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COMPARING ABSENTEE AND PRECINCT VOTERS: A VIEW OVER TIME

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Abstract

This paper examines the trend in absentee voting over the last thirty years in California. With the liberalization of absentee voting laws and practices, an increase in the numbers of absentee voters quickly followed. Absentee voters have already demonstrated their ability to influence the outcomes of local elections. An open question is what will become of absentee voters in the future. If they are the model for "voting at home," and if technological advances allow such, then the behavior of current absentee voters may be indicative of the future electorate.

The increasing trend of voters opting for absentee ballots is analyzed by using GLS on a random effects time-series cross-section model with county level data. The focus is on identifying structural factors such as changing voter demographics that have influenced the decision of voters to cast absentee ballots. Thirty-three recent state-wide elections in California are the basis for this analysis, covering the statewide primary and general elections from November 1962, through November 1994.

We find that the impact of demographics and time trends on absentee voting differ between general and primary elections. In addition, we find that a 1977 liberalization law in California had the effect of accelerating the usage of the absentee format. Finally, we conclude that absentee and precinct voting are substitutes in general elections but complements in primary elections.

Keywords: absentee voting, nested logit, panel data, political participation, aggregate nested logit, random effects

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Comparing Absentee and Precinct Voters: A View Over Time*

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1 Introduction

After narrowly losing to Diane Feinstein in the most expensive U.S. Senate campaign in history, Michael Huffington accused his opponent of benefiting from fraud in voter registration and absentee voting. Between the early 1970s and the early 1990s the percentage of ballots cast through the absentee process increased from three to four percent to over twenty percent. Refer to Figure 1. There are several accounts in the past decade of absentee voters being the decisive group—George Deukmejian beating Tom Bradley, Dan Lungren defeating Arlo Smith, and Diane Feinstein defeating a recall attempt when she was the mayor of San Francisco (Cook (1991), Dresslar (1990), Patterson and Caldeira (1985), Quinn (1983), and Willis (1994)).[1] While these outcomes may be isolated instances of the impact of absentee voters, their rapid increase in numbers raises questions regarding who are the absentee voters and is their voting behavior different from that of precinct voters. In addition to being critical to the election outcome, absentees may also be the model for the future. The information age may usher in voting at home through the telephone, home computer, or even a cable station[2]

A potential cause of the change in absentee voting in California is a 1977 law that eliminated the medical, disability, and work related requirements for requesting absentee ballots. Stemmler (1983) states that the legislation simply legalized the liberalization that had already occurred in practice. However, the liberalization of absentee voting laws has not been without challenges. The principal allegations stem from privacy issues, the use of third parties to handle absentee ballots, the potential for misuse and voter fraud.

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[1]Patterson and Caldeira note that absentees are "decisive only in the trivial sense that officials counted them last." (1985, p. 785)

[2]Cook quotes former Governor Jerry Brown stating his support for computer and telephone voting.

With few exceptions prior studies of voter behavior have either ignored absentees or stumbled upon absentees by accident, little is known about absentee voters. For example, Mueller (1969) analyzed voter fatigue and drop-off using a sample of ballots that contained a majority of absentee ballots. Perhaps unaware that absentee voting patterns differ from precinct voters, he offers conclusions on voter fatigue. However, in recent California elections we know that absentee voters in Los Angeles county vote on approximately five percent fewer propositions than do their precinct voting counterparts. One significant exception is a study by Patterson and Caldeira (1985) that examines the absentee voting rates in California and Iowa. Their primary focus is on the 1982 gubernatorial races in which the winners George Deukmejian and Terry Branstad both garnered larger shares of the absentee vote than they did of the precinct vote. Patterson and Caldeira report on the relationship between absentee rates and age, income, partisanship, turnout, and urbanization.

In general, what we do know about absentee voters seems to be the result of a few close elections where absentee voters were pivotal. For example, absentees "gave" the governorship to Deukmejian in 1982, the attorney general position to Lungren in 1990, and kept Feinstein as the mayor of San Francisco in a 1983 recall election. In addition, there are several local election outcomes that are attributed to the number of the absentee voters (see Stemmler (1983) and Walrath-Riley (1984)). At the extreme of absentee voting are mail elections. Hamilton (1988) and Magleby (1987) study elections that were held entirely through the mail. Hamilton provides a cost comparison of all-mail elections and precinct voting elections, finding that mail elections offer local governments the opportunity to save substantial amounts of money. Magleby found higher than "normal" participation for municipal elections and he determined that education was an important factor that increased participation.

This paper examines the absentee voting process and its growth over time in California. Our goal is to answer three questions regarding absentee voters. First, is it appropriate to model an individual voter's behavior as consisting of two steps, where the first decision is whether to cast an absentee ballot or not, and the subsequent decision is whether or not to vote at the precinct, given that the voter did not obtain an absentee ballot? A second interesting question is whether the legislature, as a political actor, was able to effect a change in voting behavior through the passage of a law liberalizing access to absentee ballots. Finally, we consider the opportunity cost of time model for absentee voting behavior. If it is correct then factors such as the presence of children and access to the polling location will influence a voter's decision to vote absentee.

An individual's decision to vote at the precinct or to vote absentee is the basis for the model. The decision process is depicted in Figure 2a. We assume that voters first decide whether or not to request an absentee ballot, and if not, on election day they decide whether or not to vote at a precinct polling location. Therefore, the passage of time is reflected by a left to right movement in the figure.[3]

[3]An alternate choice model is to assume that the voter first decides whether or not to vote, and if so, to vote absentee or at a polling location. This alternative appears less feasible since the decision to

[Figures 2a and 2b Here]

While our goal is to assess the impact of the change in absentee laws that took effect in 1978 and the passage of time, we also consider changing demographics and the type of election. Since the effects of each factor are separated, the independent effect of time and the law change can be analyzed.

The next section of this paper briefly describes the history of absentee voting in California and the current process for casting an absentee ballot. Section 3 of this paper outlines the econometric approach used for the time-series cross section analysis of our absentee voting model. Section 4 discusses the data sources and independent variables employed. Section 5 describes the hypotheses regarding absentee voting that will be tested with the model. Section 6 highlights the results of our analysis. The last section discusses the results, their implications on future policy, and directions for further research.

2 Absentee Voting in California

Absentee voting, in the form of proxy voting by colonial farmers, has been used in the United States since the 17th century. In California the first attempts to allow for absentee voting occurred during the Civil War.[4] Although they were found to be unconstitutional, those acts "would have allowed Union soldiers to vote away from home" (Cook 1991, p. 102). During World War I several more attempts were made to pass an amendment allowing citizens to vote absentee if they were more than ten miles away from home. The voters rejected three attempts between 1914 and 1920. Finally, in 1922 an amendment to allow absentee voting was approved by a narrow margin.[5]

The initial absentee voting law was intended to allow servicemen away from home the right to vote. However, over time absentee voting has been expanded to cover the disabled and elderly. By the 1960's the right to vote absentee was granted to those living in sparsely populated areas as a cost saving measure for the state (Patterson and Caldeira (1985), and Walrath-Riley (1984)). Election reform committees in the 1970's suggested several changes. However, none of the bills passed until 1977 when a bill introduced by Assemblyman Richard Lehman of Fresno was approved. It eliminated the requirements for voting absentee and allowed all voters access to absentee ballots. A further change came in 1982 when a bill was passed creating a permanent absentee list. It's purpose was

request an absentee ballot must occur at least seven days prior to the election, i.e., casting an absentee ballot is not an election-day event. Figure 2b depicts this alternate model.

