

Does Homeownership Influence Political Behavior? Evidence from Administrative Data

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Short Title: Does Homeownership Influence Political Behavior?

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Abstract

We combine deed-level data on homeownership with administrative data on voter turnout in local and national elections for more than 18 million individuals in Ohio and North Carolina. Using a difference-in-differences design, we find that buying a home leads individuals to participate substantially more in local elections, on average. We also collect data on local ballot initiatives, and we find that the homeowner turnout boost is almost twice as large in times and places where zoning issues are on the ballot. Additionally, the effect of homeownership increases with the price of the home purchase, suggesting that asset investment may be an important mechanism for the participatory effects. Overall, the results suggest that individual economic circumstances importantly influence political beliefs and behavior, and suggest that homeowners have special influence in American politics in part because their ownership motivates them to pay attention and to participate.

Keywords: homeownership, political participation, local elections.

Authors are listed in alphabetical order and contributed equally. The protocol for this study has been approved by the Stanford IRB (#39468). Supplementary material for this article is available in the appendix in the online edition. Replication files are available in the JOP Data Archive on Dataverse (<http://thedata.harvard.edu/dvn/dv/jop>)

“Those who hold and those who are without property have ever formed distinct interests in society.”

—James Madison, Federalist 10

To what extent do individual citizens translate their economic self interest into costly political behavior? This is an important question for understanding why some groups participate more in politics than others and how that participation might advantage them in the policy process. Classic work in political economy and political psychology shows why self interest might not drive much political behavior, because participating in democratic elections is costly and has virtually no effect on political outcomes (e.g., Downs 1957; Riker and Ordeshook 1968; Sears and Funk 1991). On the other hand, large changes in individuals’ economic circumstances—like winning the lottery, for example—seem to have large effects on individuals’ political participation and their preferences (Doherty, Gerber, and Green 2006; Peterson 2016). As an empirical matter, the precise role of economic interests in individual political behavior remains unclear.

In this paper, we consider this question by studying the effect of homeownership, and the economic incentives it imbues, on political participation. In particular, we ask: do individuals who own property turn out to vote or change their political views *because* they are property owners?

The correlation between homeownership and political participation in the United States is well-documented (e.g., Wolfinger and Rosenstone 1980; Verba et al. 1993; Fischel 2001; Oliver 2001; Oliver, Ha, and Callen 2012; Leighley and Nagler 2014). Existing studies rely mainly on correlating homeownership status with measures of political participation. As such, while they document important descriptive patterns, they leave open the question of whether becoming a homeowner increases political participation, or whether the correlation instead reflects that wealthier are, in general, more likely to own homes and also to participate in politics, for reasons separate from their status as homeowners. This alternative story is plausible since an important literature in political science and political economy

shows that, descriptively, higher-wealth and higher-status groups participate more in politics (e.g., Bechtel, Hangartner, and Schmid 2016; Braconnier, Dormagen, and Pons 2017; Enos, Fowler, and Vavreck 2013; Fowler 2013; Kasara and Suryanarayan 2015; Lijphart 1997; Verba, Schlozman, and Brady 1995).¹

In addition to being fundamental in the study of political economy, these questions also speak to recent concerns about “NIMBYism” and the political influence of homeowners (e.g., Einstein, Palmer, and Glick n.d.; Hankinson 2018; Marble and Nall 2018). Many local governments use zoning laws to restrict the supply of housing, raising the value of existing homes and reducing geographic mobility as a result (e.g., Ganong and Shoag 2017). A recent study estimates that this loss in mobility lowered aggregate US economic growth by 36% between 1964 and 2009 (Hsieh and Moretti n.d.). Evidence suggests that homeowners, who gain from high home values, oppose the development of new housing (Hankinson 2018; Marble and Nall 2018), pay more attention to local politics (Fischel 2001), and participate in local elections at higher rates (DiPasquale and Glaeser 1999; Einstein, Palmer, and Glick n.d.; Oliver and Ha 2007).²

This paper builds on this work by testing whether becoming a homeowner leads a person to participate more in local politics, perpetuating these inequalities, or whether these inequalities instead reflect pre-existing differences in the socioeconomic status and backgrounds of homeowners and non-homeowners. To gain some leverage on how homeownership changes an individual’s behavior, we combine administrative data on more than 18 million voters in Ohio and North Carolina with deed-level data on property ownership. The resulting panel dataset allows us to track when individuals become homeowners and to see how often they

¹Generally, the discipline has made great progress identifying factors that encourage turnout. For an overview, see Green and Gerber (2008). Some key factors that might influence the decision to participate include: the likelihood of influencing the outcome (Bursztyn et al. 2018; Enos and Fowler 2014); campaign effects (e.g., Enos and Fowler 2016); the ideology of the candidates running (e.g., Rogowski 2014); and racial threat (e.g., Enos 2016).

²Other important work links these land-use restrictions supported by homeowners to racial segregation in American cities (Rothstein 2017; Trounstine 2018).

turn out to vote in local and national elections, what specific local issues they are most likely to vote on, and to see several indicators of shifts in their preferences.

Using a series of individual-level difference-in-differences designs to account for pre-existing differences between homeowners and non-homeowners, we find that becoming a homeowner substantially increases an individual’s propensity to participate in local elections.³ To make comparisons among individuals with plausibly similar counterfactual turnout trends, a main version of our design exactly matches individuals based on their turnout in four pre-treatment electoral cycles (Ho et al. 2007). We find similar estimates across a range of design choices, suggesting that parallel trends is a valid assumption. We also find that the effect of becoming a homeowner on local election turnout is largest among younger homeowners and those who purchase single family residences, which suggests that “adult roles” like marriage or planning for children could explain some, but not all, of the homeownership effect (e.g., Bennett 1991; Highton and Wolfinger 2001; Plutzer 2002).

We also find that this homeowner turnout boost may be linked to zoning policy. In particular, we study local issues in Ohio, essentially ballot initiatives on local policy matters like school funding, property taxation, zoning, and liquor sales (for another study that uses data on local issues in Ohio, in particular education funding, see Kogan, Lavertu, and Peskowitz 2016).⁴ We collect data on what kinds of local issues appeared on which ballots, allowing us to compare the turnout effect of becoming a homeowner across contexts. We find that the homeowner boost in turnout is particularly pronounced—almost twice as large as the overall effect—when zoning issues are on the ballot.

To investigate the motivations behind these participatory effects another way, we estimate the effect of homeownership on local political participation across deciles of home purchase price. The effect is present even in the lowest home-price deciles, rises dramatically across deciles, and is more than twice as large in the highest decile than in the lowest. Homebuyers

³The effect of homeownership also appears to grow over time (see Figure 2). Our dataset covers about 17 years, (2000-2017), so we are somewhat limited in estimating the effects of homeownership in the very long-run.

⁴For studies of local issues in Texas, see Coate and Conlin (2004) and Coate, Conlin, and Moro (2008).

who have bought more expensive homes increase their participation in local elections more, relative to their prior behavior, suggesting that their motivation to participate may have to do with the size of the investment they are interested in protecting.

Though most theoretical work on homeowners focuses on local politics, in the Appendix we also find that becoming a homeowner increases the propensity to participate in national elections, suggesting that homeownership causes a more general shift in individuals' attention to politics. We find that the increase in national election participation becomes larger after local elections have taken place and among those who purchase their homes using Federal Housing Administration (FHA) mortgages, which suggests that habit formation and individual experience with federal housing policy could explain some of the spillover of the homeownership effect beyond local participation and into national election turnout.⁵

In sum, becoming a homeowner leads individuals to participate more in politics, to pay attention to issues that affect them as homeowners, and to participate in ways consistent with protecting their investment in the value of their property, on average. In addition to helping us understand the political advantage, and inequality in representation, of homeowners in American politics (Einstein, Palmer, and Glick n.d.), the results suggest that instrumental motivations are an important part of individual political behavior, and also suggest that government policies that encourage homeownership may have unanticipated downstream political consequences as they change the behavior and preferences of those who purchase homes.⁶

Reviewing Existing Research

To date, empirical studies of the role of homeownership in political behavior rely primarily on cross sectional datasets, either at an aggregated level (e.g., Fischel 2001; Dehring, Depken II,

⁵While we interpret this first finding as evidence of possible habit formation, there is another observationally equivalent mechanism that could be at work: it could be that individuals who turn out in one election are identified by political campaigns as likely voters, and therefore are targeted for mobilization.

⁶For a formal model related to this idea, see Prato (2018).

and Ward 2008; Jiang 2018; Oliver 2001; Oliver, Ha, and Callen 2012) or using surveys (e.g., Hankinson 2018; McCabe 2013, 2016; Oliver 2001). These studies have made great strides in understanding the relationship between homeownership and political behavior. Survey analyses of homeowners have found that suburban electoral politics is dominated by highly informed and politically engaged voters (Oliver and Ha 2007), that suburbanization is an important explanation for declining civic participation (Oliver 2001), that homeowners participate in local and national elections at higher rates than renters (e.g., Fischel 2001; McCabe 2016), and that homeowners and renters express different attitudes on a variety of issues (Oliver 2001). One limitation of these studies, however, is that they are not designed to distinguish between two key explanations for the relationship between homeownership and behavior: whether becoming a homeowner leads individuals themselves to participate more in local politics, or whether the differences in behavior reflect pre-existing differences in the socioeconomic status and backgrounds of homeowners and non-homeowners. Distinguishing between these alternate explanations is key for understanding the role of self-interest in political behavior.

The key empirical advancements in our paper are two-fold. First, we are able to examine the costly, real-world behavior of homeowners and non-homeowners choosing whether to engage in the political process. Second, because we observe an individual's participation both before and after homeownership, we are able to exploit within-person variation in homeownership status. The advantage here is that we are able to control for fixed unobservable attributes of individuals that might explain cross-sectional survey correlations between homeownership and voting, like race, education or socioeconomic background.

Administrative Data on Homeownership and Voting

To study the connection between homeownership and political behavior, we link two large datasets on individuals' real-world behavior. The first dataset contains administrative voter

files for Ohio and North Carolina, collected from each state’s Secretary of State website. We focus on these two states because they are among the states which offer voter files for free, feature robust two-party competition in national elections, provide different measures of party affiliation (voting in a partisan primary, in the case of Ohio, and registering with a party, in the case of North Carolina), and overlap well with our second dataset on homeownership.

Each voter file offers different strengths. In Ohio, turnout history dates back to the 2000 primary, so we can observe a registered voter’s full turnout history—including local election turnout—from 2000-2017. Local elections in Ohio take place in odd-numbered years, which span from 2001-2017 in our data. Local primary elections take place in May of odd-numbered years, while general elections take place in November of odd-numbered years.⁷ Ohio has an open primary system, where voters are not required to register with a party in order to vote in a party’s primary. In fact, Ohio voters do not officially register with a party at all. Instead, they affiliate with a political party by requesting the ballot of a political party in a partisan primary election.⁸ Therefore, turnout in the Ohio voter file includes information not only on whether a voter turned out in a primary election, but also on which party ballot they requested.

While North Carolina also has information on which primary election ballot a voter requests, turnout in North Carolina only dates back to the 2008 primary election. Nonetheless, North Carolina’s voter file provides some useful information that Ohio’s voter file does not. North Carolina has a series of voter file snapshots, and a common identifier allows us to link

⁷In Ohio, voters register in person or by mail with their county board of elections, or voters can register to vote online (see <https://olvr.sos.state.oh.us/>). Voters must register or update their registration no later than 30 days prior to an election; otherwise the registration will apply for the next election. We use a copy of the Ohio voter file dated August 16, 2017. To add 2017 general election turnout from the November 2017 local elections, we merge in 2017 general election turnout from a newer copy of the Ohio voter file dated June 16, 2018.

⁸<https://www.sos.state.oh.us/elections/voters/register/>

individual voters to their registration over time.⁹ Given this information, we can understand how voter file purges – or removing individuals from the voter rolls – might be affecting our results.¹⁰

The second dataset contains information on property ownership, and was collected county-by-county from public records by CoreLogic, a private data vendor. The dataset provides a variety of information about individual properties, including addresses, sales price, and assessment values, as well as the full name of the property’s owner in each year from 2000-2017. We join the two datasets together by matching exactly on county, zip code, street number, street name, last name, and first initial.¹¹ In our dataset, 49.87% of individuals are in the voter file but not in the property ownership records, 21.99% are in the property ownership records but not in the voter file, and 28.14% are in the voter file and match to property records.¹²

For each unique homeowner that does not merge to the voter file, we include them in our analysis as not having voted. This is important because it allows us to avoid potential

⁹The North Carolina voter file used for the analysis is dated January 1, 2017. To assign party registration to each registrant, we merge registrants to their party registration in voter file snapshots from the following dates: October 20, 2006; November 4, 2008; January 1, 2010; January 1, 2011; May 8, 2012; November 6, 2012; May 6, 2014; November 4, 2014; March 15, 2016; and November 8, 2016.

¹⁰We can also use these snapshots to estimate the effect of becoming a homeowner not just on partisan primary participation, but also on party registration. North Carolina has a semi-closed primary system, meaning voters who register with a party can only request the ballot of their political party in a partisan primary election but unaffiliated registrants can request any party’s primary ballot. In North Carolina, voters register in person or by mailing a completed voter registration form to their county board of elections, and they must register no later than 25 days before an election (see <https://www.ncsbe.gov/Voters/Registering-to-Vote>).

¹¹The homeownership data has two fields for property owner, so if there are two property owners we treat each owner as their own row for the purposes of the merge to the voter file. Because we match exactly on address information, each individual in the voter file will match to at most one property record.

