Does Context Trump Individual Drivers of Voting Behavior? Evidence from U.S. Movers

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Abstract

This paper assesses the relative influence of contextual drivers of voter behavior, such as economic growth, voting rules, and media consumption, vs. individual factors, such as race and education. We use individual-level panel data covering the vast majority of the U.S. voting-age population from 2008 to 2018 and track changes in movers' registration, turnout, and party affiliation as they cross state lines to estimate a value-added model including voter, state, and election fixed effects, and allowing movers' behavior to be arbitrarily different, both in levels and average trend, than non-movers'. We find that state characteristics explain about 34 percent of the observed cross-state variation in turnout, and voter characteristics the residual 66 percent. Contextual factors also exert a substantial, albeit slightly lower, influence on registration and party affiliation. Their impact on party affiliation is similar for voters of different ages, genders, and races and their impact on participation larger for younger voters. No-excuse absentee voting and education are the factors most strongly correlated with state and average voter turnout effects. Closed primaries and the number of civic organizations are the strongest predictors of state fixed effects for both Democratic and Republican Party affiliation.

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1 Introduction

People's party affiliation and their level of electoral participation are influenced by individual factors, such as race and education (e.g., Schlozman et al., 2012), and contextual factors, such as economic growth, voting rules, and media consumption (e.g., Brender and Drazen, 2008; DellaVigna and Kaplan, 2007). To determine which of these two sets of factors matters the most, we use individual-level panel data covering the vast majority of the U.S. voting-age population from 2008 to 2018, follow movers as they cross state lines, and test whether and to what extent their likelihood to register, vote, and affiliate with the Republican or Democratic Party adjusts to their destination's context. Our findings shed light on the drivers of voter behavior, which in turn determines election outcomes and public policies, and on the reasons underlying large differences in participation and partisanship across groups and locations.

Electoral participation varies greatly by race, age, education, and other individual factors: Black, Hispanic, and Asian citizens are much less likely to vote than Whites,[1] young people than seniors, and turnout is positively correlated with education, occupation, religiosity, and income (e.g., Wolfinger and Rosenstone, 1980; Verba et al., 1995; Schlozman et al., 2012; Leighley and Nagler, 2013). But socio-demographic characteristics also strongly correlate with vote choices and policy preferences (e.g., Alesina and La Ferrara, 2005; Hersh and Goldenberg, 2016; Pew Research Center, 2016; Marshall, 2019). Unequal participation across groups might thus lead to election outcomes and policies that differ substantially from the preferences of the majority of the population (Meltzer and Richard, 1981; Husted and Kenny, 1997; Mueller and Stratmann, 2003; Miller, 2008; Hansford and Gomez, 2010; Fujiwara, 2015), which can in turn weaken the legitimacy of elected officials and democratic regimes and further reduce the participation of groups that feel excluded (Lijphart, 1997).[2]

[1] For example, see: http://www.pewresearch.org/fact-tank/2017/05/12/black-voter-turnout-fell-in-2016-even-as-a-record-number-of-americans-cast-ballots/ Accessed: 6/29/2018.

[2] While preferences stated in surveys by non-voters tend to be relatively similar to voters' (Highton and Wolfinger, 2001), large shifts in vote shares and policies typically ensue from higher and more equal turnout (Tucker et al., 1986; Mueller and Stratmann, 2003; Hajnal and Trounstine, 2005; Hansford and Gomez, 2010; Fowler, 2013; Bechtel et al., 2016), in particular after the enfranchisement of women (Miller, 2008), ethnic minorities (Husted and Kenny, 1997;

Importantly, voters with different characteristics are not evenly spread out across space. Instead, segregation by ethnicity, age, or income is salient at any geographical level, with different streets, neighborhoods, counties, and states showing large differences in their racial mix-up, average age, or affluence (e.g., Massey and Denton, 1998; Enos, 2017). Turnout and partisanship differences across groups are thus mirrored in a second type of differences, across locations (e.g., Johnston et al., 2016; Brown and Enos, 2018). For example, state-level turnout in the 2014 midterm election ranged from 38.5 percent in Hawaii to 63.9 percent in Minnesota (McDonald, 2018), encouraging politicians to pay uneven attention to the needs and desires of different places as much as different groups (Cascio and Washington, 2014). Differences in partisanship between "blue" and "red" states are just as strong and they can be equally consequential, due for instance to national politicians favoring politically aligned locations (e.g., Grossman, 1994; Berry et al., 2010; Brollo and Nannicini, 2012; Bracco et al., 2015; Corvalan et al., 2018).

Geographical segregation makes identifying the factors responsible for differences in voter behavior even more important, but it also makes the task difficult. Indeed, beyond differences in average education or racial composition, states also differ in their voter registration laws (such as their registration deadline and whether they allow Election Day registration), voting rules (such as early and absentee voting and voter ID laws), polling station density, media coverage, campaign intensity, electoral competitiveness, and economic growth. Starting with Harold Gosnell's work on differences between electoral systems in Europe and in the US (Gosnell, 1930), cross-country and cross-state comparisons have established that these contextual factors are themselves associated with large differences in participation and vote choice (e.g., Rosenstone and Wolfinger, 1978; Powell, 1986; Jackman, 1987; Radcliff, 1992; Knack, 1995; Gray and Caul, 2000; Lewis-Beck and Stegmaier, 2000; Wolfinger et al., 2005; Blais, 2006; Johnston et al., 2016).

It is thus difficult to separate the share of differences in voter behavior that results from such place characteristics from the share that results from voter characteristics. But disentangling the role played by these two sets of factors is important to understand voters' decisions and inform

Cascio and Washington, 2014), or less educated citizens (Fujiwara, 2015). This indicates that the combination of group differences in participation and in preferences can have decisive policy consequences.

election-related policies. For instance, changes in voting rules will not affect voter behavior if differences are primarily driven by individual characteristics. Conversely, civic education programs will not equalize voter participation if institutional factors are its main driver.

We separate the role of voter vs. state factors by exploiting migration of U.S. voters and using the largest individual-level dataset ever assembled to study voter participation and partisanship. These novel administrative data, collected and maintained by the political data vendor Catalist, cover the vast majority of voting-age individuals in the U.S. from 2008 to 2018 and track them over time, resulting in a total of over 1.5 billion observations (approximately 250 million observations per election times six general elections). We measure two indicators of participation – voter turnout, and registration – and proxy partisanship with party affiliation, one of the strongest predictors of people's likelihood to vote for the Republicans or the Democrats. We first track changes in voter behavior for individuals who move across states in an event-study setting. If geographic heterogeneity in voter behavior is entirely driven by individual characteristics, then post-move changes in movers' registration, turnout and partisan affiliation will be uncorrelated with differences in average behavior across states of origin and destination. Conversely, if this heterogeneity is attributable to contextual factors, then movers' behavior will, after move, converge toward the average in the destination state. We find that movers' turnout jumps discretely by 0.40 (or about 40% of the difference in average participation between origin and destination) at the first post-move election and slightly decreases afterwards. Voter registration and party affiliation jump by 0.21 and 0.36 immediately after the move, and remain flat thereafter. Some changes in party affiliation may be driven by differences in primaries' rules prevalent in the origin and destination states rather than actual change in partisanship. However, the magnitude of the change in party affiliation after the move only decreases slightly, to 0.30, when we restrict the sample to moves between pairs of states with identical rules.

We then use our full sample to estimate a value-added model including voter, state, and election fixed effects, and allowing movers' behavior to be arbitrarily different, both in levels and average trend, than non-movers'. In line with the event study, we find that state characteristics explain about 34 percent of the observed variation in voter turnout between states with above-median and below-median voter turnout, and voter characteristics the residual 66 percent. The same decomposition reveals that contextual factors also explain about 26 percent of the observed cross-state variation in voter registration, and 28 and 21 percent of the cross-state variation in Democratic and Republican Party affiliation. We obtain similar estimates of the relative contributions of voter and state effects when comparing other groups of high- and low-outcome states. In sum, context exerts a considerable influence on voting behavior, but it does not matter as much as individual factors. In addition, contextual factors matter relatively more for voter turnout than for party affiliation.

Our empirical strategy allows us to make four important contributions to the literature studying the determinants of voters' behavior and attitudes. First, existing studies tend to focus on a *specific* factor, and they exploit exogenous variation to isolate its impact from the influence of correlated variables. A number of studies rely on state-level changes in voter registration laws (Burden et al., 2014), compulsory voting (Fowler, 2013; Hoffman et al., 2017), early voting (Burden et al., 2014; Kaplan and Yuan, 2019), Election Day Registration (Keele and Minozzi, 2013), or voter ID requirements (Highton, 2017), while others leverage variation – either naturally occurring or introduced by experimental manipulation – in localities and individuals' exposure to voting rules (Holbein and Hillygus, 2016; Braconnier et al., 2017), voting technologies (Fujiwara, 2015), electoral campaigns (e.g., Ansolabehere et al., 1994; Gerber and Green, 2000, 2015; Pons, 2018; Spenkuch and Toniatti, 2018), media coverage (e.g., Gentzkow, 2006; DellaVigna and Kaplan, 2007; Gentzkow et al., 2011; Falck et al., 2014; Adena et al., 2015), favorable economic context (e.g., Brunner et al., 2011; Charles and Stephens, 2013; Bagues and Esteve-Volart, 2016; Wolfers, 2018), and neighborhood composition (Perez-Truglia, 2018) to isolate the impact of these contextual factors. Another set of studies focus on voter characteristics and use exogenous variation to assess the influence of a specific factor such as education (e.g., Dee, 2004; Milligan et al., 2004; Sondheimer and Green, 2010), income (e.g., Doherty et al., 2006; Peterson, 2016), stock ownership (Kaustia et al., 2016; Jha and Shayo, 2018), or religiosity (Gerber and Green, 2016). Our goal is diametrically different, as we endeavor to assess the *overall* importance of all relevant state and voter factors.

Second, existing research designs are unable to assess the role of factors that are unobserved or that do not offer credible exogenous variation, for instance voting rules that vary across space but not time, or biological factors such as race, gender, or age, which unlike income or education are inherent to an individual. Instead, our estimates take all factors varying across states or individuals into account.

Third, we compare the relative influence of contextual and individual factors for voters of different ages, genders, and races. Contextual factors explain a larger share of the cross-state variation in turnout and registration for younger voters and a larger share of the variation in registration for ethnic minorities but a lower share of the variation in their turnout rate. Instead, the decomposition of cross-state variation in party affiliations between individual and place factors is strikingly similar for different groups.

Fourth, we build on multivariate regressions of voter turnout or partisanship by identifying observable correlates of their state and voter components. No-excuse absentee voting and education are the factors most strongly correlated with state and average voter turnout effects respectively. Closed primaries and the number of civic organizations are the strongest predictors of state fixed effects for both Democratic and Republican Party affiliation.

Methodologically, we draw on value-added models estimated in other settings, in particular on a number of recent studies which, like ours, track movers across states, companies, or schools to investigate the sources of spatial variation in health care utilization (Finkelstein et al., 2016) and intergenerational mobility (Chetty and Hendren, 2018a,b), wage differences across workers and companies (Abowd et al., 1999; Card et al., 2013), and variations in students' outcomes (Chetty et al., 2014). We are particularly indebted to the empirical framework laid out in Finkelstein et al. (2016). While our focus on movers is primarily driven by the goal to disentangle the influence of individual-level and state-level factors, it also allows us to make a substantial contribution to the literature on the political motives (e.g., Hirschman, 1970; Bishop, 2009; Abrams and Fiorina, 2012; Sussell, 2013; Tam Cho et al., 2013) and effects (e.g. Gay, 2012) of spatial mobility: we do not find evidence that spatial sorting across states is driven by gradual *changes* in movers' level of political participation but we do observe a systematic drop in participation after the move, in line with Gay (2012).

The remainder of the paper is organized as follows. Section 2 provides more information on Catalist's voter-level panel data. Section 3 lays out the empirical specifications and Section 4 presents the corresponding results. Section 5 identifies the correlates of average voter and state effects, and Section 6 concludes.

2 Data

2.1 Catalist's Voter-Level Panel Data

Our empirical strategy requires observing both individual voter behavior (registration, turnout, and party affiliation) and place of residence for the universe of the U.S. voting-eligible population at multiple elections to track movers' behavior as they cross state boundaries. Building such a panel is challenging, because files commercialized by political data vendors typically contain voters' residential information as of the day of a customer's request, but lack any information on movers' previous addresses. Fortunately, Catalist's data allow us to overcome this limitation.

Catalist is a political data vendor that maintains a national database of over 250 million unique voting-age individuals. Information on registered voters comes from voter registration and turnout records collected from all 50 states and the District of Columbia. These administrative data are supplemented by commercial records on about 55 million unregistered individuals provided by data aggregation firms and based on customer files from retailers and direct marketing companies.

Over time, Catalist continually updates its database to incorporate new state voter files released after each election as well as commercial data refreshes, and it identifies deceased voters based on the Social Security Death Master File (SSDMF) datasets. Crucially for our ability to follow movers across states, Catalist also identifies people changing addresses based on records in the USPS National Change of Address (NCOALink®) and by systematically comparing the voter lists and commercial records of different states. Catalist gives each person a unique ID, invariant across years and files. Data matching procedures are run to ascertain potential matches across files. For example, if a voter registered with the first name "Tom," but commercial records include an individual called "Thomas" with the same last name, address, and sociodemographic characteristics, Catalist will recognize that it is the same individual and reconcile the two sources of information (Ansolabehere and Hersh, 2014).

The information Catalist shares with its clients usually stems from a cross-sectional "live file," containing the present-day address and information and the full voter turnout history of every individual who ever appeared in its database. Since 2008, however, Catalist has also been saving "historical files": snapshots of its live file as of the date of each biennial nationwide election.[3]

We received six historical files, corresponding to the 2008, 2010, 2012, 2014, 2016, and 2018 nationwide elections, and matched them with the current live file. The live file constitutes our source of longitudinal information on voter behavior and the historical files our source of longitudinal information on voters' residence. To the best of our knowledge, we are the first researchers to use voter-level panel data on registration, turnout, and partisanship, and geographic residence covering the vast majority of the U.S. voting-eligible population.

For each election, the historical files we received from Catalist report voters' state and county of residence at that time, a flag for whether the voter was deceased,[4] registration status,[5] party affiliation (for voters registered in states with party registration), an indicator for permanent absentee status, and a flag for "best state."[6] According to these data, about 4.0 million voters (resp. 5.3

[3]Since it takes two to five months after Election Day for election administrators to process and give Catalist individual-level voter turnout information, historical files are copies of the live file as of two to five months after the corresponding Election Days. For instance, the 2008 historical file was saved between January and March 2009.

[4]Voters are flagged as deceased when they appear in the SSDMF.

[5]Voter registration features five possible values: A, I, D, M, or U. "A" and "I" denote voters appearing on a state registration file with, respectively, "active" or "inactive" registration status. "D" stands for "dropped" and indicates individuals who appeared on past state voter files, but not in the most recent one. "M" stands for "moved, unregistered", that is, voters who, according to NCOA or commercial data, have moved into the state, but are not found re-registered for that state. "U" are voters whose status is "unregistered" as they do not appear on current or past voter files but are known to reside in the state.

[6]When a voter is observed moving across states, Catalist creates a new record, and updates the original record (e.g., recoding the voter's registration status from "active" to "dropped") instead of erasing it. Consequently, the Catalist database is uniquely identified by voter ID *and* state. After using voter ID and state to match the historical files with the live file, we use the "best-state" flag to deduplicate on voter ID. Specifically, we deduplicate the matched historical files using the following lexicographic rules: we privilege the record corresponding to the state where a voter voted, if any; then records flagged as "best state"; then we use voter registration, privileging voter registration statuses in

million, 4.6 million, 5.9 million, and 6.7 million) moved across state boundaries between 2008 and 2010 (resp. 2010-2012, 2012-2014, 2014-2016, and 2016-2018). From the Catalist live file, we received the following variables: full turnout history, the state where the voter cast her ballot in each general election in our sample, if any, age, race, source of race information, and gender. Catalist's information on age, race and gender is available for nearly all voters and has been shown to be very reliable (Fraga, 2016b). Other variables in the Catalist's full database are only available for a subset of individuals or at a more aggregate level (such as the census block). We did not request them out of budgetary considerations.

2.2 Data Limitations

While an in-depth assessment of the Catalist's database is beyond the scope of this project,[7] it is important to note two limitations of the data. First, Catalist's coverage of the unregistered population is imperfect. In fact, Catalist acknowledges that the commercial data used for unregistered citizens cover the voting-age (VAP), rather than the voting-eligible population (VEP). Moreover, Jackman and Spahn (2018) estimate that at least 11% of the adult citizenry does not appear in commercial voter lists like Catalist's. Second, Ansolabehere and Hersh (2014) argue that Catalist's deceased flag misses some dead voters, making the total number of deceased voters in the voter file lower than it really is. The mis-categorization of some deceased voters and commercial data covering the VAP instead of the VEP likely explain why Catalist's state turnout rates are lower than McDonald (2018)'s.[8]

Despite this discrepancy in levels, two-way and Spearman's rank correlations between Catalist's and McDonald's turnout rates are very high (respectively .7836 and .8077), assuaging concerns

this order: "A", "M", "U", "I", and "D"; then we privilege the record with the oldest registration date; finally, among residual duplicates, we keep a reproducibly random record. All results are virtually identical when we deduplicate ignoring the voter turnout criterion.

[7]See Ansolabehere and Hersh (2014) for a thorough discussion of Catalist's database and the underlying data collection and maintenance practices. Other papers using cross-sectional extractions of Catalist's data include Fraga (2016a), Fraga (2016b), Hersh and Nall (2016), and Hersh and Goldenberg (2016).

[8]McDonald's turnout figures are widely considered the most reliable estimates of the share of the state voting-eligible population turning out in a particular election. See McDonald and Popkin (2001) for a discussion on how these rates are computed.

that cross-state heterogeneity in the quality of Catalist's state registration records may bias our estimates. Moreover, our event-study results are very similar when we compute mean state turnout using McDonald's instead of Catalist's data (see Section 4.2).

2.3 Summary Statistics

Figure 1a shows average turnout rates across the fifty states and the District of Columbia. State averages are computed by first calculating the percentage of individuals in the state who turn out in each election, and then taking a simple average across elections. The map reveals a North-vs.-South turnout divide, with states in the northern half of the country characterized by higher voter participation than their southern counterparts. As shown on the histogram in Appendix Figure A1a, the mean state has an average turnout rate of 43.7 percent. Minnesota has the highest turnout rate (57.6 percent), while Mississippi trails all other states with an average turnout of only 33.5 percent.

Figure 1b shows an equally striking but different geographic clustering of partisanship by state. We plot state averages of the Democratic Two-Party affiliation share, defined as the fraction of voters affiliated with the Democratic Party among voters affiliated either with the Republican or the Democratic Party, in all 30 states in which party affiliation is available. We observe a familiar divide between blue coastal states and red interior states. The Democratic Two-Party affiliation share goes from 18.3 percent in Utah to 92.5 percent in DC, and is 55.3 percent in the mean state, as reported in Appendix Figure A1b.[9]

Our analysis aims to estimate the share of differences shown in Figure 1 that results from differences in contextual factors instead of differences in the individual characteristics of the people living in each state. Our estimation strategy, described in detail in section 3, relies on tracking the voting behavior of cross-state movers. Our sample includes a total of 14.2 million one-time movers, who crossed state boundaries exactly once. For simplicity, all analyses exclude voters

[9] Appendix Figures A2 and A3 show the same maps and histograms for the four following additional outcomes: registration, affiliation with the Democratic Party, affiliation with the Republican Party, and other affiliation (a dummy equal to 1 for registered people affiliated with another party than Republicans and Democrats or not affiliated with any party).

who change states more than once.[10] Table 1 reports summary statistics separately for one-time movers and stayers, who never cross state borders in the study period. On average, movers are more likely to be White, they are slightly younger, and include a larger fraction of women. They have higher turnout and registration rates and are more likely to be affiliated with the Republican Party or registered but affiliated neither with the Republicans nor with the Democrats. Finally, Figures 2a and 2b plot the distributions of destination-minus-origin differences in mean state turnout and Democratic Party affiliation for one-time movers. Both distributions are roughly symmetric and the average differences in both outcomes are approximately zero, which implies that moves from low- to high-turnout states or moves from red to blue states are as frequent as moves in the opposite directions.[11]

3 Empirical Specifications

3.1 Main Decomposition

Our decomposition is based on the following equation:

$$y_{ijt} = \alpha_i + \gamma_j + \tau_t + \rho_{r(i,t)} + \varepsilon_{ijt}, \tag{1}$$

where y_{ijt} is a binary outcome for voter i living in state j at election t. α_i, γ_j and τ_t denote voter, state, and election fixed effects, respectively. Election fixed effects are normalized to be equal to 0 on average. For movers, $r(i,t) = t - t_i^*$ is the election relative to the first post-move election t_i^* (so $r(i,t) = 0$ if t is the first election after the move, $r(i,t) = -1$ if t is the last election before the move, etc.) and $\rho_{r(i,t)}$ indicates fixed effects for election relative to move. Under the assumption of additive separability in i, j, and t embedded in equation [1], $E(\varepsilon_{ijt}|i, j, t) = 0$.

We estimate the parameters in this equation using all movers and stayers in the Catalist database.

[10] Table A1 in the Appendix shows the fraction of movers who moved between any two of the nine census divisions: East North Central, East South Central, Middle Atlantic, Mountain, New England, Pacific, South Atlantic, West North Central, and West South Central.

[11] Figure A4 in the Appendix shows the same graph for registration, Republican Party affiliation, and other affiliation, with similar patterns.

The equation is only identified because the data include movers. Otherwise, the state fixed effects γ_j would be absorbed by the individual fixed effects α_i.

Estimating equation [1], we pursue two objectives. First, we want to estimate the total contributions of state-specific characteristics (such as voter ID laws and economic growth) and voter-specific factors (such as voters' age and education) to cross-state variation in voter behavior. Second, we aim to decompose the *share* of variation in voter behavior due to these two sets of factors and, so, determine the relative influence of state- and voter-characteristics on registration, turnout, and party affiliation.

Our decomposition between these two types of factors follows Finkelstein et al. (2016). Let $\bar{y}_{jt}$ be the expectation of y_{ijt} across voters living in state j in election t, and $\bar{y}_j$ be the average of $\bar{y}_{jt}$ across t. $\bar{y}_{jt}^{vot}$ and $\bar{y}_j^{vot}$ denote the analogous expectations for the part of voter behavior imputable to voter characteristics, $y_{it}^{vot} = \alpha_i + \rho_{r(i,t)}$. Using this notation, equation [1] implies that $\bar{y}_j = \bar{y}_j^{vot} + \gamma_j$ and, for any two states j and j',

$$\bar{y}_j - \bar{y}_{j'} = (\gamma_j - \gamma_{j'}) + (\bar{y}_j^{vot} - \bar{y}_{j'}^{vot}). \tag{2}$$

Equation [2] shows that the difference in average voter behavior across states j and j', $\bar{y}_j - \bar{y}_{j'}$, is the sum of two components. The first component, imputable to state-specific factors, is given by the difference between the corresponding state fixed effects: $\gamma_j - \gamma_{j'}$. The second component, due to voter characteristics, is given by the difference between the voter-specific components: $\bar{y}_j^{vot} - \bar{y}_{j'}^{vot}$.

The shares of the difference in voter behavior between states j and j' attributable to states and voters are then given by, respectively:

$$S^{state}(j,j') = \frac{\gamma_j - \gamma_{j'}}{\bar{y}_j - \bar{y}_{j'}}, \tag{3}$$

$$S^{voter}(j,j') = \frac{\bar{y}_j^{vot} - \bar{y}_{j'}^{vot}}{\bar{y}_j - \bar{y}_{j'}} = 1 - S^{state}(j,j'). \tag{4}$$

Although $S^{state}(j,j')$ and $S^{voter}(j,j')$ sum to 1, neither needs to be within the unit simplex, since $\gamma_j - \gamma_{j'}$ and $\bar{y}_j^{vot} - \bar{y}_{j'}^{vot}$ can have opposite signs. When we apply our decomposition to the difference in behavior between groups of states, $\bar{y}_R$, $\bar{y}_R^{vot}$, and $\bar{\gamma}_R$ denote the simple averages of $\bar{y}_j$, $\bar{y}_j^{vot}$, and γ_j across the states in group R. Similarly, we define $S^{state}(R,R')$ and $S^{voter}(R,R')$ as the shares of differences in voter behavior between states in groups R and R' attributable to states and voters, respectively. We compute the sample analogues of $\bar{y}_j$ directly from the Catalist data and denote them $\hat{y}_j$. We obtain consistent estimates $\hat{\gamma}_j$ of $\bar{\gamma}_j$ from estimating regression [1] and derive consistent estimates of $\bar{y}_j^{vot}$ by subtracting $\hat{\gamma}_j$ from $\hat{y}_j$: $\hat{y}_j^{vot} = \hat{y}_j - \hat{\gamma}_j$.

Equation [1] allows for arbitrary differences in outcome levels across voters. In particular, via the α_i's, movers' mean behavior can be arbitrarily different from non-movers' without biasing our estimates. Moreover, fixed effects for election relative to move $\rho_{r(i,t)}$ permit differential *trends* in voter behavior across movers and non-movers. Such differential trends may arise for example for turnout and registration, if movers face a cost of re-registering to the voter rolls of the state of destination (Squire et al., 1987) or if the loss of pre-existing social ties associated with moving decreases civic engagement (Gay, 2012).

