The Varied Impact of Direct Democracy on Local Housing Policies: Unraveling the Role of Socioeconomic Context

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Abstract

Local opposition to high-density residential construction is a major contributor to the housing crisis in the United States. The lack of affordable housing has wide-reaching implications for local economic performance, social challenges like homelessness and food insecurity, and income inequality. Amid this housing struggle, this study delves into the role of direct democracy in affecting local land use polices in nearly 1,000 U.S. cities between 2006 and 2018. Although direct democracy is arising as a common solution for local land use disputes, its actual implications on housing policies remained unexplored. This study, using matching and difference-in-differences design, provides robust evidence that cities adopting direct democracy are more inclined to impose stringent land use policies, often favoring established anti-growth interests in the city. This study further reveals that, in high-income cities, the effect of direct democracy remains constant, irrespective of the homeowner and renter power dynamics. However, in lower-income cities, the effect of direct democracy becomes more pronounced, underlining significant changes based on the power balance of homeowners and renters. These findings shed light on how political institution could affect public policies, and how varying socioeconomic contexts could shape democratic process in city development.

Key Words: Direct Democracy, Land Use Policy, Local Politics, Local Electoral Institution

1 Introduction

The housing crisis in the United States has become a pressing national issue. In cities and states across the country, there is a critical shortage of affordable homes. Such scarcity is driving up the cost of existing properties; between December 2019 and June 2022, home prices increased by 45%.[1]Much research points to restrictive land use policies as a key driver behind this shortage (Gyourko and Molloy, 2015). Both scholars and practitioners argue that local political opposition is a significant impediment to new housing (Dougherty 2022; Einstein, Glick and Palmer 2019). This "Not in My Backyard" (NIMBY) phenomenon involves active groups of local residents using their influence with local elected officials to block new developments, particularly those that include multi-family units. Such resistance is rooted in concerns about maintaining lower population density, preserving or increasing property values, and, in some cases, continuing patterns of housing segregation (Trounstine 2020).

While concerns about NIMBYism (Not In My Backyard) frequently headline discussions of the housing crisis, the debate over local housing policy is complex and multifaceted. Across many American cities, a YIMBY (Yes In My Backyard) movement is gaining momentum. This movement champions the development of new housing as a crucial solution to the affordability crisis, advocating for more inclusive housing policies. YIMBY advocates are forging alliances with developers and urging local governments to support and accelerate the creation of additional housing projects. These alliances are rooted in a mutual concern over the severe housing shortage and the escalating cost of living in urban areas. The rising influence of the YIMBY movement marks a significant shift in urban development debates, highlighting the increasing role of renters and the diversity of opinions on how to tackle housing affordability.

Less appreciated in these current debates about housing at the local level is the role of direct democracy. American cities frequently turn to local ballot measures to resolve contentious land use disputes. Paradoxically, the desire for heightened community engagement in development debates originated with progressive activists during the 1960s and 1970s in response to federal urban renewal initiatives (Schuetz 2022). Several studies, however, demonstrate that individuals who

attend community meetings and participate in ballot measures rarely represent "the community." Proceedings are typically dominated by older, affluent white homeowners, even where they are a minority of the population (Einstein, Glick, and Palmer 2019; Yoder 2020). Where homeowners – driven by the motivation to increase the value of their most significant asset – have outsized influence, new housing often goes unbuilt. The possibility that new projects will be overturned at the ballot box fosters a local political climate that can stifle housing production. Consequently, housing advocates have proposed shifting land use authority from local residents to a regional or even state-wide level (Schleicher and Hills 2019).