¹²The merge rates are similar across both states. 50.62% and 49.05% are in the voter file but not the property records in Ohio and North Carolina, respectively. 20.13% and 23.99% are in the property data but not the voter file, and 29.25% and 26.95% are in the voter file and matched to the ownership records. Overall, about 56.1% of individuals in the property ownership records were found in the voter file ($28.14\% / (21.99\% + 28.14\%)$). To get a sense of how this corresponds to the rate of registered voters among homeowners that we might expect absent any matching error, we collected county-level registration rates in Ohio, calculated as the number of registered voters in the county in 2017 divided by the voting age population from the 2017 American Community Survey (ACS) 5-year estimates. The average registration rate is 68.1%, which is slightly higher than the our “homeowner registration rate.” This could be a result of false negatives in the merge, which would attenuate the effects we estimate, or of the home not being owner-occupied, so that the listed owner does not register to vote using that address. The correlation between the county registration rate and our “homeowner registration” is 0.3124.

bias in our estimates from conditioning on post-treatment registration (Nyhan, Skovron, and Titiunik 2017).¹³ We also merge in yearly property history files to identify individuals in the voter file who were homeowners at one time during our panel, but are no longer homeowners. Switching from owning to renting is exceedingly rare compared to switching from renting to owning: Sinai (1997) shows that less than four percent of observations transition from owning to renting at some point over a 22-year panel. Our Ohio local elections panel shows something similar. Among over 8.5 million unique individuals, we observe more than 2.5 million instances of transitioning from non-homeowner to homeowner, but only about 85,000 instances of switching from homeowner to non-homeowner.

To construct the homeowner variable, we first define an individual to be a homeowner if they are listed as a property owner for any property designated as a single family residence, residential condominium, or duplex. Then, for analyses where general election participation is the outcome, homeownership is defined as whether an individual has been a homeowner at any time in the period between the general election at time t and the general election at time $t - 1$.¹⁴ For analyses where primary election participation is the outcome, homeownership is defined as whether an individual has been a homeowner at any time in the period between the primary election at time t and the primary election at time $t - 1$.

There are three key issues with the way we construct our dataset. The first is the possibility of false matches in the merge. If there are false positives (for example, if we match a voter to the homeownership data when he or she is in fact not that homeowner), we would falsely code that individual as treated when he or she should be in the control group. If there are false negatives (meaning we fail to match a voter to his or her homeowner record when that record actually exists), we would falsely code that individual as being in the control group. Because both datasets are high quality, featuring full names with

¹³We still face a few potential sources of bias in our estimates, most notably from the possibility of voter file purges, which we discuss in detail after presenting the main results. We do not find evidence that this source of bias affects our conclusions.

¹⁴For example, an individual is defined as a homeowner for the 2012 general election if they owned a home at any time between the 2010 and 2012 general elections.

few misspellings, these types of merge errors are likely to be rare. The merge is relatively constrained because we use information on name, street number, and street name to link records – so we can be confident that there are very few false positives, meaning individuals who are identified as homeowners but are not actually that homeowner. Moreover, more than 96% of entries in the Ohio voter file are unique within county, zip code, last name, street number, street name, and first initial, which helps to alleviate concerns about false matches due to duplicate records within the variables we use for the merge.¹⁵ To the extent that false matches are present, however, they will attenuate, or bias toward zero, the estimated effect of homeownership. There is a tradeoff in the choice of what criteria to select as sufficient to declare two records to match. While we implement a deterministic procedure here, recent literature in political science has used probabilistic merging procedures to link large administrative datasets (e.g., Enamorado, Fifield, and Imai 2019). There is a clear trade-off in using these procedures. While our linkage procedure requires exact matches on county, zip code, street number, street name, last name, and first initial in order to be linked, probabilistic methods allow for non-exact linking, which would find more matches and decrease the number of false negatives. The risk in using probabilistic linking, however, is an increase in false matches.

As a robustness check, in Section A.1 of the Appendix we implement our merge using fastLink (Enamorado, Fifield, and Imai 2019) and replicate our main result, which remains substantively similar. One advantage of using this probabilistic method is that it allows us to estimate the false positive and false negative rate for the merge. We show these estimates in the Appendix and provide some other suggestive evidence to help validate our record linkage procedure.

The second potential source of bias is that we use a version of the Ohio voter file from 2017, which means that we do not observe individuals in Ohio who have been purged from the voter file prior to 2017. Voter file purges have become a contentious issue in many states,

¹⁵This is similar to the rate found in the Texas voter file in Ansolabehere and Hersh (2017).

including in Ohio.¹⁶ Closely related, the third issue we face is due to “deadwood,” meaning obsolete records in the voter file, which could lead us to incorrectly think homebuyers moving into Ohio from out-of-state have never voted before becoming a homeowner, or that home-sellers who move out of Ohio never vote after selling their home. For example, a voter who moves out of state but remains in the voter file should be coded as missing, but the voter file does not distinguish between not voting and missingness. We address these two issues below, after presenting the main results. In both cases, we find no evidence that they affect our conclusions.

Homeownership Increases Local Turnout

We begin by estimating the effect of buying a home on turnout in local elections. For this analysis, we focus on Ohio because its state voter file provides turnout information on local primary and general elections. We include in this analysis all Ohio elections occurring in odd-numbered years, which cover a mix of statewide ballot issues and local elected offices, as well as a number of local issues.

Difference-in-Differences Design

Without access to a randomized experiment in which some individuals become homeowners while others do not, we have to use patterns of observed homebuying behavior. Specifically, we estimate equations of the form

$$Turnout_{it} = \beta Homeowner_{it} + \gamma_i + \delta_t + \epsilon_{it}, \quad (1)$$

where $Turnout_{it}$ is a simple indicator variable for whether individual i turns out to vote in the local election held at time t . In our data for Ohio, various local elections are held

¹⁶<https://www.nytimes.com/2018/06/11/us/politics/supreme-court-upholds-ohios-purge-of-voting-rolls.html>

in all odd years from 2001 to 2017. The variable $Homeowner_{it}$ is an indicator for whether individual i is a homeowner during the two-year period after the election at $t - 1$ and before the election at time t . For example, for the year 2017, the homeowner variable would switch from 0 to 1 if the individual purchased a home in 2016 or prior to the election in 2017. Finally, γ_i and δ_t stand in for individual and year fixed effects, respectively. In some estimates in the Sections A.2 and A.3 of the Appendix, we alter the year fixed effects in order to create different counterfactual trends (e.g., home value-by-year fixed effects.)

Plausibility of Parallel Trends

This difference-in-differences design relies on the assumption of parallel trends—namely, that changes in individuals’ turnout behavior after purchasing a home at time t would be the same as changes in turnout behavior for individuals who did not purchase a home at time t . In the absence of a random shock that induces home buying, we have to lean heavily on this assumption—as such, we pay close attention to several tests for its validity. In Table A.2, we pursue several strategies to validate the parallel trends assumption. First, we add leads of the homeowner variable to see if we find evidence of pre-trending. We code a homeownership lead variable, which takes the value 1 if an individual is going to become a homeowner in the next time period, after the election at t , and 0 otherwise. In some tests we add a second lead variable, which takes the value 1 if an individual is going to become a homeowner two time periods after the election at time t . Reassuringly, we find substantively small coefficients on these leads, and the coefficient on the main effect for homeowner remains similar in magnitude as our formal estimates in Table 1. Second, we re-do the results using county-by-year fixed effects, so that homeowners’ counterfactual trends are computed using only individuals who did not buy a home but live in the same county.¹⁷ We find extremely similar results in this setup. Third, we estimate the effects including individual-specific linear time trends, and

¹⁷The county-by-year fixed effects control for common shocks to turnout separately for each county, so they also control for the possibility of an important time-varying factor: voters in each county have different candidates running in the local elections in their county.

the effects shrink slightly but remain similar. Lastly, in Figure 2 we estimate the dynamic effect of homeownership on local election turnout. We describe the full procedure for this test in the Appendix, but we show that the effect of homeownership is substantively small in the election periods before an individual becomes a homeowner, and it grows large in the post-treatment periods. Taken together, these tests further add to the plausibility of the parallel trends assumption.¹⁸

Exact Matching on Pre-Trends

Despite these reassuring checks on the parallel trends assumption, we still face a situation where individuals might select into homeownership for many time-varying, unobservable reasons. Given this type of setting, we turn to one additional strategy that, unlike the simple difference-in-differences design, can accommodate the presence of time-varying unobserved factors. To do this, we exactly match individuals on the basis of their turnout over four electoral cycles in order to find a control group likely to offer more accurate counterfactual trends. Because our dataset is large, and because our outcome variable is binary, we can do better than a synthetic match and can in fact find exact matches on pre-trends for every treated individual. Specifically, we first remove from the data anyone who purchases a home before 2008, and we subset to individuals who are old enough that they were eligible to vote by 2001, the first year in our sample, so that we have non-missing outcome values for all four pre-treatment periods. We then divide the remaining sample into treatment and control, where treatment means purchasing a home in 2008-2009 and control means not purchasing a home in 2008-2009. Each treated or control individual thus has four periods of

¹⁸In addition to these tests, in Section A.3 of the Appendix we also estimate a version of the difference-in-differences that makes comparisons only among the set of people who purchase a home at some point, so that everyone in the sample achieves the wealth necessary to be a homeowner. We also include a separate set of time fixed effects within each decile of the home purchase price, so that counterfactual trends are computed among people with similar levels of wealth but who purchased their homes at different times. Together, these strategies help address the main substantive concern around parallel trends, the possibility that individuals choose to purchase homes in times when they become wealthier, which may also be times when their political behavior is changing for other reasons as well. We continue to find similar results across all of these approaches, bolstering our confidence in the estimates.

pre-treatment turnout, 2001, 2003, 2005, and 2007, leading to $2^4 = 16$ possible pre-treatment outcome strata. There are treated and control units in each of the 16 strata, and the most common stratum in the data is the set of people who never turn out to vote in any election prior to 2008. While this approach constrains the pre-trends to be the same, it does not explicitly match on other covariate information in our data. Later in the paper, we estimate counterfactual trends using only eventual homebuyers as well as individuals who are the same age.

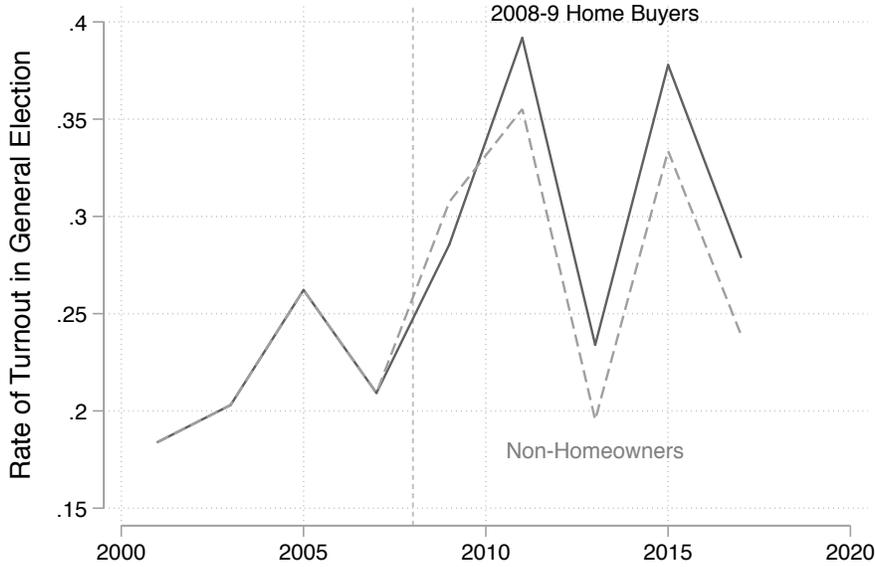
Issues of Bundled Treatment

Even if parallel trends is met, another obstacle to our approach is that individuals may be making the decision to become a homeowner at a point in their life when they are making other changes as well—for example, accepting a new job, moving to a new place, having children, and so forth. Without being able to randomize homeownership directly, our design estimates the overall effect of buying a home along with any correlated changes that individuals make when they become homeowners that also affect political participation. The possibility of contextual effects – where an individual moves to a new neighborhood, and being in that new place increases their turnout – it is especially difficult to pin down the exact set of mechanisms that drive the effect. In a series of follow-up analyses presented below, we use variation in the size of the effect to try to understand the underlying mechanisms of the effect, albeit indirectly. Overall, the patterns of effects suggest a direct link between being a homeowner and acting to protect one’s financial interest in one’s home.

Homeownership and Turnout: Graphical Evidence

In the spirit of the exact matching exercise we just described, Figure 1 plots turnout over time for people who: (a) were eligible to vote in 2001 and (b) never owned a home before 2008. The solid line represents the turnout behavior of individuals in this group who purchased homes in 2008-2009, while the dashed line represents the average turnout behavior of individuals

Figure 1 – Homeownership and Turnout in Local Elections, Ohio, Exact Matching on Four Cycles of Pre-Treatment Turnout. Individuals become substantially more active in local politics after purchasing a home.



In this analysis, we focus on individuals who bought a home in 2008-2009, had never before owned a home, and were eligible to vote as of the local election in 2001. We exact match each of these individuals to a stratum with individuals who had the exact same pre-treatment turnout pattern but who did not buy a home in 2008-2009. For 2001-2007, the plot shows the average turnout rate based on the number of observations in each stratum, and then shows that those who buy homes in 2008-2009 go on to turn out in subsequent local elections at a markedly higher rate than those who do not buy homes in this period.

in this group who did not buy a home in 2008-2009 (they may or may not have purchased a home after 2009, we do not condition on this choice). Prior to 2008, we plot the turnout in local elections, averaged over each of our 16 matched strata based on the total number of individuals in each stratum. After 2008, as the plot shows, 2008-9 home buyers turn out at noticeably higher rates than those who don't buy homes in 2008-9. The analyses below will show that this pattern holds when we turn to the formal regression estimates.

Homeownership and Turnout: Formal Evidence

We now turn to formal estimates of the effect of becoming a homeowner on participation in local politics. Table 1 presents the results for turning out in general elections (first three columns) and primary elections (second three columns). As the table shows, we find consistent evidence that individuals participate more in politics after becoming homeowners. In column 1 of Table 1, for example, we show that becoming a homeowner leads about a 4.9 percentage point increase in turnout in local general elections. This increase is relative to a baseline turnout rate of 26.5% among all of those in the sample, which includes a) all individuals who are registered to vote along with b) all homeowners, regardless of their registration status.¹⁹ We also show in Section A.1 of the Appendix that these results are robust to an alternative linking procedure.

In column 2, we implement the formal version of the exact matching strategy we described before. It is a matched difference-in-differences design where we include individual and year fixed effects, along with a set of fixed effects for each of the 16 strata in terms of turnout behavior in 2001, 2003, 2005, and 2007. Here we find a similar, though slightly smaller, estimate of the effect of homeownership on local election turnout of 3.8 percentage points.