Despite the flexibility given by the voter and relative election fixed effects, our model is restrictive in at least three important ways. First, like in other studies using movers to estimate value-added models (e.g., Finkelstein et al., 2016; Molitor, 2018), the crucial identifying assumption required to uncover unbiased estimates from equation [1] is that changes in individual drivers of voter behavior for movers do not correlate systematically with differences in average outcomes between their states of origin and destination. We do not have direct ways to test for the presence of shocks to movers' behavior that correlate with outcome differences between origin and destination and coincide *exactly* with the year of the move. However, we can reject changes in individual drivers of movers' behavior that correlate with outcomes in the origin and destination and that develop *gradually*, which would occur for example if voters who become more politically engaged over time respond by moving to relatively high-turnout states or if voters whose preferences get closer to the Democratic Party platform move to blue states. Such changes would appear as pre-trends in the event-study analysis described in Section 3.2, of which we find little evidence. This indicates that our event-study estimates do not mistakenly capture underlying changes in movers' individual characteristics and it reinforces our confidence in the decomposition of cross-state differences in voter behavior based on equation [1].

Second, equation [1] assumes that voter behavior is additively separable in its voter- ($\alpha_i + \rho_{r(i,t)}$) and state-specific components (γ_j). Since relative-election effects $\rho_{r(i,t)}$ do not depend on the specific states of origin and destination, additive separability of voter and state effects implies that the absolute change in voter behavior for voters moving from j to j' (experiencing change in state factors equal to $\gamma_{j'} - \gamma_j$) should be the same as for voters moving from j' to j (experiencing change in state factors equal to $\gamma_j - \gamma_{j'}$). We present a test of this implication in Section 4.1.

Finally, we assume that movers and non-movers face identical state effects γ_s. If movers differ from non-movers in ways that alter the relevant state effects, then our decomposition between state- and individual-level determinants of voter behavior only applies to movers, and not to the rest of the population.

3.2 Event-Study Specification

To trace out changes in voter behavior around moves, we also estimate an event-study equivalent of equation [1]. For voter i who moves from origin state $o(i)$ to destination state $d(i)$, equation [1] can be rearranged as:

$$y_{ijt} = \alpha_i + \gamma_{o(i)} + I_{r(i,t)\geq 0} \times S^{state}(d(i), o(i)) \times \delta_i + \tau_t + \rho_{r(i,t)} + \varepsilon_{ijt}, \tag{5}$$

where δ_i is the difference in average outcomes between i's states of destination and origin, $\bar{y}_{d(i)} - \bar{y}_{o(i)}$, and $I_{r(i,t)\geq 0}$ is an indicator for post-move elections.[12]

Combining $\alpha_i + \gamma_{o(i)}$ into a single voter fixed effect $\tilde{\alpha}_i$, replacing $I_{r(i,t)\geq 0}$ with indicators for election relative to move, and replacing δ_i with its sample analogue $\hat{\delta}_i = \hat{y}_{d(i)} - \hat{y}_{o(i)}$ (computed using both movers and non-movers), we obtain the following event-study specification:

$$y_{it} = \tilde{\alpha}_i + \theta_{r(i,t)} \hat{\delta}_i + \tau_t + \rho_{r(i,t)} + \varepsilon_{it}. \tag{6}$$

[12] To recover equation [1], observe that $S^{state}(d(i), o(i)) \times \delta_i = \frac{\gamma_{d(i)} - \gamma_{o(i)}}{\bar{y}_{d(i)} - \bar{y}_{o(i)}} \times (\bar{y}_{d(i)} - \bar{y}_{o(i)}) = \gamma_{d(i)} - \gamma_{o(i)}$.

The parameters of interest are the $\theta_{r(i,t)}$'s. In relative election $r(i,t)$, $\theta_{r(i,t)}$ measures movers' response to differences in average outcomes between states of destination and origin. Assuming heterogeneity in S^{state} is orthogonal to the other covariates in the model, $\theta_{r(i,t)}$ is a weighted average of $S^{state}(d(i),o(i))$, with weights given by the relative frequency of all pairs of origin and destination states.

The pattern of estimated effects offers indirect tests of our identification assumption: if move-induced changes in state characteristics cause changes in movers' behavior, then $\theta_{r(i,t)}$ should be approximately flat in all pre-move elections. For $r(i,t) \geq 0$, $\theta_{r(i,t)}$'s describe the extent to which post-move voter behavior adjusts to the difference in average outcomes between states of destination and origin. Namely, a discontinuity in the level of $\theta_{r(i,t)}$ after the move indicates how much state-level factors influence individual-level voter behavior. Moreover, the pattern of post-move coefficients can illuminate the underlying mechanisms: effects that appear suddenly on move and then remain stable suggest that discrete factors that are easy to get accustomed to (e.g., election laws) are important drivers of voter behavior, while effects that increase over time underscore the importance of "slow-moving" factors such as the influence of other voters or learning about the candidates in the destination state. Because we include voter fixed effects, the $\theta_{r(i,t)}$ coefficients are only identified up to a constant term; we therefore normalize θ_{-1} to 0.

In all event-study specifications, we compute two-way clustered standard errors by states and voters, thus accounting for the possibility that regression residuals are serially correlated at the individual level and spatially correlated at the state level.

We use the method outlined here to assess the overall influence of contextual and individual factors on voter turnout, in Section 4, and on registration and party affiliation, in Section 5.

4 Voter Turnout

4.1 Descriptive Analysis

As a preliminary look at how voter turnout changes after move, Figure 3 plots the change in movers' turnout against the destination–origin difference in voter participation $\hat{\delta}_i$. For each mover, we compute the change in voter turnout as the difference between average turnout in all post-move elections minus average turnout in all pre-move elections. If states explained individual-level turnout entirely, we would expect the slope of the graph to be 1. Conversely, if voter turnout were independent of state characteristics, we would expect the slope to be 0.

Figure 3 shows that the slope is 0.39, suggesting that state characteristics explain around 40 percent of the observed variation in voter participation. The relationship is symmetric around zero and linear, thus lending support to our model, which implies identical absolute changes in voter turnout for voters moving from state j to j' and for voters moving in the opposite direction.

With an $\times$, we also plot average changes in voter turnout for a sample of matched non-movers. Following Finkelstein et al. (2016), the matched sample is constructed by randomly drawing, for each mover-election, a non-mover in the same election who shares the mover's state of origin, sex, race, and age ventile bin.[13] To construct Figure 3, the matched sample is assigned $\delta = 0$. The matched sample and all points for movers lie vertically below 0, which reflects an overall decline of voter participation occurring in our sample period. Moreover, the matched sample lies vertically above all points for movers, suggesting that cross-state moves are associated with a decline in voter participation (Squire et al., 1987). In our model, this negative effect of moving is captured by the relative election dummies $\rho_{r(i,t)}$.

4.2 Event Study

Our main event-study results are shown in Figure 4, which plots the estimated $\theta_{r(i,t)}$ coefficients on indicators for election relative to move from equation [6]. Whiskers indicate 95-percent

[13] Age ventile bins are computed using all movers and non-movers with non-missing values of age. Along with these 20 bins, we have another category for voters with missing age.

confidence intervals constructed from two-way clustered standard errors at the voter and state levels. Event-study regressions use $\hat{\hat{\delta}}_i$'s estimated using all movers and stayers in each state, but, for computational ease, they are run using the movers sample only.[14]

The plot reveals no (partial) correlation between pre-move turnout and destination-minus-origin differences in average state turnout: estimates of θ_{-5} to θ_{-2} are close to zero and statistically insignificant. The pattern of $\theta_{r(i,t)}$ then jumps discretely at the first post-move election and slightly decreases afterwards. The point estimates on the $\theta_{r(i,t)}$'s and their standard errors are reported in Table A2, column 1.

The pre-move effects help identify differences in turnout trends as a function of where voters move (as described by δ_i). The lack of pre-trends supports the key identifying assumption that changes in individual drivers of voter turnout are not systematically correlated with differences in average participation between origin and destination. In other words, moves are not systematically preceded by gradual changes in individual determinants of voter turnout (e.g., increases in political activism before moving to high-turnout states) which would complicate the causal interpretation of post-move estimates.

The sharp positive change in $\theta_{r(i,t)}$ in the first post-move election (i.e., at $r(i,t) = 0$) indicates a significant and immediate effect of state factors on voter turnout. Consistent with the slope of Figure 3, the magnitude of the jump is approximately 0.40, suggesting that state characteristics explain approximately 40 percent of the observed cross-state variation in voter turnout. Moreover, the lack of increase in post-move adjustments is consistent with the state characteristics driving turnout being "discrete" (e.g., voting rules) and easy for voters to adapt to.[15]

[14]Estimating two-way clustered standard errors (by voters and states) using both movers and non-movers is in fact computationally very costly. However, we find virtually identical point estimates while estimating equation [6] on the full sample (results available upon request).

[15]There are at least two possible interpretations for the fact that the $\theta_{r(i,t)}$'s are actually decreasing after the move. The first is that the influence of the contextual drivers of voter turnout in the destination state decreases over time. A second possible interpretation is that the influence of contextual factors remains equally strong two to five elections after the move but that differences in these factors across states decreased between 2008 and 2018. Since the $\hat{\hat{\delta}}_i$'s (the differences in average turnout between states of destination and origin) with which the $\theta_{r(i,t)}$'s are interacted in equation [6] are time invariant, we should then mechanically expect the observed decreasing pattern. Figure A5 brings support for this interpretation. We report the results from a specification of the form in equation [6], in which we interact the $\theta_{r(i,t)}$'s with year-specific $\hat{\hat{\delta}}_{it}$'s: $y_{it} = \tilde{\alpha}_i + \theta_{r(i,t)}\hat{\hat{\delta}}_{it} + \tau_t + \rho_{r(i,t)} + \varepsilon_{it}$. In this equation, we can estimate the coefficients on all $\theta_{r(i,t)}\hat{\hat{\delta}}_{it}$'s, which are no longer colinear, and the magnitude of the post-move $\theta_{r(i,t)}$'s can no longer

State average turnout rates computed from the Catalist data enter in the $\hat{\delta}_i$'s used as regressors in the event study and they directly affect the estimated $\theta_{r(i,t)}$ as a result. For this reason, limitations of the Catalist data discussed earlier may affect the $\hat{\delta}_i$'s and thus the event-study results. To assess whether this is the case, we estimate a specification in the form of equation [6] replacing the $\hat{\delta}_i$'s computed using the Catalist data with $\hat{\delta}_i$'s constructed using Michael McDonald's turnout figures (McDonald, 2018).[16] Appendix Figure A6, which relies on $\hat{\delta}_i$'s computed using the McDonald's data, is very similar to the event-study plot based on the Catalist data. Like in Figure 4, there is no evidence of significant pre-trends. θ jumps upwards by approximately 0.35 on move, decreases to 0.25 in the fourth election since moving across states and goes back up a little in the fifth election (see column 3 of Table A2). The overall similarity of Figures 4 and A6 assuages the concern that the data limitations discussed in Section 2.2 dramatically affect our results and increases our confidence in the event-study estimates and in the related decomposition of turnout between voter and state factors, which we present now.

4.3 Decomposing Cross-State Variation in Voter Turnout

We exploit the variation underlying Figure 4 to implement two decompositions of voter turnout in its state- and voter-driven components. We start with the linearly additive decomposition discussed in Section 3.1. Using both movers and non-movers, we run a specification in the form of equation [1] to estimate place and voter effects for all 50 states and the District of Columbia. For different sets of high- and low-turnout states, we then estimate the overall and relative contributions of state and voter characteristics. That is, for different groups of states R and R' (with high and low turnout, respectively), Table 2 reports estimates of the following quantities: the total difference in

be directly interpreted as weighted averages of weighted average of $S^{state}(d(i),o(i))$ but should be compared to the pre-move $\theta_{r(i,t)}$'s. We observe a jump between θ_{-1} and θ_0 of similar magnitude as the on-move jump documented in Figure 4 (also see column 2 of Table A2). In addition, the $\theta_{r(i,t)}$'s remain flat afterwards, which is in line with our interpretation.

[16] We use McDonald's rates defined as ballots cast for the highest office in a given state-election divided by the estimated voting-eligible population in the same state-year. Michael McDonald also reports two other turnout rates: the total number of ballots counted divided by the voting-eligible population, which is not available for all states-years, and the count of votes cast for the highest office divided by the voting-age population. Results (available upon request) based on the latter turnout rates are very similar to those we report in the paper.

average voter turnout $(\bar{y}_R - \bar{y}_{R'})$, the difference due to voters $(\bar{y}_R^{vot} - \bar{y}_{R'}^{vot})$, the difference due to states $(\gamma_R - \gamma_{R'})$, the share of difference due to voters $\left(S^{voter}(R,R') = \left(\bar{y}_R^{vot} - \bar{y}_{R'}^{vot}\right) / (\bar{y}_R - \bar{y}_{R'})\right)$, and the share of difference due to states $(S^{state}(R,R') = (\gamma_R - \gamma_{R'}) / (\bar{y}_R - \bar{y}_{R'}))$.

Column 1 reports the comparison between states with above-median and below-median turnout. The difference in average turnout across the two groups is 7.2 percentage points, of which 4.8 and 2.4 percentage points are due to voter and place characteristics, respectively. This translates to voter factors accounting for approximately 66 percent of the overall difference and state factors for the residual 34 percent. Standard errors are computed using a voter-level bootstrap with 50 repetitions. Thanks to the large number of cross-state movers (approximately 14 million) and the large total number of observations (more than 1.5 billion), the estimated shares are extremely precise: their standard error is equal to 0.4 percentage points, which is two orders of magnitude smaller than the corresponding point estimates.

In columns 2–5, we report comparisons for other groups of high- and low-turnout states. Column 2 compares the 15 highest- and 15 lowest-turnout states. The overall difference in turnout is 10.6 percentage points, of which 6.3 and 4.2 percentage points are due to voter and state characteristics, respectively. The overall difference grows to 12.6 percentage points in the top-10-vs.-bottom-10 comparison (column 3), and to 15.9 percentage points in the top-5-vs.-bottom-5 comparison (column 4), with voter and state characteristics accounting for 6.8 and 5.8 percentage points and 9.2 and 6.7 percentage points respectively.

The corresponding relative contributions of voter and state factors are very similar across comparisons, with states accounting for 34 to 46 percent of the overall variation in voter turnout. These figures are in line with the slope of 0.39 on Figure 3 and with the on-move discontinuity of 0.40 in the event study shown in Figure 4, which both suggested a place share of about 40%. Along with the linear relationship shown in Figure 3, the stability of the state shares estimated using different groups of high- and low-turnout states suggests that $S^{state}(j,j')$ is not strongly correlated with $\bar{y}_j - \bar{y}_{j'}$.

Table 3 presents a second, alternative decomposition to assess the relative importance of state and voter factors. We first compute the cross-state variance of average voter turnout and estimate the cross-state variances of voter and state effects, along with their correlation: $Var(\bar{y}_j)$, $Var(\bar{y}_j^{vot})$, $Var(\gamma_j)$, and $Corr(\bar{y}_j^{vot}, \gamma_j) = \frac{Cov(\bar{y}_j^{vot}, \gamma_j)}{\sqrt{Var(\bar{y}_j^{vot})Var(\gamma_j)}}$. To estimate the variance of γ_j and $\bar{y}_j^{vot}$ and the covariance between these variables we use a split-sample approach to take into account the fact that the underlying parameters are themselves estimated.[17] We then estimate the share of cross-state *variance* in voter turnout due to voter characteristics, defined as the share of the total variance that would be eliminated by erasing differences in voter characteristics. Since $\bar{y}_j = \bar{y}_j^{vot} + \gamma_j$, the variance in $\bar{y}_j$ remaining after erasing differences in voter characteristics is $Var(\gamma_j)$ and the share of the total variance due to voter characteristics is given by:

$$S_{var}^{voter} = 1 - \frac{Var(\gamma_j)}{Var(\bar{y}_j)}. \tag{7}$$

Similarly, the share of the total variance due to place characteristics is given by:

$$S_{var}^{state} = 1 - \frac{Var(\bar{y}_j^{vot})}{Var(\bar{y}_j)}. \tag{8}$$

The advantage of this decomposition is that, unlike S^{voter} and S^{state}, S_{var}^{voter} and S_{var}^{state} do not require choosing specific sets of states to be compared. However, differently from S^{voter} and S^{state}, the variance decomposition is not additive: S_{var}^{voter} and S_{var}^{state} will not sum to 1 as long as $Cov(\gamma_j, \bar{y}_j^{vot}) \neq 0$.

The variance decomposition delivers two key results. First, equalizing voter effects would eliminate 47 percent of the cross-state variance in voter turnout; equalizing state effects would reduce the variance by 29 percent. Second, the correlation between voter and state effects is *negative*, which explains why S_{var}^{voter} and S_{var}^{state} sum to less than 1. For example, this negative correlation could signal that states with politically disengaged voters try to bridge the turnout gap with higher-

[17] We randomly assign movers within each origin-destination pair and non-movers within each state to either of two subsamples of approximately identical size. We then estimate equation [1] separately on each subsample. We estimate $Var(\gamma_j)$ (resp. $Var(\bar{y}_j^{vot})$) as the covariance between the estimated γ_j (resp. $\bar{y}_j^{vot}$) from the two subsamples. To estimate $Cov(\gamma_j, \bar{y}_j^{vot})$, we take the simple average of the covariances between the estimated γ_j from one subsample and the estimated $\bar{y}_j^{vot}$ from the other subsample.

turnout states by approving forms of convenience voting.

4.4 Heterogeneity by Voter Characteristics

We now compare the relative influence of contextual and individual factors for voters of different ages, genders, and races. Table 4 reports the results of linearly additive decompositions for subgroups defined along these dimensions. Each decomposition uses a sample restricted to movers and non-movers of the corresponding subgroup.

We first observe that the older the voters, the lower the share of state differences in their average turnout that are explained by place factors: from 64 percent, for voters less than 30 years old, to only 14 percent, for voters older than 60. This indicates that the context matters relatively more for younger voters, who also participate less on average. Second, mean turnout is much lower, but the difference between states above and below the median slightly larger, for non-Whites than Whites. The share of cross-state variation in turnout explained by contextual factors is lower for non-Whites, suggesting that individual drivers of voter turnout are relatively more impactful for them. Finally, the decomposition of cross-state variation in turnout between individual and place factors is much closer for men and women than it is across age groups and races.

5 Registration and Party Affiliation

We now disentangle the role played by contextual and individual factors in explaining variation in voter registration and party affiliation. Being registered is required to vote. Therefore, the decomposition of differences in voter registration across states that are attributable to place and individual factors can shed light on the decomposition we obtain for turnout. Party affiliation relates to a different dimension of voting behavior: not whether people participate in elections, but which party and candidates they prefer and tend to vote for. We use party affiliation as a proxy for partisanship but study it together with voter registration because we observe it only conditional on people being registered and, in most cases, it only changes when people update their registration (either switching from being unregistered to being registered, or registering again after a change of address).

We first consider voters' *unconditional* likelihood to be affiliated with a certain party: an outcome defined whether they are registered or not, and equal to 1 if they are affiliated with that party, and 0 if they are registered but not affiliated with that party or if they are not registered. We distinguish three types of party affiliation: affiliation with the Democratic Party, affiliation with the Republican Party, and "other affiliation," a dummy equal to one for people who are registered and either affiliated with a third party or not affiliated with any party. To provide overall estimates of the influence of context on party affiliation, our graphical evidence uses three observations per voter per year: one for each type of party affiliation. In the Appendix, we also show results for Democratic Party affiliation, Republican Party affiliation, and other affiliation separately.

5.1 Descriptive Analysis and Event Studies

We first replicate Figure 3 using voter registration and party affiliation as outcomes: Figures 5a and 5b plot the change in movers' registration and party affiliation against the destination-origin difference in these outcomes. As for voter turnout, the relationship is symmetric around zero and linear, indicating identical absolute changes for voters moving from state j to j' and for voters moving in the opposite direction, as our model implies. In addition, the matched sample of non-movers lies vertically above all points for movers, indicating that cross-state moves are associated with a decline in voter registration (since people need to register again after the move) and in unconditional party affiliation (which is mechanically driven down by registration).[18]

We use the event study in equation [6] to analyze election-to-election changes in these outcomes for movers. The pre-move effects for voter registration show no correlation with destination-minus-origin differences in this outcome (Figure 6a). Instead, we see a sharp positive change in the first post-move election, and no significant change afterwards. The size of the jump after move, approximately 0.21, suggests that state characteristics explain approximately one fifth of the observed cross-state variation in voter registration (see Table A3 column 1 for the detailed point estimates).

[18]We obtain similar patterns when we examine each type of party affiliation separately (Figure A7 in the Appendix).

To run the event study for party affiliation, we restrict the sample to moves between any pair of the 30 states in which this outcome is available. We estimate a specification of the form in equation [6], in which voter fixed effects, election fixed effects, and fixed effects for election relative to move are interacted with types of party affiliation:

$$y_{it}^{A} = \sum_{A=R,D,O} \left[\tilde{\alpha_i^A} + \tau_t^A + \rho_{r(i,t)}^A \right] + \theta_{r(i,t)} \hat{\delta}_i^A + \varepsilon_{it}^A, \tag{9}$$

where y_{it}^{A} is a dummy equal to 1 if voter i has affiliation A (affiliated with the Republican Party, the Democratic Party, or other affiliation) at election t and $\hat{\delta}_i^A$ is the difference in average affiliation A between i's states of destination and origin. Our two-way clustered standard errors by states and voters account for the mechanic correlation between the different party affiliation outcomes of a specific voter at any point in time. On average, people's party affiliation shows a small but significant convergence to the destination state averages before the move, with impact estimates going from -0.05 to -0.02 between relative elections 5 and -2. (Figure 6b). However, the post-move change is of a different order of magnitude: 0.36, suggesting that state characteristics explain around 36 percent of the observed variation in party affiliation. Once again, we do not see much post-move adjustment, indicating that contextual factors' influence on party affiliation is immediate and does not increase over time, similarly as for participation.

While party affiliation is the best available proxy for registered voters' partisanship in administrative data, it is important to note that movers may update their party affiliation even absent any actual ideological change. For instance, registered Democrats may turn into registered independents if they move from a state with closed primaries to a state with primaries open to unaffiliated voters, even if their issue positions remain as close to the Democratic Party's platform and their likelihood to vote for Democratic candidates as high as before. To control for differences in primaries' rules and study changes in party affiliation which are more likely to correspond to actual changes in partisanship, we run the event study on the subsample of moves between pairs of states with identical rules. We follow the National Conference of State Legislatures, which distinguishes between closed primaries, partially closed primaries, partially open primaries, primaries open to unaffiliated voters, and top-two primaries.[19] As shown on Figure 7c, the post-move change is around 0.30, which is only 10 percentage points lower than the change in the full sample of states with party affiliation. This suggests that most of the post-move change in party affiliation, in the full sample, is driven by change in actual partisanship.

Figures A8 (resp. A9) in the Appendix show event study graphs for each type of party affiliation, in the full sample (resp. the subsample of states with identical primaries' rules). The post-move changes are of similar magnitude for Democratic Party affiliation and Republican Party affiliation, and slightly larger for other affiliation (see Table A4 for the detailed point estimates). We observe some pretrends for the two latter outcomes, suggesting that voters who become closer to the Republican Party are a bit more likely to move to more Republican states.

5.2 Decomposing Cross-State Variation in Registration and Party Affiliation

We exploit the variation underlying the event-study graphs to implement linearly additive decompositions of voter registration, Democratic Party affiliation, Republican Party affiliation, and other affiliation in their state- and voter-driven components. Using point estimates from specifications of the form in equation [1], we compute the share of differences between states with high and low outcome averages that are explained by contextual and individual factors. Since states with high (resp. low) Democratic Party affiliation differ from states with high (resp. low) Republican Party affiliation or other affiliation, we run this analysis separately for each party affiliation.

The results, shown in Table 5, are in line with event-study estimates. Contextual factors account for 26 percent of the difference in average voter registration between states with above-median and below-median registration, and for 28 percent (resp. 21 and 40 percent) of the difference in party affiliation between the 15 states with highest and lowest Democratic Party affiliation (resp. Republican Party affiliation and other affiliation). Individual factors account for the remaining

[19] We also test the robustness of our results to further excluding moves from and to states with partially closed or open primaries, as the exact definition of these systems sometimes has state-specific nuances. Results available upon request.

cross-state variation. The results are very similar when we consider other groups of states. Overall, these results indicate that the relative role of contextual factors, in comparison to individual factors, is slightly lower for registration than it is for voter turnout, and that these factors also exert a substantial influence on partisanship.

The results of the second decomposition, which estimates the shares of cross-state variance in registration and party affiliation due to voter characteristics and place characteristics, bring further support for this conclusion. Equalizing voter effects and state effects would reduce cross-state variance in voter registration by 39 percent and 11 percent, respectively (Table 6). The reductions would be 89 and 45 percent for Democratic Party affiliation, 89 and 33 percent for Republican Party affiliation, and 76 and 54 percent for other affiliation.

Finally, we run the linearly additive decompositions for voters of different age groups, genders, and races (Table 7). As for voter turnout, the share of state differences in average registration that are explained by place factors is lower for older voters. However, the share of cross-state variation in registration explained by contextual factors is now substantially larger for non-Whites, suggesting that registration rules and other registration-related place factors have more impact on them. Instead, the decomposition of cross-state variation in party affiliations between individual and place factors is strikingly similar across age groups, Whites and non-Whites, and men and women.

5.3 Conditional Registration

The impact of contextual factors on people's unconditional party affiliation can result from effects on registration as well as effects on party affiliation, conditional on being registered. We now examine the latter outcome, which is the closest proxy to partisanship. To estimate the influence of the context on conditional party affiliation, we cannot simply restrict the sample to registered voters and run event studies and decompositions on this sample. Indeed, the resulting estimates would likely be affected by sample selection bias: the place effects on voter registration documented in section 5 indicate that voters who register after moving to a state with high registration may fail to register when they move to a state with lower average registration, so that their conditional party affiliation is observed only in a subset of destination states.

To address this selection issue, we plan to use the following two-step procedure. This version of the paper only describes the procedure. The corresponding results will soon be available.

