# What if Everyone Registered?
# Examining the Effects of Registration on Electoral Outcomes

Tiffany Washburn
Columbia University
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**Abstract**

This paper aims to link two extensive literatures within the study of American elections. The first, which examines the effects of campaigns, registration requirements, and mobilization efforts on levels of turnout, has viewed declining turnout as normatively problematic—but has stopped short of showing directly how each change in the electoral system has influenced electoral outcomes. The second, concerned with the relationship between turnout and electoral outcomes, has tended to produce theories about what would happen if "Everyone Voted" without explaining what changes in the electoral system would cause such a dramatic shift in voting behavior. ***Methodology:*** Using the 2004 presidential election as a test case, I explore the electoral consequences of increased registration by modeling individual-level voting behavior as a step-by-step process, including: (1) the decision to register, (2) the decision to turnout on election day, and (3) the decision to vote for a particular candidate over another. Registration probabilities are manipulated under a series of conditions, and voter behavior is aggregated to estimate state-level results. ***Findings:*** I find that the marginal effects of registration on electoral outcomes vary by state and demographic group, and that even drastically increased registration does not necessarily lead to large increases in turnout. However, under some conditions, targeted registration reforms or registration drives may significantly affect electoral outcomes.

This aims to link two extensive literatures within the study of American elections. The first, which examines the effects of campaigns, registration requirements, and mobilization efforts on levels of turnout, has viewed declining turnout as normatively problematic—but has stopped short of showing directly how each change in the electoral system has influenced electoral outcomes. The second, concerned with the relationship between turnout and electoral outcomes, has tended to produce theories about what would happen if "Everyone Voted" without explaining what changes in the electoral system would cause such a dramatic shift in voting behavior.

The tendency to focus in this way is understandable, given the extent to which the electoral system has been transformed since the 1960s. Poll taxes and literacy tests were abolished; residency requirements and closing dates were relaxed; same-day registration, absentee voting, vote-by-mail, and motor-voter programs were introduced. Campaigns became longer, more expensive, and more strategic, and (by 2004) subject to campaign finance regulation. Demographic, social, and economic shifts reshaped the electorate. And all of this had far-reaching, difficult-to-measure, and often counter-balancing consequences for voting behavior and elections. Rhine (1995) observes that "factors that should have increased turnout (e.g. higher levels of education and easier registration systems) have coincided with trends that would be expected to yield decreasing turnout, such as declining partisanship and external political efficacy. As a result, separating the independent effect of each has been difficult" (410).

Therefore, I concentrate my analysis on the potential effects of registration drives and changes in registration laws, which increase or decrease the "cost" associated with voting, and can therefore be predicted to influence both turnout and electoral outcomes. Rather than comparing elections over time, I use a single case—the 2004 presidential election—in order to

hold many election-specific factors (competitiveness, campaigns, economic environment) and state-specific factors (battleground status, local economic conditions) constant.

My focus on registration as a primary source of electoral change is founded on the work of numerous scholars, who have shown that turnout is quite high among the registered, and that "even unlikely registrants are relatively frequent voters when they do register" (Erikson 1981, 271). Decomposing turnout into registration and voting reflects the two-step process that most voters face before casting their ballot: (1) the decision to register, and (2) the decision to vote, allowing the determinants of registration to differ from the determinants of voting. Erikson (1981) finds that "standard predictors of participation are much better predictors of registration than of voting among the registered." He finds that significant predictors of registration include past voting behavior, political sophistication (involvement, opinionation, mass media attention, knowledge and interest, which are highly correlated with education and income). Meanwhile, significant predictors of voting among the registered include strength of partisanship, frequency of past presidential voting, homeownership, size-of-place, and other demographic variables.

Registration can be quite costly in terms of time and effort—perhaps even more costly than voting itself. "Indeed," say Rosenstone and Wolfinger, "it may require longer journey, at a less convenient hour, to complete a more complicated procedure—and at a time when interest in the campaign is far from its peak" (1978, 22). It may be the case, therefore, that the most unlikely registrants may actually be quite likely to vote, once they've made the effort to register; these are the voters most affected by less costly registration. On the other hand, some unlikely registrants may be equally unlikely to vote; for these voters, reducing the cost of registration does little to increase their probability of turning out on Election Day.

The relationship between the probability of registration and the probability of voting is an empirical question, and the first question that I attempt to address in this paper:

*-- How does increased registration translate into turnout?--*

## 1. The Relationship between Registration and Turnout

The decline in turnout over the last 50 years has been widely discussed within the political science literature,[1] and often attributed—at least in part—to changes in registration laws. Voter registration, first introduced in Massachusetts in 1800, took more than a hundred years to catch on, but by 1929, only three states—Arkansas, Indiana and Texas—were still holding out. The registration requirement was considered, in the North and West, a progressive measure intended to quell corruption. In the South, on the other hand, registration became an instrument of Jim Crow alongside the white primary, literacy tests, and the poll tax. In the North and West, registration represented a significant new restriction on voting, and turnout fell from 86.2 percent in 1888 to 67.7 percent in 1912 (Hansen 2001, 3). Meanwhile, in the South, where other restrictive laws had long depressed turnout, participation plummeted from 64.2 percent of eligible voters in 1888 to 29.0 percent in 1904 (3). Registration requirements imposed sometimes onerous burdens on voters; periodic re-registration rules, for example, required voters to re-register every one to four years, or purged lists when a registered voter failed to vote.[2] Throughout the 60s, the majority of states required at least a year or residency before voters were allowed to register, and most required that registration be completed more than 30 days before the election.[3]

[1] See Abramson and Aldrich 1982; Ashenfelter and Kelley 1975; Kleppner 1982; Luttbeg 1984; Reiter 1979; Shaffer 1981; Teixeira 1992.
[2] Erikson considers purging of voter lists as a potential catalyst for voting, as "people may vote to stay registered in those states that regularly purge," while other scholars have considered such laws a discouragement to voting.
[3] Rhine finds that "for every day added to the closing date, turnout tends to decline a tenth of a percentage point" (1995, 419).

Over time, registration laws have liberalized. Periodic re-registration had virtually disappeared by 1972. The 1970 Voting Rights Act Amendments (VRAA) and the subsequent Supreme Court decision established a maximum closing date of 30 days before an election. The 1993 National Voter Registration Act (NVRA) encouraged states to further relax their restrictions, prompting several states to adopt same-day voter registration, while others decreased their closing dates. It established "motor voter" programs, and mandated registration by mail.[4] Registration offices extended hours, and/or opened during evening and weekends.[5]

Yet, despite these reforms, the registration procedures currently in place in the United States are, compared to most other democracies, among the most burdensome. Unsurprisingly, although turnout rates among registered voters in the U.S. are about average among developed democracies, turnout rates among all eligible citizens are (and have long been) well below average (Hansen 2001, 5).

This conclusion, however, assumes a lot about causality, and may suggest more about American culture than registration law. Each state determines its own registration laws, within the minimal limitations established by the Constitution, court decisions, and national law. As a consequence, states' laws vary significantly; some states have historically constructed a veritable "obstacle course" of requirements for voting, while others have nearly none. North Dakota, outlier that it is, has had no registration at all since it was abolished in 1951. Political scientists, therefore, have looked to variation in state laws to examine the effect of such laws on voting behavior.

[4] Rhine finds that motor-voter registration had "a positive and significant effect on turnout. […] Each increased level of implementation appears to add a little less than a percentage point gain in turnout" (1995, 419). Knack (1995) also finds that motor voter programs implemented between 1976 and 1992 significantly increased participation rates (796).

[5] See: Wolfinger and Rosenstone (1980)

Rosenstone and Wolfinger's (1978) seminal article, "The Effect of Registration Laws on Voter Turnout," looked to state variation in election laws during the 1972 election and claimed that state registration laws—especially early closing dates and limited registration office hours—had significantly reduced turnout.

***How Do Laws Influence Turnout?***

The literature on the effect of registration laws has produced somewhat mixed results. Going back to the *The American Voter,* Campbell et al. (1960) found that restrictive laws reduce turnout, particularly among the poor and less educated, and particularly in the South. Kim, Petrocik and Enoksen (1975) modeled state-level turnout in the 1960 election as a function of individual-level effects, electoral competitiveness, and voting laws. They concluded, as well, that restrictive registration laws did, indeed, reduce turnout, but also found that the effect of demographics and interparty competition were even more important determinants.

Wolfinger and Rosenstone (1980) conducted a cross-sectional analysis of the 1972 presidential election, and showed that closing dates (registration deadlines) and office hours were the biggest factors limiting registration. By their calculation, turnout for the election would have increased 9.1 percentage points had the registration laws been less restrictive. Mitchell and Wlezien (1995) criticized Wolfinger and Rosenstone's research on the grounds that it addressed the effects of registration laws on turnout, not registration itself, and was based on a single election. Nonetheless, Michell and Wlezien came to a similar conclusion: restrictive laws reduced turnout.

Teixeira's (1992) analysis of the Current Population Survey gauged the effects of registration reform on turnout, and determines that, had all states had same-day registration, evening and Saturday registration, regular office hours, and no purge of voting lists for non-

voting, turnout would have been about 7.8% higher. Same-day registration, he concluded, had the largest potential effect. Rhine (1995) examined the relationship between voting reform and turnout through her analysis of state-level turnout for elections between 1972 and 1992. She found that "the registration closing date and motor voter registration show a clear relationship to higher turnout, whereas mail registration and eased purge procedures do not" (409) and predicted that the reforms of the Voter Registration Act of 1993 would have a negligible practical effect on turnout. She concluded that "in some circumstances registration requirements can depress turnout, but the relationship is not absolute. Other factors, like party competition and interest in the election, are sometimes more important in determining turnout differences" (411). The Help America Vote Act, passed in 2002, included a number of "reforms," which persuaded states to adopt new identification requirements for registration. Alvarez, Bailey and Katz (2007), using Current Population Survey data, found that "the strictest forms of voter identification requirements have a negative impact on the participation of registered voters relative to the weakest requirement, stating one's name" (2).

All in all, we have sufficient theoretical reason to believe that (1) registration laws may influence registration levels, (2) that under some conditions registration laws, through increased registration, increase turnout and (3) that these effects may vary across states and individuals. However, we suspect that registration laws can't perform miracles—increasing registration rates to 100% would result in a much smaller change on actual turnout.

## 2. The Relationship between Turnout and Electoral Outcome

The conventional wisdom (or perhaps the straw-man of choice) has been that, because Democratic identifiers and traditionally Democratic groups—the poor, the working class, ethnic minorities, and other members of the "natural constituency"—vote at lower rates than do

Republicans, high turnout should advantage Democratic candidates. Following this logic, the Democratic Party has tended to propose and support measures designed to increase participation, such as the National Voter Registration (a.k.a. "motor voter") Act, and opposed stricter laws, such as ID requirements. A number of studies have generally supported this view. Radcliff, for one, found "strong and unequivocal evidence" in support of the conventional wisdom, asserting that even modest increases in turnout might be enough to reverse recent presidential elections. On a similar note, Petrocik concluded that "the Democrats have suffered a turnout disadvantage of about 10 percentage points in every national election of the past three decades." Lijphart and other believers drew upon these findings, and advocated compulsory voting as a mechanism for achieving greater economic and political equality.

However, a number of studies have come to quite different conclusions. In "Turnout and the Vote: The Joke's on the Democrats," DeNardo (1980) confirmed that the electoral advantage of higher turnout for Dems in congressional races is not necessarily large nor universal, but rather depended on the strength of the party and the dynamics of the election (how frequently voters defect, e.g. whether short-term factors would encourage moderate Democrats to vote Republican). Higher turnout, according to DeNardo, will tend to advantage the minority party. As a matter of methodology, DeNardo relies on aggregate data rather than public opinion polling.

Wuffle and Collet (1997) used a similar approach—examining the correlations between turnout and vote share over 80 districts in the California Assembly, pooled state-level data for the U.S. Senate and House races, and the U.S. presidential elections. Somewhat counter-intuitively, they found that the higher the registration as a percentage of eligible voters, the worse

Democratic presidential candidates do. Highton and Wolfinger (2001) conclude that outcomes in recent presidential election would have changed little under universal turnout.

The obvious concern with studies that focus on the relationship between overall turnout rates and vote share is that they fail to take into account the characteristics of the elections—which are likely to have a major, if not dominant, effect. Candidate attributes, the economy, crimes rates, national security threats, etc.—all affect the outcome of an election, but most are ignored. Since each race is a single datapoint, it is nearly impossible to differentiate turnout effects from environmental or campaign effects. More fundamentally, the question they are answering is not "*What would have happened had turnout been higher?"* but rather "*Are elections with higher turnout associated with greater Democratic party success?*" Although related, the two questions are theoretically distinct. The latter is easier to answer, but the former is the more interesting.

In their 2003 article, "What if Everyone Voted? Simulating the Impact of Increased Turnout in Senate Elections," Citrin, Schickler and Sides attempt the difficult task of answering the counter-factual. They propose a methodology (from which I will draw extensively in this paper) to simulate the outcome of Senate races under various turnout scenarios. Although they do find that turnout has a small effect, the incumbent advantage dominates all other factors, and few Senate races are close enough to be reversed by the change in turnout.

Martinez and Gill (2005) adopt Citrin, Schickler, and Sides' methodology to simulate the outcome of five presidential elections under various turnout rates. Their results suggest that the Democratic advantage of higher turnout has flattened off significantly since the 1960s, to the point that the relationship by 2000 is indistinguishable from 0—a change they attribute to the breakdown of class cleavages along party lines. Their analysis, problematically, is conducted

entirely at the national level, and ignores the electoral college in favor of the popular vote. The decision not to disaggregate by state allows Martinez and Gill far more freedom in selecting determinants of voting behavior from their national surveys (they take advantage of a range of ideological and political-interest questions) but also misses state-level increases and decreases by focusing on the national average.

Sides, Schickler and Citrin's 2008 follow-up study, "If Everyone Had Voted, Would Bubba and Dubya Have Won?" adapts their previous approach to examine the impact of universal turnout on presidential elections between 1992 and 2004. As an improvement to their 2003 article, they incorporate a simulation in order to introduce uncertainty into the equation. In their preferred simulation, five Bush-held states switch hands: Colorado, Iowa, New Mexico, Nevada, and (notably) Ohio. Although the election outcome would have changed under their simulations of universal turnout, Sides, Schickler and Citrin maintain that the closeness of the election—not the size of the results—is the primary cause. They conclude that even universal turnout would, except in the closest elections, have a negligible effect on election outcomes.

Each of these studies, however, conflates registration and voting into "turnout" without explaining how the electorate would be convinced to turn out at higher rates. Does universal turnout result from mandatory voting? Turnout is modeled in each paper as an increase that affects all eligible voters equally—but what might cause this to happen? We know that changes in registration laws are unlikely to result in universal turnout—and also that they are unlikely to affect all voters equally. For example, "registration closing dates and motor voter laws have greater impact on turnout among the young and residentially mobile, the largest blocs of nonvoters" (Highton 2004, 511). Across states, one of three people in their twenties (as compared to only 1 out of 20 people in their sixties) have moved in the last year. By race, 13.8%

of white, 18.7% of Hispanic, 12.2% of Asian and 17.7% of black voters had moved within the last year. About 10.4% of married people had moved within the last year, compared to 20.7% of non-married people. By income, about 24% of people earning less than $15,000 a year, compared to 10% of people making more than $150,000 per year, had recently moved. As a result, these groups are more likely to bear the cost of registration more often.

This example illustrates an important dynamic with consequences for both turnout and electoral outcomes. If the preferences of the groups who register at lower rates differ significantly from the preferences of the rest of the electorate, then the addition of newly-registered voters has the potential to change the partisan composition of the electorate. This, too, is an empirical question, and the second question I address:

*--Does and increase in registration among specific groups translate into a net change in partisanship?--*

The following analysis disaggregates registration and voting, and explores how the mobilization of certain groups might affect elections. In agreement with Highton, I argue that "the partisan impact of registration laws depends on two factors: the number of people affected by a law and their political distinctiveness" (510). However, while Highton concludes that "voters are a virtual carbon copy of the citizen population," (510). I find significant differences in probabilities--of registering, voting, and voting for one party over another—between groups.

**3. About the Case: the 2004 presidential election**

The 2004 presidential election marked a dramatic shift in campaign strategy. Where previous campaigns had sought primarily to persuade swing *voters*, the "ground war" for both campaigns was now focused on the mobilization of sympathetic voters in swing *states*.[6]

[6] Battleground states : Colorado, Florida, Iowa, New Mexico, Nevada, Ohio, West Virginia, Maine, Michigan, Minnesota, New Hampshire, Oregon, Pennsylvania, and Wisconsin.

Battleground residents were besieged by armies of canvassers charged with getting likely partisan voters to the polls, and the campaigns dedicated extensive resources exclusively to mobilization efforts--$60 million and $125 million to convince Kerry and Bush voters, respectively, to turn out on Election Day. Their efforts proved quite successful indeed; 72% of eligible voters were registered in 2004, a 2-point increase from 2000. On Election Day, more than 123 million voters cast their ballots nationally—nearly 17 million more than had voted four years earlier. Ten-hour-long lines formed outside polling places in Ohio, as record numbers of both Democrats and Republicans overwhelmed under-equipped polls.

So-called "battleground" states were the focus of both Democratic and Republican mobilization efforts, and experienced higher increases in both registration and voting than did non-battleground states. However, long-standing differences also persisted; citizens in the Midwest were more likely to be registered and to vote than citizens in other regions. Minnesota had the highest level of voter registration in the country (72%) and the highest citizen turnout (79%), while Hawaii had the lowest registration (58%) and turnout (51%). As of Election Day, Idaho, Maine, Minnesota, New Hampshire, Wisconsin and Wyoming had election-day registration—and all of these also had higher-than-average voter registration rates. A number of states offered early or mail-in voting, which was associated with higher than average voting rates as well.

In the end, of course, a small (ad somewhat controversial) margin of victory in Ohio reelected George Bush. The electoral college votes barely changed since 2000; Mexico and Iowa went Republican, and New Hampshire went Democratic. What, then, might have made the difference? If registration laws had been different, would the results have changed? And can these results be generalized beyond the razor-thin outcome of 2004?

## 4. Methodology

Following Citrin, Schickler and Sides, I adopt a simulation methodology based on data from the 2004 Current Population Survey and the 2004 National Election Pool exit polls. These surveys provide a huge number of observations (112,000 and 12,300, respectively) which can be considered representative by state. Combined, these datasets include information on registration, voting, and vote choice, along with a large selection of demographic variables.

### *Data*

The Voting and Registration supplement to the Current Population Survey (CPS) is a biannual survey conducted by the Census Bureau. The survey includes voting behavior, employment status, occupation, age, sex, race, marital status, veteran status, educational attainment, and family characteristics for over 57,000 households, comprised of approximately 112,000 individuals. The CPS asked respondents whether they had registered—and if so, if they had voted in the 2004 presidential election. This survey, however, contains no information about vote choice.

The National Election Pool (NEP) exit poll was conducted by Edison Media Research and Mitofsky International, and commissioned and disseminated by subscribers of the NEP (AP, ABC, CBS, CNN, FOX, and NBC). Their November 2, 2004 data produced exit poll data for races in all 50 states and D.C. based upon a total of 11,719 Election Day interviews at 250 polling locations, and an additional 500 telephone interviews of absentee/early voters. This survey includes information about registration, voting AND vote choice.

***Estimation***

The process of voting is modeled as three steps: (1) the decision to register, (2) the decision to turn out given registration, and (3) the decision to vote for one candidate over another, given voting. Thus, I estimate a separate conditional probability for each eligible voter:

(1) Pr (REGISTERED | Eligible)

(2) Pr (VOTED | REGISTERED)

(3) Pr (VOTED DEMOCRATIC | VOTED)

For simplicity, non-eligible voters are not included in these equations, although there is no Constitutional reason that states could not expand registration to non-citizens. Also, third-party candidates are excluded, and vote share is rescaled accordingly. North Dakota has no registration, so this information is not available—and would be a moot point anyway.

Probabilities are simulated in the usual way for logit equations:

$$Pr(REGISTERED) = \frac{\exp(\boldsymbol{X\beta})}{1 + \exp(\boldsymbol{X\beta})}$$

where **Xβ** for the first two probabilities (Registration and Voting) =

$$\beta_0 + \beta_1 * YEARS\ AT\ ADDRESS + \beta_2 * EMPLOYMENT\ STATUS + \beta_{3A}\ ARMED\ FORCES + \beta_{3B} * VETERAN + \beta_4 * EDUCATION + \beta_5 * OWN\ HOME + \beta_6 * UNION + \beta_7 * INCOME + \beta_8 * PARENT + \beta_9 * OCCUPATION + \beta_{10} * METRO + \beta_{11} * METRO\ SIZE + \beta_{12} * MARRIED + \beta_{13} * SEX + \beta_{14} * RACE + \beta_{15} * AGE + \beta_{16} * RACE * SEX + \beta_{17} * PARENT * SES + \beta_{18} * MARRIED * SEX + \beta_{19} * AGE - SQUARED + \beta_{20} * METRO + \beta_{21} * RACE * INCOME + \beta_{22} * MARRIED * AGE$$

Where some data was missing, values were imputed to avoid the bias that might result was systematic non-responses. A model was estimated separately for each state, so that all

parameters were allowed to vary between states. Thus, each individual in the sample was assigned a probability of having registered, based on demographic and state characteristics.

Modeling the probabilities of vote choice (voting for Bush or Kerry) is trickier, since the CPS does not ask respondents for whom they voted. The VNS data, however, does include this information, and can be linked to the CPS data by estimating the coefficients for demographic variables common to the two surveys, and then plugging these values into the CPS data. The CPS includes fewer demographic variables, and significantly more missing data, so the model is more parsimonious:

$$\Pr(Voting\ for\ Kerry \mid Registered\ AND\ Voted) = logit(\beta_0 + \beta_1 * SEX + \beta_2 * RACE + \beta_3 * AGE + \beta_4 * METRO + \beta_5 * EDUCATION + \beta_6 * MARRIED + \beta_7 * PARENT + \beta_8 * INCOME + \beta_9 * RACE * SEX + B_{10} * RACE * INCOME + \beta_{11} * MARRIED * AGE + \beta_{12} * MARRIED * SEX + \beta_{13} * PARENT * SEX)$$

The values of the coefficients in each state were then applied to each CPS respondents' demographic characteristics. The resulting probability is considered the respondents' predicted probability of voting for Kerry (as opposed to Bush), given that they were registered and voted.

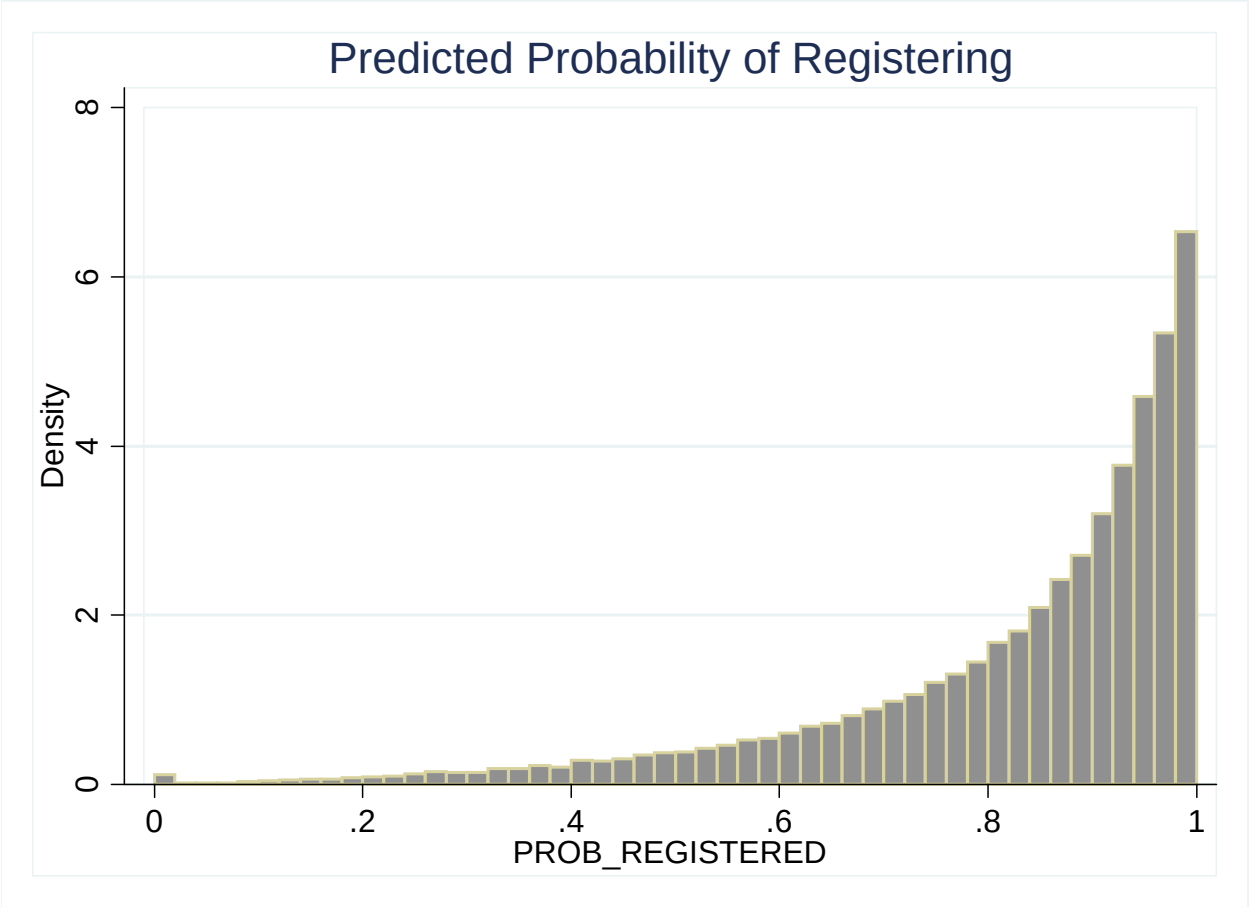
All up, then, each respondent was assigned three probabilities: (1) the probability of registering, (2) the probability of voting, given that they had registered, and (3) the probability of voting Democratic—as opposed to Republican—given that they had registered and voted.

***On Registration***

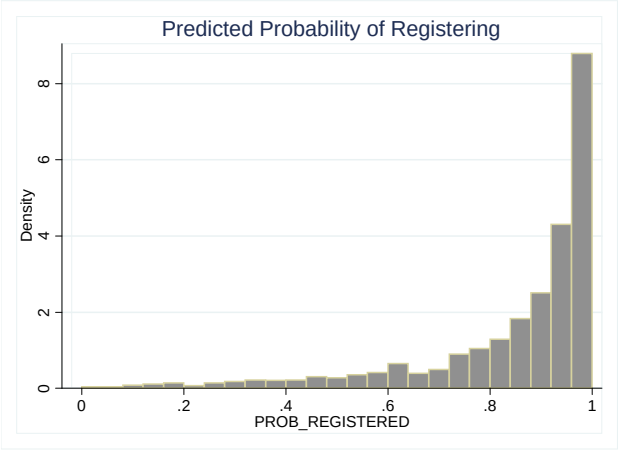
The following histograms report the predicted probabilities of registering by state. Nationally, the distribution is smooth and exponential, but both the mean and dispersion of probabilities varies by state.

**Figure 1:** Predicted Probabilities of Registering among citizens.

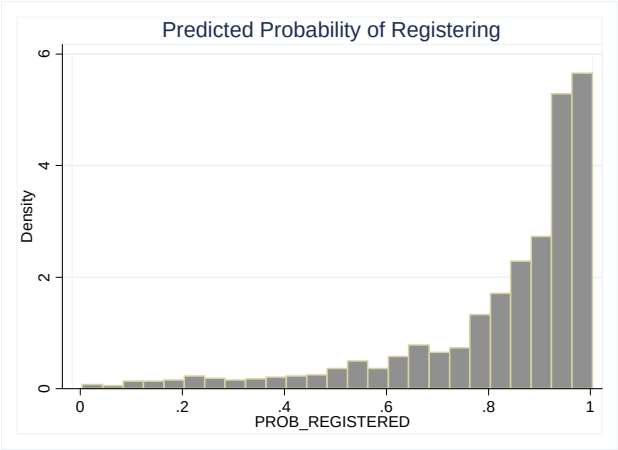
**NATIONAL**



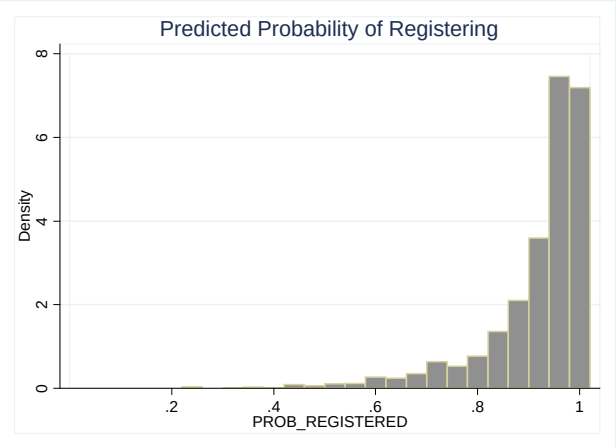

**CONNECTICUT**

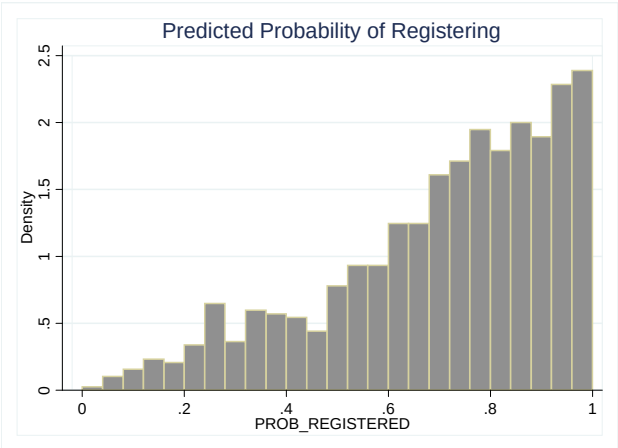



**NEVADA**



**MINNESOTA** **HAWAII**




Part of the variation between states may be attributable to differences in voter registration laws. During the 2004 election season, every state but North Dakota required registration. While the "restrictiveness" of states' registration laws is hard to quantify, states tend to differ on two dimensions: (1) the amount of time that a voter must be a resident of the state before the election, and (2) the registration deadline before each election. In Connecticut (see Figure 1), the registration deadline is only one day before the election, and there is no minimum residency time requirement. In contrast, Nevada requires that the voter has resided in the county for at least 30 days, and in the precinct for at least 10 days prior to the election. The registration deadline is at 9 p.m. on the fifth Saturday before any primary or general election, 9 p.m. on the third Saturday before any recall or special election—i.e. several weeks ahead of time (Holder 2006). Anecdotally, we find that the average person has a higher probability of registering in Connecticut than Nevada. Likewise, compare Minnesota (the state with the highest registration rate) and Hawaii (with the lowest).

Since 2004, ten states (Idaho, Iowa, Maine, Minnesota, Montana, New Hampshire, North Carolina, Wisconsin, Wyoming, and—for presidential elections—Connecticut) have adopted same-day registration. States with same-day registration had an average 12% higher voting rate

in the general, and 10% higher voting rate in the primaries, than states that did not. We expect that, over time, the ease of registration will translate into higher probabilities of registering and turning out.

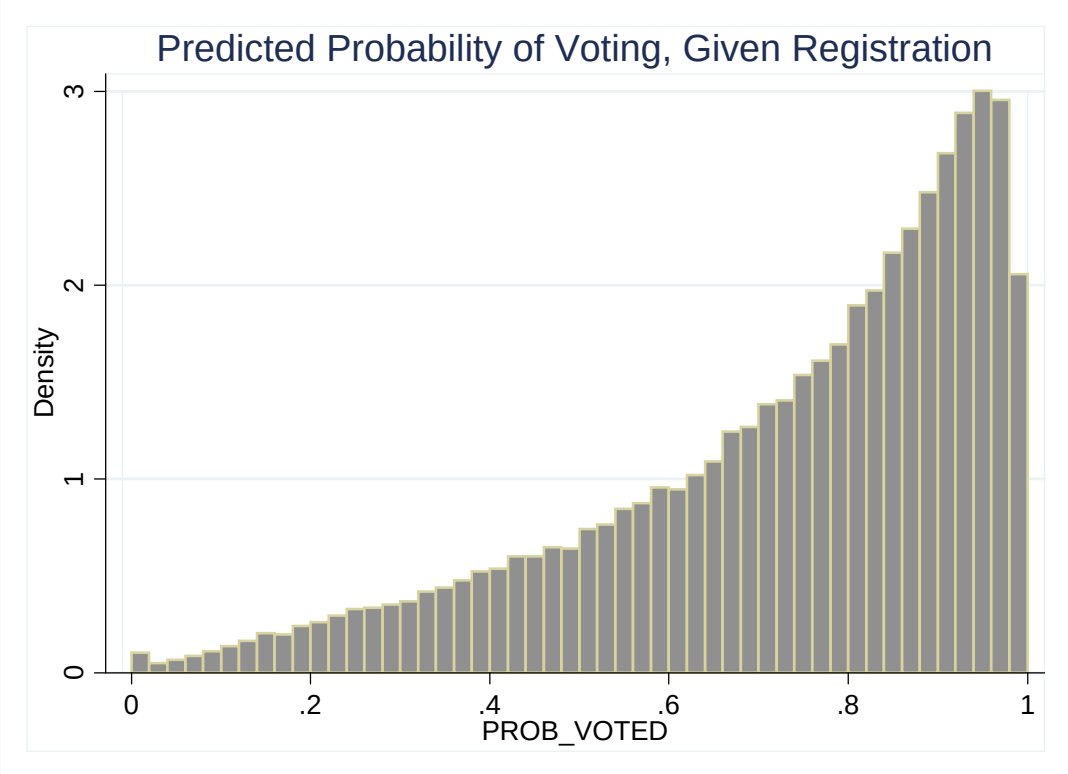
[See appendix for all state graphs]

***On Voting***

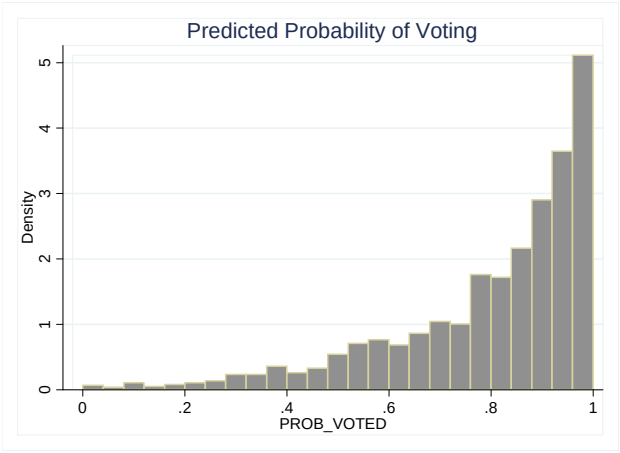
In 2004, voting rates ranged from a high of 79% in Minnesota to a low of 51% in Hawaii. The probability distributions associated with each state varied as well—in some cases (such as Maine), the vast majority of people are at the high end of the probability distribution. In contract, people in Texas are more disperse; a larger segment of the population is unlikely to vote given registration.

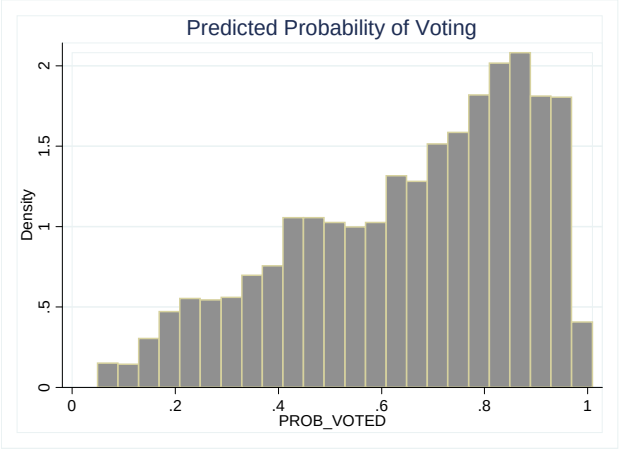
**Figure 2:** Predicted Probabilities of Voting among Registered Citizens

**NATIONAL**



**MAINE** **TEXAS**

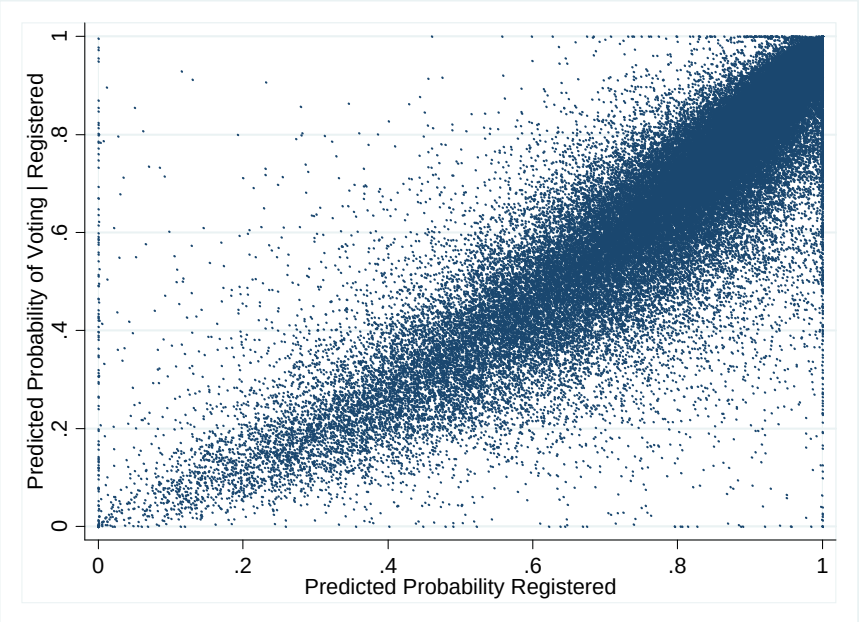



[See appendix for all state graphs]

Are unlikely registrants also unlikely voters? In general, it appears that the answer is yes. Figure 3 is a graph of each individual's probability of registering versus her probability of voting, given that she has registered. There is an obvious and strong (although imperfect) correlation between these probabilities.

**Figure 3:** Predicted Probability Registered v Probability Voted | Registration



The implications of this effect are that, as many scholars pointed out, ensuring that voters are registered who otherwise would not be doesn't necessarily translate into votes.

***Does the Democratic "natural constituency" vote less?***

The "conventional wisdom" supported or rejected by the literature claims that the groups most likely to support the democrats also tend to be the least likely to vote. Although the marginal effects from each logit model can tell us something about the effect of individual covariates on voting behavior, they cannot tell us directly whether we are right to think that strongly-democratic-leaning groups vote less than others, since they control for factors that correlate with group membership.

**Figure 4:** Difference of Means tests for various groups

| | MEAN(PROBABILITY REGISTERED) | | | MEAN(PROBABILITY VOTED) | | | MEAN(PROBABILITY VOTED DEM) | | |
|---|---|---|---|---|---|---|---|---|---|
| VARIABLE | VAR=0 | VAR=1 | DIFF (p val) | VAR=0 | VAR=1 | DIFF (p val) | VAR=0 | VAR=1 | DIFF (p val) |
| METROPOLITAN AREA | .808 | .830 | .028 (0.000) | .702 | .741 | .039 (0.000) | .421 | .544 | .012 (0.000) |
| BLACK | .823 | .834 | .011 (0.000) | .732 | .729 | -.003 (0.000) | .480 | .876 | .396 (0.000) |
| HISPANIC | **.833** | **.701** | **-.132 (0.000)** | **.742** | **.571** | **-.171 (0.000)** | .506 | .616 | .110 (0.000) |
| ASIAN | **.828** | **.675** | **-.152 (0.000)** | **.735** | **.575** | **-.160 (0.000)** | .510 | .638 | .128 (0.000) |
| OTHER RACE | **.827** | **.744** | **-.083 (0.000)** | **.735** | **.575** | **-.160 (0.000)** | .511 | .569 | .058 (0.000) |
| INCOME < $15,000 | **.842** | **.707** | **-.135 (0.000)** | **.735** | **.612** | **-.123 (0.000)** | .506 | .564 | .054 (0.000) |
| INCOME $15,000-29,999 | **.835** | **.769** | **-.066 (0.000)** | **.757** | **.564** | **-.193 (0.000)** | .512 | .524 | .012 (0.000) |
| INCOME $30,000-49,999 | **.829** | **.808** | **-.022 (0.000)** | **.747** | **.652** | **-.095 (0.000)** | .520 | .491 | -.029 (0.000) |
| INCOME $50,000-74,999 | .817 | .852 | .035 (0.000) | .738 | .708 | -.030 (0.000) | .515 | .508 | -.007 (0.000) |
| INCOME $75,000-99,999 | .816 | .890 | .074 (0.000) | .722 | .769 | .047 (0.000) | .517 | .491 | -.026 (0.000) |
| INCOME $100,000-149,999 | .815 | .918 | .103 (0.000) | .719 | .823 | .104 (0.000) | .513 | .516 | .003 (0.273) |
| INCOME $150,000 OR MORE | .818 | .932 | .114 (0.000) | .718 | .866 | .148 (0.000) | .513 | .520 | .007 (0.435) |
| AGE 18-24 | .843 | .687 | -.155 (0.000) | .722 | .891 | .169 (0.000) | .511 | .540 | .029 (0.000) |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| AGE 25-29 | **.832** | **.735** | **-.097 (0.000)** | **.755** | **.557** | **-.198 (0.000)** | .518 | .488 | .031 (0.000) |
| AGE 30-39 | **.829** | **.801** | **-.0282 (0.000)** | **.742** | **.611** | **-.130 (0.000)** | .519 | .461 | -.023 (0.000) |
| AGE 40-44 | .824 | .831 | .008 (0.000) | .738 | .700 | -.039 (0.000) | .511 | .520 | .009 (0.000) |
| AGE 45-49 | .821 | .855 | .034 (0.000) | .730 | .742 | .011 (0.000) | .516 | .492 | -.023 (0.000) |
| AGE 50-59 | .812 | .880 | .068 (0.000) | .726 | .775 | .048 (0.000) | .511 | .520 | .009 (0.000) |
| AGE 60-64 | .821 | .881 | .061 (0.000) | .714 | .812 | .098 (0.000) | .515 | .490 | -.025 (0.000) |
| AGE 65-75 | .819 | .881 | .063 (0.000) | .726 | .811 | .085 (0.000) | .513 | .511 | -.002 (0.393) |
| AGE 75 AND OVER | .820 | .879 | .059 (0.000) | .728 | .777 | .049 (0.000) | .509 | .558 | .048 (0.000) |

Figure 4 shows the difference of means tests of the three conditional probabilities we've discussed this far: the probability of registering, of voting given registration, and the probability of voting for the Democrat (Kerry) given voting. The mean probabilities of each group are compared to the probabilities of those respondents not in the group, and the difference is tested for significance. The groups in bold have a lower net probability of both registering and voting; voters who identify as Hispanic, Asian, or "other" race, whose family income is less than $50,000, and who are between the ages of 25 and 40 are less likely to register *and* to vote. Given registration, black voters, those with a family income of $50,000-$75,000, and who are between the ages of 44 and 49 are less likely to turn out.

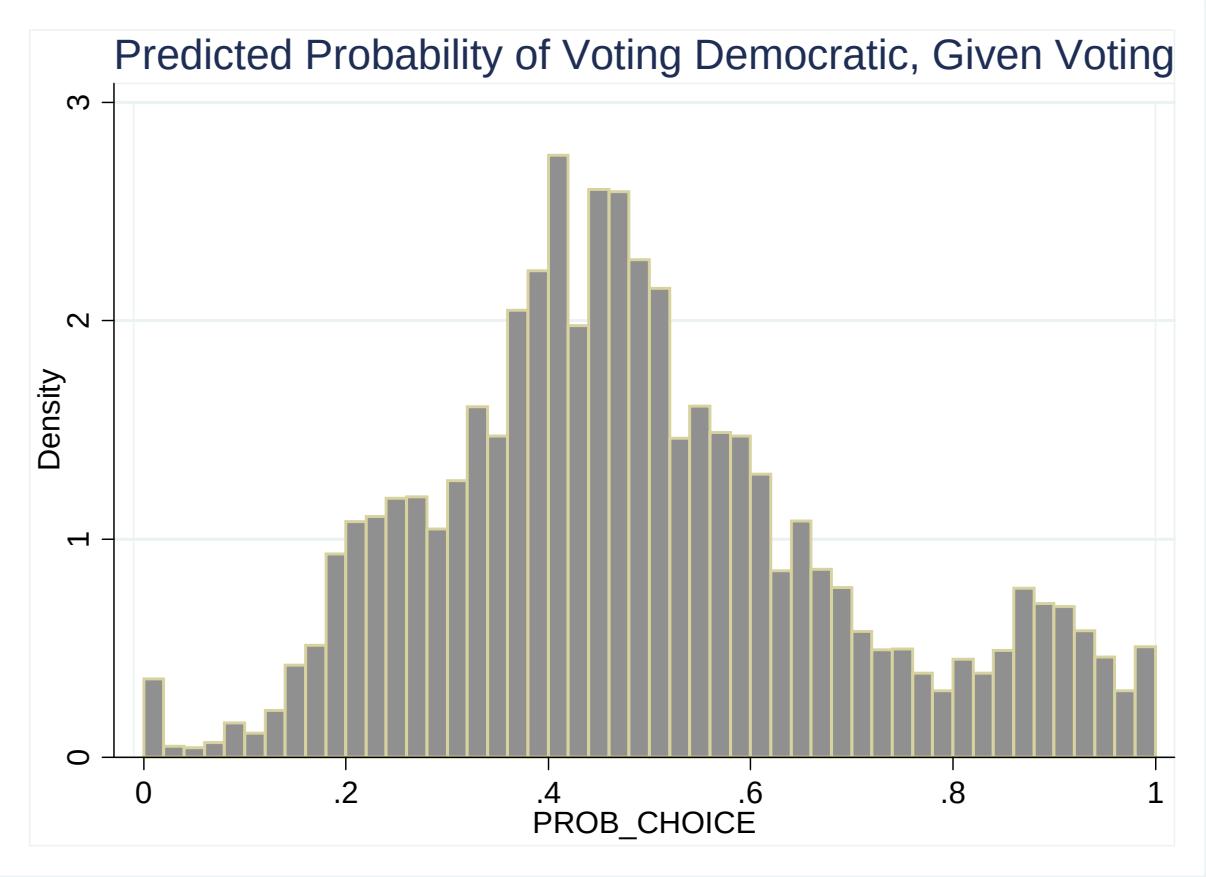
***On Vote Choice***

The probability of voting for the Democrat (Kerry) is, when aggregated nationally, approaching a normal distribution. However, when broken down by state, the distribution of likely Kerry and likely Bush voters reflects the partisan skew and the "polarization" of the electorate. Mississippi, for example, (See Figure 5) is extremely divided—voters tend to be either very likely to vote Democratic, or very likely to vote Republican. In contrast, Iowa voters

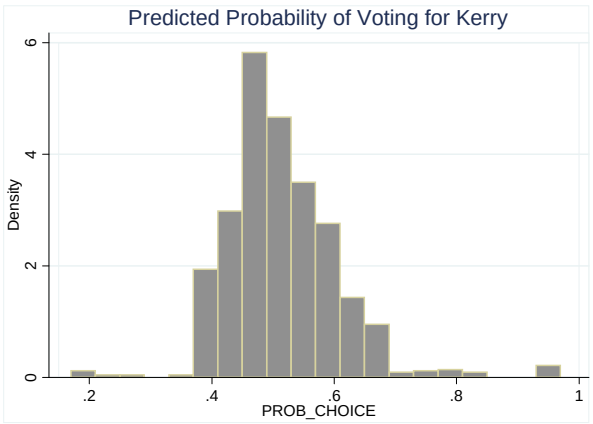
are grouped near 0.5—indicating that, although they may vote one way or another, they are less polarized than their Mississippi copartisans. Meanwhile, voters in Rhode Island and Virginia are relatively united—supporting Kerry and Bush respectively.