Finally, in column 3 we implement a slightly different version of the exact matching design, where for each of the 16 pre-treatment turnout outcome strata, we simply calculate the difference in average turnout rates for 2008-9 homebuyers and non-homebuyers for all election years from 2009 onwards, and we then average these differences over the 16 strata, weighting the average by the number of observations in each stratum. The estimate remains similar to that in the full matched difference-in-differences design. Looking across the columns, the estimates range from 2.7 percentage points to 4.9 percentage points. These estimates are

¹⁹We also estimate average local general election turnout at time $t - 1$ separately for those who will become homeowners in the next period, time t , and for those who will not yet become homeowners by time t . Average local general election turnout among these groups are 25.42% and 22.34%, respectively. The more similar the pre-treatment outcomes are on average between the treatment and control groups, it is perhaps more likely that the parallel trends assumption might hold. We interpret these quantities as perhaps reassuring, albeit indirect, evidence that the parallel trends assumption might be plausible. In the section on the plausibility of parallel trends we discuss and conduct a series of more formal parallel trends tests.

Table 1 – Effect of Homeownership on Political Participation in Local Ohio Elections.

	Turnout in General = 1			Turnout in Primary = 1		
	(1)	(2)	(3)	(4)	(5)	(6)
Homeowner	0.049 (0.0002)	0.038 (0.0002)	0.027 (0.0002)	0.019 (0.0001)	0.017 (0.0002)	0.015 (0.0002)
Observations	76319157	35896905	3988548	71366039	26001684	2889126
Outcome Mean	0.265	0.252	0.259	0.065	0.059	0.062
Individual FEs	Yes	Yes	No	Yes	Yes	No
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Sample	Full	Matched	Matched	Full	Matched	Matched

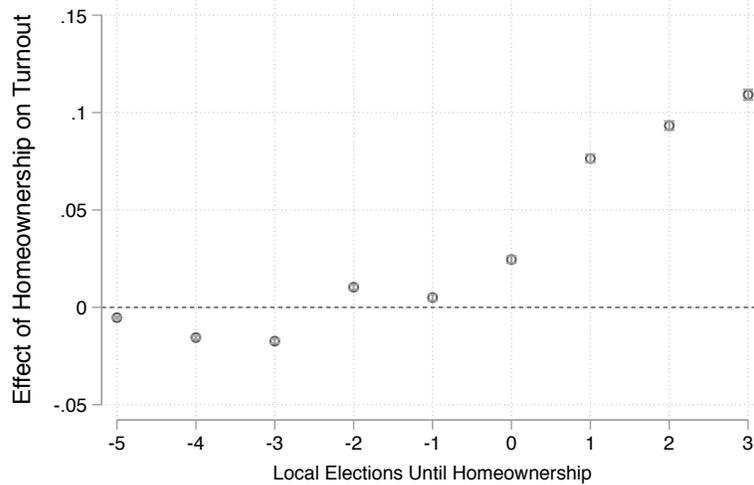
Robust standard errors clustered by individual in parentheses; standard errors in columns 3 and 6 are robust without clustering, as the data is collapsed by stratum-year. Columns 2, 3, 5, and 6 include only individuals who are exactly matched on the basis of 4 pre-treatment periods of the outcome variable.

highly precise, and they reflect large changes from baseline. The baseline turnout rate in our sample is roughly 26%, which means that these estimates reflect roughly a 10 to 19% increase in the propensity of turning out, across specifications.

The final three columns of the table repeat this exercise for primary elections, finding similar results. Although the difference in raw probabilities of turning out are lower for primaries, because fewer people vote, the proportional increase induced by homeownership is actually considerably large for primaries. Using the exact-matching results in column 5, for example, homeownership is estimated to cause roughly a 29% increase (1.7 / 5.9) in turning out in local primaries.

As discussed above, in Section A.2 we take several steps to assess the plausibility of the parallel trends assumption. Here, we show one of these tests, estimating the dynamic effect of homeownership on local turnout in general elections in Ohio (Angrist and Pischke 2009). For brevity, we describe the full procedure in Section A.2 of the Appendix. The dynamic effect plot is shown in Figure 2. The x-axis plots the number of elections until an individual becomes a homeowner, with 0 being the first election period after an individual becomes a homeowner. The effects of homeownership on local election turnout are plotted on the

Figure 2 – Dynamic Effect Plot: Local General Election Turnout in Ohio, 2001-2017.



The x-axis indicates the number of local election cycles until an individual becomes a homeowner. The y-axis plots the effect of homeownership on turnout in local general elections in Ohio, with 0 indicating the first period that an individual is a homeowner. The effect of homeownership leads on turnout are substantively small, indicating that the parallel trends assumption might plausibly hold.

y-axis. Reassuringly, we see that the effects of future homeownership on turnout in the five periods prior to homeownership are all substantively small. The effect of homeownership on local election turnout in the post-treatment periods are large.

Estimating the Effect Only Among Homebuyers

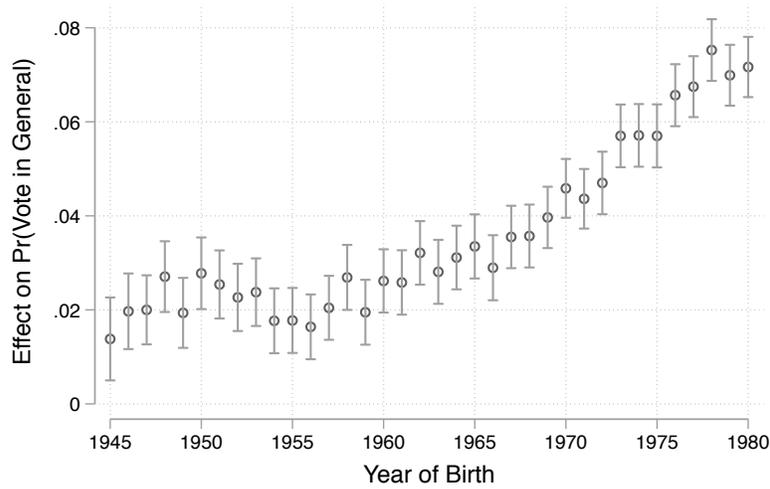
Our simple difference-in-differences design in columns 1 and 4 of Table 1 uses the full sample of individuals—both homebuyers and those who never buy a home—so it estimates counterfactual trends for homebuyers using all non-homeowners. One concern with that specification is that wealthier individuals are more likely to buy homes and may have different trends in political behavior than people who cannot afford to buy homes. For this reason, in Section A.3 of the Appendix we limit the sample to use only the set of all individuals who buy a home at some point. In those tests, we are constructing counterfactual trends for each homebuyer using the turnout behavior of other individuals who go on to buy a home but have not yet

done so. We also estimate the effect including a separate set of year fixed effects for each decile of home price, meaning we are constructing counterfactual trends for each homebuyer using the turnout behavior of other individuals who go on to buy a *similarly priced* home but have not yet done so. The results for both of these tests, shown in Table A.3, are very similar to those in the main results in Table 1.

Adult Roles and Other Life Events

As mentioned before, we are estimating the overall effect of buying a home along with any correlated changes that individuals make when they become homeowners that also affect political participation. Besides changes in wealth, another explanation for the observed effects could be changes in adult roles, such as employment, marriage, or planning for children (e.g., Highton and Wolfinger 2001). If these time-varying, unobserved attributes lead individuals to be more likely to buy a home and become more invested in local politics, this would bias our estimates upward. While we cannot directly rule out some of these social or psychological explanations using this type of administrative data, we can provide some suggestive empirical evidence for how important these explanations might be. First, to understand how the effect of homeownership on local election turnout varies for individuals at different life stages, in Figure 3 we estimate the effect separately for each year of birth, which we can observe in the Ohio voter file. In these analyses, we include only individuals who are registered to vote because we observe individuals' year of birth in the voter file but not in the homeownership records. To avoid conditioning on post-treatment registration, we subset to individuals who either never become homeowners or are registered to vote prior to becoming homeowners. We find that the effect varies across age, with the effects being largest among the youngest group in our sample. For example, our estimated effect for those born in 1975, who were 25 years old at the beginning of our study period, is nearly 4 percentage points larger than the effect among those born in 1955, who were 45 years old at the beginning of our study period. This is consistent with, although does not prove, that some of the effect

Figure 3 – Effect of Homeownership on Local Turnout Across Year of Birth.



Each point represents a point estimate as in equation 1, estimated separately for each birth year, including individual fixed effects and home value decile-by-year fixed effects. 95% confidence intervals are from robust standard errors clustered by individual.

of homeownership that we estimate could be a function of changing roles in early adulthood that correlate both with the decision to buy a home and to become more invested in local politics.

To test these adult roles explanations more formally, in the first two columns of Table 2 we replicate our main results from Table 1, but we subset to individuals who were born before 1960 and who were registered to vote prior to becoming homeowners.²⁰ These individuals are less likely to be experiencing some of the life changes that Highton and Wolfinger (2001) identify as correlated with large changes in political participation, and that we speculate likely correlate with the decision to purchase a home, like marriage or planning for children. When we subset to those born before 1960, the effect of becoming a homeowner on turnout in local general elections remains substantively large, which is consistent with the explanation that while individuals taking on adult roles might drive some of the effect, it cannot explain

²⁰Similar to our analysis in Figure 3, we subset to individuals who were registered to vote prior to becoming homeowners to avoid selecting on post-treatment registration.

Table 2 – Effect of Homeownership on Political Participation in Ohio Local Elections.

	Turnout in General = 1			
	(1)	(2)	(3)	(4)
Homeowner	0.023 (0.001)	0.032 (0.001)	0.039 (0.001)	0.016 (0.001)
Homeowner * Single Family Residence				0.043 (0.001)
Observations	16807117	1469610	36393338	36393350
Outcome Mean	0.599	0.551	0.462	0.462
Individual FEs	Yes	No	Yes	Yes
Year FEs	Yes	Yes	No	No
Year-by-Age FEs	No	No	Yes	No
Sample	Full	Matched	Full	Full
Born before 1960	Yes	Yes	No	No

Robust standard errors clustered by individual in parentheses; standard errors in column 2 are robust without clustering, as the data is collapsed by stratum-year. Columns 1 and 2 include only individuals born before 1960. Column 2 includes only individuals who are exactly matched on the basis of 4 pre-treatment periods of the outcome variable.

all of the effect of becoming a homeowner that we observe.²¹ In column 3 we evaluate this explanation in another way by including separate time fixed effects for every birth year, so that homeowners counterfactual turnout trends are only computed using non-homeowners who share the same birth year. By comparing individuals who are the same age, we are making counterfactual comparisons among those who are more likely to be experiencing similar events in the political life cycle. Again, we find that the effect of becoming a homeowner is similar.

Lastly, in column 4, we rely on information about the type of property that individuals purchase to evaluate the hypothesis that the effect is driven by individuals planning for children, albeit indirectly. We include an interaction of our homeowner variable with whether the property is designated in the property records as a single family residence, where we might

²¹Note that because Table 2 includes only registered voters, the magnitude of the coefficients should not be compared directly with those in Table 1, where property owners that are not registered to vote are included. When comparing the effects as a percent increase over the baseline turnout mean, the effects in Table 2 are slightly smaller.

expect that homebuyers of single family residences are more likely to have done so with the intention of planning for children. In this specification, we find that individuals become about 1.6 percentage points more likely to participate in local elections after purchasing a condominium or duplex, and they are about 5.9 percentage points more likely to participate after purchasing a single family residence (summing the coefficient on homeowner and the interaction term). Admittedly, this is consistent with many different interpretations, but it might signal that the effect of becoming a homeowner is more pronounced among those we might expect are planning to have children. However, the effect is positive and remains substantively large even among those who do not purchase single family residences. Overall, the evidence suggests that adult roles and other life events could explain some, but not all of the effect of becoming a homeowner.

Voter-File Purges and Selection Bias

As we mentioned before, Ohio “purges,” or removes, individuals from the voter file if they have not voted in recent elections. This could bias our estimates of the effect of homeownership if, for some reason, homeowners are purged at a higher rate than non-homeowners, so that the homeowner turnout rate we compute is inflated because it omits a set of homeowners who turn out so infrequently that they are purged from the voter file. On the other hand, if the rates of purging are roughly equal for the homeowners and non-homeowners, then purging should not affect our estimates. To test for this potential bias, we exploit a unique feature of the North Carolina voter file, where the information of individuals purged from the voter file is preserved along with a variable indicating that they have been removed. In Table A.6, we compare results for the effect of homeownership on turnout in North Carolina national general elections where we include and exclude purged voters from the analysis. The effect sizes are quite similar, although the effect of becoming a homeowner on participation is slightly larger in percentage terms when we include the removed voters. This suggests that non-homeowners are more likely to be purged than homeowners, so we

might be slightly overestimating turnout for non-homeowners, and thus underestimating the turnout boost from homeownership.

There is another potential source of bias in our estimates, which comes from the fact that we impute turnout equal to zero for those whose age made them eligible to vote but did not turn out. It could be that someone moves in from out of state, where they had been a long time voter, but they have no history of voting in Ohio.²² In these cases, we impute zero for turnout prior to their move, which would bias our estimate of the homeownership effect upward. Similarly, it could be that a habitual voter sells their home, moves out of state, and continues voting in another state – but we would impute their turnout as zero after they move. This would also lead us to overestimate the effect of homeownership. To deal with these potential issues, in Table A.7 we include a robustness check that includes the same specifications as columns 1 and 4 of Table 1, with a few adjustments. First, to address the concern that we are mistakenly setting turnout to zero for habitual voters that move in from out of state, we drop individuals whose registration year is greater than or equal to the year of their home purchase. Second, to address the concern that we are mistakenly setting turnout to zero for habitual voters that sell their home and move out of state, we set turnout to missing for individuals after they sell their home. The results in Table A.7 are positive and in fact larger than the results in Table 1. The most likely explanation for why the incorrect imputation of voting outcomes for out-of-state movers does not upward bias our estimates is that out-of-state movers are a very small fraction of the dataset.