[4]Patterson and Caldeira (1985) report that 2.7 percent of the ballots cast in 1864 were absentees.

[5]Refer to Patterson and Caldeira (1985) for additional information on other states and the passage of absentee laws during the same time period. Patterson and Caldeira also report on several early studies of absentee voting that occurred in the 1920's and 1930's.

to provide a mechanism for elderly and disabled voters to consistently receive absentee ballots, without requiring them to make a new request every election.

The current process in California allows a voter to request an absentee ballot from seven to 29 days prior to the election (there are exception conditions which allow a voter to request an absentee ballot within the seven-day period).[6] The ballots are sent to the individuals starting 29 days before the election. The voter is responsible for ensuring that the completed ballot is delivered to the appropriate location by the end of election day either through the mail or in person. In addition, third parties may also pick up a ballot and return it to election officials.

Although absentee voting may have increased participation among specific groups of voters, it is not without its problems. The problems range from processing volumes and privacy issues to allegations of fraud.[7] For example, Walrath-Riley (1984) describes the processing problems associated with the large, unanticipated numbers of absentee ballots in a local Santa Monica election. The inability of election officials to process the number of absentee ballot requests lead to many voters receiving their ballots too late to meet the election deadline. A court order mandated that the late ballots be accepted, but that their vote totals be kept separate. If a city council race was close, then these late absentee ballots were to be counted. Walrath-Riley (1984), Hamilton (1988), and Stemmler (1983) outline the privacy issues related to several court cases in the early 1980's regarding absentee voting, specifically dealing with third parties. Walrath-Riley also cites lack of voter understanding as a problem with absentee voting. Once a voter submits an application to vote absentee they are not eligible to vote at the precinct polling location. However, some voters are unaware of what they are signing and accidentally toss the ballot when it arrives in the mail. Donovan (1989) also describes absentee processing as an expensive, labor-intensive procedure during which signatures are verified and votes counted.

Other concerns associated with absentee voting are related to the media and the campaigns, such as the desire to accurately predict the outcome on a timely basis and the duration of the last campaign push. For example, predicting elections based on polls taken at polling locations may not be accurate (Quinn (1983) and Willis (1994)). It may also be several days, in fact up to 28 days in California, before official election returns are available.[8] An increase in absentee ballots increases the time between the semi-official returns issued the night of election (or morning after) and the official returns. Candidates and proposition supporters must also contend with a month-long "get out to vote" campaign and expenditure cycle rather than a single day.

[6]For example, a medical or family emergency can be a valid reason for requesting an absentee ballot withing the seven days prior to an election.

[7]Refer to Passell (1994) for an overview of a voter fraud allegation in Pennsylvania's Second State Senatorial District in Philadelphia. The difference in Democratic and Republican vote counts in absentee ballots and precinct ballots is compared to that for prior elections. This election does not appear to produce results that are similar to typical elections.

[8]Donovan considers this delay to be a "frustratingly long time in close elections (1989, p. 2896)."

3 A Model of Absentee Voting

Our empirical analysis generates estimates of the effects of demographics and trends over time on absentee voting. The economic models and econometric techniques used to estimate these effects in the absentee voting model are defined below. Since the data consists of frequencies with large numbers of observations per group, McFadden (1981) suggests that such information can be viewed as though it was produced by a representative voter repeatedly making a choice. Although the decisions are discrete, what is observed is the percentage of times a particular choice is made, which is continuous.

Before formalizing our absentee voting model found in Figure 2a, let us briefly explain our notation. Let $i = 1, \ldots, 57$, represent counties in California.[9] Let $t = 62, 64, 66, \ldots, 94$, represent the election years.[10] Let $j = 0, 1$, represent the first decision, where 1 is voting absentee and 0 is not voting absentee. The probability of voting absentee is $\mathrm{P}_{j=1}$ and the probability of not voting absentee is $\mathrm{P}_{j=0}$. Finally, let $k = 0, 1$ represent the second decision, with 1 indicating voting at the precinct polling location, and 0 representing not voting in the election. Therefore, the probability of voting at the precinct polling location is $\mathrm{P}_{k=1|j=0}$, and the probability of not voting is $\mathrm{P}_{k=0|j=0}$.

3.1 A Nested Logit Model of the Absentee Decision

We use a nested logit model to represent the choice hierarchy given in Figure 2a.[11] The conditional probability of voting given the decision to not vote as an absentee is given by:

$$\mathrm{P}_{k=1|j=0} = \frac{e^{V_1}}{e^{V_0} + e^{V_1}} \tag{1}$$

where V_k is the utility of the kth alternative. In our empirical setting we set $V_k = X\beta_k$ where X is a vector of explanatory variables affecting the decision to vote and β_k are the unobserved weights attached to these variables. As a normalization, we set $\beta_0 = 0$.

The probability of voting absentee in the first stage depends upon the expected maximum utility derived in the second stage in the nested logit model. The expected maximum utility from the decision to vote at the precinct or not vote is given by the inclusive-value:

$$incv = \log(e^{V_0} + e^{V_1}). \tag{2}$$

The probability of casting an absentee ballot is given by

$$\mathrm{P}_{j=1} = \frac{e^{Z_1}}{e^{Z_1} + e^{Z_0 + \theta incv}} \tag{3}$$

[9] Although California has 58 counties, Alpine county is excluded from the dataset since its size prevents the Bureau of the Census from publishing selected demographics due to privacy issues.

[10] The general elections analyzed in this paper occur in 1962 through 1994. The set of primary elections we analyze are from 1964 through 1994.

[11] See McFadden (1981) for the derivation of nested logit models, and Bechtel (1990) and Dubin, et al. (1992) for details on the estimation of nested logit models using aggregate data.

where Z_j is the strict utility associated with alternatives in the first stage. In our empirical application of the nested logit model, we set $Z_j = W\gamma_j$ where W is a vector of explanatory factors affecting the strict utility for the absentee/precinct decision and γ_j are the weights attached to these factors. As a normalization we set $\gamma_0 = 0$.

As is standard for the nested logit model, estimation proceeds sequentially. First we determine the expected maximum utility, *incv*, using equation (2).[12] Note that as

$$\mathrm{P}_{k=1|j=0} = \frac{e^{V_1}}{e^{V_0} + e^{V_1}} = \frac{e^{V_1}}{1 + e^{V_1}}$$

we have

$$\frac{1}{1 - \mathrm{P}_{k=1|j=0}} = 1 + e^{V_1}$$

so that $incv = \log(1 + e^{V_1}) = -\log(1 - \mathrm{P}_{k=1|j=0})$.

