

The Effects of Non-Precinct Voting Reforms on Turnout, 1972-2008

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1 Executive Summary

This report examines voter turnout in the United States from 1972-2008 and addresses two questions about the effects of non-precinct voting reforms on voter turnout: First, has the adoption of no-excuse early voting and no-fault absentee voting led to a net increase in turnout in states which have adopted these reforms? And, second, if so, have the increases in turnout occurred among particular socio-demographics groups? We find that:

1. States that have adopted no-fault absentee voting have not experienced substantially larger increases in turnout than have states that did not adopt no-fault absentee voting.
 - a. However, *controlling for other factors which affect turnout*, adoption of no-fault absentee voting leads to a long-run increase in turnout of approximately 3 percentage points.
2. States that have adopted no-excuse early voting have not experienced substantially larger increases in turnout than have states that did not adopt no-excuse early voting.
 - a. However, *controlling for other factors which affect turnout*, adoption of no-excuse early voting, coupled with an appropriately long early-voting period, does appear to lead to a long-run increase in turnout of approximately 3 percentage points.
3. The effect of no-fault absentee voting does not vary across income or education groups.
4. The effect of no-fault absentee voting has a larger effect on older voters than on younger voters.
5. The effect of no-excuse early voting does not appear to vary across income, education, or age groups.
6. The overwhelming majority of voters choosing to vote using no-excuse early voting and no-fault absentee voting are doing so as alternatives to other methods of voting, i.e., individuals voting early or absentee would likely have voted even in the absence of these non-precinct voting methods.

2 Introduction

Since 1972 25 states have adopted no-fault absentee voting, allowing citizens to request and cast an absentee ballot without any requirement that they claim or document being unavailable to cast an in-person ballot on election day. In addition, since 1972 26 states have adopted no-excuse early voting, allowing citizens to vote at select polling places prior to election day. Thus, in the 2008 election, 27 states allowed no-fault absentee balloting, and 31 states offered no-excuse early voting. Table 1 gives the number of states offering each method of non-precinct voting in each presidential election from 1972 through 2008.

[Table 1 Here]

Popular estimates suggest that nearly 40 million voters cast their ballot using some form of non-precinct voting (early, absentee or by mail), which represents about 30 percent of ballots cast in the 2008 election (compared to 20 percent in 2004 and 7 percent in 1992).¹ While large numbers of voters take advantage of both no-fault absentee voting and no-excuse early voting it remains unclear if the effect of the reforms has been to *increase* voter turnout, or to simply *shift the method* by which voters cast their ballots. In this report we attempt to answer those simple questions: has the adoption of no-fault absentee balloting by states increased net turnout, and has the adoption of no-excuse early voting by states increased net turnout?

¹ *America Goes to the Polls: A Report on Voter Turnout in the 2008 Election*, Nonprofit Voter Engagement Network, 2009

Previous research on this question is limited and mixed, but has generally suggested that the reforms have not led to increases in voter turnout.² Ideally, we would prefer answers to these questions based on research designs that maximize our ability to draw causal inferences; when we ask whether these adoptions increase turnout, we consider this to be a causal effect. A standard approach to establishing causality in the contemporary social science research examining variations in individual behavior is to use cross-sectional, multivariate models, where the dependent variable of interest (voter turnout) is modeled as a function of a set of independent variables (demographics and state election laws). Many studies examining the turnout effects of in-person early and absentee voting use this approach.

But we do not necessarily know why some states have adopted in-person early or absentee voting (while others have not), or whether those states are as a group different than the states that have not adopted these election reforms. If we were to compare turnout in states with in-person early voting to turnout in states that do not have in-person early voting, the comparison would only be valid for drawing an inference on the effect of early voting *if* the adoption of in-person early voting were not correlated with other factors related to turnout. This means that the causal inferences from any cross-sectional analysis are suspect.

An alternative approach to the research question is to analyze it as a policy innovation problem: comparing turnout in a state before the innovation to turnout in a

² Most notably, see Berkinsky, 2005; Fitzgerald, 2005; Highton, 1997; Karp and Banducci, 2000, 2001; Knack, 1995, 2001. For a full review of the literature, see *Review of Existing Research on the Effects of In-Person Early Voting and Absentee Voting on Turnout*, Leighley, Jan and Nagler, Jonathan, report produced for the Pew Charitable Trusts' Make Voting Work, a project of the Pew Center on the States (www.pewcenteronthestates.org/elections), April 22, 2009. We include some text from that report in this section.

state after adoption of the innovation. Because turnout varies from election to election, comparing turnout in a single state in a single year to turnout in the same state the year after adoption, we would not know if we were observing the impact of the electoral reform or instead observing a secular (independent) change in turnout that affected all states in that election year.