Homeownership and Turnout for Zoning Initiatives

Thus far, we have explored the effect of homeownership on overall turnout in local elections in Ohio. While homeownership appears to increase individual political participation in a

²²This is unlikely to be a large concern, given that the rate at which individuals move from state to state is relatively low. About 2.1% of individuals in the United States moved out of state from 2016-2017, and about 1.7% in the Midwest moved out of state in that period (see <https://www.census.gov/data/tables/2017/demo/geographic-mobility/cps-2017.html>).

meaningful way, we have not yet seen, beyond suggestive evidence about adult roles, any indication of why it does so. Here, we explore the specific policy issues that appear to galvanize homeowner turnout. To do so, we take advantage of the particular institution of “local issues” used in Ohio. In Ohio, many questions of local policy are voted on in what are essentially public referendums or ballot initiatives, called local issues. These issues are voted on many different levels of aggregation, such as the county, the city, the village, the township, the school district, and a number of other special districts. Within a particular county, different individuals will face different ballots due to their locations in different villages, townships, school districts, and so forth. These many overlapping districts lead to considerable variation in the issues that different individuals have the opportunity to vote on in any given year.²³

We collected data on local issues for 2013, 2015, and 2017 in Ohio. The dataset indicates what types of issues were voted on in which political units for each year. Using descriptions of each local issue provided in the data, we categorized the local issues into eleven mutually exclusive categories.²⁴ These are shown in Table 3.²⁵

Using these topic codings, we estimate interactive difference-in-differences using the equation

$$\begin{aligned} Turnout_{it} = & \beta Homeowner_{it} + \sum_{j=1}^{11} \eta_j Homeowner_{it} \times 1\{Topic\ j\ on\ ballot_{it}\} \\ & + \sum_{j=1}^{11} \rho_j 1\{Topic\ j\ on\ ballot_{it}\} + \gamma_i + \delta_t + \epsilon_{it}, \end{aligned} \quad (2)$$

which is the same as equation 1 but with the addition of interactions of the homeowner variable with indicators for whether each of the eleven topics j is present on voter i 's ballot

²³For more on the complicated nature of overlapping special districts, see Berry (2009).

²⁴For a detailed description of how we coded each local issue, see section A.9 of the Appendix.

²⁵In Ohio, many liquor referendums are voted on at the precinct level. Given the structure of the local issues data and the fact that the precinct names are not standardized across the voter file and local issues data, we often merge liquor referendums to the voter file at the city level. To the extent that there is measurement error in whether a particular voter had a liquor referendum on his or her ballot, this would attenuate the additional effect of homeownership for when issues related to liquor are on the ballot.

Table 3 – Types of Local Issues Voted on in General Elections, Ohio, 2013-2017

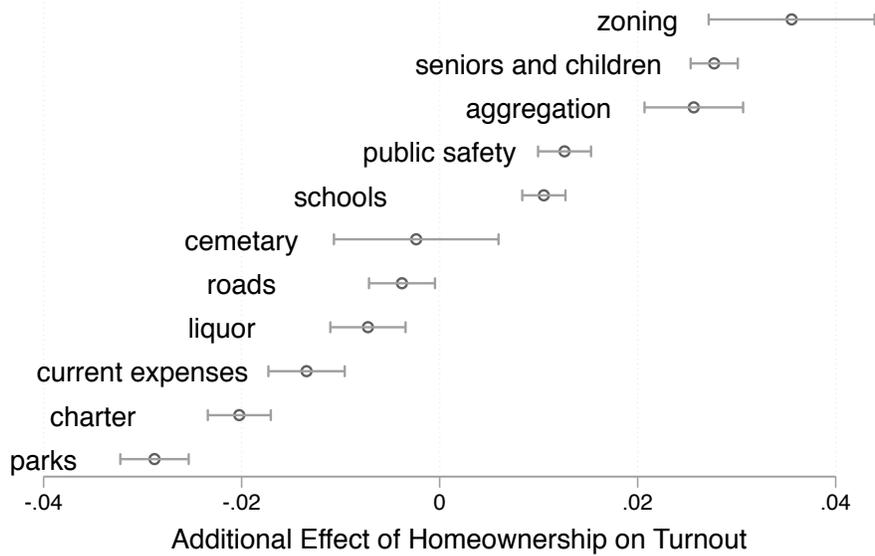
Issue Type	% Voters with Issue on Ballot in General Election					
	County	City	Township	School	Village	Total
Aggregation	0.010	0.010	0.010	0.000	0.003	0.030
Cemetery	0.000	0.000	0.010	0.000	0.001	0.011
Charter	0.093	0.068	0.000	0.000	0.002	0.157
Current Expenses	0.040	0.004	0.008	0.000	0.007	0.056
Liquor	0.000	0.018	0.038	0.000	0.001	0.056
Parks	0.051	0.009	0.005	0.000	0.002	0.067
Public Safety	0.014	0.020	0.079	0.000	0.008	0.117
Roads	0.015	0.012	0.035	0.000	0.003	0.064
School	0.000	0.000	0.000	0.187	0.000	0.187
Seniors and Children	0.145	0.001	0.002	0.000	0.000	0.148
Zoning	0.000	0.007	0.005	0.000	0.000	0.012
Miscellaneous	0.501	0.019	0.003	0.000	0.002	0.513
Any	0.609	0.135	0.158	0.187	0.023	1.000

The table shows the percentage of registered voters that have each issue type appear on their general election ballot, separated by locality. The total column shows the percentage of registered voters that have that issue type appear on their general election ballot in any of their registered localities. Any is whether the voter had any issue type, including miscellaenous, appear on their general election ballot. We review our coding of local issue types in the Appendix.

in the election at time t . With the inclusion of individual and year fixed effects, the variation for estimating these interaction terms comes from the fact that in different election cycles, the county, city, township, village, and/or school district may each have different types of local issues on the ballot. The omitted category is a catch-all for elections with miscellaneous or no local issues. We estimate this equation using our preferred specification of separate time fixed effects for each decile of home purchase price, as discussed with column 2 of Table 1. To be clear, the variation in the presence of certain issues on ballots is not randomly assigned; nevertheless, examining variation in the effect of homeownership across these issues at least permits us to see if patterns are consistent with the idea that homeowners pay attention to particular issues related to their homeownership.

Figure 4 presents the results. Each point in the plot reflects the corresponding interaction coefficient from equation 2. The largest interaction coefficient is for zoning. When a local

Figure 4 – Homeownership and Turnout Across Local Issues. Each point represents an interaction coefficient from equation 2, estimating the additional effect of homeownership on general-election turnout when a given type of local issue is being voted on in the county, city, township, school district, or village. The regression employs value decile-by-year fixed effects, as in column 2 of Table 1. Bars are 95% confidence intervals from robust standard errors clustered by individual. As the plot shows, homeownership particularly appears to encourage turnout when issues regarding aggregation, public safety, schools, seniors and children, or zoning are being voted on.



issue concerning zoning is on the ballot, the effect of homeownership on turnout is nearly 4 percentage-points larger—an increase in effect size of roughly 100% over the baseline estimate from column 2 in Table 1. Since zoning is one of the most important mechanisms by which homeowners can influence the quantity and types of housing that a locality allows to be built, the fact that this interaction coefficient is so large is consistent with the idea that homeowners form political preferences, and act on these preferences in elections, partially on the basis of their individual circumstances. Rather than behaving only based on long-running, inherited views, individuals become more politically active after becoming homeowners, and become especially active on zoning votes that have the potential to impact the value of their homes directly.

After seniors and children, the category that exhibits the next largest additional effect of homeownership on turnout is aggregation. Aggregation votes are votes on whether localities should negotiate rates for service—usually, electricity service—as a collective. As such, each aggregation vote has a direct impact on each individual’s pocketbook, increasing or decreasing their personal costs depending on the terms and the status quo. The fact that aggregation votes are associated with a substantial increase in the effect of homeownership on turnout again suggests that economic incentives can directly lead to costly political behavior.

The remainder of the issue areas exhibit a range of interaction effects, some negative and some positive. While some of the variation seems plausibly related to preserving and increasing home values—public safety, schools, and seniors and children issues are the next three largest interactions, and all may have implications for home values as well as the psychological value of one’s home—we hesitate to draw overly strong conclusions. Issues related to cemeteries, charters, liquor, and parks may all be lower salience because they relate less clearly to home values, but votes concerning current expenses seem highly relevant to homeowners’ political interests yet are associated with smaller effects of homeownership on turnout. Likewise, votes to reform charters could potentially have important implications for homeowners. Moreover, as with any test of an effect’s heterogeneity, there could be any number of omitted variables that correlate both with the types of issues that appear on local ballots and the size of the effect. For example, zoning issues are more likely to appear on the ballot in areas with larger numbers of homeowners. If the effect of becoming a homeowner on local turnout is larger for individuals in areas with higher homeownership rates in general, this could explain some of the larger effect where zoning issues are on the ballot. Therefore, it is difficult to conclude with certainty that these local issues, and not other attributes that correlate with them, fully explain the differences in effect size. Understanding the details of these votes, and how much of an impact each vote would have on home values, would be a logical step to follow up on these analyses in the future.

To summarize, a major shift in an individual’s economic and social situation—becoming a homeowner—has important effects on the propensity to participate, and this effect is concentrated in votes on particular issues of interest to homeowners. Homeowners are especially more likely to turn out when they have the opportunity to vote on local issues related to zoning policy. These patterns are entirely consistent with, although do not prove, the so-called “homevoter” hypothesis (Fischel 2001), and they help us to understand the behavioral roots of the homevoter. Homeownership changes individuals’ political behavior, making them pay more attention to political issues related to their new asset and encouraging them to participate in local elections at higher rates.

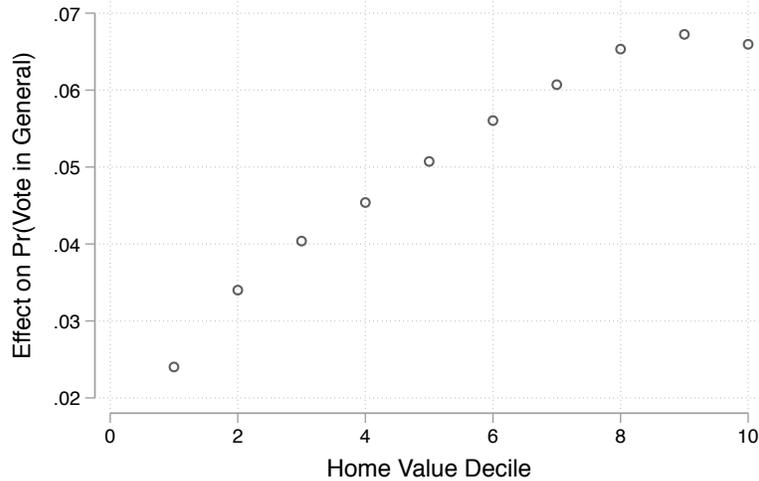
Investment vs. Long-Term Stability Mechanisms

So far, we have estimated the effect of buying a home on local election turnout, and we have presented evidence that specific policy issues—such as zoning initiatives—seem particularly related to the homeowner turnout boost. Here, we consider whether these effects seem to relate to an investment motivation, as in the homevoter literature, where homeowners are thought to participate out of a desire to preserve and increase the value of their property, and whether they relate to a time-horizon motivation in which homeownership creates long-term residential stability, leading individuals to care more about local politics regardless of personal economic incentives. We stress that these are not mutually exclusive mechanisms.

To examine the investment mechanism, in which homeowners act to preserve the value of their home, in Figure 5 we estimate the effect of becoming a homeowner on local turnout across home purchase price. The logic is that purchases of more expensive homes have bigger assets to protect and therefore more incentive to participate.²⁶ Each point in the figure represents a point estimate from equation 1, but we estimate it separately for each

²⁶Relatedly, existing evidence suggests a link between home price and political preferences (Ansell 2014), though the focus in that work is on appreciation while we are focusing on the initial size of the home investment.

Figure 5 – Effect of Homeownership on Local Turnout Across Home Purchase Price.



Each point represents a point estimate as in equation 1, estimated separately for each decile in terms of home purchase price, including individual fixed effects and year fixed effects. 95% confidence intervals from robust standard errors clustered by individual are not plotted because they are too small.

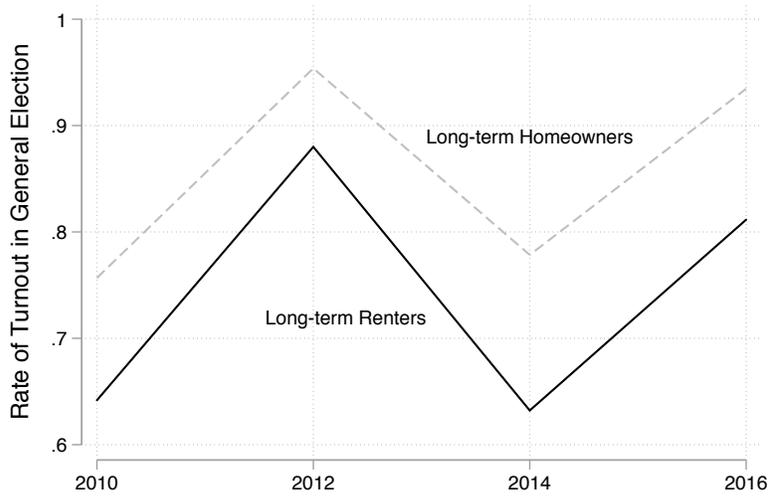
decile of home purchase price.²⁷ The effect of homeownership for individuals who buy more expensive homes is clearly larger than for individuals who buy less expensive homes. Based on this evidence, it appears that individuals with higher-valued assets are encouraged to participate even more in local elections. If homeownership only encouraged turnout through the time horizon mechanism, we would not expect to see effects vary as a function of purchase price.²⁸

Second, it could be that homeowners and renters who have lived in the same area for a long time are similarly motivated to participate in politics, but that homeowners have higher

²⁷In Section A.4 of the Appendix, we conduct a test of the parallel trends separately for each home value decile.

²⁸Related to the investment mechanism, it could be that the effect of becoming a homeowner on participation is larger for individuals with home mortgages than for those who do not take out mortgages. The logic is that leveraged individuals with home mortgages face greater financial risk from their homes depreciating, and so might be more motivated to protect the value of their home. In Table A.10 in the Appendix, we interact homeownership with whether there is a mortgage associated with the home purchase, and we do not find substantial differences in the effect size among homeowners with and without mortgages.

Figure 6 – General-Election Turnout Among Long-Term Homeowners and Long-Term Renters Who Voted in 2008.