Despite such fears about the influence of direct democracy in limiting proposals for new housing developments, little empirical research examines its impact on land use and housing policies at the local level. In this study, I use a repeated cross-sectional dataset that measures housing restrictiveness in American cities, and a difference-in-differences design to evaluate the impact of local direct democracy institutions. I find that cities that transition to direct democracy tend to implement more restrictive land use regulations. Whether and how much they do so, however, is conditioned on local contextual factors. Specifically, in low-income cities, the effects of direct democracy are conditioned on the mix of homeowners and renters in the community. As the share of renters increases, the effects of direct democracy on housing restrictiveness begin to wane. At especially high shares of renters, direct democracy works to reduce land use restrictiveness. I do not observe this effect in high-income cities, where the effects of direct democracy are insensitive to the mix of homeowners and renters. These findings underscore both the large impacts of local political institutions and the complex interactions they create with local contextual factors, including socio-economic status and existing housing patterns.

2 Literature Review

The U.S. housing system primarily relies on private markets (Schuetz 2022). Constraints on land development and urban expansion often emerge due to variations in physical terrains and scarcity

of natural resources (Alchian and Demsetz 1973; Libecap 1989; Lubell, Geiock and Ramirez de la Cruz 2009). This political economy perspective argues that geographical factors can influence the cost of housing construction in different regions. For instance, bedrock facilitates vertical construction (Rosenthal and Strange 2008), while rugged terrains hinder housing supply due to the complexities of construction (Saiz 2010). Water bodies can restrict available land and, consequently, the housing supply. Similarly, a larger land area offers greater opportunities for new development. In the meantime, the proportion of land dedicated to natural areas can limit the land available for new housing, decreasing the issuance of building permits (Lubell, Geiock and Ramirez de la Cruz 2009).

The core premise of the political economy model is that local politics and institutions play a minimal role in housing supply. Instead, land use regulations largely reflect market dynamics and land scarcities, rather than political decision-making. This framework aligns with Peterson's perspective on the roles of various government tiers within federalism. Peterson delineates two primary economic objectives for domestic governance: developmental and redistributive. He contends that redistribution is best managed by the national government, whereas local governments should take the lead in development initiatives. According to Peterson, local governments are ideally positioned to oversee development programs since they are consistently influenced by market forces and are inherently attuned to market considerations (2012). More important point of Peterson (1981) is that local governments seek to maximize land values, which also sidelines politics and suggests market forces should prevail over local preferences.

While traditional economic research highlights natural constraints in construction and development, scholars like Fischel (2001) emphasize the influence of single-family homeowners in shaping local zoning policies. Fischel's "homevoter hypothesis" suggests that homeowners, as active participants in local politics, have considerable sway over government decisions, especially those affecting property values. He argues that public officials often prioritize homeowners' interests, focusing on maintaining or increasing the value of single-family homes. While acknowledging some developer influence, Fischel contends that it pales in comparison to the power exerted by en-

gaged “homevoters” protecting their property investments. Local political institutions, according to this perspective, inconsequential.

Contrasting with the view that homeowner influence dominates to the extent that local political institutions are sidelined, Logan and Molotch present an argument that positions cities as entities strategically focused on maximizing land value within their jurisdictions. Logan and Molotch argues that urban policy decisions are shaped by an economic rationale that seeks to enhance the overall value of land, which naturally aligns with the interests of developers (1985). Their perspective acknowledges the role of ”growth machines” – coalitions comprising developers, professionals, the business community, and local elected officials who rely on one another’s support. This view emphasizes the complexity of land use policies, suggesting they are a product of both economic ambitions and the intricate landscape of local political alliances, rather than solely the outcome of natural limitations or homeowners’ protective instincts regarding their property investments. While acknowledging the importance of local politics, Logan and Molotch, similarly to Fischel, do not delve deeply into the specific roles and impacts of local political institutions on urban development processes.

In recent years, scholars have started to accommodate local politics into the discussion of urban growth. De Benedictis-Kessner and his colleagues (forthcoming) study the impact of mayoral partisanship on local housing policies. They offer evidence that electing a Democratic versus Republican mayor influences the local housing inventory. Specifically, cities with Democratic mayors see a rise in multifamily housing construction. The impact of mayoral partisanship is most pronounced in cities where city councilors lack veto power over land use changes. Lubell, Feiock, and Ramirez (2009) utilized a political market framework to analyze the ways in which the structures of local political institutions influence the power dynamics between development and environmental interests during urban expansion. Their study emphasized the critical role of interactions between the structures of city executive branches and various interest groups, and how these interactions shape land use development.