We argue that a preferred approach which avoids the "cross-state" and "cross-time" complications inherent in using either approach is to combine the cross-sectional and single-state time-series analyses into a cross sectional time series model and estimation. This approach would treat the adoption of absentee voting and the adoption of in-person early voting as 'interventions', and seek to determine if such interventions raised or lowered turnout in the states. The unit of analysis would be the state-year; the dependent variable would be turnout percentage in the state-year; and independent variables would include demographic and political characteristics argued to affect voter turnout, along with variables for each state-year indicating whether the state had in that year adopted either absentee or in-person early voting.

As we showed in *Review of Existing Research on the Effects of In-Person Early Voting and Absentee Voting on Turnout* (April, 2009), very few studies have tried this approach. Instead, most studies either utilize a single cross-section (using either individual or aggregate data based on either national or state- or county-level data), or change over time in a single state (again, using either individual or aggregate data based on either national or state- or county-level data). And we concluded that "the preponderance of the research on the effects of in-person early and absentee voting fails

to demonstrate that these electoral reforms increase turnout." We also pointed out that given the limits of the existing work, it was too early to draw strong conclusions from it.

3 Data

Our data include aggregate-level measures of voter turnout, election laws, and political characteristics of states from 1972 through 2008; the unit of analysis for each variable is the state-year. We briefly describe these measures (and their sources) in this section (for additional details of how they are operationalized see Appendix I). Turnout. Our measures of turnout by state for each year from 1972 through 2008 are drawn from multiple sources. For our primary analysis of the effects of no-fault absentee voting and no-excuse early voting on aggregate turnout, we rely on 'official turnout' - a measure of recorded turnout in each state divided by the state voting age population.³

For our analysis of the effect of these election law reforms on turnout of different demographic groups, we need a measure of the turnout rate of the subgroup of interest by state. Because official turnout rates are not reported by demographic subgroups, we compute measures of turnout by subgroup for each state using the *reported* turnout from the Census Bureau's Current Population Survey (CPS), where individual-level reports of turnout are aggregated for the subgroups of interest, by state. The CPS is a monthly survey of approximately 50,000 households conducted by the Census Bureau, generating

³ Our measure of official turnout for 1972-1976 comes from the Congressional Research Service Publication, "Voter Registration and Turnout: 1984-1994." For 1980 to 2008 we use data made available by Michael McDonald. We use voting age population for 1972 and 1976, and citizen voting age population for 1980-2008 as the denominator. Because the proportion of non-citizens was very low in 1972 and 1976, we do not believe this is a substantial source of error.

90,000 observations of individuals.⁴ The sample size is large enough to produce enough respondents per state to generate meaningful estimates of turnout for each demographic group. Since we are working with the raw data, we can aggregate turnout by state for any group we choose.⁵

Our demographic categories of interest include income, education, age, and race. We measure income by the respondents' position in the income distribution: each respondent is assigned to an income quintile based on their reported income. Each respondent is placed in one of four education categories: less than high school, high school graduate, some college, or college graduate. We then compute turnout for each group of respondents in each state for each presidential election year.

Election Laws. The other set of variables of primary interest are the adoption of no-fault absentee voting and no-excuse early voting by each state. We utilize a data set on these variables recently constructed as part of the Pew Charitable Trusts' Make Voting Work project.⁶ The primary research method used to produce this dataset was review of relevant state statutes and administrative codes (hereinafter referred to simply as “laws”) identified using standard search procedures in Lexis-Nexis and Westlaw. Each state in each year was coded as having adopted absentee voting or not; and as having adopted in-person early voting or not.

In coding these state statutes over time, we defined *absentee voting* as the option of requesting, completing and returning a ballot prior to Election Day, and being able to

³We refer to these 90,000 observations as respondents, even though in fact a single individual in each household is used as an informant for other adults in the household.

⁵ However, there is no state identifier in the CPS for 1976. Thus 1976 is dropped from the sub-group analyses we report.

⁶ For additional details on the election law data, see "Report on the 1972-2008 Early and Absentee Voting Data Set", Cemenska, et-al, Pew Charitable Trust, September, 2009.

do so without being present in person at an election office or precinct. We defined *in-person early voting* as a one-stop transaction in which the voter requests a ballot, completes the ballot, and returns the completed ballot; states were only classified as allowing early voting if the relevant statutory language explicitly permits the voter to complete the ballot *in the presence of election officials*. This definition may exclude some states in which early voting takes place, where those operations are not explicitly described in state statutes. We use the terms “in-person early voting” and “early voting” interchangeably below.

Table 1 above, which describes the changes in the number of states adopting no-fault absentee voting and no-excuse early voting since 1972, is based on this data set. At the beginning of the period, only two states allowed no-fault absentee voting and five states allowed no-excuse early voting. By 2008, 27 states allowed no-fault absentee voting and 31 states allowed no-excuse early voting. Thus we see drastic change over the period.