**Figure 5:** Probabilities of Voting Democratic | Voted

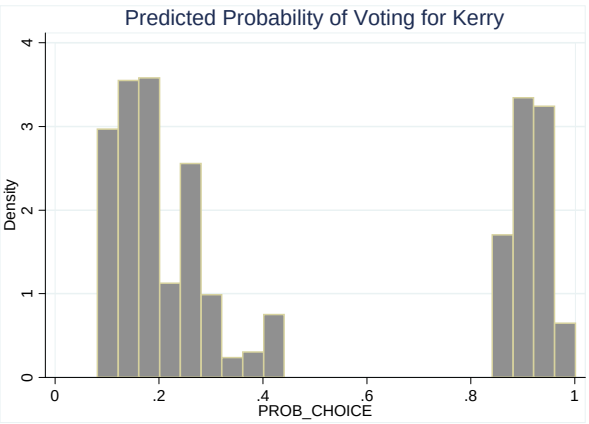
**NATIONAL**



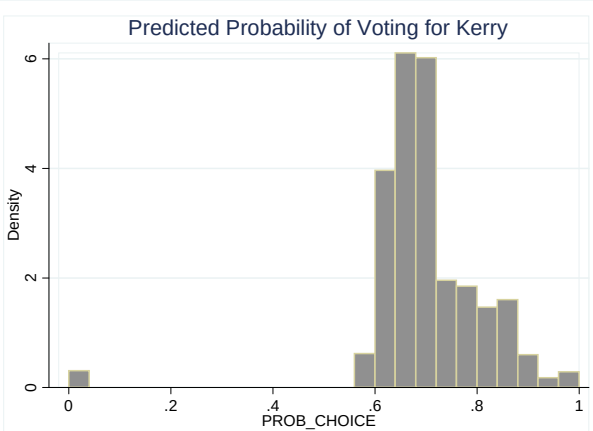
IOWA



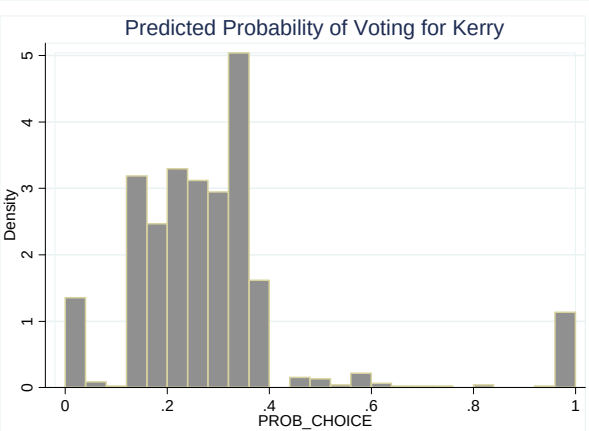

MISSISSIPPI




RHODE ISLAND




VIRGINIA




[See appendix for all state graphs]

These patterns suggest differences in "polarization" between states. A clustered distribution suggests a more indifferent electorate, while the split distributions suggest a (literally) divided electorate.

The take-home message of this paper, however, is not in the separate probability distributions, but rather in the way that they interact to produce electoral outcomes …which is where the simulations come in.

## 5. Simulations

Once all the probabilities are computed, we simulate the results of elections under various turnout conditions. In each simulation, a turnout threshold is established. Probabilities of turnout are computed:

$$\Pr(Turnout) = \Pr(REGISTERED) * \Pr(VOTED)$$

In each simulation, an error term is incorporated into each probability. The logic is that, in reality, probabilities are (by definition) probabilistic. Thus, a voter with a low predicted probability will occasionally vote in an election that someone with a much higher predicted probability does not. The probabilities+e form a distribution for each state.

For each of 100 simulations, the turnout threshold is set, and all voters whose probability is greater than the threshold are considered to have voted. I then take the mean of their probabilities of voting for the Democrat or Republican, and compute a vote total. The totals from all 100 simulations are averaged.[7]

***Disclaimers***

A number of rather heroic assumptions will be necessary to proceed. First, we must believe that—at least to an acceptable degree—a person's probability of voting can be predicted using purely demographic information. The methodology and data preclude incorporating party or ideology, political interest, or policy preferences. The prediction need not be perfect, but we assume that, on average, the error term does not correlate with the predicted probabilities of registering, voting, and choosing the Democrat.

[7] Another approach might have been to dichotomize the vote choice variable, so that anyone with a probability under 0.5 would be considered a Republican, and anyone over 0.5 would be considered a Democrat. I replicated my simulations using this methodology, and got very similar results. The method used here seems more methodologically defensible, as we must assume that there is error in the prediction of each of these probabilities, and taking the average is essentially calculating the expected value of the total vote.

Second, we must assume that increasing the probability of registration does in fact change the probability of turning out by a factor of $\frac{1}{\Pr(REGISTERED)}$. That is, we assume that the registered are not systematically different from the unregistered. From a rational choice standpoint, this assumption is defensible—if costs of registering and voting decrease the probability of turning out, then lessening the costs will increase this probability. Empirically, this is difficult to determine directly.[8]

We also assume the existence of some people who, regardless of registration, will not vote, unless the voting conditions themselves change. Thus, we assume a ceiling above which efforts to increase registration will stop increasing turnout.

Finally, we assume that the respondents in each survey reported their voting behavior accurately—or at least that false reports are random. I have corrected for over-reported turnout by state (shifting the intercept to match actual turnout), but I cannot correct for false reports of registration and voting if these correlate with the independent variables included in the model. If, for example, those who falsely report voting are disproportionately male, then this will bias my estimates. Problematically, it seems likely that this has happened to some degree; it is commonly believed that false positives are more likely to be low-income, less educated, and non-white.

The good news, given the likelihood that there is some bias in the model, is that if these groups over-report voting, the effect of increasing their probabilities of registration will appear to be less in the model than it would be in actuality, since their vote is factored into the simulation

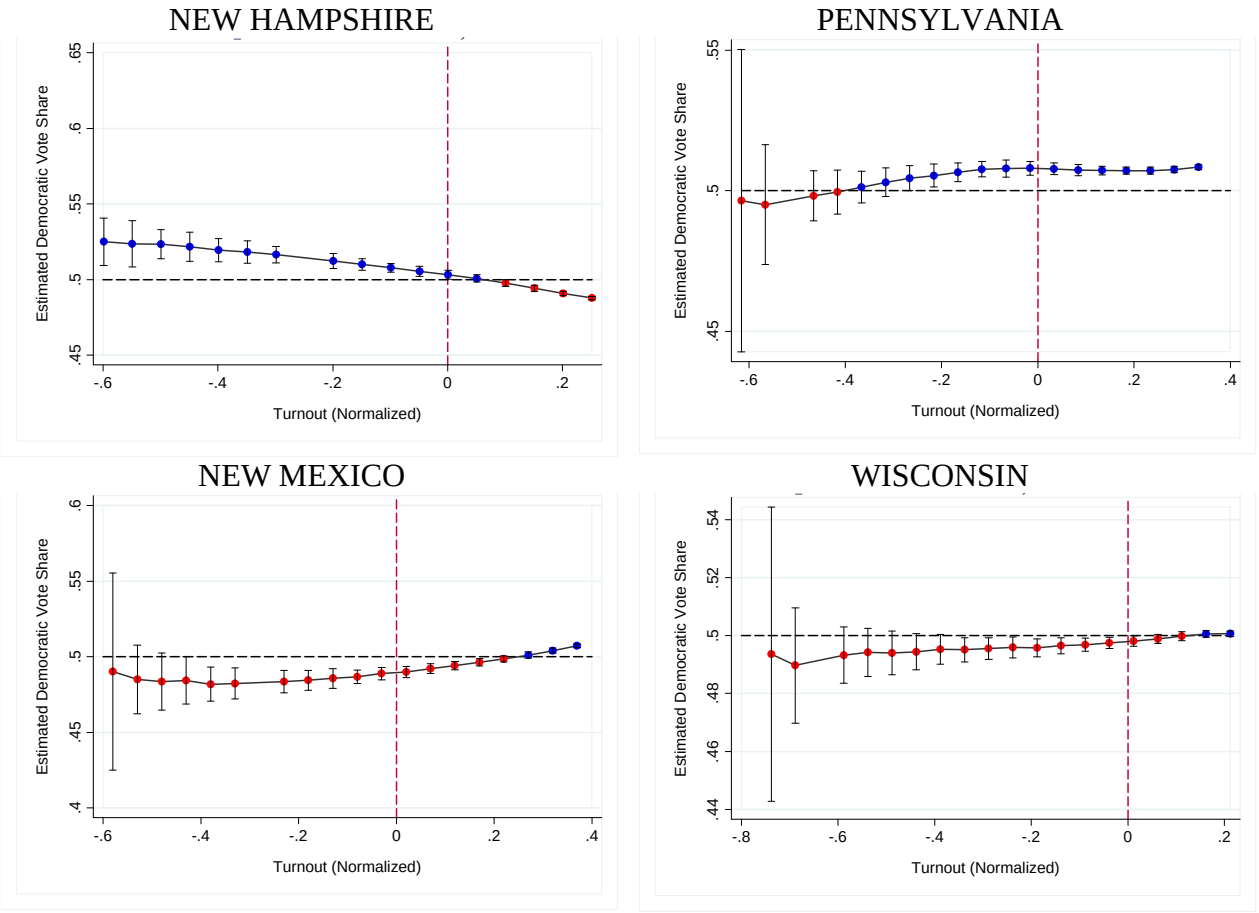
[8] I conducted a small analysis of ANES data, in which I compared the candidate preferences that respondents expressed BEFORE the election took place. It seems that demographic predictors of this vote choice are not statistically different for those who ended up voting, and those who didn't, or for the registered and unregistered.

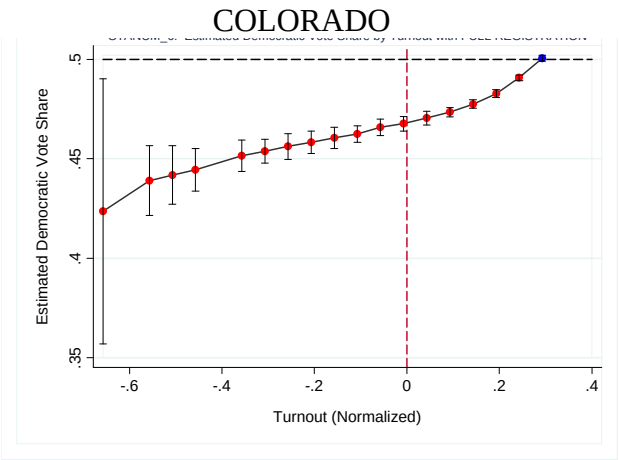
when turnout is low. Thus, the results would be more conservative than we would hope. Although not ideal, if you have to make an error, Type II is the way to go.

***Simulation 1: Increased Turnout under Existing Conditions***

As Citrin, Schickler and Sides do, I begin by simulating electoral outcomes when turnout varies *without changing registration.* In the majority of cases, increases or decreases in vote share do not cross the 50% threshold. Some of the exceptions are reported in Figure 6. Note that the horizontal dashed line in each graph represents 50% vote share, while the vertical dashed line represents actual turnout in the 2004 election. To simplify interpretation, I've scaled turnout so that actual turnout in the election is at 0. A 10-point increase in turnout, then, is at 0.1.

**Figure 6:** Simulation 1—Increased Turnout






Although in most cases higher turnout does increase the likelihood of voting Democratic, a few states see a Republican surge with higher turnout—or a non-linear effect that both rises and falls at points (see, for example, New Hampshire, Florida, California, and Oregon). According to these simulations, full registration would have caused: Colorado (9 electoral votes), Wisconsin (10), and New Mexico (5) to go Democratic, and New Hampshire (4) to go Republican, for a net gain to the Democrats of 20 votes—enough to change the 2004 election results. However, the pipe dream of 100% turnout seems an unlikely achievement.

Therefore, I turn to changes in registration to provide more nuance to our predictions about "increased turnout."

[See appendix for all state graphs]

***Simulation 2: Increased Registration Distributed across All Voters***

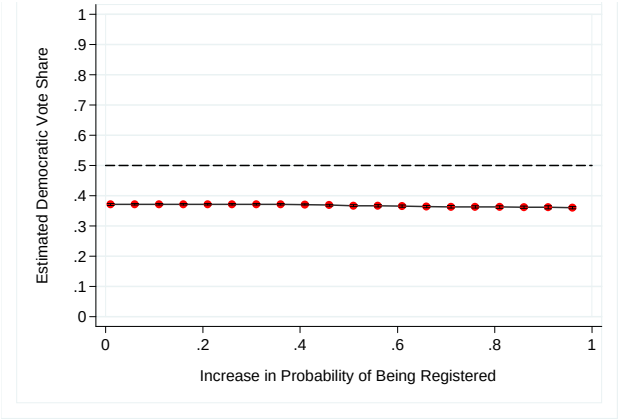
For the second simulation, I address the titular question of this paper: What if everyone registered? Probabilities of registering are manipulated, and the probabilities of turning out are recalculated to reflect this change. The simulation procedure is repeated for progressively higher increases of registration—at 1, everyone is registered. In each state, the turnout level is held at the actual level of turnout for the election.

The net effect of increased registration is greater in some states than in others. For example, New Mexico's turnout barely budges, while Nevada's increases about 12% with full

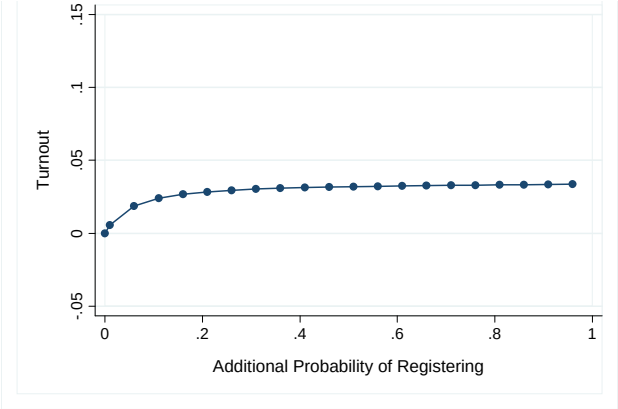
registration. The leveling-off after a certain increase in registration reflects the high correlation between probability of registering and probability of voting—registering extra voters who don't vote doesn't increase turnout.

**Figure 7:** Simulation 2—Increased Registration Distributed across All Voters

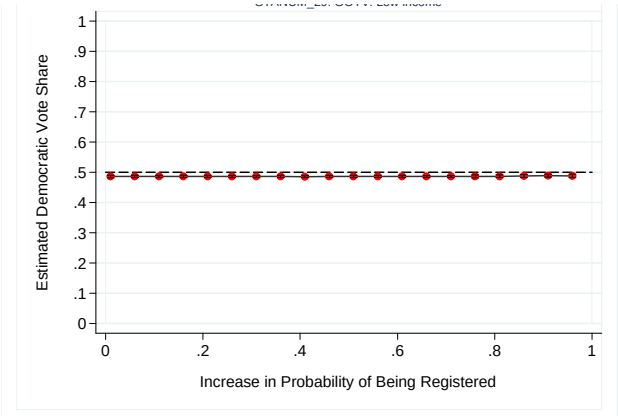
NEW MEXICO: Vote Share



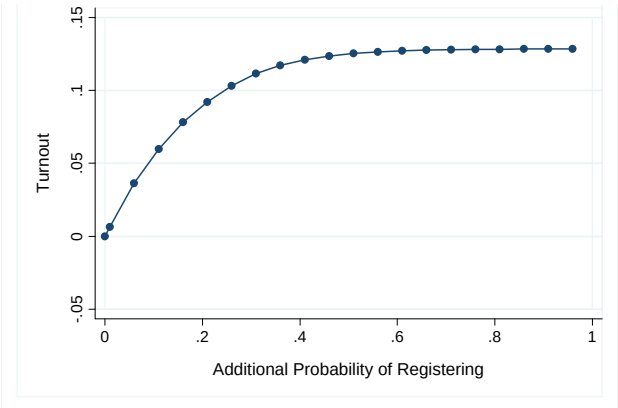

NEW MEXICO: Turnout




NEVADA: Vote Share




NEVADA: Turnout



The following simulations model targeted increases in registration. The groups I chose to target—black voters, Hispanic voters, low-income voters, and students—are considered dominantly democratic (see Figure 4), and perhaps the ones most likely to be differentially affected by liberalized registration laws. I examined both the implications for increases in their registration levels on turnout (left) and on vote share (right). For each of these simulations, we see that (consistent with our theory), the net effect of increased registration on vote share is a function of (1) the group's prevalence in the state; (2) the difference between the group's partisanship and the partisanship of the state as a whole; and (3) the probabilities of registration and voting for each group. These factors interact to produce a change in vote share.

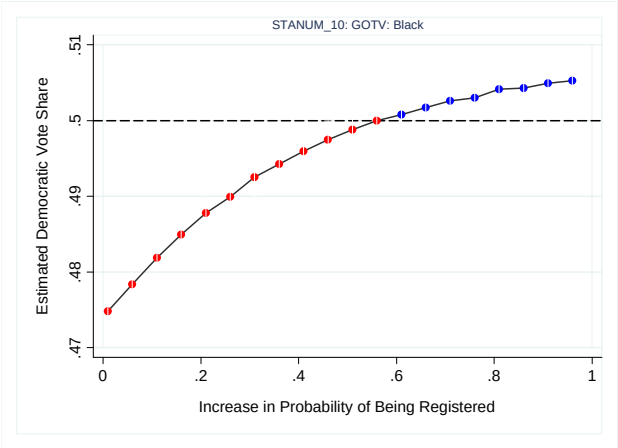
[See appendix for all state graphs]

***Simulation 3: Registering Black Voters***

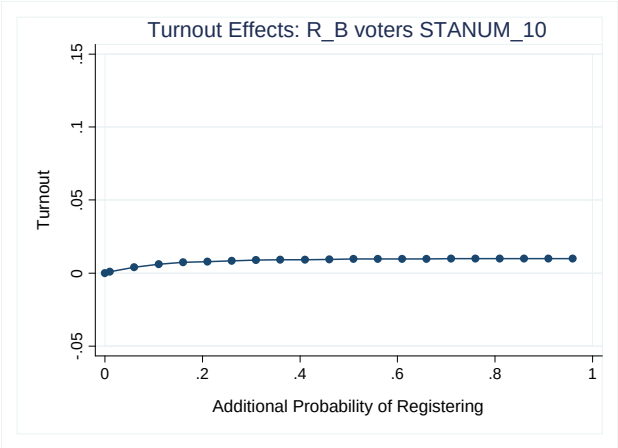
When the registration rates of black voters are increased, the states most affected were in the South: Florida (27 electoral votes), Louisiana (9), Mississippi (6), and Georgia (15) went Democratic with high black registration—as did Wisconsin (10). No states went democratic—thus, the Democrats came out ahead, with 66 additional electoral votes.

**Figure 8:** Simulation 3-- Registering Black Voters

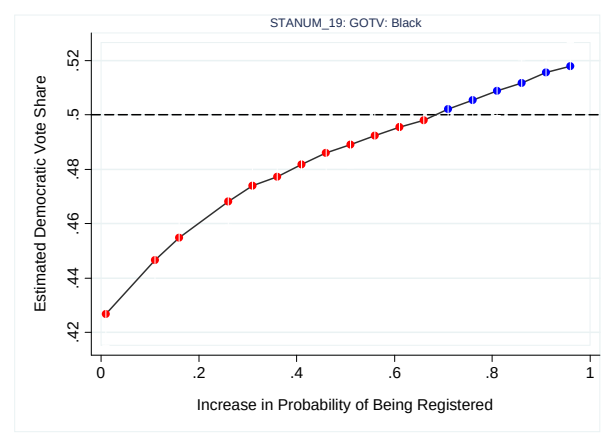
**FLORIDA:** Vote Share



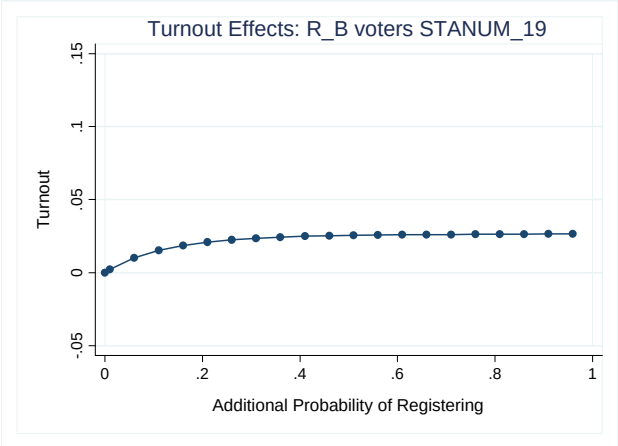

**FLORIDA:** Turnout



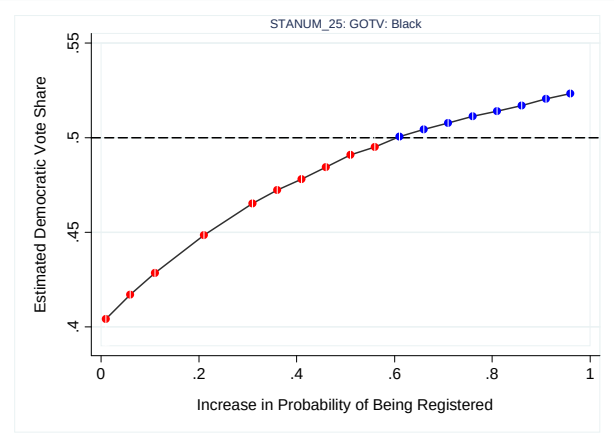
**LOUISIANA:** Vote Share



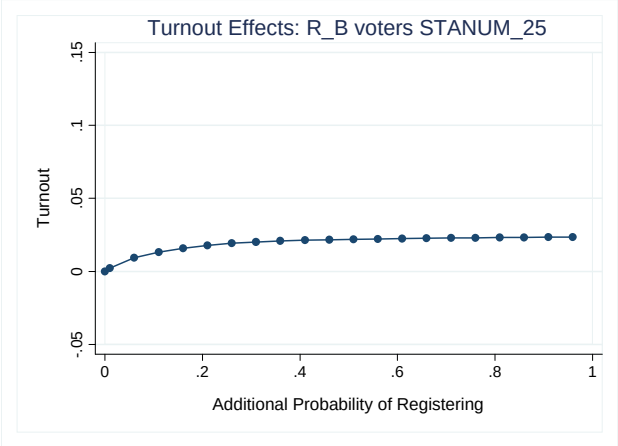

**LOUISIANA:** Turnout



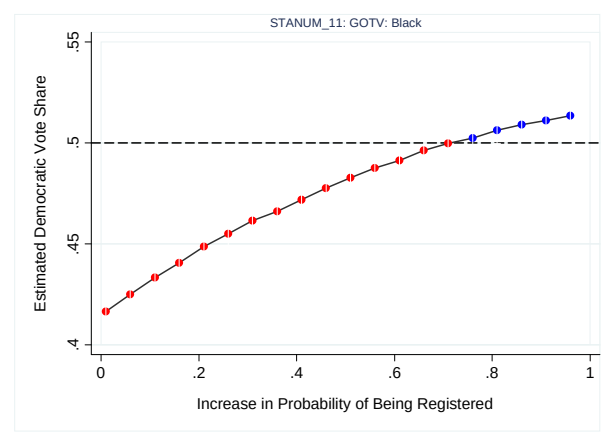

**MISSISSIPPI:** Vote Share



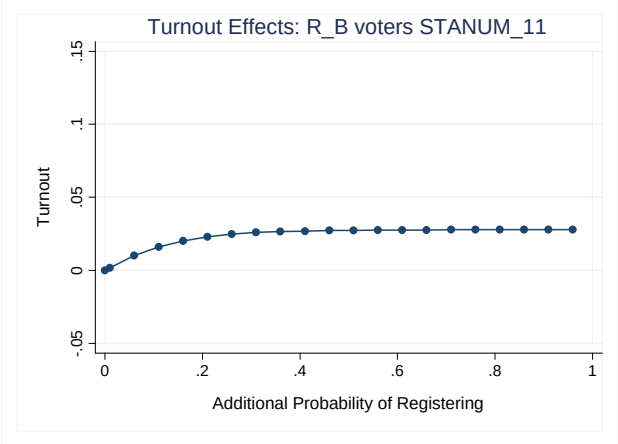

**MISSISSIPPI:** Turnout




**GEORGIA:** Vote Share




**GEORGIA:** Turnout



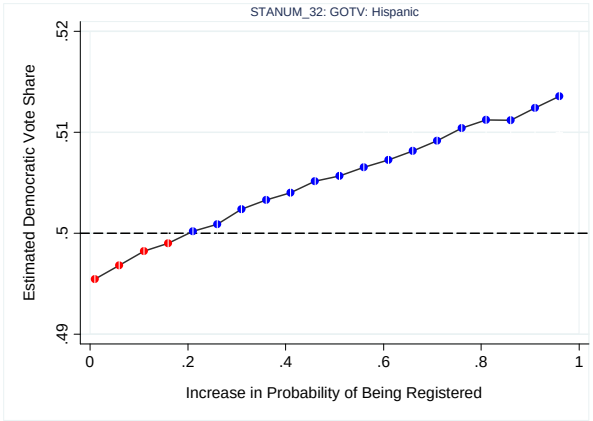

[See appendix for all state graphs]

### *Simulation 4: Registering Hispanic Voters*

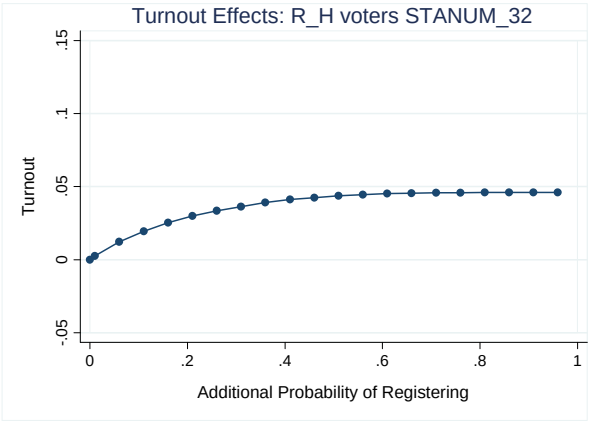
While the effects of registering black voters were greatest in the South, the effects of registering Hispanic voters are greatest in the Southwest. New Mexico (5 electoral votes), however, is the only state whose vote share crosses 0.5. These 5 votes wouldn't have been enough to reverse Bush's 35-vote lead.

**Figure 9: Simulation 4—Registering Hispanic Voters**

NEW MEXICO: Vote Choice




NEW MEXICO: Turnout




[See appendix for all state graphs]

The last two of these groups—students and low income students—are less Democratic on average than black of Hispanic voters.

### *Simulation 5: Registering Students*

Although increasing registration among students has a (small) effect in some states, these effects are not enough to change any electoral votes.

[See appendix for all state graphs]

***Simulation 6: Registering Low-Income voters***

Likewise, registering low-income voters have a small but insignificant effect on vote share.

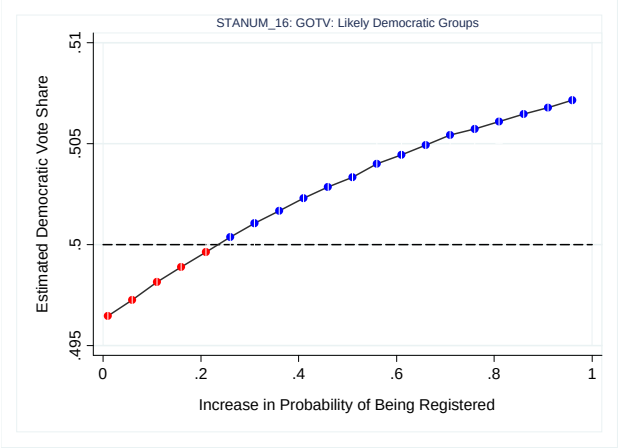
[See appendix for all state graphs]

***Simulation 7: Registering the "Natural Constituency"***

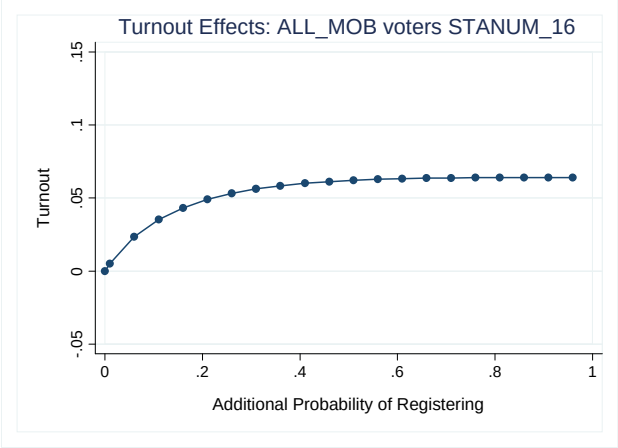
Finally, I model the effect of increasing registration among all these groups simultaneously. Strangely, when all these effects are combined, they produce less of a change in most states than registering black voters or Hispanic voters alone did; only Iowa (7) and New Mexico (5) changed hands.

**Figure 10:** Registering the "Natural Constituency"

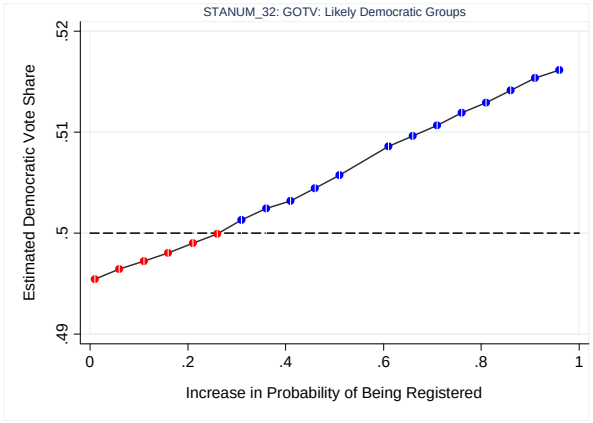
IOWA: Vote Share



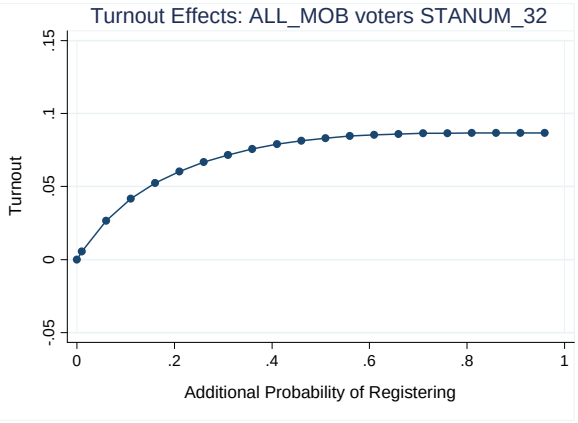

IOWA: Turnout



NEW MEXICO: Vote Share




NEW MEXICO: Vote Share




[See appendix for all state graphs]

## 6. **Conclusions**

How does registration affect electoral outcomes? It depends on who is affected by changes in registration. As an example, when black and Hispanic voters are registered at higher rates, we see potentially large effects in the South and Southwest, respectively. However, because different variables have different effects over different states, the effects of combinations of variables can be difficult to predict ex ante.

Nonvoters are not, as Highton suggests, "carbon copies" of the voting population. However, significant turnout and vote share effects are most evident when certain segments of the nonvoting population are affected to a greater degree than others—a likely result of changes in registration laws—such as closing dates and residency requirements. Nor do voters, as Erikson has suggested, simply "vote because they have registered." Rather, increasing probabilities of registration can have a large or small effect on probabilities of turning out, depending on the intermediate probability of voting.

***Opportunities for future research***

A natural next step would be to examine whether changes in registration probabilities might affect the "natural constituency" of the Republican party to the extent that it affected the Democratic groups, and whether these effects translate into electoral effects. After all, it is unreasonable to think that Democrats would benefit exclusively from electoral reform. It may even be logical to incorporate into the model decreased turnout in response to registration laws—for example, the recent Help America Vote act, which among its provisions includes a requirement that states check IDs before voters register. These sorts of laws may be reasonable expected to decrease turnout to some extent among minorities—especially Hispanics, who are disproportionately foreign-born and may not have obtained a U.S. ID.

One crucial question remains: what registration laws affect levels of registration? This effect is extraordinarily difficult to measure, but given the right data—and perhaps over time—it may be possible to estimate the average effects of changes in specific laws on registration rates.

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# Appendix 1:

# Predicted Probability of Registering

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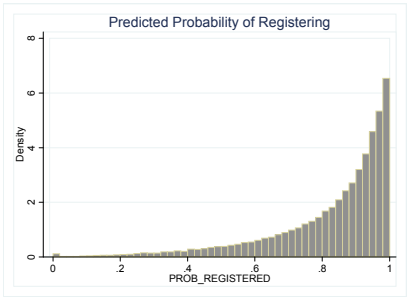


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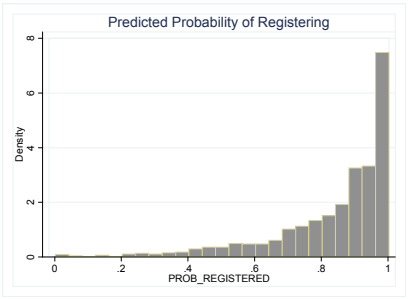


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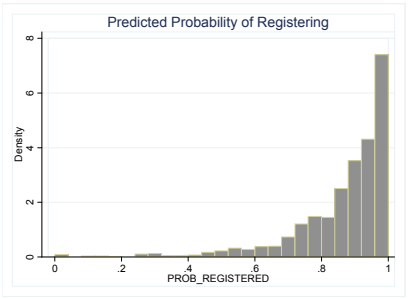


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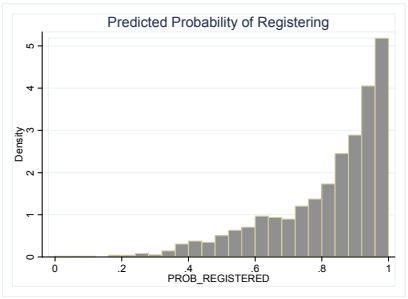


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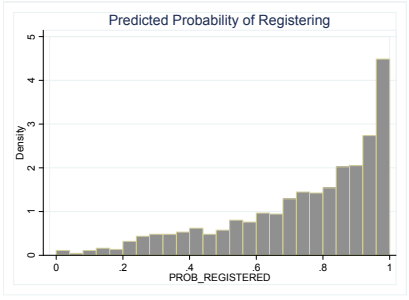


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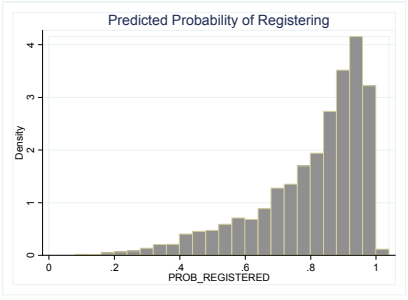


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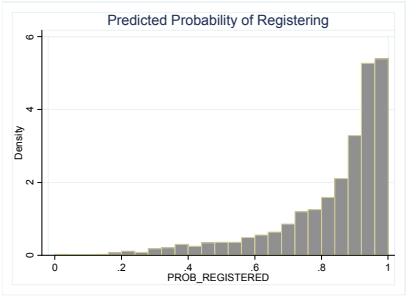


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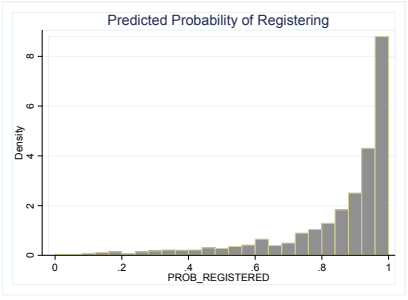


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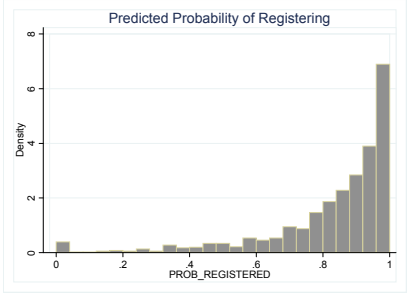


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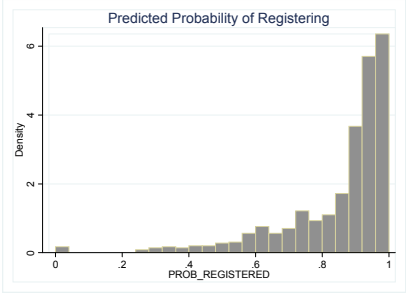


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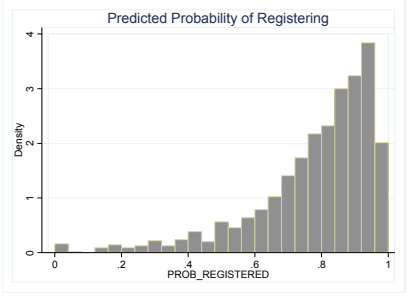


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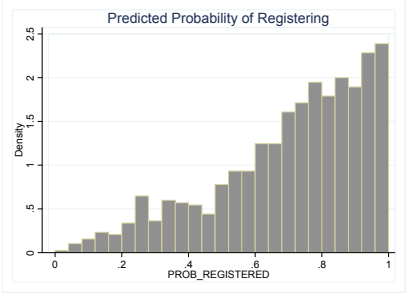


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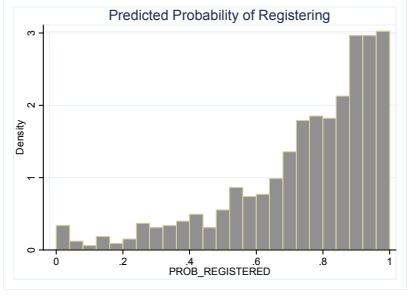


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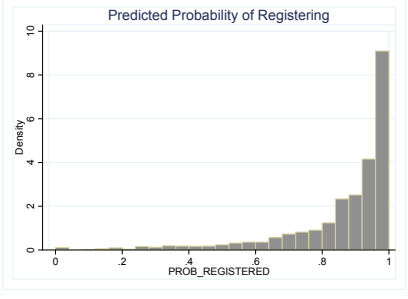


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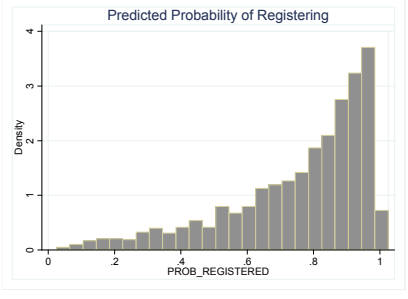


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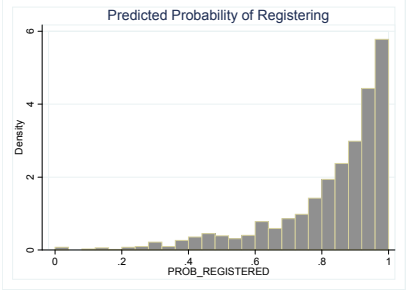

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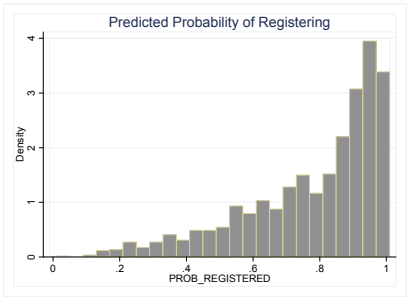


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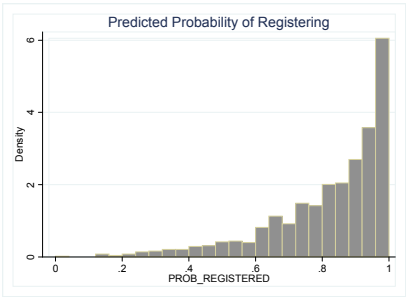


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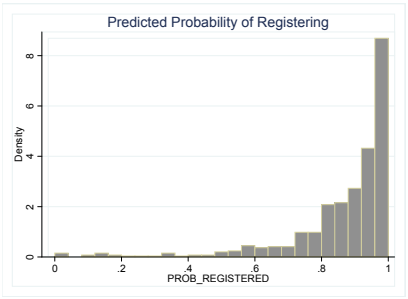


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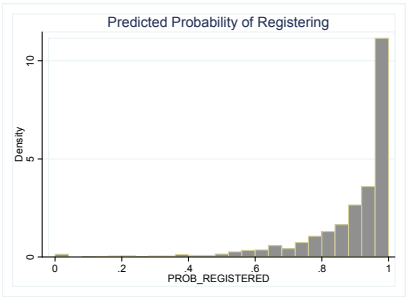


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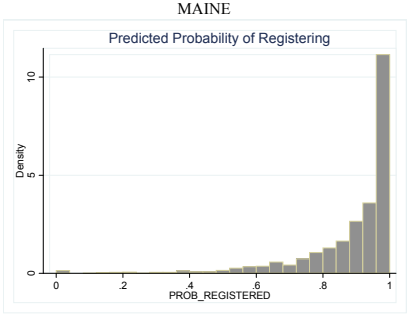


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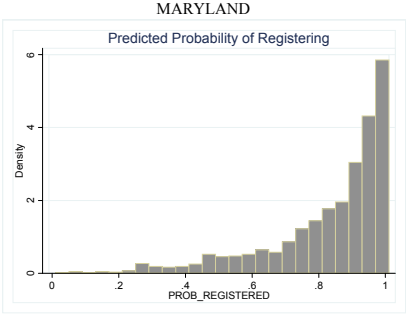


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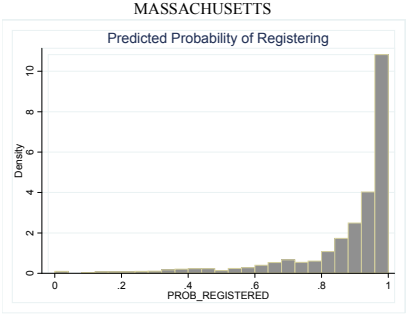


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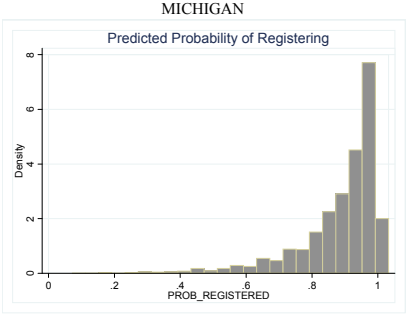


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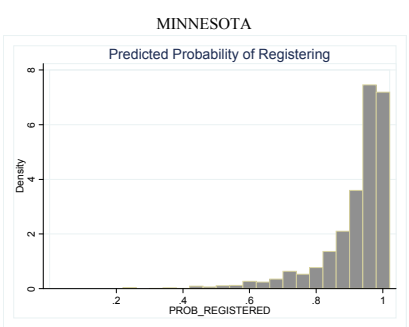


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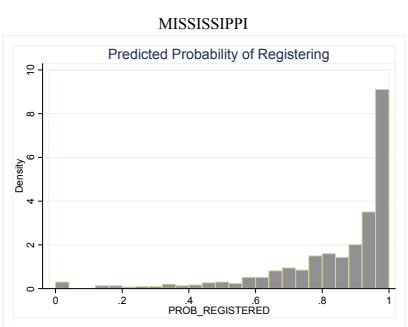


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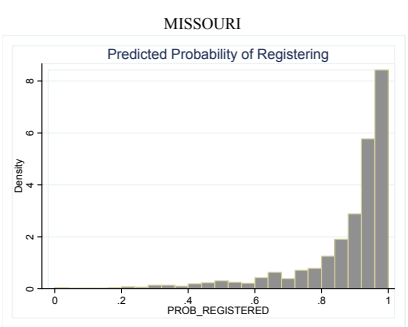


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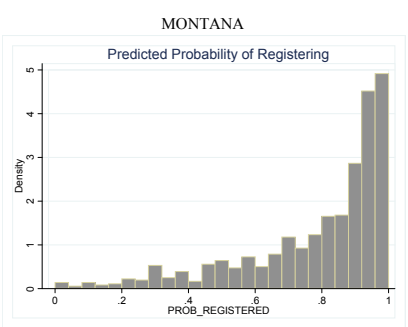


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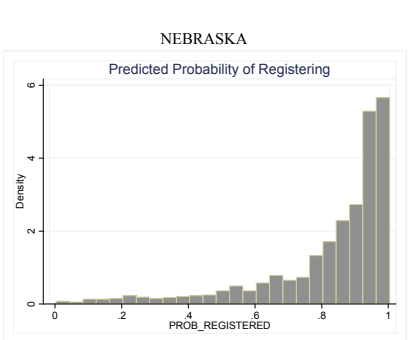


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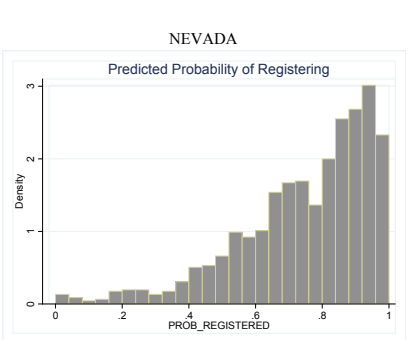


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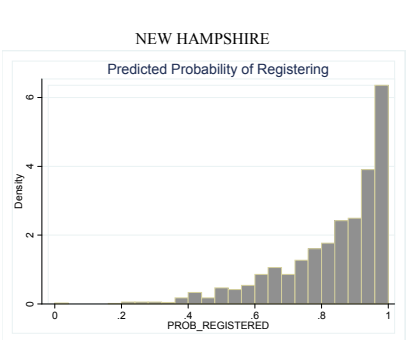


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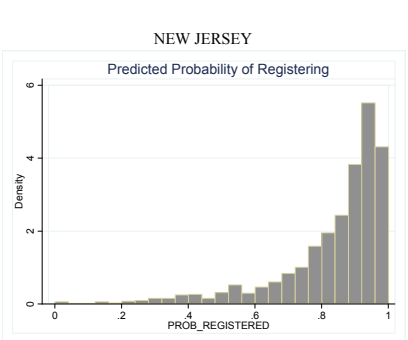

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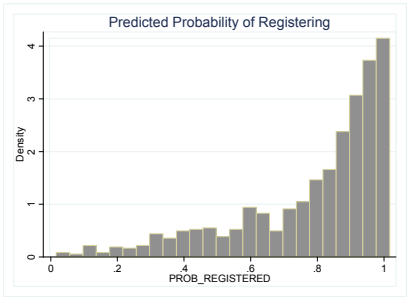


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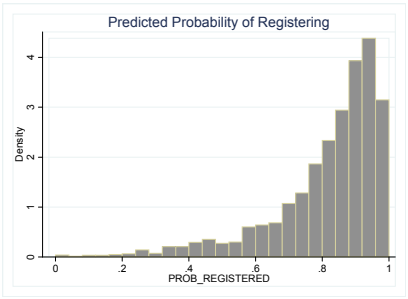


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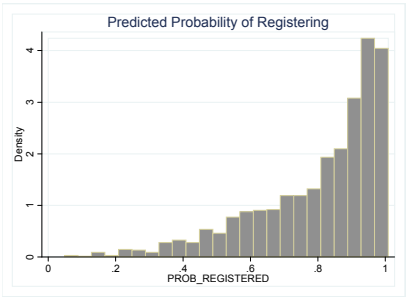


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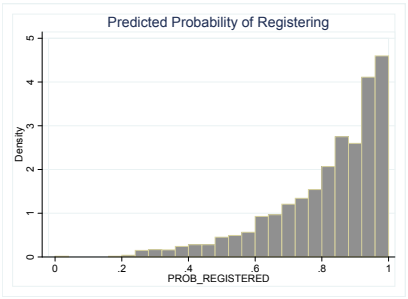


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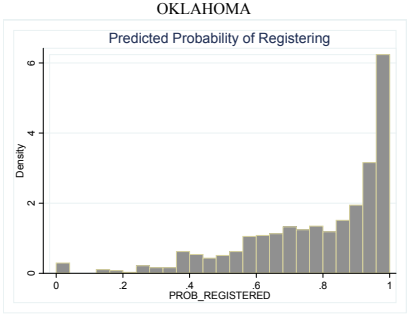


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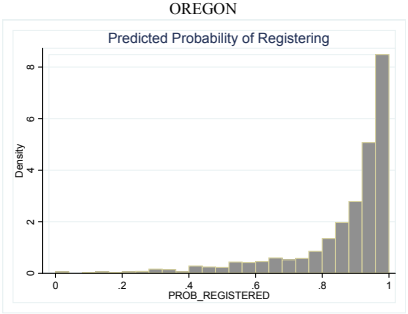


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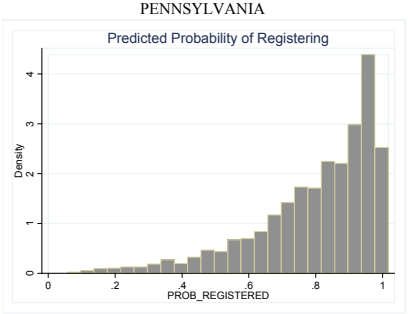


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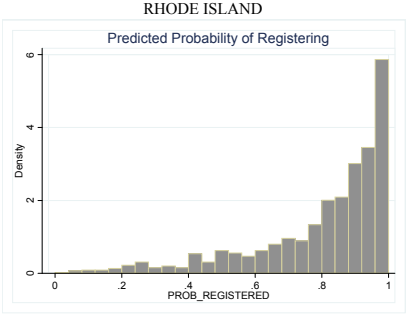