We first estimate an event study to measure the impact on registration and unconditional party affiliation of moving to a state with higher registration and higher conditional Democratic Party affiliation than the state of origin (henceforth, trajectory one) relative to moving to a state with lower registration and lower conditional Democratic Party affiliation (trajectory zero):

$$y_{it} = \alpha_i + \beta I_{r(i,t)\geq 0} \times T_i + \tau_t + \rho_{r(i,t)} + \varepsilon_{it}, \tag{10}$$

where $T_i = 1$ if mover i followed trajectory one and 0 if she followed trajectory zero. We estimate this equation using all movers who followed trajectory one or zero and no other voter. Importantly, note that we compare moves to states with higher vs. lower conditional Democratic Party affiliation in order to measure the effect of state differences in average partisanship. In addition, we require trajectory one (resp. trajectory zero) destination states to have higher (resp. lower) average registration than the state of origin, to satisfy a "no-defiers" assumption required by our bounding exercise and described below.

Second, we construct bounds on the effects on conditional party affiliation by adapting Lee (2009)'s method to our setting and based on estimates derived in step one. Using the potential outcomes framework, we define R_0 and R_1 as binary variables indicating if the mover registers after the move when $T = 0$ and $T = 1$, respectively. In the data, we only observe $R = TR_1 + (1-T)R_0$: we know whether movers following trajectory one register after the move but not whether they would have done so had they followed trajectory zero, and conversely. Similarly, we define D_0 and D_1 as binary variables indicating if the mover affiliates with the Democratic Party conditional on registering when $T = 0$ and $T = 1$, respectively. We only observe $D = R[TD_1 + (1-T)D_0]$: when the voter does not register after the move ($R = 0$), she cannot affiliate with the Democratic Party ($D = 0$) and we do not observe whether she would have done so if she had registered. When she registers after the move ($R = 1$), we observe whether a voter following trajectory one affiliates with the Democratic Party but not whether she would have done so had she followed trajectory zero, and conversely.

We further define four types of movers: "always takers," who always register after the move, whether they follow trajectory zero or one; "never takers," who never register after the move; "compliers," who register after the move if they follow trajectory one, not if they follow trajectory zero; and "defiers," who register after the move if they follow trajectory zero, not trajectory one. The key assumption we use to derive bounds is that there are no defiers: all movers who follow trajectory zero and register would also have registered after trajectory one. Our choice to compare moves to states with higher registration vs. lower registration makes this assumption likely to be satisfied. We also check the robustness of our results to imposing that trajectory one (resp. trajectory zero) destination states have registration rate higher (resp. lower) by 5 percentage points to the origin state, to further reduce the risk of violating the no-defiers assumption. Under this assumption, we have that $R_1 \geq R_0$ and we can write the impact on unconditional Democratic Party affiliation as the sum of the impact on registration, multiplied by the likelihood that compliers following trajectory zero would affiliate with the Democrats if they registered; and the impact on conditional Democratic Party affiliation (for compliers and always takers), multiplied by the probability of registering of movers following trajectory one:

$$\underbrace{E(D_1R_1 - D_0R_0)}_{Effect\ on\ D} = \underbrace{Prob(R_1 > R_0)}_{Effect\ on\ R} \cdot \underbrace{E(D_0|R_1 > R_0)}_{Unobservable}$$

$$+ \overbrace{E[D_1 - D_0|R_1 = 1]}^{Effect\ on\ Dem\ affiliation\ cond\ on\ being\ always-taker\ or\ complier} \cdot E(R_1)$$

From this expression, we get:

$$\overbrace{E[D_1 - D_0 | R_1 = 1]}^{Effect\ on\ Dem\ affiliation\ cond\ on\ being\ always-taker\ or\ complier} = \frac{1}{E(R_1)}[\underbrace{E(D_1R_1 - D_0R_0)}_{Effect\ on\ D} - \underbrace{Prob(R_1 > R_0)}_{Effect\ on\ R} \cdot \underbrace{E(D_0|R_1 > R_0)}_{Unobservable}] \tag{11}$$

$E(D_0|x=0,R_1>R_0)$ is the likelihood that compliers would affiliate with the Democratic Party if they registered, absent treatment (i.e., when they follow trajectory zero). By definition, compliers do not register when they follow trajectory zero (but only when they follow trajectory one). This term is thus unobservable. Since all the other terms on the right-hand side of equation [11] are observed, we can derive bounds on the effect on winning conditional on running by making assumptions about this term.

To obtain an upper bound, we set $E(D_0|x=0,R_1>R_0)=0$, as the largest possible effect occurs if we assume that trajectory zero compliers would never affilicate with the Democratic Party after the move if they decided to register. To obtain a lower bound, we replace the unobservable term by the probability that trajectory one compliers register as Democrats. The choice of this high probability makes our lower bound conservative.

We use this method to construct two sets of bounds: bounds for the impact of trajectory one relatively to trajectory zero on *average* conditional Democratic Party affiliation after the move, using estimates of registration and unconditional Democratic Party affiliation effects based on equation [10]; and bounds for the impact and on this outcome *for each election after the move*, using the following extended equation:

$$y_{it} = \alpha_i + \beta_{r(i,t)}T_i + \tau_t + \rho_{r(i,t)} + \varepsilon_{it}, \tag{12}$$

We use a bootstrapping procedure to estimate the standard errors of the bounds: we draw a sample from our data with replacement, compute the lower and upper bounds as indicated above, repeat these two steps a large number of times, and estimate bounds' empirical standard deviation. We divide the results by the difference in average conditional Democratic Party affiliation between trajectory-one destination and origin states minus the difference in this outcome between trajectory-zero destination and origin states, so that the magnitude of the change after the move can be compared to estimates for unconditional outcomes provided in the rest of the paper. Finally, to use all movers, we also exploit another pair of trajectories – moves towards states with lower conditional Democratic Party affiliation and higher registration and towards states with higher conditional Democratic Party affiliation and lower registration – and provide pooled estimates using all four trajectories.

6 Correlates of Voter and Place Effects

To explore possible mechanisms behind our results, we assess the relative importance of individual and contextual factors which may influence place and average voter effects. For each outcome, we use the $\hat{\gamma}_j$'s and $\hat{y}_j^{vot}$'s estimated from equation [1] as independent variables in regressions that control for observable state and voter characteristics. While the results do not necessarily represent causal evidence, we improve upon multivariate regressions of voter turnout or partisanship by identifying observable correlates of their state and voter components.

We explore three sets of state characteristics: voting and registration rules, characteristics of the electoral landscape, and socioeconomic and political environment. Among voting rules, we include strict voter identification laws, open primaries, closed primaries, and the availability of same-day registration, no-excuse absentee voting, and early voting.[20] While our regressions are

[20] We follow the National Conference of State Legislature (NCSL)'s classification of early and no-excuse absentee voting, strict voter identification laws, and open and close primaries: http://www.ncsl.org/research/elections-and-campaigns/absentee-and-early-voting.aspx (accessed: 07/03/2019). First, early (in-person) voting means that any eligible voter may cast a ballot in person during a designated period before Election Day, without providing an excuse. No-excuse absentee voting means that the state will mail an absentee ballot to all registered voters who request one. The voter, who does not need to offer an excuse (e.g., being out of town on Election Day), may return the ballot by mail or in person. Second, in states with strict voter ID laws, voters without acceptable identification must cast a provisional ballot and also take additional steps after Election Day for the vote to be counted. Third, states with closed primaries allow only registered party members to cast a ballot in a given party's primary. By contrast, a voter in an open-primary state is free to choose in which primary to vote and this decision does not register the voter with that party.

cross-sectional, some states changed these voting rules during our sample period. We therefore construct time-invariant regressors by measuring the share of elections in our sample covered by each rule. The second group of state factors includes the share of 2008–2018 elections concurring with gubernatorial and U.S. Senate elections and average electoral competitiveness in presidential elections.[21] We expect voting rules and the electoral landscape to primarily affect registration and turnout state fixed effects. Instead, our third group of state factors may affect both participation and party affiliation. We characterize the socioeconomic and political environment through five variables. Population density might matter for at least two reasons: low density might limit interpersonal discussions about politics and hence voters' interest in elections, and it also correlates with larger average distance to the polling station (Gimpel and Schuknecht, 2003), thus making voting more costly. State GDP growth may affect the likelihood of reelecting the incumbent, and having a Republican governor may affect partisanship as well as the stringency with which voting rules are applied. The number of civic organizations is included as a proxy for civic mindedness and social capital, which may increase participation, while the incarceration rate may instead be an obstacle to participation (Gerber et al., 2017).

For voters, we include state averages of socio-demographic predictors of voter turnout and ideology: age, minority status, education, income, the fraction of immigrants, and the fraction of homeowners (e.g., Schlozman et al., 2012; Marshall, 2019).

Figure 7 summarizes the correlates of the estimated state effects on voter turnout. Each row represents a different correlate. The left panel reports estimates and 95-percent confidence intervals from bivariate OLS regressions of the estimated state effects ($\hat{\gamma}_j$) on state and voter correlates. All covariates are standardized by subtracting the mean and dividing by the standard deviation. There are 51 observations, corresponding to the 50 states and the District of Columbia. In the right panel, we present estimates and standard errors from a multivariate OLS regression on regressors chosen with a first-stage Lasso regression (Belloni and Chernozhukov, 2013).[22]

[21]We use electoral competitiveness in presidential elections because Washington D.C. elects no voting member of Congress (though it holds mayoral elections concurrently with midterm federal elections). Results are virtually identical when we use average electoral competitiveness in congressional elections and drop D.C.

[22]In the first stage, we select regressors using a Lasso regression with a penalty chosen by a 10-fold cross-validation

Among state characteristics, the strongest predictors of turnout state effects are the availability of Election Day voter registration and no-excuse absentee voting, which lower the cost of voting, as well as open primaries and electoral competitiveness, which increase its benefits. All four variables are positively correlated with state effects, consistent with intuition and the existing literature, and the first three are significant at the 5 percent or 10 percent level.

Figure 8 reports analogous results for the estimated average voter effects. We find no obvious relationship between state characteristics and average voter effects on turnout, except for a negative (but not significant) correlation with incarceration rate, likely explained by the cost (and, in some states, the outright ineligibility) faced by felons and ex-felons to vote. Conversely, bivariate correlations with voter characteristics are broadly consistent with intuition: average voter effects are higher in states with more U.S.-born, non-Hispanic white, homeowners, older, richer, and more educated voters. This is particularly true for education, which is the only voter characteristic selected in the Lasso regression.

Finally, we regress *individual-level* (not average) voter fixed effects ($\hat{\alpha}_i$'s) on individual-level covariates available from Catalist: age, gender, and race. We show the results in Figure A10 in the Appendix.[23] Again, we find a positive correlation with age and a negative one with minority status.

Figure A12 in the Appendix reports results from the same regressions for voter registration. Interestingly, Election Day voter registration is negatively correlated with registration state effects, which may result from the fact that many people only register conditional on voting, in states in which same day registration is available, while in other states the number of registrants exceeds the number of those who actually turn out on the day of the election. In addition, incarceration rate is again negatively correlated with average voter effects. At the individual level (Figure A13c), being

to minimize the mean squared error. In the second stage, we estimate coefficients and standard errors through a multivariate OLS on the selected covariates.

[23] When we explore correlates of average voter fixed effects, we have only 51 observations (i.e., one per state) but a large set of covariates, thus justifying the Lasso selection procedure. At the opposite, here we have a large number of observations (i.e., one per voter) but few controls. Therefore, in each graph exploring the correlates of the individual-level fixed effects, the right panel reports estimates from a multivariate OLS regression that includes all voter characteristics that are observed at the individual level. The omitted categories for age and gender are voters with missing age and gender information, respectively. The omitted category for race includes voters with unknown race, along with non-Hispanics, non-White, non-African American voters.

Hispanic and missing age information correlate negatively with the probability to be registered.[24]

We interpret the results on observable correlates of place and average voter effects on unconditional party affiliation with more caution since they rely on fewer observations and any factor's impact on this outcome may reflect either influence on registration or influence on party affiliation, conditional on being registered. As shown on Figure 9a, closed primaries and the number of civic organizations are the strongest (positive) predictors of Democratic Party affiliation state effects. In closed-primaries states, participating in the primaries is conditional on being affiliated with the Democratic Party, providing a strong incentive for Democratic leaning voters to take this step. In addition, a larger number of civic organizations may indicate stronger social capital, and a subset of these organizations may actively engage in registration drives and encourage citizens to affiliate with the party they support, explaining the positive correlation of state effects with this covariate. Interestingly, closed primaries and the number of civic organizations also strongly predict Republican Party affiliation state effects, supporting our interpretations of these correlations (see Figure A13a in the Appendix). Instead, the Lasso regression does not select any covariate for other party affiliation, which may result from the fact that registered voters' decisions to affiliate with a third party or not to affiliate with any party, which are both captured by this residual category, are determined by different factors (Figure A14a in the Appendix).

Consistent with intuition, the correlations of the fraction of ethnic minority voters and average education with average voter effects on Democratic Party affiliation are positive and negative, respectively (Figure 9b). The negative correlation of the fraction of immigrants in the population with these effects may reflect push-back against the Democratic Party's pro-immigration platform, in states in which immigration is the strongest. More surprising is the positive correlation found with median age. All these correlations are significant at the 5 or 10 percent level. The only (negative) covariate of average voter effects on Republican Party affiliation selected by a Lasso regression is population density, which may reflect the fact that voters living in more rural areas are more likely to hold issue positions aligned with the Republicans.

[24] The latter correlation (which can be inferred from the positive correlation of all included age-group dummies in the right panel) is unsurprising, as it may be relatively hard to obtain age information for never-registered voters.

Correlates of individual-level voter fixed effects (Figures A11, A14c, and A15c for Democratic Party, Republican Party, and other affiliation, respectively) also follow intuition: minority status strongly and positively correlates with Democratic affiliation, and negatively so with Republican affiliation. Similarly, being a female predicts larger voter fixed effects for Democratic than Republican affiliation.

7 Conclusion

This paper assesses the overall influence of contextual factors on voter behavior relative to the influence of individual drivers. We use a dataset assembled by political data vendor Catalist to identify voters who move across states and to track their behavior over time. Event-study graphs show that movers' turnout, registration, and party affiliation are mostly stable before move, suggesting that changes in individual drivers of voter behavior do not correlate systematically with differences in average outcomes between movers' states of origin and destination. Movers' turnout jumps by 40 percent of this difference in the first election after the move and does not increase afterwards, indicating that differences in state characteristics exert a large influence over individual-level turnout and that state factors with immediate effects, such as voting rules or distance to the polling station, matter more than variables expected to affect behavior more gradually, such as peer pressure. Voter registration and party affiliation also jump immediately after the move, and they remain flat thereafter. The change in party affiliation remains important when we restrict the sample to moves between states with identical primaries' rules, suggesting that contextual factors also exert a large influence on partisanship, but the magnitude of the jump is lower than for turnout.

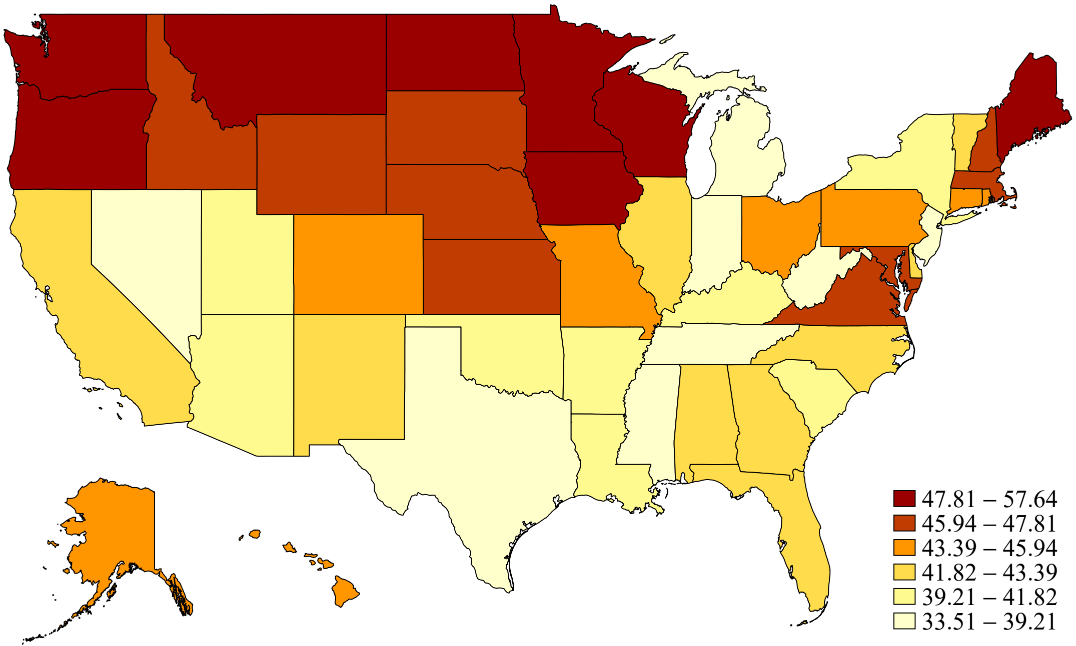
Exploiting the variation underlying these event-study results, we decompose voter behavior in its state and voter components with a value-added model that includes voter, state, and election fixed effects and allows movers' behavior to be arbitrarily different, both in levels and average trend, than non-movers. We find that state characteristics explain about 34 percent of the observed variation in participation between states with above-median and below-median voter turnout, and voter characteristics the residual 66 percent. Place factors also explain 26 percent of the difference in average registration rates between states with above-median and below-median voter registration and 28, 21, and 40 percent of the cross-state variation in Democratic Party affiliation, Republican Party affiliation, and the fraction of registered voters who are registered and either affiliated with a third party or not affiliated with any party. We obtain similar estimates of the relative contributions of voter and state attributes when comparing other groups of states. In an alternative decomposition, we estimate the share of cross-state variance in voter turnout due to voters vs. states and find that equalizing voter effects would eliminate 47 percent of the cross-state variance in voter turnout, compared to a 29 percent reduction when equalizing state effects. The shares of cross-state variance due to voter and place characteristics are 39 and 11 percent for voter registration, 89 and 45 percent for Democratic Party affiliation, 89 and 33 percent for Republican Party affiliation, and 76 and 54 percent for other affiliation. Contextual factors explain a larger share of the cross-state variation in turnout and registration for younger voters and a larger share of the variation in registration for ethnic minorities than Whites. Instead, the decomposition of cross-state variation in party affiliations between individual and place factors is strikingly similar for different age groups, races, and genders.

The observable factors most strongly correlated with the estimated state effects are the availability of Election Day voter registration and no-excuse absentee voting, which lower the cost of voting, as well as open primaries and electoral competitiveness, which increase its benefits. Education is the only voter characteristic selected as predictor of turnout average voter effects in a Lasso regression, and its correlation with them is significant and positive. Factors which are significantly correlated with state and average voter effects on party affiliation are for the most part different than for participation. Closed primaries, which provide an incentive to affiliate with the party one is closest to ideologically, and the number of civic organizations, a proxy for social capital, are the strongest predictors of both Democratic and Republican Party affiliation. The fraction of ethnic minority voters is positively correlated with average voter effects for Democratic Party affiliation, and average education and the fraction of immigrants are negatively correlated with it. Population density is negatively correlated with average voter effects on Republican Party affiliation.

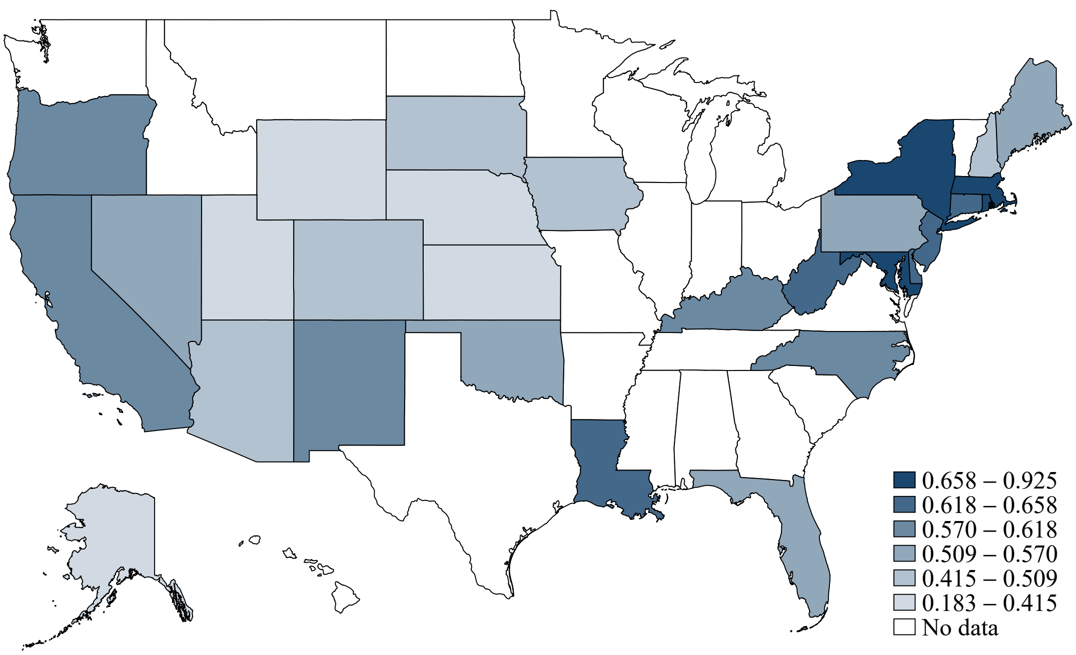
The fact that our sample covers the vast majority of voting-age individuals in the U.S. from 2008 to 2018 (a total of about one and a half billion observations) makes these results unusually precise and their external validity maximal. Overall, our findings demonstrate that context exerts a considerable influence on participation and, to a slightly lesser extent, partisanship, but that it does not trump individual drivers of voting behavior: the latter explain more than half of the variation in registration, turnout, and any type of party affiliation observed across states.

Figure 1: Voter Turnout and Democratic Two-Party Affiliation Share by State, 2008–2018

(a) Distribution of Turnout across States



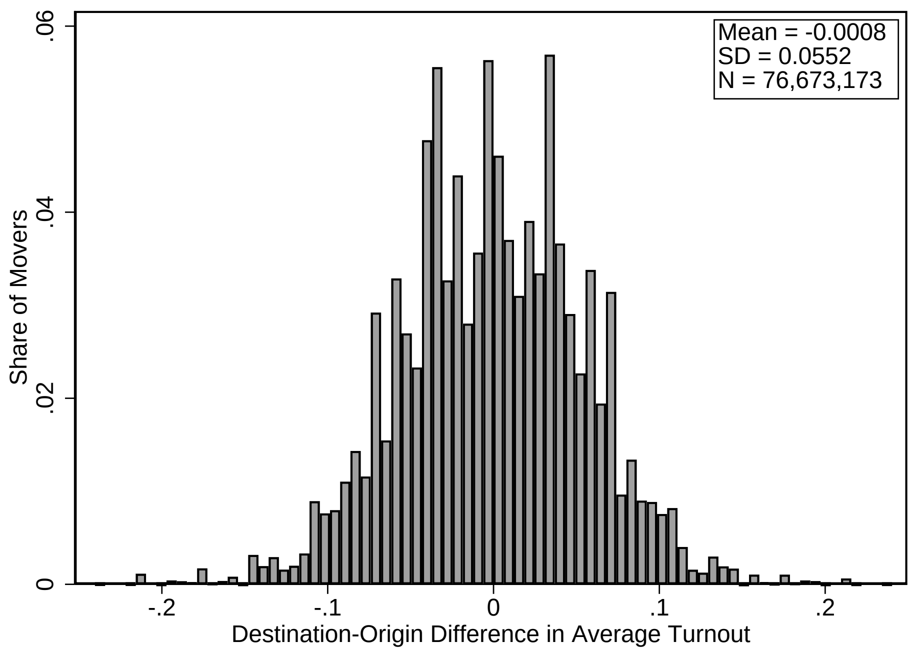
(b) Distribution of Democratic Two-Party Affiliation Share across States



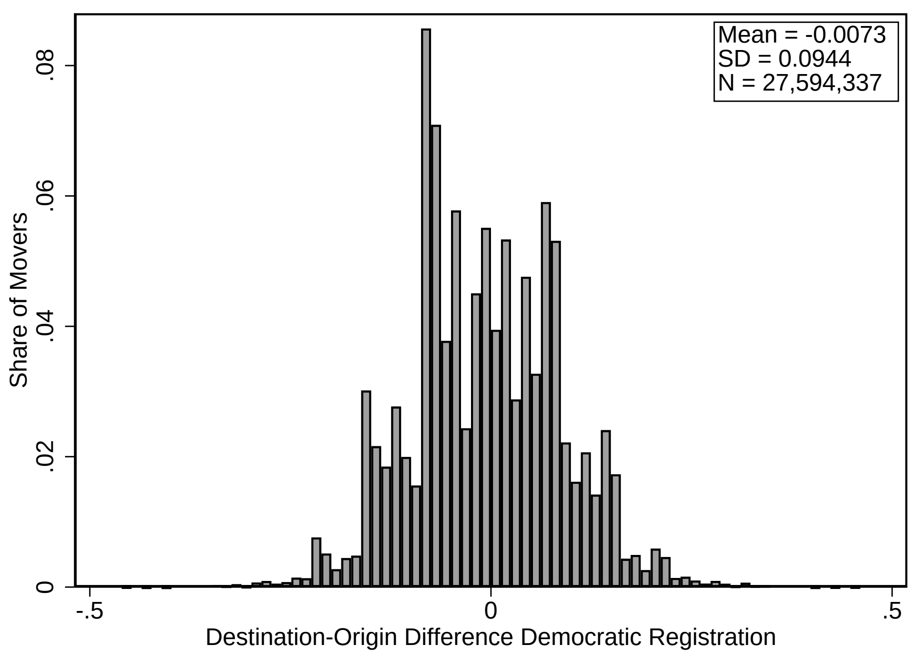
Notes: The maps plot average state turnout and Democratic Two-Party affiliation share (the number of voters affiliated with the Democratic Party as a fraction of voters affiliated either with the Republican or the Democratic Party) in the Catalist data in six bins. The Lower and upper limits of the outcome in each bin are displayed in the legend. For each state, we take the simple outcome average across the six elections (2008–2018) in the Catalist data. The sample is all movers and non-movers.