In the multivariate analyses below, we also control for other electoral laws, such as the number of days before the election that registration closes and the availability of election day registration. These data were also taken from the 1972-2008 Early and Absentee Voting Data Set.⁷

State Political Characteristics. In the multivariate models we also include measures of campaign activity and electoral competitiveness, factors often associated with higher voter turnout. Each state in each year is coded as having races for senate (or not) and governor (or not); the closeness for each of those races when present; and the

⁷ We note that we use the state as the unit of analysis, thus any intra-state variation, for instance when individual counties adopt different rules, is not accounted for. We use the statewide value as reported in the 1972-2008 Early and Absentee Voting Data Set.

closeness of the presidential election in the state. The competitiveness measures are based on the election outcomes of each contest. We take the reciprocal of the absolute value of the difference in vote share of the two major party candidates. Thus higher numbers indicate more competitive races.

4 Data Analysis: Simple Intervention

In this section we simply look at what happened by comparing the change in turnout of states adopting no-fault absentee voting or no-excuse early voting with the change in turnout over the same time period for states that did not adopt each reform at the same time. The adoption of election reforms by so many states over such a long period makes it reasonably straightforward to determine the impact of the reforms. We utilized two different measurement strategies to determine their net impact in a bi-variate setting.

First, for each state that adopted no-fault absentee voting between the years 1976 and 2008, we looked at the change in turnout for the state from the election immediately preceding adoption to the election immediately following adoption.⁸

To control for any nationwide changes in turnout between elections, we also compute the matching change in turnout between the same election years for the set of states that did not change their no-fault absentee voting laws between the relevant elections. Thus in the election of 1980, we compare the change in turnout of the three states that adopted no-fault absentee voting between 1976 and 1980 to the change in

⁸ Since our initial year of data is 1972, we do not know if states with no-fault absentee voting in 1972 also had it in 1968, so we can not use turnout in 1972 as a measure of the impact of adoption of no-fault absentee voting. Also note that we are only considering elections in presidential years. In computing this pre/post difference, we use the previous presidential, not the previous statewide, election, e.g., a state that adopted no-fault absentee voting in 1979, the election preceding adoption would be 1976, not 1978.

turnout of the 47 states that did not alter their absentee voting laws between 1976 and 1980.

Table 2 provides the results of these calculations. For 1980, the states that adopted no-fault absentee voting had an average increase in turnout 0.2 percentage points, while the 47 states which did not adopt no-fault absentee voting between 1976 and 1980 had an average *decrease* in turnout of 0.4 percentage points. Thus, the difference between them, or the estimate of the impact of adoption of no-fault absentee voting, was 0.6 percentage points. Because the number of states that are used in these pre-post comparison groups vary substantially by year, we then compute a weighted average of these comparisons, and estimate the impact of adoption of no-fault absentee voting to be 1.4 percentage points.⁹

[Table 2 Here]

The results of an identical analysis for the adoption of no-excuse early voting by the states are reported in Table 3. Here the weighted average of the effects over the years is only a 0.4 percentage point difference in turnout between states adopting no-excuse early voting and the comparison set of states. Together, these results suggest that the states adopting no-fault absentee voting and no-excuse early voting had a small increase in turnout relative to those states that did not.

[Table 3 Here]

This initial approach to estimating the effects of non-precinct voting reforms on turnout, however, is limited in that each calculation only utilizes one pair of elections per state that adopted a reform: the election immediately prior to reform, and the election

⁹ We weight each year by the number of states adopting no-fault absentee voting for that year.

immediately after the reform. If either of those elections were unusual in any of the states, our estimates of the election reform effects might be incorrect. And so our second approach to asking whether the adoption of these reforms has led to an increase in turnout is to broaden the comparison set of elections: if we compare all elections from 1972 to the year prior to adoption, to all elections from the year of adoption to 2008 - was the increase in turnout higher for those states that adopted no-fault absentee voting than for those states that did not adopt no-fault absentee voting in the entire period?

For each state that adopted no-fault absentee voting, we calculated average turnout for the state for each election since 1972 prior to adoption of no-fault absentee voting, and for each election since adoption of no-fault absentee voting up to 2008. We look at the change in average turnout for the state between the two periods - pre-adoption versus post-adoption - and compare it to the change in turnout averaged over those same two periods for the set of states which never adopted no-fault absentee voting. This is a far more comprehensive analysis than our initial approach, the typical approach used in discussions of election reform effects, that simply compares the turnout of states adopting no-fault absentee voting immediately before and after adoption.

Here we get slightly different answers. Over the entire period from 1972 to 2008, the states that adopted no-fault absentee voting during this period had an average turnout increase of 1.6 percentage points, considering all pre-adoption elections versus all post-adoption elections. However, over the same period the control group of states also had a turnout increase of 1.6 percentage points. For early voting, the comparable figures are a 1.3 percentage point increase in states that adopted no-excuse early voting, compared to a 3.4 percentage point increase over the same time period for states that did not adopt no-

excuse early voting. Thus using this method, we would conclude that states adopting no-fault absentee voting had no increase in turnout relative to states that did not adopt no-fault absentee voting, and that states adopting no-excuse early voting actually had a turnout increase 2.1 percentage points *lower* than states that did not adopt no-excuse early voting (these values are reported in the bottom rows of Tables 2 and 3).