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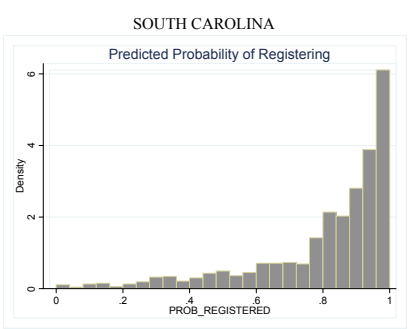


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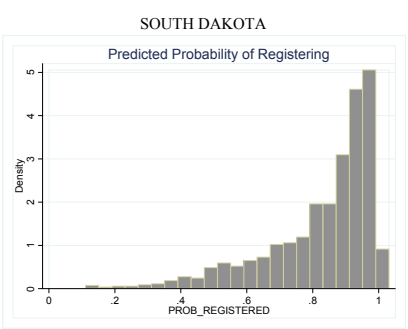


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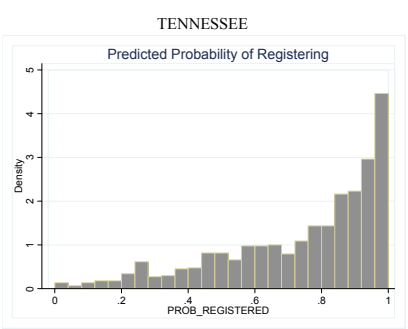


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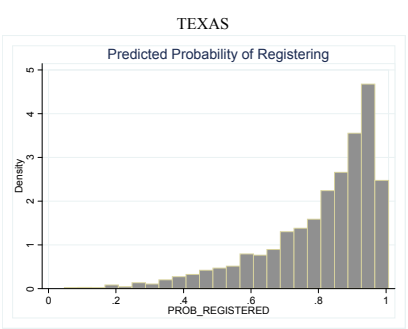


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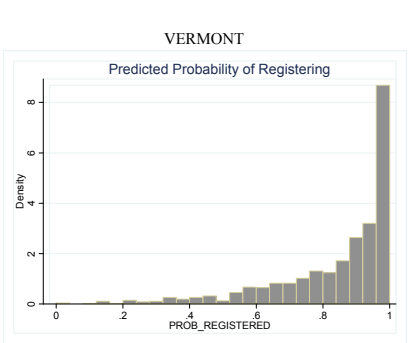


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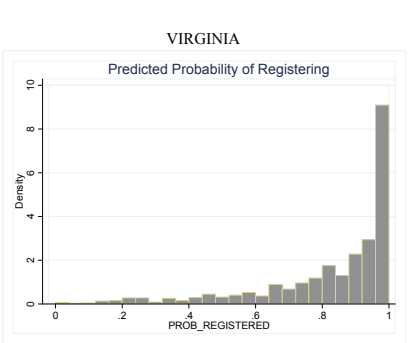


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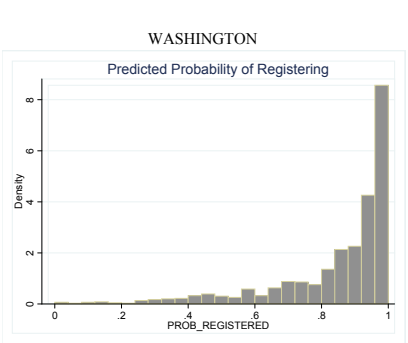


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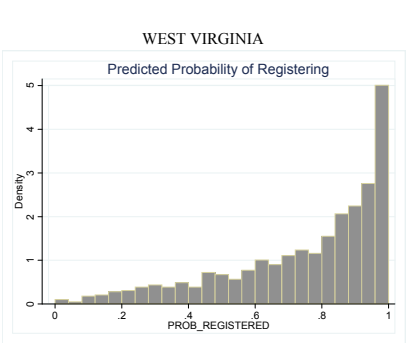

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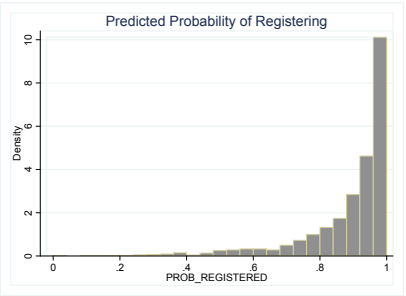


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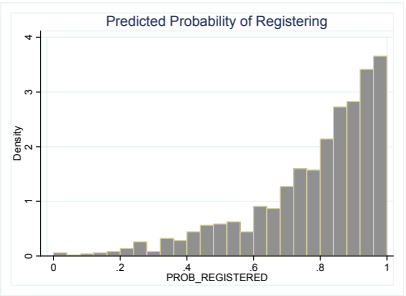

# Appendix 2:

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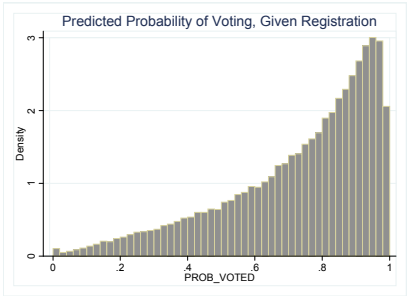


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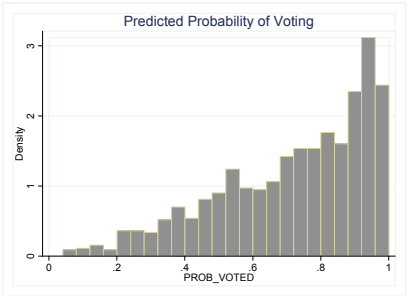


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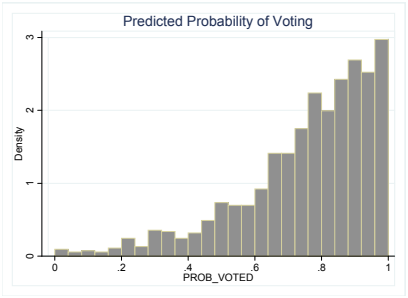


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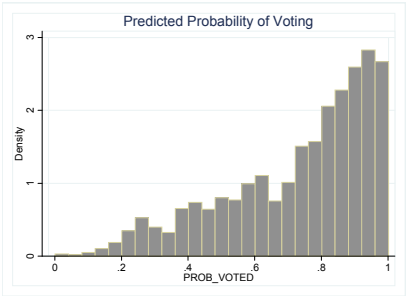


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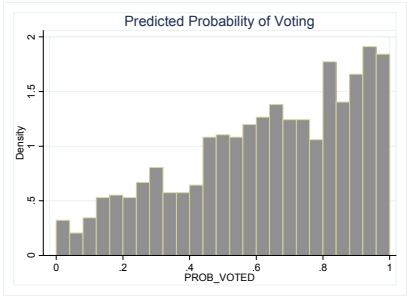


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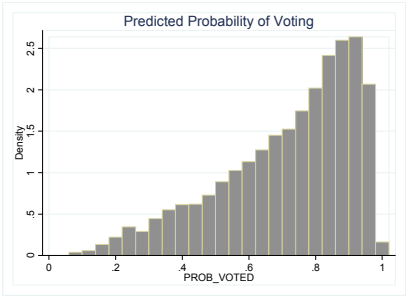


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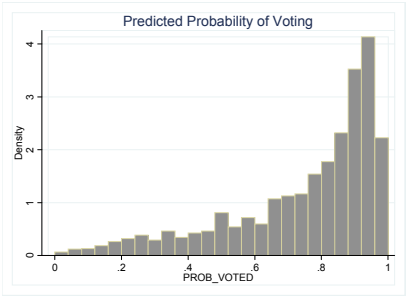


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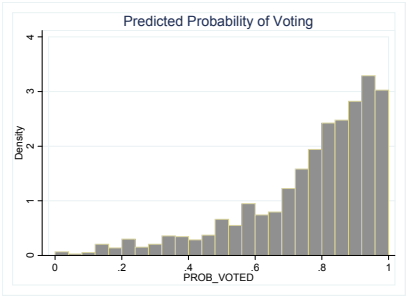


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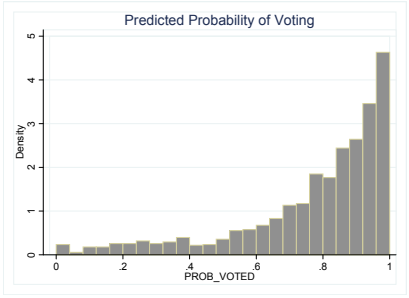


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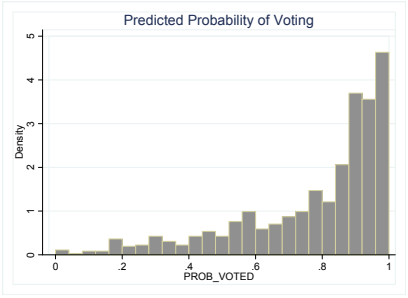


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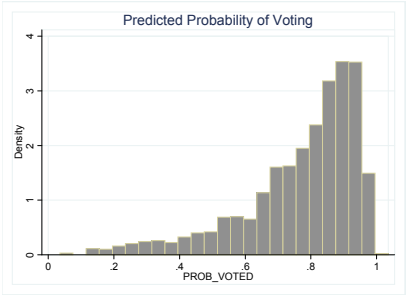


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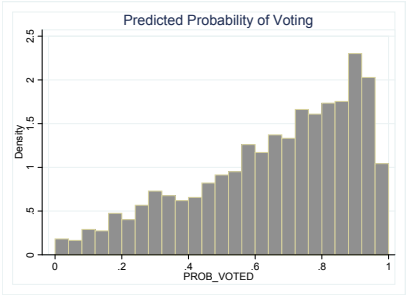


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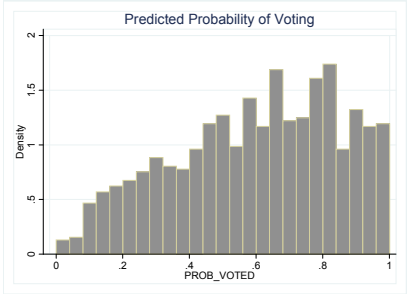


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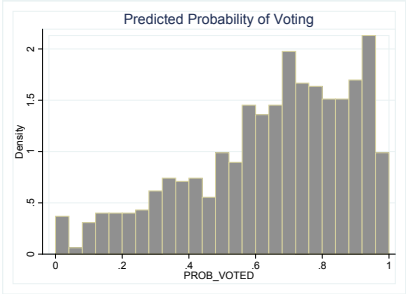


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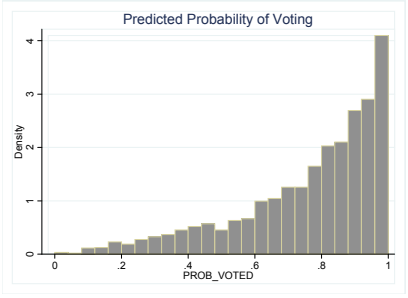


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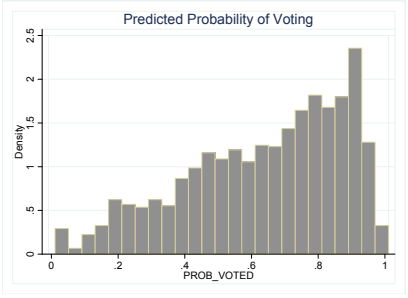

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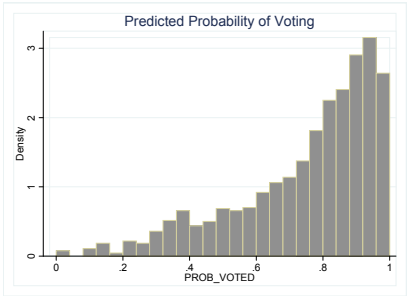


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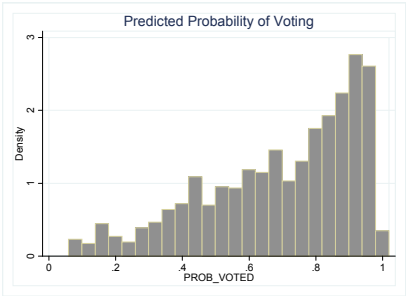
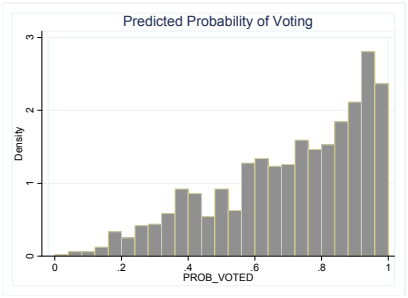



KENTUCKY

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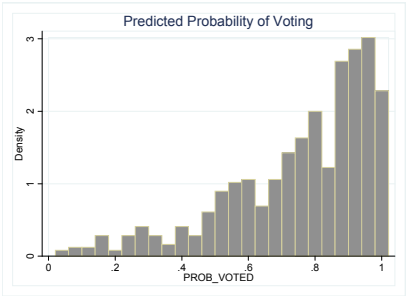


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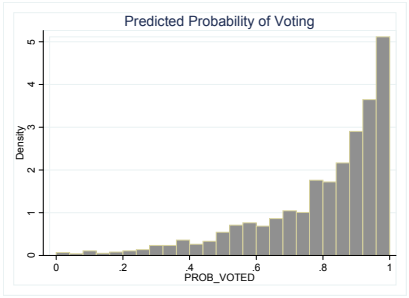


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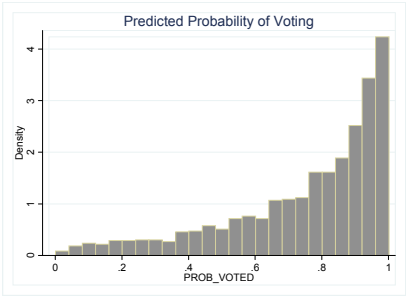


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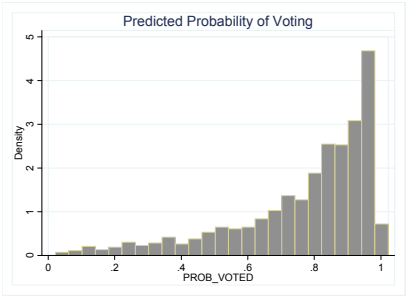


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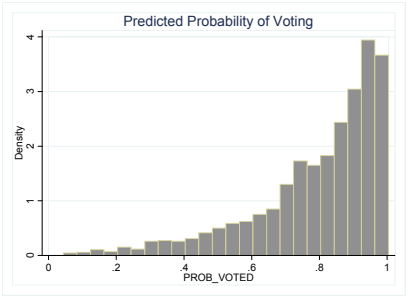


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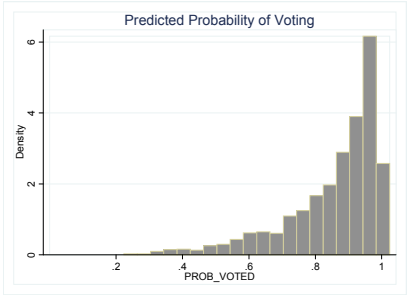


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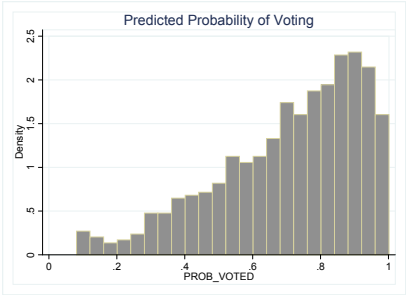


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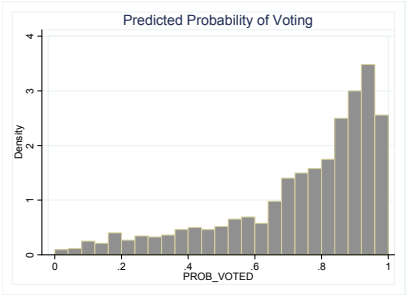


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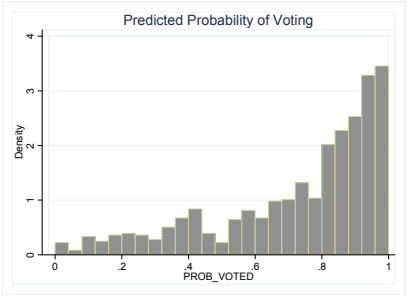


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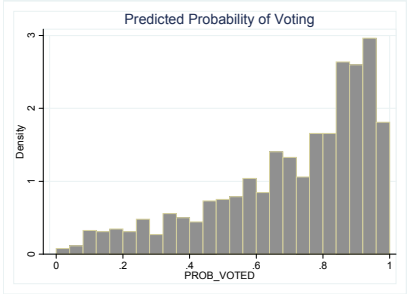


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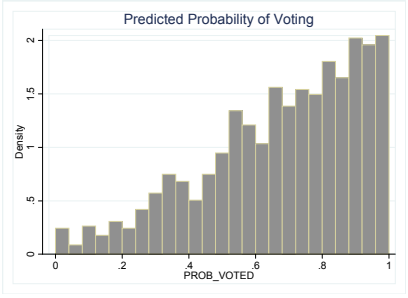


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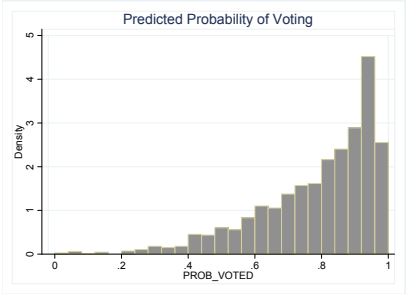


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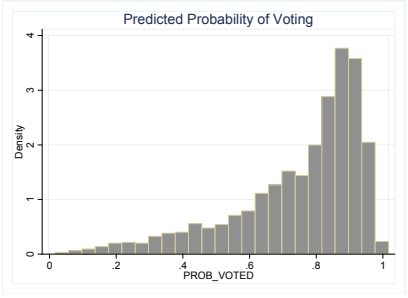

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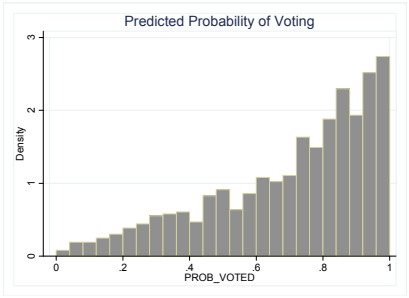


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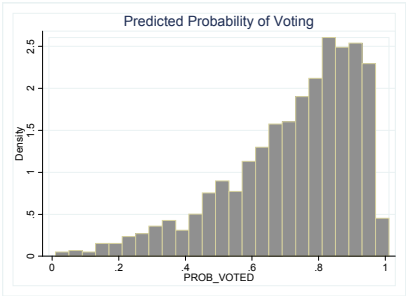
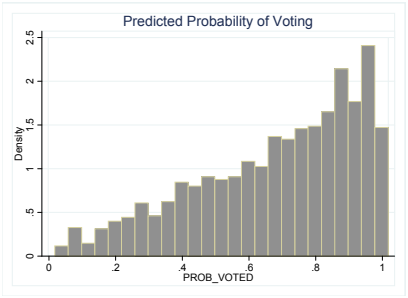



NORTH CAROLINA

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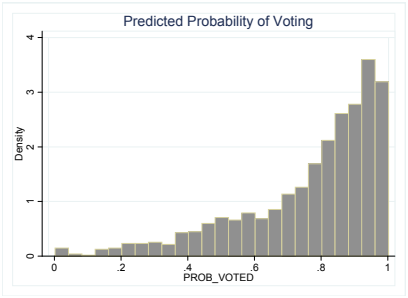


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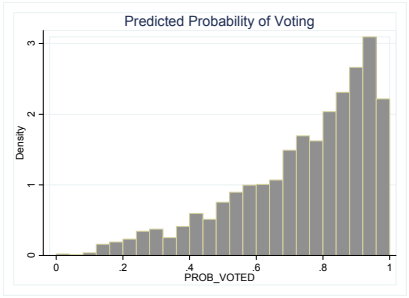


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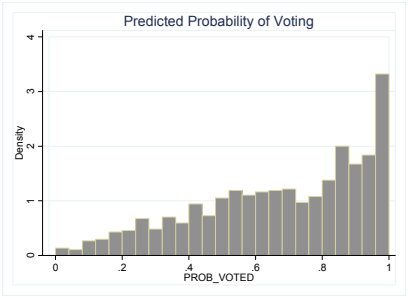


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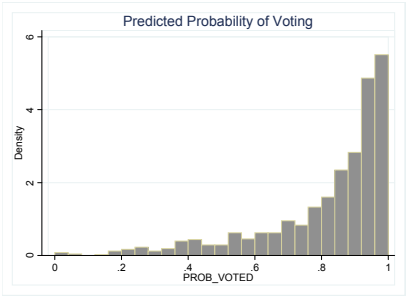


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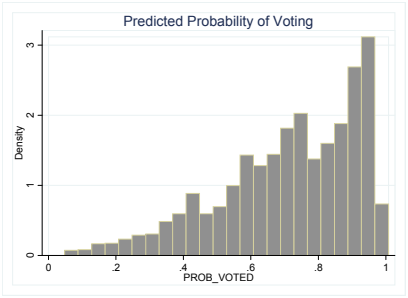


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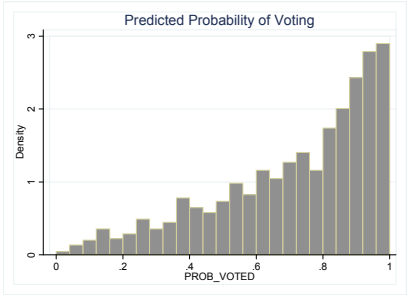


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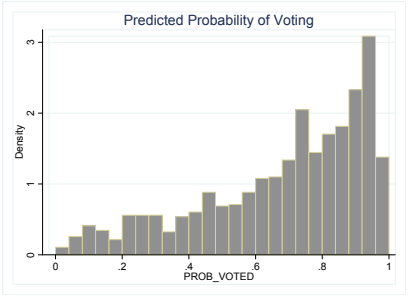
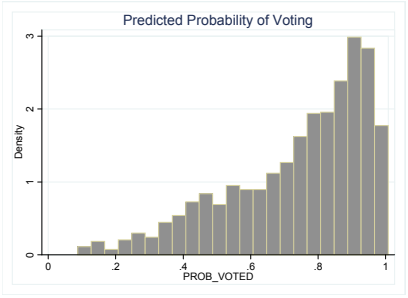



SOUTH DAKOTA

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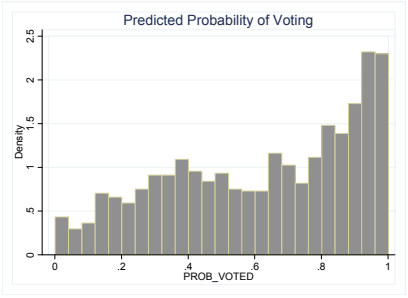


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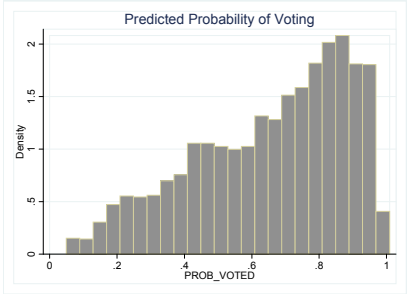


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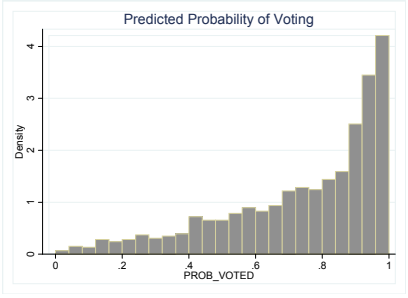


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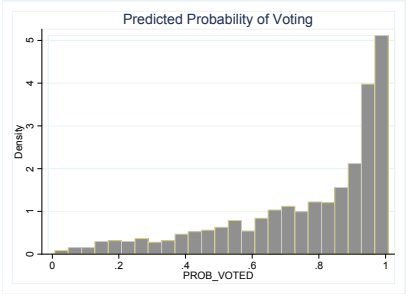
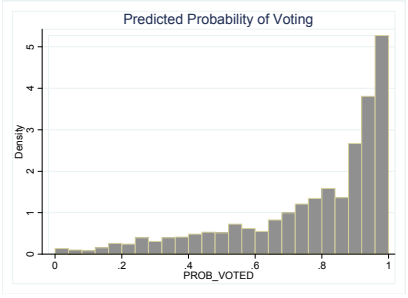
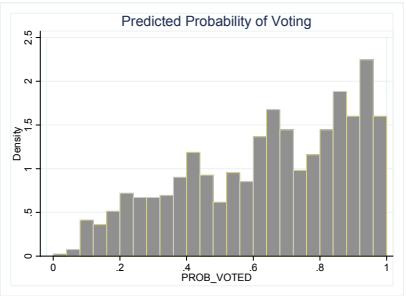



WASHINGTON



WEST VIRGINIA

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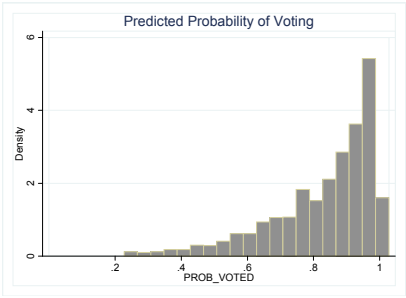


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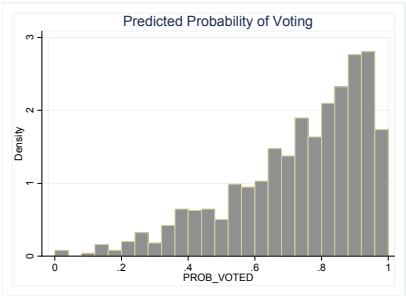
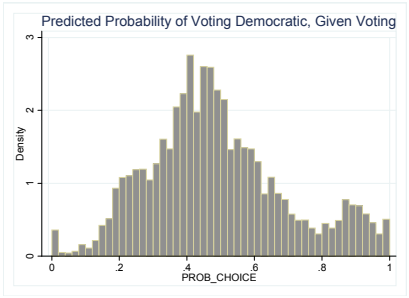


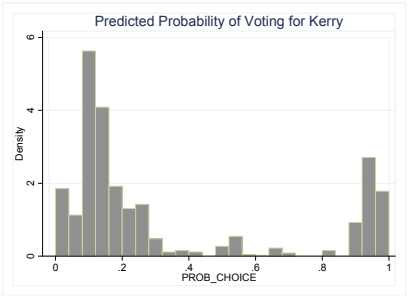
# Appendix 3:

# Predicted Probability of Voting Democratic

NATIONAL




ALABAMA

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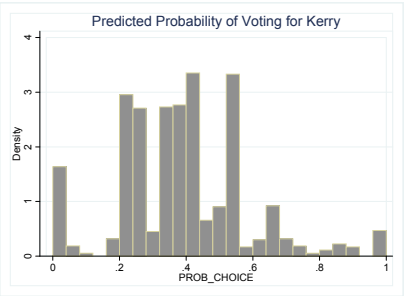
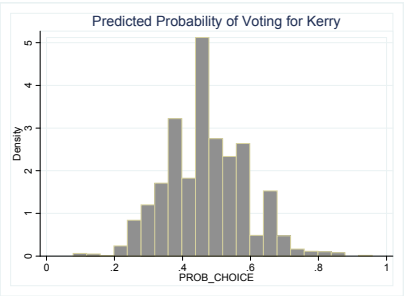
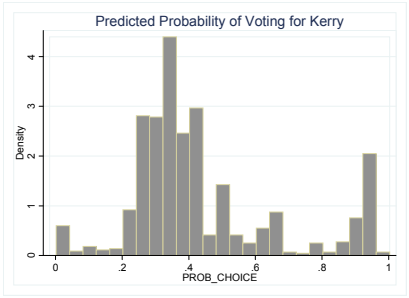


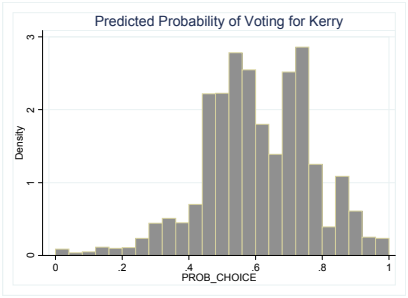

ARIZONA




ARKANSAS




CALIFORNIA

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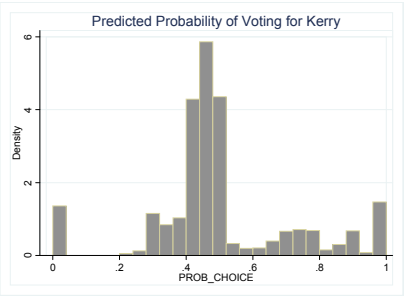
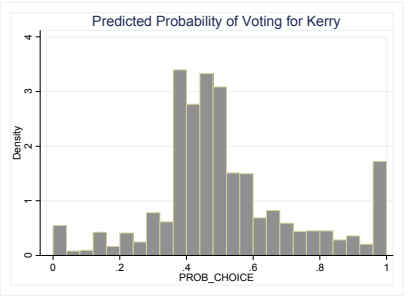
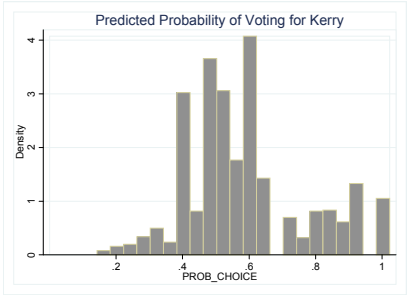


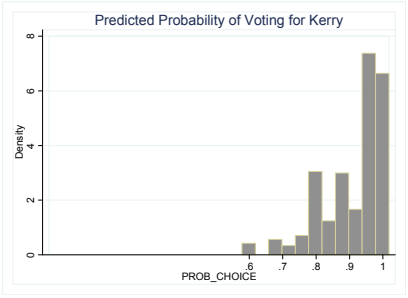

CONNECTICUT



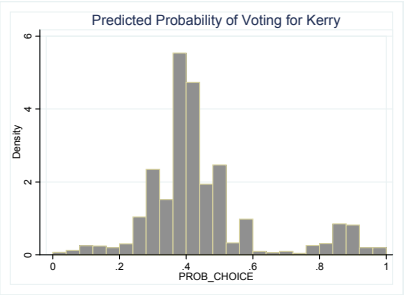

DELAWARE



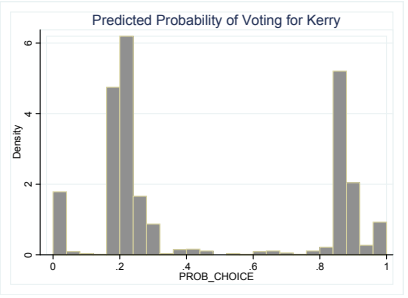

D.C.



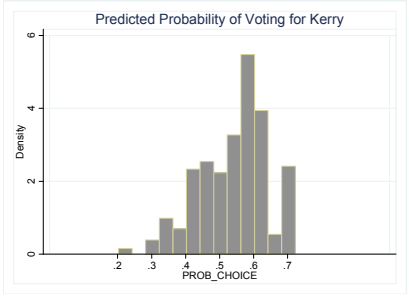

FLORIDA




GEORGIA




HAWAII

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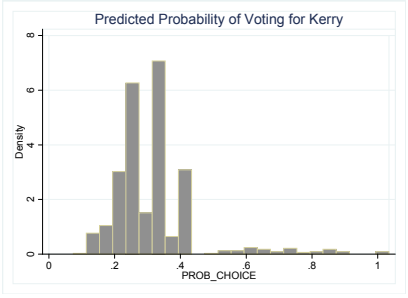


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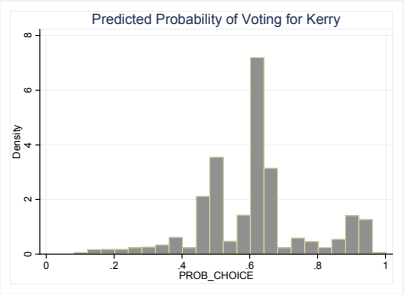


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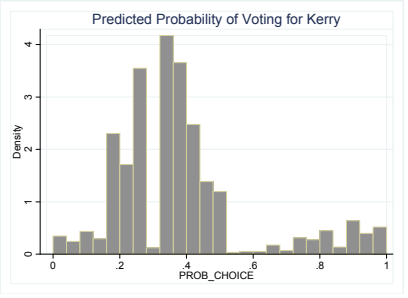
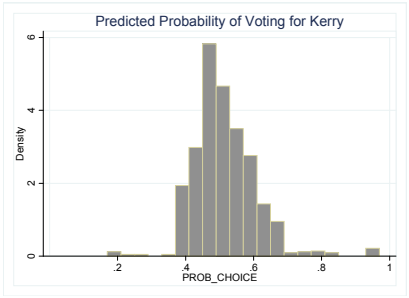


IOWA

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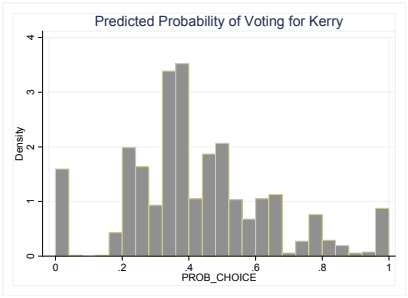


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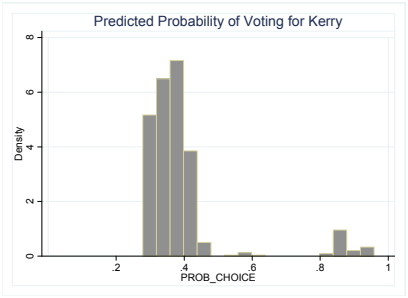


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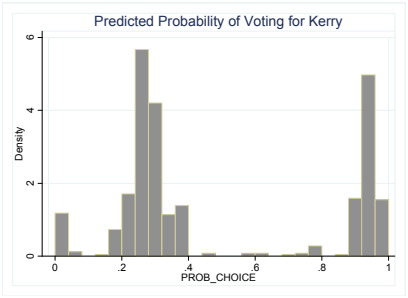


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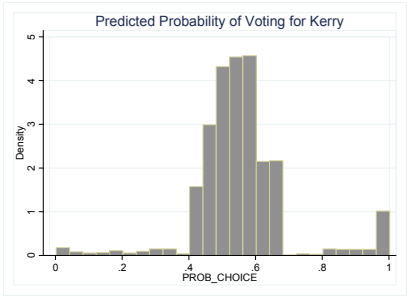


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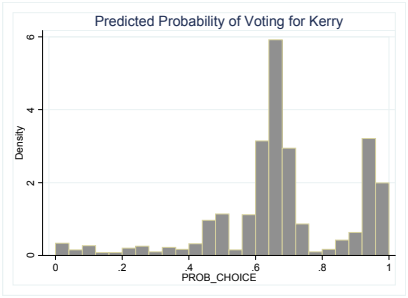


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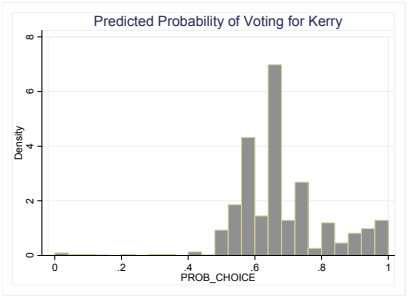


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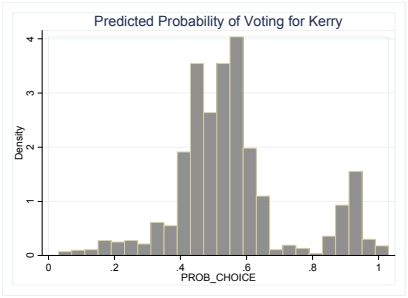


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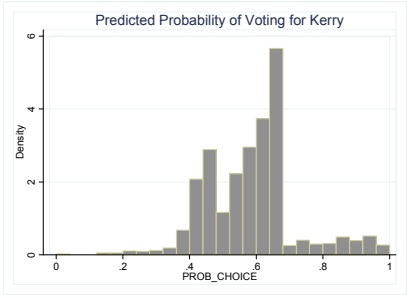


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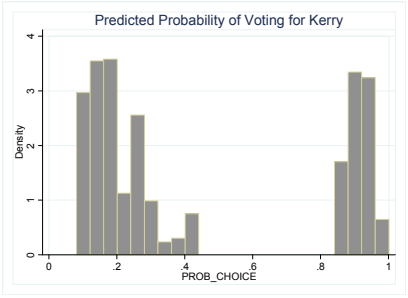
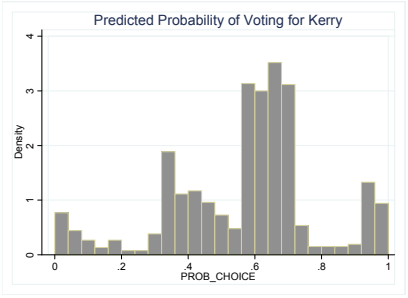
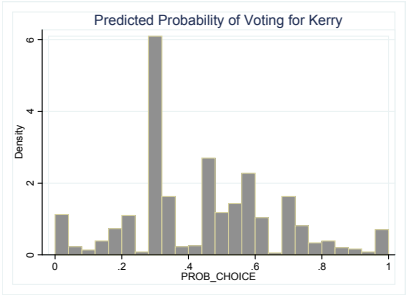



MISSOURI




MONTANA

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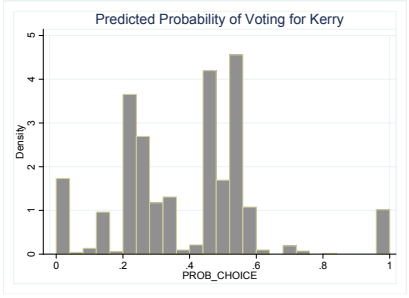


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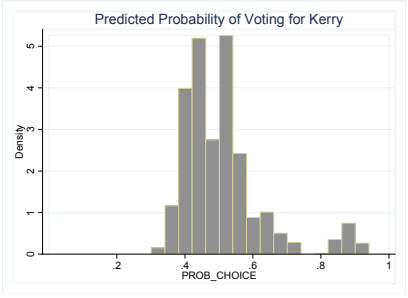


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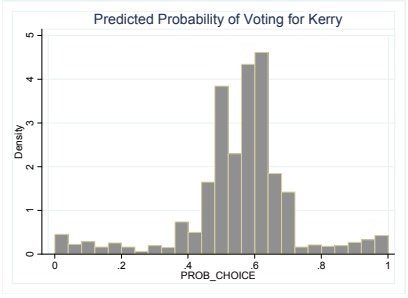


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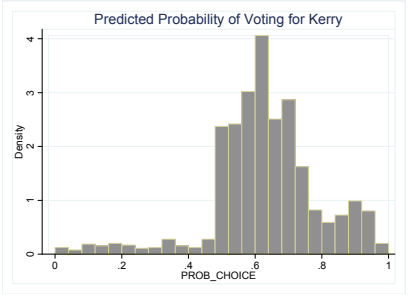

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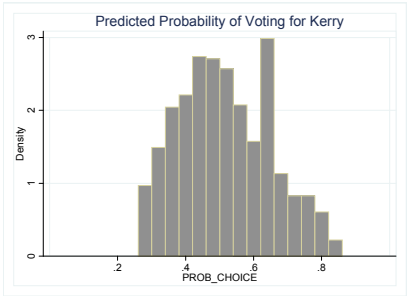


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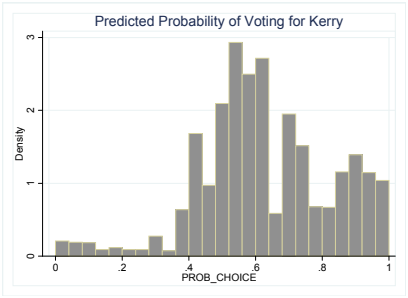
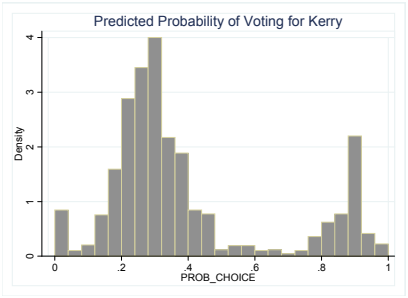



NORTH CAROLINA

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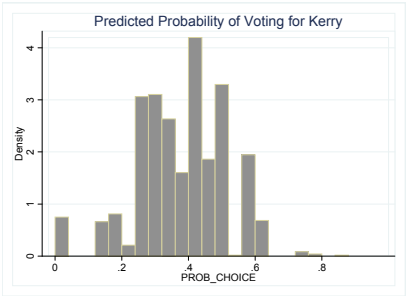


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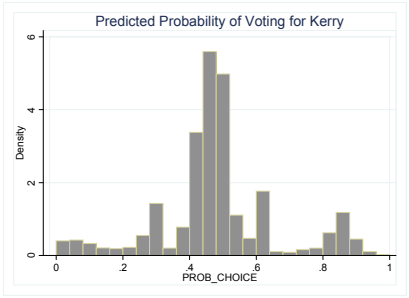


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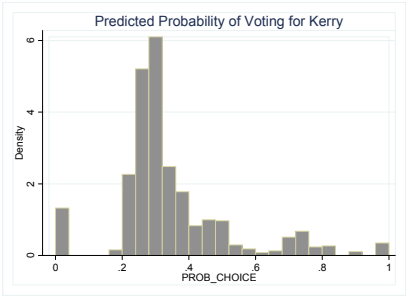


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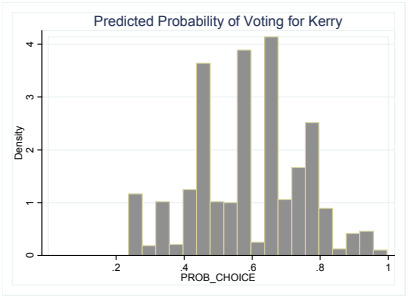


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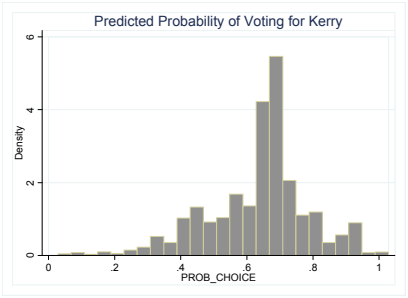
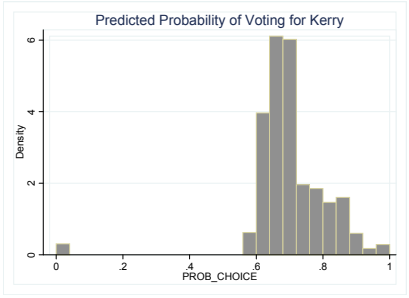
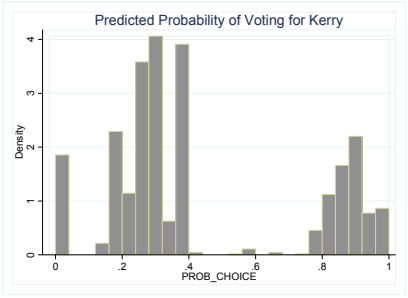


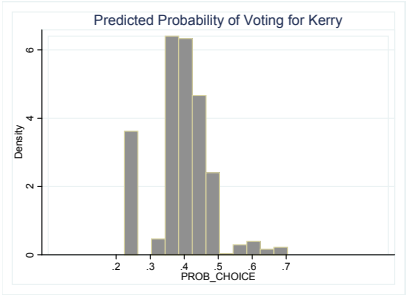

RHODE ISLAND



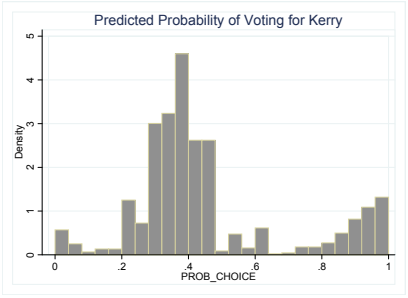

SOUTH CAROLINA




SOUTH DAKOTA




TENNESSEE

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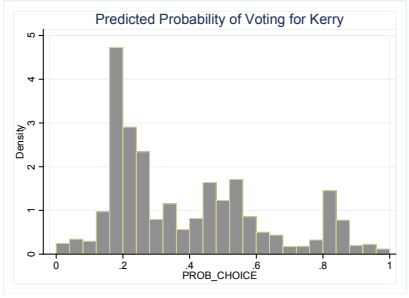


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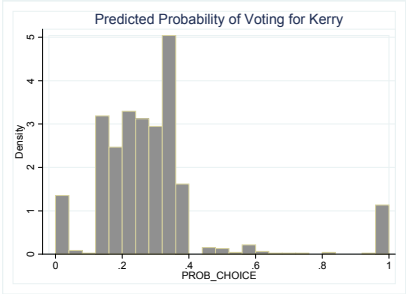
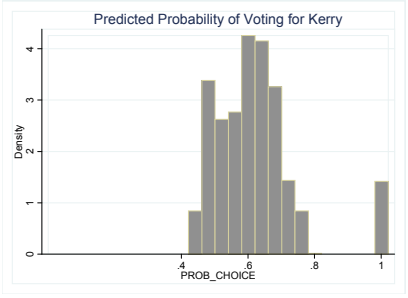
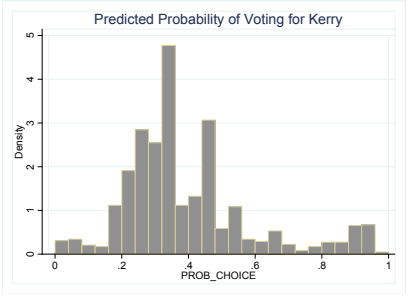


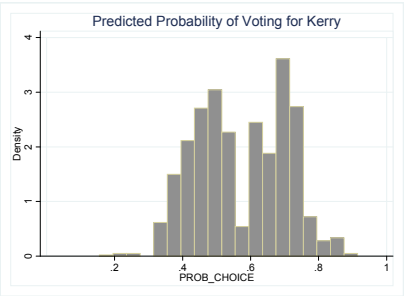

VIRGINIA



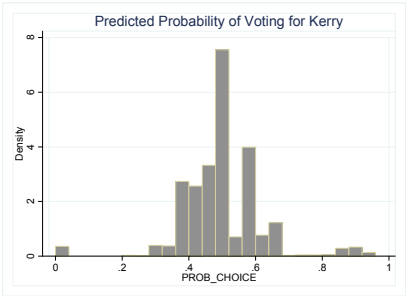

WASHINGTON



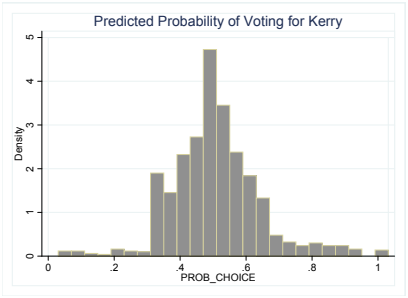
WEST VIRGINIA




WISCONSIN



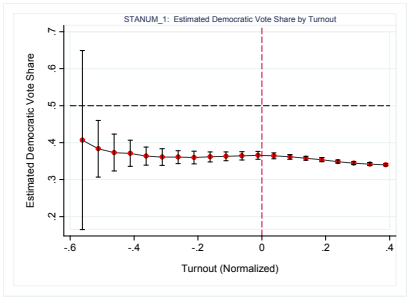

WYOMING



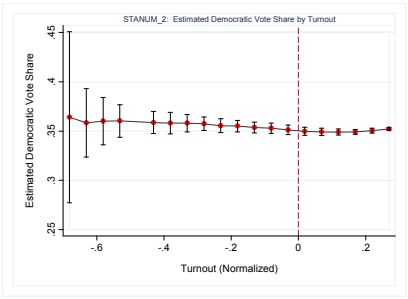
# Appendix 4:

# Simulation 1—Increased Turnout under Existing Conditions

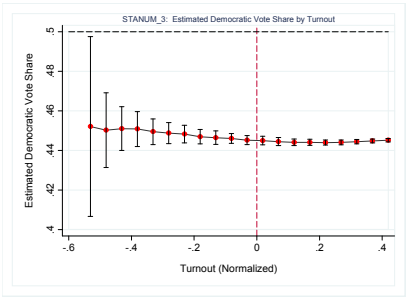
## Alabama




## Alaska

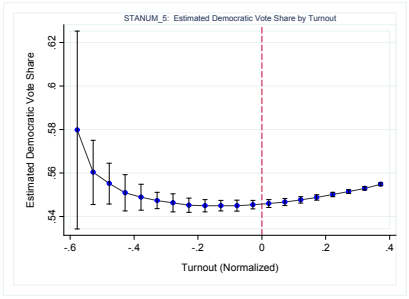



## Arizona

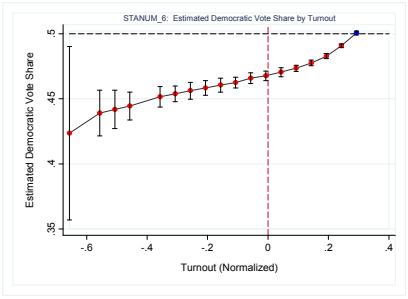



## Arkansas

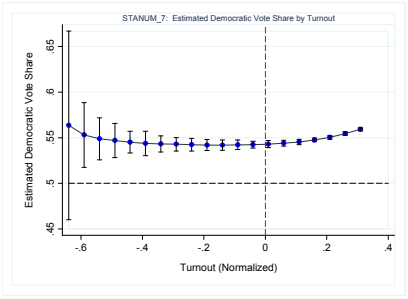
## California



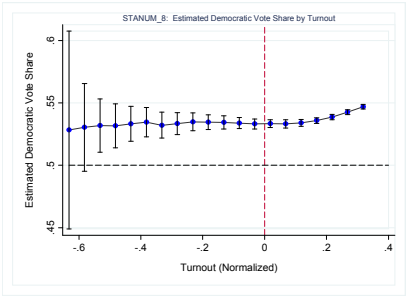

## Colorado



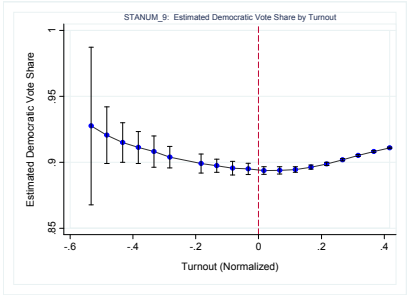

## Connecticut



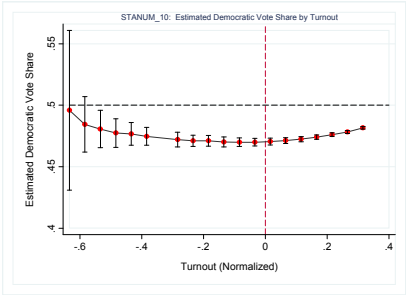

## Delaware



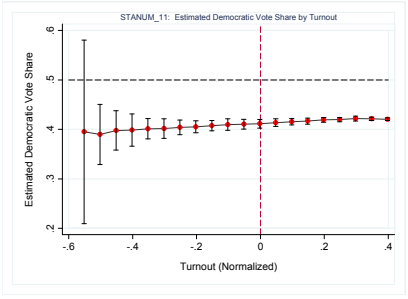

## D.C.



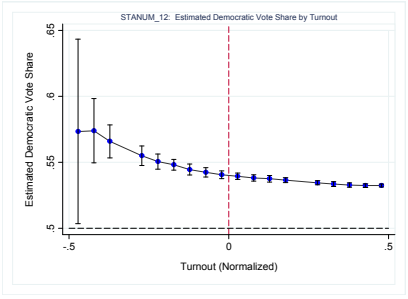

## Florida



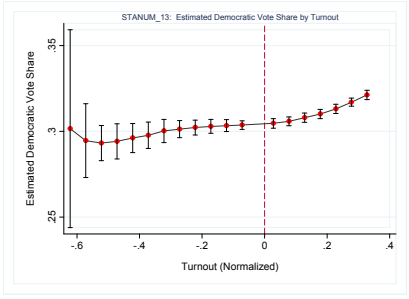

## Georgia



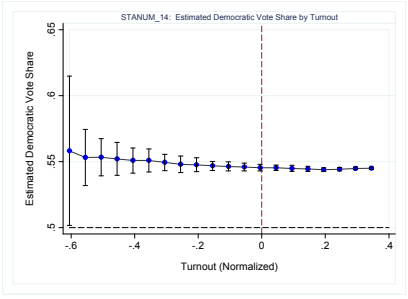

## Hawaii



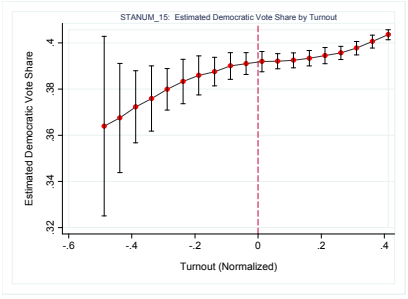

## Idaho



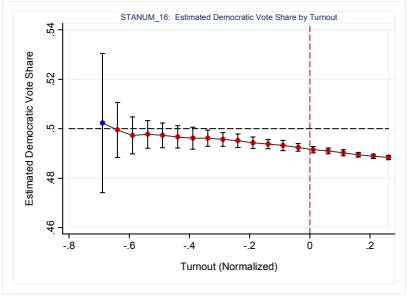

## Illinois




## Indiana




## Iowa



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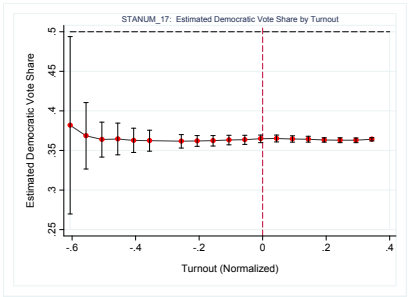
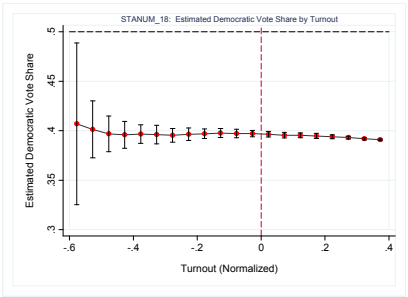



## Kentucky

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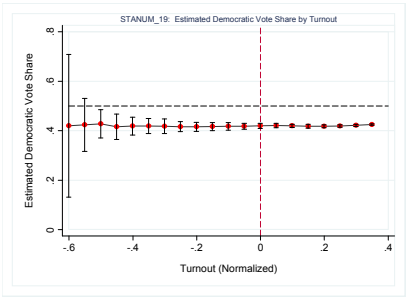
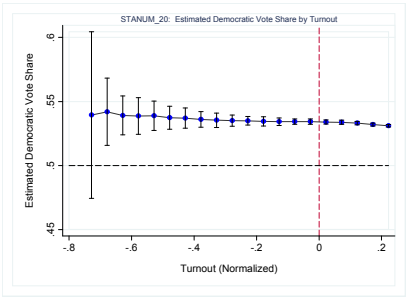
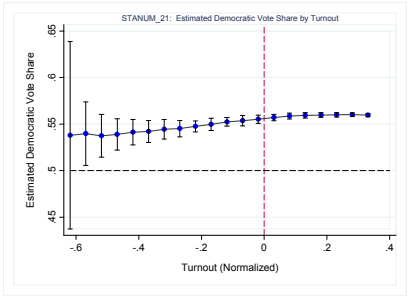



## Maine




## Maryland

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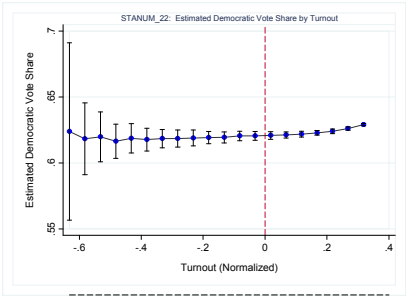


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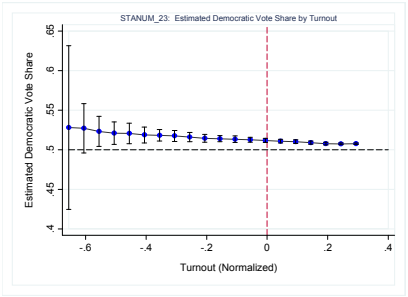
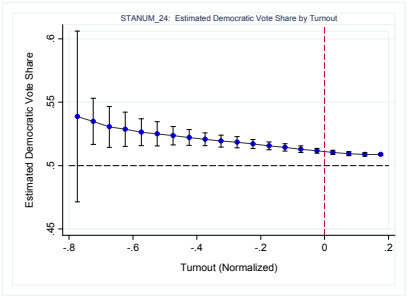



## Minnesota

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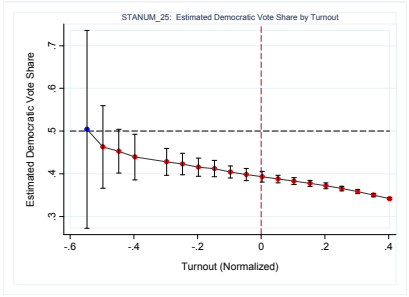


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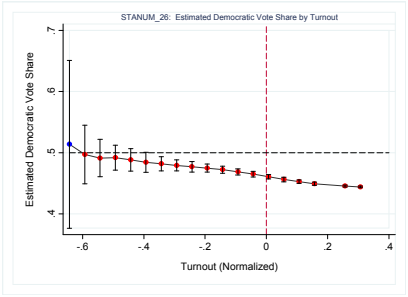


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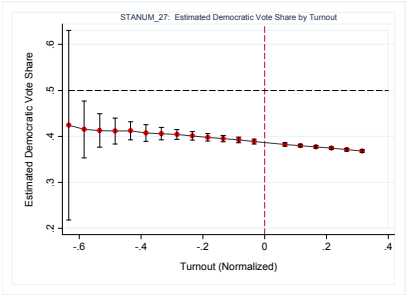
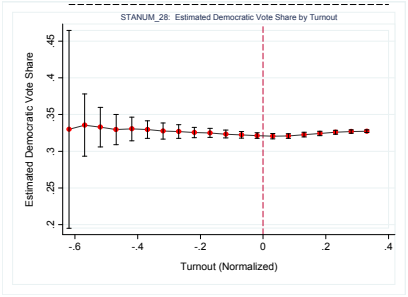
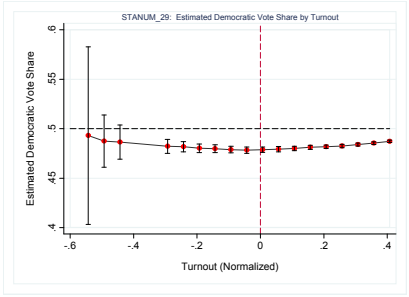


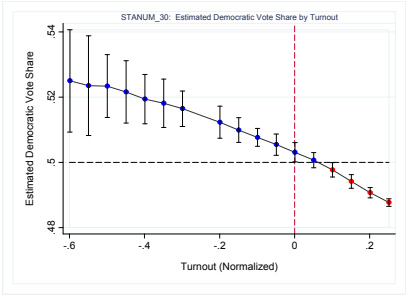

## Nebraska




## Nevada




## New Hampshire

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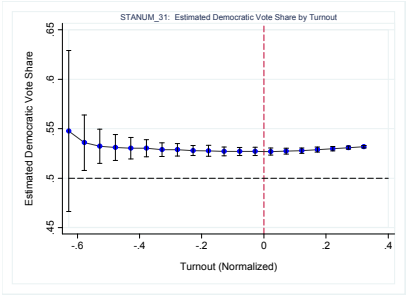


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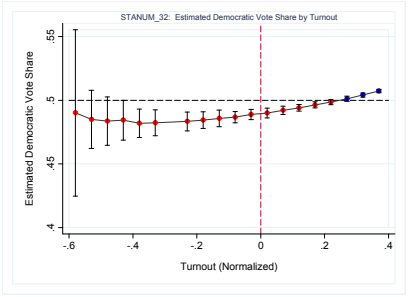
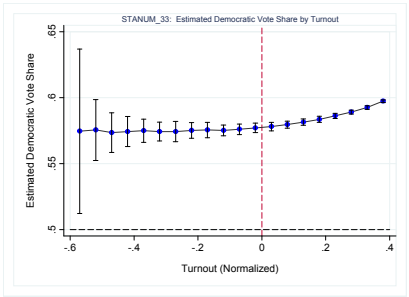


## New York

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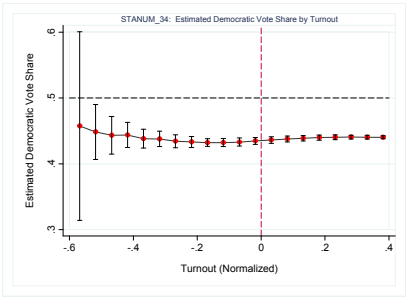


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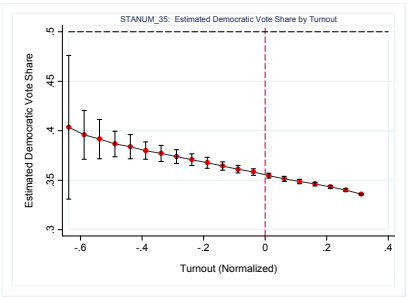
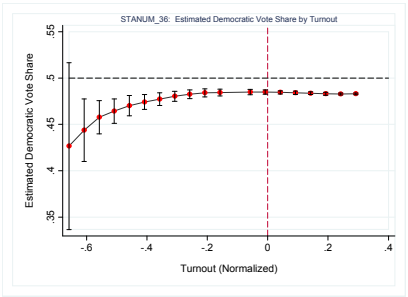



## Ohio

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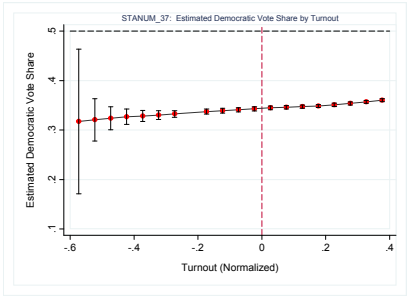


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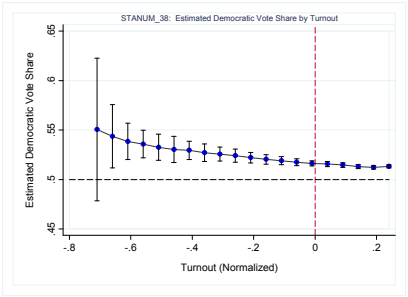
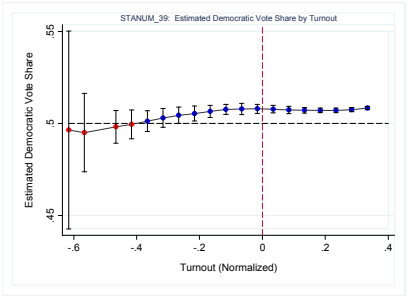
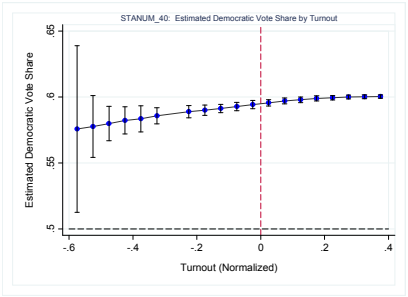


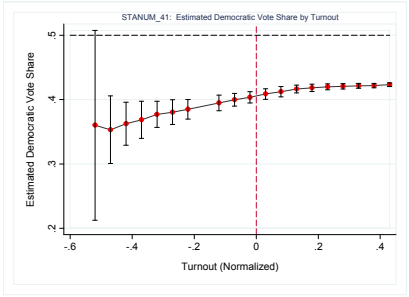

## Pennsylvania




## Rhode Island




## South Carolina

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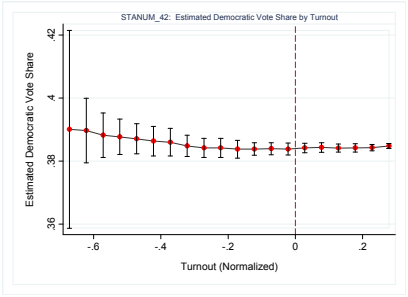
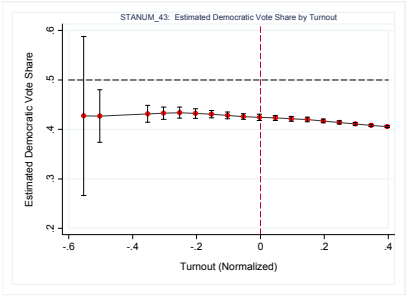



## Tennessee

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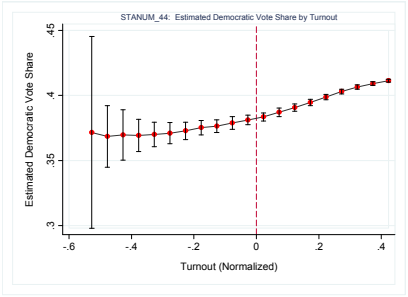
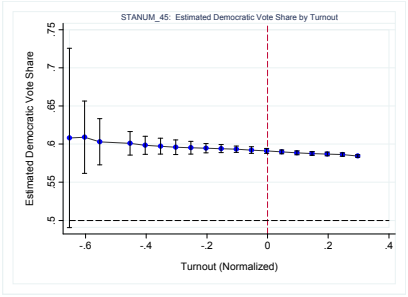
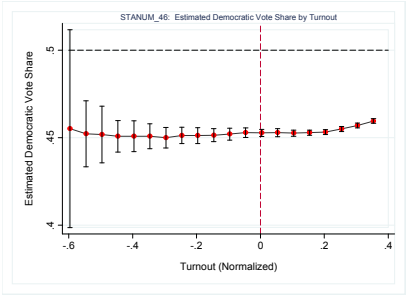



## Utah

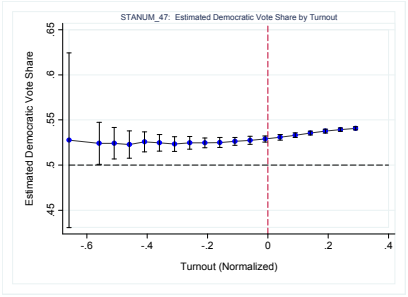
## Vermont



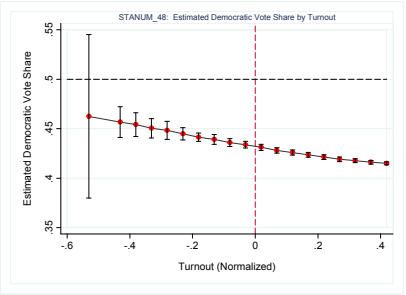

## Virginia



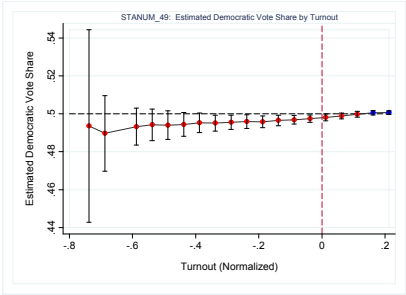

## Washington



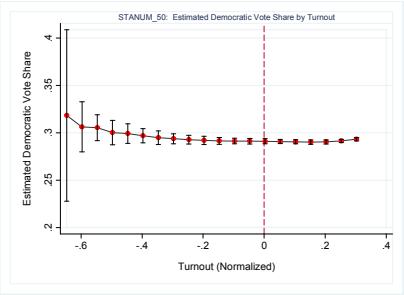
## West Virginia




## Wisconsin



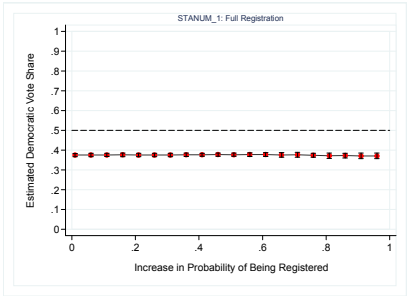

## Wyoming



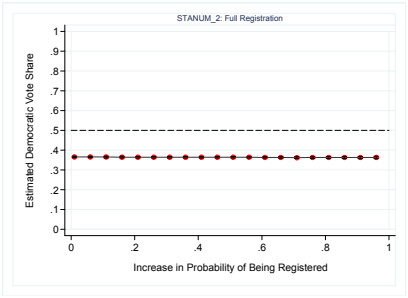
# Appendix 5:

# Simulation 2—Increased Registration Distributed across All Voters

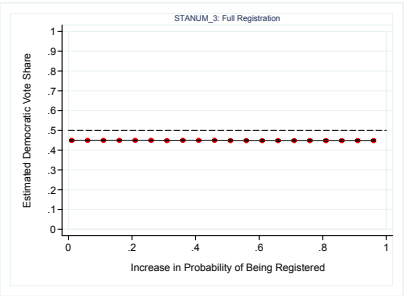
ALABAMA



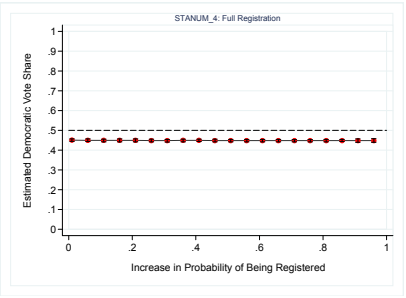

ALASKA



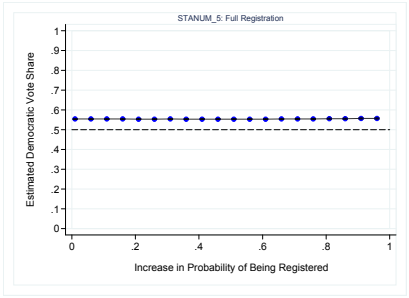

ARIZONA



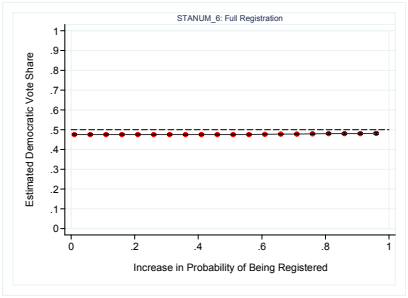

ARKANSAS



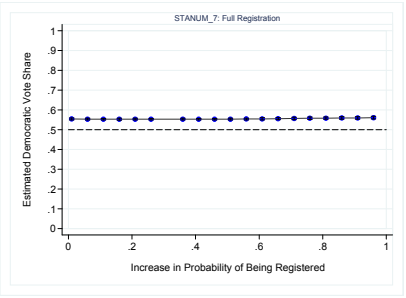

CALIFORNIA



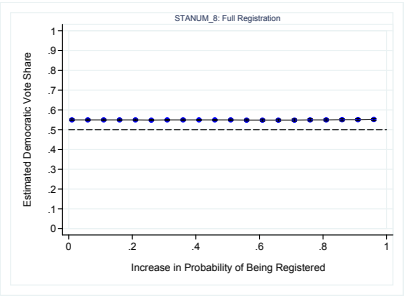

COLORADO



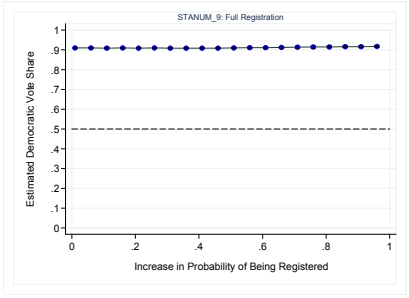

CONNECTICUT



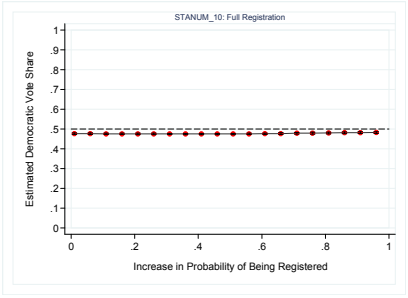

DELAWARE



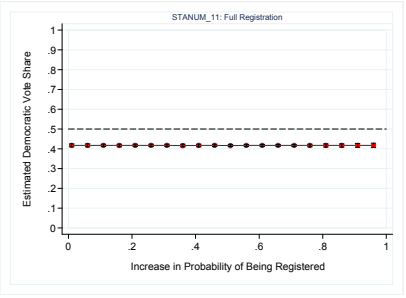

D.C.



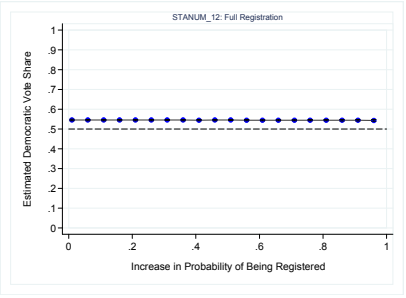

FLORIDA



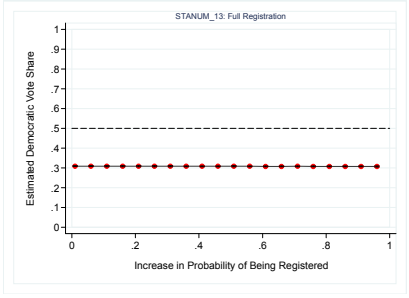

GEORGIA



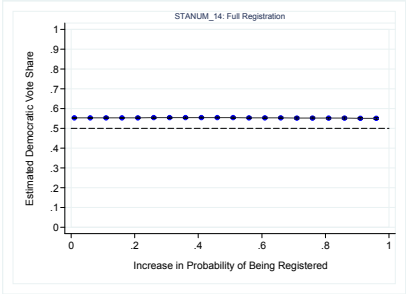

HAWAII



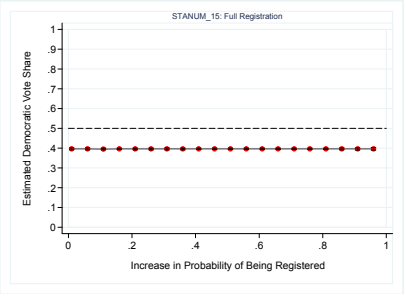

IDAHO



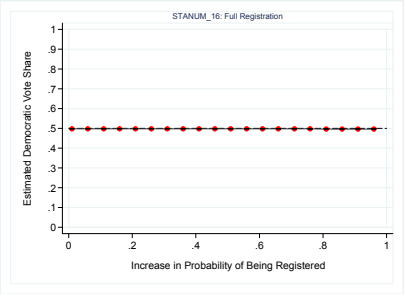

ILLINOIS



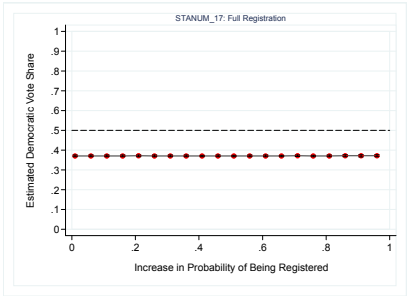

INDIANA



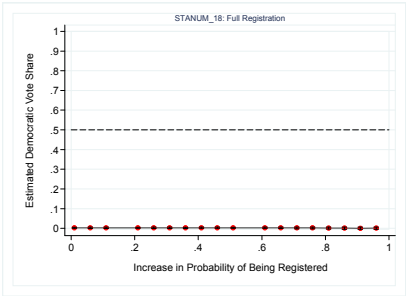

IOWA



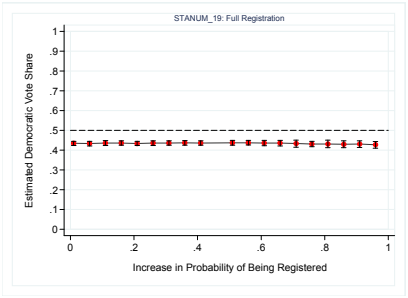
KANSAS



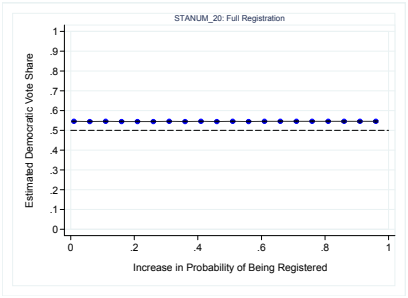

KENTUCKY



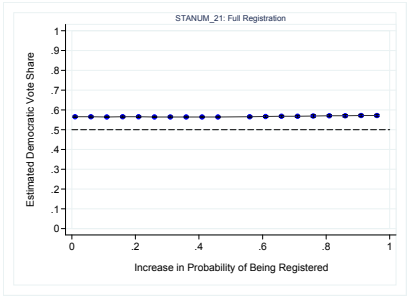

LOUISIANA



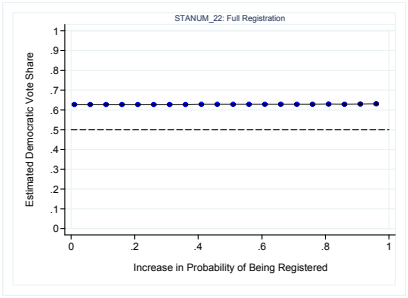

MAINE



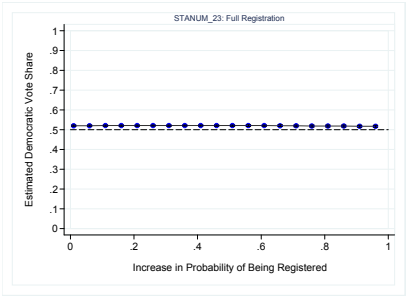

MARYLAND



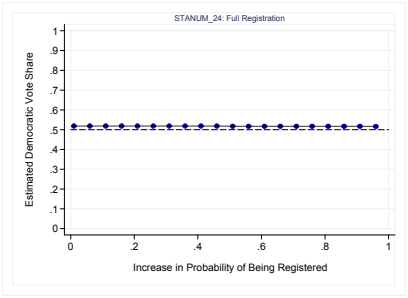

MASSACHUSETTS



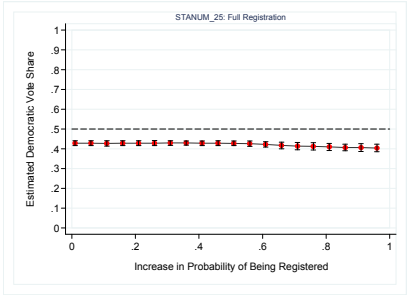

MICHIGAN



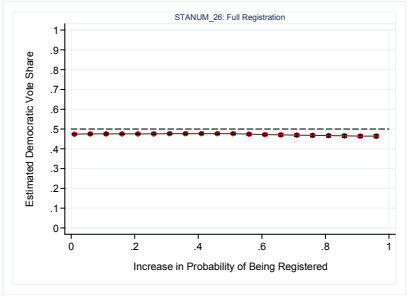

MINNESOTA



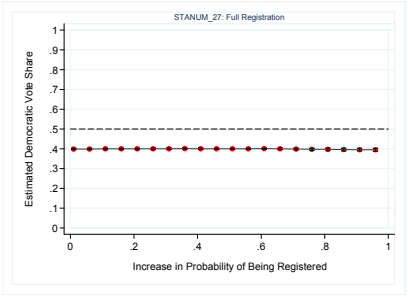

MISSISSIPPI



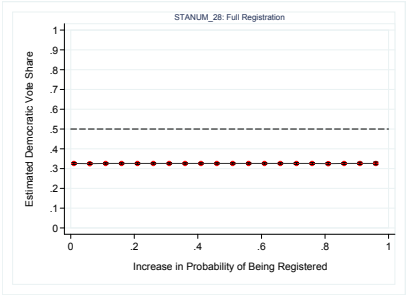

MISSOURI



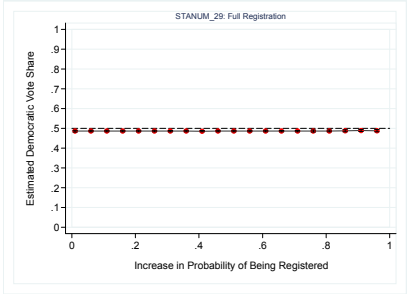

MONTANA



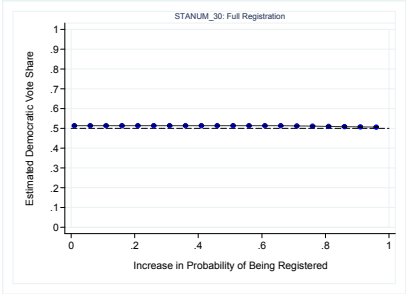

NEBRASKA




NEVADA




NEW HAMPSHIRE

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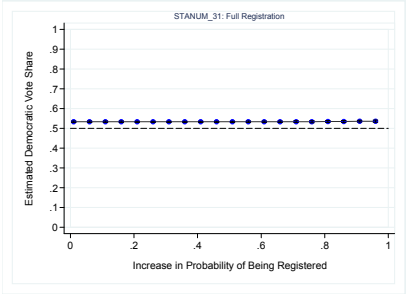


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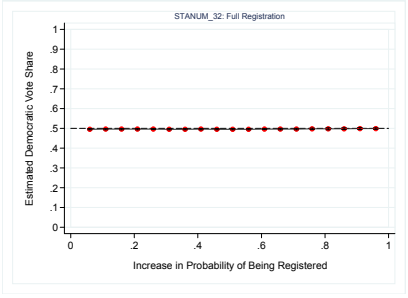
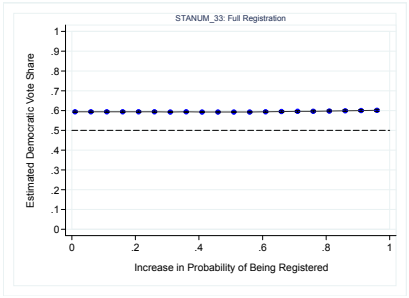
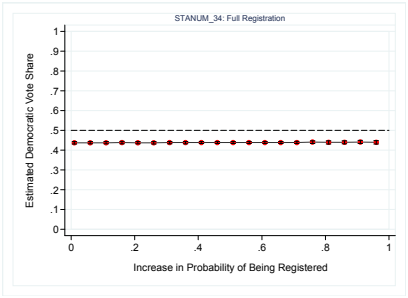


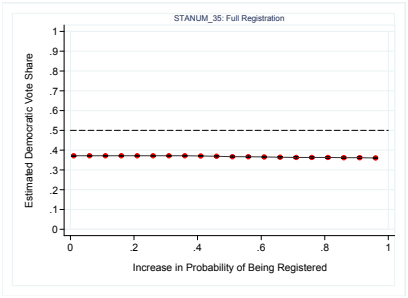
NEW YORK




NORTH CAROLINA




NORTH DAKOTA

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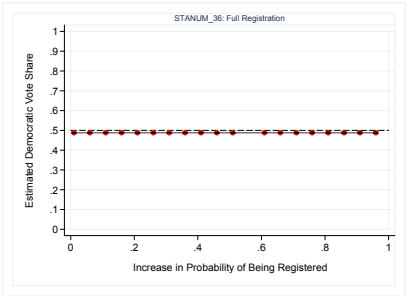


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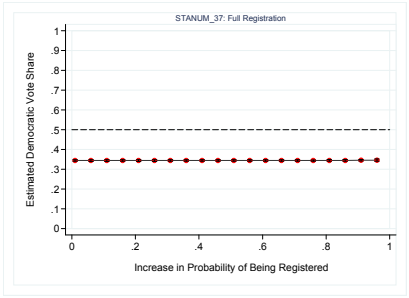


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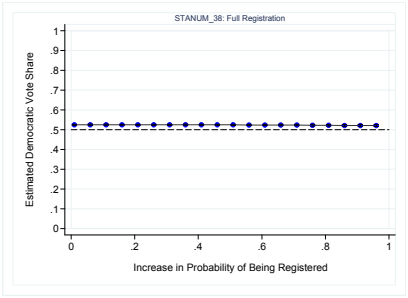


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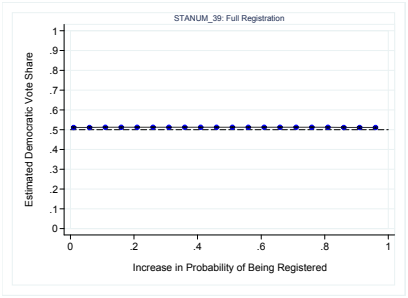


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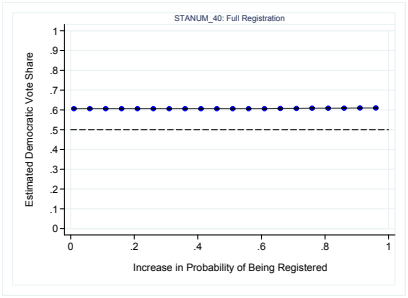


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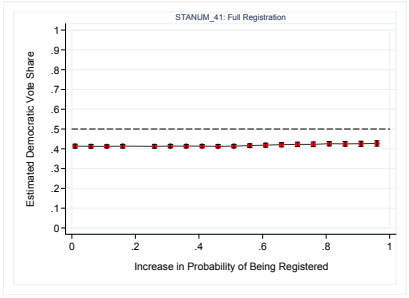


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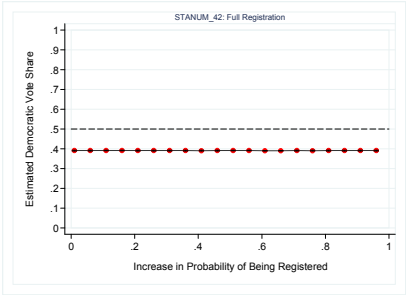


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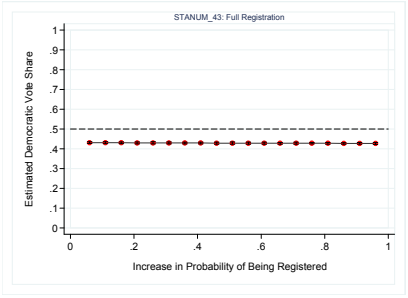


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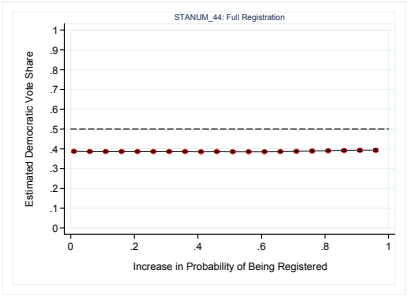


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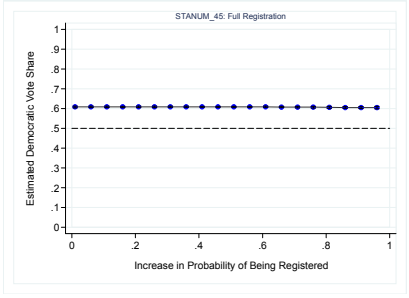
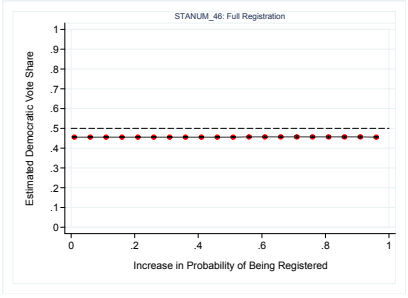



VIRGINIA

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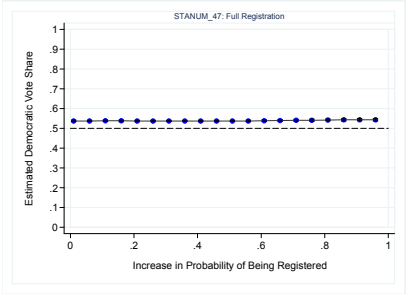


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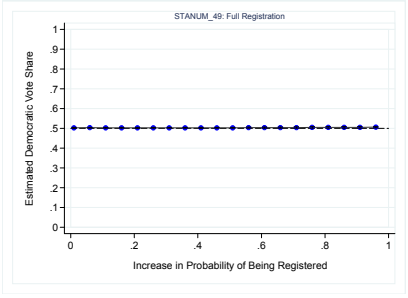

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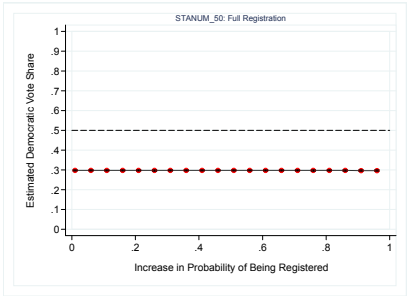


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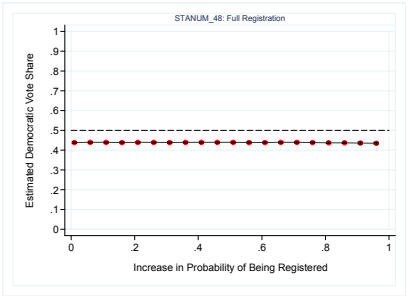

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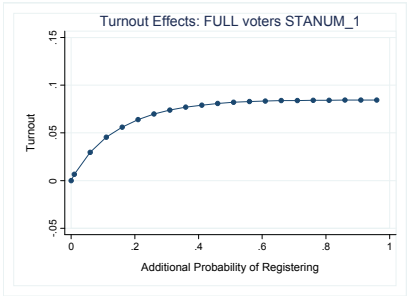


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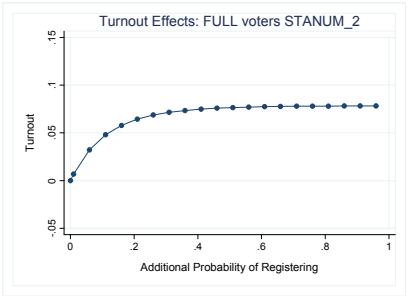


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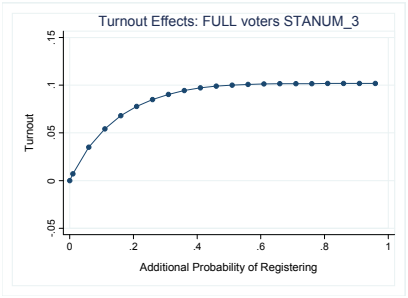


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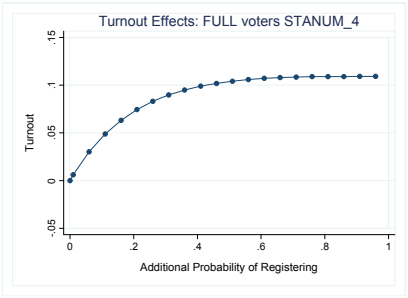


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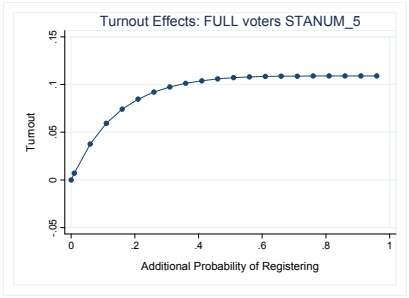


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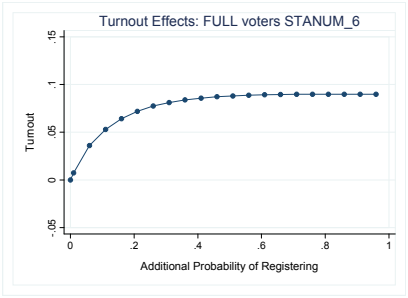


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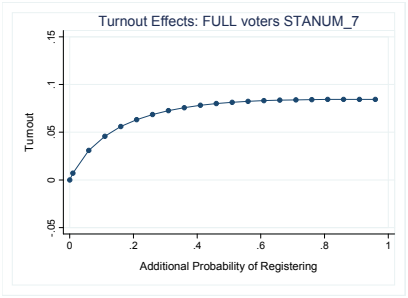


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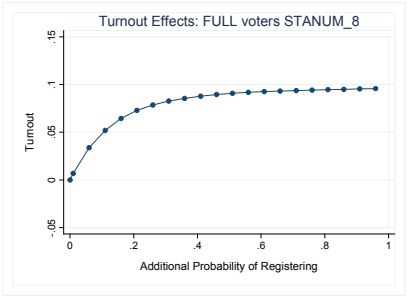
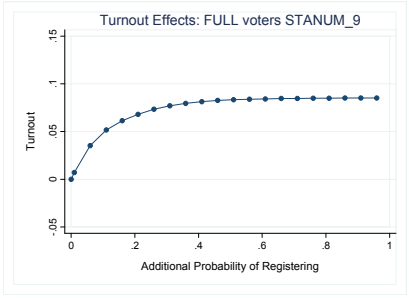



D.C.

