” envelope that must be signed and stamped. Although the calculation of undervotes and overvotes remains the same, in a VBM election the calculation of votes not counted for any other reason differs slightly from that in a polling place election. In a VBM election, ballots received at the clerk’s offices are first checked for authenticity in order to determine whether the signature envelope should be opened and then whether the security envelope should be processed. A ballot might not be counted for four reasons: (a) it was received after the deadline, (b) the signature envelope was not completed properly, (c) either the signature envelope or the security envelope might contain multiple ballots, or (d) it was determined that a ballot was returned by someone not qualified to vote.

Provided that the verification is done properly, the last item differs from the others, as any ballots that are excluded are correctly excluded from *both* the number of eligible voters and the number of votes cast.⁵ Grouping these ballots with other lost ballots can be misleading. Thus, a revised measure that excludes the ballots cast by ineligible voters is more appropriate. This revision is especially important given that HAVA includes the residual vote as a useful measure of voting system performance, an issue subject to periodic review by the Election Assistance Commission.

The data necessary for calculating the residual vote and all its component parts was available for Multnomah County. The original conceptualization of the residual vote was examined to compare the results from Multnomah County to the residual vote for the 40 largest counties in the United States as reported in the Caltech/MIT study. For the 2000 election in Multnomah County, a total of 302,413 ballots were examined by the clerk’s office in the race for president, and 5,728 of them (1.9%) were not counted.⁶ Of those not counted, 1,935 (0.64%) were undervotes, 1,433 (0.47%) were overvotes, and 2,360

(0.78%) were not counted at all. In the latter group, 593 were returned after the deadline,⁷ 453 were returned in envelopes that were not completed properly, 12 envelopes contained multiple ballots, and 1,302 were returned by individuals not qualified to vote. In the Caltech/MIT study, 23 of the 38 largest counties for which a residual vote could be tabulated had residual vote rates lower than 1.9%, whereas 15 had rates that were at least as high or higher.

We recommend the following formulas be used to calculate the residual vote rate for VBM elections:

$$\text{Residual Vote Rate} = \frac{\text{Residual Votes}}{\text{Ballots Returned by Eligible Voters}}, \text{ where,}$$

$$\text{Residual Votes} = \text{Undervotes} + \text{Overvotes} + \text{Ballots Not Counted at All}$$

$$\begin{aligned} \text{Ballots Not Counted at All} = \\ \text{Ballots returned after the deadline} + \text{ballots returned in envelopes} \\ \text{not completed properly} + \text{envelopes containing multiple ballots} \end{aligned}$$

$$\begin{aligned} \text{Ballots Returned by Eligible Voters} = \\ \text{Total Ballots Examined} - \text{Ballots Returned by Ineligible Voters} \end{aligned}$$

The inclusion of the ballots that were not counted because it was determined that they were returned by individuals who were not qualified to vote obscures the measure of votes lost. When these 1,302 ballots are excluded, the number of residual votes is 4,426 and the baseline for comparison becomes the 301,111 ballots returned by eligible voters. Therefore, the residual vote rate based on the number of ballots returned by eligible voters then drops to 1.47%. Seventeen of the 38 largest counties for which the residual vote rate was calculated by the Caltech/MIT researchers had lower residual vote rates.

The residual vote and its component parts provide useful tools for the evaluation of voting equipment and methods. When examining VBM elections, it is important to consider the ways in which errors are likely to originate. Overall, VBM in Oregon and Multnomah County performs well in terms of recording votes that citizens intended to cast. We now look more closely at the occurrence of undervotes and overvotes for Multnomah County.

UNDERVOTING AND OVERVOTING

We used the Multnomah County ballots to examine two important components of the residual vote, undervoting and overvoting. To simplify the analytic task, we focused on the races for president, Congress, state offices for which all voters in Multnomah County could vote, and state measures. These data permitted an analysis of rates of voting across the ballot and patterns of voting by party.

In both sets of ballots, the occurrence of overvotes was relatively rare. In the candidate races under investigation, a total of 7 overvotes was recorded out of 5,808 possible votes cast. This translates into 0.12% of all potential votes cast by the 726 voters for eight offices.⁸ The degree of overvoting among the state measures was higher but remained negligible. A total of 47 overvotes was registered out of a possible 18,824 votes for 26 issues that appeared on the ballot. That is, out of all potential votes, only 0.25% registered as overvotes. Because overvoting was not prevalent, we turn our focus to undervotes.

Table 1 shows the percentage of undervotes out of the number of individuals who could have cast a ballot for each of the offices examined. Although the percentage of undervotes for president is miniscule, it is quite large for the judicial positions. With the exception of the race for state treasurer, the percentage of undervotes increases as one moves down the ballot. A lower percentage in Table 1 corresponds to a higher level of turnout.

