Does Homeownership Influence Political Behavior? Evidence from Administrative Data*

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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.

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

–James Madison, Federalist 10

1 Introduction

An important literature in political science and political economy shows that 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). This pattern is puzzling because participating is costly and has virtually no effect on political outcomes (e.g., Downs 1957; Riker and Ordeshook 1968).[1] Do individuals form political beliefs and choose to participate in elections because of their personal economic circumstances? More generally, do economic circumstances lead individuals to take political action?[2] We study these questions in the context of property ownership. In particular, we ask: do individuals who own property turn out to vote or change their political views *because* they are property owners?

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;

[1] More generally, 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).

[2] Some studies show that large changes in economic circumstances – winning the lottery, for example – affects political participation and preferences (Doherty, Gerber, and Green 2006; Peterson 2016).

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).[3]

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 do so, 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 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. A main version of our design compares individuals who buy homes of similar prices at different times, in case non-homebuyers provide bad counterfactual trends for the types of people with enough money to buy homes. We also implement a version of the difference-in-differences design in which we exactly match individuals based on their turnout in four pre-treatment electoral cycles—essentially, the strongest version of the synthetic matching approach from Abadie, Diamond, and Hainmueller (2010). We find similar estimates across these 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 (Highton and Wolfinger 2001).

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

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 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, 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.

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

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

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.[5]

2 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.[6] In Ohio, voters register in person or by mail with their county board of elections, or voters can register to vote online.[7] 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. 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

[5]For a formal model related to this idea, see Prato (2018).

[6]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.

[7]See `https://olvr.sos.state.oh.us/`

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 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. Voter files often only contain current party registration rather than a full history of party registration. Fortunately, however, North Carolina has a series of voter file snapshots, and a common identifier allows us to link individual voters to their party 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] 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.[11]

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, assessment values, and home characteristics, 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.[12] In our dataset, 49.87%

[8] `https://www.sos.state.oh.us/elections/voters/register/`

[9] The 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.

[10] We can also use these snapshots to estimate the effect of becoming a homeowner not just on partisan primary participation, but also on party registration.

[11] See `https://www.ncsbe.gov/Voters/Registering-to-Vote`.

[12] The 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.

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.[13]

For each unique homeowner that does not merge to the voter file, we include them in our analysis as not having voted. 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 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

[13]The 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.

[14]For 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.

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 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. To the extent that false matches are present, however, they will attenuate, or bias toward zero, the estimated effect of homeownership. In Section A.1 of the Appendix we provide some suggestive evidence to 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 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, and most recently in Ohio.[15] 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.

[15] https://www.nytimes.com/2018/06/11/us/politics/supreme-court-upholds-ohios-purge-of-voting-rolls.html

3 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 and local elected offices, as well as a number of local issues.

3.1 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

$$Turnout_{it} = \beta Homeowner_{it} + \gamma_i + \delta_t + \epsilon_{it}, \tag{1}$$

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 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 below, we alter the year fixed effects in order to create different counterfactual trends (e.g., home value-by-year fixed effects.)

3.1.1 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.1, we pursue two strategies to validate the parallel trends assumption. First, we add leads of the homeowner variable, to see if we find evidence of pre-trending; 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.[16] We find extremely similar results in this setup. Taken together, these tests further add to the plausibility of the parallel trends assumption.

In addition to these tests, 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.

3.1.2 Exact Matching on Pre-Trends

Despite these strategies to make the parallel trends assumption more plausible, we still face a situation where individuals might select into homeownership for many time-varying,

[16]The 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.

unobservable reasons. Given this type of setting, we turn to a strategy that, unlike the simple difference-in-differences design, can accomodate 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. This matching exercise is similar in spirit to Abadie, Diamond, and Hainmueller (2010). 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 pre-treatment turnout, 2001, 2003, 2005, and 2007, leading to $2^4 = 16$ possible pre-treatment outcome strata. For example, the most common stratum in the data is the set of people who never turn out to vote in any election prior to 2008.

3.1.3 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. In a series of follow-up analyses presented below, we use variation in the size of the effect to get at the underlying mechanisms of the effect. 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.