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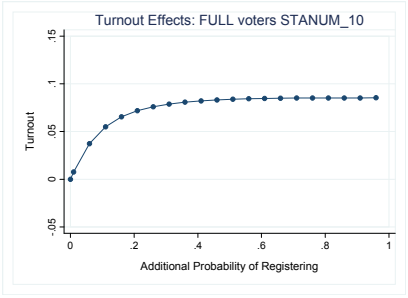


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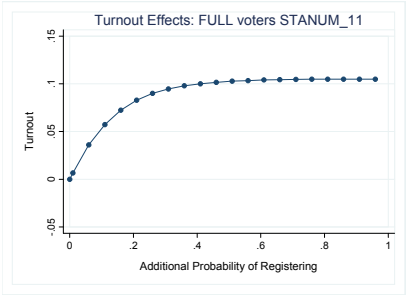


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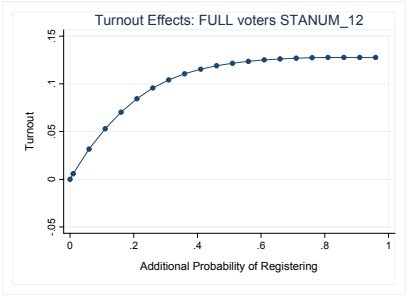


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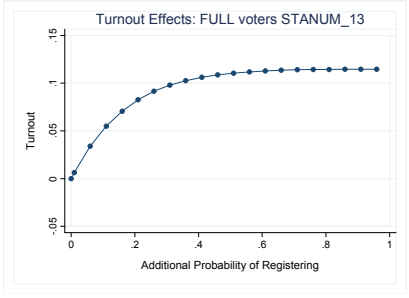


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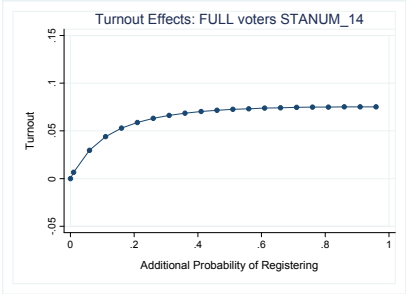


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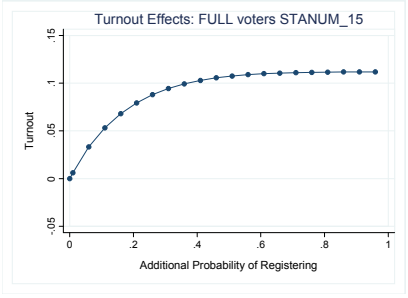


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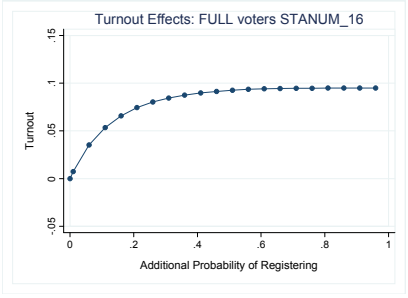

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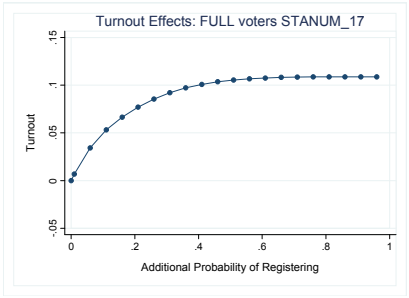


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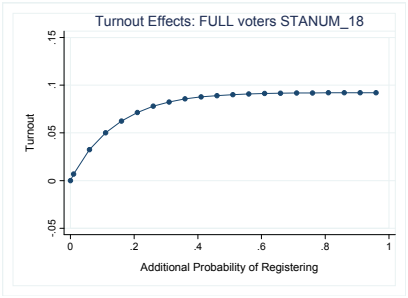


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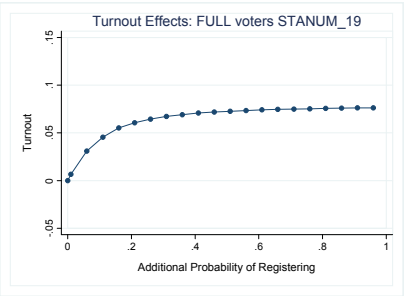


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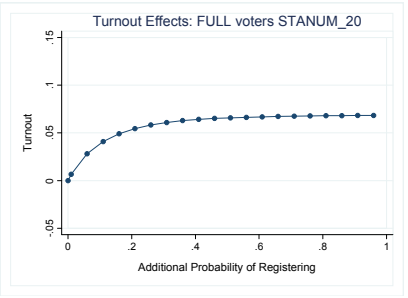


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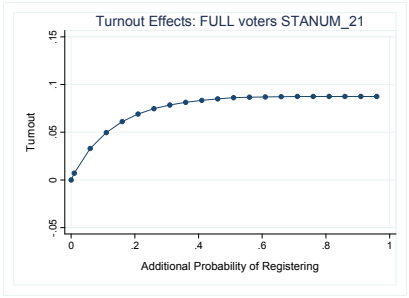


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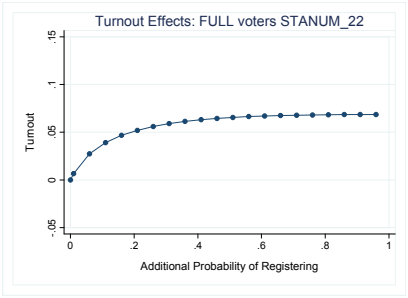


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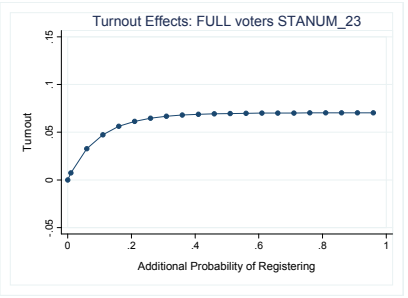


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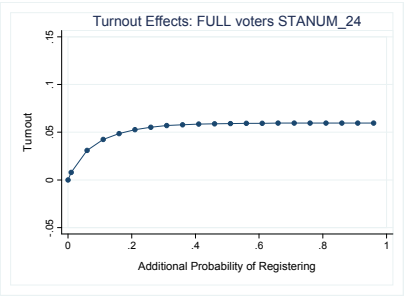


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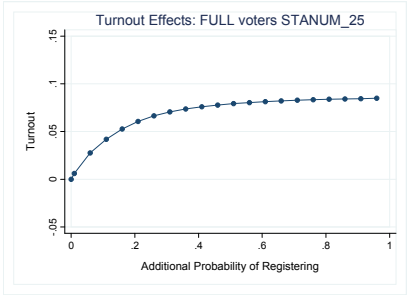


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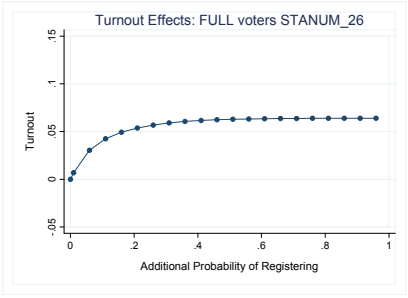


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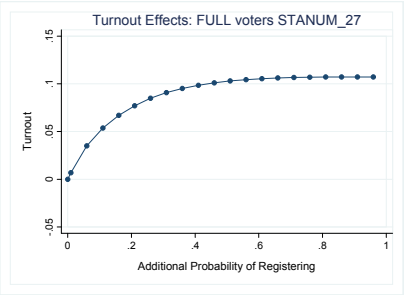


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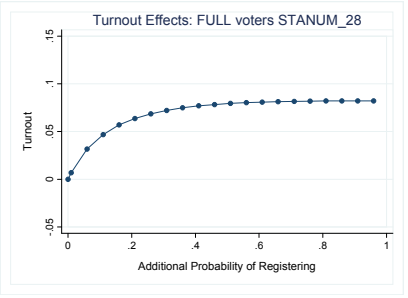


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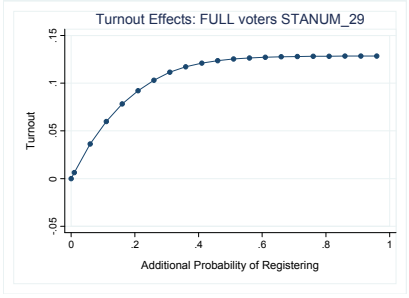
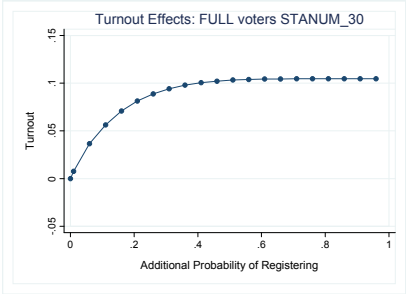
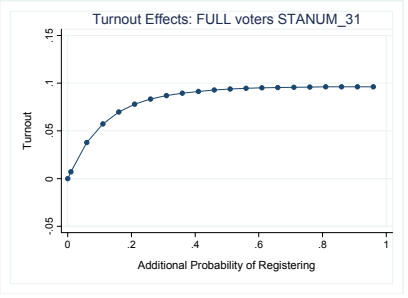


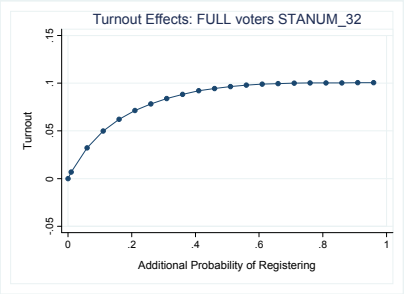

NEW HAMPSHIRE



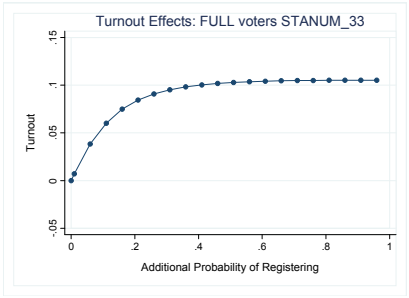

NEW JERSEY



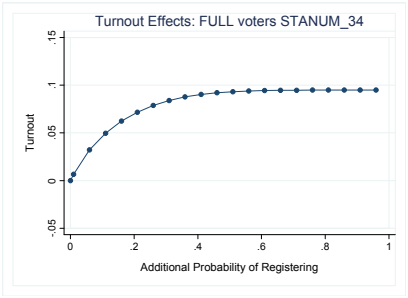

NEW MEXICO



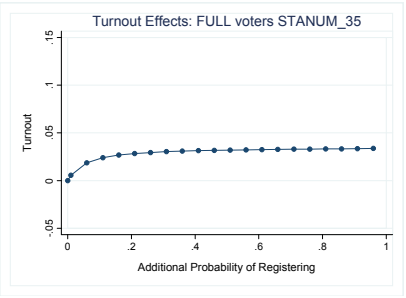
NEW YORK



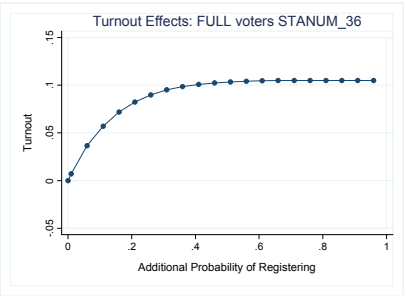

NORTH CAROLINA



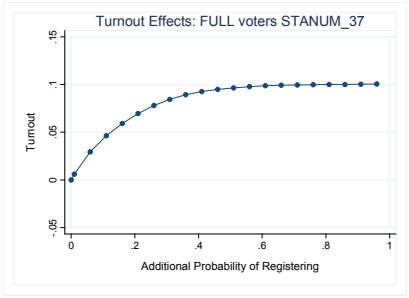

NORTH DAKOTA



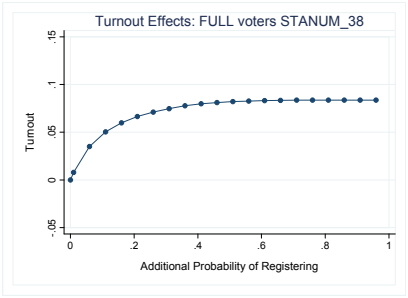

OHIO



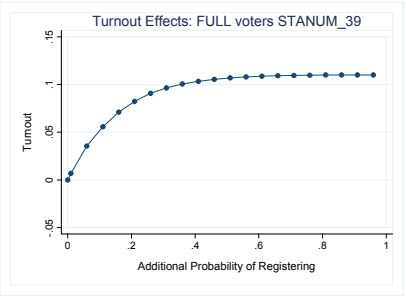

OKLAHOMA



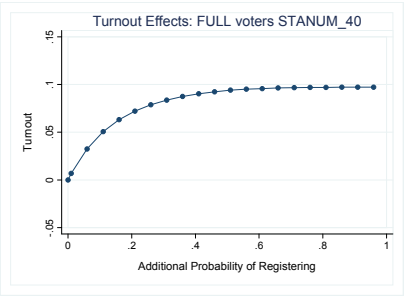

OREGON



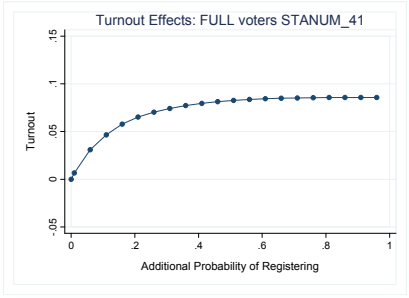

PENNSYLVANIA



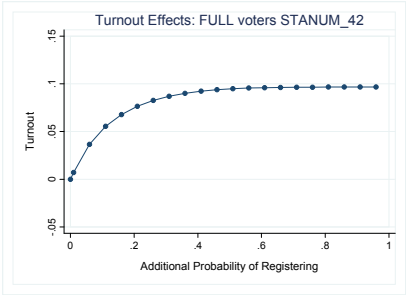

RHODE ISLAND



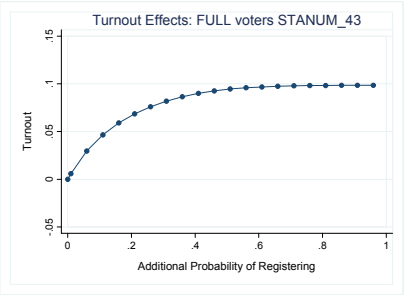

SOUTH CAROLINA



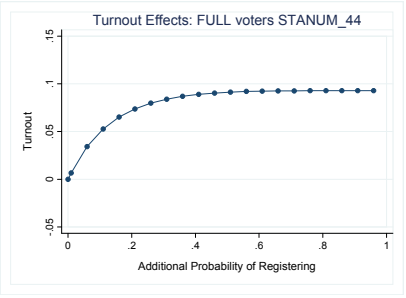

SOUTH DAKOTA




TENNESSEE




TEXAS

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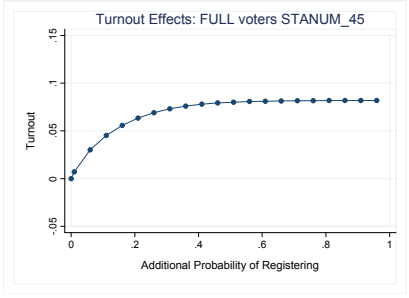
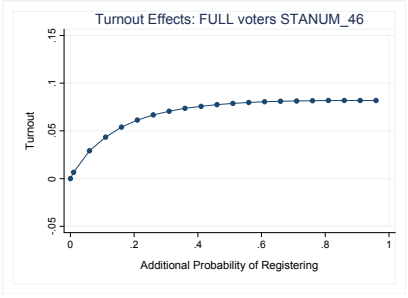
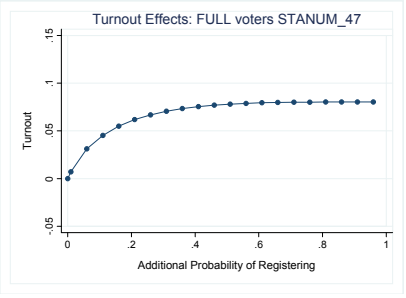


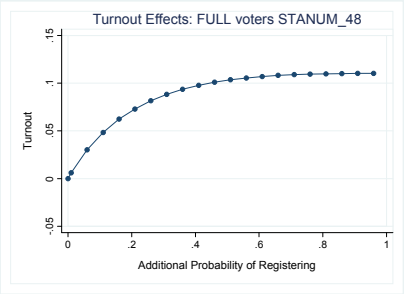

VIRGINIA



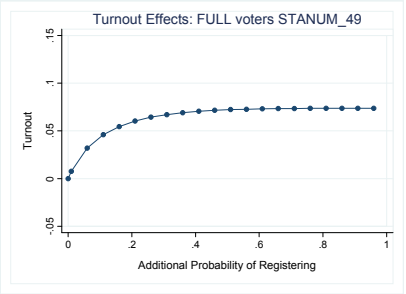

WASHINGTON



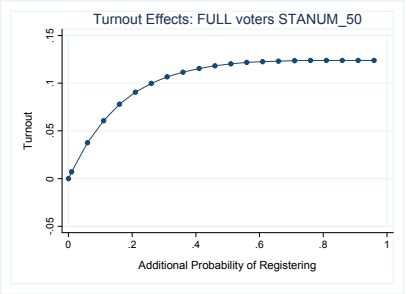

WEST VIRGINIA



WISCONSIN



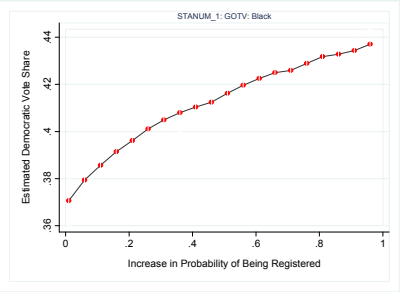

WYOMING



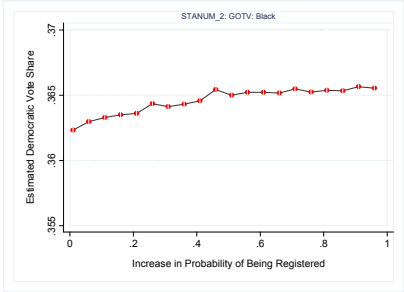
# Appendix 6:

# Simulation 3—Registering Black Voters

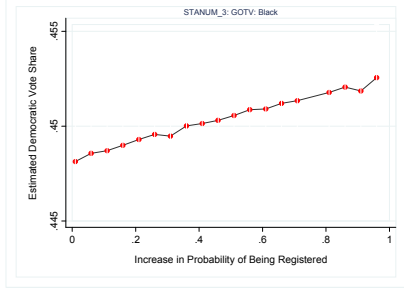
ALABAMA



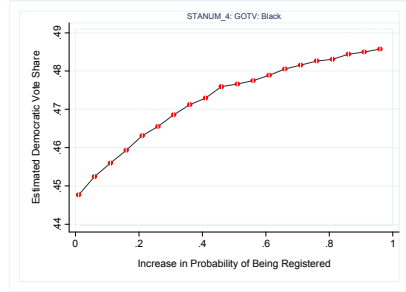

ALASKA



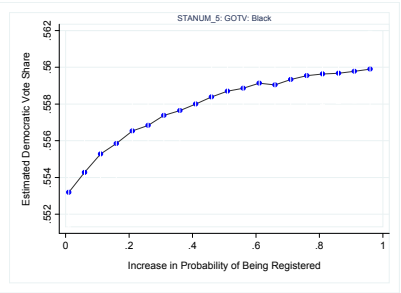

ARIZONA



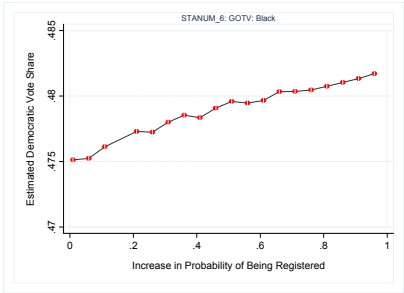

ARKANSAS



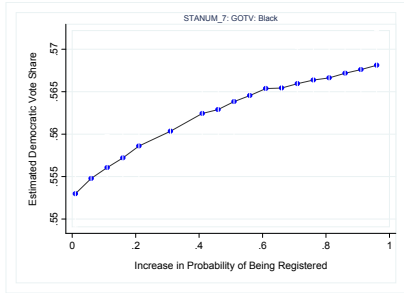

CALIFORNIA



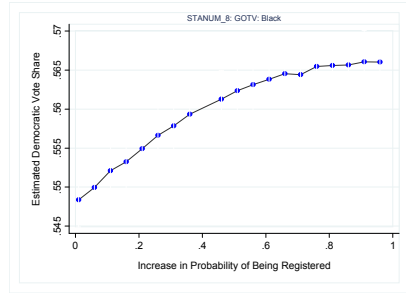

COLORADO



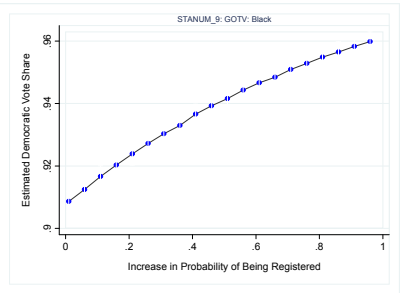

CONNECTICUT



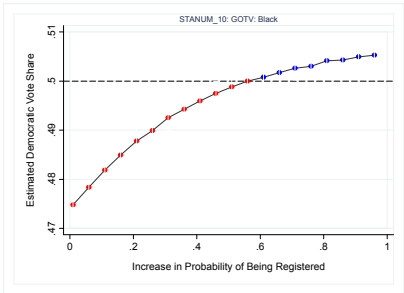

DELAWARE



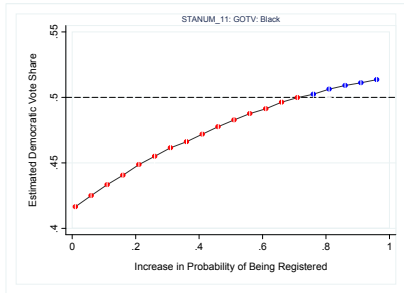

D.C.



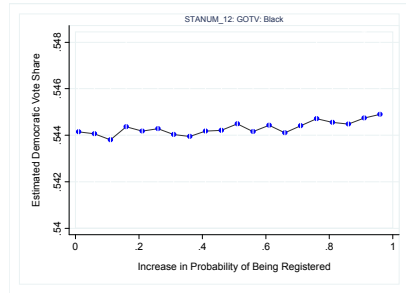

FLORIDA



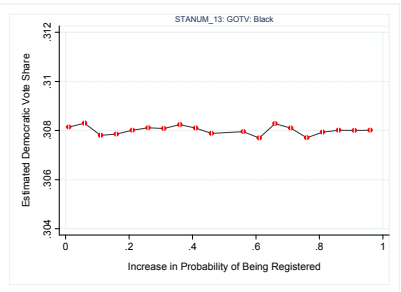

GEORGIA



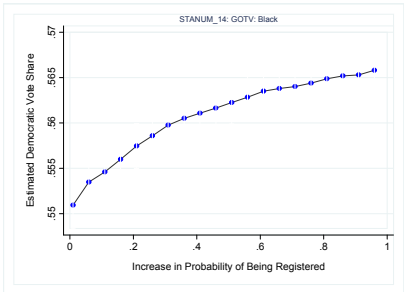

HAWAII



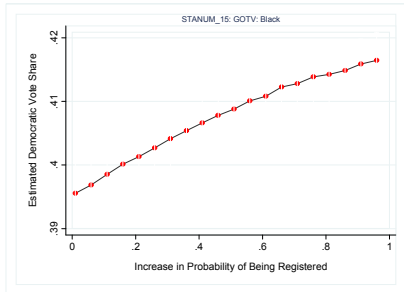

IDAHO



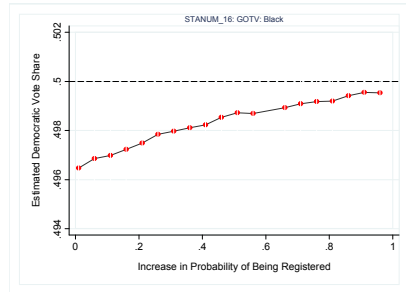

ILLINOIS



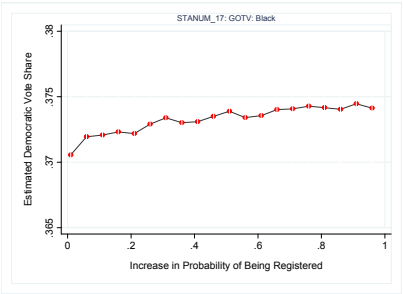

INDIANA



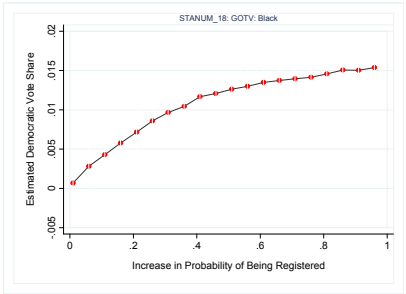

IOWA



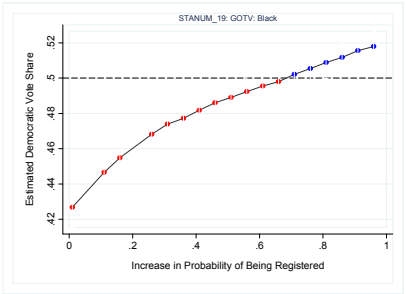
KANSAS




KENTUCKY




LOUISIANA

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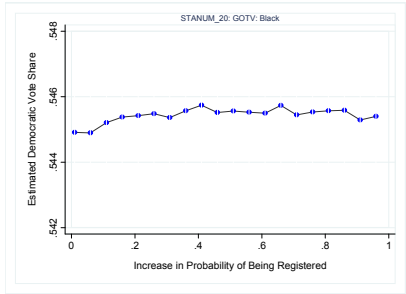
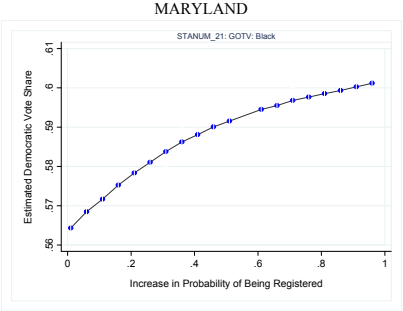



MARYLAND

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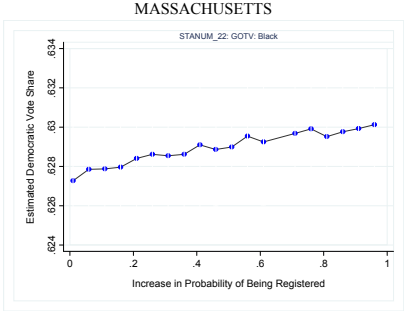


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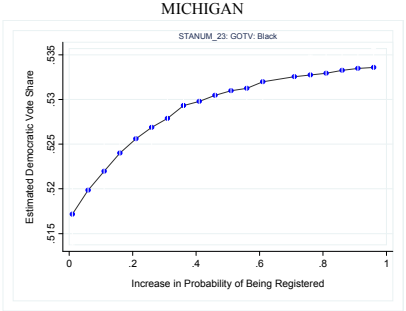


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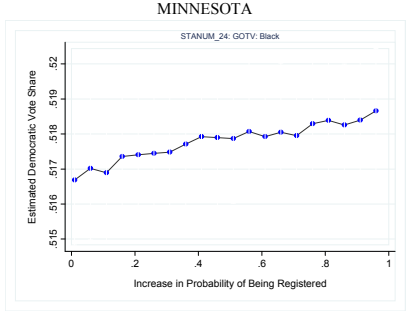


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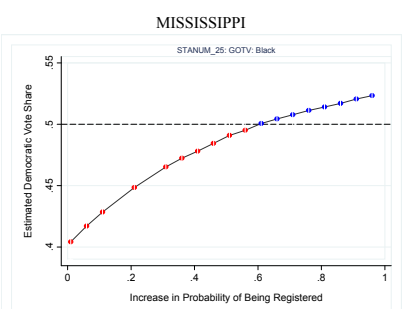


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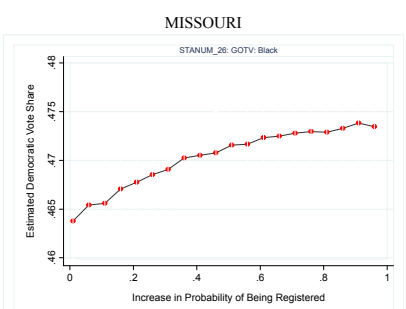


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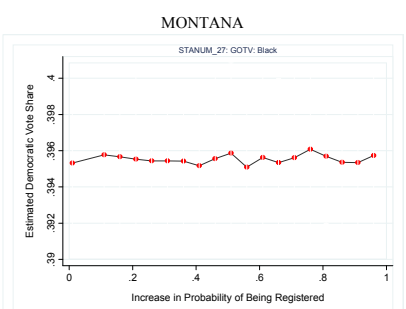


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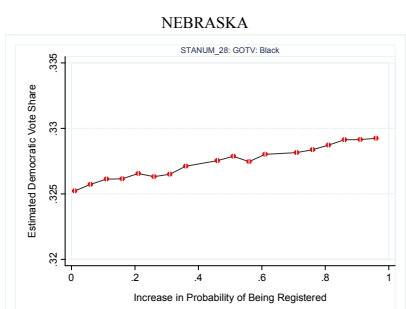


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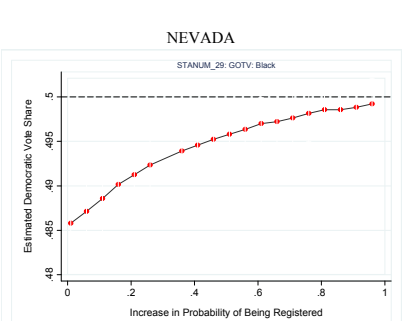


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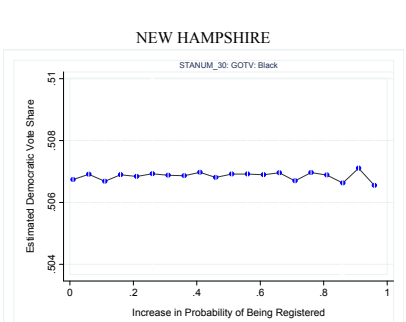


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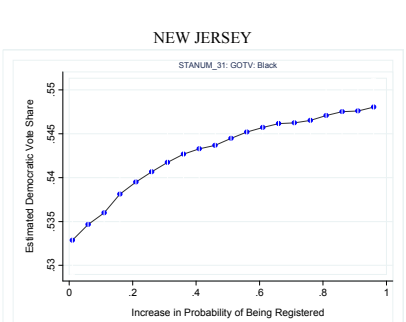


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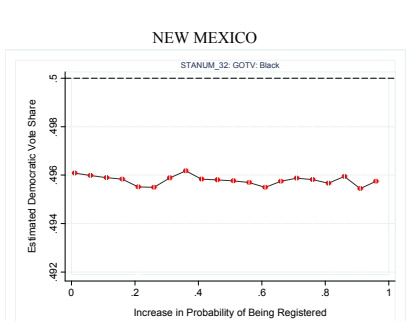

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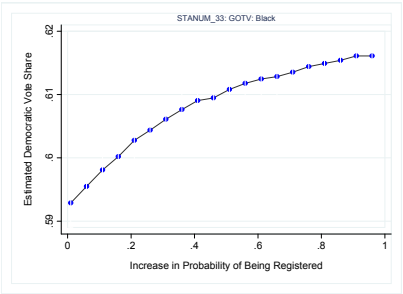


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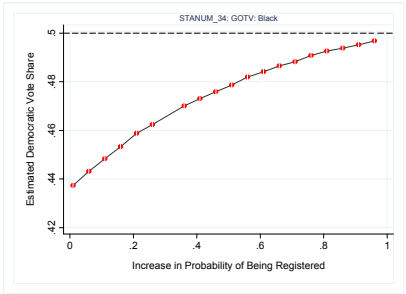


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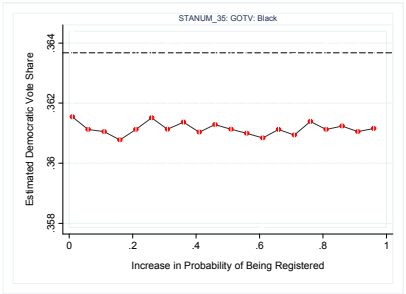


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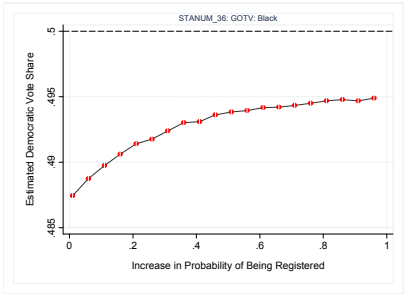


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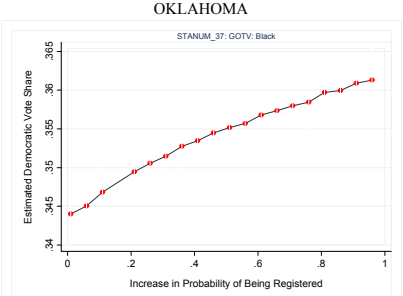


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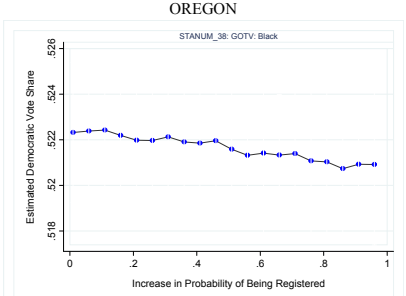
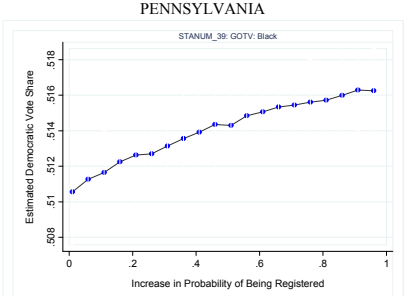
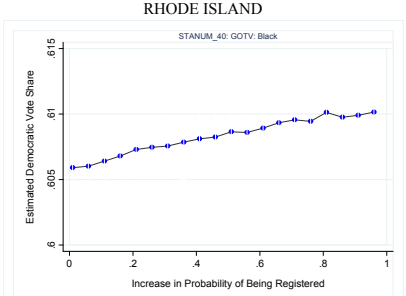


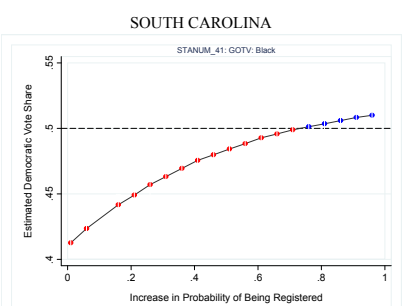

PENNSYLVANIA



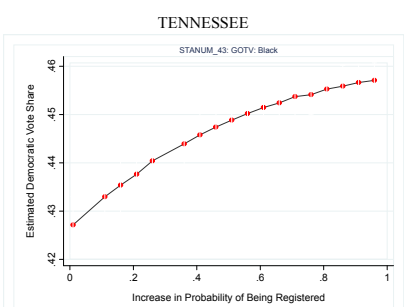

RHODE ISLAND



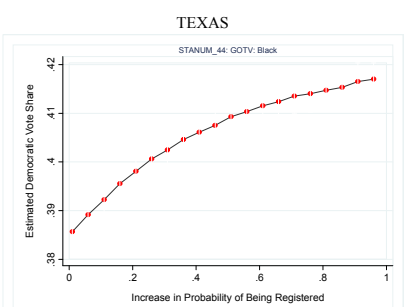

SOUTH CAROLINA



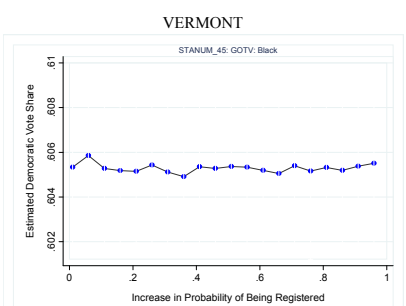

TENNESSEE



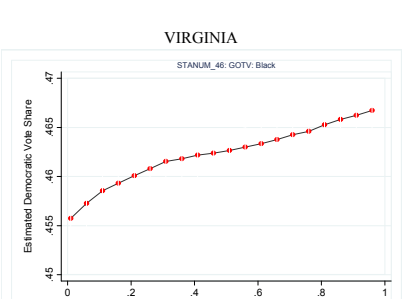

TEXAS



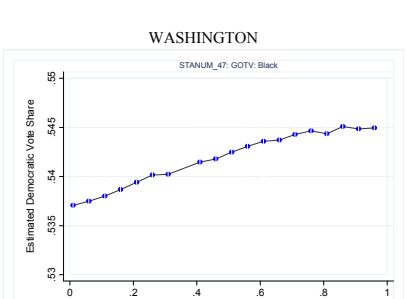

VERMONT



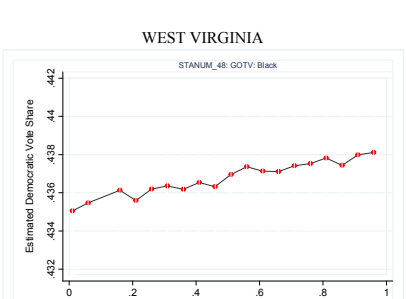

VIRGINIA



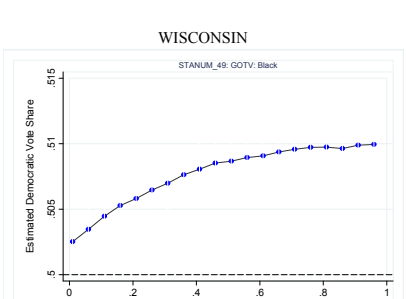

WASHINGTON




WEST VIRGINIA




WISCONSIN



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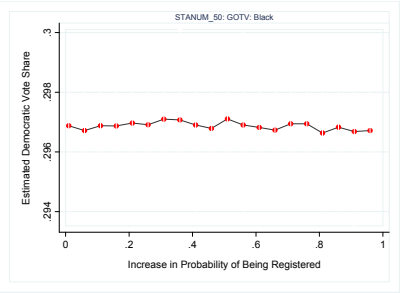
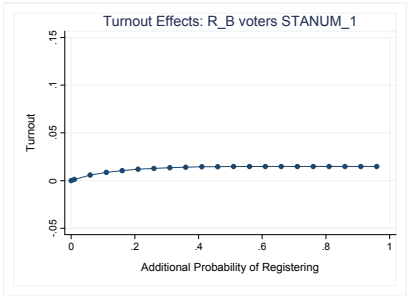
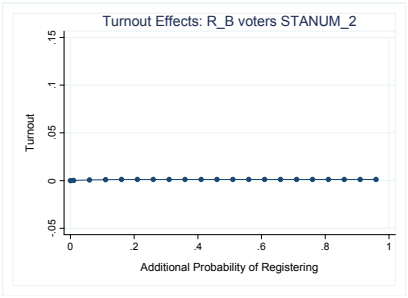

STANUM_50: GOTV: Black
Estimated Democratic Vote Share
.294
.296
.298
.3
0
.2
.4
.6
.8
1
Increase in Probability of Being Registered

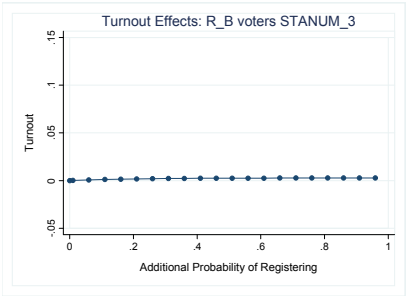
ALABAMA



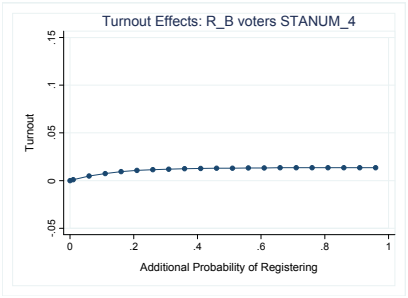

ALASKA



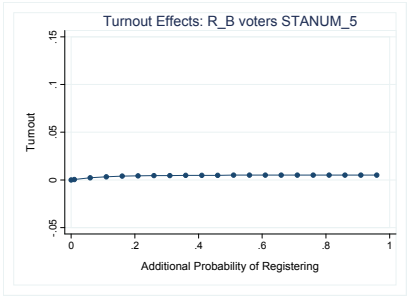

ARIZONA



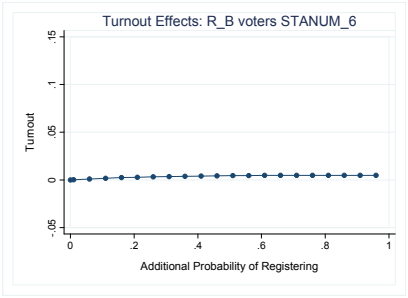

ARKANSAS



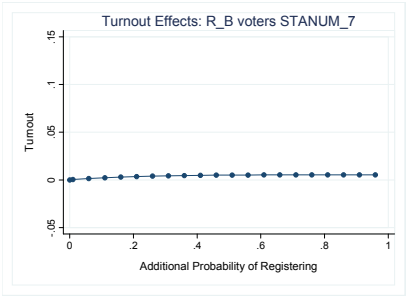

CALIFORNIA



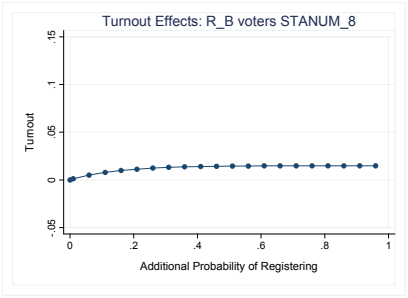

COLORADO




CONNECTICUT




DELAWARE

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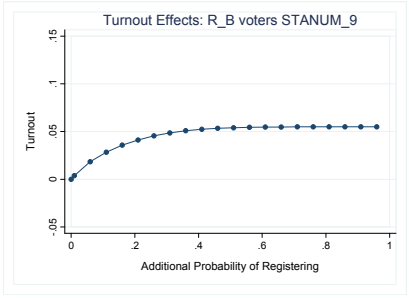


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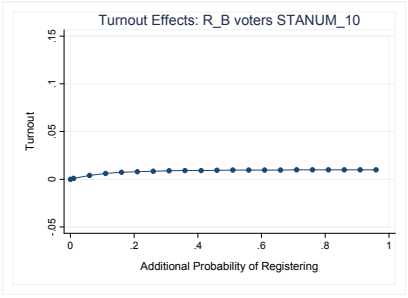


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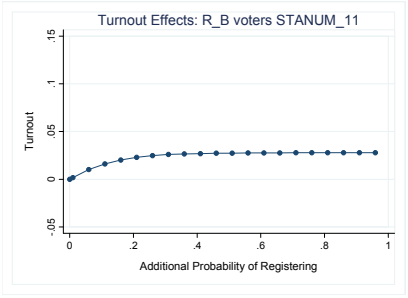


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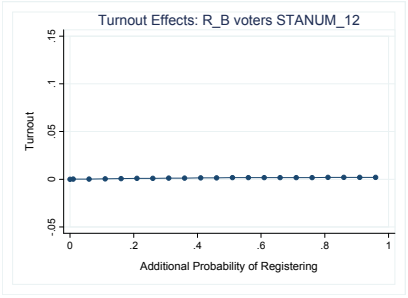


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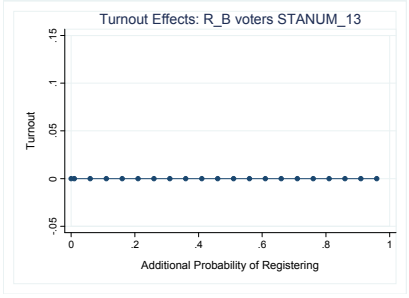


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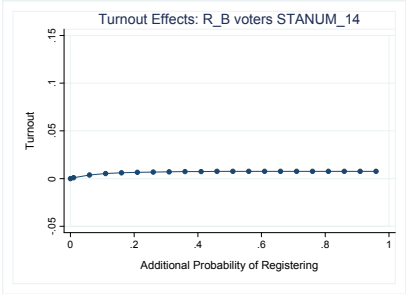


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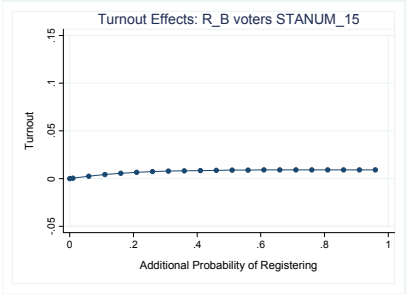


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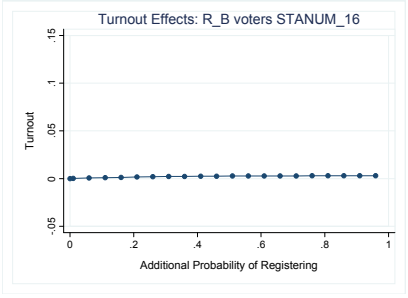

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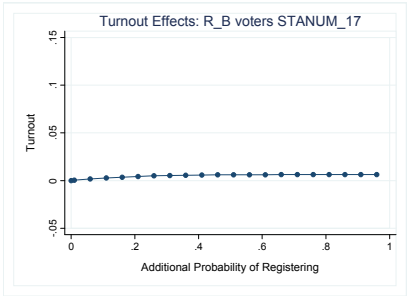


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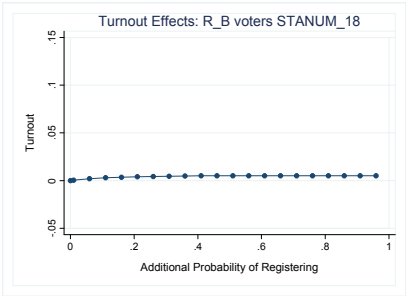


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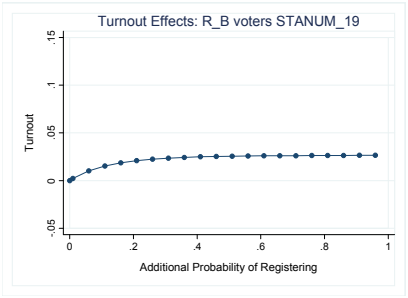


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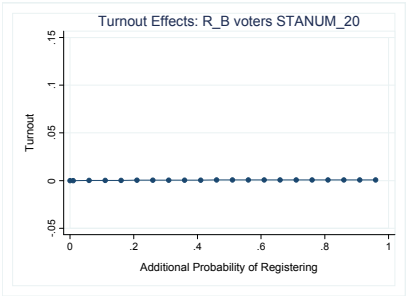


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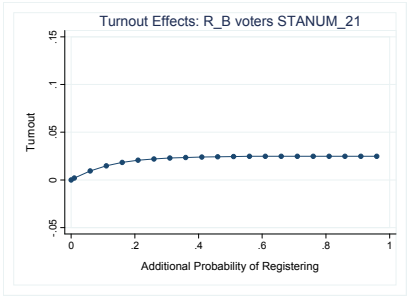


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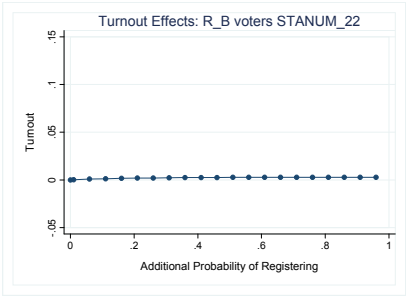


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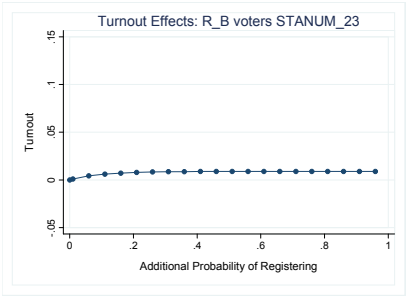


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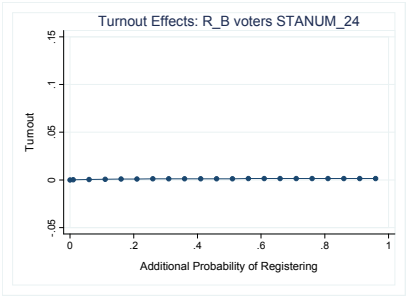


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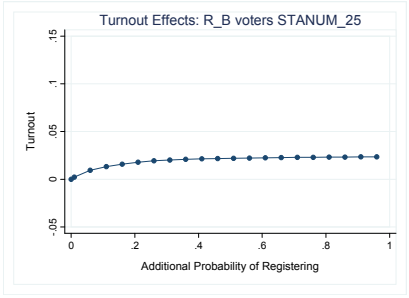


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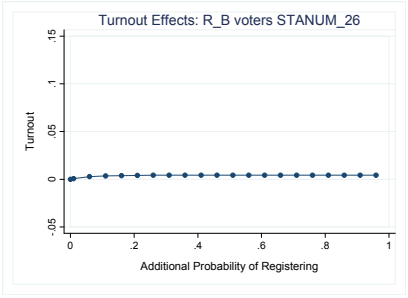


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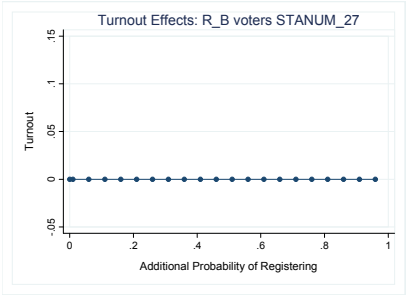


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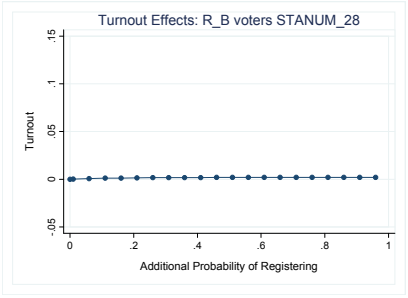


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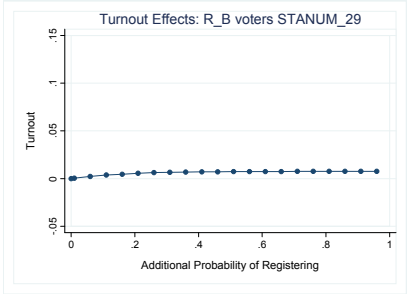


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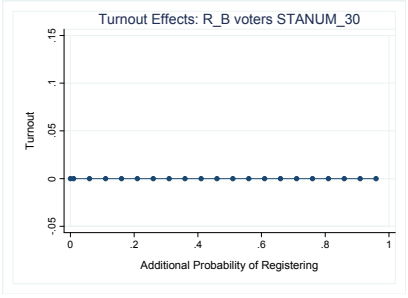


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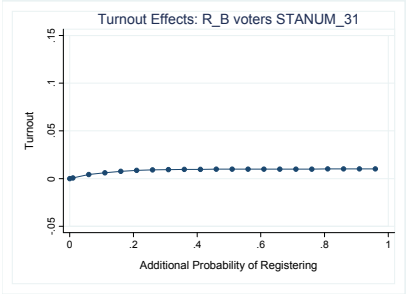


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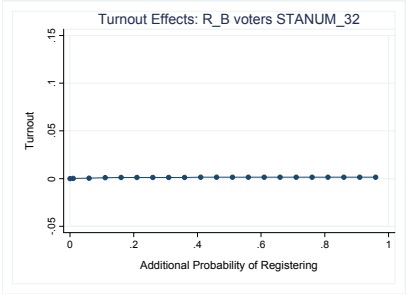

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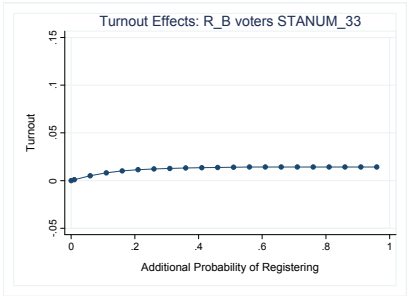


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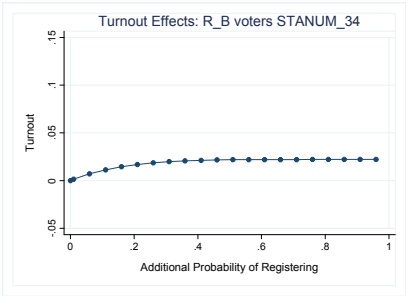


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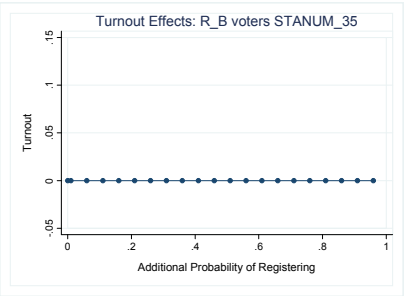


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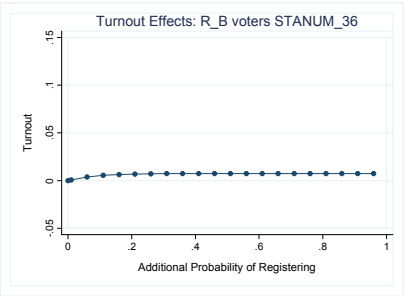


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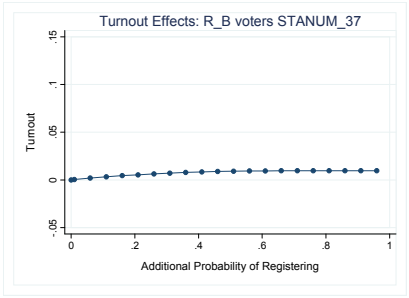


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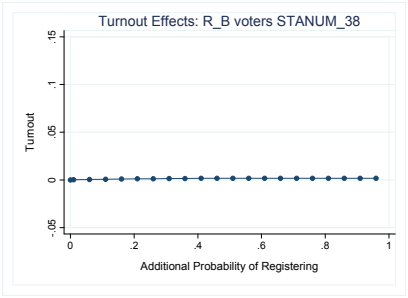


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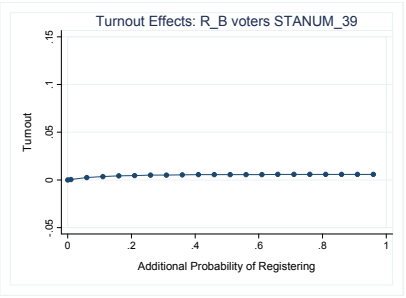
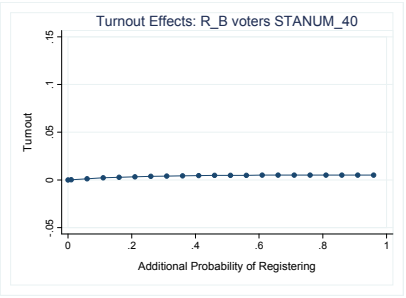



RHODE ISLAND

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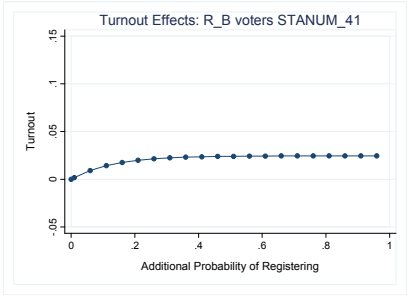
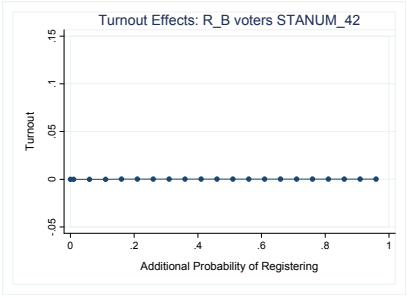