These aforementioned studies and theories frequently downplay the influence of local political

institutions. Recently, scholars have started to explore how local institutions, particularly district elections, impact housing policies at the city level. Hankinson and Magazinnik, for example, examine the impact of cities' transition from at-large to district-based city council elections on new housing permits (2023). They find that district elections work to reduce the new multifamily housing supply, especially in segregated cities with significant and consistently underrepresented minority populations. This line of inquiry echoes earlier examinations by researchers such as Paul Lewis, who also explored the broader effects of local political institutions on urban growth (1996). This line of research points out how political institutions can potentially influence local land use policies.

A few studies examine direct democracy's influence on the housing supply. In a 2009 study, Lubell, Feiock, and Ramirez discovered that cities practicing direct democracy actually issued more building permits, a finding that goes against their initial assumption. They had expected cities with direct democracy to favor pro-environmental land-use policies and thus allow less new development compared to cities without direct democracy. Their empirical result contrasts with the findings of Gerber and Phillips (2004). In Gerber and Phillips' model, voters safeguard their interests by typically opposing new developments, thus more effectively curbing urban sprawl than municipal administrations. They examined data from selected California communities and evaluated the consequences of voter mandates on land use procedures and results. Their findings suggest that while these mandates do not halt new developments, they do compel developers to recompensate existing residents for tolerating certain downsides of expansion. The discrepancies in these two studies can be traced back to how these two sets of researchers quantify local land development. There might be distinctions between the influence of direct democracy on policies as opposed to routine permitting decisions. Moreover, Gerber and Phillips focused on referendum requirements for large-scale developments rather than the broader presence of direct democracy provisions. A common thread among the few studies on direct democracy's impact on housing is the assumption that direct democracy affects all areas uniformly, without taking into account variations in local socioeconomic and demographic contexts.

This study contributes to existing research on direct democracy and housing policies in three important ways. First, I propose a novel theory that moves beyond the "homevoter" model and explains how direct democracy can reshape the power dynamics between homeowners, renters and elected officials. Second, I utilize a comprehensive dataset that measures land use regulations and the presence of direct democracy institutions in a large and diverse sample of American cities over a 12-year time span. This national scope improves upon the existing store of geographically confined studies and allows for a more rigorous analysis of direct democracy's impact. Indeed, I utilize a difference in differences design that takes advantage of variation in the timing of cities' adoption of direct democracy institutions. Third, I empirically examine how local contextual factors, such as socioeconomic status and the mix of residential housing patterns, interact with direct democracy to shape its impact on land use regulations. Understanding the conditional effects of direct democracy is essential for determining this institution's broader implications for equity and inclusivity in urban development, especially in light of the history of housing discrimination and segregation in the U.S.

3 Theory and Hypotheses

In developing predictions about the effects of direct democracy on land use restrictiveness, I rely on a few important assumptions. First, I assume that both homeowners and renters possess relatively homogenous policy preferences respectively. Homeowners typically hold negative views on permissive land use regulations, whereas renters generally support new development (Hankinson 2018; McCable 2018) . This stance for renters stems from the understanding that more housing supply can help keep rents and housing costs more affordable, aligning with their material interests in lower living expenses.

Second, I assume that direct democracy has a majoritarian effect, which implies that the majority of voters in a given jurisdiction will utilize this institution to enforce their preferences on the entire population, including minority groups. Direct democracy, has been found to significantly align policy outcomes with the preferences with median voter (Gerber 1996; Matsusaka and Mc-

Carty 2001; Romer and Rosenthal 1979). Matsusaka's (2010) examination of policy congruence across American states in 2005 revealed that initiative states exhibited 18% higher congruence than non-initiative states in ten specific policy domains. Further using state and local revenue and expenditure data, and public opinion indicators, he concluded that direct democracy tends to reflect majority preferences, be they conservative or liberal (Matsusaka 2000; Berry et al., 1998).