The conclusion from both of these analyses is very clear: states that have adopted no-fault absentee voting or no-excuse early voting have *not* experienced a substantial increase in turnout relative to states that did not adopt those reforms. And we note that these are not estimates based on samples of data. This is merely a statement of fact about what did happen in these states. There is no uncertainty about the numbers in Tables 2 and 3 as accurate descriptions of what did occur from 1972 to 2008.

However, while we have shown that states adopting no-fault absentee voting and no-excuse early voting did *not* experience an increase in turnout relative to states that did not adopt these reforms - this does not answer the counterfactual question as to what would have happened had these states *not* adopted no-fault absentee voting or no-excuse early voting? While it is tempting to infer that no-fault absentee voting and no-excuse early voting do not raise turnout, it may be the case that the set of states adopting these reforms were not random - and that other factors were at work to depress turnout in those states, thus masking the impact of the reforms.

The simple conjecture is that it is possible that the states adopting these reforms did so in order to combat other trends negatively affecting turnout. Or, it is possible that the states adopting these reforms also were states that had less competitive elections post-reform, leading to lower turnout. In the following section we perform a cross-sectional

time-series analysis to control for observable characteristics of the states such as demographic characteristics, other elections laws, and competitiveness of elections, that were changing over this period.

5 Data Analysis: Multivariate Analysis

While the comparisons of turnout before and after adoption of no-fault absentee voting and no-excuse early voting we present above is a standard way to analyze a policy intervention, we also want to be sure that the results are not affected by other factors that influence turnout. We want to be sure that turnout in states that adopted no-fault absentee voting did not rise, or was not depressed, because some other factors known to be related to turnout changed in those states. To check for this, we estimated a multivariate model to predict turnout in a state, based on a range of factors known to influence turnout. Previous research has shown that turnout can be affected by: demographic factors such as age, education, and income; election registration rules such as how many days before an election registration closes and the availability of election day registration; and the presence of a close election that could stimulate turnout (see, for example, Fenster, 1994; Fitzgerald, 2005; Franklin 2004; Highton, 1997; Leighley and Nagler, 1992; Nagler 1991; Rosenstone and Hansen, 2003). We include all these factors at the state level in a multivariate model.

Following standard practice in estimation of cross-sectional time series models, we include dummies for each election year (save one), and dummy variables for each

state (except one) to allow for idiosyncratic year to year variation in turnout and for fixed effects at the state level that we do not measure.¹⁰

In Table 4 we report the estimated long-run effect of adoption of no-fault absentee voting and of no-excuse early voting on aggregate state turnout. Because previous research (i.e., Barreto et al, 2006; Berinsky 2005; Karp and Banducci 2001) suggests (indirectly) that absentee voting does not increase overall turnout, the results of our analysis are striking. Contrary to conventional wisdom, no-fault absentee voting, *ceteris paribus*, appears to lead to increases in turnout. According to our analysis, adoption of no-fault absentee voting has increased the turnout of states adopting it by 2.7 percentage points over what their turnout would have been without no-fault absentee voting. And this estimate is significant at the traditional 95% level: the 95% confidence interval is (1.4, 4.4). Similarly, adoption of no-excuse early voting has led to an increase in turnout of 2.8 percentage points for states adopting it over what their turnout would have been without it. However, while this is our best estimate, it fails to reach the 95% threshold for significance. However, it is significant at the 88% level, thus we are certainly more confident than not based on the estimates that no excuse early voting *does* lead to increases in turnout.

[Table 4 Here]

We have a brief point to make on the statistical significance of the result. Based on our estimates, we are *not* 95% certain that no excuse early voting leads to increases in turnout. However, we are 100% certain (conditional on the model specification we adopt) that in the period from 1972 to 2008, states that adopted no-excuse early voting had higher turnout rates, *ceteris paribus*, than states that did *not* adopt no-excuse absentee. So

¹⁰ See Appendix II for more detail on this.

while there is uncertainty about the future, there should be no uncertainty about the past. Our analysis reveals that during the period 1972-2008, states that adopted no-fault absentee voting or no-excuse early voting had higher turnout than they would have had without these reforms. That these states did *not* actually experience increased turnout relative to other states - as we showed in our earlier analysis - can be attributed to other factors affecting turnout in the states.