The grey dashed line represents the general election turnout rate among long-term homeowners, defined as those who live at the same home address from 2008-2016. The black solid line represents the general election turnout rate among long-term renters, defined as those who live at the same rental address from 2008-2016. Long-term homeowners turnout in general elections at higher rates than long-term renters. For this figure, we condition on residents who voted in the 2008 general election.

residential stability than non-homeowners.²⁹ Survey evidence suggests that homeowners are more likely to vote than renters, but also that residents who have lived in an area for a long time are much more active in their communities than newer residents (McCabe 2016).³⁰ The residential stability explanation would suggest that long-term homeowners and long-term renters should be similarly likely to participate in politics. In Figure 6, we present some descriptive evidence comparing general-election turnout among long-term homeowners and long-term renters in North Carolina. We use North Carolina rather than Ohio for this analysis because the North Carolina voter file has snapshots over time, so we can identify long-term residents. We categorize individuals as long-term residents if their residential

²⁹Residential stability positively correlates with political participation (Ansolabehere, Hersh, and Shepsle 2012).

³⁰Interestingly, McCabe (2016) shows that residential stability explains differences in many community-minded social behaviors, like volunteering or other neighborly activities. The evidence for differences between homeowners and renters on these types of activities, meanwhile, is mixed.

address in the voter file is the same for every voter file snapshot from 2008 through 2016. Individuals that merge to the deed records are long-term homeowners, while those that do not merge to the deed records are long-term renters. To avoid issues related to the possibility that renters could disproportionately be deadwood in the voter file, we condition on having voted in the 2008 general election, and then we compare general election turnout among these long-term homeowners and long-term renters from 2010 through 2016. We can see in Figure 6 that long-term homeowners are about 10 percentage points more likely to vote in the general elections than long-term renters (overall turnout rates are high for both groups because we have conditioned on voting in 2008). These are purely descriptive differences, so we would not want to ascribe the differences in general-election turnout to the effect of purchasing a home, alone. However, we do observe that long-term homeowners are behaving quite differently than long-term renters. We interpret this evidence as consistent with, but again cannot prove directly, that the incentives associated with owning a home encourage individuals to participate in politics.

In Table A.9 in the Appendix, we also estimate the effect of homeownership on turnout in local general elections separately for those who go from renters to homeowners at some point during the panel and those who go from being homeowners to renters. The estimates in Table 1 incorporate both of types of individuals into the estimation, but these effects need not be symmetric. Homeownership might encourage voting habits that remain even after someone sells their home, for example. As discussed before, the fraction of individuals who transition from homeownership to renting is small, but the results in Table A.9 indicate that homeownership leads to an increase in local turnout among those who enter homeownership, but it does not lead to a decline in turnout among those who leave homeownership. This suggests that habit formation might be an important part of how homeownership shapes voting behavior in local elections. We explore this mechanism in more detail in Section A.5 of the Appendix.

Conclusion

Understanding whether and how individuals translate their personal circumstances into costly political behavior is a fundamental question in political economy. Top-down accounts of politics often focus on the conflict between the haves and the have-nots, but bottom-up accounts of individual voters in democracies struggle to explain how, if at all, individuals map their experiences and incentives to political action. For example, summarizing the political behavior literature that is largely pessimistic about the role of self interest in political behavior, Marble and Nall (2018: 1) write: “low-income conservative Republicans and affluent liberal Democrats alike are described as voting ‘against their own interests’.”

As Marble and Nall (2018) argues, these questions are particularly salient with regard to housing policy in the United States. The success of local communities in restricting the housing supply has deterred many individuals from moving to the areas that offer the most economic opportunities. In the aggregate, these outcomes suggest the success of homeowners in pursuing their self interest. Our analyses suggest one part of the explanation for this success. Becoming a homeowner causes individuals to participate more in local and national politics, on average, at least in North Carolina and Ohio. These participatory effects of homeownership help to explain apparent homeowner advantages in the policy process at both the local and national level.

Documenting these effects does not explain *why* homeowners choose to participate more. We have attempted four main follow-up analyses to try to shed light on this question. First, we explored how the effect of homeownership on local election turnout varies by age and property type, finding that the effect is largest among younger homeowners and those who purchase single family residences. This suggests that formative life experiences, or “adult roles,” could be motivating increased attention to local politics. Nonetheless, we still find positive and large effects among older homeowners and among owners of condominiums and other types of property, suggesting that preserving home values could still explain a substantial portion increased participation in local politics.

Second, we explored local issues voted on in Ohio, finding that homeowners are particularly mobilized to vote on initiatives related to zoning policy. This suggests that homeowners at the local level are able to solve the collective action problem and mobilize to influence the policies that most directly regulate the supply of homes. Whether they solve this problem simply through an individual preference to participate, or through group-level social sanctioning or encouragement, or through other means, is an important question for future work on this subject, but the initial takeaway seems relatively clear: many individuals in our sample translate their personal circumstances into costly political behavior despite the incentives to free-ride off of the political actions of other citizens.

Third, we examined how the effect of homeownership on local political participation varies with the price paid for the home. Homeowners who own more valuable homes exhibit larger increases in their propensity to participate in local elections. This suggests that individuals may be motivated to participate in local politics in order to preserve the value of their investment in their home, just as the homevoter hypothesis would predict.

Fourth, in the Appendix we explored differences in the effect of homeownership on political preferences at the national level, finding that voters become more likely to vote in national elections. These effects are largest after a local elections have already taken place, which suggests that habit formation might explain some of the increase in national election turnout. Or, alternatively, once homeowners participate in one local election, they might be identified as likely voters and subsequently mobilized by political campaigns. We also find the effect of homeownership is larger among those with FHA mortgages, which suggests that individual experiences with federal housing policies explain some of the increase in national election turnout. Although existing research on the voting behavior of homeowners focuses on local politics, where homeowners' economic incentives are sharpest, our evidence suggests that these incentives have spillovers into national politics as well.

While none of these follow-up analyses is able to test these mechanisms directly, they are consistent with there being a direct link between homeownership and taking action to protect

one's home value. Many mechanisms may be at work, but the changing economic incentives that accompany homeownership appear to be an important part of the explanation for increased turnout. Future work should continue to explore how property ownership, or other important changes in an individual's financial situation, maps to their political behavior, and why.

In addition, these results suggest that policies that encourage or reward homeownership may have political consequences. While we stress that we have not carried out a credible program evaluation of an intervention to stimulate homeownership, by getting people into homes through mortgage assistance, subsidies, and favorable tax treatment, the federal government may produce a more active citizenry. Normatively, this may be a double-edged sword. On the one hand, encouraging active participation in politics is generally considered a positive thing; on the other, encouraging it via homeownership may increase political and economic inequality. Because homeownership appears to encourage participation, policies that encourage homeownership may prop up existing status quos by creating a larger constituency in favor of restrictive zoning policies and other pro-homeowner policies that disadvantage those without property.

Finally, and more broadly, our analyses may suggest the value of turning to administrative data to answer questions about individual political behavior. Although survey analyses of homeowners have proven fruitful for many purposes, there is considerable value in being able to scrutinize the costly, real-world behavior of homeowners and non-homeowners choosing whether to engage in the political process. The increased availability of voter-file data, along with the growth of publicly available information on property ownership in many counties, present exciting opportunities for future research in this area.

Acknowledgements

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Online Appendix

Intended for online publication only.

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A.1 Validating the Record Linkage

To help validate our record linkage procedure, we replicate the main result from Table 1 fastLink (Enamorado, Fifield, and Imai 2019), a probabilistic method that allows for error in string variables but can still link large administrative datasets relatively quickly. We use fastLink to merge exactly on county and zip code, while allowing for probabilistic linking on last name, first name, street number, and street name.³¹ Unlike our deterministic linking in the main body of the paper, fastLink can still link records with small differences in name and address, while our method relies on exact matching on name and address. Therefore, fastLink will have a higher match rate than our procedure, by construction. Probabilistic linking methods also have the added advantage that they allow us to estimate the false positive and false negative rates. Using a threshold of 0.85, we estimate a false positive rate of 0.49%, which is very low. The estimated false negative rate is about 21.20%, meaning about 21% of registered voters are not linked but likely have a corresponding match in the property records. For reference, this is lower than the estimated false negative rate from merging the 2012 Cooperative Congressional Election Study (CCES) data to individual-level donor records (Enamorado, Fifield, and Imai 2019). Using this procedure we find about 36.36% of individuals in Ohio are in the voter file but not linked to a homeownership record, 21.22% are homeowners but are not matched to the voter file, and 42.43% of individuals are matched to both the voter file and a homeownership record.

Table A.1 – Effect of Homeownership on Political Participation in Local Ohio Elections using fastLink.

	Turnout in General = 1			Turnout in Primary = 1		
	(1)	(2)	(3)	(4)	(5)	(6)
Homeowner	0.004 (0.000)	0.020 (0.000)	0.018 (0.000)	0.009 (0.000)	0.008 (0.000)	0.007 (0.000)
Observations	57044043	32453677	32456440	54511095	31923340	31925700
Outcome Mean	0.147	0.090	0.090	0.033	0.022	0.022
Individual FEs	Yes	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	No	Yes	Yes	No	Yes
Year-by-Value FEs	No	Yes	No	No	Yes	No
Sample	Full	Owners	Owners	Full	Owners	Owners

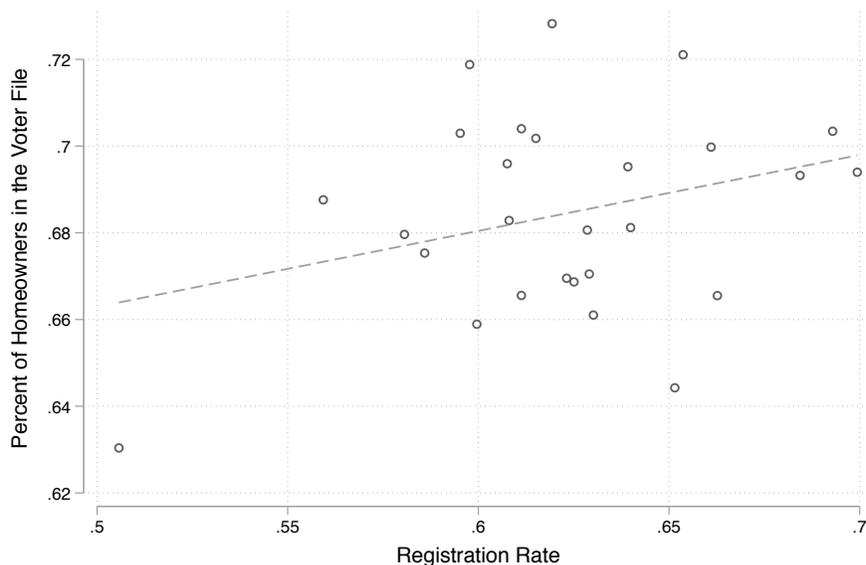
Robust standard errors clustered by individual in parentheses. Columns 2, 3 and 5, and 6 include only individuals who become homeowners at some point during the study period.

The results using fastLink are shown in Table A.1. The results are substantively very similar as our main results in Table 1. We should note that the results are smaller in percentage point terms, but they are similar in magnitude as a percent increase over the outcome mean. One reason we prefer our deterministic linking method is that we are able

³¹For each record in the voter file, we select the property record with the highest probability of being a match, and we select a threshold of 0.85 to declare a pair a match.

to link the voter file with annual tax history files in CoreLogic, which helps us to build out the treatment variable in cases where there is missing information about the sale date in the most recent property records. Computational constraints prevent us from doing probabilistic linking of entire Ohio voter file for each tax history file. Therefore, for the robustness check in Table A.1 we drop many individuals in the voter file who are homeowners but have a missing value for the sale date in the most recent property record file, and this is why the mean of local turnout is smaller in Table A.1 than in the main result in Table 1.

Figure A.1 – Homeowner Registration Rate Versus Overall Registration Rate, Ohio Counties



Note: Each point represents a county with population over 100,000 in Ohio. The x-axis is the registration rate, where the numerator is the number of registrants in the Ohio voter file and the denominator is the county’s voting age population according to the 2017 American Community Survey (ACS) 5-year estimates. The y-axis is the percent of homeowners in the CoreLogic records that match to the voter file. These are positively related with a correlation coefficient of 0.312, which helps to validate the record linking.

As a second check on our merge procedure, we also compare the rate at which homeowners are registered according to our linkage procedure with the overall registration rates in each county in Ohio. To do so, we collected county-level registration rates in Ohio, calculated as the number of registered voters in the 2017 voter file divided by the county’s voting age population estimate from the 2017 American Community Survey (ACS) 5-year estimates. Figure A.1 shows the scatter plot of our county-level homeowner registration rate, defined as the fraction of homeowners in the county who merge to the voter file according to our linkage procedure, against the overall county-level registration rate. These two measures correlate positively at 0.312, which helps us feel more confident in our record linkage procedure. The average registration rate is 68.1%, which is slightly higher than our homeowner registration rate. There are a few reasons why our homeowner registration rate might be lower than the

overall county registration rate: 1) false negatives in the merge, which would attenuate the effects we estimate, or 2) homes might not be owner-occupied, in which case we would not expect that the listed owner would be registered to vote at the property's address.

A.2 Validating Parallel Trends Further

Here, we carry out four further tests to validate the assumption of parallel trends, focusing on our main analysis on the effect of homeownership on local election turnout.

Table A.2 – Validating Parallel Trends for the Local Turnout Analysis.

	Turnout in General				Turnout in Primary			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Homeowner	0.050 (0.000)	0.040 (0.000)	0.051 (0.000)	0.032 (0.000)	0.017 (0.000)	0.019 (0.000)	0.021 (0.000)	0.009 (0.000)
Homeowner, $t + 1$	-0.009 (0.000)	-0.001 (0.000)			0.006 (0.000)	-0.000 (0.000)		
Homeowner, $t + 2$		0.003 (0.000)				0.005 (0.000)		
Observations	33391889	28892520	37897139	37897139	32220591	27858002	36224042	36224042
Outcome Mean	0.290	0.276	0.290	0.290	0.075	0.077	0.075	0.075
Individual FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	No	No	Yes	Yes	No	No
County-Year FEs	No	No	Yes	No	No	No	Yes	No
Individual Linear Trends	No	No	No	Yes	No	No	No	Yes

Robust standard errors clustered by individual in parentheses.