3.2 Homeownership and Turnout: Graphical Evidence

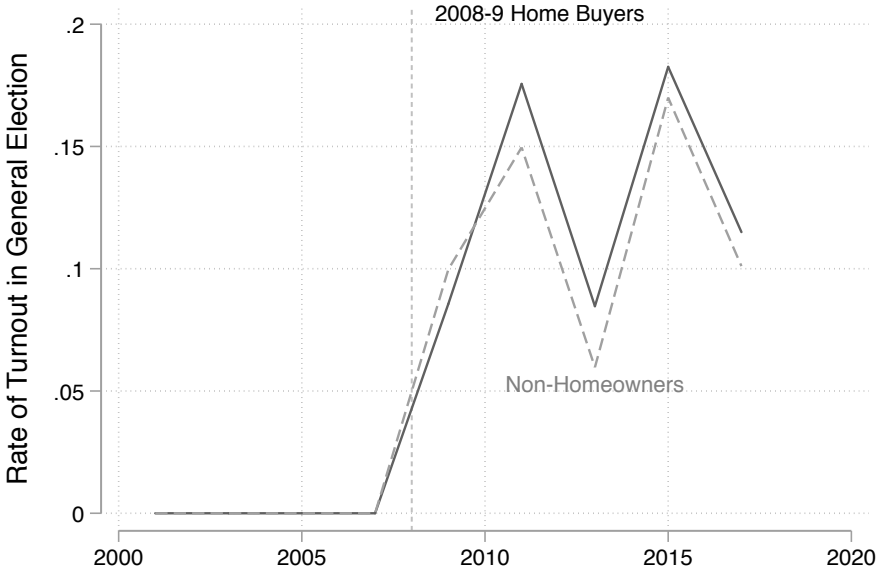
In the spirit of the exact matching exercise we just described, Figure 1 plots turnout over time for people who: (a) were eligible to vote in 2001; (b) did not turn out for any of the local general elections between 2001 and 2009; and (c) never owned a home before 2008. The solid line represents the turnout behavior of individuals in this group who purchased homes in 2008-2009, while the dashed line represents the average turnout behavior of individuals 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, no one in either the treated or control group ever turns out by construction, which is why both lines start out flat at 0 on the plot. 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 include all 16 matched strata.

3.3 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 four columns) and primary elections (second four columns). As the table shows, we find consistent evidence that individuals participate more in politics after becoming homeowners.

In column 1, we perform the simple difference-in-differences, which includes individual fixed effects and year fixed effects. In this specification, we are estimating the counterfactual trends for homebuyers using all non-homeowners. Since the obvious concern is that wealthier individuals are more likely to buy homes and may have different trends in political behavior than people who can't afford to buy homes, in columns 2 and 3 we focus only on homeowners. In column 2, using only the set of all individuals who buy a home at some point in our sample, 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

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 only on individuals who bought a home in 2008-2009, have never before owned a home, did not turn out in any of the elections from 2001-2007, and were eligible to vote as of the local election in 2001. As the plot shows, 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.

results are extremely similar using this alternative setup. In column 3, 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.

In column 4, we implement the formal version of the exact matching strategy we described before. For each of the 16 strata in terms of turnout behavior in 2001, 2003, 2005, and 2007, we 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. Here we find a similar, though smaller, estimate. Looking across the columns, the estimates range from 2.7 percentage points to 5.1 percentage points. These estimates are highly precise, and

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)	(7)	(8)
Homeowner	0.049	0.049	0.051	0.027	0.019	0.022	0.022	0.022
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	76319157	37897139	37897139	7546032	71366039	36224042	36224042	4767732
Outcome Mean	0.265	0.290	0.290	0.262	0.065	0.075	0.075	0.063
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.

they reflect large changes from baseline. The baseline turnout rate in local general elections in Ohio is roughly 27%—that is, 27% of individuals present in our sample turn out to vote in any given local election—which means that these estimates reflect roughly a 10 to 19% increase in the propensity of turning out, across specifications.