Third, homeowners outnumber renters, meaning that the median voter in a city is likely a homeowner. Figure 1 displays data from the American Community Survey that shows the distribution of renters and homeowners in American cities. On average, homeowners constitute the majority in city residents. Last, homeowners are overrepresented in the electorate due to differences in their inclination to participate in voting (DiPasquale and Glaeser 1999; McCabe 2016; Oliver and Ha 2007). Figure 2 draws on data from the cumulative American National Election Survey (ANES). The panels in the first two rows indicate that homeowners are more likely to exhibit characteristics (age, education and wealth) that translate into high levels of political participation. Not surprisingly, that turnout gap between homeowners and renters consistently exceeds 10 percentage points. The importance of these differences is apparent in the panels in the bottom row, which shows that homeowners and renters have different partisan preferences. Yoder (2020) offers evidence that these differences in participation and preferences are readily apparent at the local level. Using property records from California and Texas and an original dataset of individual remarks from local council meetings, Yoder finds that property ownership is associated with heightened political engagement.

Combining the policy preferences of homeowners and renters suggests that in cities dominated by homeowners, there is likely to be a higher degree of land use restrictiveness. Conversely, as the proportion of renters—who tend to favor more relaxed land use regulations—rises, we can anticipate a corresponding decrease in local land use restrictiveness. This leads to my first hypothesis:

Hypothesis 1 (H1): Land use restrictiveness decreases as the share of renters in a city increases.

When direct democracy is implemented in a city, land use policies tend to align more closely

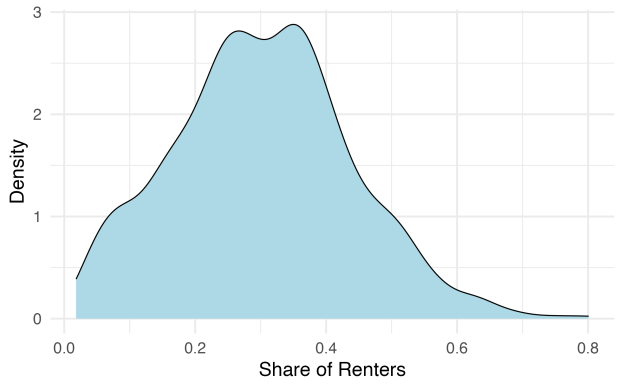

Figure 1: Distribution of Share of Renters Across Cities

Note: Figure 1 illustrates that in cities across the United States, the majority have a higher proportion of homeowners.

with the preferences of the city's median voter, who is often a homeowner. Given this demographic tendency, the adoption of direct democracy is likely to result in land use policies that reflect homeowners' preferences for greater restrictiveness. Based on this rationale, I put forward the second hypothesis:

Hypothesis 2 (H2): Implementing direct democracy in a city results in tighter land use regulations.

The hypothesis posits that the implementation of direct democracy in cities often results in stricter local land use policies. This stems from the principle that direct democracy mirrors the median voter's preferences, typically those of homeowners. However, as Figure 2 suggests, the electoral strength of homeowners versus renters varies across cities. Factors like community wealth, education levels, and racial composition, which are historically linked to preferences for strict growth control policies, are likely to condition the effects of direct democracy institutions. For example, previous research indicates that more affluent communities often advocate for restrictive land use policies (Donovan and Neiman 1992; Bowes and Ihlanfeldt 2001; Maser, Riker, and Rosett 1977; Lubell, Feiock, and Cruz, 2009; Troustine 2020). In high-income cities, the adoption of direct democracy could amplify the interests of affluent homeowners, leading to increased land use restrictiveness. My third hypothesis reflects this possibility:

Hypothesis 3a (H3a): The positive effects of direct democracy on land use restrictiveness will

Figure 2: Distribution of Share of Renters Across Cities

Note: Figure 2 demonstrates that homeowners are generally wealthier, older, more educated, and more conservative.

be larger in high-income cities, where the power of homeowners is greater, than in low-income cities.