Figure 2: Destination-Origin Difference in Voter Turnout and Democratic Party Affiliation

(a) Distribution of Destination-Origin Difference in Voter Turnout

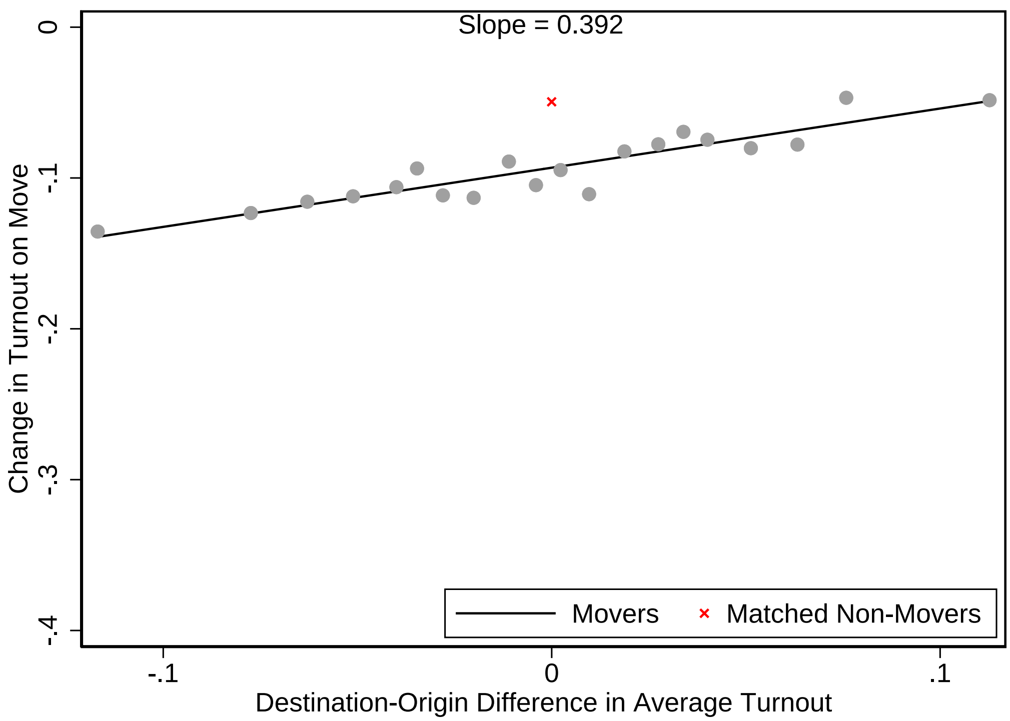


(b) Distribution of Destination-Origin Difference in Democratic Party Affiliation



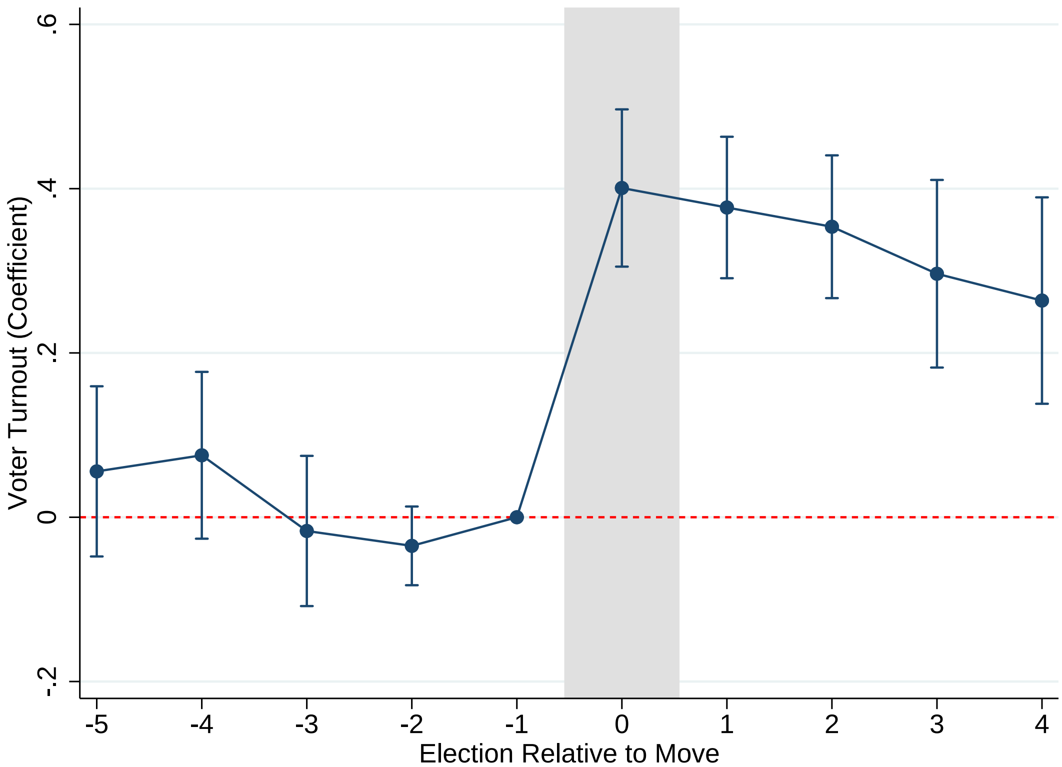
Notes: The figures show the distributions of the difference in average turnout and Democratic Party affiliation across states of origin and destination ($\hat{\delta}_i$) in the movers sample. The sample is all mover-years.

Figure 3: Change in Movers' Turnout Against Destination-Origin Difference in Voter Turnout



Notes: the figure shows how voter turnout changes before and after move in relation to differences in average participation across states of origin and destination. The x- axis displays the average $\hat{\delta}_i$ for movers in each ventile. For each ventile, the y-axis shows average turnout in all post-move elections minus average turnout in all pre-move elections. The line represents the best linear fit from a simple OLS regression using the 20 data points, and its slope is reported on the graph. For comparison, we also compute the change in turnout for a sample of matched non-movers and denote it with an $\times$ in the graph. Details on the matching procedure are described in the text.

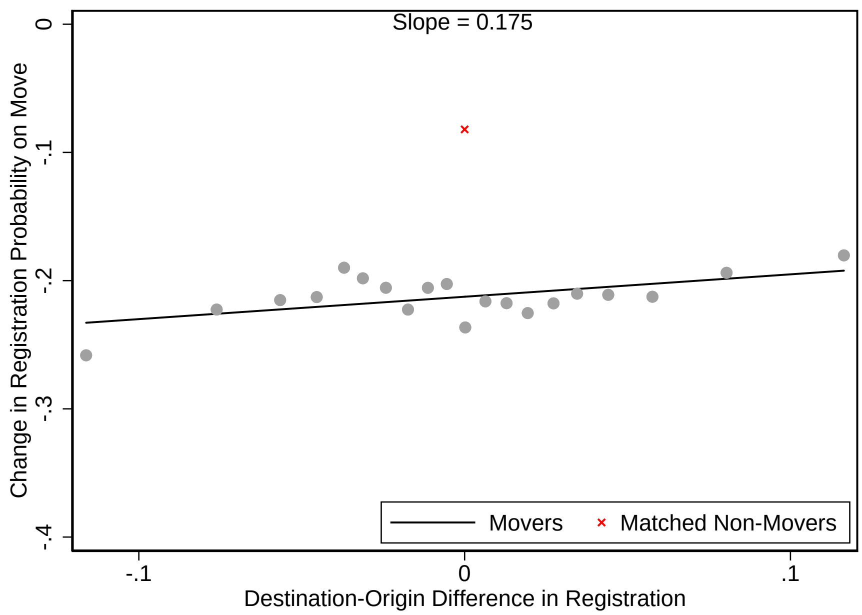
Figure 4: Event-Study Plot, Voter Turnout



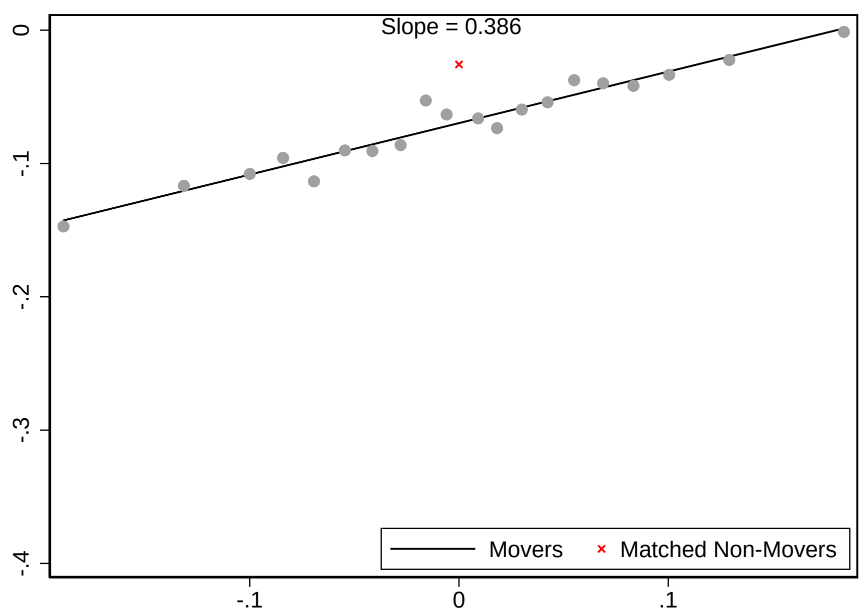
Notes: The figure plots estimates of $\theta_{r(i,t)}$ and 95-percent confidence intervals (robust to two-way clustering by states and individuals) from event-study specification [6]. The dependent variable y_{it} is a dummy equal to 1 if voter i voted in election t, and 0 otherwise. For each mover, $\hat{\hat{\delta}}_i$ is constructed using the difference in average turnout in the state of destination across all elections in our sample minus average turnout in the state of origin. The sample is all mover-years ($N = 76,673,176$).

Figure 5: Change in Movers' Registration and Party Affiliation Against Destination-Origin Differences

(a) Change in Movers' Registration Against Destination-Origin Differences in Registration



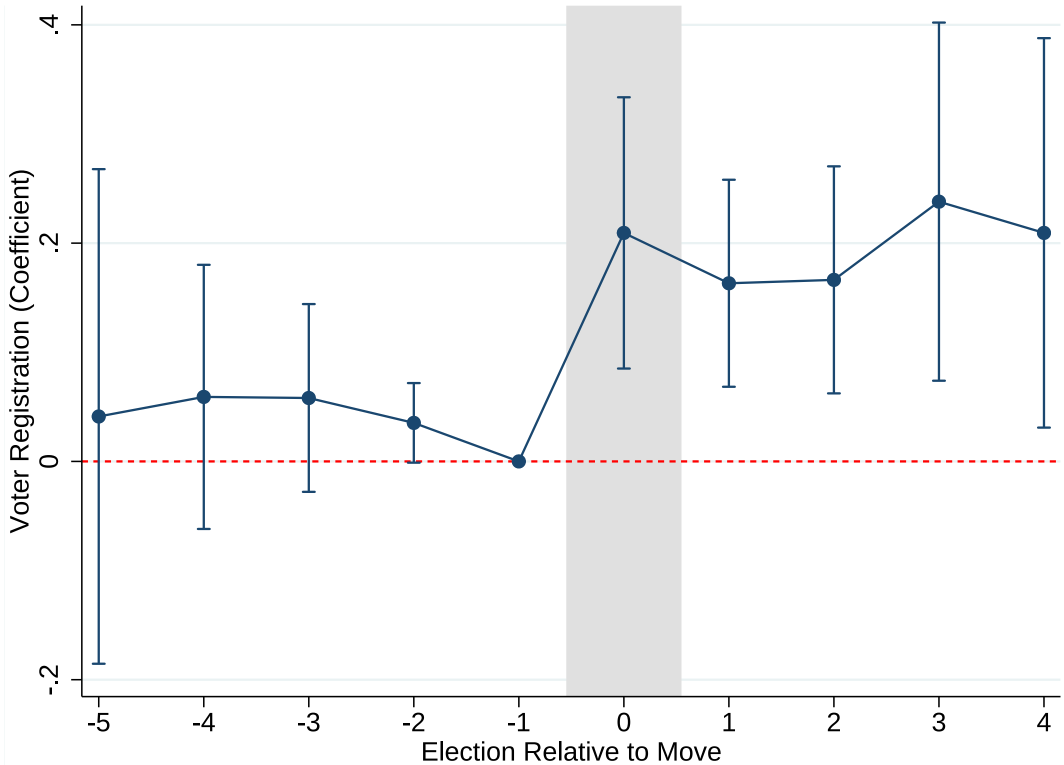
(b) Change in Movers' Party Affiliation Against Destination-Origin Differences in Party Affiliation



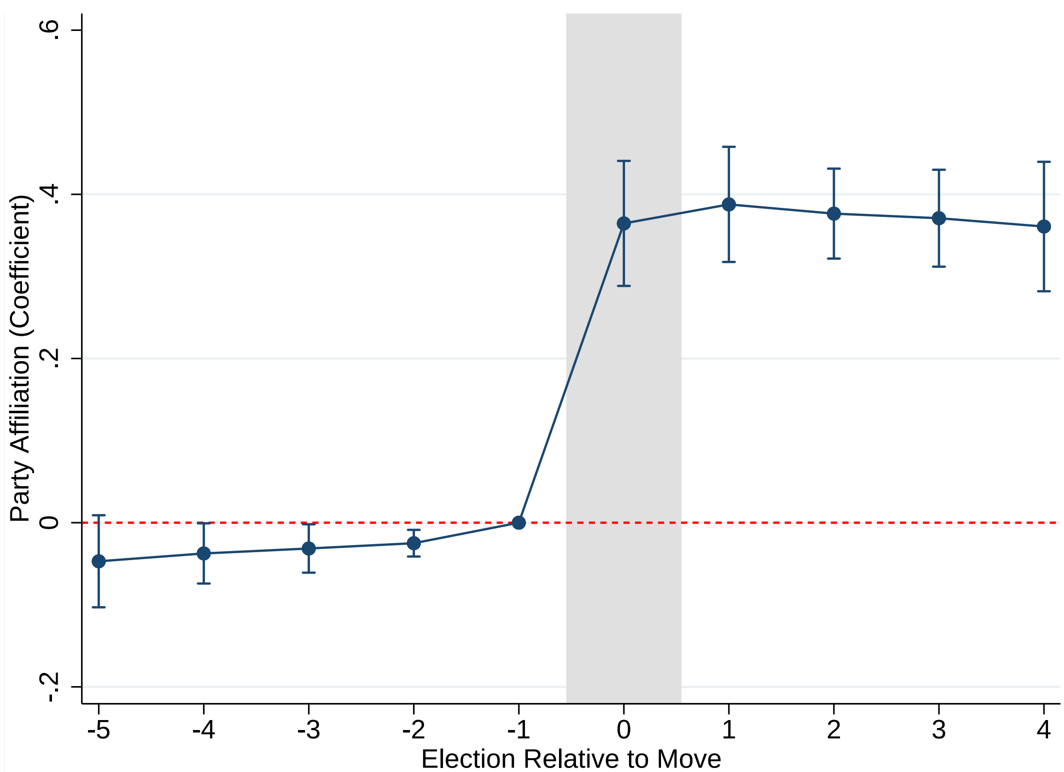
Notes: the figures show how voter registration (resp. party affiliation) change before and after move in relation to differences in average outcomes across states of origin and destination. The party affiliation graph uses three observations per voter, indicating their affiliation with the Democrats, with the Republicans, and "other affiliation," a dummy equal to one if they are registered and affiliated with a third party or not affiliated with any party. Other notes as in Figure 3.

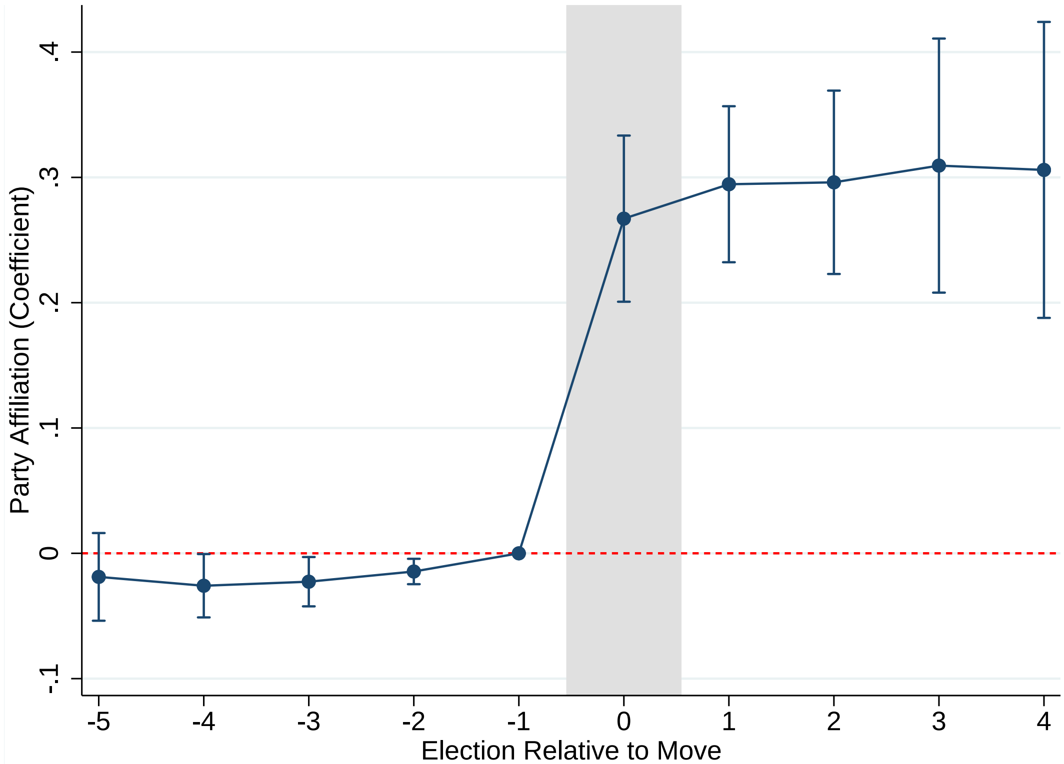
Figure 6: Event-Study Plots, Registration and Party Affiliation

(a) Event-Study Plot, Voter Registration



(b) Event-Study Plot, Party Affiliation

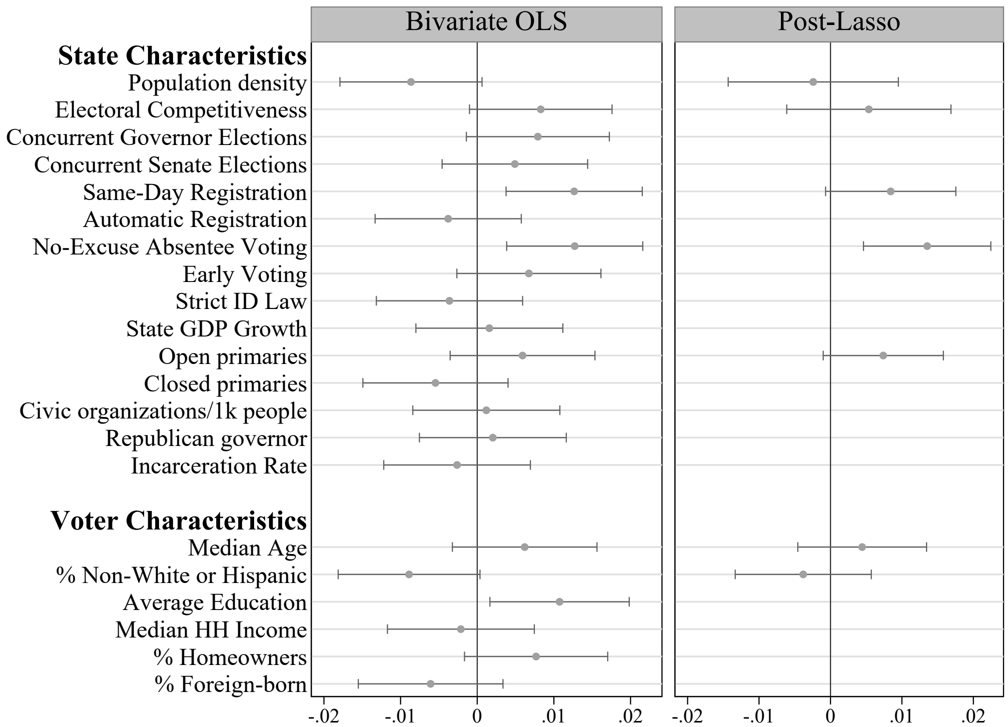




(c) Event-Study Plot, Party Affiliation, States with Identical Primaries Rules

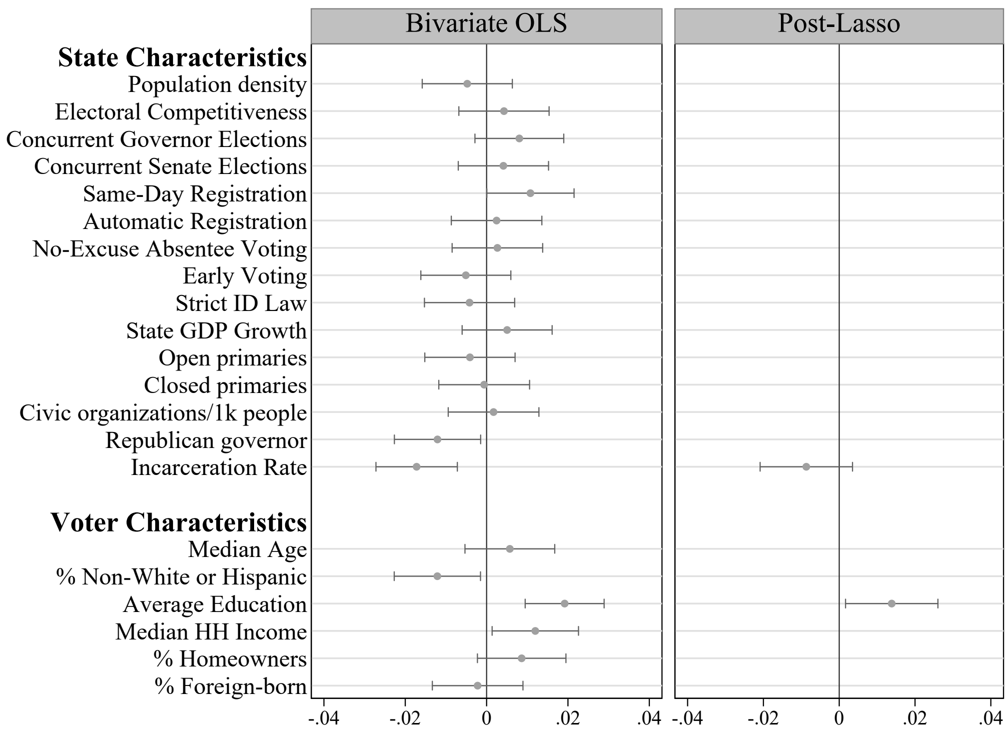
Notes: The figure plots estimates of $\theta_{r(i,t)}$ and 95-percent confidence intervals (robust to two-way clustering by states and individuals) from event-study specifications [6] (for the first graph) and [9] (for the second and third graphs). In the first graph, the dependent variable y_{it} is a dummy equal to 1 if voter i was registered for election t, and 0 otherwise. In the second and third graphs, the dependent variable is a dummy equal to 1 if voter i was affiliated with a given party for election t and 0 if they were registered but not affiliated with this party or if they were not registered, and we use three observations per voter, indicating their affiliation with the Democrats, with the Republicans, and other affiliation. For each mover, $\hat{\delta}_i$ is constructed using the difference in average outcome in the state of destination across all elections in our sample minus average outcome in the state of origin. The sample is all mover-years ($N = 76,673,176$) in the first graph, all mover-years for moves between states in which party affiliation is available ($N = 82,783,011$ mover-year-parties, corresponding to $N = 27,594,337$ mover-years) in the second, and all mover-years for moves between states in which party affiliation is available and with identical primaries rules in the third.

Figure 7: Correlates of Turnout State Effects



Notes: The left panel reports estimates and 95-percent confidence intervals from bivariate OLS regressions of state fixed effects $\hat{\gamma}_j$'s on state and average voter characteristics. The right panel shows results of a post-Lasso multivariate regression. All covariates are standardized to have mean 0 and unitary standard deviation. To obtain post-Lasso estimates, we first run a Lasso regression using all covariates, choosing the penalty with a 10-fold cross-validation to minimize the mean squared error. We then run a single multivariate OLS regression on the covariates selected by the Lasso regression. The sample in both panels consists of the 50 states plus the District of Columbia. Population density comes from 2010 decennial census data. Electoral competitiveness is defined as the average margin of victory of the presidential candidate who carried the state in the 2008, 2012, and 2016 presidential elections. The share of 2008-2018 general elections covered by strict voter ID laws, as well as the share of elections in which same-day voter registration, automatic voter registration, no-excuse absentee voting, and early voting were available to voters in each state come from the National Conference of State Legislatures. Information on states' primary election types also comes from the NCSL. Counts of civic organizations/1k people are from Rupasingha et al. (2006, with updates). 2008Q1-to-2018Q4 state GDP compound annual growth rates come from the U.S. Bureau of Economic Analysis. The incarceration rate (per 100,000 adults) comes from the Bureau of Justice Statistics, 2013 correctional population figures. "Republican governor" denotes the share of 2008–2018 elections with a sitting Republican governor. Median age, the share of non-white or Hispanic population, and the share of population in owner-occupied housing units come from 2010 decennial census data. Average education is the share of the state population 25 or older with a high-school degree as computed from 2016 5-year ACS data. Median household income and the percentage of foreign-born population also come from 2016 5-year ACS data.