6 Impact of Reforms on Different Demographic Groups

We also estimated our multivariate model for different demographic groups: income (quintiles one thru five), education groupings (less than high-school degree, high school degree, some college, college graduates), and age groups (18-24, 25-30, 31-45, 46-60, 61-75, and 76-90 year olds). We did this by computing turnout for each state for each election year for each group, then estimating the multi-variate model described above individually on each group for the same 1972-2008 period. In Table 5 we show the effects of changes in no-fault absentee voting and no-excuse early voting on the turnout of each of our demographic groups. The first column gives the estimated effect of adopting no-fault absentee voting on turnout of the group, and the second column gives the 95% confidence interval about that estimate. The third column gives the estimated effect of adopting no-excuse early voting for each group, and the fourth column gives the 95% confidence interval about that estimate. There are very limited differences in these estimates across different sub-groups; we really cannot distinguish differences in the magnitude of the effects of these reforms across education, income or age groups. For no-fault absentee voting, estimated effects for only four of the 15 groups are significant at

the 95% level (some college, quintile 4, and ages 45-50 and 61-75). Thus it does appear that no-fault absentee voting has a larger effect on older voters than on younger voters. We generally also cannot distinguish across the groups in the effect of no-excuse early voting. We see substantial overlaps of the confidence intervals across almost all groups. While no-excuse early voting appears to have a particularly large effect on the second quintile, looking at the confidence interval we see that we cannot be very sure of this.¹¹

[Table 5 Here]

7 Conclusions

Nearly all previous studies of the effects of non-precinct voting reforms on voter turnout have been limited by not having data across multiple states and multiple time periods, or failing to adequately allow for unmeasured characteristics of states that can affect turnout. We have addressed each of these concerns by using multiple ways to assess the effects of these election reforms. This report thus provides the most comprehensive look to date at the effect of no-fault absentee voting and no-excuse early voting on turnout.

We show that contrary to conventional wisdom, no-fault absentee voting *has* raised turnout - all those absentee votes that have been cast are *not* votes that would have simply been cast at the polling place were no-fault absentee voting not available. Our estimate of the effect of no-fault absentee voting is significant at the 95% level. And

¹¹ We note that these estimates of no-excuse early voting are highly sensitive to the length of the early voting period. The model includes both the availability of no-excuse early voting, and the length of the early voting period as both of these describe the actual electoral rule. The first differences in this table are calculated using an early voting period of 45 days. We also calculated these first differences assuming an early voting period of 30 days, and include these in the appendix in Table A3. They are smaller estimated effects, and fewer of them reach traditional levels of significance. Thus our estimates suggest that early voting is less helpful with a shorter early voting period (see also Table A1 with the coefficients of the model).

these differences in turnout appear to be especially notable among older, rather than younger voters, the only group-specific difference we report. Though we have to be clear that we do not have the same level of statistical precision in claiming this difference that we do in claiming that no-fault absentee voting does increase turnout overall. For no-excuse early voting, the result is more nuanced. The effectiveness of no-excuse early voting appears to depend on the length of the voting period. A sufficient voting period appears to lead to increased turnout. These effects are at best fairly limited overall. The estimated increases in turnout are less than three percentage points for each reform.

These estimates are average effects. The effect of these reforms may depend on the activities of political campaigns. Explicit efforts by campaigns to mobilize voters via either absentee voting or early voting could raise the impact of either method of voting. The effect of these reforms could also be different at races below the level of presidential elections. For these elections, which are generally less salient and can feature much lower turnout, the effects could be larger.

8 References

- Barreto, M. A., M. J. Streb, M. Marks & F. Guerra. 2006. "Do Absentee Voters Differ from Polling Place Voters? New Evidence from California." *Public Opinion Quarterly* 70(2):224-234.
- Berinsky, A. J. 2005. "The Perverse Consequences of Electoral Reform in the United States." *American Politics Research* 33(4): 471-491
- Fenster, M. J. 1994. "The Impact of Allowing Day of Registration Voting on Turnout in U.S. Elections from 1960 to 1992." *American Politics Quarterly* 22(1):74-87.
- Fitzgerald, M. 2005. "Greater Convenience but Not Greater Turnout: The Impact of Alternative Voting Methods on Electoral Participation in the United States." *American Politics Research* 33(6):842-867.
- Franklin, Mark N. 2004. *Voter Turnout and the Dynamics of Electoral Competition in Established Democracies Since 1945*. Cambridge: Cambridge University Press.
- Highton, B. 1997. "Easy Registration and Voter Turnout." *Journal of Politics* 59(2):565-575.
- Karp, J. A. & S. A. Banducci. 2000. "Going Postal: How All-Mail Elections Influence Turnout." *Political Behavior* 22(3):223-239.
- Karp, J. A. & S. A. Banducci. 2001. "Absentee Voting, Mobilization, and Participation." *American Politics Research* 29(2):183-195.
- Knack, S. 1995. "Does Motor Voter Work? Evidence from State-Level Data." *Journal of Politics* 57(3):796-811.
- Knack, S. 2001. "Election-Day Registration: The Second Wave." *American Politics Research* 29(1):65-78.
- Leighley, J. and Nagler, J., 2009. *Review of Existing Research on the Effects of In-Person Early Voting and Absentee Voting on Turnout*. Report produced for the Pew Charitable Trusts' Make Voting Work, a project of the Pew Center on the States (www.pewcenteronthestates.org/elections).
- Leighley, J.E. & J. Nagler. 1992. "Individual and Systemic Influences on Turnout: Who Votes, 1984." *Journal of Politics* 54:718-740.
- Nagler, J. 1991. "The Effect of Registration Laws and Education on United States Voter Turnout." *American Political Science Review* 85:1393-1405.