We replace $\mathrm{P}_{k=1|j=0}$ by the actual frequency of precinct voting given the non-absentee choice to achieve a consistent estimate of *incv*. Once the expected maximum utility for the second stage has been calculated we proceed to estimate the absentee/precinct model given in equation (3). In our formulation of the nested choice model the conditional choice probability model for $\mathrm{P}_{k=1|j=0}$ is not specifically estimated even though the data would permit this estimation if it were of independent interest.

3.2 Estimation of the Nested Logit Model

The estimation of equation (3) requires special treatment for the aggregate time-series cross-sectional nature of the underlying data. We can re-write equation (3) in log-odds form as:

$$\begin{aligned} \log\left(\frac{\mathrm{P}_1}{(1 - \mathrm{P}_1)}\right) &= Z_1 - [Z_0 + \theta incv] \\ &= W\gamma_1 - \theta incv. \end{aligned} \tag{4}$$

Using an estimate of the left-hand side of equation (4) which depends on the cross-sectional time-series measurement of the log-odds probability of absentee/precinct probabilities implies

$$\log\left(\frac{\hat{\mathrm{P}}_{1it}}{1 - \hat{\mathrm{P}}_{1it}}\right) = W_{it}\gamma_1 + \rho incv_{it} + \tilde{\epsilon_{it}} \tag{5}$$

where $\rho = -\theta$ and $\tilde{\epsilon_{it}} = \log(\hat{\mathrm{P}}_{1it}/(1 - \hat{\mathrm{P}}_{1it})) - \log(\mathrm{P}_{1it}/(1 - \mathrm{P}_{1it}))$.

The variance of $\tilde{\epsilon_{it}}$ is not constant but depends on the underlying probabilities, P_{1it}, and the number of ballots cast in county i and election t, N_{it}. It can be shown that

[12] Note that the coefficient of the inclusive-value in equation (3) is anticipated to be in the unit interval. Refer to McFadden (1981) for additional information.

$\text{Var}(\tilde{\epsilon_{it}}) = 1/(N_{it}\hat{\text{P}}_{it}(1-\hat{\text{P}}_{it}))$ (see Maddala, 1983). To compensate for the heteroscedasticity introduced by the variation in the number of observations per county per election and the differentials in absentee voting rates, we use the weight $w_{it} = N_{it}\text{P}_{1it}(1-\text{P}_{1it})$. The weighted model:

$$w_{it}\left[\log\left(\frac{\hat{\text{P}}_{1it}}{(1-\hat{\text{P}}_{1it})}\right)\right] - w_{it}\left[\log\left(\frac{\text{P}_{1it}}{(1-\text{P}_{1it})}\right)\right] = w_{it}\tilde{\epsilon_{it}} = \epsilon_{it}. \tag{6}$$

has $\text{Var}(\epsilon_{it}) = \text{Var}(w_{it}\tilde{\epsilon_{it}}) =$ a constant.

While the weighted model has constant variance, it is not reasonable to expect that observations across time for a specific county are independent. Since our data consists of electoral information by county across thirty years, a dependence in the error structure across time which is specific to the individual county may exist. To account for this possible error structure we assume a random effects decomposition for ϵ_{it}. Under this assumption $\epsilon_{it} = \alpha_i + \eta_{it}$ where $\text{E}(\alpha_i) = \text{E}(\eta_{it}) = 0$, $\text{Var}(\alpha_i) = \sigma^2_\alpha$, $\text{Var}(\eta_{it}) = \sigma^2_\eta$, $\text{Cov}(\alpha_i, \alpha_j) = 0$, $i \neq j$, $\text{Cov}(\eta_{it}, \eta_{js}) = 0$, $i \neq j$ and $\text{Cov}(\eta_{it}, \eta_{js}) = 0$, $i \neq j$ and $t \neq s$. η_{it} are therefore i.i.d. over time and α_i are i.i.d. over counties. However, the serial dependence $\text{Cov}(\epsilon_{it}, \epsilon_{is}) \neq 0$ arises due to the presence of the common random component α_i.

The generalized least squares estimates for the model in equation (5) can be achieved by subtracting a fraction, δ, of the time averaged data by county from each observation $(\epsilon_{it} - \delta\epsilon_{i\cdot})$ where

$$\delta = 1 - \left(\frac{\sigma^2_\eta}{(\sigma^2_\eta + T\sigma^2_\alpha)}\right)^{\frac{1}{2}}. \tag{7}$$

This fraction is a function of the error variances of between- and within- group estimators, with adjustments made for degrees of freedom.[13] Given the estimates of σ^2_η and σ^2_α we can determine the weight δ needed for GLS estimation as well as the proportion of the variance of ϵ_{it} that is due to the county specific effect α_i. If the proportion is large, then most of the unobservable variance is specific to the county effect. The proportion of total variance from the county specific component is:

$$\frac{\sigma^2_\alpha}{\sigma^2_\alpha + \sigma^2_\eta} = \frac{1-\zeta^2}{1+(T-1)\zeta^2} \tag{8}$$

where $\zeta = 1 - \delta$.

4 Data Sources and Independent Variables

We employ two primary data sources in our analysis, the *Statement of Vote* (SOV) published by the California Secretary of State's office, and the *County and City Databook*

[13]See Maddala (1971) for further information on the GLS time-series cross-section estimation procedure. Note that δ should lie in the unit interval.

published by the Department of Commerce, Bureau of the Census. The SOV, available after the official vote count is completed, contains county level information on the number of eligible voters, registered voters, and results by candidate for state and national offices. Our analysis covers the statewide primary and general elections from November 1962 through November 1994, using information from a total of thirty-three elections.[14] For these elections the SOV also includes the number of ballots cast at precinct polling places and those cast by absentees.[15] Our analysis of general elections employs 17 elections, with 57 counties represented in each election, for a total of 969 observations. The primary election analysis is based on 16 elections (June 1964 through June 1994) with 57 counties, minus four counties not reporting absentees for 1976, and minus one county in 1986 that failed to report Republican registration, for a total of 907 observations.

In addition to the data for the dependent variables (percent voting absentee), the SOV also provides the data for an independent variable. The percentage of registered voters that register as Republicans is included in our analysis as a measure of party affiliation. While the percentage of registered voters that are Republican tends to be correlated with demographic factors, that correlation is not perfect. A regression of the log odds of Republican registration on the demographic, geographic, and time trend variables accounts for only 46 percent of the variance. Therefore, the Republican registration percentage may reflect partisanship leanings beyond those indicated by the other factors alone.[16]

The *County and City Databook* contains county level decennial census information. Data from the 1960, 1970, 1980, and 1990 Census of Population and Housing were interpolated for the intervening elections. A constant growth rate calculated from 1980 to 1990 was used to extrapolate the 1990 census data for 1991 through 1994. The independent variables obtained from the historical census data include all the demographic variables identified in Table 1. The descriptive statistics for the demographic, party affiliation, and turnout variables are given for each decennial census year in Table 2.