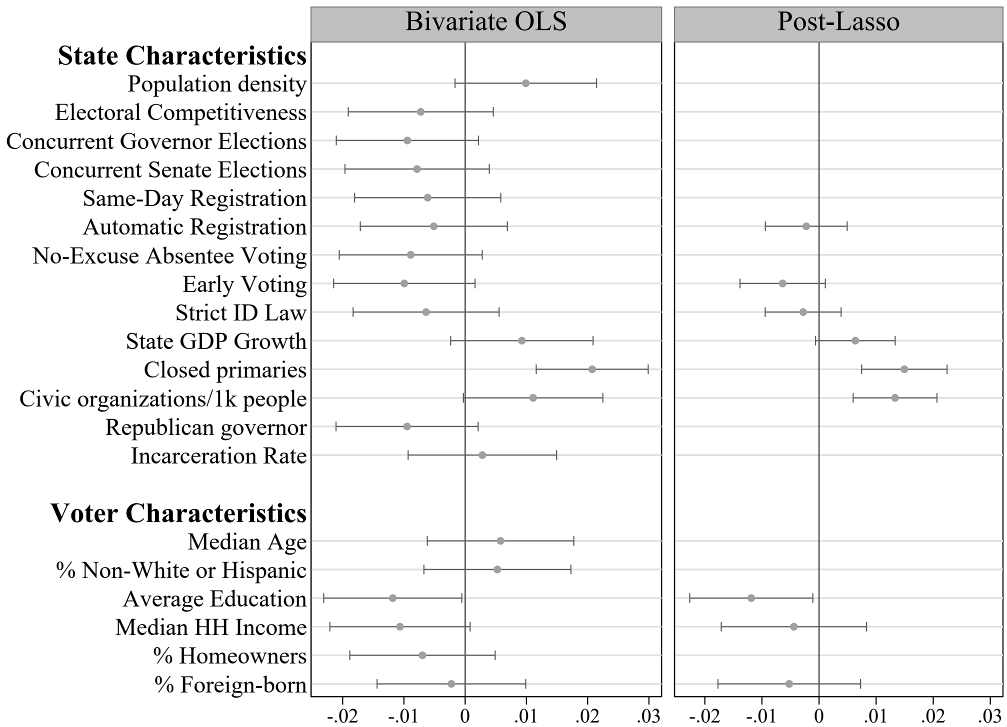
Figure 8: Correlates of Turnout Average Voter Effects



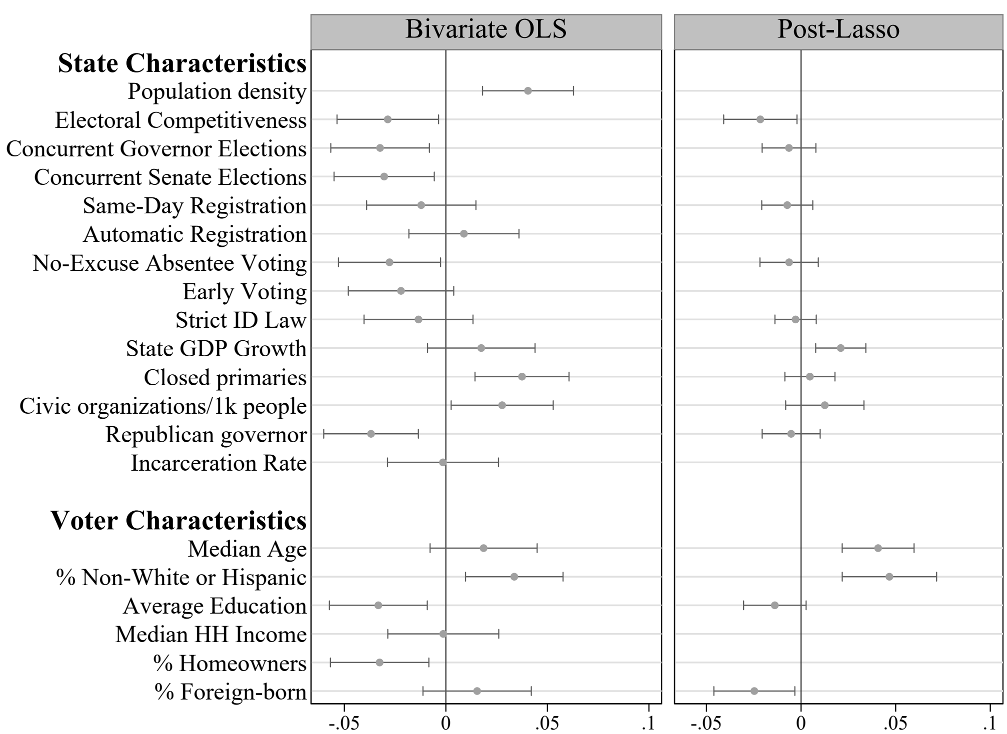
Notes: The Figure shows results from bivariate OLS regressions (left panel) and from a post-Lasso multivariate regression (right panel) of state-level averages of voter effects ($\hat{y}_j^{vot}$) on state and voter characteristics. Other notes as in Figure 7.

Figure 9: Correlates of Democratic Party Affiliation State and Average Voter Effects

(a) Correlates of Democratic Party Affiliation State Effects



(b) Correlates of Democratic Party Affiliation Average Voter Effects



Notes: Notes as in Figures 7 and 8.

Table 1: Summary Statistics on Movers and Stayers

	Nonmovers (1)	Movers (2)
Female	.526	.544
Non-Hispanic White	.733	.830
Non-Hispanic Black	.123	.086
Other non-Hispanic	.046	.034
Hispanic	.098	.051
Age:		
Missing values	.111	.024
Mean	47.12	46.00
Std. dev.	18.50	18.36
Voted	.421	.514
Registered	.680	.768
Party registration:		
Living in a party registration state	.558	.593
…and registered as Democrat	.160	.165
…and registered as Republican	.113	.147
…and registered for other party or unaffiliated	.106	.145
…and unregistered	.179	.136
Avg N Elections Observed	5.214	5.640
N voters	349,236,576	14,203,494
N voter-years	1,499,660,672	76,673,176

Notes: Columns 1 and 2 report summary statistics, respectively, in the samples of stayers (i.e., voters who never cross state borders) and movers (i.e., voters who cross state borders exactly once).

Table 2: Linearly Additive Decomposition of Turnout Differences

	Outcome: 1(Voted)			
	Top 25/ Bottom 26	Top 15/ Bottom 15	Top 10/ Bottom 10	Top 5/ Bottom 5
	(1)	(2)	(3)	(4)
Difference in Average Turnout				
Overall	.072	.106	.126	.159
Due to Voters	.048	.063	.068	.092
Due to States	.024	.042	.058	.067
Share of difference due to				
Voters	.665	.598	.541	.580
States	.335	.402	.459	.420
	(.004)	(.005)	(.004)	(.013)

Notes: Each column reports the results of our main decomposition of voter turnout using a different set of areas R and R'. Standard errors (in parentheses) are calculated using a voter-level bootstrap with 50 repetitions. The sample used to run the underlying regression [1] consists of all movers and non-movers (N=1,576,333,848 voter-years).

Table 3: Variance Decomposition of Turnout Differences

	(1)
Cross-State Variance of Average	
Voter Turnout	.00212
Voter Effects	.00151
State Effects	.00112
Correlation of Average Voter and State Effects	-.19651
	(.00591)
Share variance would be reduced if:	
Voter effects were made equal	.472
	(.005)
State effects were made equal	.286
	(.004)

Notes: The table reports results of the variance decomposition described in Section 4.2. Cross-state variances of average voter and state effects, as well as their correlation, are estimated using the split-sample approach described in the text. Standard errors, reported in parentheses, are computed using a voter-level bootstrap with 50 repetitions. The sample used to run the underlying regression [1] consists of all movers and non-movers (N=1,576,333,848 voter-years).

Table 4: Linearly Additive Decomposition of Turnout Differences by Subgroup

Sample	N (1)	N from Movers (2)	Mean Turnout (3)	Above/below Median Diff (4)	Share due to Voters (5)
(1) Aged 18 through 29	276,926,028	16,207,896	.341	.077	.361
(2) Aged 30 through 44	363,659,898	21,515,206	.415	.090	.633
(3) Aged 45 through 59	389,115,605	17,889,470	.534	.092	.742
(4) Aged 60 or older	360,108,576	18,559,192	.572	.088	.862
(5) Female	830,964,933	41,712,104	.435	.071	.666
(6) Male	715,940,499	34,526,024	.428	.074	.661
(7) White	1,162,319,642	63,628,668	.458	.071	.524
(8) Non-white	414,014,186	13,044,505	.335	.078	.677

Notes: This table reports the turnout decompositions in the 26 states with highest vs. 25 states with lowest turnout, estimated separately by age (as of the first election in which a voter is observed), gender, and race.

Table 5: Linearly Additive Decomposition of Registration and Party Affiliation Differences

	Top 25/ Bottom 26 (1)	Top 15/ Bottom 15 (2)	Top 10/ Bottom 10 (3)	Top 5/ Bottom 5 (4)
Panel A. Outcome: 1(Registered)				
Overall Difference	.069	.106	.132	.163
Due to Voters	.051	.082	.099	.109
Due to States	.018	.025	.033	.054
Share Due to Voters	.743	.767	.751	.669
Share Due to States	.257	.233	.249	.331
Panel B. Outcome: 1(Registered Democrat)				
Overall Difference	-	.142	.195	.276
Due to Voters	-	.102	.136	.198
Due to States	-	.041	.058	.079
Share Due to Voters	-	.716	.702	.716
Share Due to States	-	.284	.298	.284
Panel C. Outcome: 1(Registered Republican)				
Overall Difference	-	.111	.160	.244
Due to Voters	-	.088	.121	.200
Due to States	-	.023	.039	.044
Share Due to Voters	-	.793	.755	.821
Share Due to States	-	.207	.245	.179
Panel D. Outcome: 1(Registered Unaffiliated/3rd Party)				
Overall Difference	-	.147	.199	.268
Due to Voters	-	.089	.122	.155
Due to States	-	.058	.077	.114
Share Due to Voters	-	.603	.615	.577
Share Due to States	-	.397	.385	.423

Notes: Each panel in this table replicates the decompositions of Table 2 using different outcomes. In Panels B-D, the sample of the underlying regressions is restricted to the 30 states for which Catalist records party affiliation. The outcomes in Panels B, C, and D are a dummy for whether a voter is registered and affiliated with, respectively, the Democratic party, the Republican party, a 3rd party or is registered without party affiliation.

Table 6: Variance Decomposition of Registration and Party Affiliation Differences

	Outcome:			
	1(Registered)	1(Registered Republican)	1(Registered Democrat)	1(Registered Unaff./3rd Party)
	(1)	(2)	(3)	(4)
Cross-State Variance of Average				
Outcome	.00223	.00899	.00609	.00857
Voter Effects	.00198	.00498	.00411	.00394
State Effects	.00137	.00099	.00065	.00206
Correlation of Average Voter and State Effects	-.33964	.68127	.40675	.45311
Share variance would be reduced if:				
Voter effects were made equal	.387	.890	.893	.760
State effects were made equal	.112	.446	.325	.541

Notes: The table reports results of the variance decomposition described in Section 4.2. Cross-state variances of average voter and state effects, as well as their correlation, are estimated using the split-sample approach described in the text. Standard errors, reported in parentheses, are computed using a voter-level bootstrap with 50 repetitions. The sample used to run the underlying regression [1] consists of all movers and non-movers (N=1,576,333,848 voter-years). The sample for columns 2-4 is restricted to the 30 states for which Catalist records party affiliation.

Table 7: Linearly Additive Decomposition of Registration and Party Affiliation Differences by Subgroup

Sample	N (1)	N from Movers (2)	Mean Outcome (3)	Above/below Median Diff (4)	Share due to Voters (5)
Panel A. Outcome: 1(Registered)					
(1) Aged 18 through 29	276,926,028	16,207,896	.802	.098	.401
(2) Aged 30 through 44	363,659,898	21,515,206	.723	.081	.642
(3) Aged 45 through 59	389,115,605	17,889,470	.764	.063	.691
(4) Aged 60 or older	360,108,576	18,559,192	.754	.055	1.169
(5) Female	830,964,933	41,712,104	.690	.073	.706
(6) Male	715,940,499	34,526,024	.695	.072	.731
(7) White	1,162,319,642	63,628,668	.697	.072	.785
(8) Non-white	414,014,186	13,044,505	.648	.122	.469
Panel B. Outcome: 1(Registered Democrat)					
(1) Aged 18 through 29	153,915,872	9,447,349	.319	.167	.720
(2) Aged 30 through 44	201,674,160	12,427,845	.288	.158	.742
(3) Aged 45 through 59	218,525,248	10,554,051	.321	.164	.758
(4) Aged 60 or older	206,514,704	11,614,561	.344	.167	.714
(5) Female	464,071,296	24,717,140	.314	.149	.710
(6) Male	400,916,448	20,490,706	.262	.141	.733
(7) White	636,085,760	37,671,020	.247	.120	.661
(8) Non-white	246,056,016	7,796,831	.387	.199	.683
Panel C. Outcome: 1(Registered Republican)					
(1) Aged 18 through 29	153,915,872	9,447,349	.182	.121	.826
(2) Aged 30 through 44	201,674,160	12,427,845	.199	.121	.846
(3) Aged 45 through 59	218,525,248	10,554,051	.248	.131	.819
(4) Aged 60 or older	206,514,704	11,614,561	.266	.140	.709
(5) Female	464,071,296	24,717,140	.193	.113	.809
(6) Male	400,916,448	20,490,706	.224	.113	.760
(7) White	636,085,760	37,671,020	.253	.121	.763
(8) Non-white	246,056,016	7,796,831	.079	.063	.759
Panel D. Outcome: 1(Registered Unaffiliated or 3rd Party)					
(1) Aged 18 through 29	153,915,872	9,447,349	.310	.186	.590
(2) Aged 30 through 44	201,674,160	12,427,845	.234	.158	.621
(3) Aged 45 through 59	218,525,248	10,554,051	.190	.163	.668
(4) Aged 60 or older	206,514,704	11,614,561	.143	.147	.692
(5) Female	464,071,296	24,717,140	.183	.149	.603
(6) Male	400,916,448	20,490,706	.209	.146	.610
(7) White	636,085,760	37,671,020	.199	.151	.612
(8) Non-white	246,056,016	7,796,831	.177	.123	.498

Notes: This table reports decompositions in states above vs. below the median outcome, estimated separately by age (as of the first election in which a voter is observed), gender, and race.

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A Online Appendix

- Appendix A.1: Additional Summary Statistics
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  - Figure A2: Distribution of Voter Registration and Democratic, Republican, and Other Affiliation by State, 2008–2018
  - Figure A3: Average Voter Registration and Democratic, Republican, and Other Affiliation by State, 2008–2018
  - Figure A4: Distribution of Destination-Origin Difference in Voter Registration and Republican and Other Party Affiliation
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  - Figure A5: Event-Study Plot: δ_i Defined Using Year-Specific Differences in Average Turnout Between States of Destination and Origin
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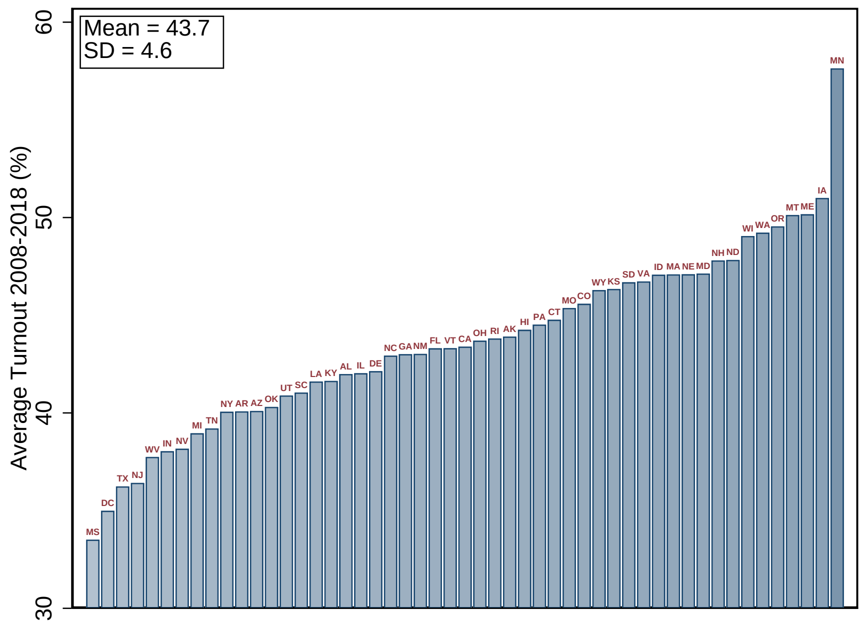
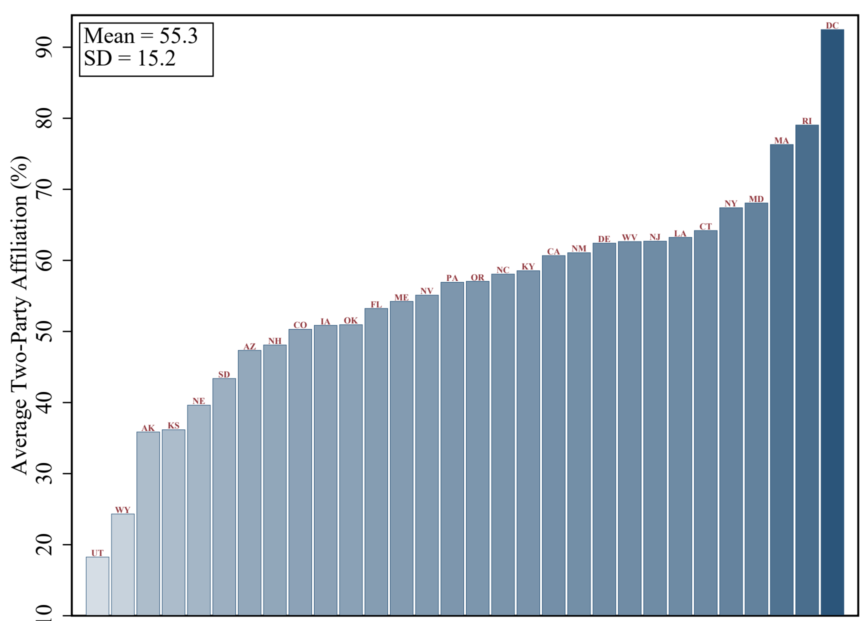
A.1 Additional Summary Statistics

Figure A1: Average Voter Turnout and Democratic Two-Party Affiliation Share by State, 2008–2018

(a) Average Turnout by State



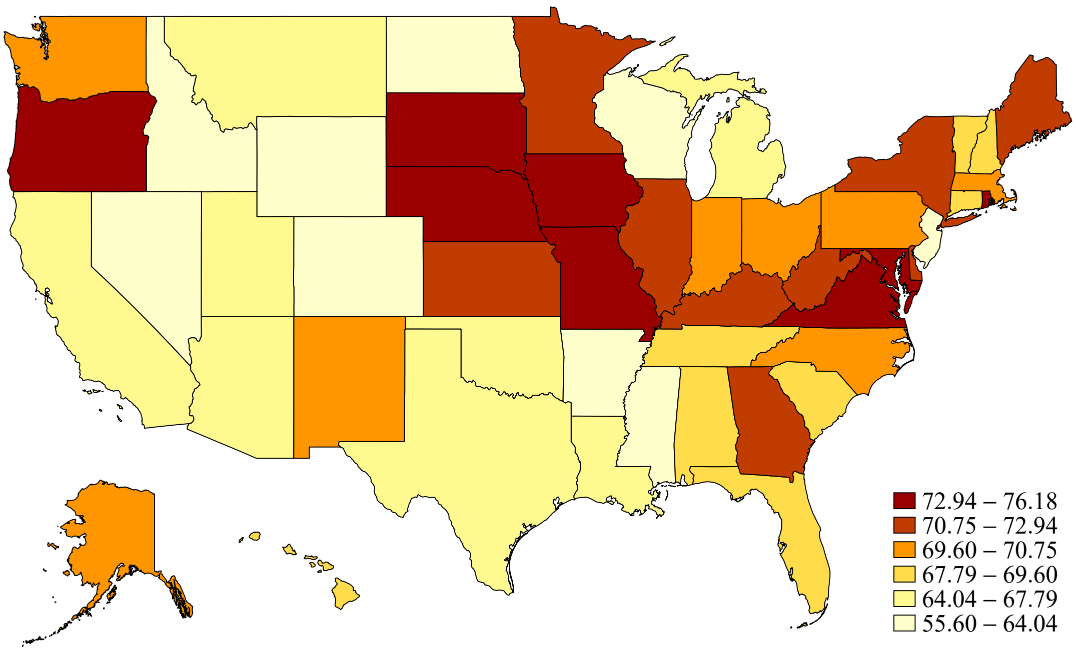
(b) Average Democratic Two-Party Affiliation Share by State



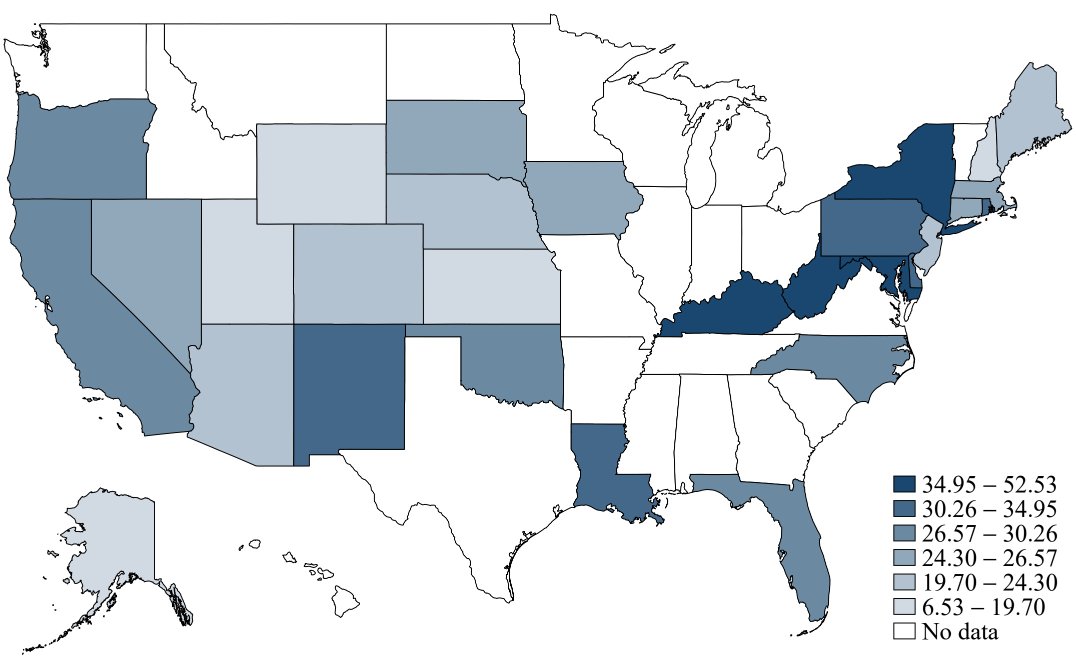
Notes: For each state, we show the simple average of turnout and Democratic Two-Party affiliation share across the six elections (2008–2018) in the Catalist data. The sample is all movers and non-movers.