However, direct democracy, while potentially amplifying calls for more restrictive land use policies, particularly pronounced in more affluent cities, often resonates with pre-existing sentiments. In these cities, well-established preferences for land use, often skewed towards maintaining the status quo, predates the adoption of direct democracy. Consider, for example, a predominantly upper-middle-class suburb characterized by expansive single-family zoning. Such a community, steeped in a tradition of exclusivity in housing, may have little appetite for radical shifts in development patterns. The existing zoning and land use policies in these areas effectively serve as a bulwark against rapid growth or high-density developments. Consequently, the introduction of direct democracy in such contexts might not cause significant changes in land use policy. The already entrenched preferences for limited growth mean that direct democracy may serve more as a reinforcement of existing policies rather than a catalyst for new ones. This scenario presents an interesting phenomenon: cities or towns inherently resistant to growth due to their socio-economic makeup and historical development patterns may not experience a substantial impact from direct democracy in terms of land use changes. Therefore, I propose the following hypothesis:

Hypothesis 3b (H3b): In higher-income cities, the impact of direct democracy on land restrictivness does not vary with the power of homeowners.

The influence of direct democracy on land use policies might be particularly significant in lower-income and rapidly growing cities, where the dynamic between homeowners and renters is more fluid. In such environments, direct democracy can accentuate the prevailing power dynamics, potentially leading to more pronounced policy outcomes. For example, in fast-developing areas with ample land for multifamily housing that is affordable for low- and middle-income families, the introduction of direct democracy could empower homeowners to push for strict development limits, such as caps on the annual number of new housing units. This scenario underscores the potential of direct democracy to sway urban growth directions, swinging between expansive development and the imposition of restrictions on new housing projects.

Conversely, renters in these cities, who are particularly sensitive to changes in housing and rental prices, may see urban development as a means to ease their financial strain. With direct democracy, these renters have the opportunity to advocate for more housing construction, challenging restrictive sentiments and possibly steering policies towards less stringent land use regulations. Given this landscape, direct democracy can amplify the influence of the majority group, be it homeowners or renters, on land use policies. Therefore, the expected impact of direct democracy on land use policies may differ based on the city's demographic composition: in lower-income cities with a majority of homeowners, it could lead to stricter land use regulations, whereas in cities dominated by renters, more lenient policies might prevail.

Hypothesis 4 (H4): In lower-income cities, direct democracy strengthens the correlation between the majority residential status—whether homeowner or renter—and the level of restrictiveness in land use policies, intensifying the policy preferences of the predominant group.

4 Data

To examine the influence of direct democracy on local land use restrictiveness, I collect data from a variety of sources. My study's primary dependent variable is local land use restrictiveness. I measure this using the Wharton Residential Land Use Regulation Index (WRLURI) derived from community surveys carried out in 2006 and 2018. Given the dataset's repeated cross-sectional nature, I amalgamate cities that partook in both survey years, aligning them by their Geographical Identifier Code (GEOID) as established by the U.S. Census Bureau. This method facilitates the formation of a cohesive panel dataset. Figure 3 displays the geographic dispersion of cities in this consolidated dataset.

The Wharton Residential Land Use Regulatory Index (WRLURI) breaks down into 11 sub-indices, standardized around a mean of zero and a standard deviation of one, where lower scores signal less restrictive land use policies. To clarify the specific regulatory environments across different cities, I have classified them into three regulatory intensity categories based on their WRLURI scores. Cities in the bottom quartile are labeled as "lightly regulated," those in the middle two quartiles as "moderately regulated," and cities in the top quartile as "highly regulated." This classification reveals that even cities deemed lightly regulated enforce certain rules; for example, they typically require approvals from at least two local bodies, and about 94% have minimum lot size requirements.