The data presented in Figure 1 reveal that with the exception of the races for Congress, the results obtained from individual ballots from Multnomah County voters are consistent with the turnout results statewide. For the individuals in the sample, turnout in the race for Congress is higher relative to the other nonpresidential offices than state-level turnout for congressional seats. Otherwise, as is the case statewide, turnout is highest for the presidential race, turnout for secretary of state exceeds that of the attorney general, which in turn exceeds that for treasurer, and turnout for the judicial positions is a great deal lower than turnout for the partisan races. Overall, with the exception of the judicial positions, we see that the occurrence of undervotes is relatively low.

Undervotes for each state measure are displayed in Figure 2 for Multnomah County. These data, along with those presented in Figure

TABLE 1
Undervotes as a Percentage of Ballots Returned by
Eligible Voters for Each Office, 2000 General Election,
Multnomah County, Oregon ($n = 726$ for Each Office)

<i>President</i>	<i>Congress</i>	<i>Secretary of State</i>	<i>Treasurer</i>	<i>Attorney General</i>	<i>Supreme Court Judge</i>	<i>Appeals Court Judge</i>	<i>Circuit Court Judge</i>
0.28%	2.62%	3.72%	6.61%	5.10%	26.17%	45.18%	45.32%

1, show that Oregon voters are active participants on referenda in Multnomah County and across the entire state. The analysis of the individual ballots shows that across the 26 measures on the 2000 Oregon ballot, a total of 999 undervotes was recorded for our sample of individual voters. This translates to an average of 5.31% of all potential votes cast across the 724 individuals and 26 measures. Figure 2 shows that the percentage of undervotes fluctuates, and the evidence suggests that for state measures, undervotes in Multnomah County are not a function of position on the ballot.

The individual ballots also allow for an examination of differences in undervotes based on presidential preference. Overall, 49.6% of the individuals in our sample voted in each of the candidate races for statewide offices located after the presidential race on the ballot. Whereas 54% of Gore voters voted in each of the other candidate races for statewide offices, 44% of Bush voters did, and only 36% of Nader voters did. The differences between Gore and Bush voters and Gore and Nader voters are statistically significant ($p = .02$ and $p = .01$, respectively).

Another perspective on this issue can be found by examining the number of undervotes recorded. The average number of undervotes for all Gore voters was 1.22 for the remaining four offices, including more than half who did not have any. The average for Bush voters was 1.52, and the average for Nader voters was 1.80 across the same remaining offices. Again, the differences derived from comparing Gore and Bush voters and Gore and Nader voters are statistically significant ($p = .03$ and $p = .02$, respectively).

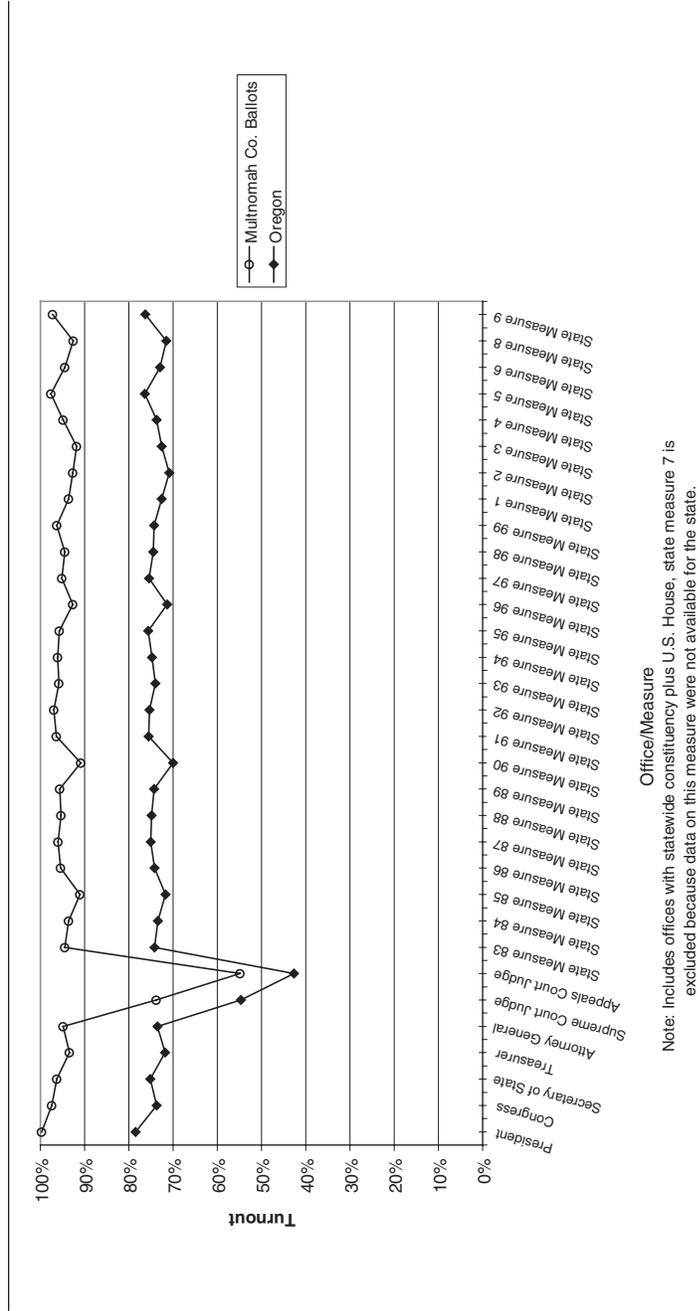


Figure 1: Patterns of Turnout From Multnomah County Ballots^a Compared to Oregon^b

a. Measured as 100% – percentage of undervotes.

b. Measured as a percentage of registered voters.