The final four 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, for example, homeownership is estimated to cause roughly a 35% increase (2.2 / 6.3) in turning out in local primaries.

3.4 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

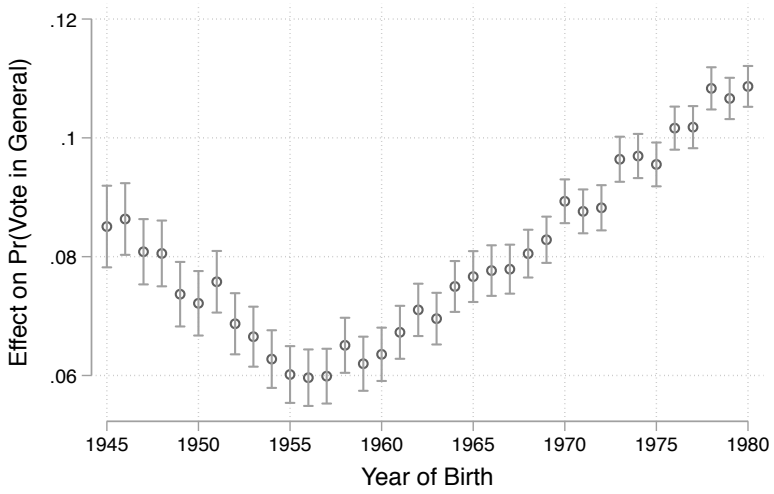
to be more likely to buy a home and become more invested in local politics, this would bias our estimates upward. While we cannot directly rule out some of these social or psychological explanations using this type of administrative data, we can provide some suggestive empirical evidence for how important 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 2 we estimate the effect separately for each year of birth, which we can observe in the Ohio voter file.[17] In practice, we estimate this equation using our preferred specification of separate time fixed effects for each decile of home purchase price, as in, for example, column 2 of Table 1.[18] 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 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 four columns of Table 2 we replicate our main results from Table 1, but we subset to individuals who were born before 1960, or who were over the age of 40 at the start of our panel. 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

[17] 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.

[18] We privilege this specification because it compares homeowners to individuals who would eventually purchase a similarly priced home, but had not yet done so. By doing this, we are able to make comparisons among individuals who likely have more similar wealth, making the parallel trends assumption more plausible.

Figure 2 – Effect of Homeownership on Local Turnout Across Year of Birth.



Note: 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.

that while individuals taking on adult roles might drive some of the effect, it cannot explain all of the effect of becoming a homeowner that we observe.[19] In column 5 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 6, 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

[19]Note that because Table 2 includes only registered voters, the magnitude of the coeffcients 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.

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

	Turnout in General = 1					
	(1)	(2)	(3)	(4)	(5)	(6)
Homeowner	0.077	0.056	0.058	0.075	0.084	0.022
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)
Homeowner * Single Family Residence						0.034
						(0.001)
Observations	22735762	11667015	11667015	2438514	59564247	42597560
Outcome Mean	0.508	0.582	0.582	0.448	0.340	0.282
Individual FEs	Yes	Yes	Yes	No	Yes	Yes
Year FEs	Yes	No	Yes	Yes	No	No
Year-by-Value FEs	No	Yes	No	No	No	Yes
Year-by-Age FEs	No	No	No	No	Yes	No
Sample	Full	Owners	Owners	Matched	Full	Owners
Born before 1960	Yes	Yes	Yes	Yes	No	No

Robust standard errors clustered by individual in parentheses; standard errors in columns 4 are robust without clustering, as the data is collapsed by stratum-year. Columns 1 through 4 include only individuals born before 1960. Columns 2, 3 and and 6 include only individuals who become homeowners at some point during the study period. Column 4 includes only individuals who are exactly matched on the basis of 4 pre-treatment periods of the outcome variable.

the property is designated in the property records as a single family residence, where we might 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 2.2 percentage points more likely to participate in local elections after purchasing a condominium or duplex, and they are about 5.6 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.