To further illustrate the practical implications of these classifications, I calculated the mean WRLURI scores for each category and selected a city close to each category's mean score for a more detailed examination. Iron River, Michigan, represents the "lightly regulated" category, showcasing relatively streamlined development processes requiring approval from only two local entities. Caernarvon, Pennsylvania, exemplifies the "moderately regulated" group, with development proposals needing clearance from three authorities. Malabar, Florida, stands out in the "highly regulated" category, where projects must navigate through approvals from up to five different bodies, including, but not limited to, the county zoning and environmental review boards.

This approach allows for an understanding of how cities fall into categories that meaning-

fully differ in regulatory intensity and the specific regulatory characteristics that underpin these differences. It's important to note, however, that these categories serve to elucidate variations in regulatory environments across cities for descriptive purposes and are not used as the dependent variable in subsequent analyses. This method highlights the diversity in land use regulation and its implications for development processes, reflecting significant variations in approval times and procedural complexities across different regulatory categories.

To get a clearer picture of what makes up the overall index, I break it down to examine its individual components more closely. This process led to the identification of a secondary dependent variable for the analysis: the number of bureaucratic processes required for new construction projects. This variable quantitatively measures the degree of regulatory oversight in cities by assigning them scores from 0 to 21, based on the number of local boards or commissions that must approve new construction projects. A score of 0 denotes no requirement for approval from the local planning commission, while a score of 1 means that the commission's approval is mandatory. Further, a score of 2 indicates that not only is the commission's approval required, but a supermajority vote is also necessary for a project to move forward.[2]

My primary independent variable is a binary variable, taking the value of one for cities with direct democracy and zero for those without. Data collection was multifaceted: I initially gathered information from Ballotpedia and Initiative and Referendum Institute by the University of Southern California, which aggregate local ballot measures. To enhance the dataset and verify the information, I also examined city government websites for additional details on direct democratic institutions.

Another important variable for my hypothesis is the proportion of renters in a city. To determine this, I utilize data from the 2000 American Community Survey's five-year estimates, where respondents indicate whether they rent or own their homes. The renter share is calculated by dividing the total number of renters by the city's total voting-age population. To analyze Hypotheses 3 and 4, I categorized cities into high-income and low-income groups based on their median income levels. This process involved calculating the median income for each city in the dataset and

then ranking the cities by their median income. Cities with a median income above the overall median for all cities were classified as high-income, while those with a median income below this threshold were designated as low-income cities.

To mitigate the influence of potential confounding factors on land use policies, a range of control variables were carefully selected and incorporated. These include the city's population size, the proportion of white residents, the percentage of residents holding a college degree, as well as the median housing value of the city. The data for these control variables were sourced from the American Community Survey (ACS). To maintain consistency and accuracy in the analysis, all socio-economic and demographic data utilized are based on the year 2000. For the purpose of integrating these variables with the World Land-Use Regulations and Land Inventory (WLRULI) dataset, GEOID identifiers were employed as a linking mechanism. Additionally, the classification of each city as part of a metropolitan area was also considered as a control variable. The summary statistics provided in Table 1 offer a detailed overview of these covariates, capturing the diverse characteristics of the cities in this study's sample. To mitigate potential bias in the sample selection process, I developed weights based on the inverse probability of cities being included in the final sample.

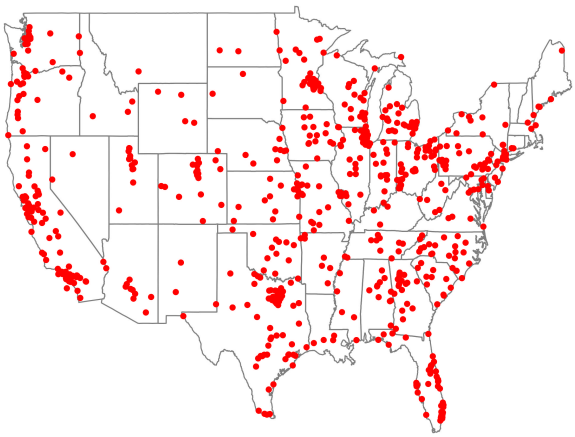

Figure 3: Locations of all Cities in the Dataset

Note: The geographical locations of the cities included in this study were determined using coordinates obtained from the Google Maps Platform.