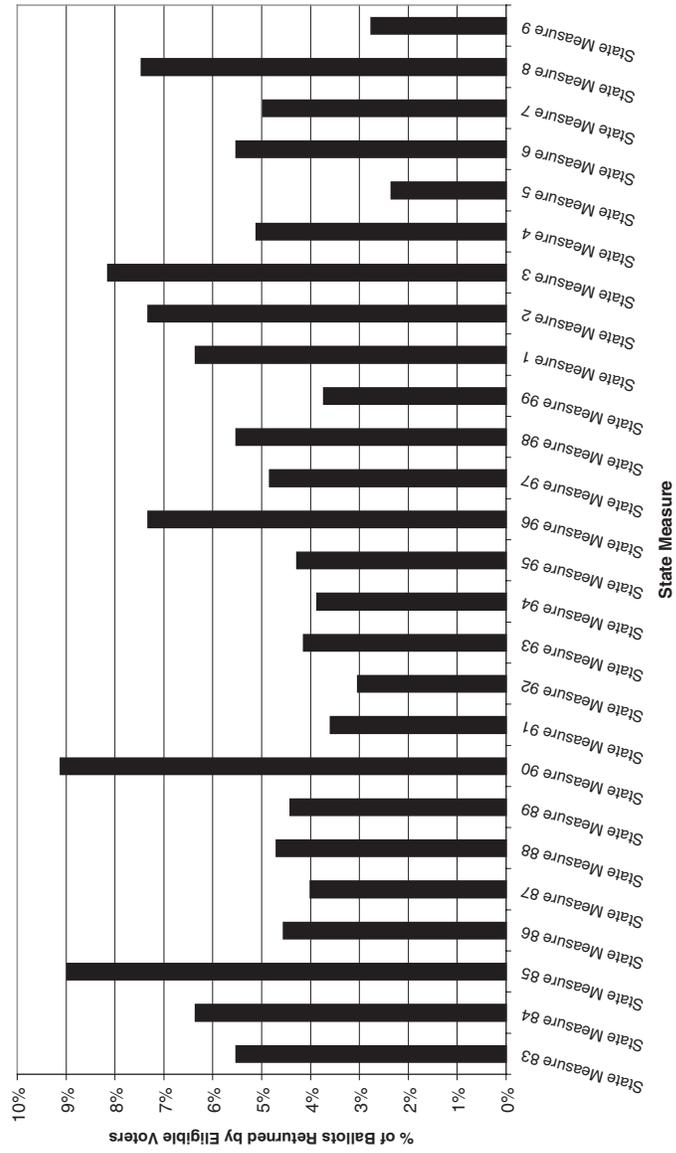


Figure 2: Undervotes as a Percentage of Ballots Returned by Eligible Voters for Each Measure, 2000 General Election, Multnomah County, Oregon (n = 724 for Each Measure)

STRAIGHT-TICKET VOTING

Another way to assess the effects of a balloting system is to examine the patterns of observed voting by party. How much straight or split-ticket voting occurs in a particular voting system? And does the system result in more or less straight-ticket voting in comparison to other systems? These questions are best answered by an examination of individual ballots rather than with aggregate data. We begin with an analysis of individual ballots for Multnomah County in 2000 and then make use of Thomsen's (1987) estimator for ecological inference to examine aggregate-level data, testing it against the results from the individual ballots. Given the success of the estimator, we complete the analysis by using county-level data for other elections.

As noted by Beck, Baum, Clausen, and Smith (1992), straight-ticket voting is often assessed using races for president and Congress. Using the sample of ballots from Multnomah County in 2000, we examined the contests for all five statewide partisan offices (president, U.S. House of Representatives, secretary of state, state treasurer, and state attorney general). Excluding those who had one or more undervotes or one or more overvotes recorded for these offices (that is, looking only at ballots for those who voted for all five offices), 62% of voters voted a straight ticket across the five offices. These voters were not equally divided among the parties. In total, 14% of voters voted a straight Republican ticket and 48% voted a straight Democrat ticket.