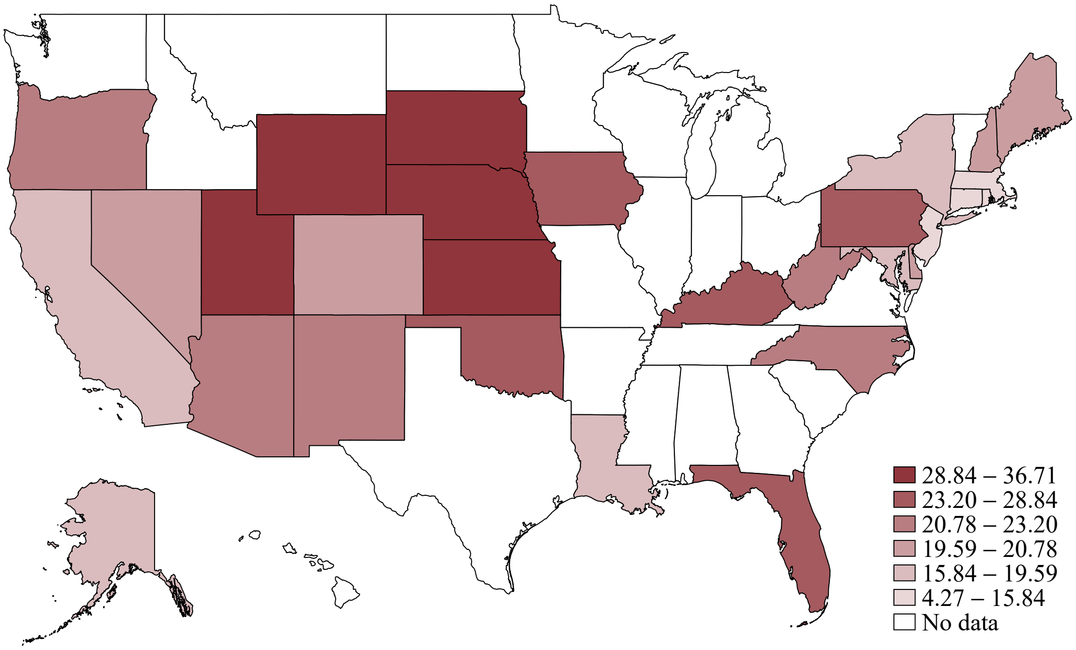
Figure A2: Distribution of Voter Registration and Democratic, Republican, and Other Affiliation by State, 2008–2018

(a) Distribution of Registration across States

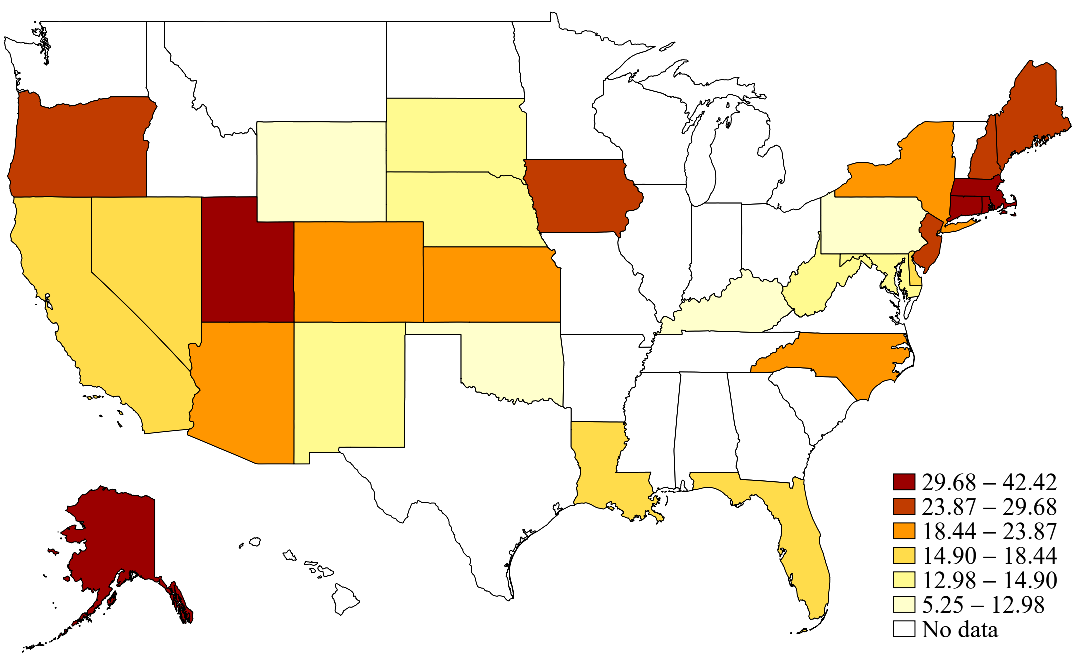


(b) Distribution of Democratic Party Affiliation across States





(c) Distribution of Republican Party Affiliation across States

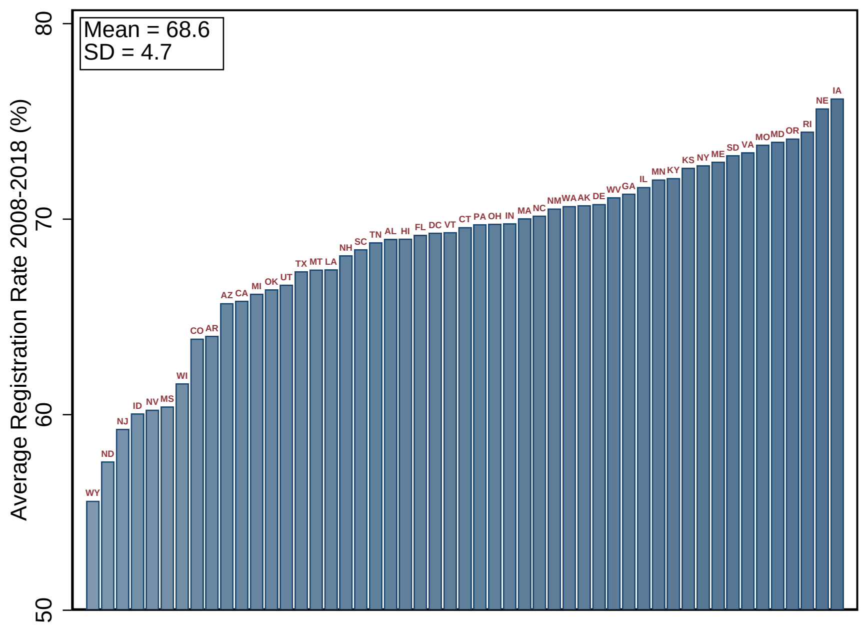


(d) Distribution of Other Affiliation across States

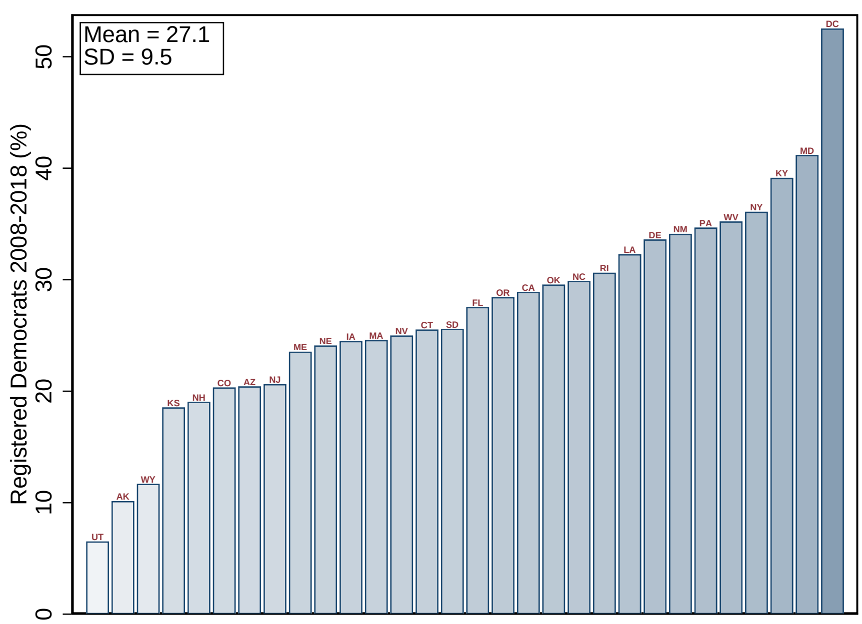
Notes: The maps plot average state registration, Democratic Party affiliation (a dummy equal to 1 for registered Democrats and 0 for people who are not registered or registered but not affiliated with the Democrats), Republican Party affiliation (defined similarly), and other affiliation (a dummy equal to 1 for registered people affiliated with another party than Republicans and Democrats or not affiliated with any party) in the Catalist data in six bins. Lower and upper limits of the outcome in each bin are displayed in the legend. For each state, we take the simple outcome average across the six elections (2008–2018) in the Catalist data. The sample is all movers and non-movers.

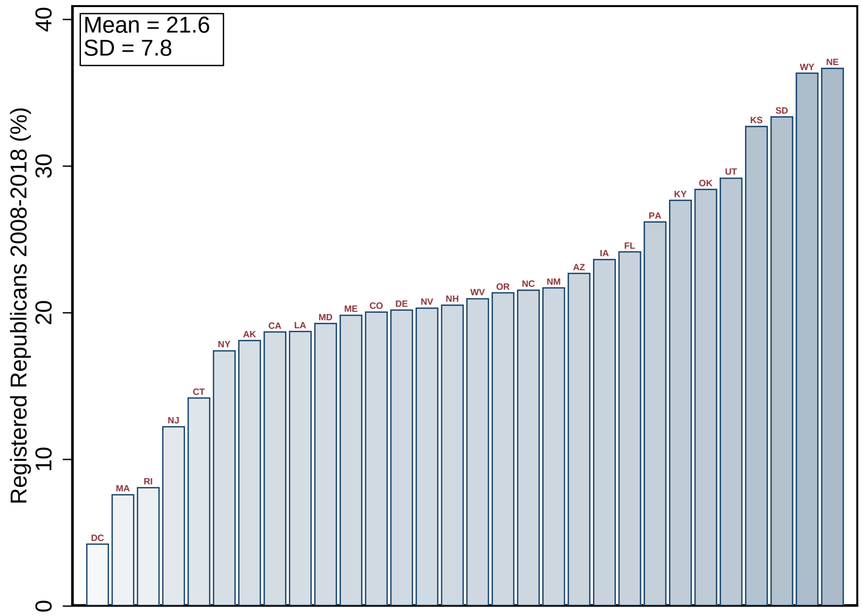
Figure A3: Average Voter Registration and Democratic, Republican, and Other Affiliation by State, 2008–2018

(a) Average Registration by State

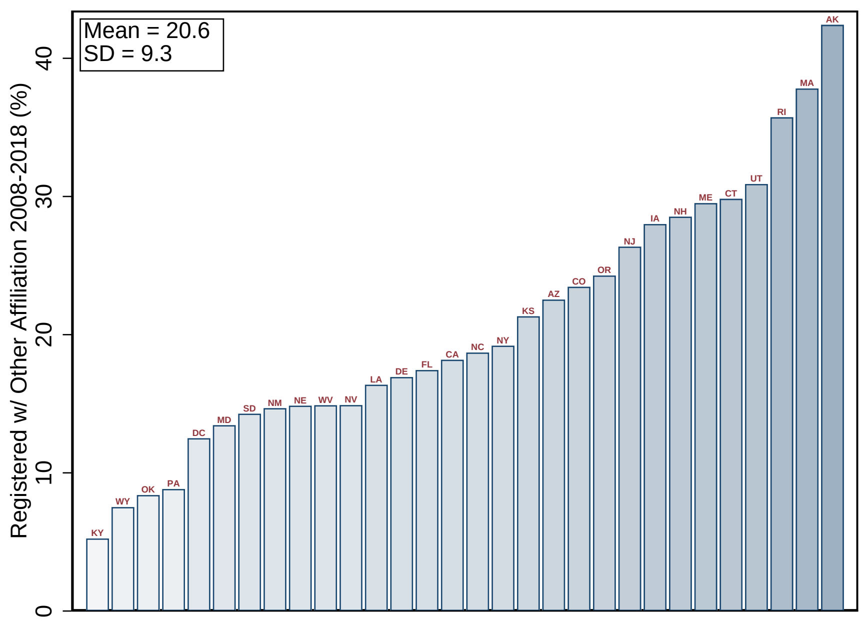


(b) Average Democratic Party Affiliation by State





(c) Average Republican Party Affiliation by State

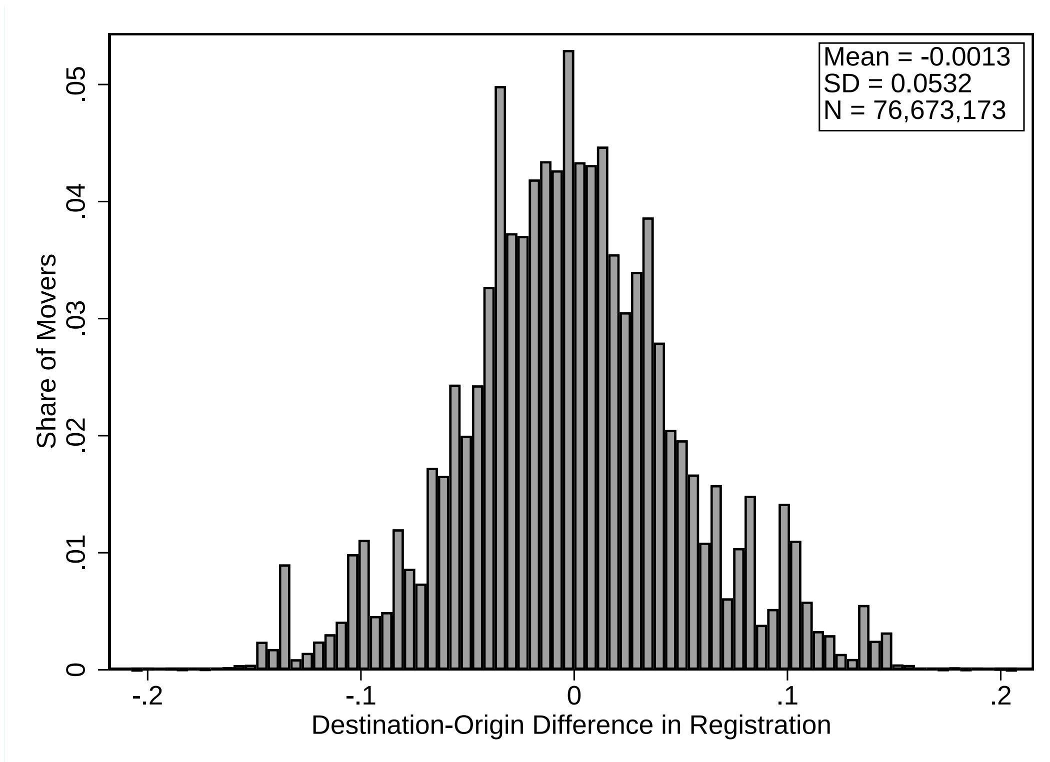


(d) Average Other Affiliation by State

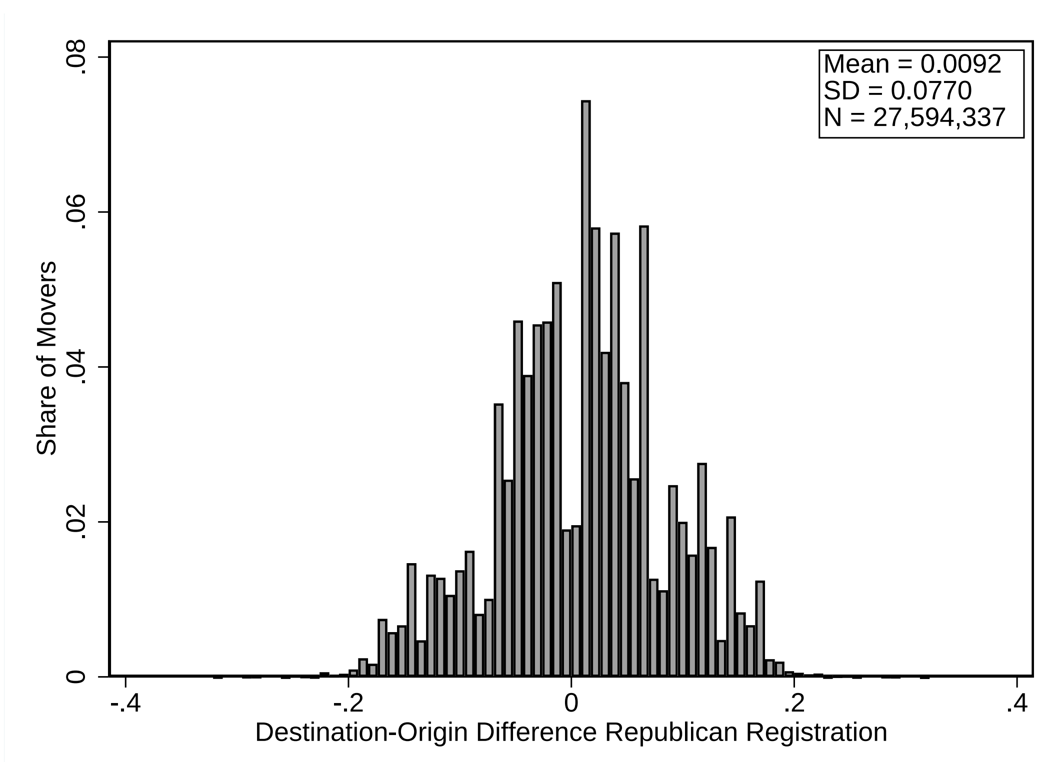
Notes: For each state, we show the simple average of registration, Democratic Party affiliation, Republican Party affiliation, and other affiliation across the six elections (2008–2018) in the Catalist data. The sample is all movers and non-movers.

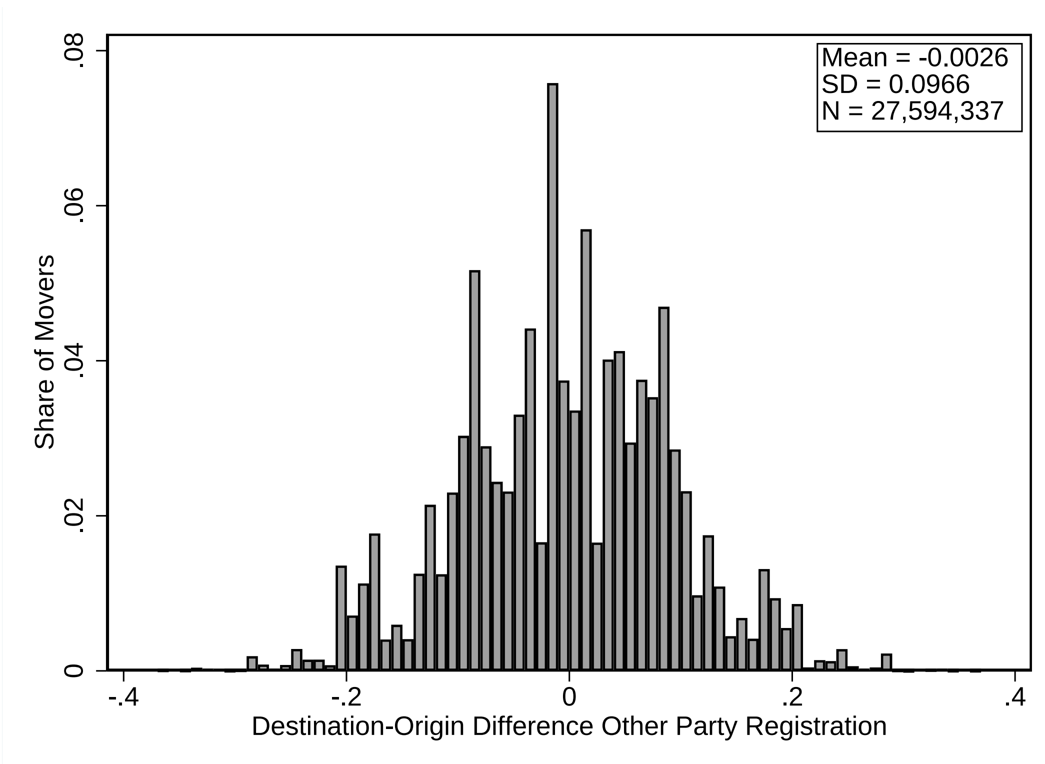
Figure A4: Distribution of Destination-Origin Difference in Voter Registration and Republican and Other Party Affiliation

(a) Distribution of Destination-Origin Difference in Registration



(b) Distribution of Destination-Origin Difference in Republican Party Affiliation





(c) Distribution of Destination-Origin Difference in Other Affiliation

Notes: The figures show the distributions of the difference in average registration (resp. Republican Party affiliation and other affiliation) across states of origin and destination ($\hat{\delta}_i$) in the movers sample. The sample is all mover-years.

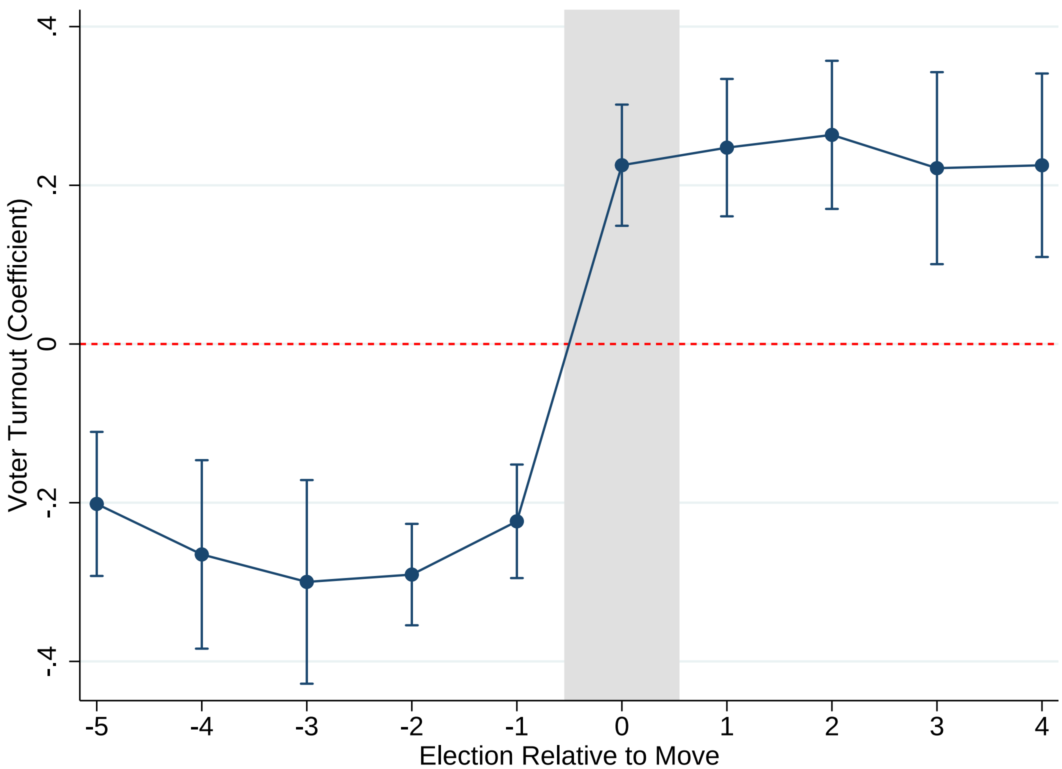
Table A1: Movers by pairs of census divisions

		Destination									
		ENC	ESC	M-A	M	NE	P	SA	WNC	WSC	Total
Origin	East North Central	3.04	1.15	0.65	1.54	0.26	1.18	4.07	1.30	1.21	14.40
	East South Central	0.86	0.79	0.18	0.29	0.07	0.28	1.96	0.21	0.71	5.36
	Middle Atlantic	0.76	0.27	2.77	0.71	1.05	1.01	5.83	0.21	0.61	13.21
	Mountain	0.81	0.22	0.36	2.42	0.20	2.53	1.21	0.77	1.18	9.71
	New England	0.24	0.10	0.69	0.31	1.70	0.46	1.93	0.09	0.22	5.75
	Pacific	0.87	0.33	0.66	3.99	0.38	3.54	1.79	0.61	1.48	13.65
	South Atlantic	2.23	1.43	2.75	1.36	1.03	1.63	9.89	0.67	1.76	22.75
	West North Central	1.16	0.22	0.18	1.12	0.09	0.65	1.05	1.95	0.97	7.41
	West South Central	0.65	0.55	0.32	1.13	0.14	0.98	1.55	0.67	1.77	7.75
	Total	10.62	5.07	8.56	12.86	4.93	12.27	29.29	6.48	9.92	100.00

Notes: Each cell reports the percentage of all movers who moved from the census division in row to the census division in column. The denominator is all movers.

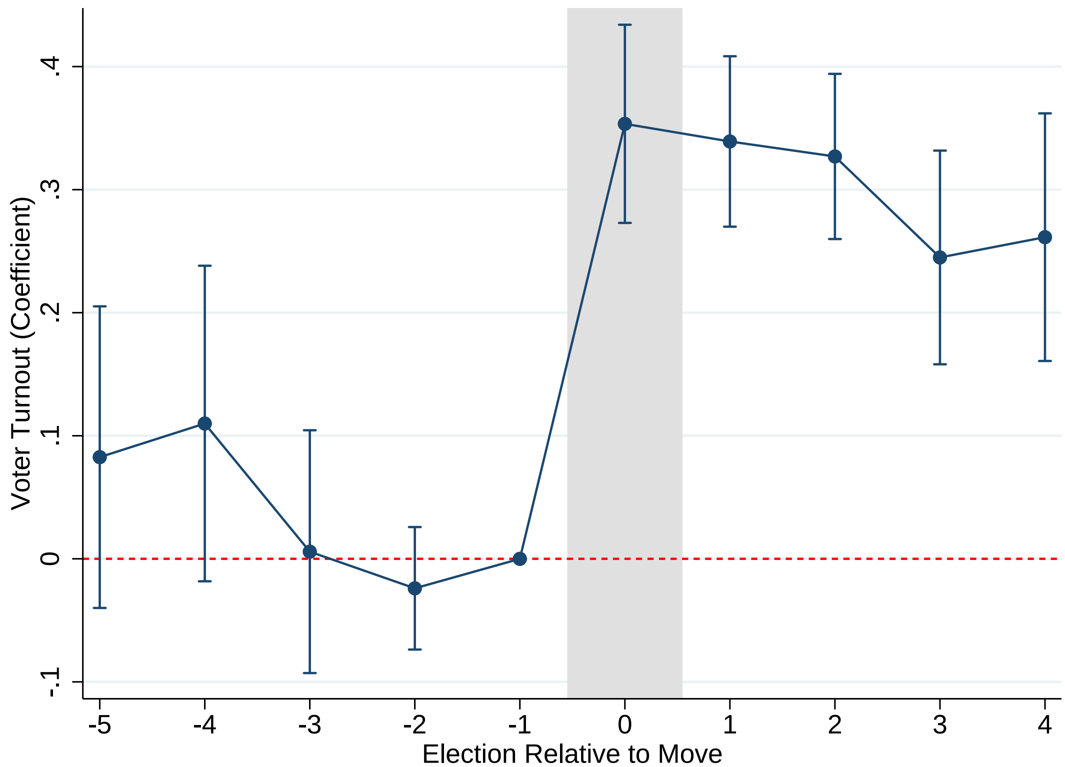
A.2 Additional Results

Figure A5: Event-Study Plot: δ_i Defined Using Year-Specific Differences in Average Turnout Between States of Destination and Origin



Notes: The figure replicates Figure 4 using year-specific $\hat{\delta}_{it}$'s instead of the time-invariant $\hat{\delta}_i$'s.