[Tables 1 and 2 Here]

One note should be made regarding the racial and ethnic background of voters in California. Although it is preferable to include other racial and ethnic groups, such as

[14]There were three special statewide elections during this period (November 1973, November 1979, and November 1993) that are omitted from our analysis.

[15]There were two exceptions in the time period. In November 1974 and June 1976 the total number of absentee ballots cast by county was not tabulated in the SOV. However, the number of absentees per candidate per county was available for the U.S. Senate contest in both of those elections. Therefore, the proportion of absentee ballots in each of those contests is used in place of the proportion of total ballots that were absentee.

[16]Note that since the Republican registration percentage is a function of income and education, the partial derivatives of voting propensity with respect to such factors do not result in "natural" experiments. For example, it would not be reasonable to assume that an increase in real median family income would occur without a corresponding increase in Republican registration.

Latino-Americans and Asian-Americans, in our analysis, the data is not available for the entire time series. Information beyond the percentage of African-Americans and "foreign stock" is not available for 1960 and 1970. The availability of the data does however match the increase in the numbers and visibility of diverse racial and ethnic groups.[17]

The remaining independent variables are related to the geographic location of a county, the context or ballot attractiveness of the election, the time of the election. The two areas of California we isolated are the San Francisco Bay Area (counties which border the bay plus Santa Cruz) and Southern California (counties south of Santa Barbara, Ventura, Los Angeles, and Riverside). The elections are also divided into midterm and presidential elections. Our analysis of the effect of time on the increase of absentee voting is broken down into three terms: a dummy variable indicating elections occurring after 1979, a trend term measuring the number of years since 1961, and another trend term for the period after 1979.

5 Hypotheses

The first set of independent variables listed in Table 1 include the demographic characteristics of the county. If conservative Republican coalitions are the dominant force behind getting out the absentee vote, as Cook (1991) and Willis (1994) suggest, then specific segments of the population fitting the stereotypical profile of a conservative have probably been courted more often and more intensely for absentee voting. Conversely, those outside the mold have probably received fewer direct mail requests for absentee voting and, hence, have felt less of a push to vote absentee. This may include the non-white segment of the population, which leads us to hypothesize a negative relationship between African-American populations and absentee voting.

Wolfinger and Rosenstone (1980) found education to be the most important factor in determining participation. Dubin and Kalsow (1994) separated political participation into three events, registration, turnout, and ballot completion, and also found that education is a significant, positive influence in all three events. The question then becomes, if more educated people are more likely to turnout, given that they've registered, which method of voting will they use? Will they vote absentee more or less often than others? An analysis of Republican registration over the same time period demonstrates a negative relationship with median education. Since Republicans have been the most successful group in getting out the absentee vote we anticipate a negative relationship between absentee voting and education.

If the decision to cast a ballot through the absentee process rather than at the polling location is the result of "...an on-the-go society of always-busy, two-worker families," as Cook suggests (1991, p. 101), then people with fewer time demands may vote at the polling place more frequently. Cook and Quinn (1983) both tell stories of absentee voters

[17] A future research project will use census tract level electoral data matched with the race and ethnicity information available since 1980.

that are consistent with theories that place an opportunity cost on time and anticipate that voters minimize their costs of voting. If the cost of going to the precinct polling location on election day is recognized to be too high prior to that day, then the voter may chose to obtain an absentee ballot. On the other hand, those with less crowded schedules may anticipate that they will not feel as much time pressure on election day. This implies that the unemployment rate should be negatively correlated with absentee voting, and that the presence of young children will be positively related to absentee voting.

The absentee process is also thought to be used by higher income, older, more conservative voters (see Cook (1991), Oliver (1995), and Willis (1994)). If that is true, then income, percent over age 64, and Republican party affiliation should be positively correlated with absentee voting.[18] In addition, anecdotal evidence regarding election results for Dan Lungren in 1990 and George Deukmejian in 1982, among others, indicates that absentee voting and Republican registration should be positively correlated.

Homeownership is a proxy for Teixeira's (1992) social connectedness, and as such may signal the level of commitment to one's community. As a result, we would expect homeowners to register and vote more often. The question is open as to whether they will utilize absentee ballots more or less frequently than renters.

There are two types of absentee voters, which are indistinguishable in our data; the first type is the "voluntary" absentee voter, and the second is the voter who lives in a sparsely populated area. As a cost control measure the voters in some rural areas are required to vote absentee—precinct polling locations are cost prohibitive.[19] Of the voluntary absentee voters there are those that are either out-of-town or too busy to vote on election day, and those who live some distance from polling locations. In order to save time or for convenience, voters in more rural areas may make use of the absentee ballot more often. We include a percent urban variable in our analysis to control for the presence of involuntary absentee voting.[20]

The geographic location of counties in California may be important for two reasons. The first is that they may represent pockets of established minority groups, i.e., those who are eligible to vote and have ready access to media and public resources in their native language. The Bay Area and Southern California may also represent the major media markets for the state.[21] As such advertisers may be able to increase their reach

[18]Refer to Patterson and Caldeira for a similar set of socioeconomic variables. They analyze the effects of the percentage over 64 and the percent Democrat on the absentee voting rate. Note that Patterson and Caldeira report that the Republican advantage drops in half between 1978 and 1982.

[19]Hamilton (1988) compares the costs of several all-mail ballot elections, finding that mail balloting results in significant savings over precinct voting. The savings Hamilton reports range from 17 percent to 75 percent of the cost of a precinct-voting election.

[20]See also Patterson and Caldeira (1985), who use percent urban, and Oliver (1995), who uses percent suburban and percent rural, as examples of other studies that consider the impact of local electoral conditions. In addition, in California the local registrar is allowed to determine whether or not a polling location will be provided (Patterson and Caldeira (1985)).

[21]The population in the Bay Area ranges from 20.5 percent of the current population of California, to a high of 23.8 percent of the population in the early 1960s. The southern California counties account

and a specified saturation level at a lower cost. Hence, it may be more effective for a get-out-to-vote campaign to target the Bay Area or the southern part of the state.[22] The relative cost per additional vote will be significantly lower than that for other areas of the state. Both of these reasons lead to an expectation of increased absentee voting in the Bay Area and southern California.

In addition, we analyze the effect of midterm versus presidential elections on absentee voting. Since political participation levels, measured as either registration or turnout rates, is typically higher in presidential elections than midterm elections, it may be reasonable to assume that absentee rates will also be higher for presidential elections. If the level of absentee voting is correlated with the attractiveness of the ballot, and if the presidential ballot is assumed to be more attractive than voting for the governor, then absentee rates should be higher for presidential years.