Furthermore, Gore voters were more likely to stick with other Democratic candidates than Bush voters were to stick with other Republican candidates. Sixty-eight percent of Gore voters voted for Democrats in the remaining four statewide partisan races, whereas 48% of Bush voters voted for Republicans in the same remaining races. Unfortunately, we cannot compare these results to those from previous elections that did not use VBM because data from individual ballots are not available. However, using Thomsen's (1987) estimator for ecological inference we can compare estimates from pairs of contests in a single election to similar pairs in other elections.⁹

Before we made extensive use of the estimator, it was essential to assess its performance in this context. We did so by comparing its results for the information derived from the sample of individual ballots to precinct-level data from Multnomah County. Having shown the

effectiveness of the Thomsen estimator in Multnomah County (see appendix), we move to an analysis of county-level data for the entire state.¹⁰ This permits us to compare the 2000 VBM election results with those from the 1992 and 1996 elections. The results were obtained through an examination of votes cast for the Democratic, Republican, or other candidates—abstainers, undervoters, and overvoters were excluded.¹¹

Given that the VBM system provides voters with a longer time to think through their choices and the benefit of a voters' pamphlet mailed to their home to use as a reference in making their choices, we expected that straight-ticket voting would decline across these elections. The data presented in Table 2 summarize the results among voters. The evidence fails to support our hypothesis that straight-ticket voting would decrease over this time period; in fact, it increased by 20%. The trend cannot be due to the advent of the voters' pamphlet, as this has been used in Oregon for some time.¹² The data in Table 2 indicate that Democratic voters were somewhat more likely to vote a straight ticket, but the large increase in Republican straight-ticket voting fuels the overall increase found from 1992 to 1996. These results suggest that factors such as the individual candidates in each race and their pairings, especially for president, as well as factors such as incumbency in both contests, exerted a significant impact on straight- and split-ticket voting. For example, these results are consistent with the conclusion that in 1992 Perot drew more support away from Bush than from Clinton. A reduction in support for Bush in 1992 in favor of Perot among those who voted Republican in the House race would lead to lower levels of straight-ticket voting in 1992 among Republicans. The relative importance of these factors merits additional study.¹³

In sum, although it was expected that straight-ticket voting would decrease due to the convenience of having a voters' pamphlet and added time to make decisions, it does not appear that VBM altered patterns of partisan voting across this time period. Those voting Democrat for president were more likely to stick with the party than were those voting Republican for president. This pattern held across individuals in Multnomah County whether measurement was done using a series of races or just a pair of races in the 2000 election and for the state as a whole across three recent elections looking at pairs of races

TABLE 2
Straight-Ticket Voting for President and U.S. House of
Representatives in Oregon, Thomsen's (1987) ECOL Estimates
from County-Level Data (*n* = 36 Counties, Republican as Base)

	<i>1992 %</i>	<i>1996 %</i>	<i>2000 %</i>
Straight-ticket	57.5	65.3	68.7
Republican straight-ticket voters	21.4	29.1	31.6
Democrat straight-ticket voters	36.1	36.2	37.1
Republican loyalty rate	65.8	74.4	68.0
Democrat loyalty rate	84.9	76.9	78.9

in each of the elections. Given the wide availability of county-level data and the success of the Thomsen estimator, these results suggest that researchers should include patterns of straight-ticket voting among the criteria they use to evaluate the impact of election reforms. We are not arguing that increased or decreased straight-ticket voting is a desirable goal; we are merely suggesting its appropriateness as an indicator of the impact of election administration reform on the behavior of the electorate.

ROLLOFF AND DROP-OFF

An examination of voting behavior for candidates and issues down the ballot and changes in turnout by party across elections provides additional insight into the impact of VBM in Oregon. Rolloff refers to the degree to which turnout decreases as one moves down the ballot in a single election, whereas drop-off refers to the extent to which turnout decreases across elections. We measure drop-off using the votes cast for president for the 1992, 1996, and 2000 elections.

As previously noted, we investigated rolloff using a variety of methods. Each analysis told the same story: Rolloff across the ballot in Oregon is low and remained so in the 2000 VBM general election. An examination of turnout among registered voters for each office in which every citizen had an opportunity to vote¹⁴ and ballot measures provide the most complete and informative picture. This includes all federal and statewide offices for which named candidates ran and all referenda.

Although the exact offices and issues at stake each year varied somewhat, the patterns for 1992 and 1996 are remarkably similar to those for 2000 (presented in Figure 1).¹⁵ As one moves down the ballot (literally) through the candidate races, turnout trends downward slightly. The correlation between ballot position and turnout was $-.81$ for 1992, $-.95$ for 1996, and $-.84$ for 2000, all of which were statistically significant at $p < .01$. In the elections of 1992 and 2000, turnout in the races for judicial positions was dramatically lower than turnout for all other candidate races. Otherwise, the degree of rolloff for the candidate races is low. Statewide judicial races were not on the ballot in 1996. Although the turnout series in that election declines as one moves through the candidate races, without the judicial races the decline in turnout is less severe than in 1992 and 2000.