3.5 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.2, 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.[20] 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

[20]This 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`).

after they move. This would also lead us to overestimate the effect of homeownership. To deal with these potential issues, in Table A.3 we include a robustness check that includes the same specifications as 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.3 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.

4 Homeownership and Turning Out 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 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.[21]

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.[22] These are shown in Table 3.[23]

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

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

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 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 preferrerd 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

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

[22] For a detailed description of how we coded each local issue, see section A.4 of the Appendix.

[23] In 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

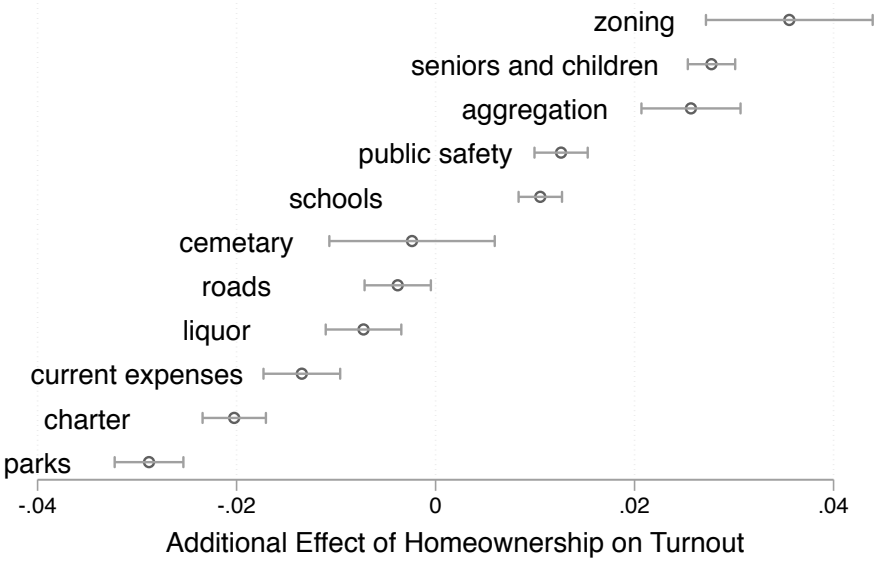
	% Voters with Issue on Ballot in General Election					
Issue Type	County	City	Township	School	Village	Total
Aggregation	0.010	0.010	0.010	0.000	0.003	0.030
Cemetery	0.000	0.000	0.010	0.000	0.001	0.011
Charter	0.093	0.068	0.000	0.000	0.002	0.157
Current Expenses	0.040	0.004	0.008	0.000	0.007	0.056
Liquor	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

Note: 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. Aggregation refers to electric and gas aggregation. Cemetery refers to issues related to maintaining and operating cemeteries. Charter refers to amendments or revisions to local charters. Current expenses refer to adding, renewing, or replacing levies to maintain the locality's current operating expenses. Liquor refers to liquor referendums, often relating to Sunday sales or liquor sales at a particular location. Parks refers to maintaining or improving local parks, recreation centers, and recreational services. Public safety refers to adding, renewing, or replacing levies for local fire protection, police protection, or ambulances and emergency medical services. Roads refers to adding, renewing, or replacing levies to maintain roads, streets, bridges, and other local infrastructure. School refers to building or improving local schools, as well as covering operating expenses. Seniors and children refers to providing and maintaining services and facilities for senior citizens and children. Zoning refers to local zoning plans or amendments. Miscellaneous is any issue not sorted into any of the above categories. Any is whether the voter had any issue type, including miscellaenous, appear on their general election ballot.

permits us to see if patterns are consistent with the idea that homeowners pay attention to particular issues related to their homeownership.

Figure 3 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 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,

Figure 3 – 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.



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.