Rosenstone, S. J. & J.M. Hansen. 2003. *Mobilization, Participation and Democracy in America*. New York: Longman.

Appendix I - Model Specification

To control for other factors that can influence turnout, we specified a multivariate model of turnout that could be estimated with a time-series cross-sectional model. Thus the basic unit of analysis is turnout in each state in each year. For estimating the model on sub-groups of the population, the unit of analysis is turnout of that group in each state in each year. Since turnout is a proportion between zero and one, we used the log-odds of turnout as the dependent variable. We included in the model factors known to effect turnout, measured at the state level. We included a set of election laws: the number of days before the election that registration closed, and the availability of election day registration, as well as a multiplicative interaction between the two, and the availability of voter registration when registering for a drivers license. We included measures of the demographics of each state as well: the proportion of citizens between the ages of 25-30, 31-45, 46-60, 61-76, and 76-89; and the proportion of citizens with high-school degrees, with some college experience, and with college degrees. We also included the mean of state per-capita income in real dollars. And since competitiveness of elections effects turnout, we included variables for the presence of a senate or gubernatorial election, as well as a measure of the closeness of those elections.

Finally, we also include a lagged dependent variable, and state and year fixed effects. The reason for inclusion of the fixed-effects for states is that there may be some unmeasured characteristic of the states that adopted no-fault absentee voting or no-excuse early voting that makes them different than the other states, and might perhaps lead to higher increases in turnout over the period studied. By including the state fixed-effect, we remove this possibility. The reason for the inclusion of year fixed effects is

straightforward: there are factors causing nationwide increases and declines in turnout from year to year, and since with only 10 elections they *might* be correlated with the adoption of election reforms, including the fixed effects is essential to get consistent estimates.

While the strength of the specification we have adopted is that we can have great faith in any positive relationships we find between election reforms and increases in turnout, the weakness of the specification is that with a saturated model such as we have, we might not have the statistical power to identify all existing relationships.

To estimate the magnitude of each institutional reform, we estimate the long-run impact of the adoption of a reform in a state with a turnout rate of 50%.¹² To estimate the effect of early voting, we assumed an early voting period of 45 days. [Though see Appendix Table A3 for estimated effects with an early voting period of 30 days.]

For the demographic sub-groups, the same model was estimate for each group, but here turnout (and lagged turnout) was measured as the turnout for that group, using the CPS.

¹² The choice of a baseline of 50% of course gives us a higher estimated effect for a change in a dependent variable causing an increase in turnout than a higher baseline would. But the effect is minimal, and so for simplicity we use the 50% baseline. For instance, a 60% baseline would give us a confidence intervals of (1.3, 4.2) for the effect of absentee voting, rather than the confidence interval of (1.4, 4.4) which we report in Table 4. Also, for low-turnout states considering reforms, 50% is the more realistic baseline.

Table 1: Adoption of Voting Reforms

	Number of States w/	
	No-Fault Absentee Voting	Early Voting
1972	2	5
1976	3	6
1980	6	7
1984	6	7
1988	6	9
1992	12	11
1996	16	14
2000	22	22
2004	24	27
2008	27	31

Entries are number of states in any given year with the indicated voting provision.

Table 2: Impact of Adoption of No-Fault Absentee Voting

Year ^a	Change in Aggregate Turnout		Diff ^d
	States Adopting No-Fault Absentee-Voting ^b	Other States ^c	
1976 (1)	-3.3	-1	-2.3
1980 (3)	0.2	-0.4	0.6
1984 (0)	-	-	-
1988 (1)	-2.1	-2.1	0.1
1992 (6)	6.5	5.3	1.2
1996 (5)	-5.2	-7	1.8
2000 (6)	4	2.2	1.8
2004 (2)	9.4	6	3.4
2008 (3)	2.4	1.2	1.2
Weighted Average:			1.4
Pre-Post Comparison^e	1.6	1.6	0

^a Numbers in parentheses are the number of states adopting no-fault absentee voting in the row-year.

^b Entries are the average change in actual turnout from the previous presidential election for those states adopting no-fault absentee voting between the previous presidential election and the election of the row-year.

^c Entries are the average change in actual turnout from the previous presidential election for those states which had no change in their absentee voting laws between the two elections.

^d Entries are the difference in change in turnout experienced by states adopting no-fault absentee voting between elections, and those states which did not change absentee voting laws between elections.

^e See text for explanation of pre-post comparison involving all election results from 1972-2008.