The most striking finding was the complete lack of evidence of rolloff for the state measures. That is to say, there was no correlation between ballot position and turnout on the referenda; the correlations were $-.03$ ($p = .94$), $.18$ ($p = .42$), and $-.02$ ($p = .92$) for 1992, 1996, and 2000, respectively. In each of these elections, the highest turnout state measure appeared farther down the ballot than the lowest turnout state measure. Although the number of state measures grew over this time period and a change to VBM was made for the 2000 election, turnout for state measures was not affected by ballot position. Rather, voters seemed to be voting selectively, deciding whether to vote on a state measure based on other criteria. These relationships merit additional attention as the time series of VBM elections lengthens in order to sort out the potential contributions of VBM and specific issues on the ballot to turnout patterns.

Across the three elections under investigation, turnout was highest in 1992, followed by 2000, and then 1996. As previously noted, we examine turnout for president among registrants for these three elections. With ECOL we estimated retention rates, loyalty rates, and mobilization rates by partisan preference. Based on the work of Berinsky, Burns, and Traugott (2001) we expected to find evidence that retention (voting in two successive elections) was a larger force in the VBM election than was mobilization (recruiting new voters into the electorate). Furthermore, based upon their use of vote histories and survey estimates for elections from 1994 to 1996, we did not

TABLE 3
Calculations of Voter Transitions in Presidential Races,
Thomsen's (1987) ECOL Estimates Using County-Level Data

<i>1992 to 1996</i>		<i>1996</i>				
<i>Voter Transitions</i>						
<i>(Republican as Base)</i>	<i>% Republican</i>	<i>% Democrat</i>	<i>% Other</i>	<i>% Abstain</i>	<i>% Total</i>	
<i>1992</i>						
Republican	17.8	1.6	1.3	6.2	26.9	
Democrat	0.2	27.4	2.4	4.9	34.9	
Other	8.6	2.4	5.4	4.2	20.7	
Abstain	0.8	1.7	0.6	14.5	17.6	
Total	27.4	33.1	9.7	29.8	100.0	
<i>1996 to 2000</i>						
<i>Voter Transitions</i>						
<i>(Republican as Base)</i>						<i>2000</i>
<i>1996</i>						
Republican	23.7	0.7	0.6	2.6	27.6	
Democrat	0.9	28.5	1.5	2.1	33.0	
Other	4.6	2.0	2.2	1.0	9.7	
Abstain	7.4	5.7	0.9	15.8	29.7	
Total	36.5	36.9	5.1	21.5	100.0	

expect retention rates to differ by party preference. Table 3 and Table 4 present the results.

For the most part, the results presented conform to expectations. Although a larger proportion of 1992 abstainers also abstained in 1996 (82.39%) than 1996 abstainers stayed home in 2000 (53.20%), this decline is consistent with what would be expected based on changes in the competitiveness of the elections. The election in 1996 was much more dull than either the 1992 or 2000 elections; that is, the more closely contested race between Gore and Bush brought out more people who skipped the 1996 election than the race between Clinton, Dole, and Perot brought out 1992 abstainers. In addition, given that the race between Clinton, Dole, and Perot was less competitive than the race between Clinton, Bush, and Perot, it is not surprising that 1992 abstainers were the most likely group to abstain in 1996 and that a larger proportion of those who did show up in 1996 voted for

TABLE 4
Summary Statistics (Based on Estimates Presented in Table 3)

	<i>% 1992-1996</i>	<i>% 1996-2000</i>
Republican loyalty rate	66.17	85.87
Democrat loyalty rate	78.51	86.36
Republican retention rate	76.95	90.58
Democrat retention rate	85.96	93.64
Overall retention	81.33	92.03
Persistent abstention rate	82.39	53.20
Abstainers transitioning to Republican	4.55	24.92
Abstainers transitioning to Democrat	9.66	19.19
Abstainers transitioning to voting	17.61	47.14

Clinton. We also see that Bush voters in 1992 were more likely to defect to Clinton in 1996 than Clinton voters in 1992 were to defect to Dole at the next election.

The tables also reveal that both groups of partisans exhibited high loyalty (voting for the same party both times) and retention (voting both times) rates. However, the results in Table 3 indicate that Perot's presence in 1992 hurt the Republicans more than the Democrats. About 42% of those voting for "Other" candidates (97% of the votes for Other candidates were for Perot) in 1992 voted Republican for president in 1996, whereas only 12% switched to Democrat for president in 1996. Using such loyalty or retention rates, from 1996 to 2000 there is little evidence to suggest that either party gained more than the other; both seemed to improve compared to the results from the 1992 to 1996 transition. However, when one considers the transition from nonvoting in 1996 to voting in 2000, the Republicans gained a larger share (24.9%) than did the Democrats (19.2%).

In sum, four results stand out. First, retention rates in Oregon are high and increased with the move to VBM. Second, neither party had an advantage in terms of retaining its supporters; the shift in balloting method was party neutral. Third, mobilization increased substantially with the shift to VBM. And finally, Republicans mobilized more of those who sat out the 1996 election than did the Democrats. Some of the latter movements might be due to the presidential pairings in 1992, 1996, and 2000, but without additional information, we are unable to

parse out the separate effects of VBM and the changes in the political environment that took place over this time period.