Additionally, we want to analyze the effect of time on the increase in absentee voting. First we look for a shift in the level of absentee voting following the law change. Although this shift may occur at the first opportunity, i.e., 1978, it's reasonable to assume a delay. Our analysis assumes a delay of at least one election, implying that it was 1980 before an observable shift in absentee voting occurs. This delay assumes that there is a learning period before large numbers of voters realize that they too can apply for an absentee ballot. Since both the number and percentage of voters utilizing absentee ballots increases dramatically after 1980 this shift should be positive. Refer to Table 3 for the percentages of absentee voters in California statewide elections since November 1962. The second time variable is the overall trend, which we hypothesize to have a positive effect. The time since the law change also appears to have a positive effect.

[Table 3 Here]

6 Results

The percent of registered voters chosing to cast absentee ballots is given in Table 3 and shown in Figure 3. With the exception of 1978, general elections elicit a higher percentage of absentee voters. The rate of absentee voting is relatively "flat" prior to the change in legislation, with the predictable midterm lows and presidential highs. After the law change, however, the general election absentee rate climbs quickly, still with peaks and valleys. The primary election absentee rate begins the time series at a lower rate, meets that of general elections at the time of the law change, but does not increase as fast after that point. The primary election absentee rate also demonstrates the midterm lows and presidential highs as seen in the general election.

for 54.0 percent of the current population, down from 54.8 percent in the early 1960s.

[22]The Bay Area and southern California indicators also proxy for the levels of campaign spending in California. Although our analysis might benefit from the additional detailed information regarding campaign spending, these figures are currently unavailable from the state of California.

[Figure 3 Here]

6.1 Estimation of Affects of Independent Variables

The estimates for our nested aggregate logit absentee voting model are given in Table 4 for general elections, and Table 5 for Primary elections. The graphs in Figure 3 show the actual versus predicted absentee voting rates for general and primary elections. Although the model slightly over-predicts the absentee voting rate, it appears to work very well for both general and primary elections.[23]

The results related to demographic factors are generally consistent with our expectations. African-Americans vote absentee less often, which may be due to a lack of recruiting on the part of the Republican party absentee "drives" in recent years.[24] Increasing the percentage of people over the age of 64 increases the percentage of absentee voters. This should not be surprising since the over 64 age group was one of the original groups the 1977 legislation was intended to help. The presence of young children also increases absentee voting. Again, the legislation change allows parents of such children the convenience of voting at home. With potentially a relatively low opportunity cost of time, unemployed workers tend to vote absentee less often than their counterparts. Consistent with our hypothesis regarding education and Republican party registration, education is negatively related to absentee voting in both elections, although the result is only statistically significant for general elections.

One surprising result is related to the income factor in the analysis. Patterson and Caldeira report findings that are consistent with the popular press regarding income. They indicate that there is a positive relationship between high incomes and absentee voting for the three California elections studied. Our empirical analysis of elections covering a thirty year period does not support this prediction. In fact, the relationship is negative in both types of elections, statistically significant for primaries, and almost significant for general elections. Also surprising is the mixed result on urban versus rural dwellers. The relationship is not significant for either election type, and is of opposite signs.[25]

Although we did not make a prediction regarding homeownership and absentee voting, the results indicate a strong negative relationship. This implies that renters vote absentee more often than homeowners, *ceteris paribus*. One possible explanation is that perhaps a

[23]The predicted values are based on population weighted means by year for each independent variable. In effect, this creates variables that reflect the state-wide demographics.

[24]This finding is in contrast with that of Patterson and Caldeira (1985) where they found no difference in absentee voting rates for blacks and Hispanics. However, it should be noted that their analysis only considered three general elections.

[25]Note that this result conflicts with that of Patterson and Caldeira (1985). They find a strong negative relationship between urban and absentee voting for 1978, 1980, and 1982. However, they indicate that their result should be treated with "healthy skepticism" since California law allows local registrars to determine if voters will be provided with a polling location.

connection between being "on the road" for work and renting exists. Another possibility is that homeowners may feel an increased sense of civic responsibility or obligation such that they turnout at precinct polling locations in greater numbers.

The results on geographic location, Republican party affiliation, and midterm elections are mixed. As expected, both the San Francisco Bay Area and southern California exhibit positive and significant relationships with absentee voting in state-wide general elections. Contrary to the popular press and specific election anecdotes, the percentage of voters that are registered as Republicans does not appear to impact the absentee voting rate. Although the percent of Republicans varies from 18 percent to 87 percent, it does not appear to affect absentee voting. The impact of midterm elections is as anticipated. Significantly fewer voters cast absentee ballots in midterm elections than do in presidential elections.

[Tables 4 and 5 Here]

With respect to the inclusive-value factor, the expected maximum utility of not voting absentee, our results for the two election types differ. The coefficient of the inclusive-value term is of the expected sign and in the unit interval for general elections (ρ=0.243, t-stat=4.58). This supports our hypothesis of a nested model for voter decisions, consistent with the process depicted in Figure 2a. As the percentage of precinct voters increases, the inclusive-value of not voting absentee increases. This in turn decreases the utility of voting absentee, thereby decreasing the fraction of voters casting absentee ballots. Since the inclusive-value coefficient lies strictly between zero and one, we conclude that while absentee and precinct voting are substitute activities, they are not perfect substitutes. This means that a increase in precinct voting decreases both absentee voting and not voting, but not in strict proportion.[26]

However, the coefficient of the inclusive-value term in the model of primary elections is negative, which is inconsistent with the decision process shown in Figure 2a.[27] An

[26]Had the inclusive-value coefficient been estimated to be at either extreme of the unit interval, i.e., at zero or one, the implication for the relationship between absentee and precinct voting would have been different. If the coefficient of the inclusive-value term had been one, the model in Figure 2a would be equivalent to a three-choice non-nested multinomial logit model. In this case, as the percentage of precinct voters increases, the percentages of absentees and individuals not voting would decrease proportionately. At the other extreme, if the coefficient on the inclusive-value term had been zero then the model in Figure 2a would be equivalent to two independent binary logits, one for each decision. In this case, an increase in precinct voting would not come at the expense of absentee voting, but would instead come entirely from the not-voting population.

[27]Note that prior studies of primary voters typically examine the decision to vote in primary elections versus general elections. For example, Norrander (1989) finds that there are a few minor ideological differences between primary and general voters. Nownes (1992) finds differences in campaign interest between primary election voters and general election only voters, but he does not find evidence of a differences in social-psychological factors that might motivate voters to participate. Norrander also reports (1991) that primary election voters are core voters, implying that primary voters require a lower level of stimulus to participate. In contrast, our analysis examines the differences in individual level decision processes and the sequence of choices faced by a voter.

alternate nesting is depicted in Figure 2b. The first decision for a voter is that of turnout, and the second decision, given the decision to vote, is whether to vote absentee or at a precinct polling location. Our preliminary results for this model show that it is not inconsistent with the voting behavior for primary elections. Interestingly, the Figure 2b model is also not supported by the data for general elections. Therefore, it appears that voters may be following two different decision models when deciding how to cast a ballot, depending on the election type.[28]

An alternate explanation for the sign of the inclusive-value term in the second stage model can be found in the theory of substitutes and complements. Recall that the term as used in the logit model is $\log(1 - P_{k=1|j=0})$, where $P_{k=1|j=0}$ is the fraction of non-absentee voters voting at the polling location. By construction the nested logit model displayed in Figure 2a allows for a substitute relationship between absentee voting and precinct voting as we have discussed above. Inspection of the inclusive-value term with respect to changes in the percent voting at the polling location shows this rather directly. As the probability of voting at the precinct increases, $\log(1 - P_{k=1|j=0})$ decreases. Since this term is multiplied by a positive coefficient in the estimated logit model, a decrease in absentee voting is predicted to follow. This too suggests that in general elections absentee and precinct voting are substitutes.