Table 3: Impact of Adoption of No-Excuse Early Voting

Year ^a	Change in Aggregate Turnout		
	States Adopting No-Excuse Early-Voting ^b	Other States ^c	Diff ^d
1976 (1)	-9.1	-0.9	-8.2
1980 (1)	2.1	-0.4	2.5
1984 (0)	-	-	-
1988 (2)	-1.6	-2.2	0.6
1992 (2)	8.2	5.3	2.8
1996 (3)	-4.8	-7	2.2
2000 (8)	2.6	2.4	0.2
2004 (5)	7.1	6	1.1
2008 (4)	0.5	1.3	-0.9
Weighted Average:			0.4
Pre-Post Comparison^e	1.3	3.4	-2.1

^a Numbers in parentheses are the number of states adopting no-excuse early voting in the row-year.

^b Entries are the average change in actual turnout from the previous presidential election for those states adopting no-excuse early voting between the previous presidential election and the election of the row-year.

^c Entries are the average change in actual turnout from the previous presidential election for those states which had no change in their early voting laws between the two elections.

^d Entries are the difference in change in turnout experienced by states adopting no-excuse early voting between elections, and those states which did not change early voting laws between elections.

^e See text for explanation of pre-post comparison involving all election results from 1972-2008.

Table 4: Effects of Legal Changes on Aggregate Turnout

Institutional Measure	Long-Run Effect of Adopting Institutional Measure on Turnout ^a	95% Confidence Interval on Long-Run Effect
No Fault Absentee Voting	2.7	(1.4, 4.4)
Early Voting (45 day period)	2.8	(-1.0, 7.4)

^a Cell entries are the estimated long-run percentage point increase in turnout caused by adoption of the indicated institutional measure.

Table 5: Effects of No-Fault Absentee Voting, No-Excuse Early Voting, and Early Voting Period, 1972-2008: Dependent Variable: Log-Odds Voter Turnout by State by Year.

	No-Fault Absentee Voting^a	95% Confidence Interval	No-excuse Early Voting^b	95% Confidence Interval
Education				
<i>Less than HS</i>	1.3	(-1.2, 3.8)	5.8	(1.7, 10.8)
<i>HS Diploma</i>	1.3	(-0.4, 3.1)	1.7	(-2.0, 5.3)
<i>Some College</i>	2.0	(0.4, 3.7)	5.3	(1.8, 9.0)
<i>College +</i>	1.1	(-0.9, 3.0)	5.6	(1.6, 9.5)
Income				
<i>Quintile 1</i>	2.0	(-0.2, 4.3)	4.9	(-0.4, 10.2)
<i>Quintile 2</i>	0.6	(-1.8, 2.9)	10.3	(6.6, 14.7)
<i>Quintile 3</i>	-0.1	(-1.6, 1.4)	4.0	(0.2, 7.7)
<i>Quintile 4</i>	2.3	(0.0, 4.6)	3.7	(-1.3, 8.9)
<i>Quintile 5</i>	1.6	(-0.3, 3.6)	7.8	(2.1, 13.0)
Age				
<i>18-24</i>	1.0	(-0.9, 3.0)	6.2	(1.1, 11.1)
<i>25-30</i>	0.3	(-1.8, 2.1)	5.0	(0.1, 10.4)
<i>31-45</i>	0.4	(-2.0, 2.8)	6.2	(1.6, 11.0)
<i>46-60</i>	2.6	(0.8, 4.8)	0.9	(-3.5, 5.0)
<i>61-75</i>	3.1	(1.3, 5.1)	6.0	(1.1, 11.1)
<i>76-84</i>	-0.7	(-4.2, 2.9)	1.2	(-6.1, 8.7)

^a Cell entries are the estimated long-run percentage point increase in turnout caused by adoption of no-fault absentee voting.

^b Cell entries are the estimated long-run percentage point increase in turnout caused by adoption of no-excuse early voting, assuming an early voting period of 45 days. Note that these numbers are estimated with less precision than other estimates, and are sensitive to the length of the early voting period.

Table A1: Coefficients of Model of Aggregate Turnout

	Regression Coefficient	Standard Error
Lagged-Turnout	0.531	0.077
Registration Closing Days	-0.001	0.001
No-Excuse Early Voting	-0.080	0.028
Early Voting Period	0.003	0.001
No-Fault Absentee Voting	0.052	0.015
Election Day Registration	0.008	0.008
EDR * Reg-Closing-Days	0.004	0.002
DMV registration	0.005	0.020
State Per-Capita Income	0.000	0.000
Proportion of Citizens age 25-30	0.071	0.637
Proportion of Citizens age 31-45	0.789	0.489
Proportion of Citizens age 46-60	0.535	0.527
Proportion of Citizens age 61-75	0.666	0.519
Proportion of Citizens age 76-84	0.573	0.710
Proportion of Citizens with HS Diploma	0.614	0.241
Proportion of Citizens with Some College	0.126	0.310
Proportion of Citizens with College +	0.870	0.311
Presidential-Election-Closeness	0.002	0.005
Gubernatorial-Election-Closeness	0.003	0.006
Senatorial-Election-Closeness	0.000	0.001
Presence of Gubernatorial Election	0.061	0.031
Presence of Senatorial Election	0.014	0.007
1976	0.030	0.096
1980	0.010	0.087
1984	-0.011	0.077
1988	-0.140	0.065
1992	0.092	0.053
1996	-0.331	0.043
2000	-0.104	0.032
2004	0.084	0.022
Intercept	-0.693	0.510
[STATE DUMMIES OMITTED]		
Number of Observations	450	
R2	0.9333	