In the first test, we include a lead of the homeowner variable—i.e., a variable which takes the value 1 if an individual is going to become a homeowner in the next time period, after the election at t . A large coefficient on this lead would suggest the presence of pre-trending. As columns 1 and 4 of Table A.2 show for general and primary election turnout, respectively, the main effect on homeowner remains large and similar in magnitude to the estimates in Table 1 with the inclusion of this lead, and the coefficients on the leads themselves are an order of magnitude smaller than the coefficients on the main effects, and in the opposite direction in the case of general-election turnout (they are “statistically significant” because of the extremely large sample sizes.) In the second test, shown in columns 2 and 5 for general and primary election turnout, respectively, we include two leads of the homeowner variable; again we find similar coefficients on the main effects and small effects on the leads. As such, this is reassuring evidence that parallel trends might hold. Nonetheless, in the main text we carry out a series of additional robustness checks to make the parallel trends assumption more plausible.

The third test is simply to alter the counterfactual time trends in a way different from in the body of the paper. In the paper, we focused on using counterfactual trends based on individuals’ homebuyer status and the value of their home; here, we instead focus on using individuals who live near each other. To do so, we include county-by-year fixed effects. As noted in the body of the paper, we also include county-by-year fixed effects for a substantive reason: by giving each county its own set of time fixed effects, we control for common, county-level unobservable shocks that could affect trends in local election turnout. For example, voters in different counties vote for different sets of candidates in local elections. As the

estimates in columns 3 and 6 show, estimates are unchanged, relative to those in Table 1, when we use these alternative fixed effects.

In the next test, we include unit-specific linear time trends. These controls allow for individuals to have their own (linear) turnout trends, and the estimates in these specifications remain largely similar, although they do shrink slightly.

Finally, following Angrist and Pischke (2009) we estimate the dynamic effect of homeownership on local turnout in general elections in Ohio, an approach similar in spirit to Granger (1969). Specifically, we estimate the following equation:

$$Turnout_{it} = \gamma_i + \lambda_t + \sum_{\tau=0}^m \delta_{-t} D_{t-\tau} + \sum_{\tau=1}^q \delta_{+\tau} D_{t+\tau} + \epsilon_{it}, \quad (3)$$

where D is the homeownership treatment indicator, and the sums on the right-hand side allow for m lags and q leads, or anticipatory effects. On the right-hand side, $\gamma_i + \lambda_t$ stand in for individual and year fixed effects, respectively. The idea here is that future homeownership status should not affect turnout, so each of the q δ terms should be substantively small. We implement this test with 5 leads of homeownership, a switching indicator at $t = 0$, and 3 lags of homeownership. The results are shown in Figure 2. The x-axis plots the number of elections until an individual becomes a homeowner, with 0 being the first election period after an individual becomes a homeowner. The δ coefficients are plotted on the y-axis. Reassuringly, we see that the effects of future homeownership on turnout in the five periods prior to homeownership are all substantively small. The effect of homeownership on local election turnout in the post-treatment periods are large.

Taken together, these tests provide further reassurance that the parallel trends assumption might hold.

A.3 Effect of Homeownership on Local Election Turnout, Homeowners Subsample

In this section we estimate a version of the difference-in-differences in Table 1 that makes comparisons only among the set of people who purchase a home at some point, so that everyone in the sample achieves the wealth necessary to be a homeowner. The simple difference-in-differences in column 1 of Table 1, which includes individual fixed effects and year fixed effects, estimates counterfactual trends for homebuyers using all non-homeowners. One concern with that specification is that wealthier individuals are more likely to buy homes and may have different trends in political behavior than people who cannot afford to buy homes. For this reason, in column 1 of Table A.3 we use only the set of all individuals who buy a home at some point in our sample, and we include a separate set of year fixed effects for each decile of home price. This means that we are constructing counterfactual trends for each homebuyer using the turnout behavior of other individuals who go on to buy a similarly priced home but have not yet done so. The results are extremely similar using this alternative setup. In column 2, we go back to using simple year fixed effects, but we continue to only include homeowners, so that counterfactual trends are coming from other homebuyers who have not yet bought their homes. Again, the estimate is very similar. Columns 3 and 4 mirror the specifications in columns 1 and 2, but use turnout in local primary elections in Ohio as the outcome. The results are very similar to those in the main results in Table 1 in the main text.

Table A.3 – Effect of Homeownership on Political Participation in Local Ohio Elections.

	Turnout in General = 1		Turnout in Primary = 1	
	(1)	(2)	(3)	(4)
Homeowner	0.049 (0.000)	0.051 (0.000)	0.022 (0.000)	0.022 (0.000)
Observations	37897139	37897139	36224042	36224042
Outcome Mean	0.290	0.290	0.075	0.075
Individual FEs	Yes	Yes	Yes	Yes
Year-by-Value FEs	Yes	No	Yes	No
Year FEs	No	Yes	No	Yes
Sample	Owners	Owners	Owners	Owners

Robust standard errors clustered by individual in parentheses. All columns include only individuals who become homeowners at some point during the study period.

A.4 Assessing Parallel Trends Across Home Value Deciles

In this section, we conduct a test to evaluate the parallel trends assumption for the results in Figure 5, where we estimate the heterogeneity in the effect of homeownership on local turnout across home value deciles. In Figure 5 we find that the effect of becoming a homeowner on local turnout increases with the value of the home purchased, suggesting that individuals with higher-valued assets become especially motivated to participate in local politics.

To evaluate the parallel trends assumption for this analysis, we generate the same lags and leads plot shown in Figure 2 – described fully in Section A.2 – but we subset only to those homeowners in each home value decile. Each lags and leads plot, then, provides a parallel trends test for each of the point estimates in Figure 5. As we show in the lags and leads plots in Figures A.2 and A.3 for home value deciles 1-6 and 7-10, respectively, the tests for parallel trends look reassuring across different home value deciles. In each plot, the coefficients are substantively small in the pre-periods and grow large in the post-periods. There appears to be a small amount of pre-trending in home value deciles 9 and 10, but those coefficients are small in magnitude. Overall, we interpret this evidence as reassuring that the parallel trends assumption might hold across different home values deciles.

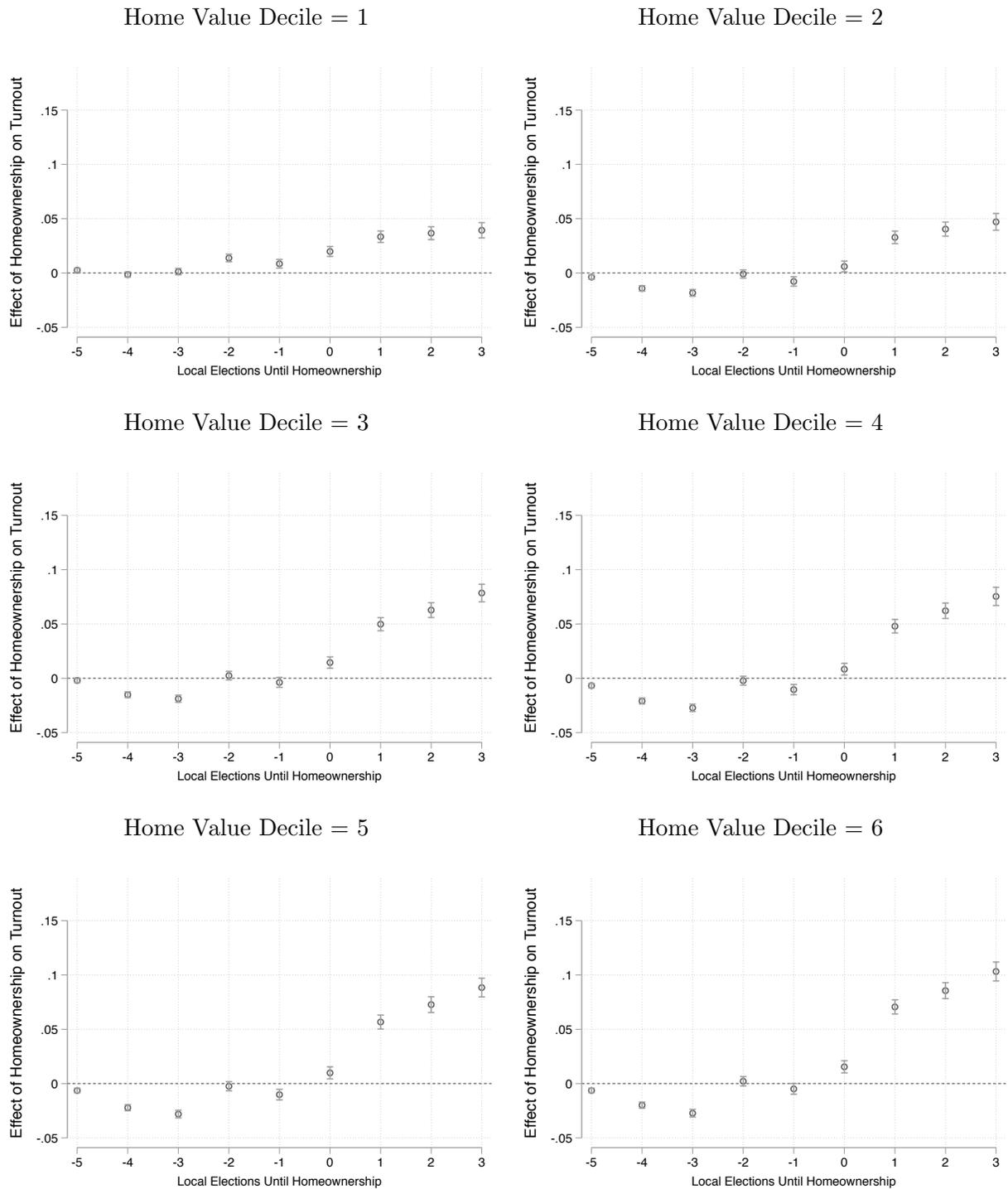


Figure A.2 – Dynamic Effect Plot: Local General Election Turnout in Ohio, Estimated Separately by Home Value Deciles 1-6. *Note:* The x-axis indicates the number of local election cycles until an individual becomes a homeowner. The y-axis plots the effect of homeownership on turnout in local general elections in Ohio, with 0 indicating the first period that an individual is a homeowner. The effect of homeownership leads on turnout are substantively small in all cases, indicating that the parallel trends assumption might plausibly hold across home value deciles.

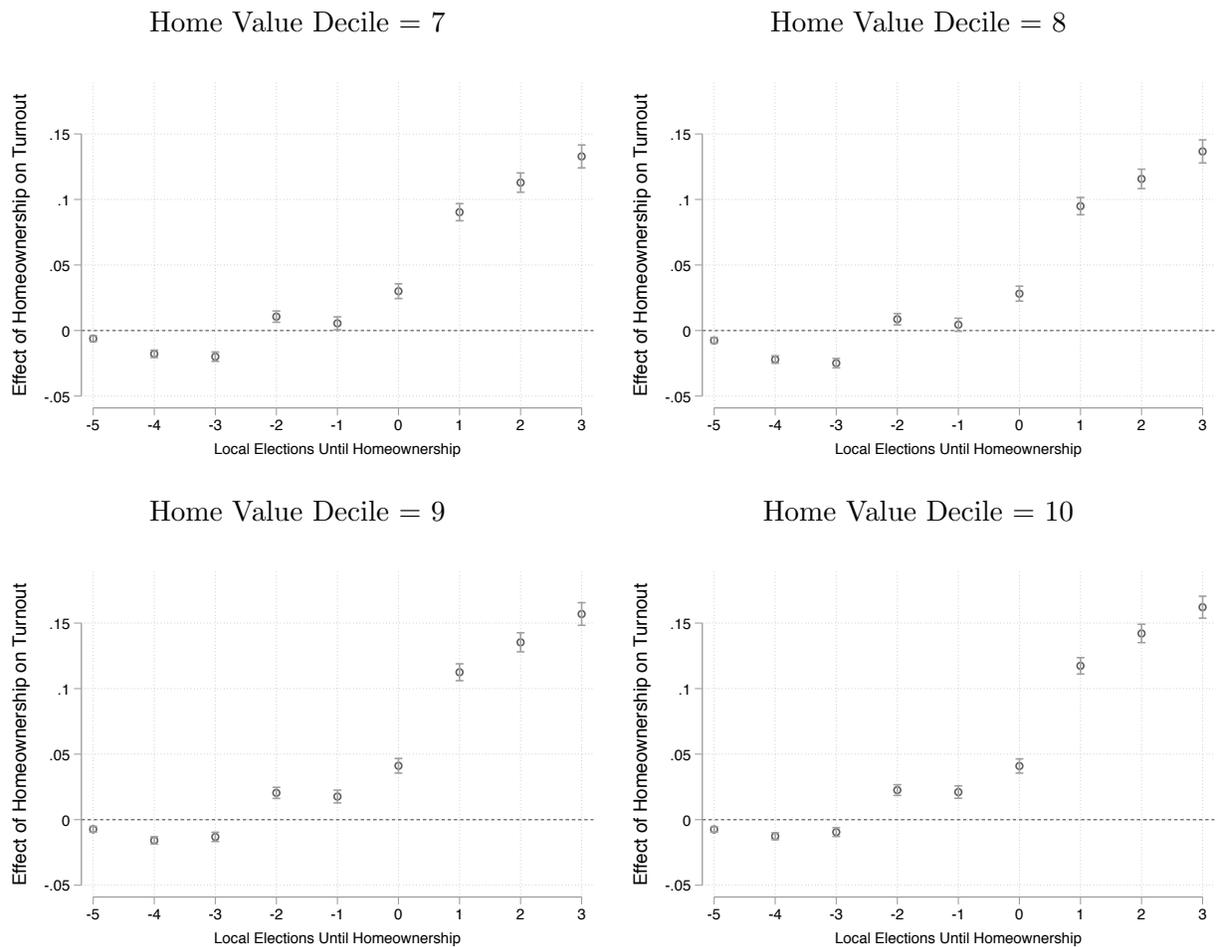


Figure A.3 – Dynamic Effect Plot: Local General Election Turnout in Ohio, Estimated Separately by Home Value Deciles 7-10. *Note:* The x-axis indicates the number of local election cycles until an individual becomes a homeowner. The y-axis plots the effect of homeownership on turnout in local general elections in Ohio, with 0 indicating the first period that an individual is a homeowner. The effect of homeownership leads on turnout are substantively small in nearly all cases, indicating that the parallel trends assumption might plausibly hold across home value deciles.