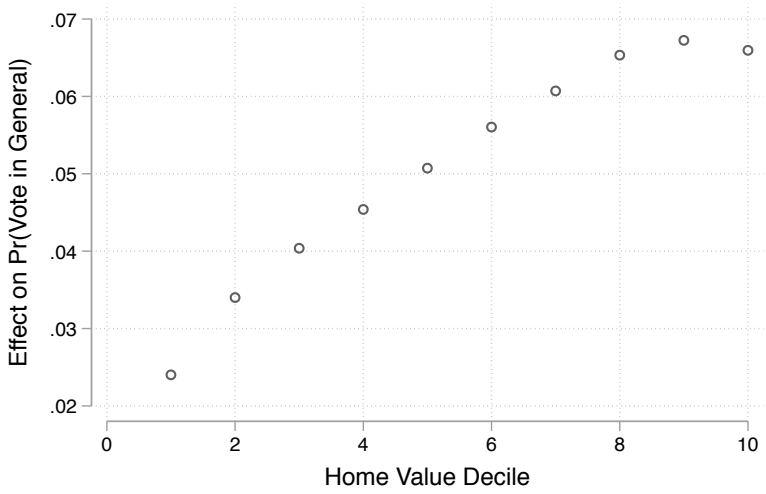
After seniors and children, the category that exhibits the next largest additional effect of homeownership on turnout is aggregation. Aggregation votes are votes on whether localities should negotiate rates for service—usually, electricity service—as a collective. As such, each aggregation vote has a 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. 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 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.

Figure 4 – Effect of Homeownership on Local Turnout Across Home Purchase Price.



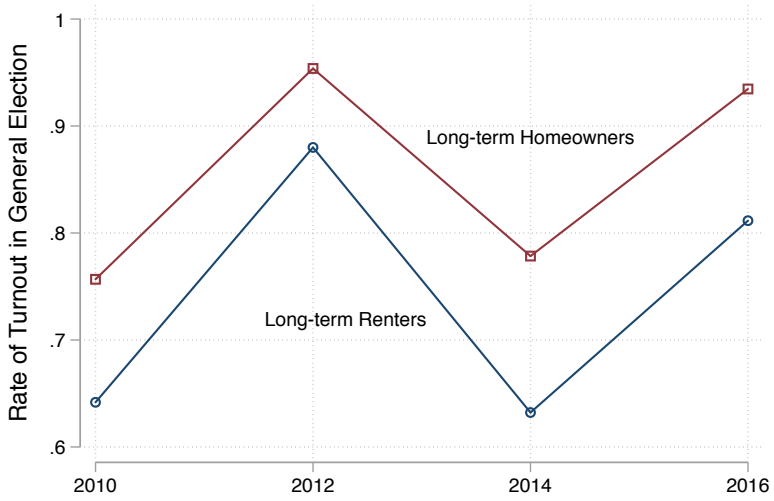
Note: Each point represents a point estimate as in equation 1, estimated separately for each decile in terms of home purchase price, including individual fixed effects and year fixed effects. 95% confidence intervals from robust standard errors clustered by individual are not plotted because they are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

5 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 4 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

Figure 5 – General-Election Turnout Among Long-Term Homeowners and Long-Term Renters Who Voted in 2008.



Note: The squares represent the general election turnout rate among long-term homeowners, defined as those who live at the same home address from 2008-2016. The circles represent 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.

bigger assets to protect and therefore more incentive to participate.[24] Each point in the figure represents a point estimate from equation 1, but we estimate it separately for each decile of home purchase price. 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.[25]

[24] Relatedly, 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.

[25] Related 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.4 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.

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 residential stability than non-homeowners.[26] 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).[27] The residential stability explanation would suggest that long-term homeowners and long-term renters should be similarly likely to participate in politics. In Figure 5, 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 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 5 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). This evidence is descriptive, so we would not want to ascribe the difference in general-election turnout to the effect of purchasing a home, alone, but the figure does provide some suggestive evidence that long-term homeowners are behaving differently than long-term renters. Again, this seems consistent with the explanation that the incentives associated with owning a home encourage political participation.

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

[27] Interestingly, 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.

6 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 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 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

Table 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	0.082	0.084	0.041	0.051	0.032	0.034	0.050
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(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.

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 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.