SOUTH DAKOTA

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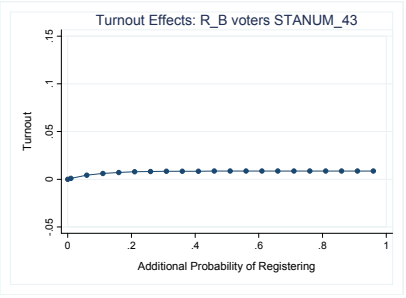


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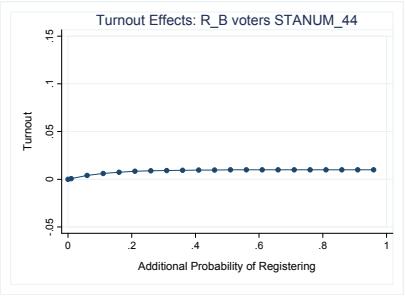


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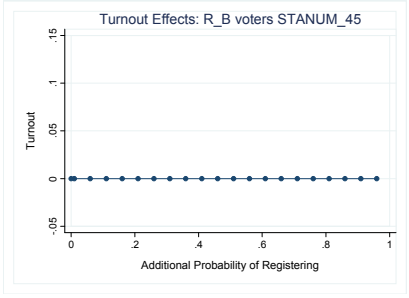


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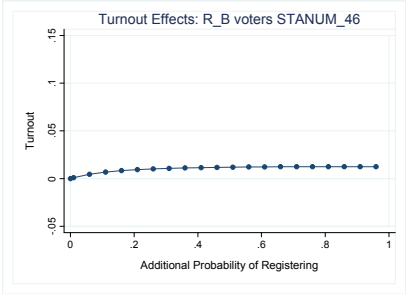
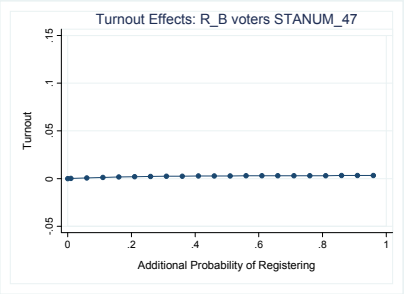
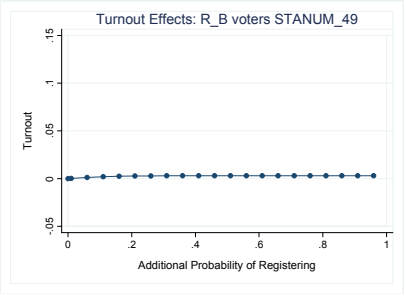



WASHINGTON




WEST VIRGINIA



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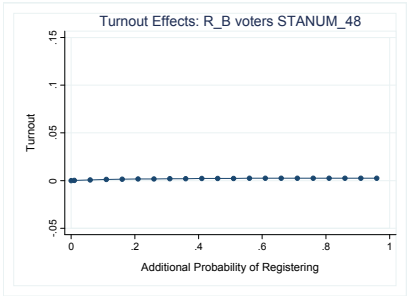
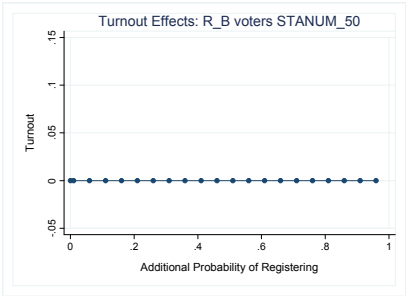


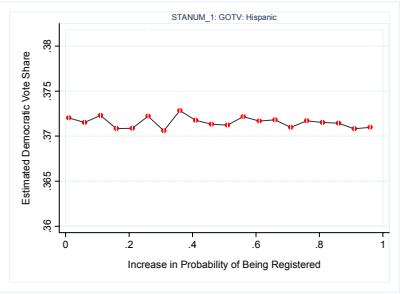

WYOMING



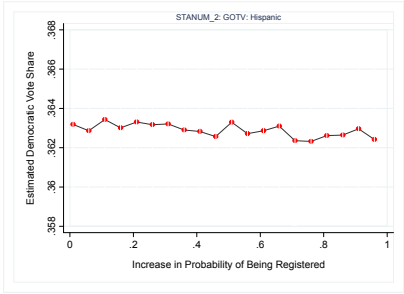
# Appendix 7:

# Simulation 4—Registering Hispanic Voters

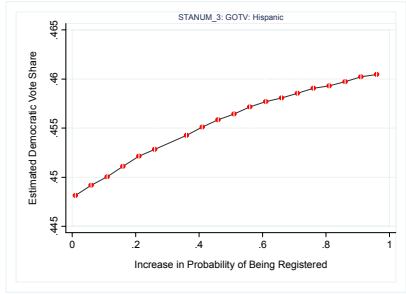
ALABAMA



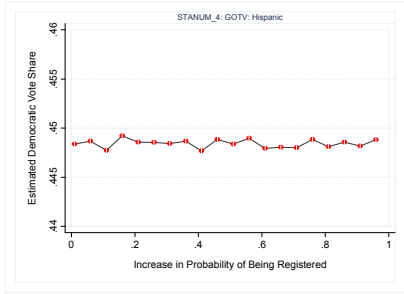

ALASKA



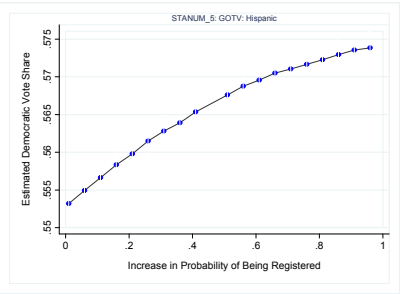

ARIZONA




ARKANSAS




CALIFORNIA

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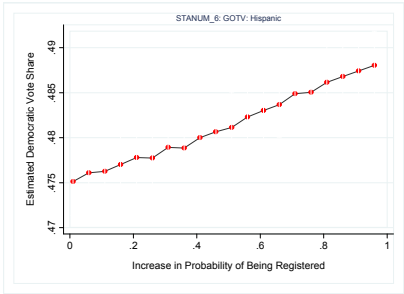
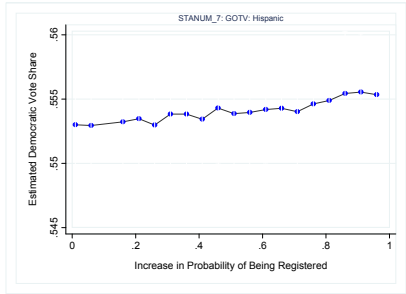
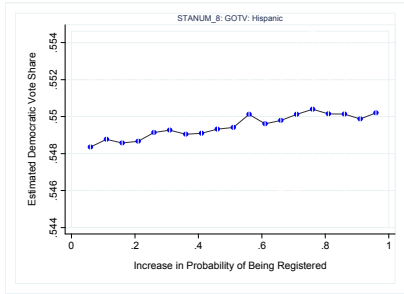


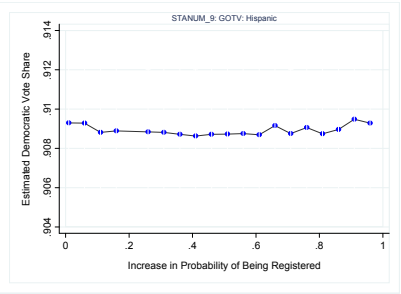

CONNECTICUT



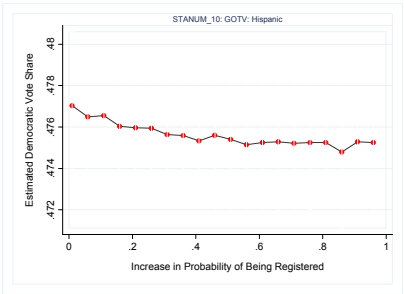

DELAWARE



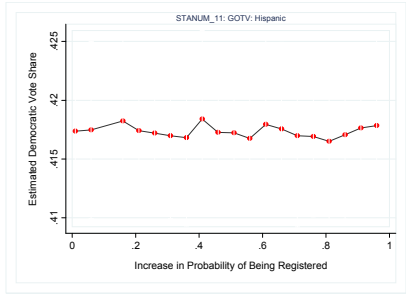

D.C.



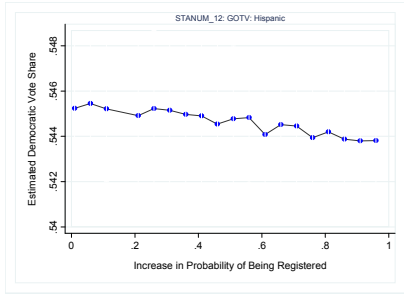

FLORIDA



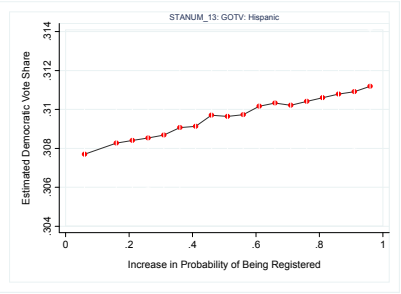

GEORGIA



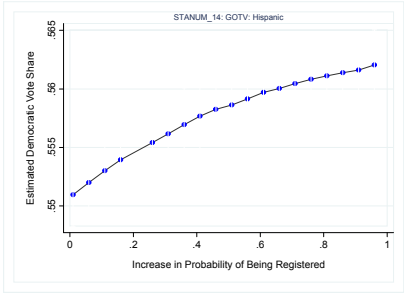

HAWAII



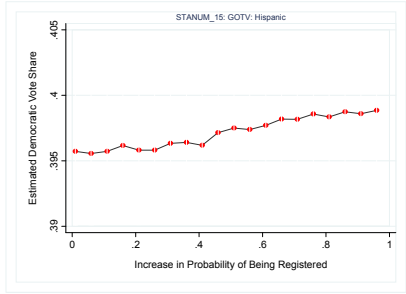

IDAHO



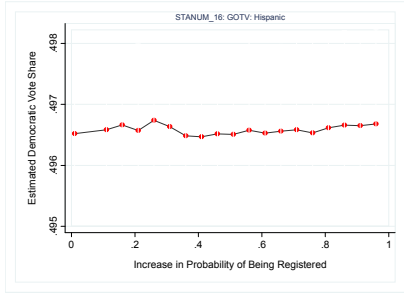

ILLINOIS



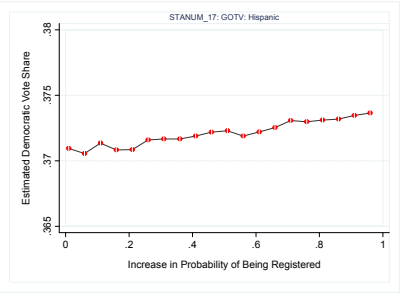

INDIANA



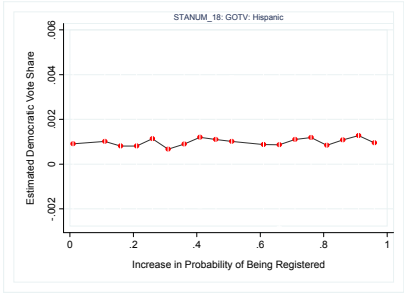

IOWA



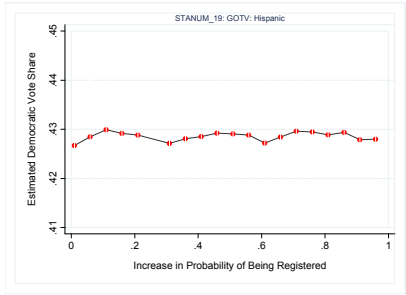
KANSAS




KENTUCKY




LOUISIANA

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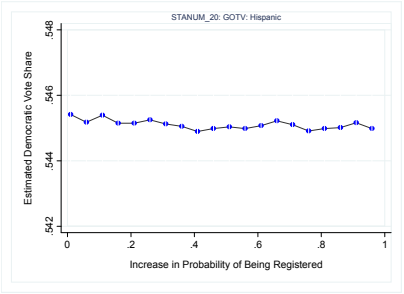


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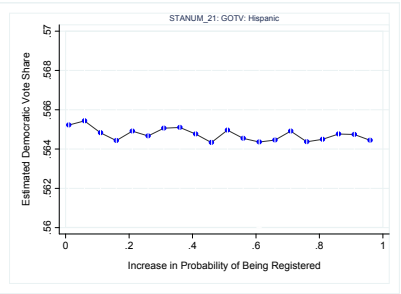


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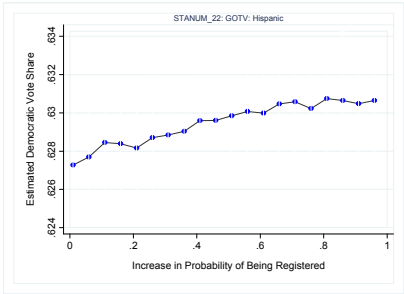


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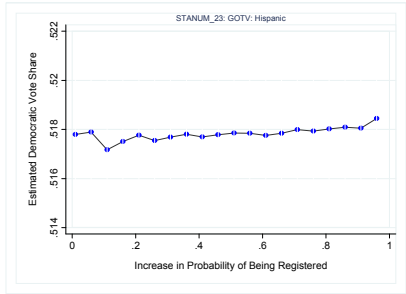


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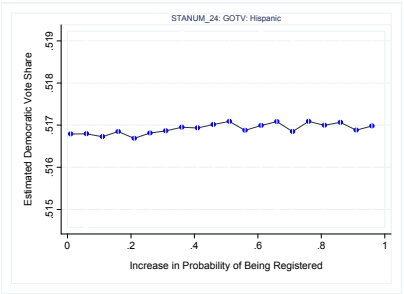


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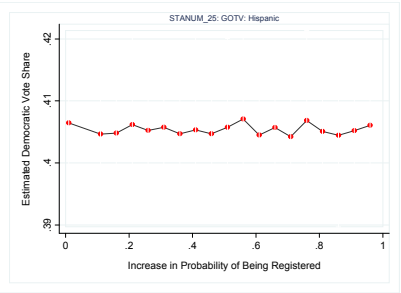


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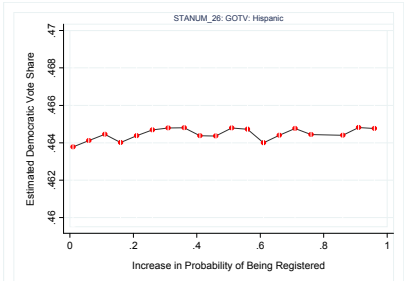


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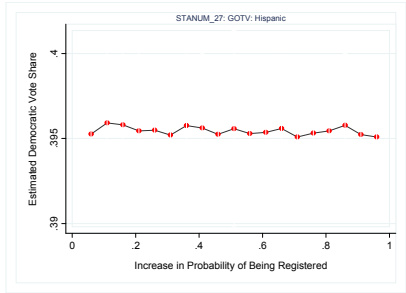


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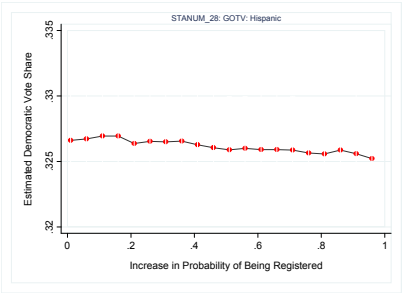


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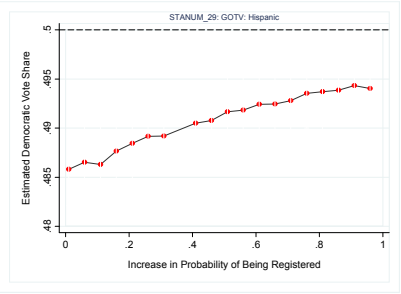


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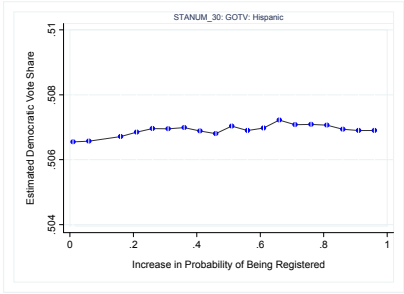


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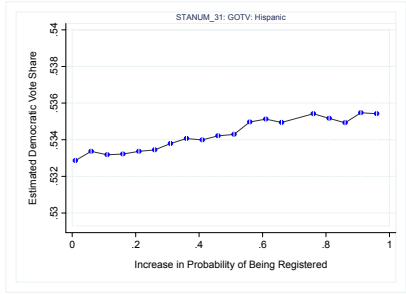


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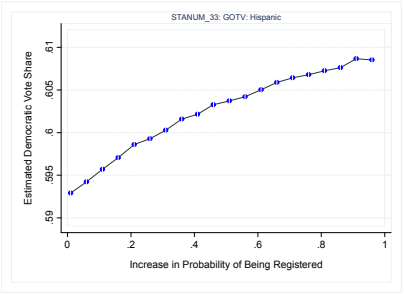

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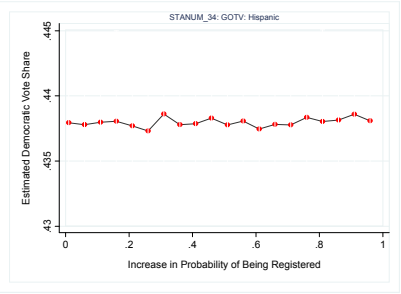


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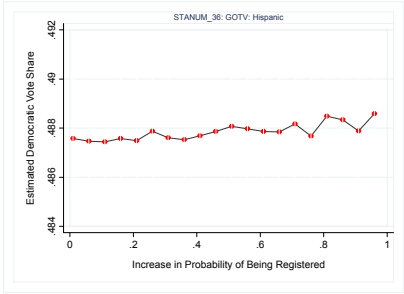


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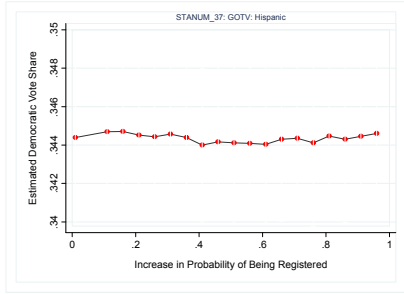


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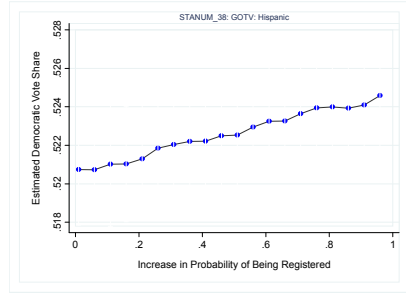


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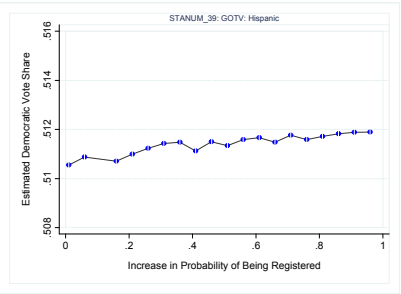


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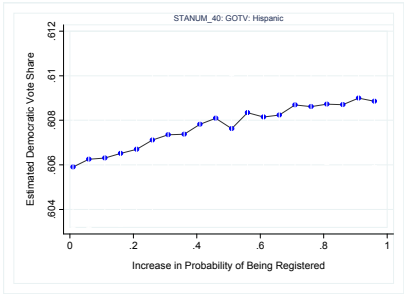


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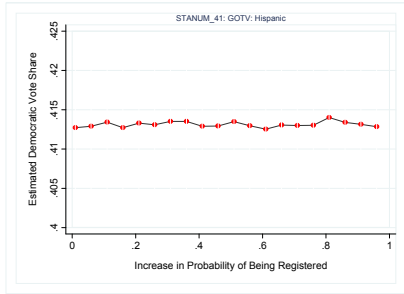


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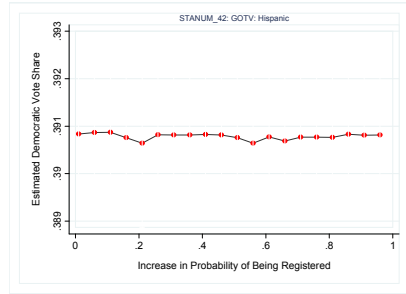


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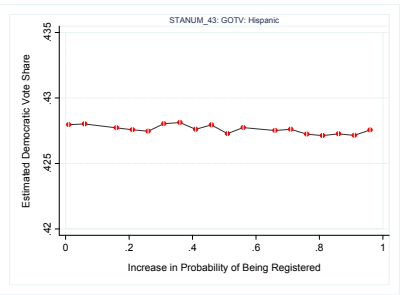


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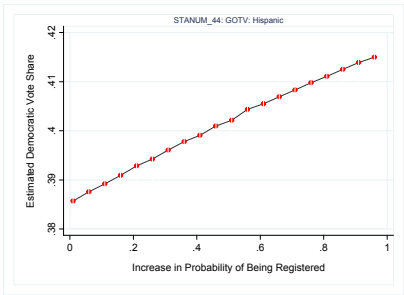


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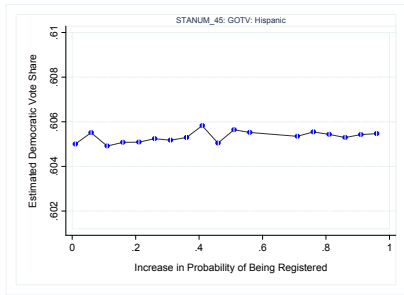


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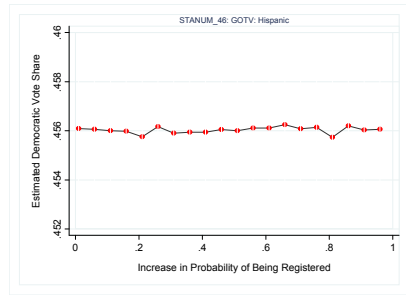


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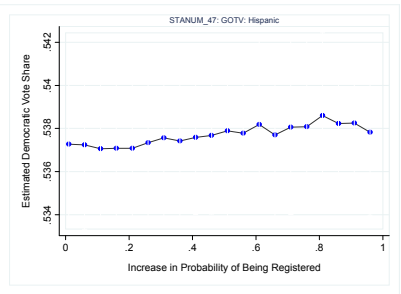


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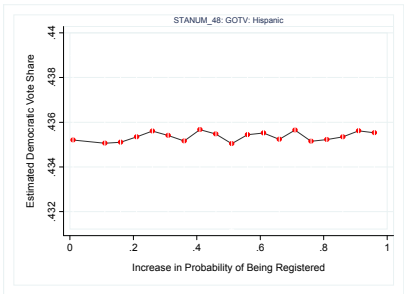


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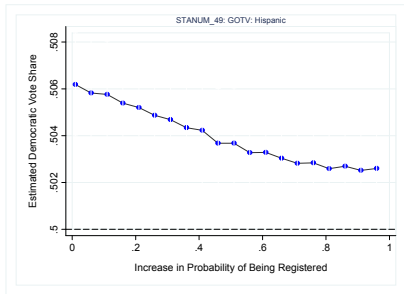


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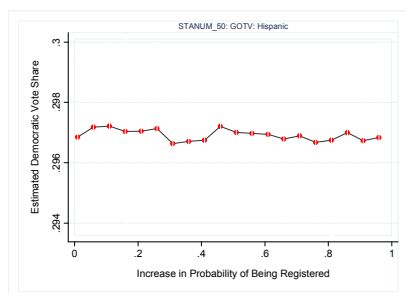

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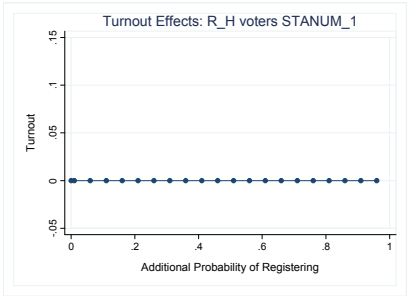


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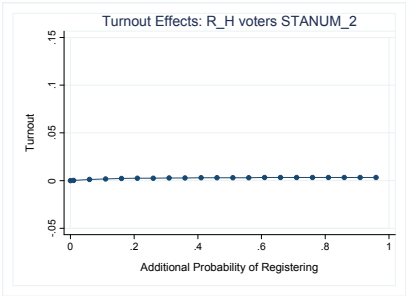


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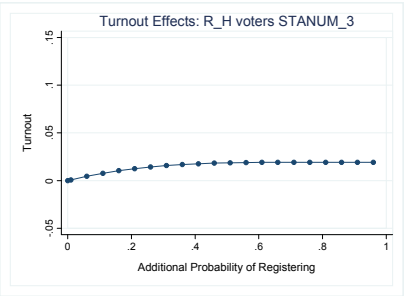


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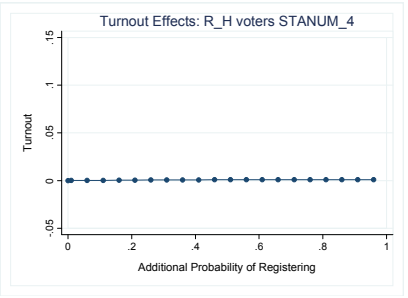


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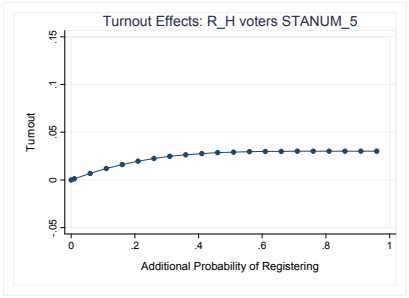


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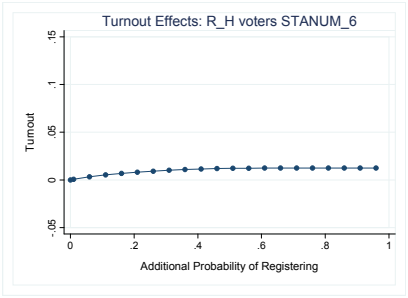


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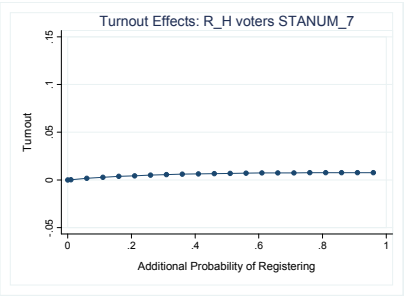


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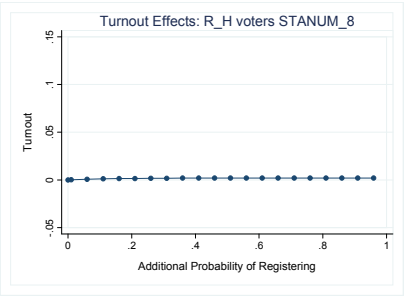


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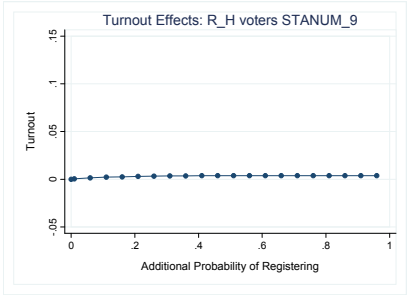


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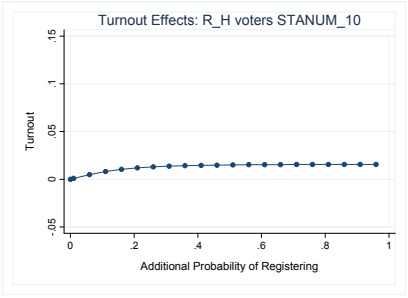


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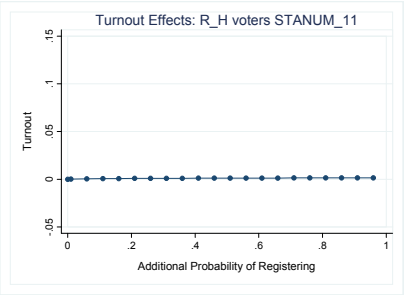


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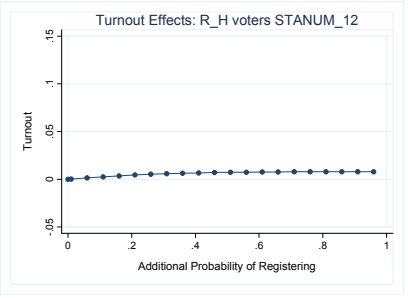


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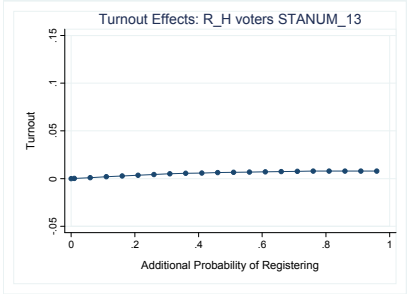


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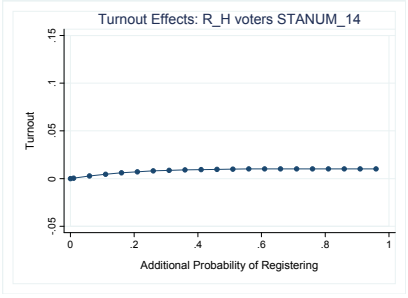


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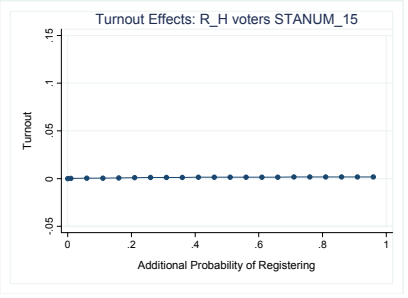


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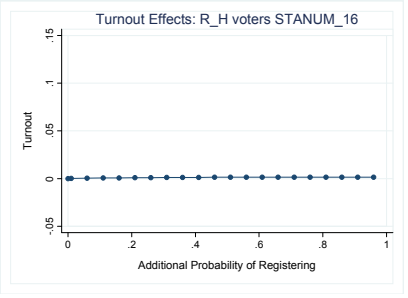

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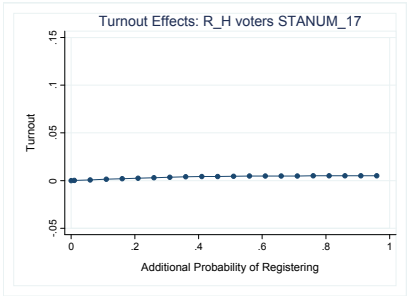


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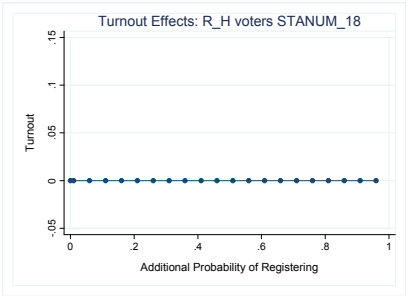


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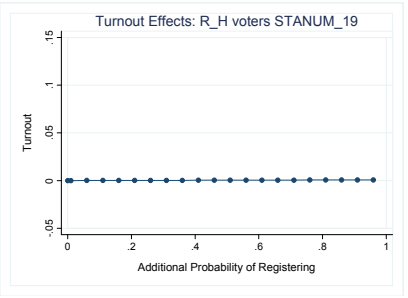


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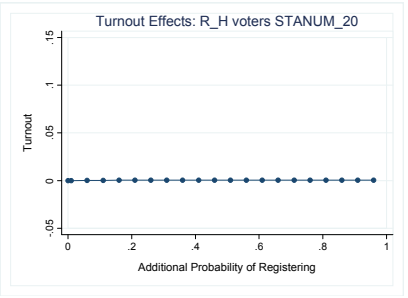


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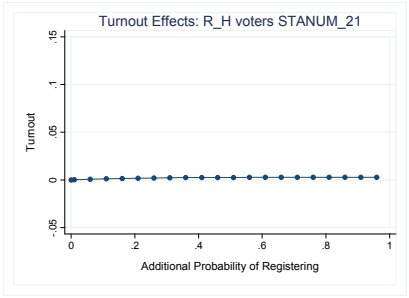
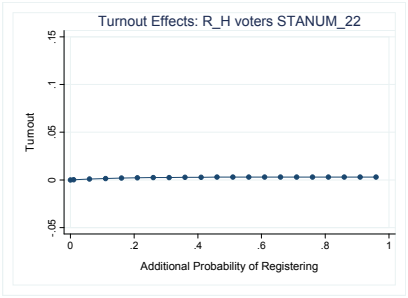



MASSACHUSETTS

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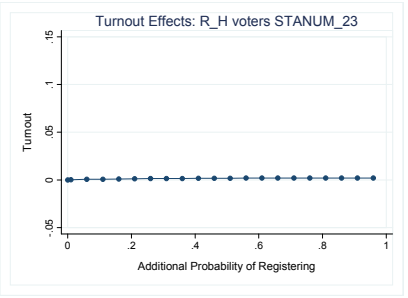


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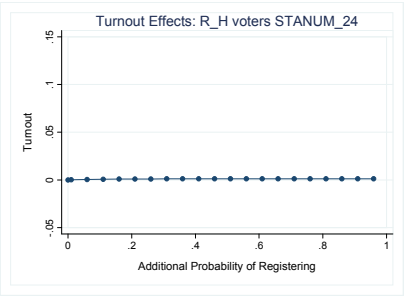


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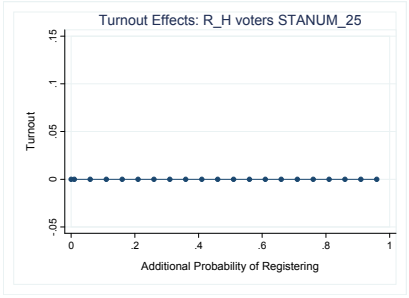


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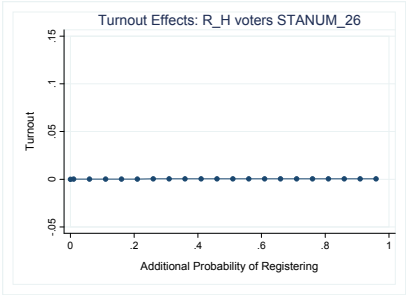


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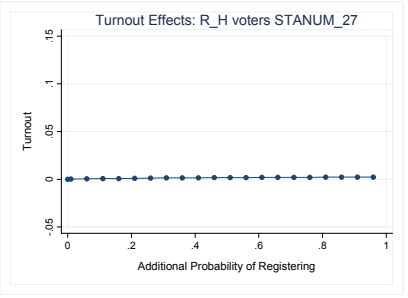


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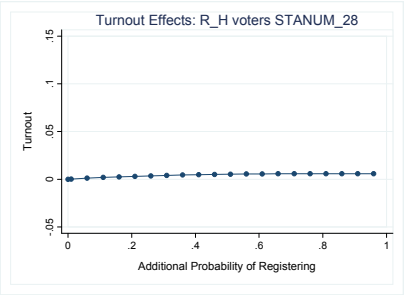


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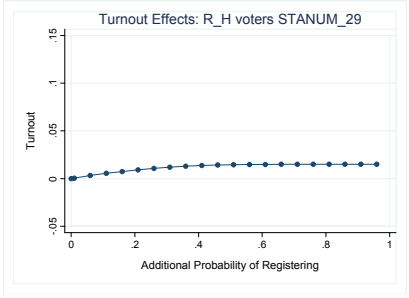


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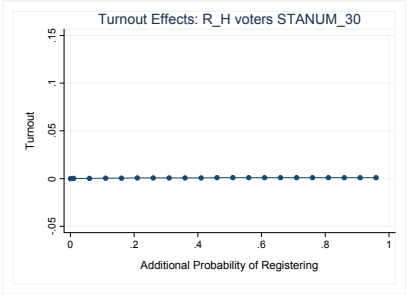


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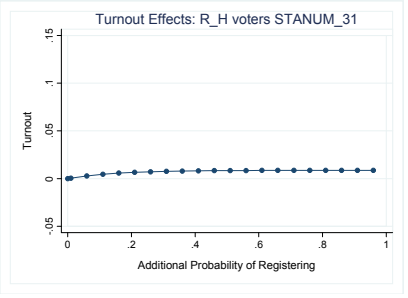
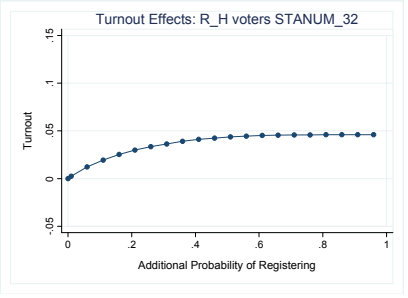



NEW MEXICO



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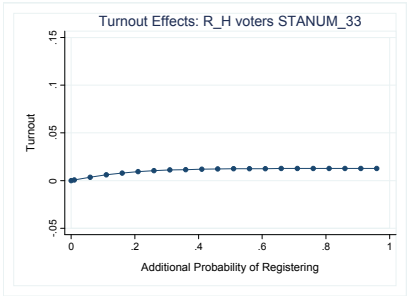


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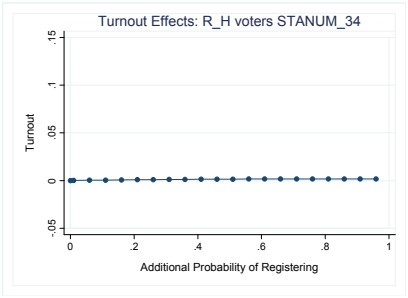


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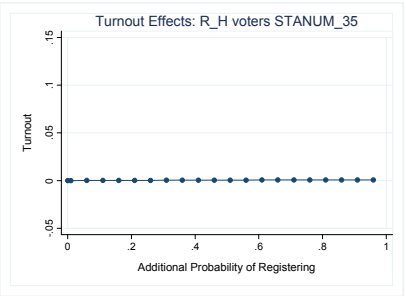


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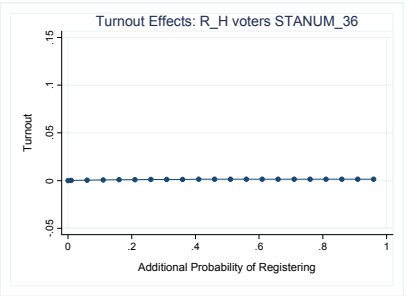


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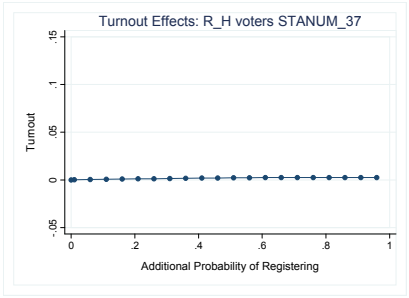


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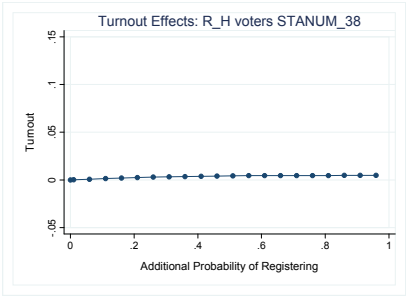
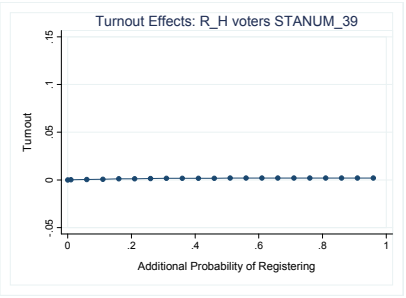



PENNSYLVANIA

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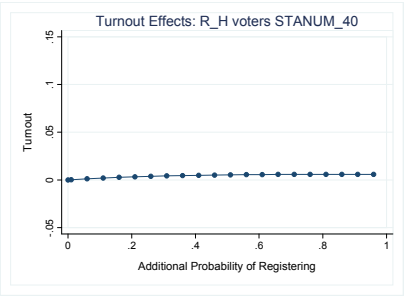


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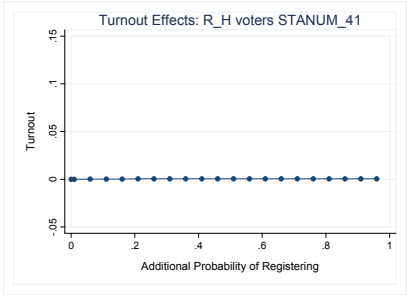


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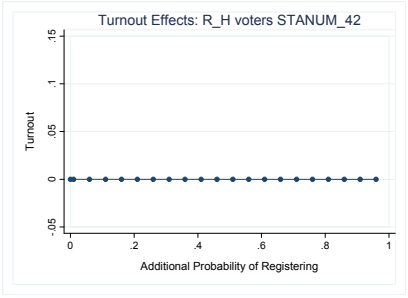


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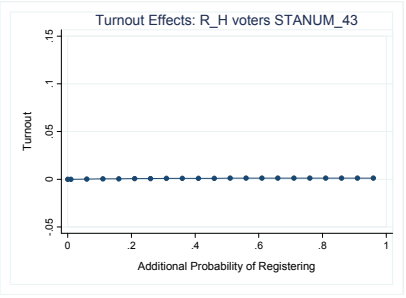


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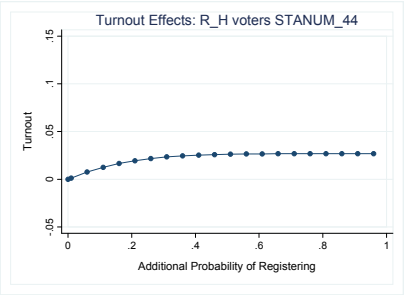


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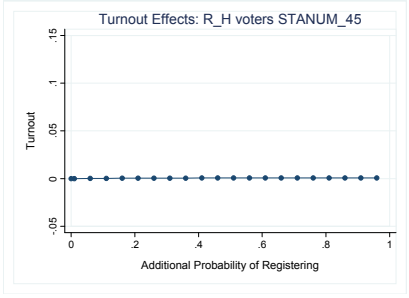
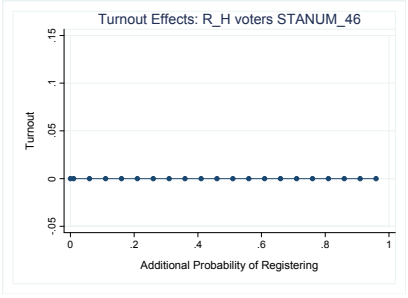
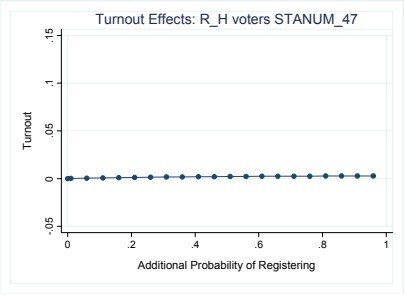


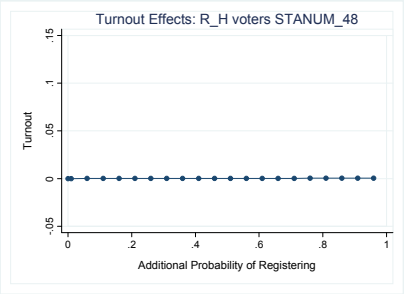

VIRGINIA



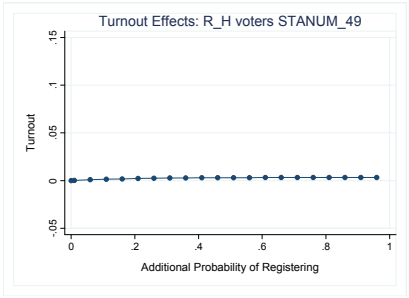

WASHINGTON



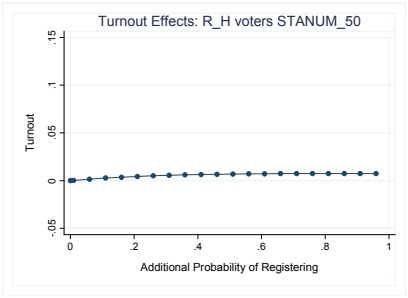

WEST VIRGINIA



WISCONSIN



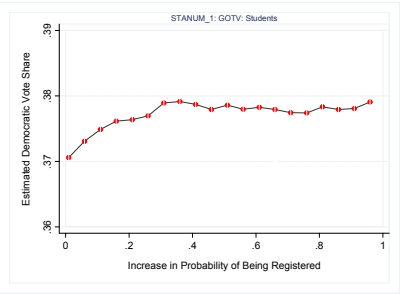

WYOMING



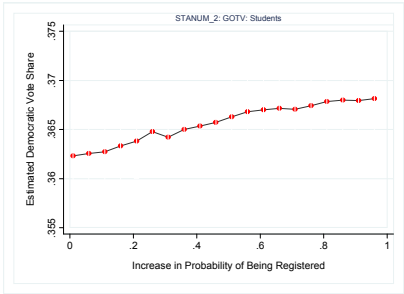
# Appendix 8:

# Simulation 5—Registering Students

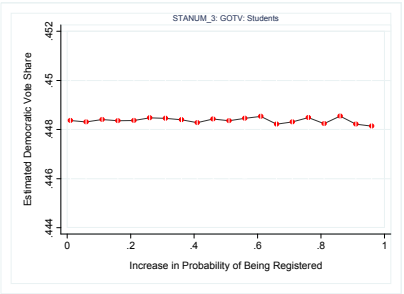
ALABAMA



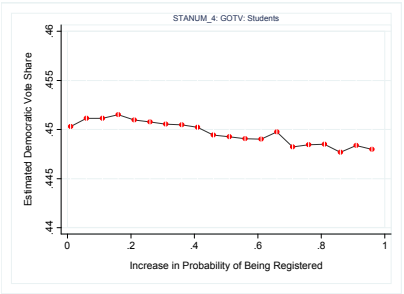

ALASKA



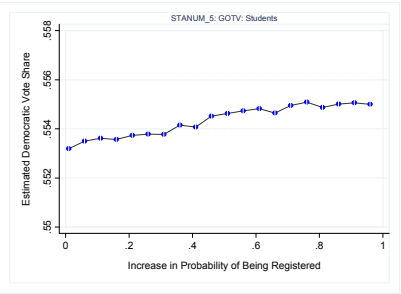

ARIZONA



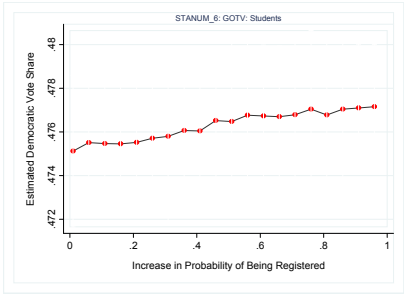

ARKANSAS



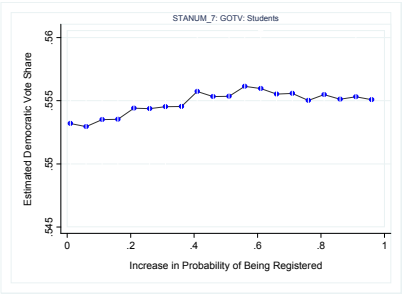

CALIFORNIA



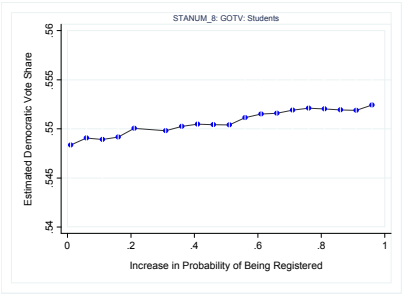

COLORADO



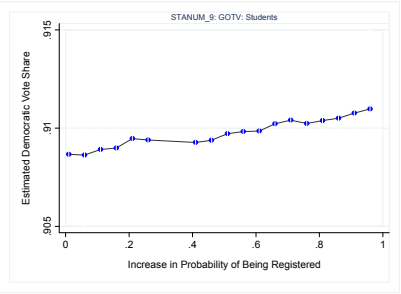

CONNECTICUT



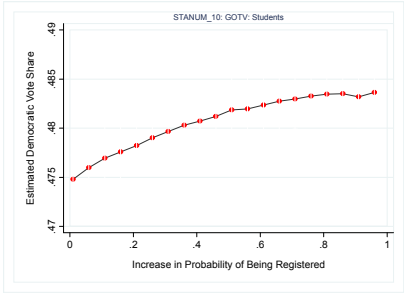

DELAWARE



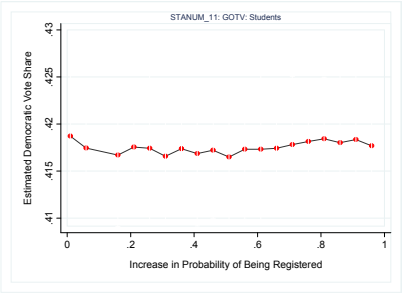

D.C.