CONCLUSION

Our results can be viewed in two ways: (a) narrowly, in terms of the impact of VBM on behavior in Oregon, and (b) more broadly in anticipation of HAVA. Overall, we have shown that the evaluation of electoral reforms need not be limited to examination of changes in turnout and the composition of the electorate. The evaluation of the residual vote and its components, straight- and split-ticket voting, rolloff, and drop-off are also important criteria. And as we have demonstrated, the data and methods to perform appropriate analyses are quite accessible.

Using a variety of data sources, we were able to make a number of important conclusions regarding the effect of VBM on several aspects of voting behavior. We have also provided a formula to calculate the residual vote for VBM elections and have shown that in the absence of individual-level data, Thomsen's (1987) estimator for ecological inference provides an effective and practical means to conduct analysis of straight- and split-ticket voting. However, Oregon is just one case, and our analysis is limited to a short time span that also saw changes in the political landscape. As more elections are held by mail, increasingly valuable conclusions regarding the effects of VBM on voter behavior in various types of elections can be made, including how durable they turn out to be.

Overall, we find that the move to VBM did not disrupt previous patterns of voter behavior in Oregon. Historically, rolloff across the Oregon ballot has been low, and neither the introduction of VBM nor the increased number of issues that appear on the Oregon ballot have had an impact on rolloff. In addition, although we expected that VBM would lead to a decrease in straight-ticket voting, this was not the case. Although we cannot attribute all of the effects to the move to VBM, our analysis of drop-off suggests that both retention and mobilization increased, that retention rates did not differ by party preference, and that the Democrats were somewhat less successful at mobilizing abstainers than were the Republicans.

Based on our examination of data from Multnomah County, we found that the residual vote rate compared favorably with other counties in the United States and overvotes were extremely rare. We also found that although undervotes were low, they increased as one moves down the partisan portion of the ballot. These conclusions based on the 2000 presidential election can serve as benchmarks for the analysis of future elections.

The analysis of individual ballots suggests a number of new ways to assess the impact of ballot methods—by looking at patterns of undervoting and overvoting by partisan preferences and at patterns of straight- and split-ticket voting. This suggests the utility of developing a data monitoring system for tracking these measures over time to account for the impact of both subsequent changes in election procedures and the adaptive behavior of voters. Ideally, this would include preserving files of individual ballot images as well as small-unit ecological data at the precinct level.

Overall, voters and election officials in Oregon have embraced VBM. The incremental implementation of VBM over a 20-year period surely contributes to our finding that little changed with the full-scale implementation of VBM. That VBM serves to retain voters more so than mobilize voters (Berinsky et al., 2001) also plays a role. States interested in adopting VBM can provide their citizens and election officials with valuable experience by first allowing unrestricted absentee voting (which a number of states already do) and by allowing VBM in smaller scale elections. We would expect similar results to those found in Oregon for states that allow unrestricted absentee voting and allow VBM in local and special elections, such as Colorado and Washington. Changing to a new system quickly, VBM or otherwise, could produce more drastic changes in behavior.

With the experience of the 2000 presidential election and the implementation of HAVA on the horizon, we find ourselves in a period ripe for advances in our understanding of voter behavior. In describing a move to a former “new” voting technology, Mueller (1969) said the following about innovations and data:

In the last few years the popularity of punch card ballots has greatly increased, which means that millions of ballots, voted by all segments of society, are now becoming available in highly convenient form. An exploitation of this vast source of data could serve to broaden and clarify considerably the conclusions reached here. (p. 1212)

Taking Mueller's advice seriously is an important step toward avoiding a repeat of the problems faced in 2000. We need to be assembling new data resources in what is expected to be a period of rapid administrative change as a result of HAVA in order to exploit the possibility of analyzing its impact on voter behavior.

Although most people think of the changes in the electoral system that will result from HAVA in technological terms, HAVA will also lead to changes in ballot form and administrative procedures. Evaluations of reform must be cognizant of unintended consequences and how responses to reform change over time as voters and election administrators learn from their experiences with new systems. Because the HAVA changes will be implemented relatively suddenly, the possibility that unintended changes in behavior could result in the short term must be taken seriously.

One way for research to proceed is the preparation of experimental study designs to investigate these possibilities systematically (Alvarez, 2002; Traugott, 2002). A second possibility would be to organize new data collections so that behavior in places experiencing change could be compared to areas where no change occurs in a series of quasi or natural experiments. The primary focus of all of these studies would be an analysis of elements of the "residual vote" that includes undervotes, overvotes, and spoiled ballots. But patterns of voting across the ballot, including rolloff and straight- and split-ticket voting, are also important measures that should be considered as potential consequences of ballot design and device selection in any particular election or across elections in transition from one set of administrative procedures to another.