A.5 Homeownership and Turnout in National Elections

So far, we have documented the link between homeownership and local elections, following the homevoter literature. However, we can also use our data to investigate possible links between homeownership and national elections. There are cross-cutting theoretical predictions that make it valuable to study the effect of homeownership on national political behavior. On the one hand, by stimulating political attention at the local level, homeownership may also have spillover effects, leading individuals to become more politically aware in general, boosting turnout in national elections. This would be in line with predictions from Prato (2018), which suggests that homeownership leads to a permanent shift in information acquisition among voters. Relatedly, national election turnout might increase as a result of habit formation, where individuals become homeowners and participate more in local elections, and this habit affects their participation in national elections. Additionally, while the homevoter literature often suggests that homeowners should be relatively indifferent to national politics, the federal government does play an important role in subsidizing housing and offering preferential tax treatment to homeowners. On the other hand, local political participation could be a substitute for national political participation, in which case homeownership, by shifting attention to local politics, could detract from national political participation. We stress that these explanations need not be mutually exclusive.

Table A.4 – Effect of Homeownership on Political Participation in National Elections, North Carolina and Ohio.

	Turnout in General = 1				Turnout in Primary = 1			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Homeowner	0.082 (0.000)	0.082 (0.000)	0.084 (0.000)	0.041 (0.000)	0.051 (0.000)	0.032 (0.000)	0.034 (0.000)	0.050 (0.000)
Observations	117864385	44410953	44410953	13703508	126673490	44981204	44981204	14618592
Outcome Mean	0.316	0.422	0.422	0.250	0.135	0.208	0.208	0.115
Individual FEs	Yes	Yes	Yes	No	Yes	Yes	Yes	No
Year FEs	Yes	No	Yes	Yes	Yes	No	Yes	Yes
Year-by-Value FEs	No	Yes	No	No	No	Yes	No	No
Sample	Full	Owners	Owners	Matched	Full	Owners	Owners	Matched

Robust standard errors clustered by individual in parentheses; standard errors in columns 4 and 8 are robust without clustering, as the data is collapsed by stratum-year. Columns 2, 3 and 6, and 7 include only individuals who become homeowners at some point during the study period. Columns 4 and 8 include only individuals who are exactly matched on the basis of 4 pre-treatment periods of the outcome variable.

Table A.4 shows turnout estimates using the same approach from Table 1, following equation 1. As the table shows, we find substantial effects of homeownership on turnout in national elections, both for general elections (left four columns) and primary elections (right four columns). The wide variation across specifications makes us less confident about the precise magnitude of these effects—and bear in mind that the baseline rate of turnout is quite a bit higher in national elections—but we see across-the-board evidence for positive turnout effects.

In Table A.5 we rely on variation in the size of this effect on national turnout to better distinguish between possible explanations for this increase. First, to test for the possibility

of habit formation driving the increase in turnout, we include an interaction of the homeowner variable with an indicator for whether, for a given homeowner, the national election occurs after a local election has taken place. The intuition is that if habit formation from participating in local elections is driving all of the effect on national turnout, we should only observe the effect of becoming a homeowner after there has been a local election for that homeowner. In column 1 of A.5 the coefficient on the homeowner variable suggests that the effect of becoming a homeowner on national election turnout is about 4 percentage points before a local election has taken place. The fact that this coefficient is positive suggests that habit formation cannot explain all of the effect – however, looking at the interaction term, the effect increases substantially, to about 9.5 percentage points, after a local election has taken place. This is consistent with, although does not prove, that homeowners increase their participation in local elections, and that voting habit spills over to national election turnout.

Table A.5 – Effect of Homeownership on Political Participation in National Elections by Local Election Timing and FHA Mortgage Status, Ohio.

	Turnout in General = 1		Turnout in Primary = 1	
	(1)	(2)	(3)	(4)
Homeowner	0.040 (0.000)	0.077 (0.000)	0.007 (0.000)	0.032 (0.000)
Homeowner × After Local Election	0.055 (0.000)		0.031 (0.000)	
Homeowner × FHA Mortgage		0.021 (0.001)		0.001 (0.001)
Observations	37815321	37815321	37815321	37815321
Outcome Mean	0.457	0.457	0.230	0.230
Individual FEs	Yes	Yes	Yes	Yes
Year-by-Value FEs	Yes	Yes	Yes	Yes
Sample	Owners	Owners	Owners	Owners

Robust standard errors clustered by individual in parentheses; all columns include only individuals who become homeowners at some point during the study period.

Next, we test whether the federal government’s role in housing might explain some of the increase in national election turnout. To do this, in column 2 of Table A.5 we interact the homeowner variable with whether a homeowner acquired their home through a mortgage from the Federal Housing Administration (FHA).³² If voters’ experiences with national level housing policies drive increases in national election turnout, we would expect that the

³²Individuals with FHA-backed mortgages differ from those with conventional mortgages on a variety of observable characteristics. Those with FHA mortgages are younger, have lower valued homes, and vote in local elections at lower rates than those with conventional mortgages. Median birth year for those with FHA and conventional mortgages are 1975 and 1966, respectively; median home value is about \$100,000 and \$135,000; and turnout in local elections is 14% and 21%.

effect should be larger among those with FHA mortgages. Indeed, we see that the effect of becoming a homeowner on national general election turnout is more than 2 percentage points higher among those with FHA mortgages than among those without. This is consistent with the explanation that voters' firsthand experiences with federal housing policy encourage turnout in national elections. In columns 3 and 4, we repeat the same results using turnout in national primary elections as the outcome, and we see similar patterns, with the exception that we do not find large differences in the effect on national primary elections for those with versus without FHA mortgages. This difference is consistent with a number of explanations, but one likely possibility is that the lower salience of primary elections might limit the ability of FHA homeowners to become galvanized to protect their benefit from the federal government (e.g., Campbell 2003; Mettler 2005). We also re-estimate the specification in column 2 using local election turnout as the outcome, and we do not find evidence of a difference in the effect of homeownership on local turnout for those with and without FHA-backed mortgages. This makes us more confident that the results in Table A.5 can be explained by individuals' being motivated to turn out in national elections based on direct experiences with benefitting from a federal government policy.

Overall, becoming a homeowner leads to an increase in national election turnout, suggesting that homeowners pay more attention to politics in general, beyond only local politics.³³ Follow up analyses suggest that some of this increase could be coming from information spillovers, from habit formation, and from firsthand experience with federal housing policy.

³³In Section A.11 of the Appendix, we also estimate the effect of homeownership on partisan preferences, finding that homeowners become more likely to participate in both Democratic and Republican primary elections, on average.

A.6 Voter File Purge and Selection Bias

Table A.6 – Effect of Homeownership on Political Participation in National General Elections, North Carolina.

	Including Purged Voters			Excluding Purged Voters		
	(1)	(2)	(3)	(4)	(5)	(6)
Homeowner	0.094 (0.000)	0.094 (0.000)	0.087 (0.000)	0.102 (0.000)	0.115 (0.000)	0.108 (0.000)
Observations	73429987	29482978	22218491	42207777	24157335	19033142
Outcome Mean	0.242	0.332	0.385	0.420	0.405	0.450
Individual FEs	Yes	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	No	Yes	Yes	No	Yes
Year-by-Value FEs	No	Yes	No	No	Yes	No
Sample	Full	Owners	Owners	Full	Owners	Owners

Robust standard errors clustered by individual in parentheses. The first three columns include voters in North Carolina who were removed from the voter file, while the last three columns exclude these voters. Columns 2, 3, 5, and 6 include only individuals who become homeowners at some point during the study period.

In this section, we first examine how voter file purges might affect our estimates of the effect of homeownership. In the body of the paper, we use evidence from voter files in North Carolina and Ohio. One potential issue that arises when using voter files is that their composition changes over time. For example, voters might be purged from the voter rolls, and each state has its own rules and guidelines for when voters should be removed from the voter file.³⁴ We would like to avoid conditioning on post-treatment behavior. For example, if our treatment (homeownership) affects political participation, and political participation in turn affects the likelihood that a voter is purged and does not show up in the current version of the voter file, our estimates could be biased by the fact that we are selecting on those who remain in the voter file. Ideally we would like to be able to include not only individuals in the most recent copy of the voter file, but also everyone who has ever been registered at some point during the course of our study. Ex ante, the direction of the bias is ambiguous. If we fail to observe homeowners who are purged from the voter file and therefore do not turn out to vote, we would overestimate the effect of becoming a homeowner on participation. However, if we fail to observe non-homeowners who are purged from the voter file, we would underestimate the effect of becoming a homeowner on participation. In order to test how voter file purges might be affecting our estimates, we limit the analysis just to North Carolina, where the information of individuals purged from the voter file is

³⁴Federal law does prohibit states from removing voters from the voter rolls unless certain criteria are met. For example, the National Voter Registration Act of 1993 prohibits states from removing voters “by reason of the person’s failure to vote” (see <https://www.gpo.gov/fdsys/pkg/STATUTE-107/pdf/STATUTE-107-Pg77.pdf>)

preserved along with a variable indicating that they have been removed.³⁵ In Table A.6, we report the main results for the effect of homeownership on turnout in North Carolina national general elections where we both include and exclude purged voters from the analysis. The point estimates with and without purged voters are quite similar, although the effect of becoming a homeowner on participation is slightly larger when we include the removed voters. This suggests that non-homeowners are more likely to be purged than homeowners, so we might be slightly overestimating turnout for non-homeowners, and thus underestimating the turnout boost from homeownership.

Table A.7 – Effect of Homeownership on Political Participation in Local Ohio Elections, Robustness Check

	Turnout in General = 1 (1)	Turnout in Primary = 1 (2)
Homeowner	0.106 (0.000)	0.025 (0.000)
Observations	51563083	47424873
Outcome Mean	0.327	0.083
Individual FEs	Yes	Yes
Year FEs	Yes	Yes
Sample	Full	Full

Robust standard errors clustered by individual in parentheses.

Another potential source of bias in our estimates comes from the fact that we impute turnout equal to zero for those whose age made them eligible to vote but did not turn out. It could be that someone moves in from out of state, where they had been a long time voter, but they have no history of voting in Ohio. In these cases, we impute zero for turnout prior to their move, which would bias our estimate of the homeownership effect upward. Similarly, it could be that a habitual voter sells their home, moves out of state, and continues voting in another state – but we would impute their turnout as zero after they move. This would also lead us to overestimate the effect of homeownership. In Table A.7 we include a robustness check that includes the same specifications as columns 1 and 4 of Table 1, with a few adjustments. First, to address the concern that we are mistakenly setting turnout to zero for habitual voters that move in from out of state, we drop individuals whose registration year is greater than or equal to the year of their home purchase. Second, to address the concern that we are mistakenly setting turnout to zero for habitual voters that sell their home and move out of state, we set turnout to missing for individuals after they sell their home. In essence, we are now estimating the “switch-on” effect of registered voters purchasing a home on their subsequent turnout as new homeowners. The results in Table A.7 are similar to those from Table 1—in fact, for this subset we find a significantly larger effect of homeownership on local turnout—suggesting that our overall positive effect is not driven by the potential bias from imputing turnout for out-of-state movers.

³⁵Ohio’s voter file does not have this feature, so we exclude Ohio voters for this part of the analysis.

A.7 Effect of Homeownership on Registration

In this section, we estimate the effect of homeownership on being registered to vote in Ohio. We code an indicator variable for whether the individual was registered to vote in a given year based on the registration date in the Ohio voter file. We estimate a difference-in-differences design including all individuals who own a home at some point during the panel, both those who merge to the voter file and those who do not. Our results, shown in Table A.8, indicate that becoming a homeowner leads to about a 15 percentage point increase in the likelihood that the voter is on the voter rolls. It makes sense that this effect is larger than the estimated effect on turnout, because in our main analysis we can think of the outcome, voting in local elections, as the product of a) being on the voter rolls and b) turning out to vote in the local election.

Table A.8 – Effect of Homeownership on Voter Registration in Ohio, 2001-2017

	Registered to Vote = 1	
	(1)	(2)
Homeowner	0.155 (0.0002)	0.151 (0.0002)
Observations	37110963	37110963
Outcome Mean	0.424	0.424
Individual FEs	Yes	Yes
Year FEs	Yes	No
Year-by-Value FEs	No	Yes
Sample	Owners	Owners

Robust standard errors clustered by individual in parentheses. Both Columns include individuals who are homeowners at some point during the study period.

A.8 Estimating the Effect Separately for Becoming a Homeowner and Becoming a Renter

In Table 1, we show that homeownership leads to an increase in local election turnout. Those estimates, however, rely on variation in the homeownership variable for two different types of individuals: those who are renters but become homeowners at some point during the panel, and those who are homeowners but become renters at some point during the panel. These effects need not be symmetric, and there are theoretical arguments for why they might not be. We show in A.5 that habit formation could be an important part of the explanation for the effect of homeownership on turnout. If the experience of homeownership leads to an increase in local turnout, and individuals form stable voting habits, we would expect the decrease in turnout for going from owning to renting would be smaller than the increase in turnout for going from renting to owning. With this in mind, in columns 1 and 2 of Table A.9 we estimate the effect of homeownership only among those who transition from renting to owning, and in columns 3 and 4 we estimate the effect only among those who transition from owning to renting at some point over the length of the panel.

Table A.9 – Effect of Homeownership on Political Participation in Local Ohio Elections, by Homeownership Transition Status

	Turnout in General = 1			
	(1)	(2)	(3)	(4)
Homeowner	0.041 (0.000)	0.041 (0.000)	-0.006 (0.002)	-0.006 (0.002)
Observations	21181857	21181857	588971	588971
Outcome Mean	0.214	0.214	0.314	0.314
Individual FEs	Yes	Yes	Yes	Yes
Year FEs	Yes	No	Yes	No
Year-by-Value FEs	No	Yes	No	Yes
Sample	Becoming Owners	Becoming Owners	Becoming Renters	Becoming Renters

Robust standard errors clustered by individual in parentheses. Columns 1 and 2 subset to individuals who transition from renting to owning at some point over the course of the panel. Columns 3 and 4 subset to individuals who transition from owning to renting at some point over the course of the panel.