FLORIDA




GEORGIA

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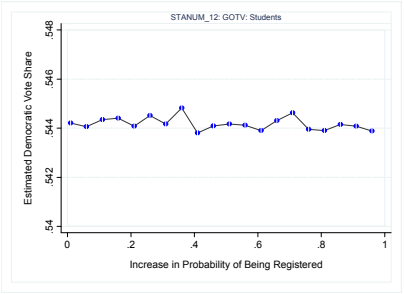
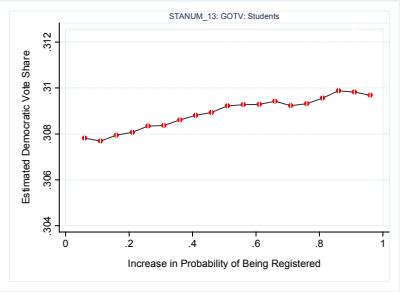
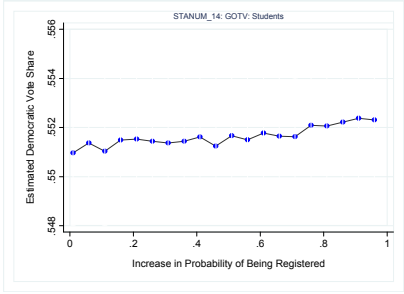



IDAHO




ILLINOIS

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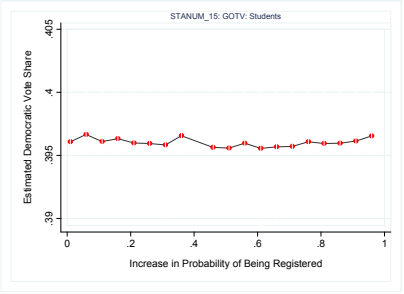


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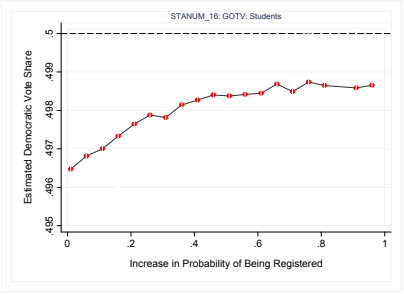
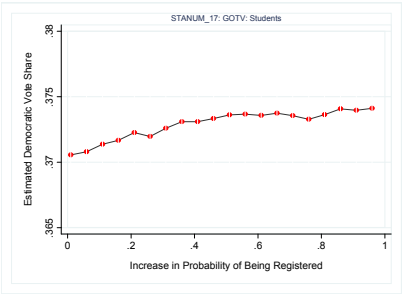


KANSAS

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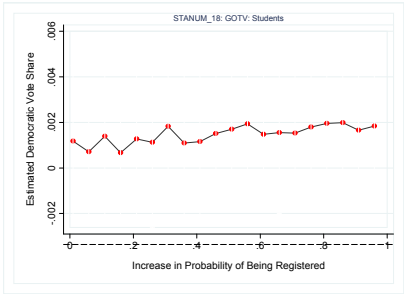


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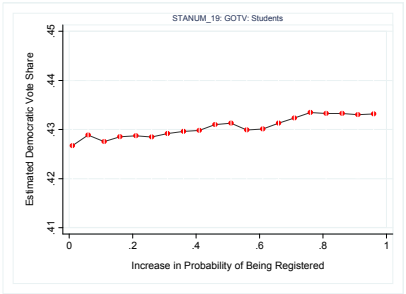


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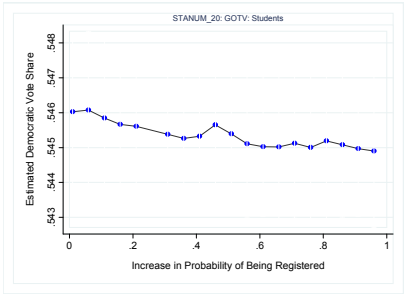
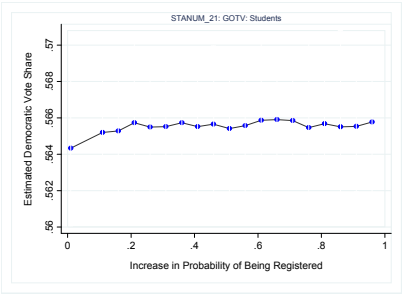



MARYLAND

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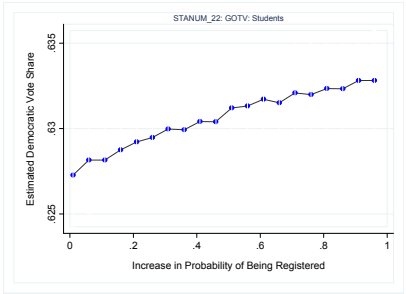


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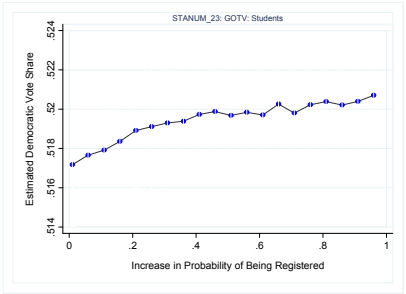


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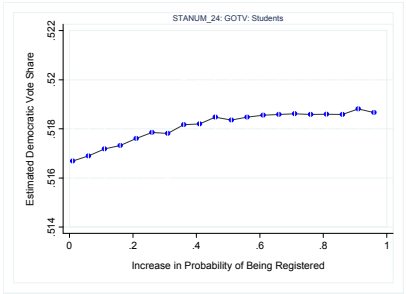


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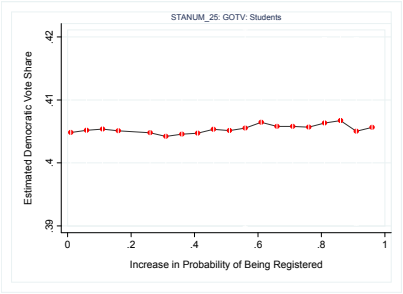


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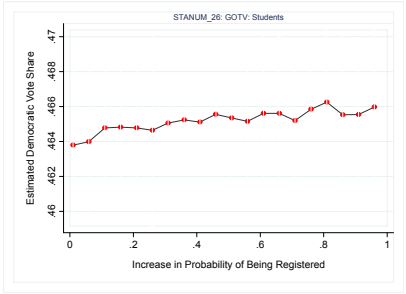
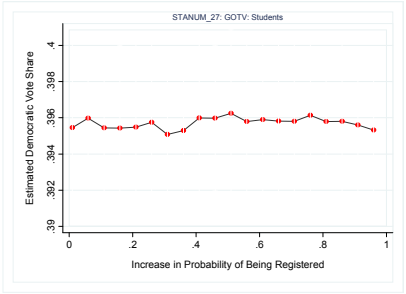



MONTANA

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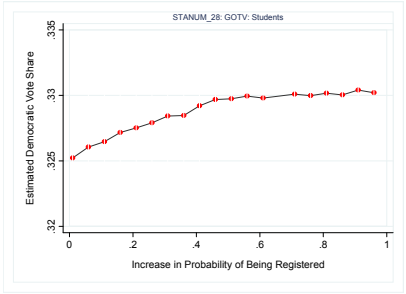


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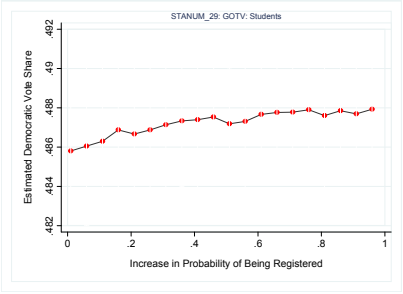


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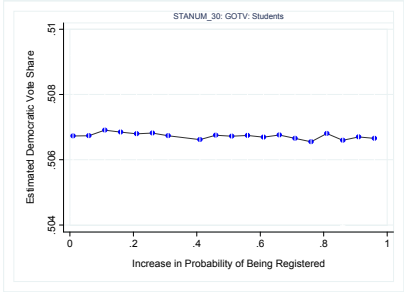


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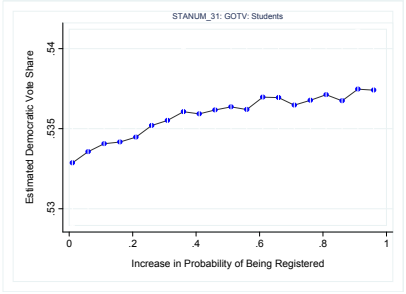


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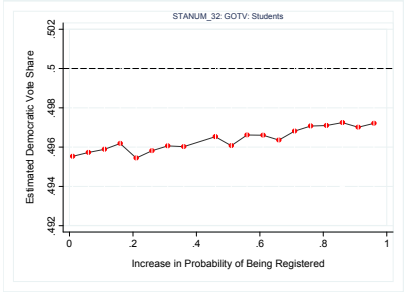

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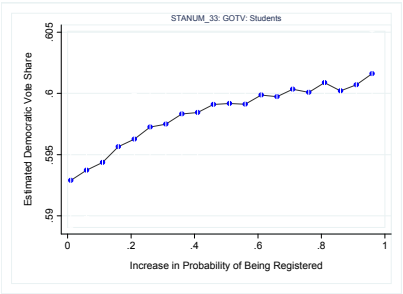


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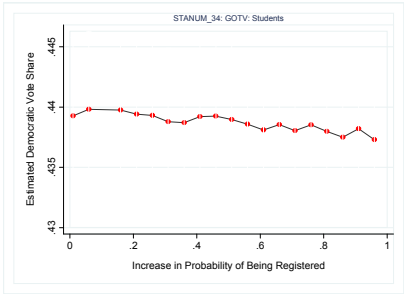


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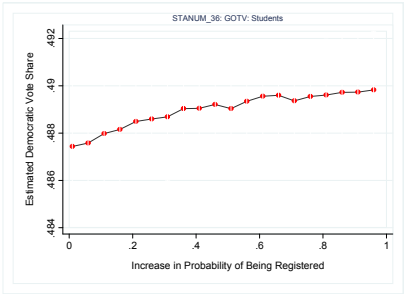


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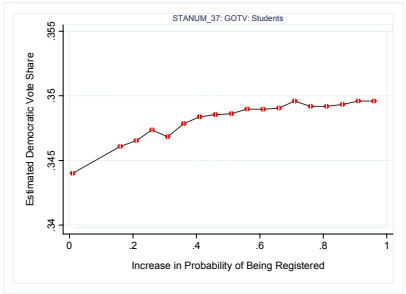
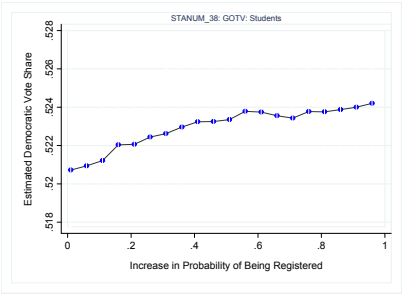
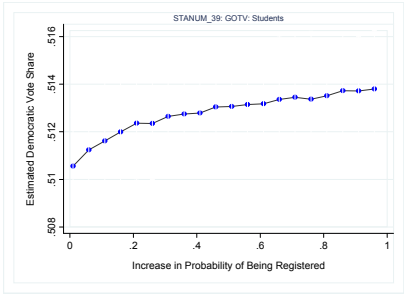



OREGON




PENNSYLVANIA

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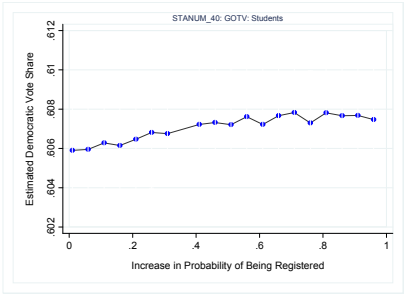
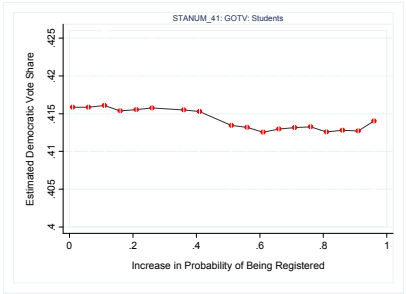
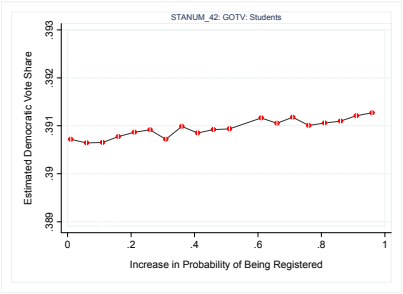


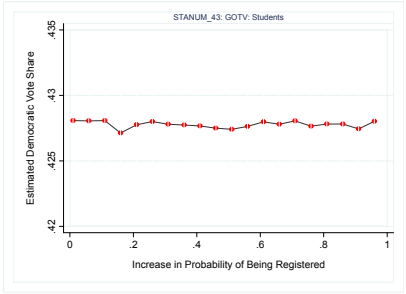

SOUTH CAROLINA



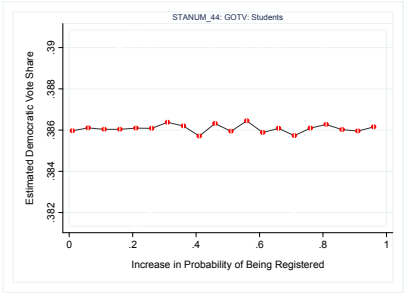

SOUTH DAKOTA




TENNESSEE




TEXAS

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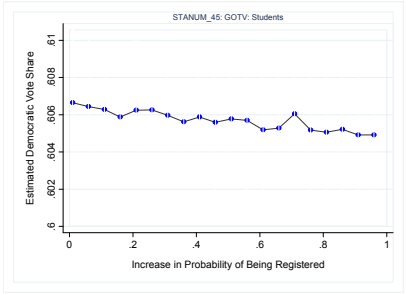


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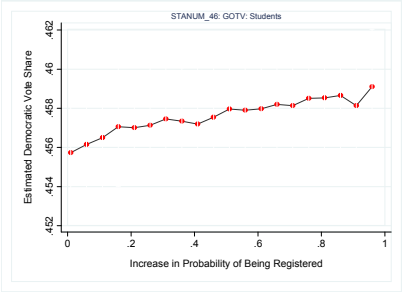


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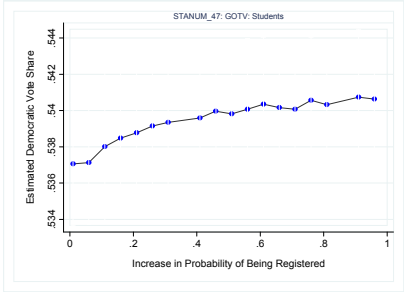


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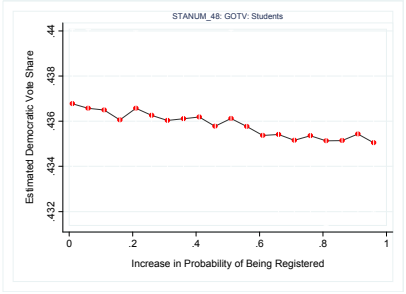


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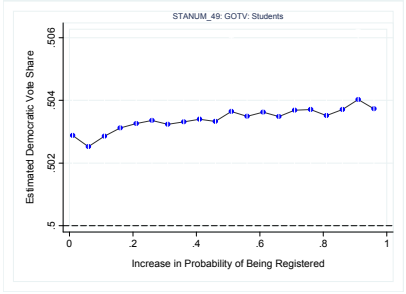

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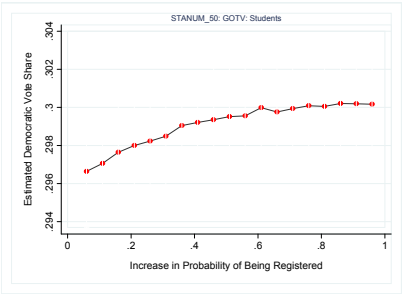
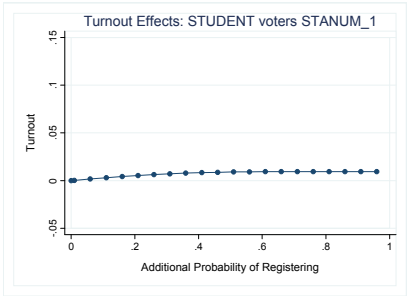

STANUM_50: GOTV: Students
Estimated Democratic Vote Share
.294
.296
.298
.3
.302
.304
0
.2
.4
.6
.8
1
Increase in Probability of Being Registered

ALABAMA

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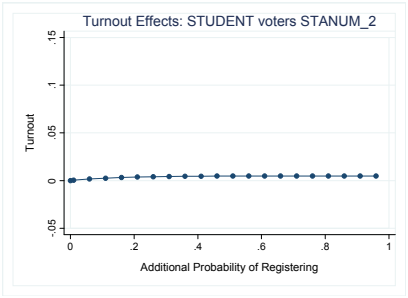


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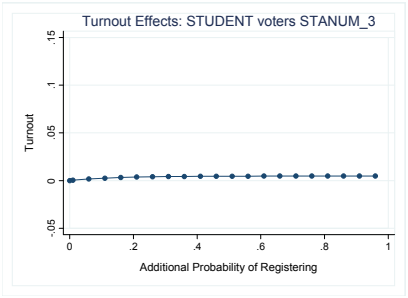


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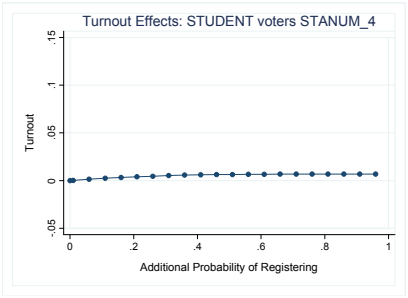


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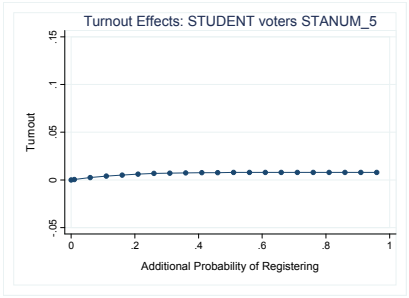


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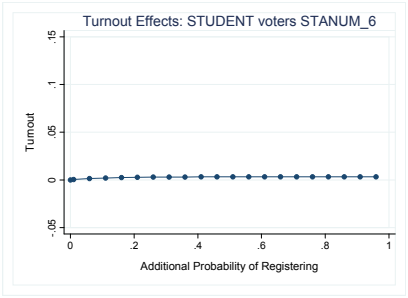


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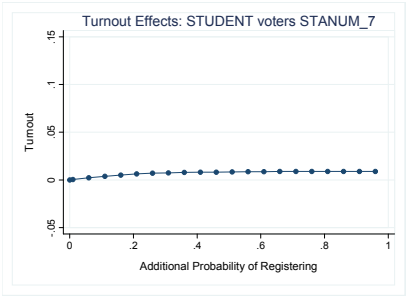


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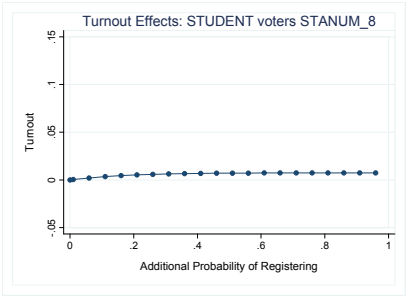
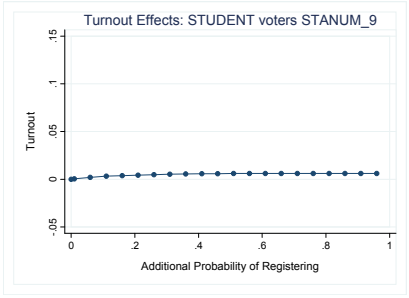
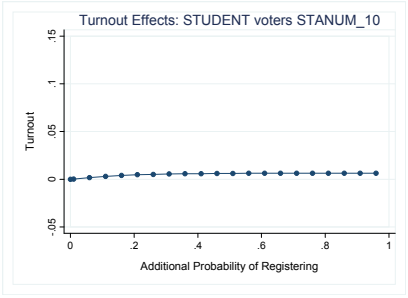



D.C.




FLORIDA

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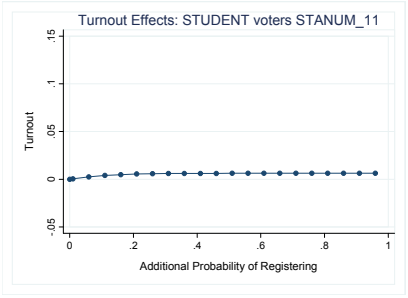


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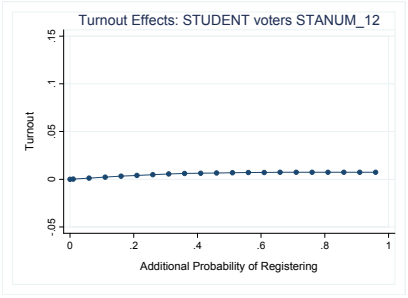


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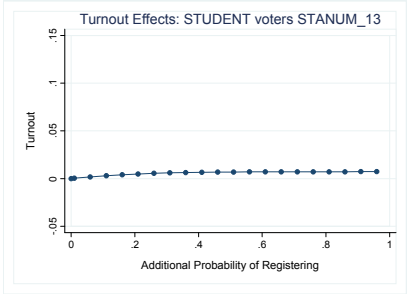


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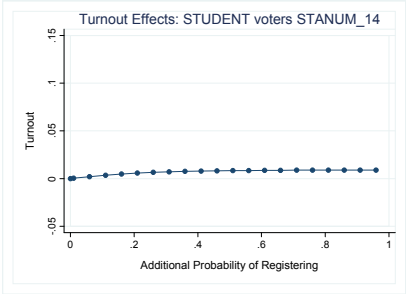


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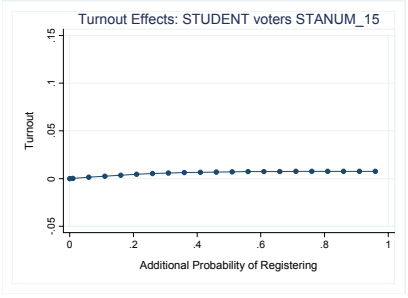


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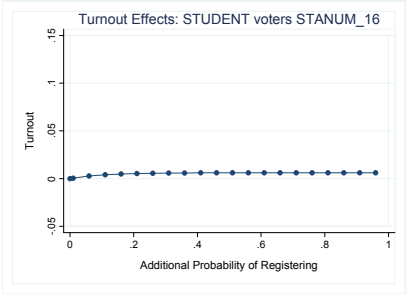

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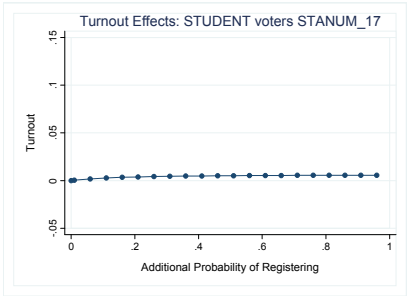


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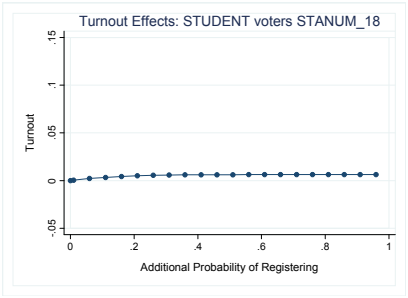


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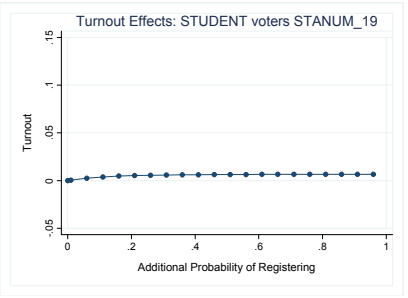


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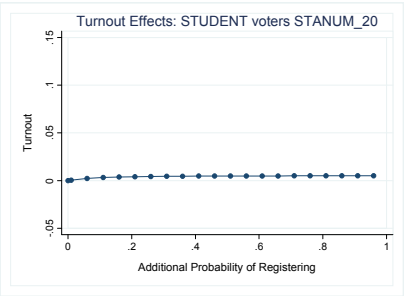
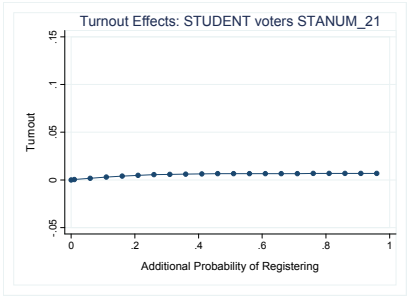
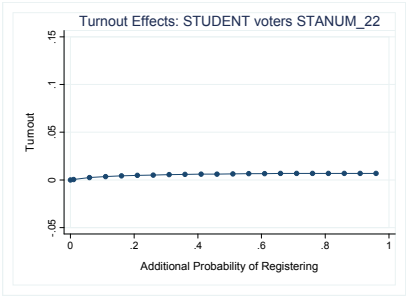



MARYLAND




MASSACHUSETTS

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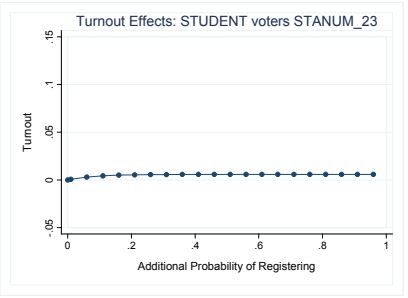


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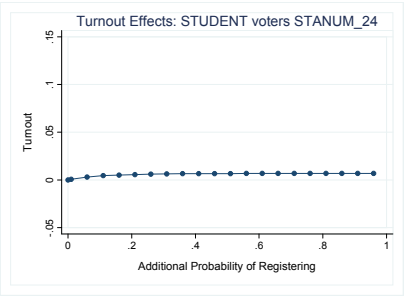


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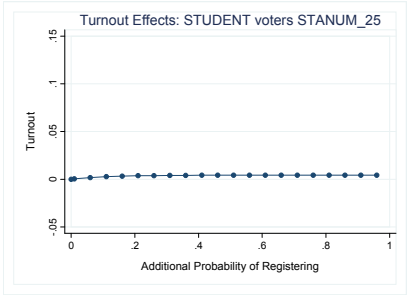


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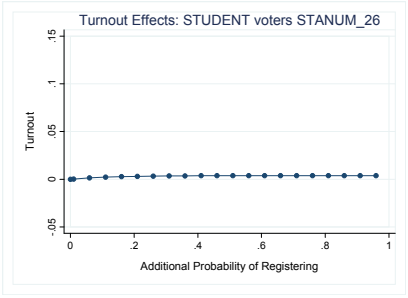


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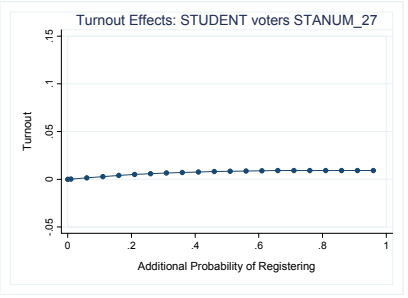


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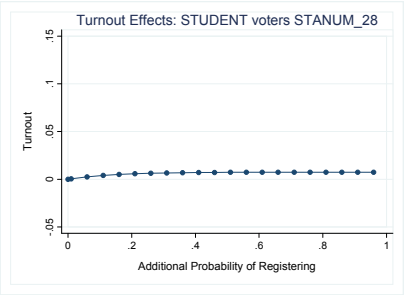
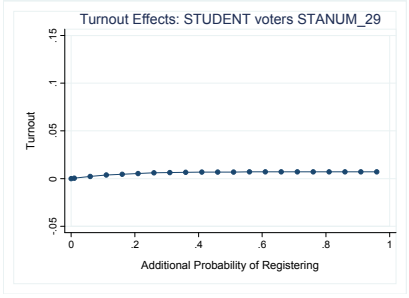



NEVADA

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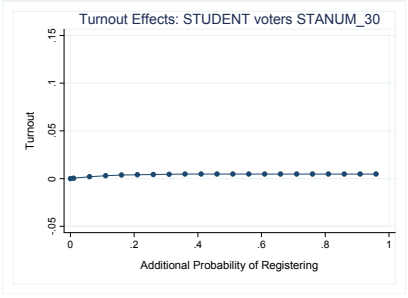


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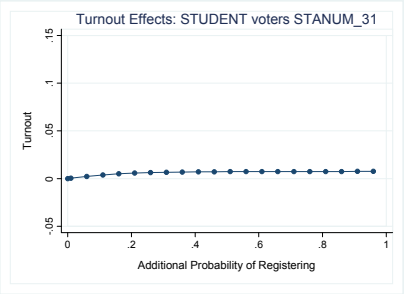


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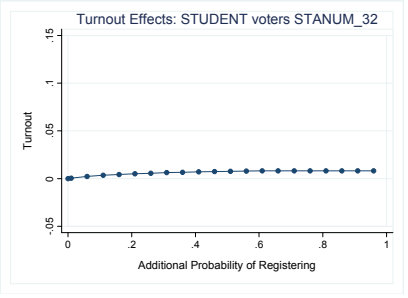
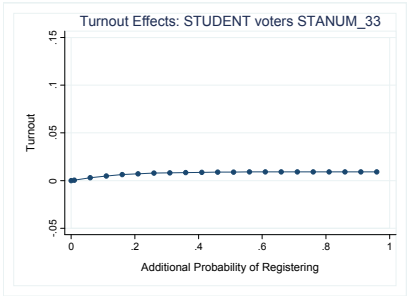


NEW YORK

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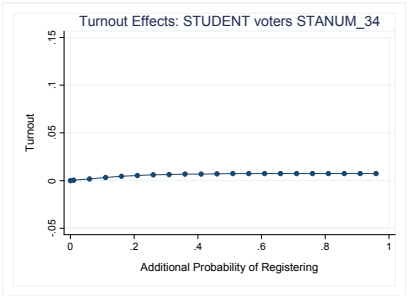
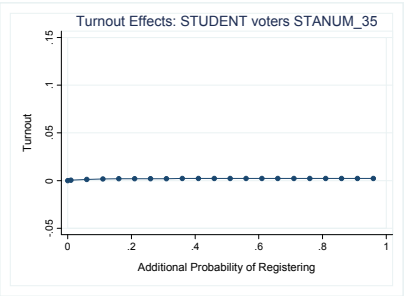



NORTH DAKOTA

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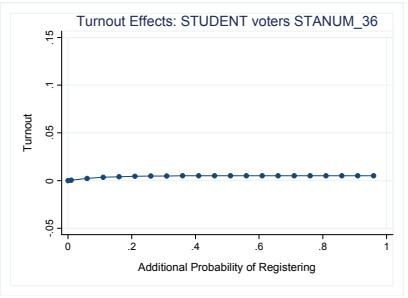


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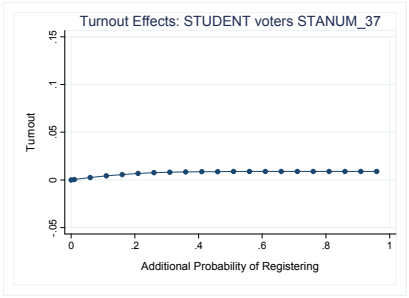
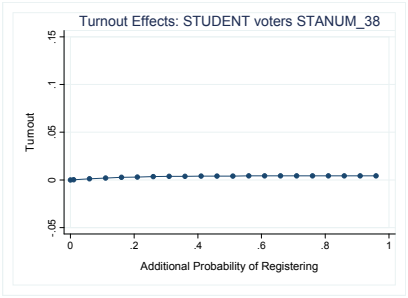
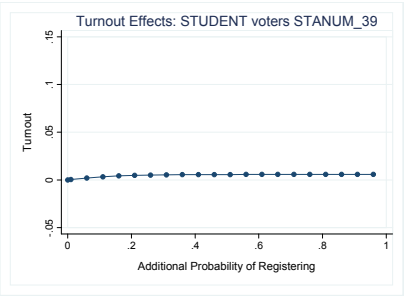


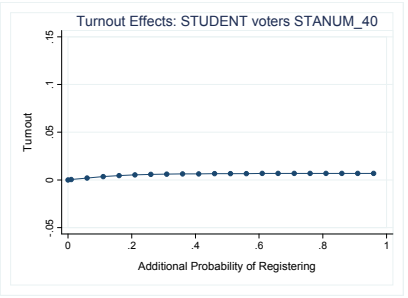

OREGON



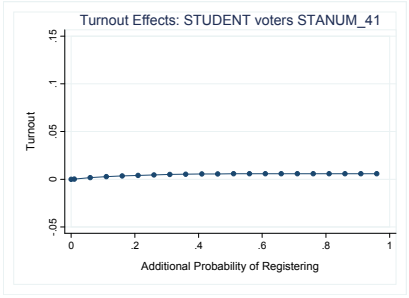

PENNSYLVANIA



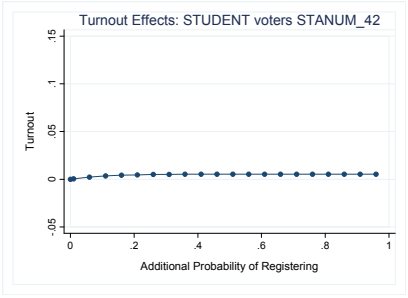

RHODE ISLAND



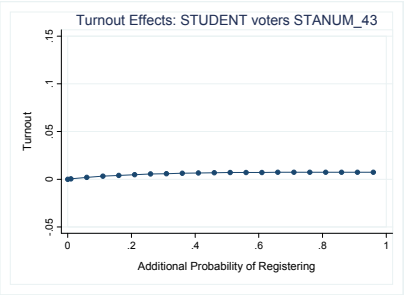

SOUTH CAROLINA




SOUTH DAKOTA




TENNESSEE

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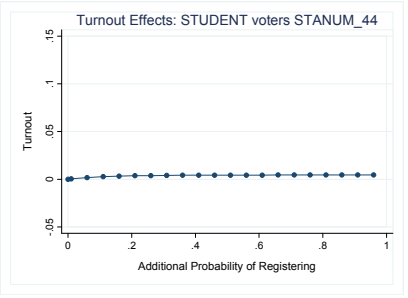


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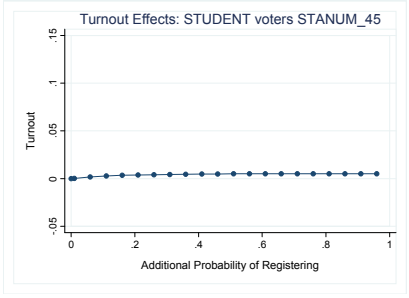
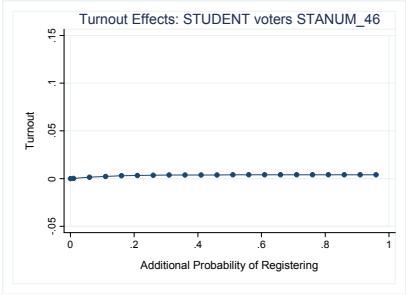
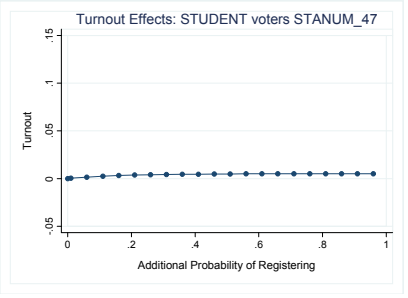


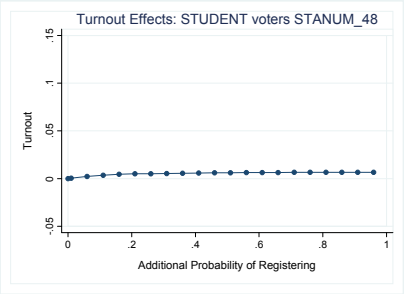

VIRGINIA



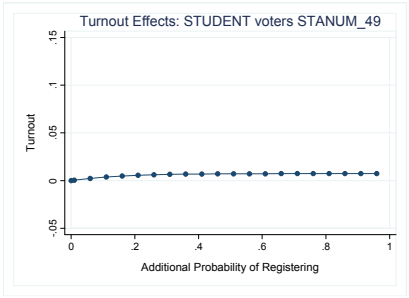

WASHINGTON




WEST VIRGINIA



WISCONSIN

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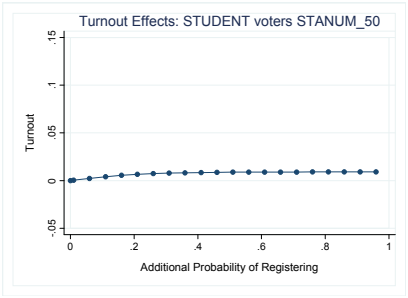
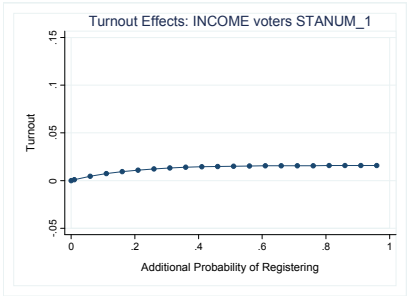


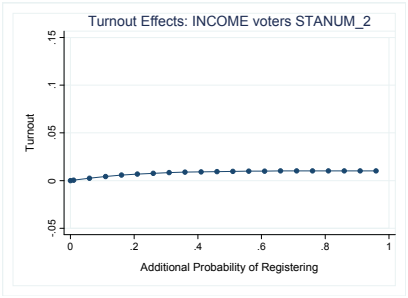
# Appendix 9:

# Simulation 6—Registering Low-income Voters

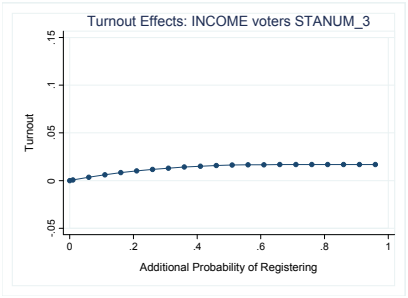
ALABAMA



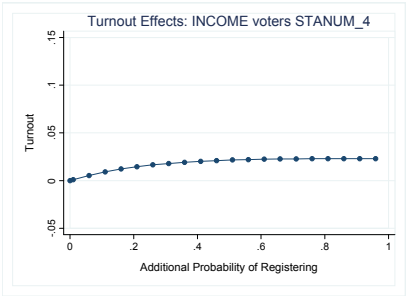

ALASKA




ARIZONA




ARKANSAS

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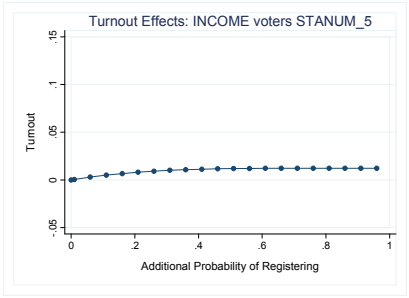


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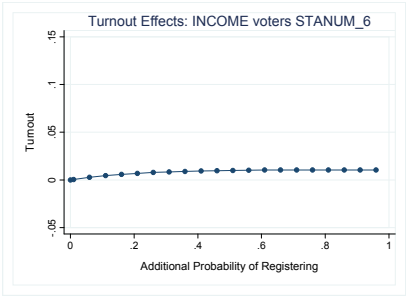


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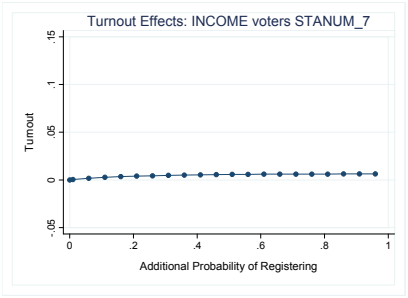


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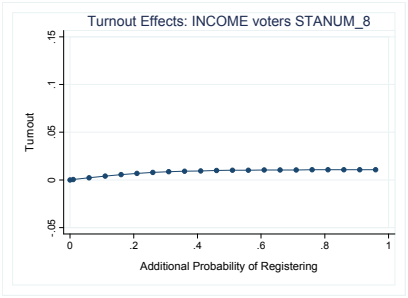
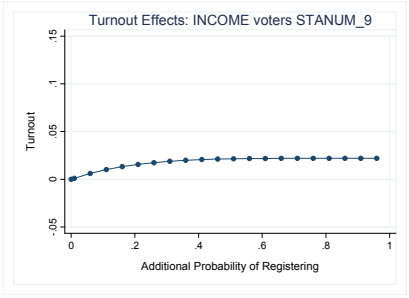



D.C.

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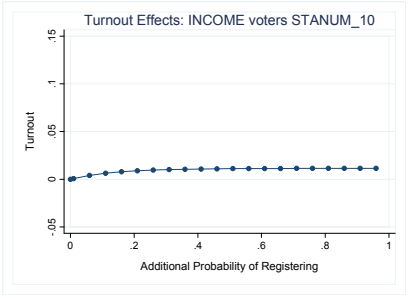


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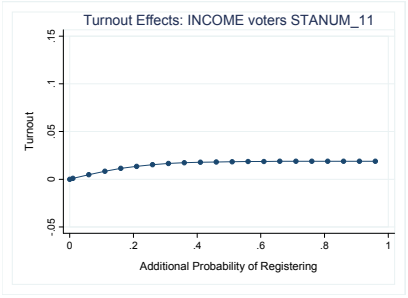


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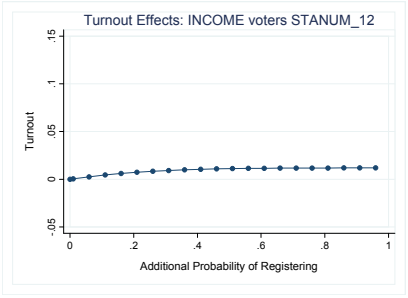


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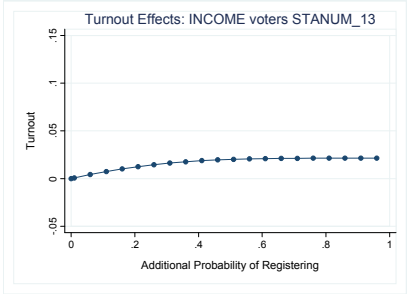


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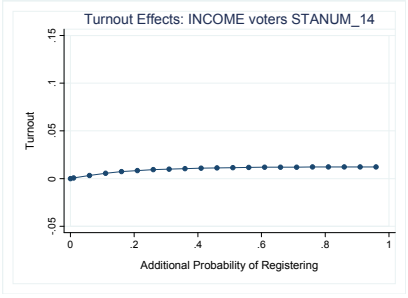


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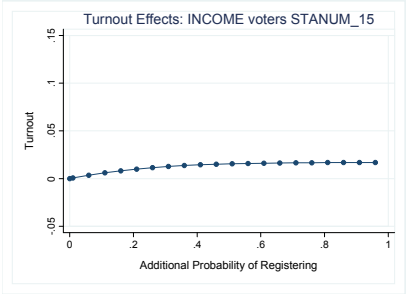


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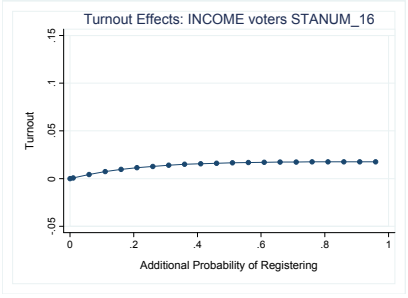

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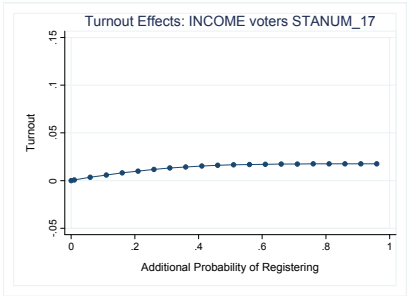


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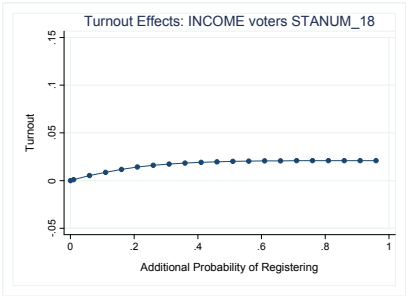


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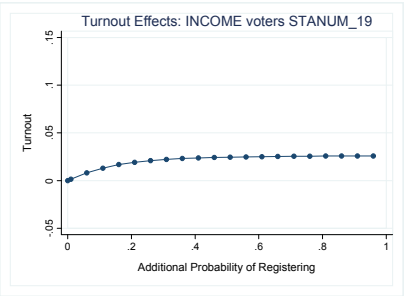


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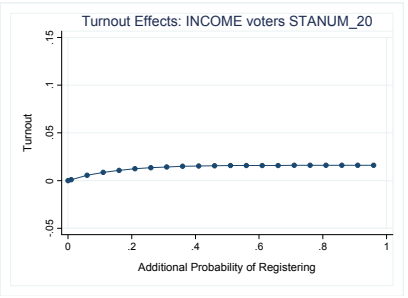


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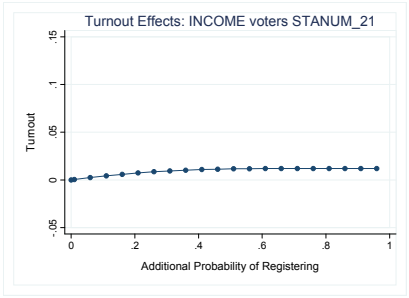
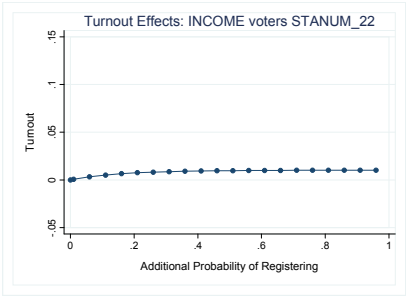
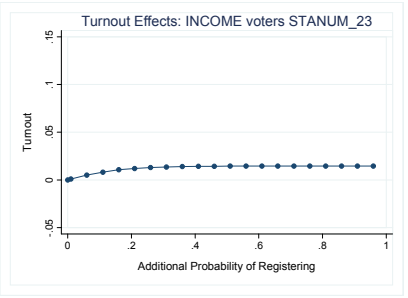



MASSACHUSETTS




MICHIGAN

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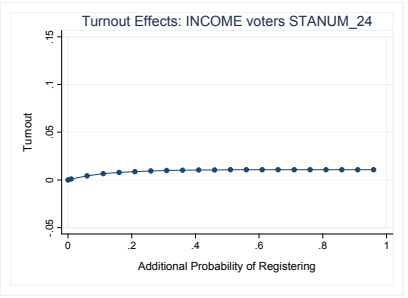


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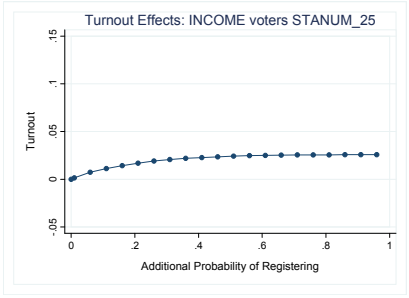


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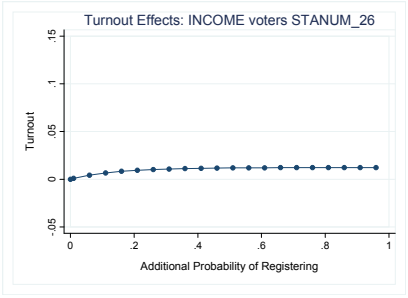


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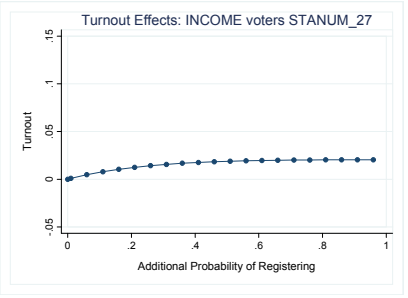


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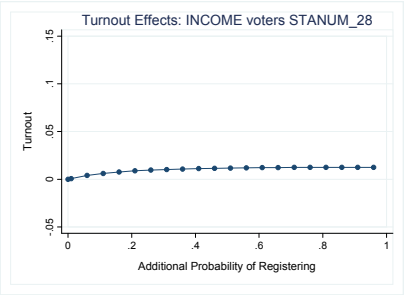


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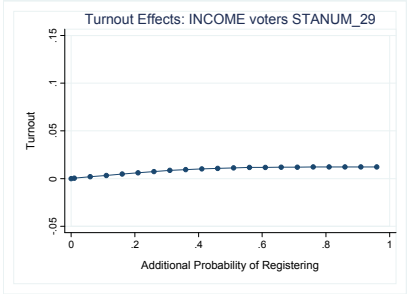


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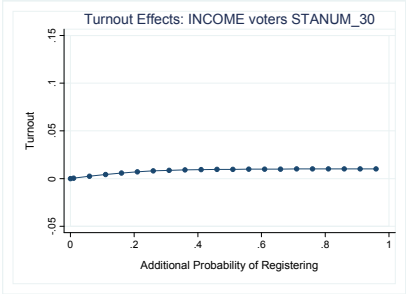