APPENDIX

Although ecological inference techniques are used most frequently to analyze voter transitions across elections, we used Thomsen's (1987) estimator (implemented via his ECOL software) for ecological inference to examine straight-ticket voting as well as voter transitions across elections.¹⁶ In a review of the Thomsen estimator, Achen (2000) notes that tests of the estimator suggest it is quite successful. In addition, Park (2001) shows that the Thomsen estimator performs well in comparison to King's (1997) ecological inference method, which, as Park discusses, is limited when applied to more than two parameters. The Thomsen estimator also performs well compared to Goodman's (1953, 1959) ecological regression, which can produce estimates that are logically impossible, that is, outside the range of 0 to 1. The Thomsen software allows for estimation of a multitude of parameters, and it incorporates a microfoundation, an underlying partisanship dimension that drives a voter's choices, with a nonlinear specification that prevents estimates of voting probabilities falling outside of the logical range.

The results derived from the sample of individual ballots and from precinct-level data using Thomsen's estimator are presented in Appendix Table 1.¹⁷ As the first part of the table reveals, 57% of the voters whose ballots were analyzed voted Democratic for president and Congress, whereas 16% voted Republican for president and Congress.¹⁸ The results from Thomsen's estimator, reported in the second part of the table, are strikingly similar; 57% of all voters voted Democrat in both races and 20% voted Republican in both races. The index of dissimilarity is a measure presented in Thomsen (1987) to compare ecological inference results to survey results; here we have a sample of ballots rather than a survey, but the logic still applies. Thomsen, Berglund, and Worlund (1991) note that the index of dissimilarity "can be interpreted as the proportion of votes which must be relocated in one sub-table to construct the other sub-table" (p. 447). In addition, they argue that a more fair assessment is achieved by adjusting the survey (ballot for our purposes) results to the actual marginal results. Using the unadjusted ballot data, the index of dissimilarity calculated from Appendix Table 1 is 6.4%, and if the ballot results are adjusted to the actual marginals, is 6.7%.¹⁹ These results compare favorably with the index of dissimilarity values presented in Thomsen et al. (1991) and Thomsen (2000).²⁰

APPENDIX TABLE 1
Calculations of Straight- and Split-Ticket Voting in Multnomah County in the
2000 General Election Using Individual Ballots and Thomsen's (1987) ECOL Estimates

<i>President</i>	<i>Individual Multnomah County Ballots (n = 726 Ballots)</i>				<i>Congress</i>			
	<i>% Republican</i>	<i>% Democrat</i>	<i>% Other</i>	<i>% Total</i>	<i>% Undervote</i>	<i>% Overvote</i>	<i>% Total</i>	<i>% Total</i>
Republican	16.12	7.85	0.83	0.69	0.14	0.14	25.62	
Democrat	1.65	57.16	3.86	1.38	0.00	0.00	64.05	
Other	0.83	3.86	4.55	0.28	0.00	0.00	9.50	
Undervote	0.00	0.00	0.00	0.28	0.00	0.00	0.28	
Overvote	0.00	0.55	0.00	0.00	0.00	0.00	0.55	
Total	18.60	69.42	9.23	2.62	0.14	0.14	100.00	
<i>ECOL Estimates From Multnomah County Precinct-Level Data (n = 141 Precincts, Republican as Base)</i>								
Republican	19.5	4.9	0.8	2.6	0.2	0.2	27.9	
Democrat	0.6	57.4	3.7	1.2	0.0	0.0	62.9	
Other	0.3	3.7	3.9	0.3	0.0	0.0	8.2	
Undervote	0.3	0.1	0.1	0.1	0.0	0.0	0.6	
Overvote	0.2	0.1	0.1	0.1	0.0	0.0	0.5	
Total	20.8	66.1	8.6	4.3	0.2	0.2	100.0	

APPENDIX TABLE 2
Calculations of Straight- and Split-Ticket Voting in Multnomah County
in the 2000 General Election Using Individual Ballots and Thomsen's (1987)
ECOL Estimates Excluding Abstainers, Undervoters, and Overvoters

<i>Individual Multnomah County Ballots (n = 702 Ballots)</i>				
<i>President</i>	<i>Congress</i>			<i>% Total</i>
	<i>% Republican</i>	<i>% Democrat</i>	<i>% Other</i>	
Republican	16.67	8.12	0.85	25.64
Democrat	1.71	59.12	3.99	64.81
Other	0.85	3.99	4.70	9.54
Total	19.23	71.23	9.54	100.00
<i>ECOL Estimates From Multnomah County Precinct-Level</i> <i>Data (n = 141 Precincts, Republican as Base)</i>				
Republican	21.0	6.3	0.9	28.2
Democrat	0.6	59.1	4.0	63.7
Other	0.3	4.0	3.8	8.1
Total	21.9	69.4	8.7	100.0

NOTES

1. These procedures include "early voting," whereby machines are made available for a few weeks before election day so people can vote (see Richardson & Neely, 1996; Stein, 1998; Stein & Garcia-Monet, 1997), unrestricted absentee voting that allows registrants to request an absentee ballot without having to explain why they cannot vote at the polls on election day (see Oliver, 1996), and the ability to register as a "permanent absentee voter" so ballots will be mailed to a voter's home in advance of every election day.