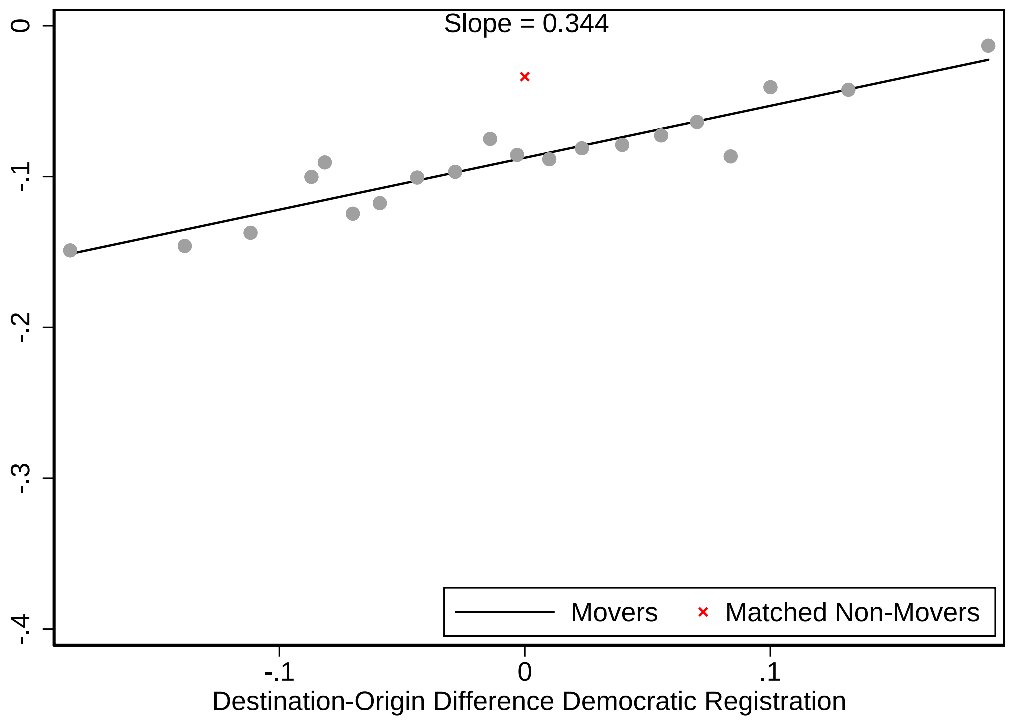
Figure A6: Event-Study Plot: δ_i Defined Using McDonald's State Turnout Figures



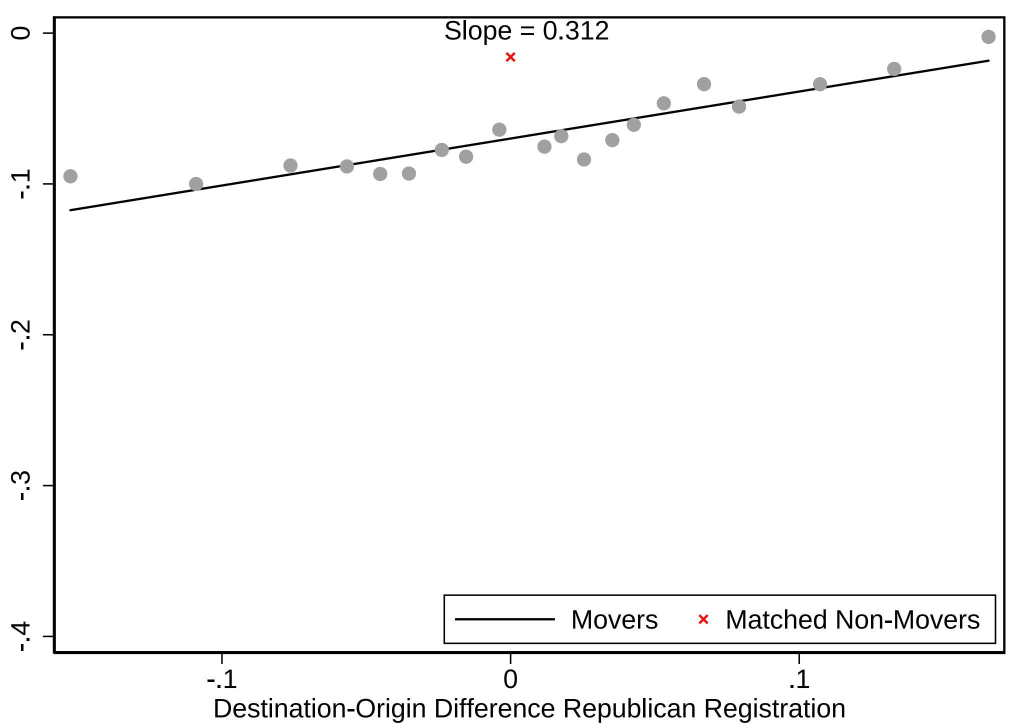
Notes: The figure replicates Figure 4 using $\hat{\delta}_i$'s based on McDonald (2018)'s turnout data instead of the Catalist data.

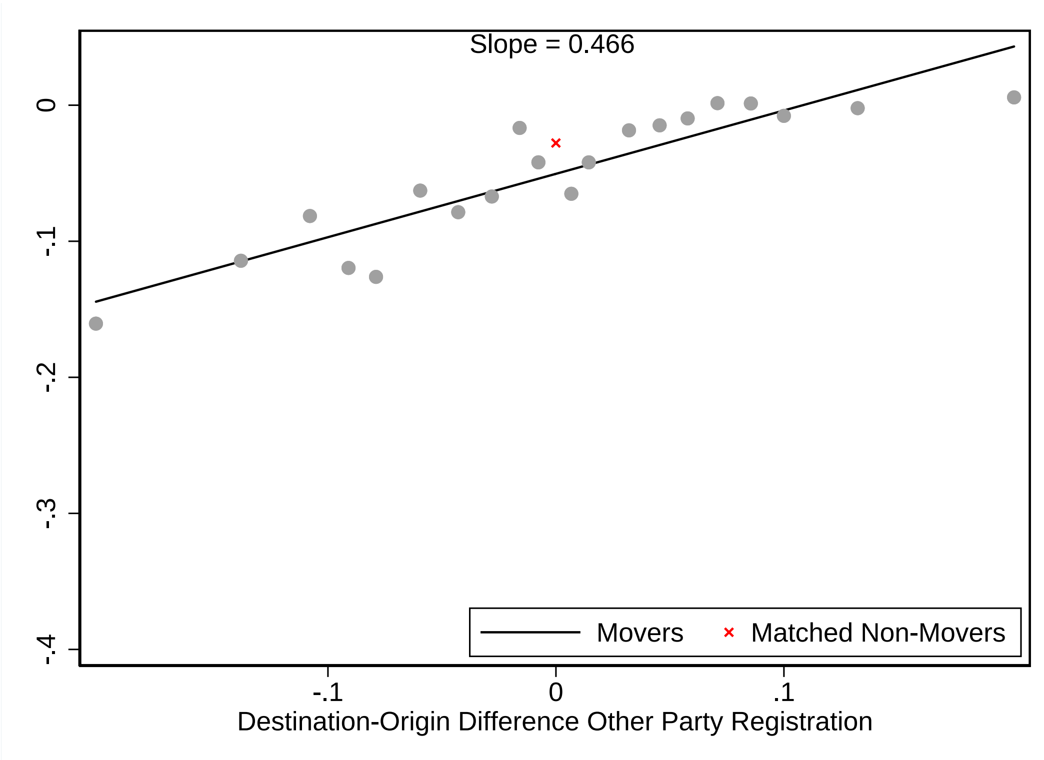
Figure A7: Change in Movers' Democratic, Republican, and Other Affiliation Against Destination-Origin Differences

(a) Change in Movers' Democratic Party Affiliation Against Destination-Origin Differences



(b) Change in Movers' Republican Party Affiliation Against Destination-Origin Differences



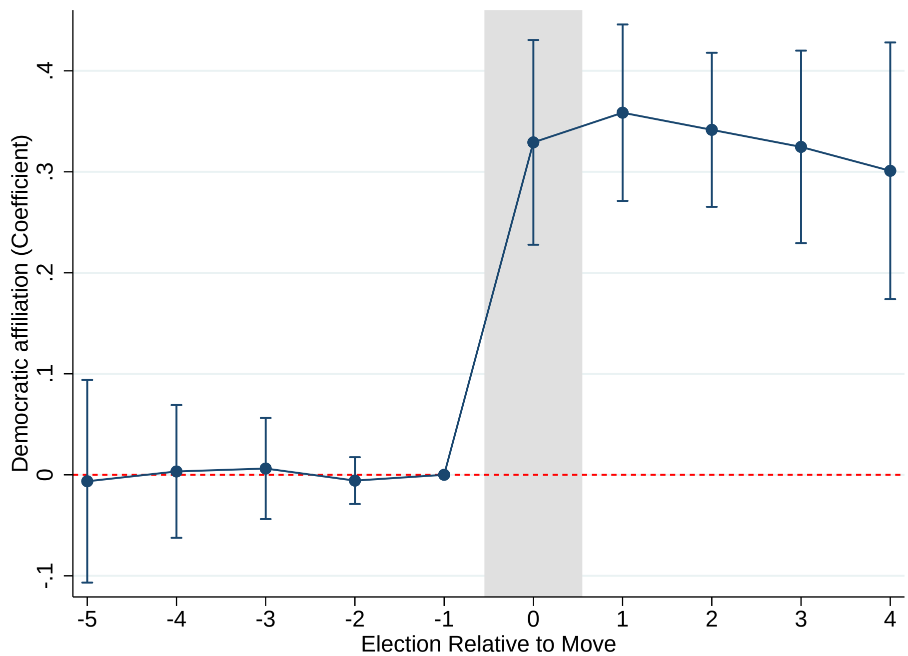


(c) Change in Movers' Other Affiliation Against Destination-Origin Differences

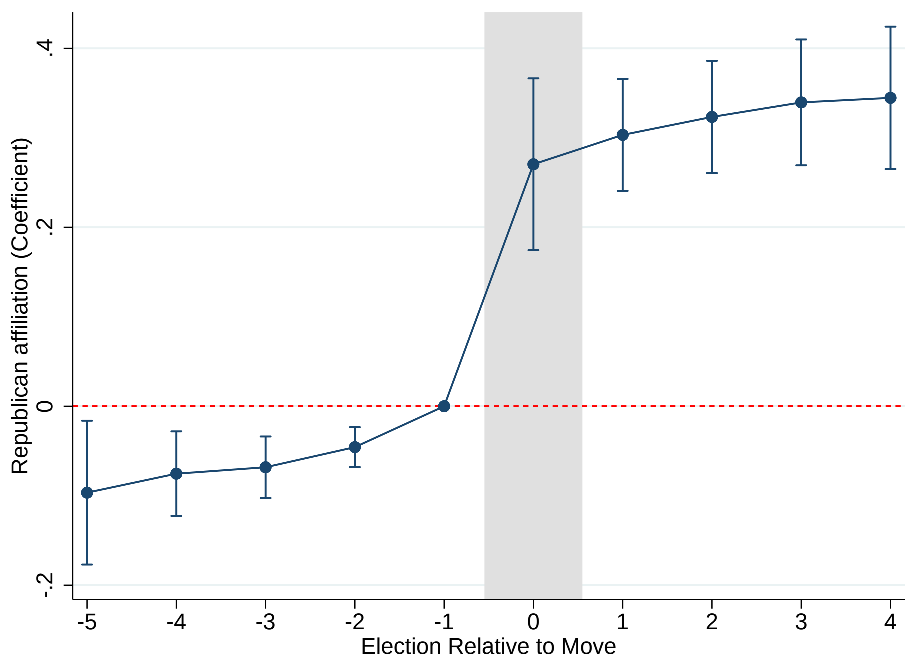
Notes: the figures show how Democratic, Republican, and other party affiliation change before and after move in relation to differences in average outcomes across states of origin and destination. The x- axis displays the average $\hat{\hat{\delta}}_i$ for movers in each ventile. For each ventile, the y-axis shows average Democratic, Republican, or other party affiliation in all post-move elections minus average Democratic, Republican, or other party affiliation in all pre-move elections. The line represents the best linear fit from a simple OLS regression using the 20 data points, and its slope is reported on the graph. For comparison, we also compute the change in Democratic, Republican, and other party affiliation for a sample of matched non-movers and denote it with an $\times$ in the graph. Details on the matching procedure are described in the text.

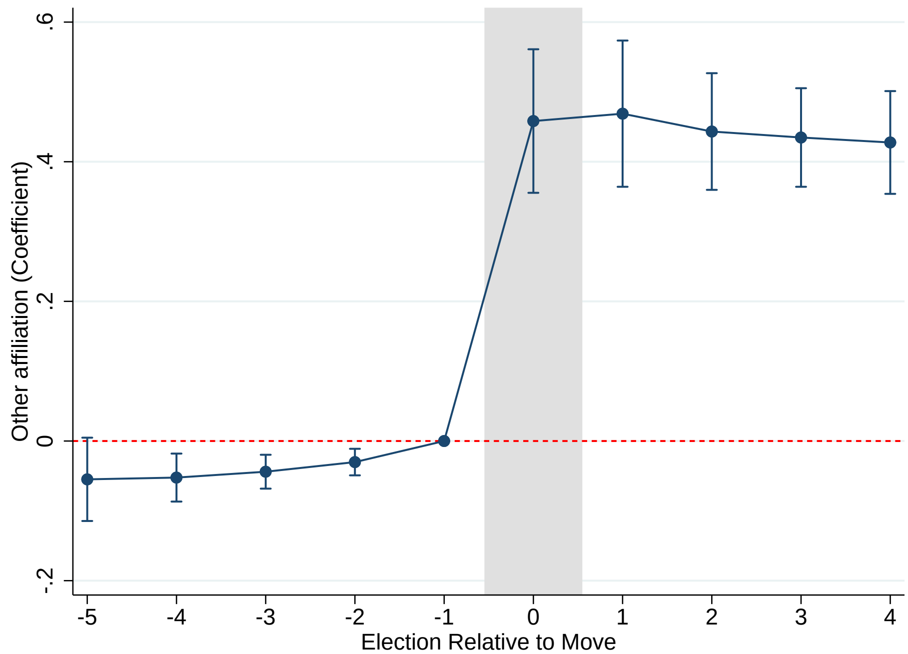
Figure A8: Event-Study Plots, Democratic, Republican, and Other Affiliation

(a) Event-Study Plot, Democratic Party Affiliation



(b) Event-Study Plot, Republican Party Affiliation



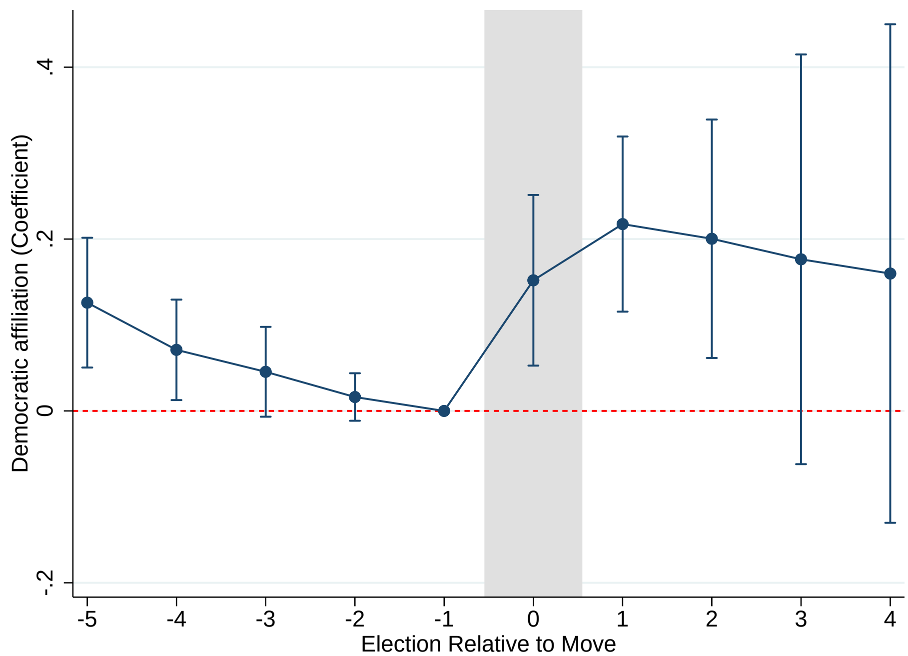


(c) Event-Study Plot, Other Affiliation

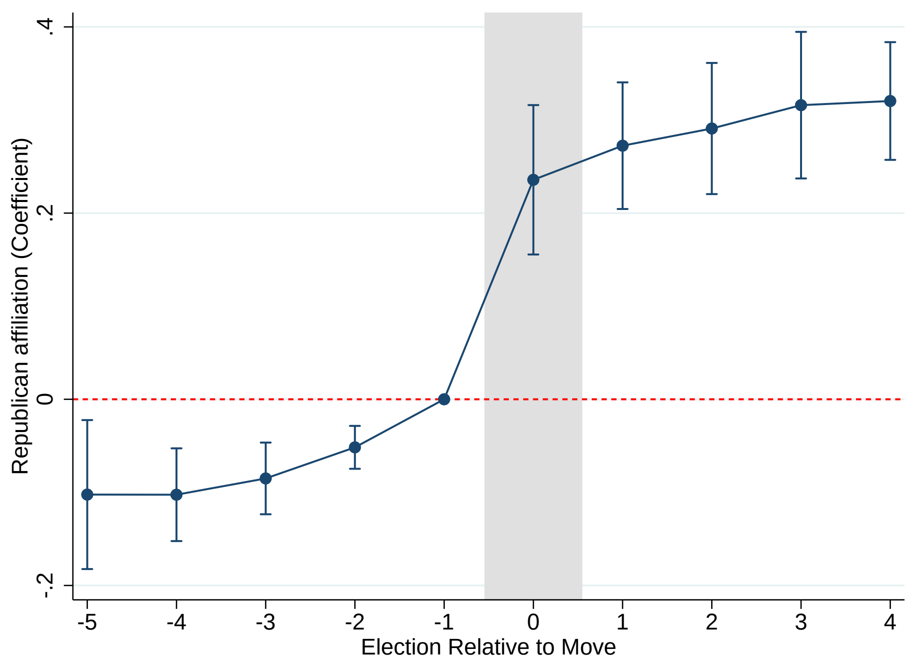
Notes: The figure plots estimates of $\theta_{r(i,t)}$ and 95-percent confidence intervals (robust to two-way clustering by states and individuals) from event-study specification [6]. The dependent variables are dummies defined whether voters are registered or not and equal to 1 if they are affiliated with the Democratic Party (resp. Republican Party and other affiliation), and 0 otherwise. For each mover, $\hat{\delta}_i$ is constructed using the difference in average outcome in the state of destination across all elections in our sample minus average outcome in the state of origin. The sample is all mover-years for moves between states in which party affiliation is available.

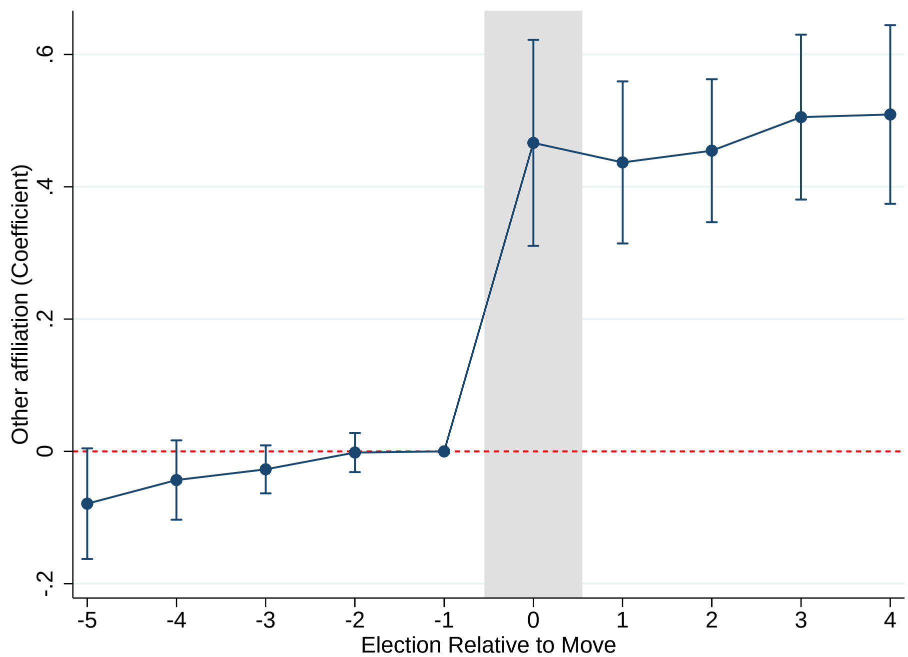
Figure A9: Event-Study Plots, Democratic, Republican, and Other Affiliation, States with Identical Primaries Rules

(a) Event-Study Plot, Democratic Party Affiliation, States with Identical Primaries Rules



(b) Event-Study Plot, Republican Party Affiliation, States with Identical Primaries Rules

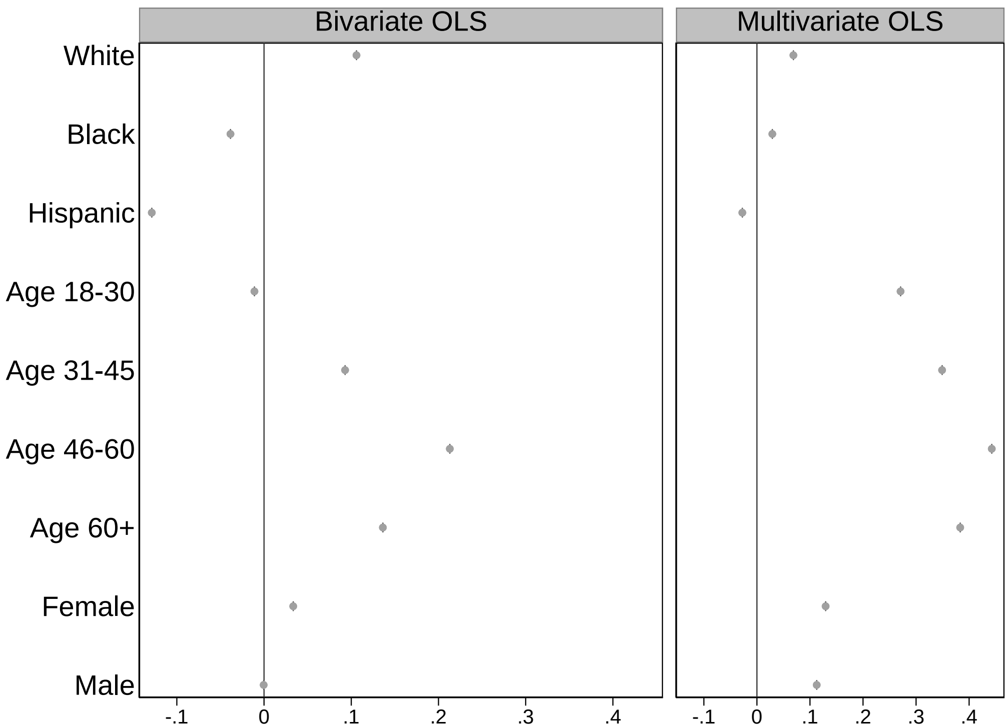




(c) Event-Study Plot, Other Affiliation, States with Identical Primaries Rules

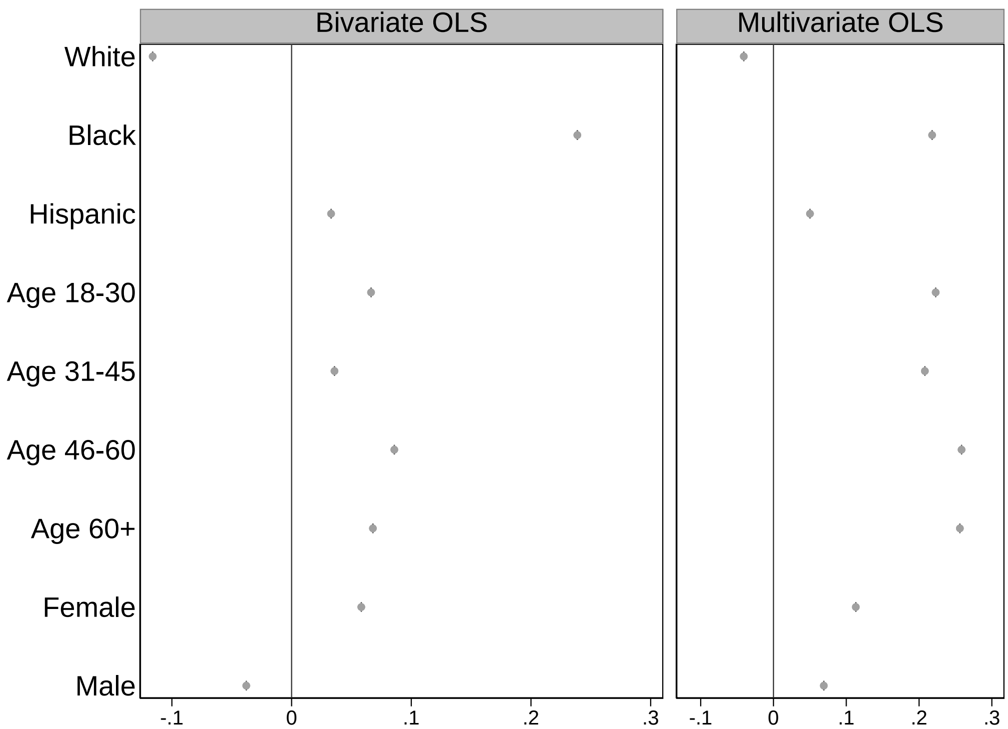
Notes: The figure plots estimates of $\theta_{r(i,t)}$ and 95-percent confidence intervals (robust to two-way clustering by states and individuals) from event-study specification [6]. The dependent variables are dummies defined whether voters are registered or not and equal to 1 if they are affiliated with the Democratic Party (resp. Republican Party and other affiliation), and 0 otherwise. For each mover, $\hat{\hat{\delta}}_i$ is constructed using the difference in average outcome in the state of destination across all elections in our sample minus average outcome in the state of origin. The sample is all mover-years for moves between states in which party affiliation is available and with identical primaries rules.

Figure A10: Correlates of Turnout Individual-Level Voter Effects



Notes: The Figure shows results from bivariate OLS regressions (left panel) and from a multivariate OLS regression (right panel) of individual voter effects ($\hat{y}_j^{vot}$) on voter characteristics available in the Catalist data. The reference categories (i.e., the voter characteristics omitted from the right panel) for age and gender consist of voters with missing age and gender information, respectively. The reference category for race includes voters with unknown race, along with non-White, non-Hispanic, non-African American voters. Other notes as in Figure 7.