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 5 we interact the homeowner variable with whether a homeowner acquired their home through a mortgage from the Federal Housing Administration (FHA). If voters experiencies with national level housing

Table 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	0.077	0.007	0.032
	(0.000)	(0.000)	(0.000)	(0.000)
Homeowner × After Local Election	0.055		0.031	
	(0.000)		(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.

policies drive increases in national election turnout, we would expect that the 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.

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.[28] 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.

[28]In Section A.6 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.

7 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 postive and large effects among older homeowners and among owners of condomiums 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, 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 and among those with FHA mortgages, which suggests that habit formation and 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.

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 proprietary datasets on property ownership, present exciting opportunities for future research in this area.

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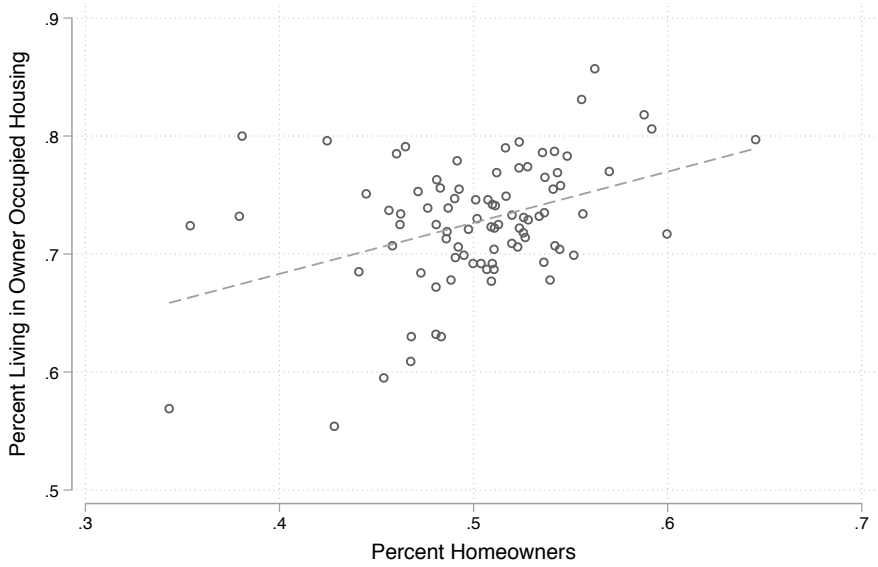
Online Appendix

Intended for online publication only.

A.1 Validating the Record Linkage

To help validate our record linkage procedure, for each county we compare the rates of homeownership from our merge to the proportion of individuals who live in owner-occupied housing according to the 2010 Census. The results for Ohio are shown in Figure A.1. Our homeownership rate in a county is given by the number of unique homeowners in the property records divided by the sum of all homeowners plus registered voters who did not merge to a homeownership record. Because we miss individuals who are neither property owners nor registered voters, our homeownership rate will be lower on average than the proportion living in owner-occupied housing from the Census. Nonetheless, we find that these quantities are strongly positively correlated: in counties where a larger proportion live in owner-occupied housing, we find a larger proportion of individuals in the voter file are homeowners. This evidence makes us more confident in the record linkage procedure.

Figure A.1 – Rates of Homeownership Versus Rates of Living in Owner-Occupied Housing, Ohio Counties



Note: Each point represents a county in Ohio. The x-axis is the rate of homeownership, where the numerator is all homeowners and the denominator is all homeowners plus registered voters that did not merge to a homeownership record. The y-axis is the percent of the population that lives in owner-occupied housing according to the 2010 Census. These are positively related with a correlation coefficient of 0.394, which helps to validate the record linking.

A.2 Validating Parallel Trends Further

Here, we carry out three 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.1 – Validating Parallel Trends for the Local Turnout Analysis.

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

A.3 Voter File Purge and Selection Bias

Table A.2 – 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	0.094	0.087	0.102	0.115	0.108
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(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.[29] 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

[29] Federal 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`)

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

	Turnout in General = 1			Turnout in Primary = 1		
	(1)	(2)	(3)	(4)	(5)	(6)
Homeowner	0.106	0.091	0.093	0.025	0.043	0.043
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	51563083	13735435	13735435	47424873	12826623	12826623
Outcome Mean	0.327	0.562	0.562	0.083	0.156	0.156
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 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 preserved along with a variable indicating that they have been removed.[30] In Table A.2, 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. In our most preferred specification (Columns 2 and 5), the point estimates 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.