Note that the opposite appears to be true for primary voting. An increase in precinct voting in a primary may occur along with an increase in absentee voting. Again, looking at the equation we estimated, an increase in the probability of voting at the precinct leads to an increase in the probability of voting absentee since the sign of the inclusive-value term is negative.[29]

The last set of independent variables we analyze are time related. The first trend variable, Trend1, shows that the level of absentee voting in general elections was fairly stable, perhaps increasing slightly, through the entire time series. In primary elections the Trend1 variables shows a significant positive impact on absentee voting rates. The intent of the dummy variable was to identify any level shift in absentee voting due to the legislation. It appears that given all other changes, the absolute level change was negative. However, this is offset by a positive and significant effect from the Trend2 variable, the time trend after the law change.

6.2 Impact of Legislation

The effect of the legislation can be measured by eliminating the dummy variable and the second time trend variable, Trend2. Refer to the graphs in Figure 4 for the resulting

[28]Note that these results are preliminary. When cell counts are small, as is the case with primary elections where the absentee vote rate is relatively low, the Berkson-Theil minimum chi-squared estimators can have significant small sample bias.

[29]It is worth noting that the choice model in Figure 2b is not inconsistent with the hypothesis that absentee and precinct voting are complementary activities.

changes in predicted levels of absentee voting. The predictions are based on population weighted averages of the demographics, with the Dummy79 and Trend2 variables present in the "predict" curves, and those two variables set to zero in the "no change" curves. In the general election the curve reflecting no legislation is virtually "flat," with a slight decline at the end and the typical midterm valleys and presidential peaks. In short, the level of absentee voting today would be no different than that in the 1960s and 1970s. We performed an F-test for the hypothesis that the impact of the dummy and Trend2 variable were not significant. The value of the test was 28.3, which exceeds the critical values of 3.0. Therefore, we conclude that the legislation was indeed significant in changing the level of general election absentee voting. The F-test for the primaries resulted in a value of 8.6, exceeding the 95 percent critical value of 3.0, but the absolute predicted difference in voting was negligible as shown in Figure 4.[30]

[Figure 4 Here]

7 Discussion and Conclusion

The first question is what impact did the change in absentee laws have on voter participation? Based on our discovery of which choice model, Figure 2a or 2b, more accurately reflects the voter's decision process we have a preliminary answer to the question. It appears that liberalizing absentee voting policies may have actually increased political participation in primaries, beyond what it would have been *ceteris paribus*, since the activities are complements. However, the impact of liberalizing absentee laws on general election participation differs since absentee and precinct voting are substitute activities in general elections, albeit not perfect substitutes. Thus, the legislative changes of 1977 may have only slowed the decline in turnout for general elections rather than actually increasing the total level of participation. Note that this result is not inconsistent with Patterson and Caldeira's findings that "partisan candidates are likely to harvest absentee votes in the very localities where their party is otherwise strong (1985, p. 784-785)." The fact that we find voters casting absentee in place of voting at the precinct is also consistent with results from Texas (Donovan (1989)). Donovan reports that "advance voting has not achieved its prime goal (p. 2895)," with turnout decreasing three percentage points, placing Texas near the bottom of the states for turnout.

The next concern is related to the effect of differences in counties on the absentee voting rate. If we calculate the proportion of the variance in absentee rates that is due to county effects, we find that 4.9 percent of the variance in general elections is attributable to county effects. In primary elections that percentage falls to 3.8 percent.[31] Most of the

[30] Another test related to the change is legislation is whether the rate of increase in absentee voting, i.e., the slope of the curve differs in the two periods. This can be tested directly by examining the Trend2 variable. The resulting F-test for general elections has an F-test value of 41.5, far exceeding the 95 percent critical value. The primary election results yield an F-test value of 4.4, with a 95 percent critical value of 3.85.

[31] The value of ζ is 0.73077 for general elections and 0.784556 for primary elections.

unobserved variation in voting behavior occurs over time.

What would have happened without the liberalization in absentee voting? Over the last four years (1990 through 1994) the general election model predicts an average of 13.1 percent absentee voting with the law change, and 5.3 percent without the law change. Similarly, the primary model predicts an average of 7.9 percent absentee voting with the change, and 7.1 percent without the change.

To date we have found that the rate of absentee voting is higher now than it would have been without the liberalization.[32] We have also discovered that voters use different choice models in general and primary elections regarding the decision to vote absentee. These differences are important when attempting to determine the impact on participation that liberalization has had. The different choice models and their implications are also important if, as Patterson and Caldeira (1985) suggest, other state will follow California in passing permissive absentee laws.

While these findings are important, there are many open questions about absentee voters. Although we now have a better understanding of who votes absentee in which elections, we need to study their ballot completion rates and voting patterns. Do they indeed vote similar to the precinct counterparts, or are their vote patterns significantly different? If they consistently complete less of the ballot, then even though they turnout to vote, they are "less" represented in the outcome of the election. Our future research will be directed to learning more about voter roll-off, ballot fatigue, strategic voting, and voting patterns as they relate to the differences between absentee and precinct voters. We will also attempt to answer questions related to which proposition or candidate campaigns may benefit or be hurt by an increase in absentee voting.

[32]This is consistent with Oliver's (1995) analysis of the absentee voting rates across the fifty states. He found that for the 1992 general election voters in states with more liberal absentee laws voted absentee more often.

Tables

Table 1: INDEPENDENT VARIABLES

VARIABLE	DEFINITION
Demographics	
African-American	% of the population reporting African-American.
Education	Median Years Education for persons over 25 years old.
Income	Median Family Income for the prior year, in real terms (000's).
Over 64	% of the population over 64 years old.
Under 6	% of the population under 6 years old.
Owner	% of households in owner-occupied housing units.
Unemployment	% of unemployment in the civilian labor force.
Urban	% of population residing in an urban area.
Geographic Areas	
Bay Area	Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Santa Cruz, Solano and Sonoma counties.
Southern California	Imperial, Los Angeles, Orange, Riverside, San Diego, Santa Barbara, and Ventura counties.
Party Affiliation	
Republican	% of registered voters that are Republican.
Elections	
Midterm	Election year was 1962, 1966, 1970, 1974, 1978, 1982, 1986, 1990, or 1994.
Time	
Dummy79	Dummy indicating if election occurred after 1979, 0 otherwise.
Trend1	Election year minus 1961.
Trend2	Election year minus 1961 if the year is after 1979, 0 otherwise. squared.