Table 1: Summary Statistics of Key Variables

Variable	Mean	Median	Standard Deviation
Median Income	46,387.6	40,784	20,390.97
Median Income (log)	10.67	10.62	0.38
College Education Rate	0.06	0.05	0.07
Share of Renters	0.30	0.30	0.14
White Pop (%)	0.77	0.84	0.21
Population	26,465.46	12,189.5	49,698.11
Population (log)	9.49	9.41	1.09
Median Housing	135,321.7	105,400	105,120.4
Median Housing (log)	11.63	11.57	0.56

5 Empirical Strategy and Methodology

To examine Hypothesis 1, which suggests that cities with more restrictive land use policies have a lower percentage of renters, I conduct a simple linear regression. In this analysis, the main independent variable is the percentage of renters in a city, and the dependent variable is the level of land use restrictiveness. This approach aims to clarify the impact of homeowner-renter dynamic on land use policies.

To investigate my H2, H3 and H4 that direct democracy increases cities' land use restrictiveness, I follow Blom-Hansen, Houlberg and Serritzlew (2014) and employ the difference-in-differences (DiD) approach to isolate the effect of direct democracy. The control group consists of cities that did not have direct democracy in 2006 and did not implement it by 2018 (i.e., receiving a direct democracy score of zero in both years). The treatment group consists of cities that did not have direct democracy in 2006 but implemented it by 2018.

The logic is this: the difference in land restrictiveness scores for the treatment group before and after the switch, is an estimate of the combined effect of changes in direct democracy and time. The difference in land restrictiveness for the control group, before and after the reform, is an estimate of the effect of time, but not of changes in direct democracy. The difference between these two differences constitutes the DiD estimator, which estimates the average casual effect of the changes to direct democracy on land use restrictiveness for the treated units (or the average treatment effect

for the treated, ATT). If my hypothesis is correct, we should observe positive regression coefficient for my DiD estimator. The DiD estimator can be obtained from the following regression analysis:

$$y_i = \alpha + \beta_1 \times TG_i + \beta_2 \times T_i + \beta_3 \times TG_i \times T_i + \varepsilon_{it} \tag{1}$$

is a dummy variable taking the value of 1 if city i belongs to the treatment group (0 otherwisse), T_i is the time indicator, a dummy variable taking the value of 1 if the observation is measured post reform (0 otherwise), and $TG_i * T_i$ is an interaction term. It can easily be shown that β_3 is the DiD estimator (see Wooldridge 2009). Furthermore, β_1 is an estimator of the differences between the treatment and control groups, before the reform. If cities were assigned to receive the treatment randomly, this should be close to zero. β_2 is an estimate of the general trend in the restrictiveness of land use regulation over time. This may be positive or negative, depending on a variety of factors such as the city's ideological change, population growth and so on. Before turning to results, given the observational nature of the data at hand, we must first caution against mistaken inferences that might arise from selection bias given the nonrandom nature of cities turning to direct democracy. If, for example, more exclusive and homogeneous cities opted for popular votes because this institution makes it easier to discriminate against the economically disadvantaged, then any result could only be best interpreted as an upper bound for the effect of direct democracy on land restrictiveness. Hence, the difference-in-difference (DiD) design hinges on the common trends assumption. Nevertheless, a constraint of the existing dataset is its limited coverage in the years 2006 and 2018. Consequently, there is an absence of pre-treatment data to directly assess this assumption. Therefore, I delve into an alternative dependent variable to test the parallel trends assumption. The Census Bureau annually releases the Building Permits Survey (BPS), encompassing comprehensive statistics on new privately-owned residential construction at the national, state, and local levels. This dataset primarily relies on self-reports from various jurisdictions. I gathered data spanning from 2003 to 2006 at the census place level. I integrate the BPS dataset with the WRLURI data, utilizing the GEOID code for linkage. This merging process enables me to access building permits data spanning from 2003 to 2006 for approximately 250