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.3 we include a robustness check that includes the same specifications as 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

[30] Ohio's voter file does not have this feature, so we exclude Ohio voters for this part of the analysis.

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.3 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.

A.4 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.[31] 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.[32]

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.

[31] See `https://www.sos.state.oh.us/elections/election-results-and-data/`

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

A.5 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.4, we do not find evidence of an added boost to local turnout for homeowners with mortgages relative to homeowners without mortgages.

Table A.4 – 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	0.052	0.051	0.019	0.021	0.021
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Homeowner × Mortgage	-0.002	0.000	-0.002	0.001	0.003	0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(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.6 Effect of Homeownership on Partisan Preferences

In addition to examining effects on turnout, at the national level we can also take advantage of indicators of partisanship in order to study effects on political preferences. Table A.5 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 evidence for polarization, rather than only a shift in the conservative direction. While some voters become more likely to vote in Republican

Table A.5 – 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	0.007	0.009	0.025	0.015	0.017	0.018	0.024
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(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.

primaries, others become more likely to vote in Democratic primaries. These effects are similar in magnitude for both parties. Again, this pattern is potentially consistent with Prato (2018), which predicts that, by obtaining more information about politics, homeowners should better sort into parties.

A.7 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.6, 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.6 – 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	-0.005	-0.002
	(0.000)	(0.000)	(0.000)
Homeowner × FHA	-0.030	-0.036	-0.028
	(0.000)	(0.001)	(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.6 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").

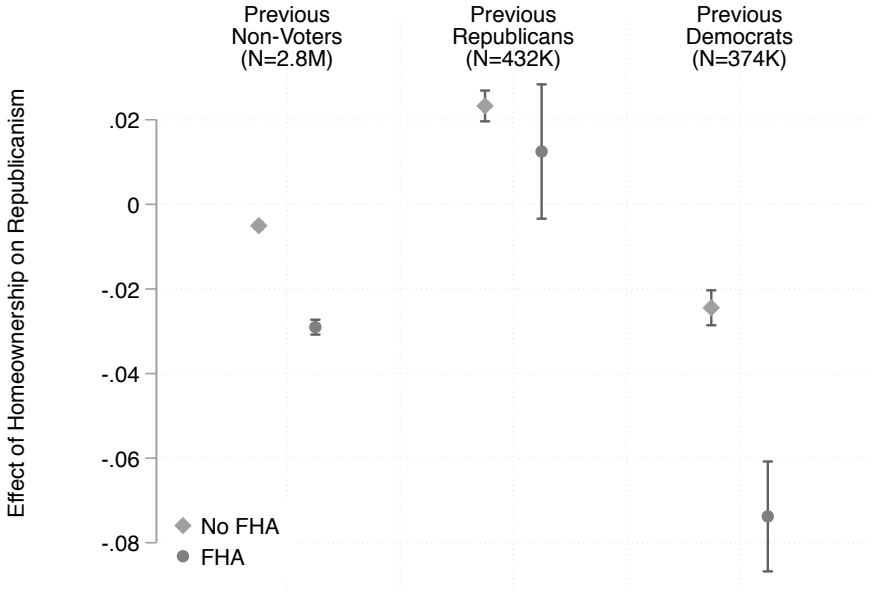
Figure A.2 plots the resulting estimates, which were estimated using the value decile by year fixed effects. The first two point estimates reflect the effect of homeownership on Republicanism for previous non-voters. The diamond is the point estimate for individuals who do not receive FHA loans, while 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.2 – 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).

A.8 Homeownership and Party Registration

In this section, we study the effect of homeownership on registering with a party, as distinct from turning out to vote in a party's primary, which we studied in the body of the paper. 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.7 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.

Table A.7 – 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	0.018	0.009	0.006
	(0.000)	(0.000)	(0.000)	(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.