A.9 Coding Local Issues in Ohio

In Table 3, we show the different types of local issues on voters' ballots, sorted into eleven mutually exclusive categories. To generate these codings, we downloaded data on local issues in 2013, 2015, and 2017 from the Ohio Secretary of State website.³⁶ Each row in the data is a local issue on the election ballot in a locality. We use a few columns to categorize each spreadsheet of local issues. First, we identify the type of locality using "Subdivision Type," which indicates whether the local issues applies to a county, city, township, village, or school district. Next, we categorize the issues based on two other variables in the local issues data. The first variable, "Question Type," indicates whether the local issue is a bond, levy, liquor option, etc. The second variable, "Purpose," includes a short description of the local issue.³⁷

We sort each local issue into category according to the following simple coding rules:

- *Aggregation*: Purpose contains "aggregation"
- *Cemetery*: Purpose contains "cemete"
- *Charter*: Purpose contains "charter"
- *Current Expenses*: Purpose contains "current" and "expenses"
- *Liquor*: Question Type is "liquor"
- *Parks*: Purpose contains "park" or "recrea"
- *Public Safety*: Purpose contains "fire" or "police" or "safety" or "emergency medical services" or "ems" or "ambulance"
- *Roads*: Purpose contains "road" or "street" or "bridg"
- *Schools*: Subdivision Type is "school"
- *Seniors and Children*: Purpose is "senior" or "elderly" or "child"
- *Zoning*: Purpose is "zoning"

Anything not coded under any of the categories above is sort under the *Miscellaneous* category.

³⁶See <https://www.sos.state.oh.us/elections/election-results-and-data/>

³⁷Examples of local issue purposes include "police protection," "sunday sales," "maintain and operate cemeteries," "zoning amendment," and "current expenses."

A.10 Effect of Homeownership by Presence of Home Mortgage

To further explore the investment mechanism of the effect of homeownership on local turnout, in this section we examine how this effect varies by whether there is a mortgage associated with the home purchase. The logic is that leveraged individuals with home mortgages stand to lose (gain) more from their homes depreciating (appreciating) in value, so they might be more motivated to protect the value of their home. To estimate the additional local turnout boost from having a home mortgage, we interact the homeowner indicator with an indicator for whether there is a mortgage associated with the home purchase. Of course, we do not randomize access to home mortgages, so the individuals who choose to use them will differ systematically from other individuals. However, we are still estimating within-person effects of homeownership. In Table A.10, we do not find evidence of an added boost to local turnout for homeowners with mortgages relative to homeowners without mortgages.

Table A.10 – Effect of Homeownership on Political Participation in Local Ohio Elections, by Home Mortgage

	Turnout in General = 1			Turnout in Primary = 1		
	(1)	(2)	(3)	(4)	(5)	(6)
Homeowner	0.050 (0.000)	0.052 (0.000)	0.051 (0.000)	0.019 (0.000)	0.021 (0.000)	0.021 (0.000)
Homeowner × Mortgage	-0.002 (0.000)	0.000 (0.000)	-0.002 (0.000)	0.001 (0.000)	0.003 (0.000)	0.001 (0.000)
Observations	76319157	42597560	37897139	71366039	40713777	36224042
Outcome Mean	0.265	0.282	0.290	0.065	0.073	0.075
Individual FEs	Yes	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	No	Yes	Yes	No	Yes
Year-by-Value FEs	No	Yes	No	No	Yes	No
Sample	Full	Owners	Owners	Full	Owners	Owners

Robust standard errors clustered by individual in parentheses. Columns 2, 3 and 5, and 6 include only individuals who become homeowners at some point during the study period.

A.11 Effect of Homeownership on Partisan Turnout

In addition to examining effects on turnout, at the national level we can also take advantage of primary elections to study effects on participation in partisan elections. Table A.11 presents the results for two outcome variables: turning out to vote in a Republican primary in the election at time t , and turning out to vote in a Democratic primary in the election at time t . As the results show, we find that while some voters become more likely to vote in Republican primaries, others become more likely to vote in Democratic primaries. These effects are similar in magnitude for both parties. This pattern is potentially consistent with Prato (2018), which predicts that, by obtaining more information about politics, homeowners should better sort into parties.

Table A.11 – Effect of Homeownership on Partisan Preferences in National Elections, North Carolina and Ohio.

	Turnout in Rep Primary = 1				Turnout in Dem Primary = 1			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Homeowner	0.031 (0.000)	0.007 (0.000)	0.009 (0.000)	0.025 (0.000)	0.015 (0.000)	0.017 (0.000)	0.018 (0.000)	0.024 (0.000)
Observations	126673490	44981204	44981204	13885830	126673490	44981204	44981204	14618484
Outcome Mean	0.059	0.097	0.097	0.046	0.067	0.097	0.097	0.059
Individual FEs	Yes	Yes	Yes	No	Yes	Yes	Yes	No
Year FEs	Yes	No	Yes	Yes	Yes	No	Yes	Yes
Year-by-Value FEs	No	Yes	No	No	No	Yes	No	No
Sample	Full	Owners	Owners	Matched	Full	Owners	Owners	Matched

Robust standard errors clustered by individual in parentheses; standard errors in columns 4 and 8 are robust without clustering, as the data is collapsed by stratum-year. Columns 2, 3 and 6, and 7 include only individuals who become homeowners at some point during the study period. Columns 4 and 8 include only individuals who are exactly matched on the basis of 4 pre-treatment periods of the outcome variable.

One limitation of this test is that an increase in turnout in partisan primaries cannot distinguish between mobilization and preferences. It could be that homeownership increases an individual’s participation, which could include both dormant Democratic and Republican voters. In other words, the result in Table A.11 could be driven by activation of voters with different preferences rather than inducing a change in preferences themselves.

To understand this more, we turn to studying the effect of homeownership on registering with a party, as distinct from turning out to vote in a party’s primary. In Ohio, individuals register for a party by voting in its primary, so there is no further party registration to study; however, in North Carolina, individuals register directly with a party, and then can choose whether or not to vote in the primary. As a result, we can use North Carolina to study effects on party registration, directly. This is a relevant measure because it may reflect political preference as distinct from mobilization, whereas turning out in a partisan primary is a combination of both preference shifts and mobilization.

As Table A.12 shows, we find positive effects on both Democratic and Republican registration patterns like we did in primary turnout patterns. Homeowners become more likely to register for both parties. Although the evidence is indirect, it is at least suggestive that

homeownership might lead to increased turnout in partisan primaries partly because of activation, and partly because of changes in partisan preferences.

Table A.12 – Effect of Homeownership on Party Primary Participation and Registration: North Carolina.

	Turnout in Rep Primary (1)	Turnout in Dem Primary (2)	Register Rep (3)	Register Dem (4)
Homeowner	0.008 (0.000)	0.018 (0.000)	0.009 (0.000)	0.006 (0.000)
Observations	29666360	29666360	27498537	27498537
Outcome Mean	0.075	0.083	0.337	0.338
Individual FEs	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes

Robust standard errors clustered by individual in parentheses.

A.12 Effect of Homeownership with FHA Mortgages

How and why homeownership shapes individuals’ political beliefs, leading some to become Democratic while others become Republican, is hard to know.

In Table A.13, we examine one dimension that may help shed light on the process: whether or not an individual received help from the federal government, in the form of mortgage insurance, in order to qualify for their home loan. Specifically, we estimate effects of homeownership on partisanship for individuals who do and do not receive FHA-backed loans. To measure partisanship, we again examine turnout in partisan primaries in Ohio and North Carolina. Because we are now interested in detecting net shifts in preferences towards either the Democrats or Republicans, we now create a single measure of partisanship, Republicanism, defined as

$$Republicanism_{it} = \begin{cases} 1 & \text{if } i \text{ votes in Republican primary at time } t \\ 0 & \text{if } i \text{ votes in no primary at time } t \\ -1 & \text{if } i \text{ votes in Democratic primary at time } t. \end{cases}$$

We then re-estimate the difference-in-differences, as in equation 1, with the addition of an interaction of the homeownership treatment variable with an indicator for whether the individual received an FHA-backed loan. We omit the main effect on this FHA indicator as it is subsumed by the individual fixed effects.

Table A.13 – Effect of Homeownership on Partisan Political Participation, Across Mortgage Type. Home buyers receiving FHA assistance are more likely to shift in a Democratic direction in future elections.

	Primary Turnout (1=Rep, 0=None, -1=Dem)		
	(1)	(2)	(3)
Homeowner	0.019 (0.000)	-0.005 (0.000)	-0.002 (0.000)
Homeowner × FHA	-0.030 (0.000)	-0.036 (0.001)	-0.028 (0.001)
Observations	125006087	43463595	53321147
Outcome Mean	-0.008	0.000	0.000
Individual FEs	Yes	Yes	Yes
Year FEs	Yes	No	Yes
Value-by-Year FEs	No	Yes	No
Sample	Full	Owners	Owners

Robust standard errors clustered by individual in parentheses.

Table A.13 presents the results across the three main specifications we have used throughout the paper. As the table shows, individuals who receive FHA loans are substantially more

likely to move in a Democratic direction after purchasing a home. This is true across specifications. As the coefficients on the main effects show—focusing particularly on columns 2 and 3, which feature the strongest version of the design—there is little detectable net shift towards either party among individuals who do not receive FHA assistance.

The leftward shift we observe among FHA recipients could indicate a change in preferences, or it could indicate mobilization of individuals who already held Democratic political preferences. To investigate these respective mechanisms, we examine outcome data from 2006 on, and we re-estimate the effects above for three types of individuals: those who’ve never participated in a primary election before 2006 (“previous non-voters”); those who participated in at least one Republican primary but no Democratic primaries before 2006 (“previous Republicans”); and those who participated in at least one Democratic primary but no Republican primaries before 2006 (“previous Democrats”).

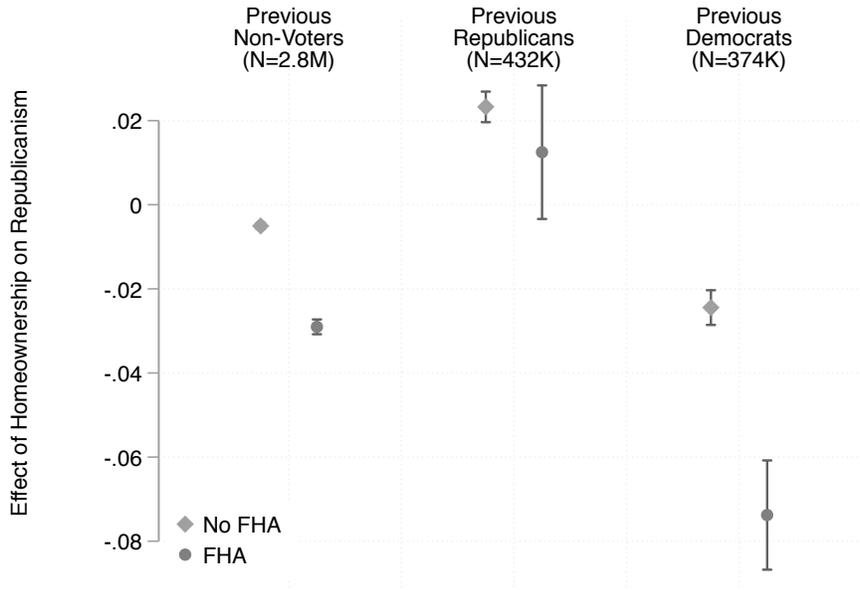
Figure A.4 plots the resulting estimates, which were estimated using the value decile by year fixed effects. The first two point estimates reflect the effect of homeownership on Republicanism for previous non-voters. The diamond is the point estimate for individuals who do not receive FHA loans, while the circle is for those who do. As the points show, previous non-voters who do not receive FHA loans shift slightly towards the Democrats; this shift is much more pronounced for those who do receive FHA loans. Because we do not know the pre-existing political views of these individuals, since they did not previously vote in a partisan primary, these effects could indicate mobilization, a shift in preferences, or some combination of the two, but they seem to offer some suggestive evidence that homeownership produces a political shift that is different for those who receive federal government help.

The second two point estimates are for previous Republicans. While previous Republicans who do not receive FHA loans become more Republican (diamond point), those who do receive FHA do not appear to shift noticeably in either direction. Inference is more difficult here as relatively few individuals who previously participated in a Republican primary and received FHA loans.

The final two point estimates are for previous Democrats. Here we see substantial mobilizing effects of homeownership, which become extremely large for those individuals who receive FHA loans.

What these effects mean is not precisely clear. We have not randomized access to FHA mortgages, so the individuals who are eligible for them and choose to use them will differ systematically from other individuals. On the other hand, we are still estimating within-person effects of homeownership, and the counterfactual trends we generate use only other individuals in the same home-price decile. While we are hesitant to ascribe these patterns to a causal effect of receiving an FHA mortgage, they show that the type of individuals who receive these loans go on to become more left-leaning. This is at least consistent with the notion that individuals form their political preferences in part based on their experiences, with those who benefit from federal government assistance becoming more supportive of the expansion of the federal government and of the party that typically espouses related policy positions (e.g., Campbell 2011; Pierson 1995). Given these results, we suspect that future work leveraging quasi-random variation in access to government housing programs would be valuable.

Figure A.4 – Effects of Homeownership on Partisanship, Measured by Primary Turnout, Across Previous Partisanship and FHA Status. Homeownership increases the probability that individuals participate in subsequent Democratic primaries when individuals receive FHA assistance for their home mortgage. This is true among individuals who had not participated in a primary before becoming a homeowner (left two point estimates in the plot) and among individuals who participated in at least one Democratic primary before becoming a homeowner (right two point estimates in the plot).



Note: Outcome variable takes the value 1 if individual votes in Republican primary, 0 if votes in no primary, and -1 if votes in Democratic primary. Previous Non-Voters are individuals who have never voted in a primary for either party before. Previous Republicans are individuals who voted in at least one previous Republican primary and no previous Democratic primaries. Previous Democrats are individuals who voted in at least one previous Democratic primary and no previous Republican primaries. Sample sizes in plot refer to number of individuals, not number of observations (which are individual-years).