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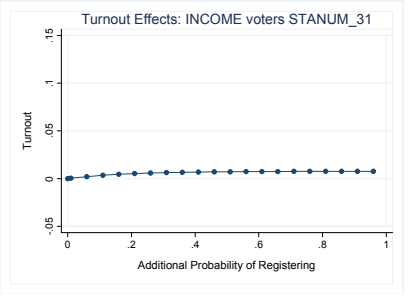


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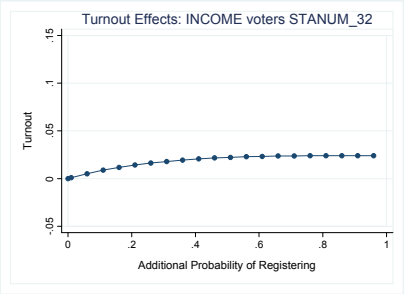

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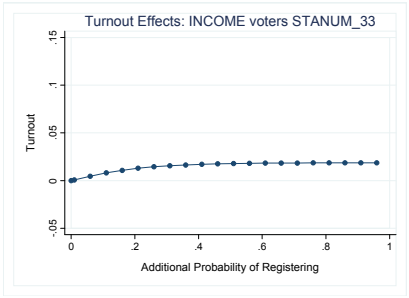


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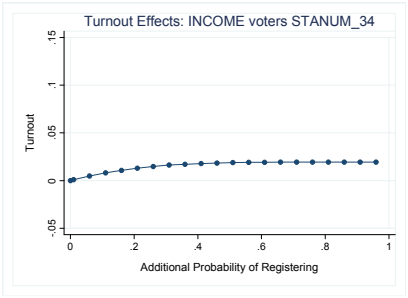


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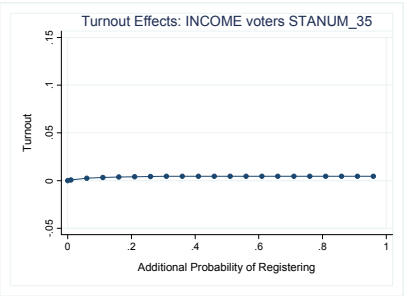


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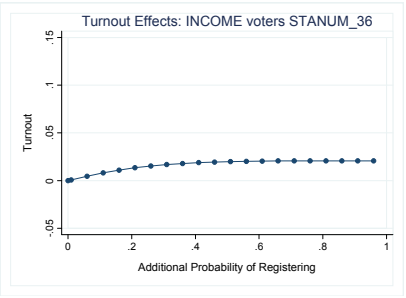


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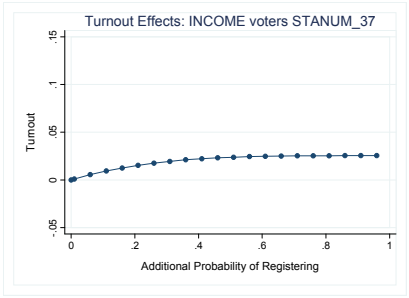


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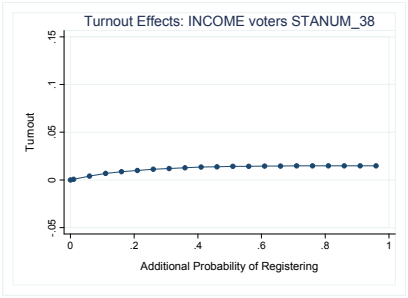


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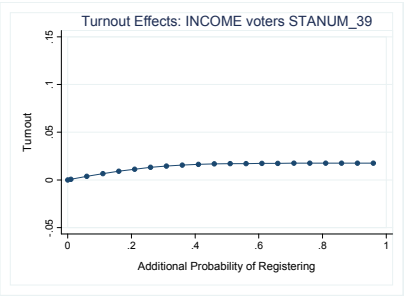


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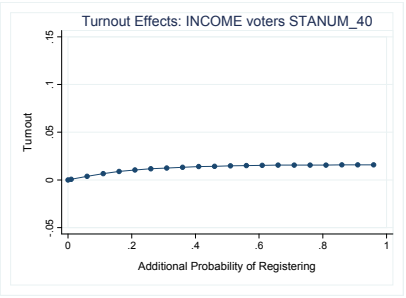
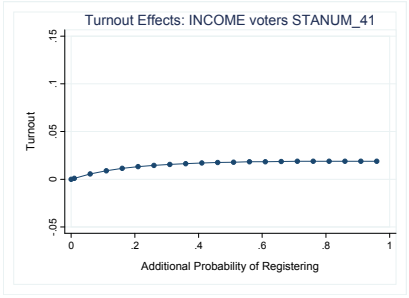
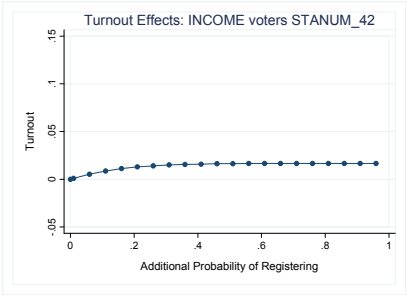



SOUTH CAROLINA




SOUTH DAKOTA

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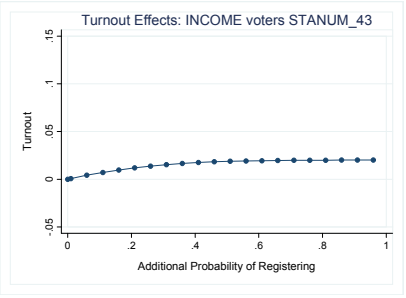


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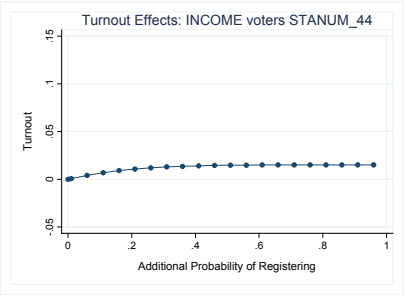


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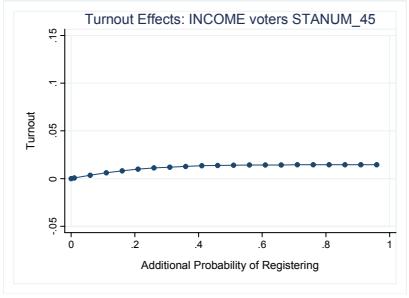


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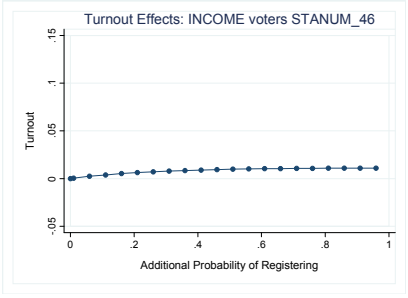
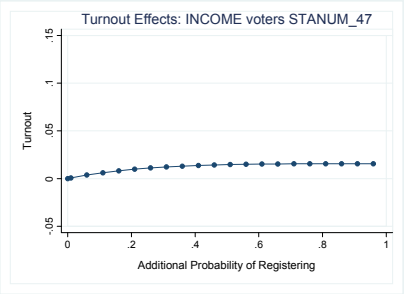
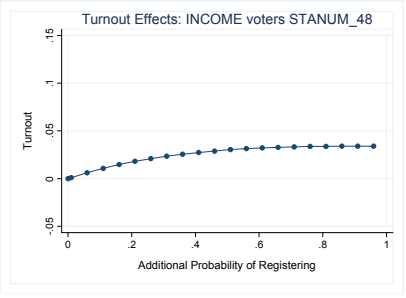



WASHINGTON




WEST VIRGINIA



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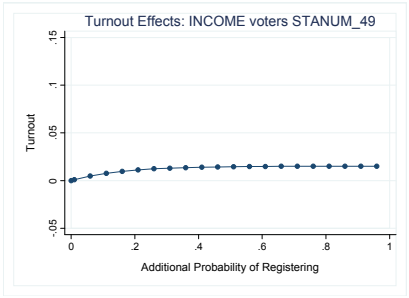
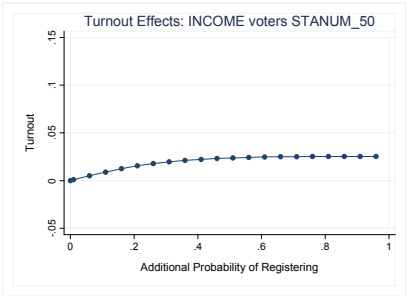


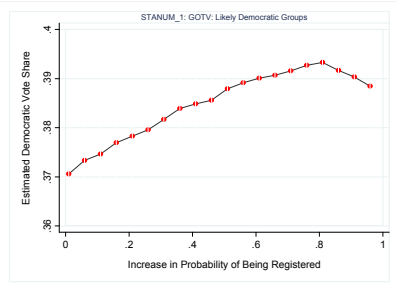

WYOMING



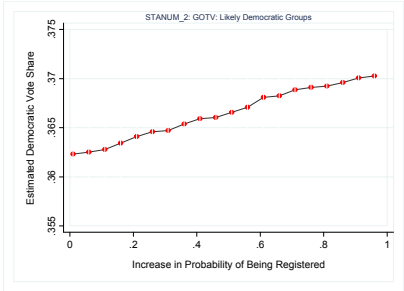
# Appendix 10:

# Simulation 7—Registering the “Natural Constituency”

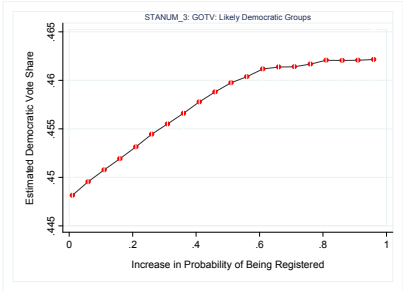
ALABAMA




ALASKA




ARIZONA

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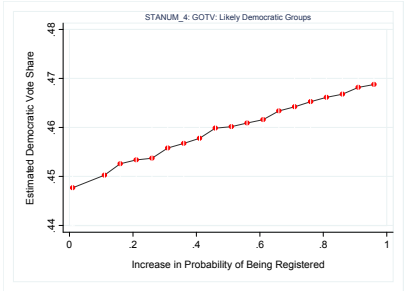
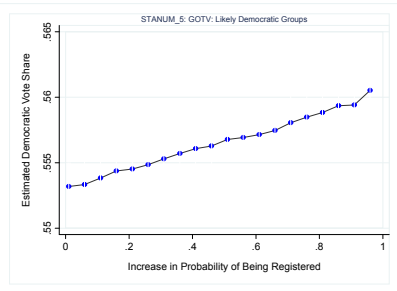
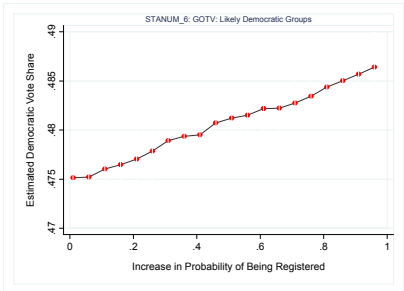


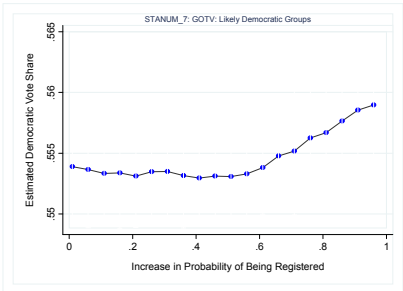

CALIFORNIA



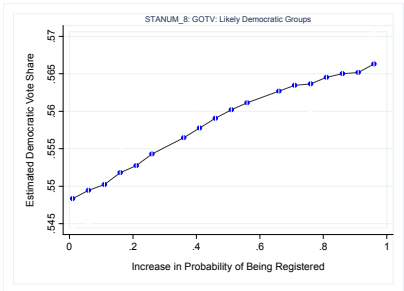

COLORADO



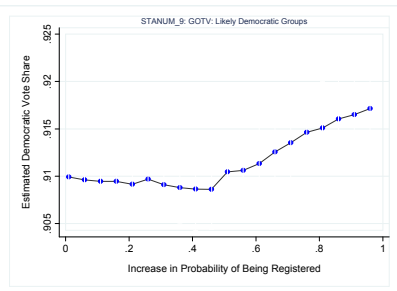

CONNECTICUT



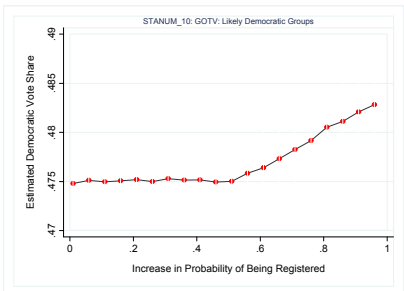

DELAWARE



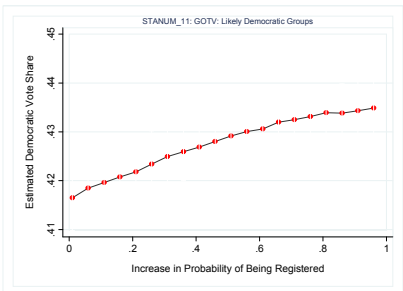

D.C.



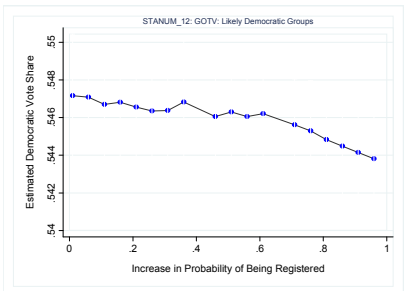

FLORIDA



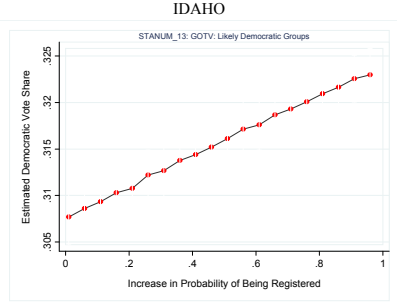

GEORGIA



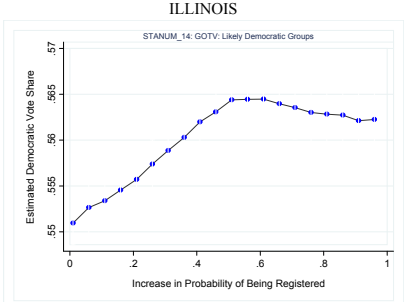

HAWAII



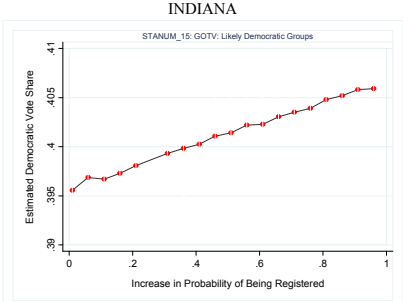

IDAHO




ILLINOIS




INDIANA

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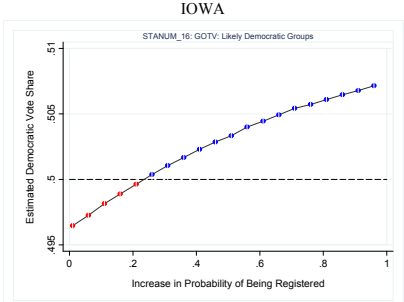

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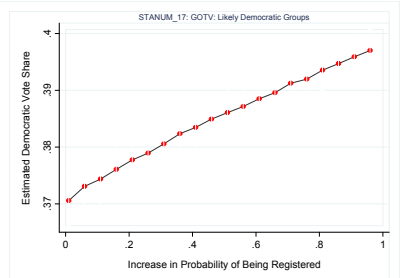


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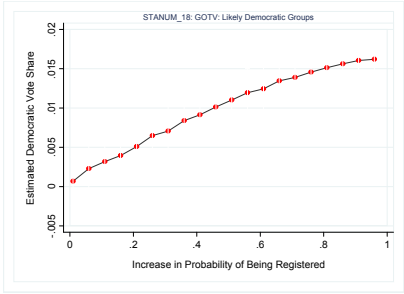


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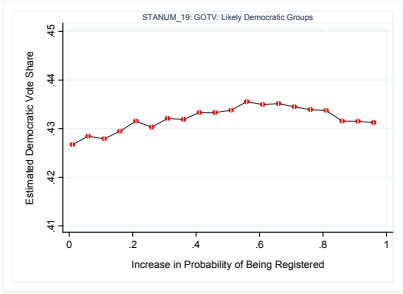


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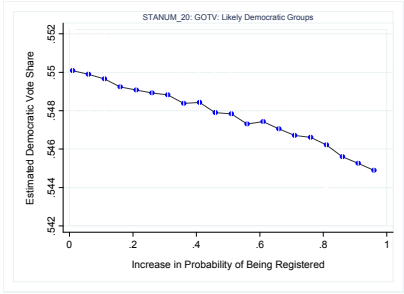


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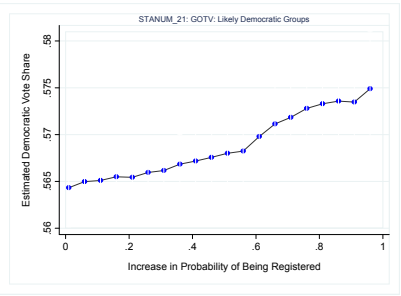
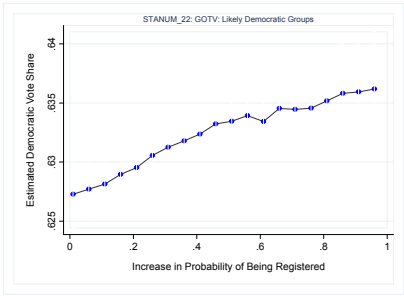
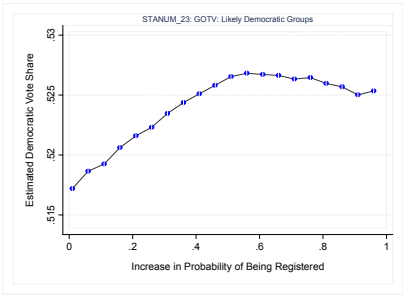



MASSACHUSETTS




MICHIGAN

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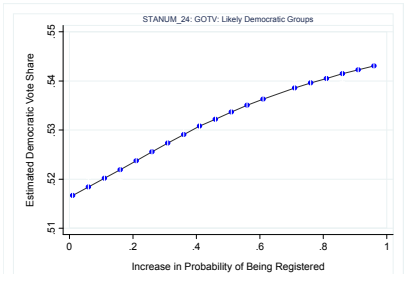


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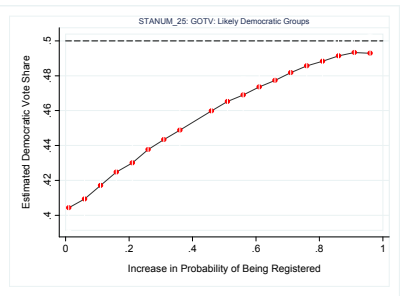


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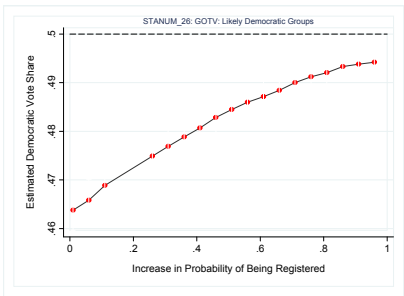


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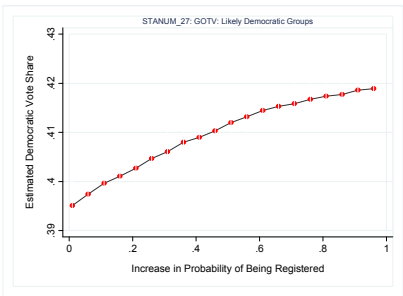


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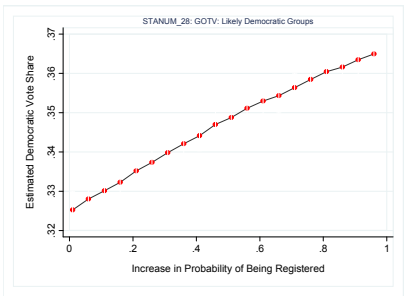


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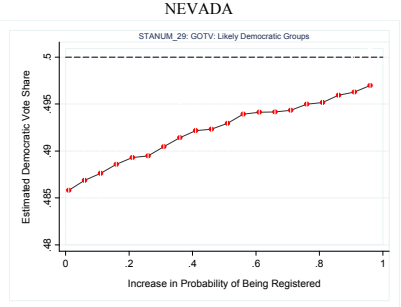


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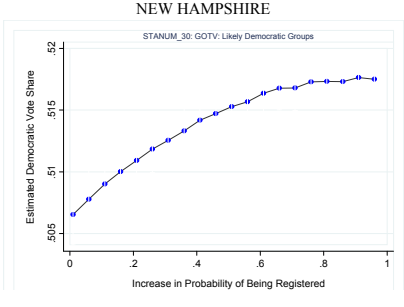


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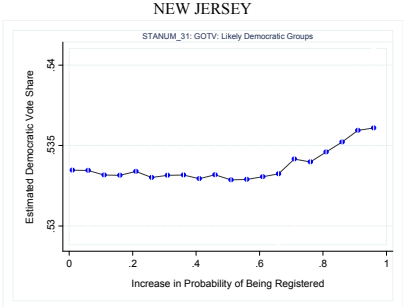
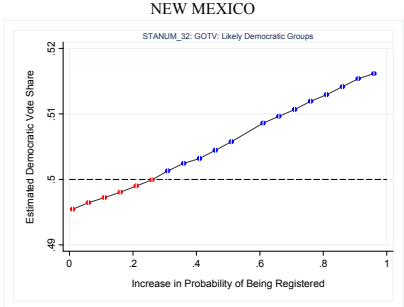



NEW MEXICO



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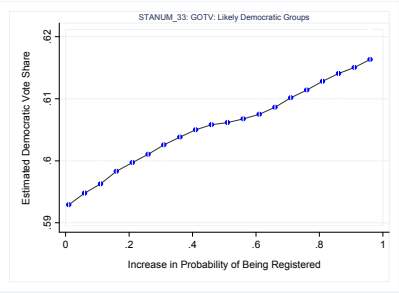


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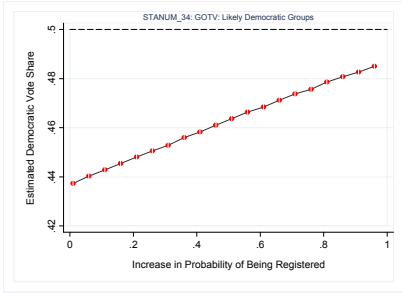


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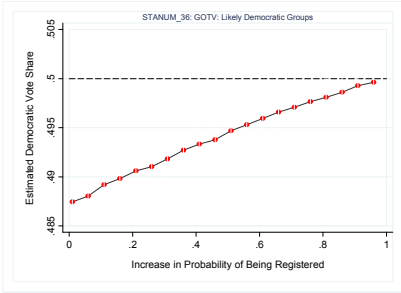


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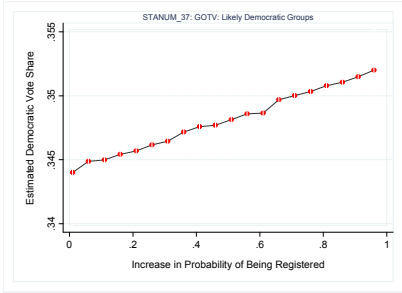


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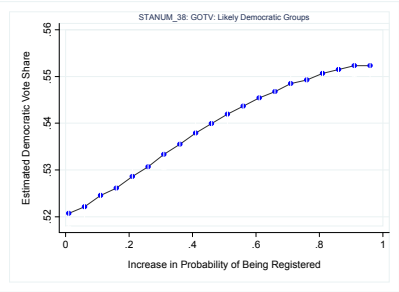


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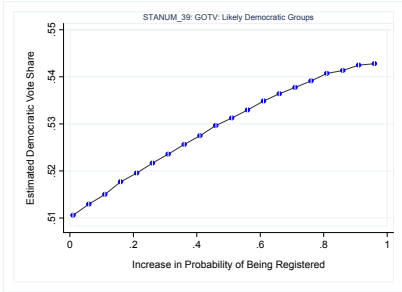


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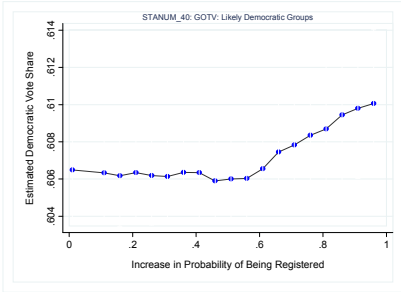


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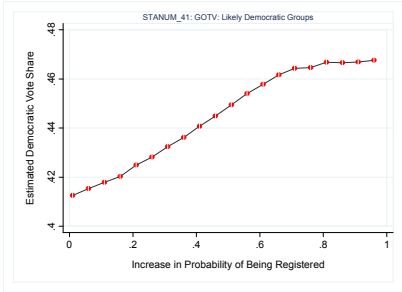
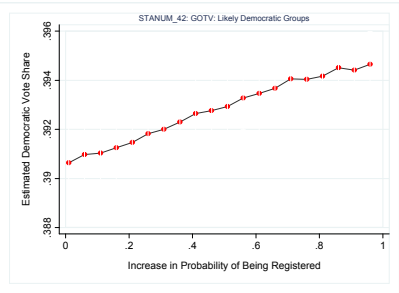



SOUTH DAKOTA

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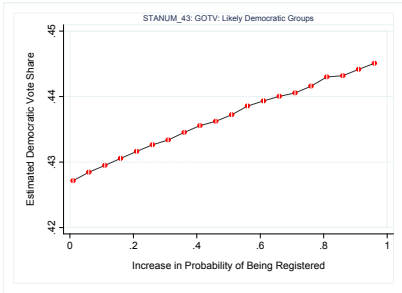


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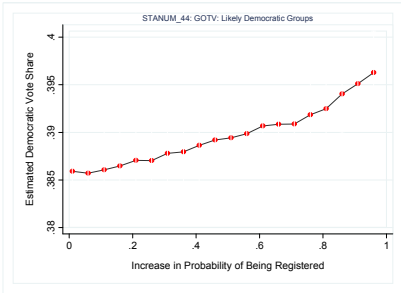


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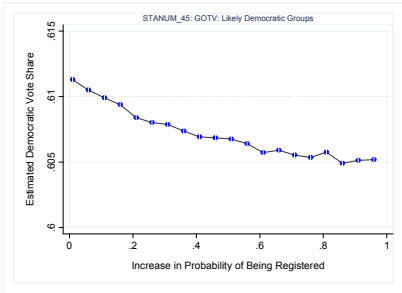


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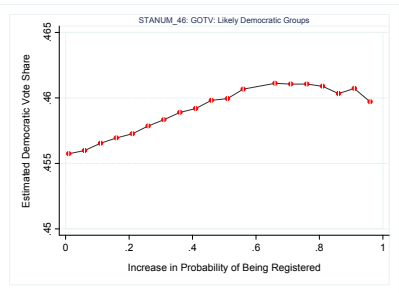


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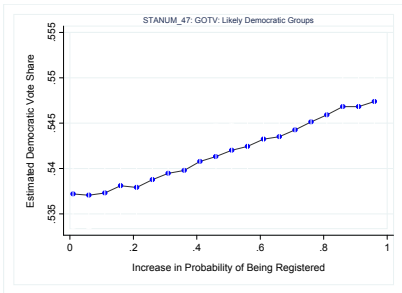


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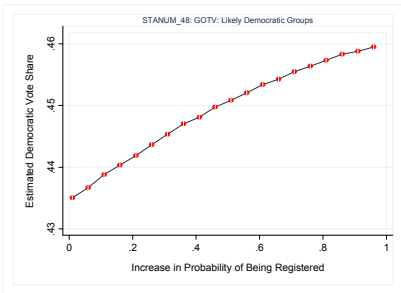


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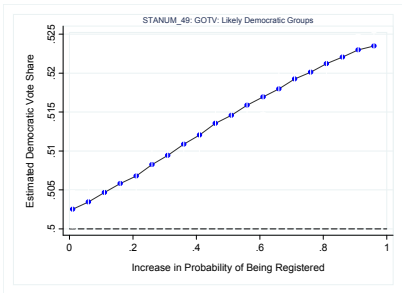

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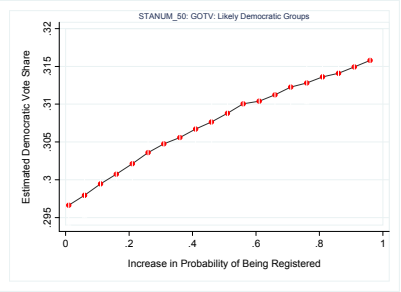
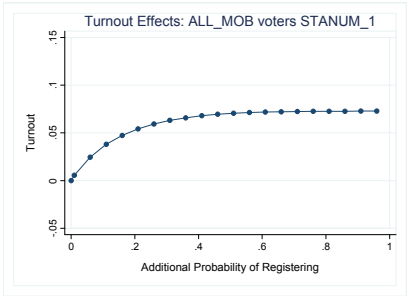

STANUM_50: GOTV: Likely Democratic Groups
Estimated Democratic Vote Share
.295
.3
.305
.31
.315
.32
0
.2
.4
.6
.8
1
Increase in Probability of Being Registered

ALABAMA

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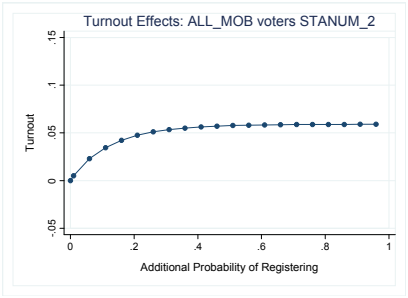


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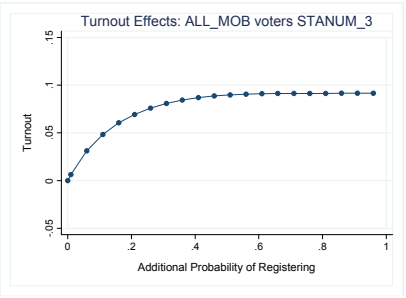


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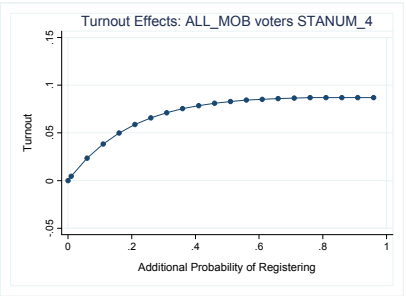
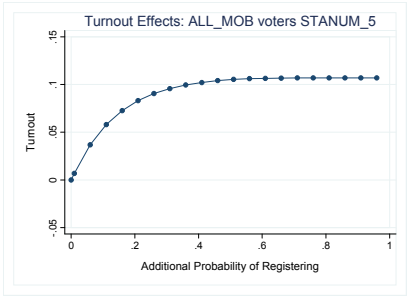



CALIFORNIA

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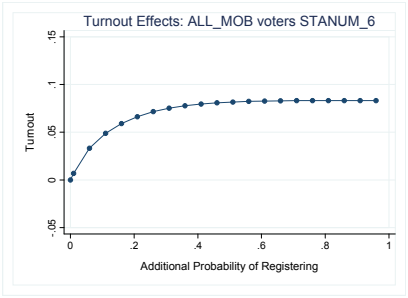
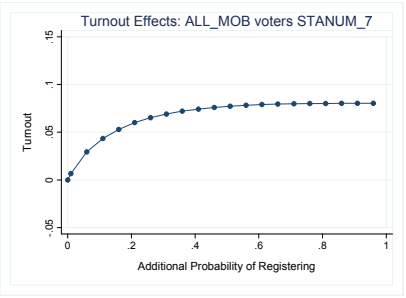
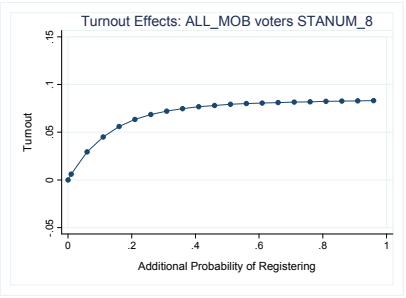


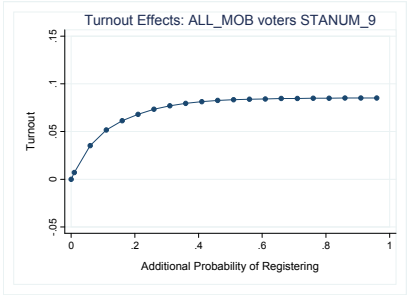

CONNECTICUT



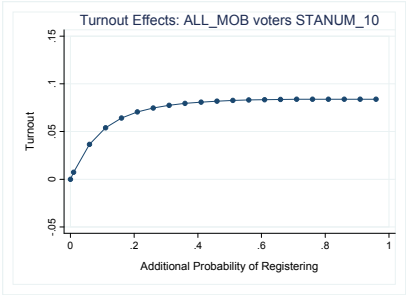

DELAWARE



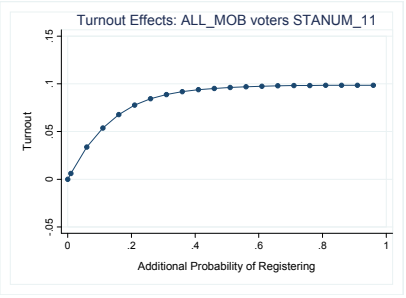

D.C.




FLORIDA




GEORGIA

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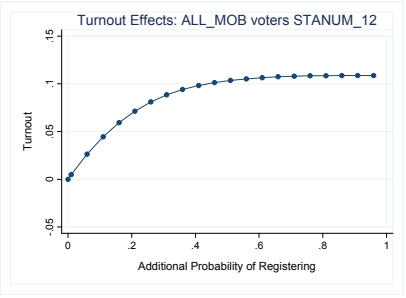


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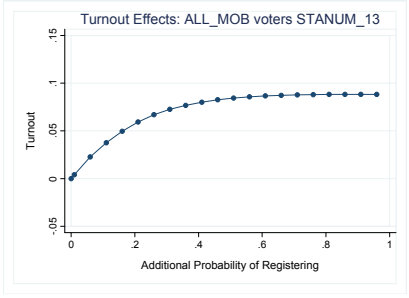


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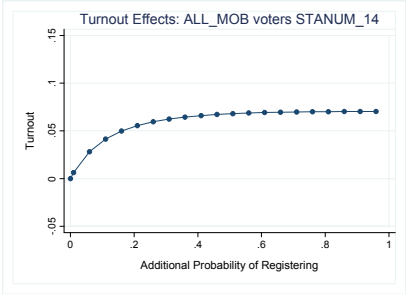


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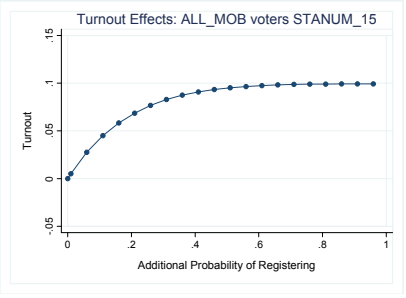
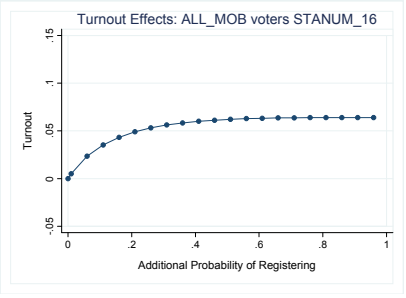



IOWA



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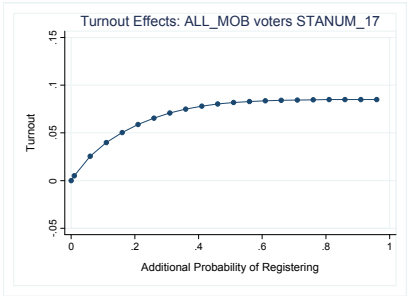


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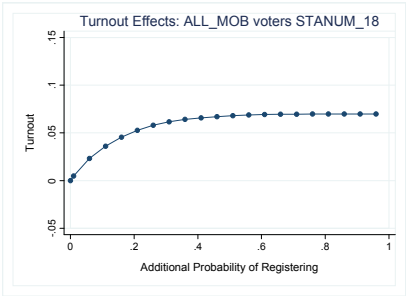
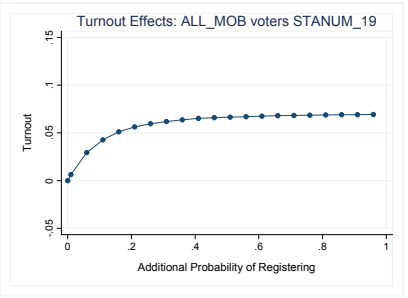
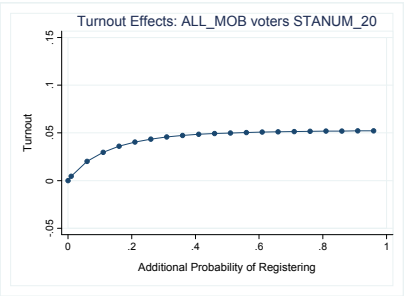


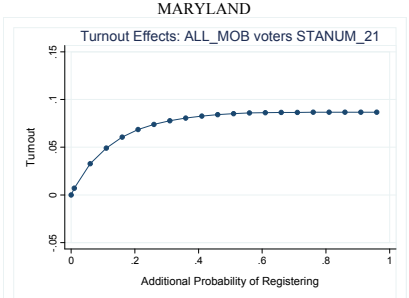

LOUISIANA



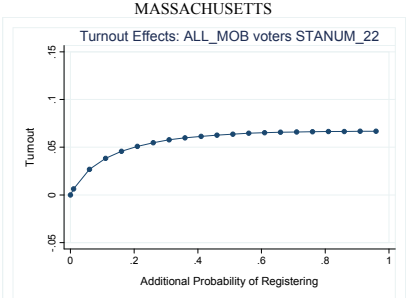

MAINE




MARYLAND




MASSACHUSETTS

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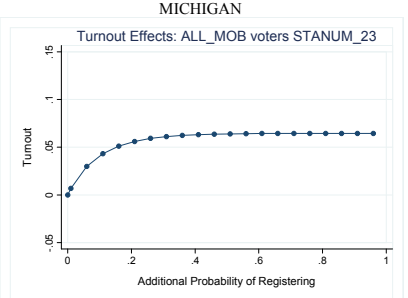
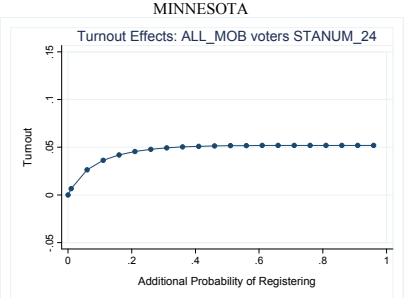



MINNESOTA

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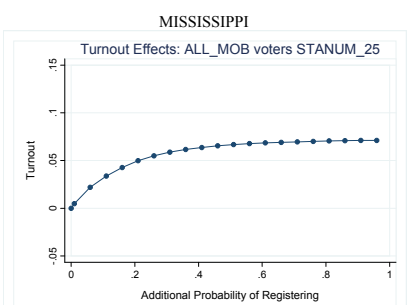


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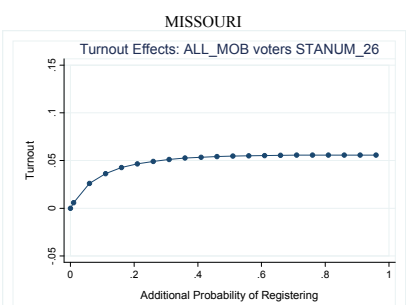
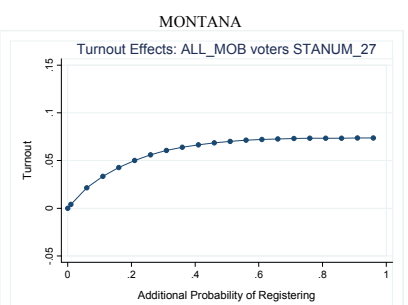



MONTANA

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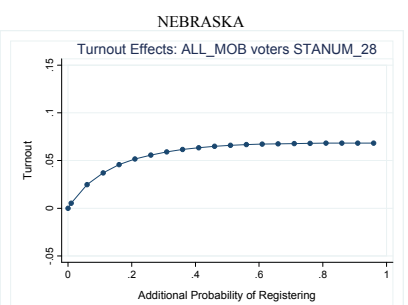


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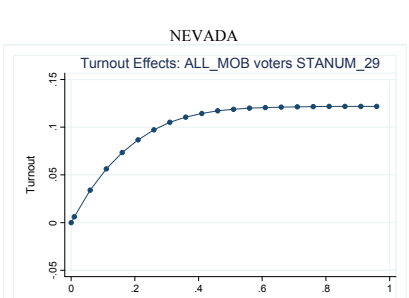


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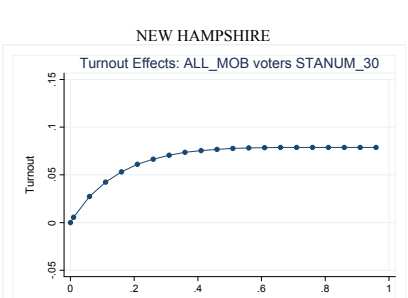


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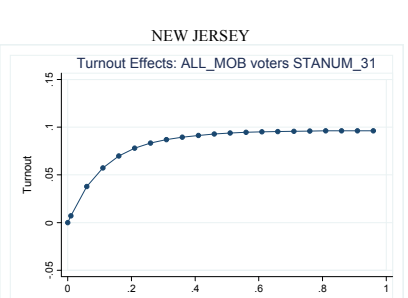


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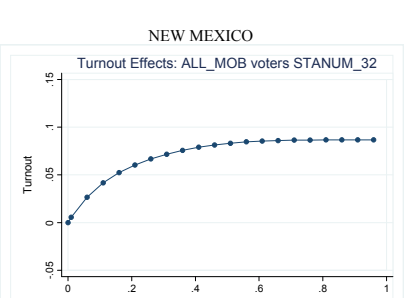

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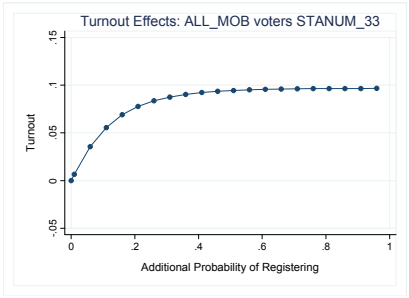


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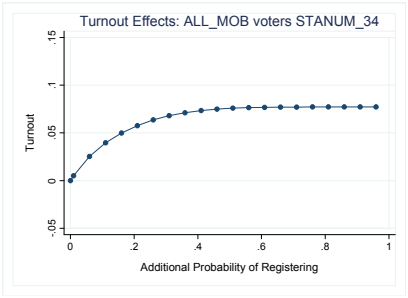


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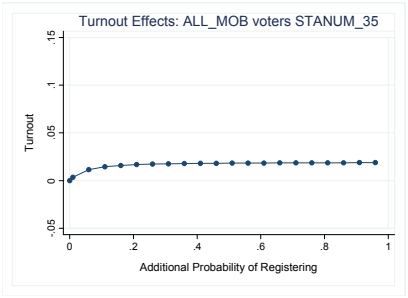


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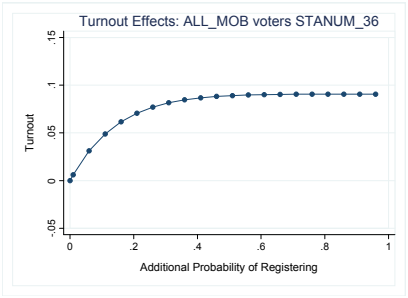


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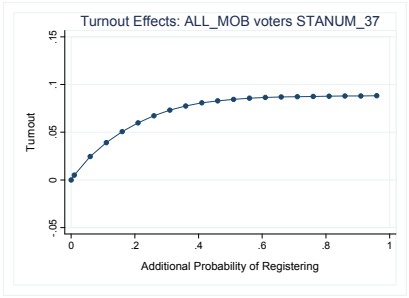


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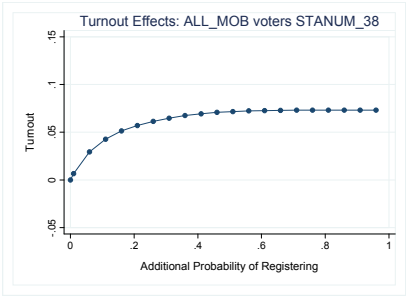


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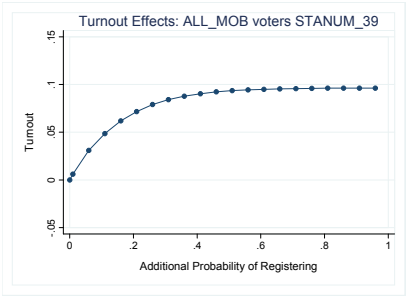


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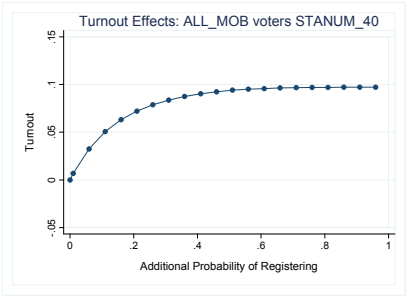


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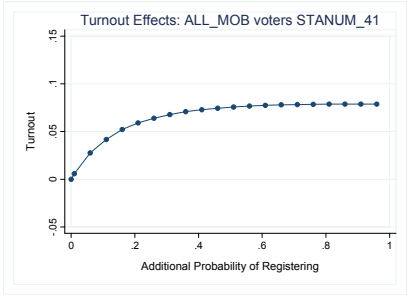
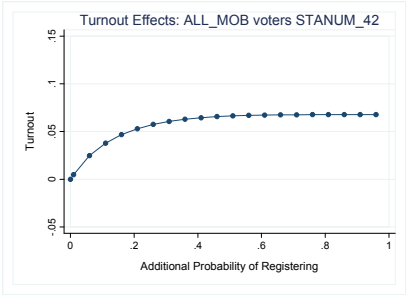



SOUTH DAKOTA

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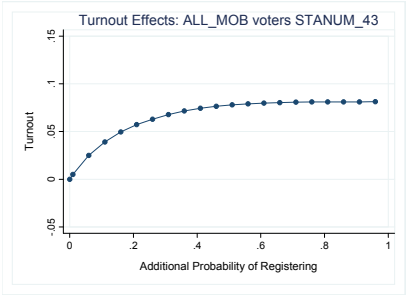


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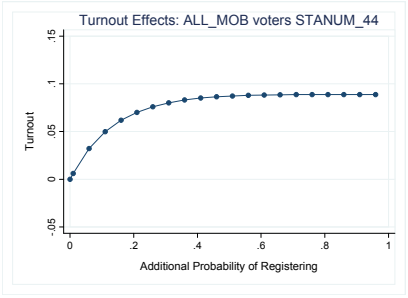


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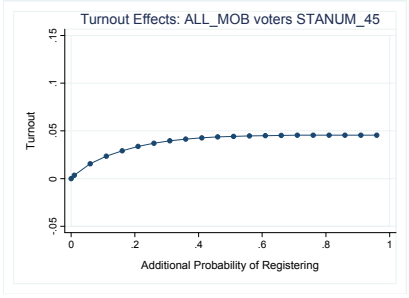
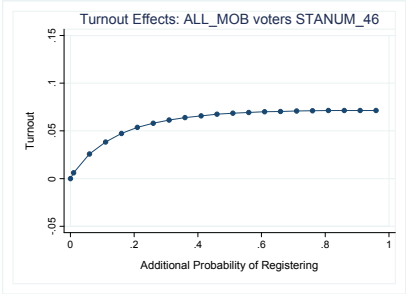
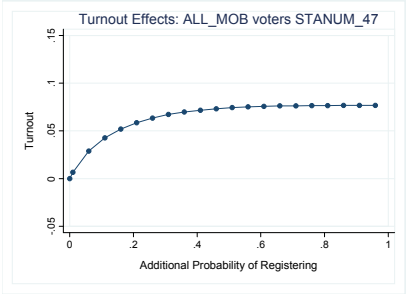



VIRGINIA




WASHINGTON

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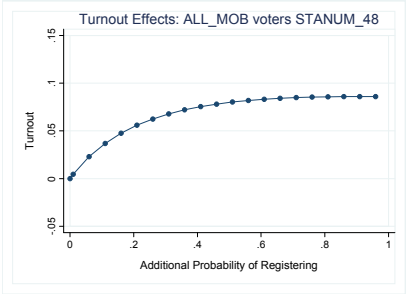

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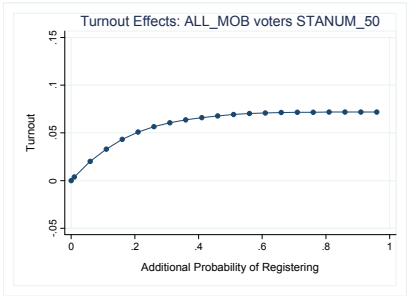


WYOMING