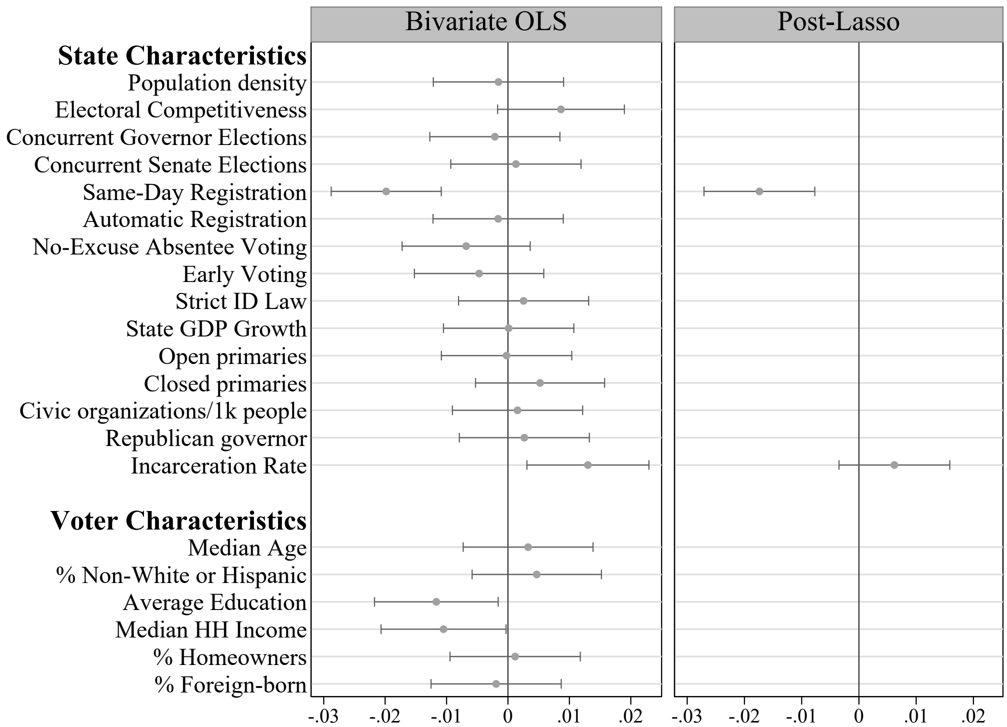
Figure A11: Correlates of Democratic Party Affiliation Individual-Level Voter Effects



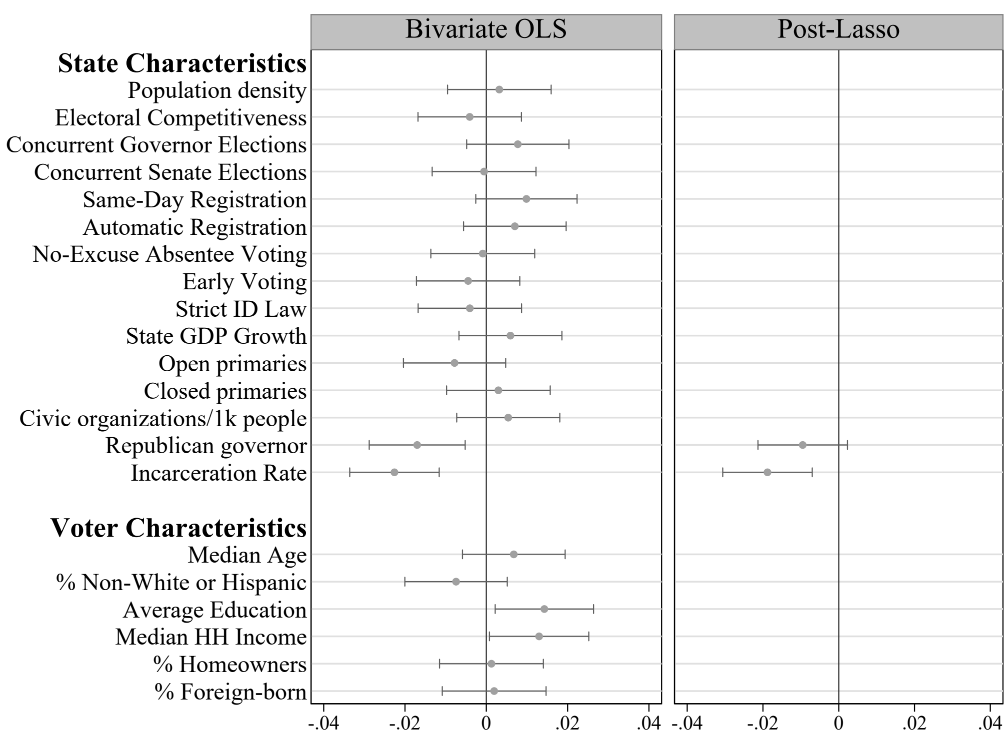
Notes: Notes as in Figure A10.

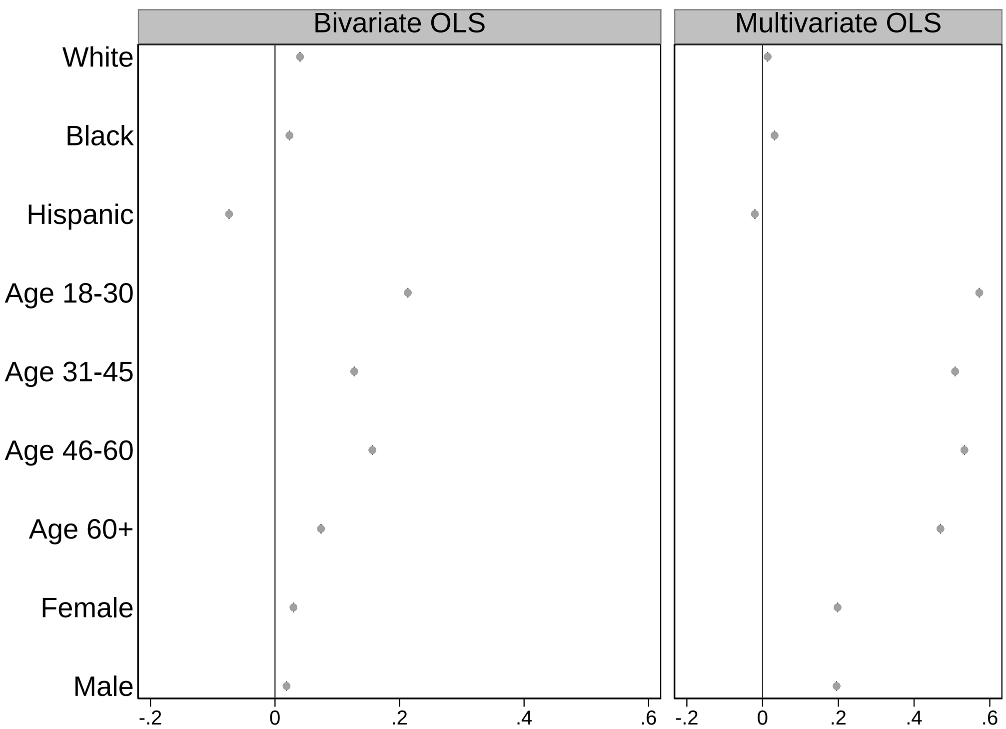
Figure A12: Correlates of Registration State and Voter Effects

(a) Correlates of Registration State Effects



(b) Correlates of Registration Average Voter Effects



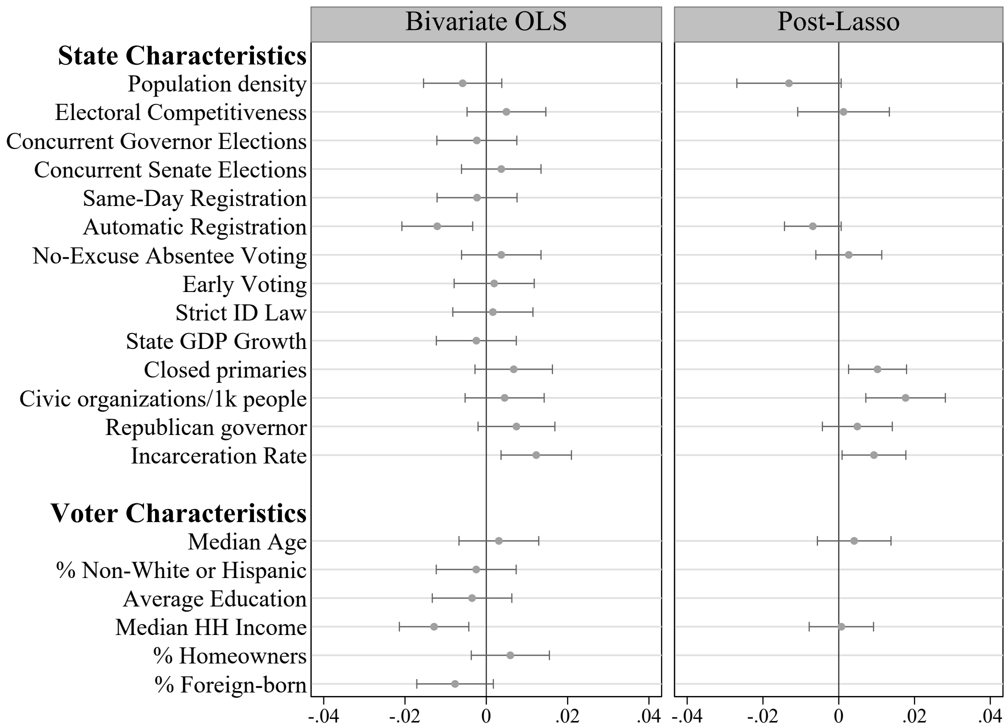


(c) Correlates of Registration Individual-Level Voter Effects

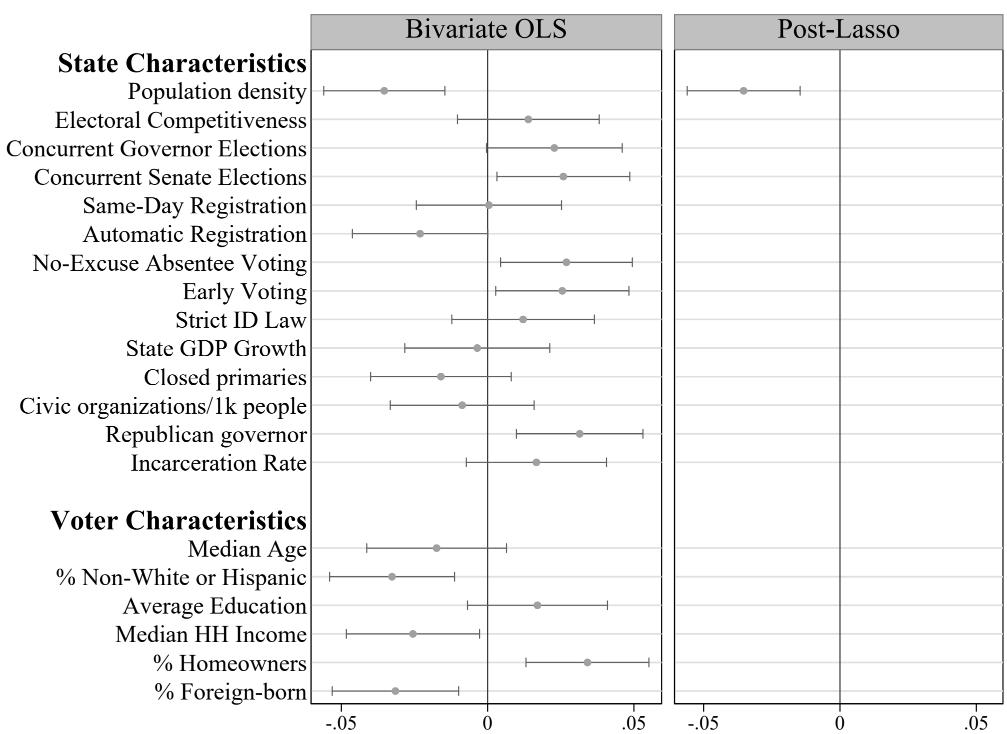
Notes: Notes as in Figures 7, 8, and A10.

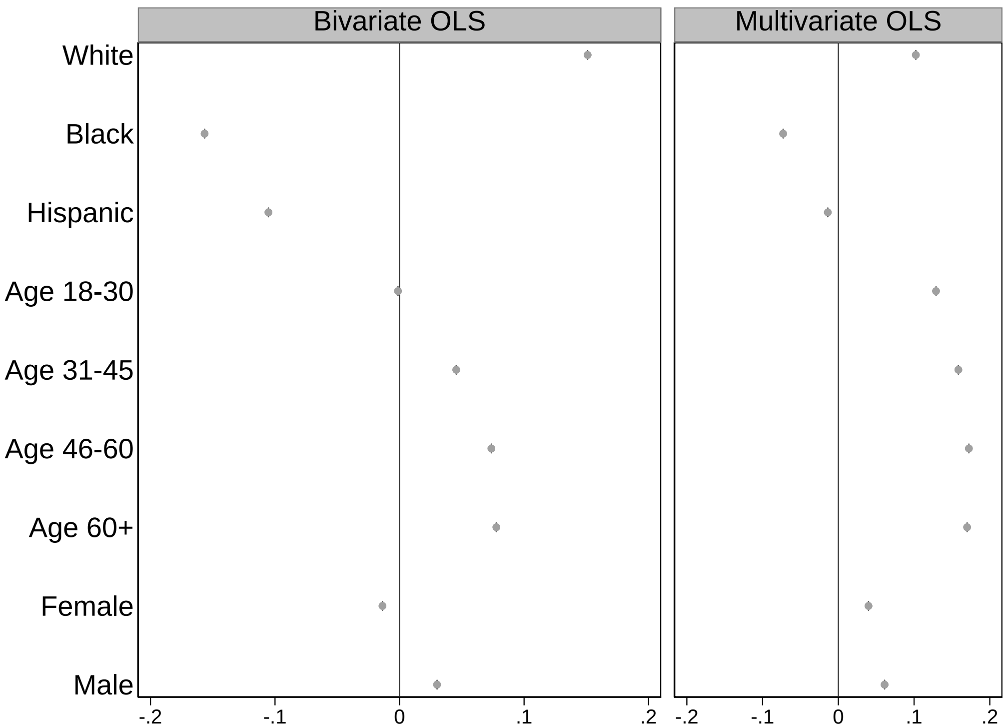
Figure A13: Correlates of Republican Party Affiliation State and Voter Effects

(a) Correlates of Republican Party Affiliation State Effects



(b) Correlates of Republican Party Affiliation Average Voter Effects



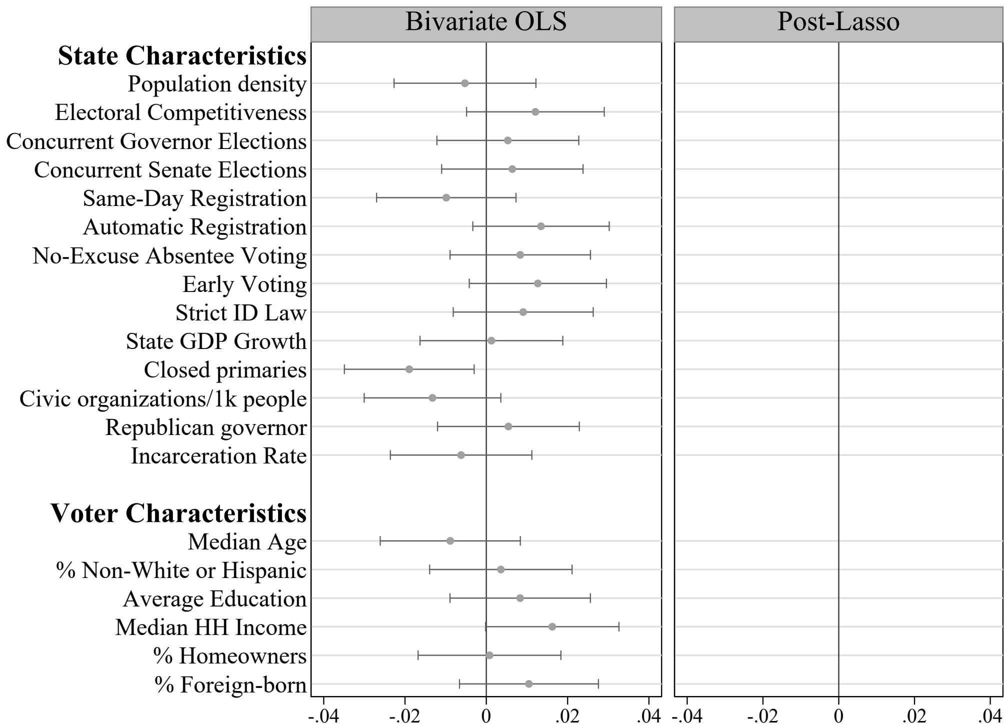


(c) Correlates of Republican Party Affiliation Individual-Level Voter Effects

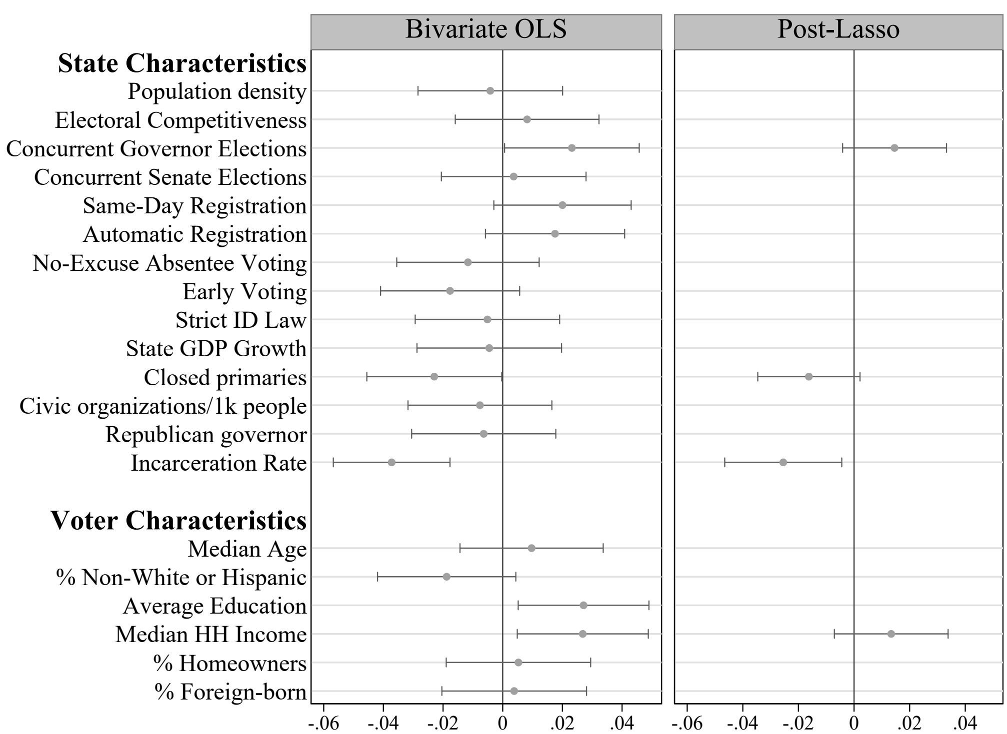
Notes: Notes as in Figures 7, 8, and A10.

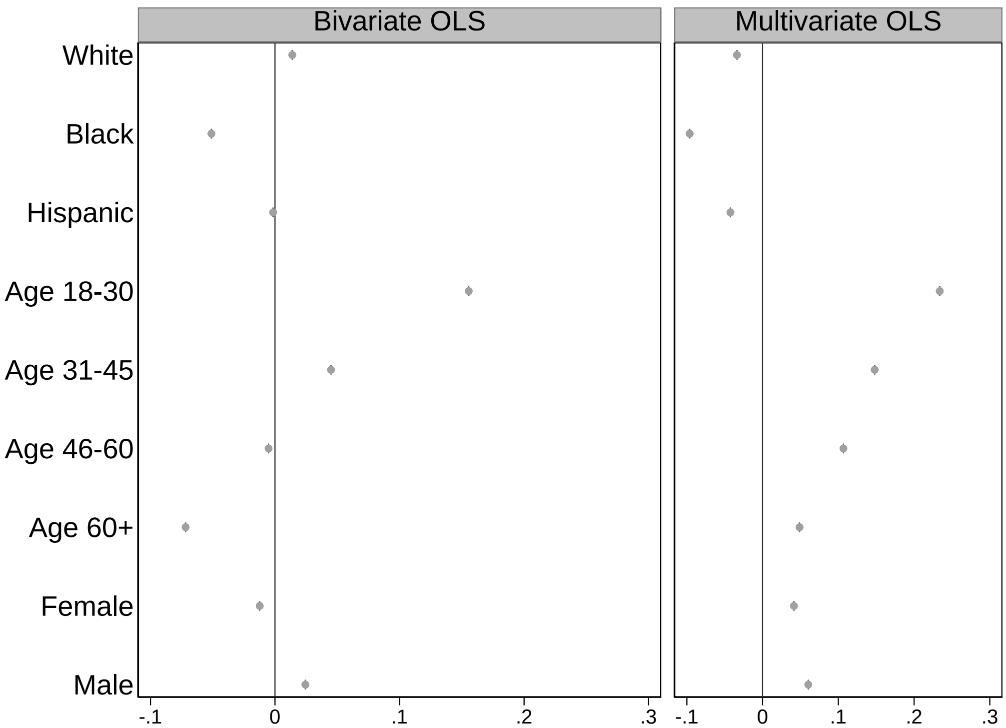
Figure A14: Correlates of Other Affiliation State and Voter Effects

(a) Correlates of Registration State Effects



(b) Correlates of Registration Average Voter Effects





(c) Correlates of Registration Individual-Level Voter Effects

Notes: Notes as in Figures 7, 8, and A10.

Table A2: Event-Study Estimates for Turnout

	Outcome:	
	1(Voted)	1(Voted) McDonald's Delta's
	(1)	(2)
δ_i×(5 elections pre-move)	.056	.083
	(.052)	(.061)
δ_i×(4 elections pre-move)	.075	.110
	(.051)	(.064)
δ_i×(3 elections pre-move)	-.017	.006
	(.045)	(.049)
δ_i×(2 elections pre-move)	-.035	-.024
	(.024)	(.025)
δ_i×(1 elections pre-move)	-	-
	-	-
δ_i×(1st post-move election)	.401	.353
	(.048)	(.040)
δ_i×(2nd post-move	.377	.339
	(.043)	(.034)
δ_i×(3rd post-move	.354	.327
	(.043)	(.033)
δ_i×(4th post-move election)	.296	.245
	(.057)	(.043)
δ_i×(5th post-move election)	.264	.261
	(.063)	(.050)
Voter FEs	✓	✓
Year FEs	✓	✓
Relative Year FEs	✓	✓
N	76,673,176	76,673,176
N voters	14,203,494	14,203,494

Notes: The table reports event-study estimates and standard errors for turnout. Column 2's specification uses delta's based on Michael McDonald's turnout data. Standard errors are two-way clustered by voters and states.

Table A3: Event-Study Estimates for Registration and Party Affiliation

	Outcome:	
	1(Registered)	1(Party Affiliation)
	(1)	(2)
δ_i×(5 elections pre-move)	.041	-.047
	(.113)	(.027)
δ_i×(4 elections pre-move)	.059	-.037
	(.060)	(.018)
δ_i×(3 elections pre-move)	.058	-.031
	(.043)	(.014)
δ_i×(2 elections pre-move)	.035	-.025
	(.018)	(.008)
δ_i×(1 elections pre-move)	-	-
	-	-
δ_i×(1st post-move election)	.209	.365
	(.062)	(.037)
δ_i×(2nd post-move	.163	.388
	(.047)	(.034)
δ_i×(3rd post-move	.166	.377
	(.052)	(.027)
δ_i×(4th post-move election)	.238	.371
	(.082)	(.029)
δ_i×(5th post-move election)	.209	.361
	(.089)	(.039)
Voter FEs	✓	✓
Year FEs	✓	✓
Relative Year FEs	✓	✓
N	76,673,176	82,783,011
N voters	14,203,494	5,104,711

Notes: The table reports event-study estimates and standard errors for turnout. Standard errors are two-way clustered by voters and states.

Table A4: Event-Study Estimates for Democratic, Republican, and Other Party Affiliation

	Outcome:		
	1(Registered Democrat)	1(Registered Republican)	1(Registered Unaff./3rd Party)
	(3)	(4)	(4)
$\delta_i \times$(5 elections pre-move)	-.006	-.097	-.055
	(.049)	(.039)	(.029)
$\delta_i \times$(4 elections pre-move)	.003	-.075	-.052
	(.032)	(.023)	(.017)
$\delta_i \times$(3 elections pre-move)	.006	-.068	-.044
	(.024)	(.017)	(.012)
$\delta_i \times$(2 elections pre-move)	-.006	-.046	-.030
	(.011)	(.011)	(.009)
$\delta_i \times$(1 elections pre-move)	-	-	-
	-	-	-
$\delta_i \times$(1st post-move election)	.329	.270	.458
	(.050)	(.047)	(.050)
$\delta_i \times$(2nd post-move	.359	.303	.469
	(.043)	(.031)	(.051)
$\delta_i \times$(3rd post-move	.342	.323	.443
	(.037)	(.031)	(.041)
$\delta_i \times$(4th post-move election)	.325	.340	.435
	(.047)	(.034)	(.035)
$\delta_i \times$(5th post-move election)	.301	.345	.428
	(.062)	(.039)	(.036)
Voter FEs	✓	✓	✓
Year FEs	✓	✓	✓
Relative Year FEs	✓	✓	✓
N	27,594,337	27,594,337	27,594,337
N voters	5,104,711	5,104,711	5,104,711

Notes: The table reports event-study estimates and standard errors for turnout. Standard errors are two-way clustered by voters and states.