Table 2: MEAN VALUES OF INDEPENDENT VARIABLES

VARIABLE	1960	1970	1980	1990
Demographics				
African-American	2.46	2.86	3.07	3.40
	(2.78)	(3.33)	(3.79)	(3.64)
Education	11.27	12.19	12.68	12.19
	(0.87)	(0.41)	(0.35)	(0.63)
Income	20.16	24.28	19.88	27.12
	(2.67)	(3.77)	(3.44)	(6.35)
Over 64	9.60	10.44	11.58	12.91
	(3.18)	(3.27)	(2.95)	(3.83)
Under 6	10.75	7.72	7.29	9.16
	(1.52)	(1.12)	(1.20)	(1.45)
Owner	61.58	60.97	62.91	61.93
	(6.87)	(6.31)	(7.46)	(7.63)
Unemployment	7.17	7.71	9.33	7.72
	(2.30)	(1.12)	(3.32)	(2.37)
Urban	49.49	56.40	59.79	65.15
	(29.07)	(31.11)	(31.12)	(28.78)
Party Affiliation – Republican Registration				
Primary Elections†	39.40	40.49	35.21	39.50
	(5.67)	(5.38)	(4.48)	(6.43)
General Elections†	39.56	39.94	35.53	39.62
	(8.57)	(5.42)	(4.63)	(6.51)
Percent Precinct Voting				
Primary Elections†	73.84	67.78	64.88	47.41
	(3.21)	(6.43)	(4.44)	(9.98)
General Elections†	79.25	76.86	77.34	58.77
	(2.36)	(3.03)	(3.43)	(6.99)

† The electoral data in the 1960 column is from 1962 for general elections, and 1964 for primary elections rather than 1960.

Table 3: ACTUAL ABSENTEE PERCENTAGES †

	CALIFORNIA STATEWIDE ELECTIONS	
YEAR	PRIMARY	GENERAL
1962	n/a‡	2.07
1964	1.53	3.72
1966	1.22	2.62
1968	1.82	3.89
1970	1.25	2.34
1972	2.24	3.87
1974	1.68	2.23
1976	3.54	3.67
1978	3.28	3.10
1980	3.21	4.83
1982	2.94	4.54
1984	3.63	6.99
1986	3.49	5.34
1988	4.56	10.24
1990	6.23	10.77
1992	7.95	12.92
1994	7.13	13.33

† The absentee rate in this table is the percent of registered voters casting absentee ballots.
‡ The 1962 primary election data was not available.

Table 4: GENERAL ELECTION RESULTS

VARIABLE	ESTIMATED COEFFICIENT		T-STATISTIC
Constant	-0.965	**	-2.10
Demographics			
African-American	-0.031	***	-7.09
Education	-0.100	***	-3.56
Income	-0.007		-1.50
Over 64	0.050	***	5.48
Under 6	0.028		1.43
Owner	-0.009	***	-2.79
Unemployment	-0.042	***	-4.82
Urban	-0.002		-1.05
Geographic Areas			
Bay Area	0.188	***	2.58
Southern California	0.095	**	2.07
Party Affiliation			
Republican	0.154		0.63
Elections			
Midterm	-0.346	***	-13.41
Time			
Dummy79	-1.225	***	-5.66
Trend1	0.007		1.34
Trend2	0.072	***	6.44
Inclusive Value/Not Absentee	0.243	***	4.58
Number of Observations	969		
Corrected R-Squared	0.70171		

Notes: *p=.10, **p=.05, ***p=.01
The dependent variable is the log odds of voting absentee.

Table 5: PRIMARY ELECTION RESULTS

VARIABLE	ESTIMATED COEFFICIENT		T-STATISTIC
Constant	-4.370	***	-8.95
Demographics			
African-American	-0.023	***	-4.88
Education	-0.031		-1.10
Income	-0.011	**	-2.52
Over 64	0.054	***	5.79
Under 6	0.046	**	2.32
Owner	-0.009	***	-2.68
Unemployment	-0.041	***	-4.62
Urban	0.001		0.66
Geographic Areas			
Bay Area	0.142	*	1.83
Southern California	0.137	***	2.84
Party Affiliation			
Republican	0.114		0.46
Elections			
Midterm	-0.060	***	-3.63
Time			
Dummy79	-0.583	***	-2.78
Trend1	0.063	***	12.18
Trend2	0.023	**	2.10
Inclusive Value/Not Absentee	-0.637	***	-9.96
Number of Observations	907		
Corrected R-Squared	0.63834		

Notes: *p=.10, **p=.05, ***p=.01
The dependent variable is the log odds of voting absentee.

Figure 1: Absentees as Percent of Ballots Cast

general (□) primary (△)