Cross-Sectional Time Series estimates, panel corrected standard errors. Dependent variable is log-odds ratio of turnout for the state. Unit of analysis: the state-year. Time Period, 1972-2008 (1976 omitted).

Table A2: Coefficients of model of Turnout: By Demographic Group

	No-fault Absentee Voting	Standard Error	No-excuse Early Voting	Standard Error	Early Voting Period	Standard Error
Education						
<i>Less than HS</i>	0.041	0.051	-0.086	0.048	0.006	0.002
<i>HS Diploma</i>	0.043	0.035	-0.069	0.041	0.003	0.002
<i>Some College</i>	0.069	0.034	-0.167	0.072	0.008	0.003
<i>College +</i>	0.041	0.046	-0.139	0.051	0.008	0.003
Income						
<i>Quintile 1</i>	0.076	0.051	-0.141	0.003	0.007	0.004
<i>Quintile 2</i>	0.022	0.046	-0.109	0.060	0.011	0.003
<i>Quintile 3</i>	-0.002	0.036	-0.185	0.059	0.008	0.003
<i>Quintile 4</i>	0.080	0.050	-0.163	0.064	0.007	0.004
<i>Quintile 5</i>	0.067	0.049	-0.158	0.074	0.011	0.004
Age						
<i>18-24</i>	0.031	0.039	-0.235	0.059	0.010	0.003
<i>25-30</i>	0.009	0.044	-0.158	0.075	0.008	0.004
<i>31-45</i>	0.013	0.045	-0.149	0.063	0.008	0.003
<i>46-60</i>	0.092	0.042	-0.013	0.067	0.001	0.003
<i>61-75</i>	0.119	0.042	-0.073	0.065	0.007	0.003
<i>76-84</i>	-0.029	0.091	0.116	0.164	-0.001	0.007

Cross-Sectional Time Series Analysis of Turnout by State by Year by demographic-group. Each row represents the coefficients of the key-variables of interest from a distinct regression. Thus the table shows estimates from 15 separate regressions. Dependent variable is the log-odds ratio of turnout of the indicated group for each row.

Table A3: Effects of No-Fault Absentee Voting, No-Excuse Early Voting, and Early Voting Period, 1972-2008: Dependent Variable: Log-Odds Voter Turnout by State by Year.

	No-Fault Absentee Voting^a	95% Confidence Interval	No-excuse Early Voting^b	95% Confidence Interval
Education				
<i>Less than HS</i>	1.3	(-1.2, 3.8)	3.0	(0.3, 6.2)
<i>HS Diploma</i>	1.3	(-0.4, 3.1)	0.4	(-2.0, 2.8)
<i>Some College</i>	2.0	(0.4, 3.7)	1.9	(-0.5, 4.4)
<i>College +</i>	1.1	(-0.9, 3.0)	2.5	(-0.2, 5.2)
Income				
<i>Quintile 1</i>	2.0	(-0.2, 4.3)	2.0	(-1.0, 4.8)
<i>Quintile 2</i>	0.6	(-1.8, 2.9)	5.9	(3.5, 8.9)
<i>Quintile 3</i>	-0.1	(-1.6, 1.4)	1.2	(-1.3, 3.6)
<i>Quintile 4</i>	2.3	(0.0, 4.6)	0.9	(-2.2, 4.1)
<i>Quintile 5</i>	1.6	(-0.3, 3.6)	4.0	(0.5, 7.3)
Age				
<i>18-24</i>	1.0	(-0.9, 3.0)	1.9	(-1.3, 4.9)
<i>25-30</i>	0.3	(-1.8, 2.1)	1.9	(-1.1, 5.1)
<i>31-45</i>	0.4	(-2.0, 2.8)	2.5	(-0.7, 5.6)
<i>46-60</i>	2.6	(0.8, 4.8)	0.5	(-2.2, 3.2)
<i>61-75</i>	3.1	(1.3, 5.1)	3.4	(0.2, 6.7)
<i>76-84</i>	-0.7	(-4.2, 2.9)	1.8	(-2.4, 5.7)

^a Cell entries are the estimated long-run percentage point increase in turnout caused by adoption of no-fault absentee voting.

^b Cell entries are the estimated long-run percentage point increase in turnout caused by adoption of no-excuse early voting, assuming an early voting period of **30 days**. Note that these numbers are estimated with less precision than other estimates, and are sensitive to the length of the early voting period.