2. Data from individual ballots are not ordinarily available from Oregon, either at the local or state level. However, through the cooperation of Vicki Ervin, director of elections in Multnomah County, we had the opportunity to analyze individual ballots cast for the 2000 general election.

3. This information was available for a total of 2,075 "A" ballots and 2,066 "B" ballots. Due to the length of the ballots, and thus the time necessary to enter the data manually, we drew a one-third random subsample of 726 A ballots and 724 B ballots for analysis. This provided us with approximately 7 ballots for each of the 104 precincts selected. For a selection of offices and state measures, we examined information from the ballots entered and from aggregate counts from the ballots not entered against one another and against county-level data. We did not find any evidence to suggest that the subsample of ballots selected differed systematically from either those not sampled or from official county level results.

4. Using aggregate data, we examined rolloff across the ballot in a number of ways, including (a) general patterns of turnout for each office for 1992, 1996, and 2000 and (b) a correlational analysis of the relationship between turnout and ballot position for all offices in Oregon for 1992, 1996, and 2000.

5. A similar argument could be made regarding the number of undervotes that result from the conscious decision of the voter to skip a given ballot item. However, one cannot separate this type of undervote from those resulting from the failure of the equipment to read a mark made by a voter intending to vote for the ballot item in question.

6. The California Institute of Technology (Caltech)/Massachusetts Institute of Technology (MIT) (2001) study finds that residual votes accounted for 1.5% of all ballots cast in Oregon in 1996 and for 1.6% of all ballots cast in Oregon in 2000.

7. It is likely that the Caltech/MIT measure of the residual vote would fail to include these ballots. Thus, one could argue that these ballots should be excluded when using the Caltech/MIT conceptualization of the residual vote. Because these ballots fit within the definition, and because the failure to cast one's vote on time is more problematic in a voting by mail election, we include these ballots. If these 593 ballots are removed, the residual vote rate drops from 1.9% to 1.7%.

8. We aggregate the results from the first and third congressional districts, as doing so brings all the ballots under investigation.

9. Although the estimation of voter transitions across elections is the typical use of ecological inference techniques, our attention is focused on the estimation of transitions between candidates in a single election as well.

10. We also examined precinct-level results for the entire state in 2000. Given that precinct data were not available statewide for other elections, and the similarity of the results for the 2000 election, we use county-level data in our subsequent analysis.

11. The elimination of these categories is justified because there is insufficient data to provide separate estimates for the three excluded categories, the categories do not fit well with the assumptions employed by ECOL (Achen, Thomsen, personal communication, 2002), and the observed levels of undervotes and overvotes were small. Furthermore, these individuals could

not cast a straight-ticket vote by definition. As was the case with our tests of ECOL (see appendix), Republican Party support is used as the base category.

12. Oregon has produced the pamphlet since 1903 and mailed it to households since 1950. Although we do not have information regarding the extent to which the voters use the pamphlet to make their choices, it seems logical to conclude that Oregon voters are quite accustomed to having this information at their disposal.

13. There may also be a problem in that the 1992 and 1996 elections had a Senate race on the ballot whereas the 2000 election did not. In case the second-highest office on the ballot affected the results, we also examined the top two offices on each ballot across the three elections. That is, we examined the president and Senate pairs for 1992 and 1996, and the president and U.S. House of Representative pair for 2000. We found patterns similar to those found in Table 2. These results are available upon request.

14. Offices without a statewide constituency, such as those for state legislature, were aggregated.

15. Due to the similarity in the patterns across the three elections, figures for 1992 and 1996 are not presented here; they are available upon request.

16. Analysis was performed using Thomsen's ECOL software that can be downloaded from <http://www.ps.au.dk/srt/Ecology.htm>.

17. The comparisons were also run using only those who recorded a valid vote. The results appear in Appendix Table 2. The substantive results match those presented in Appendix Table 1; ECOL performs extremely well. The choice of a reference party is essential for estimation; we found in this analysis that the choice of party did not alter the results and therefore the substantive interpretation of the results. These results are available upon request.

18. Among those who did not cast any undervotes or overvotes, 59% voted for the Democrat in both races whereas 17% voted for the Republican in both races. See the first part of Appendix Table 2.

19. Using Democrats and Others as reference categories produces similar results; the index of dissimilarity is 8.2% unadjusted or 5.6% adjusted when Democrats are used as the base, and 9.8% unadjusted or 10.2% adjusted when Others are used as the base. Appendix Table 3 presents the adjusted ballot results.

20. Thomsen, Berglund, and Worlund (1991) report the following: For three pairs of Danish elections from 1968 to 1975, an average index of dissimilarity (DS) of 16.9% unadjusted or 12.5% adjusted; for five pairs of Swedish elections from 1970 to 1985, an average DS of 13.4% unadjusted or 12.3% adjusted; and for three pairs of Finnish elections, an average DS of 15.6% unadjusted or 8.6% adjusted. Thomsen (2000), in an examination of voter transitions in the Danish elections of 1990 and 1994, reports an adjusted DS of 12.3%.

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