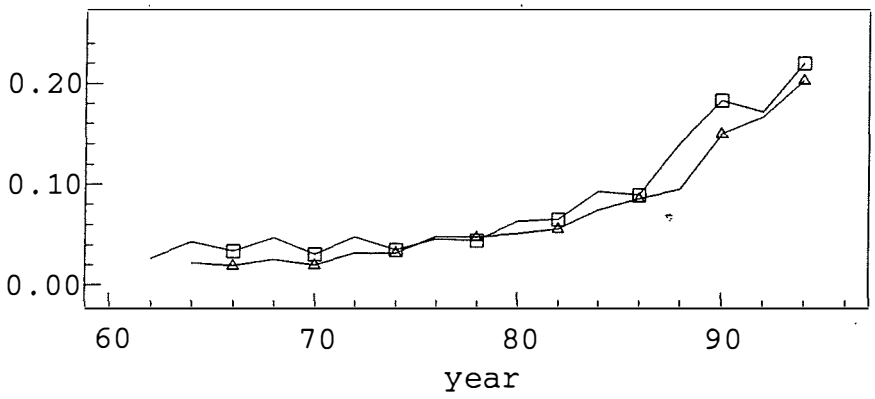


Figure 2a: Absentee Voting Model

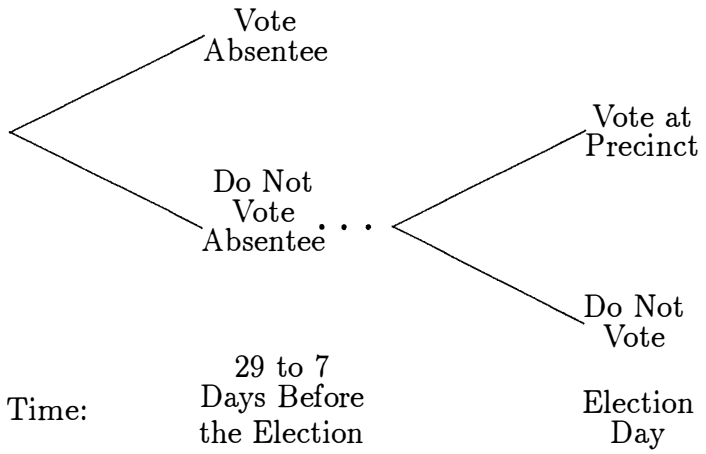


Figure 2b: Alternate Absentee Voting Model

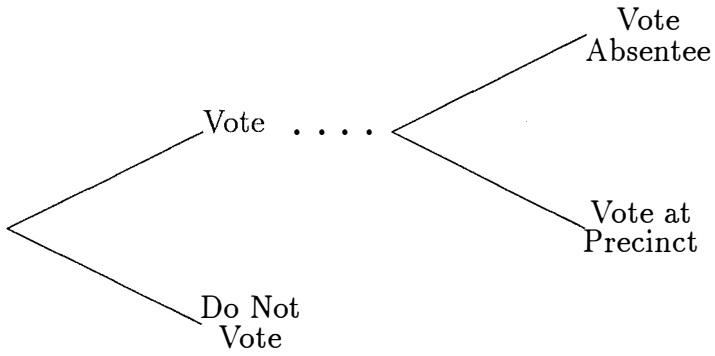
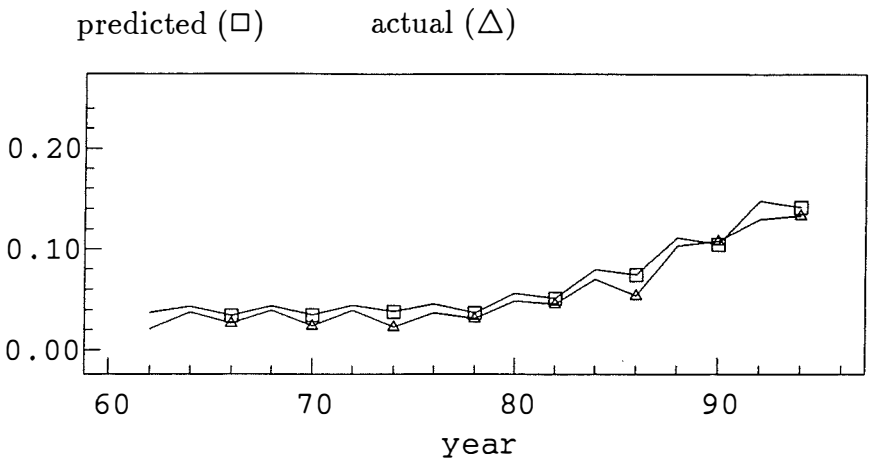


Figure 3: Actual Versus Predicted Absentee Voting as Percent of Registered Voters

General Elections



Primary Elections

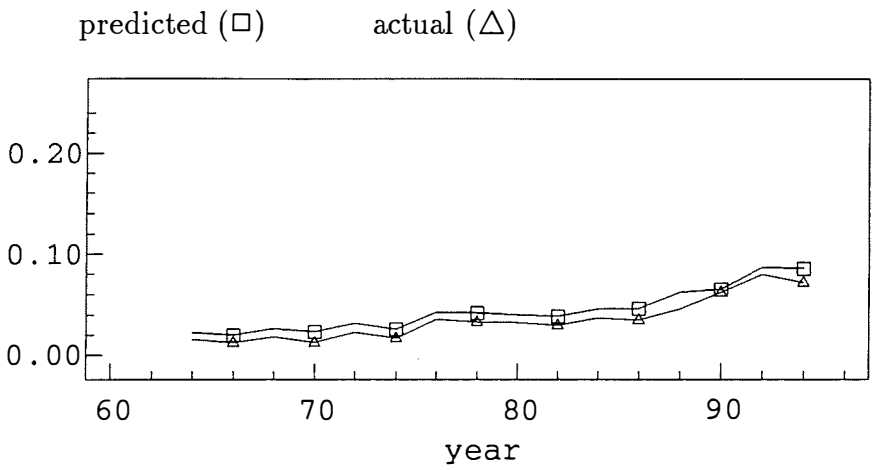
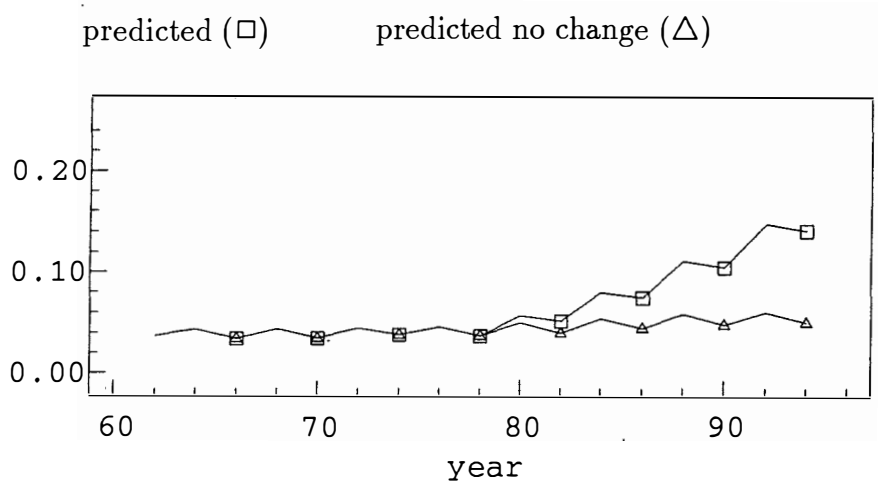
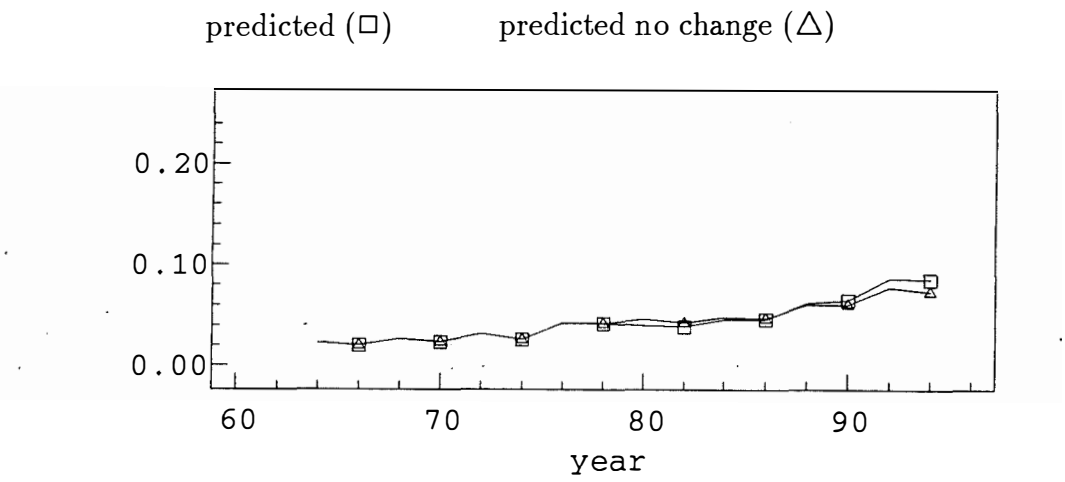


Figure 4: Predicted Absentee Voting With and Without Legislation

General Elections



Primary Elections



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