treated cities and 420 cities in the control group.[3]Figure 4 presents an event study that examines the issuance of permits prior to 2006, a pivotal year when cities might begin transitioning to direct democracy. The plot demonstrates that the number of permits issued in the years leading up to 2006 does not significantly deviate from zero. This finding indicates that the trends in permit issuance were comparable and ran parallel for both the treatment and control groups in the pre-treatment period. The lack of significant differences prior to the implementation of direct democracy is crucial for the robustness of the causal inferences drawn from this study. It suggests that any post-2006 variations in permit issuance can be more confidently attributed to the effects of transitioning to direct democracy, rather than to pre-existing disparities between the groups.

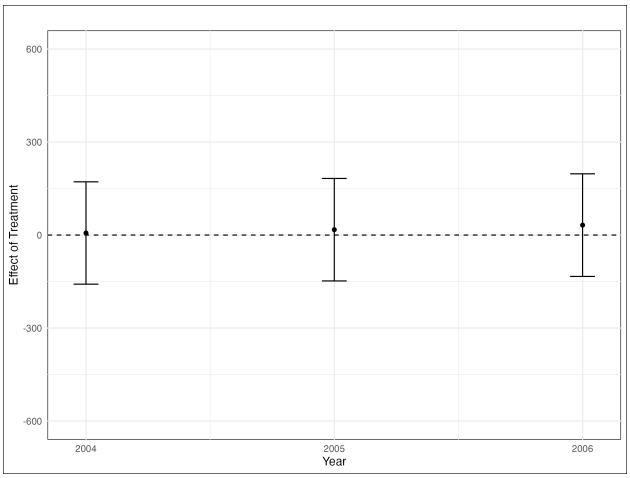

Figure 4: Distribution of Share of Renters Across Cities

Note: Figure 4 reveals that the issuance of permits does not significantly differ between the treatment and control groups. Please consult Table 1 in the Appendix to see full regression results of the event study.

Furthermore, concerns related to selection bias in this study are alleviated by the distinctive nature of the U.S. federal system. This system is characterized by a complex interplay of authorities shared among federal, state, and local governments, as described by Grodzins (2000). Cities in the United States, lacking independent constitutional status, derive their powers from state constitutions and statutes. Particularly in Dillon's rule states, which include 39 states and partially in 8 others.[4] Cities have limited autonomy, operating under state-imposed constraints. This structure often leads to cities transitioning to direct democracy through state-level enabling legislation,

especially in general rule cities that follow state codes rather than their own charters.

We cannot, of course, exclude entirely the possibility that cities turned to direct democracy due to the hope of tightening land regulations. We can, however, reduce the possibility of selection bias by using matching to minimize observable differences between treatment and control group cities.[5] Matching is a data preprocessing technique wherein treated units are matched with control cases that are similar, if not identical, in terms of background covariates (Rubin 2006; Ho et al. 2017). This approach serves to diminish variance among potentially confounding covariates across groups, thereby concurrently reducing bias in my estimates of treatment effects. Additionally, it mitigates model dependence by eliminating "extreme counterfactuals" — control observations that lack a direct counterpart among the treated units (King and Zeng, 2006).

The primary objective of matching is to alleviate any biases introduced by covariates in both the treatment and control groups, effectively simulating a randomized experiment using observational data. Initially, pairs were identified using the MatchIt package, and 1:1 nearest neighbor matching without replacement was applied, matching switching cities with non-switching cities. Matching was based on several demographic and socioeconomic characteristics of the city, such as median housing value, its logarithmic value, total population and its logarithmic equivalent, percentage of white residents, percentage of renters, and the proportion of residents with college education. Additionally, the median income level of the city was considered, as well as whether the city is part of a metropolitan area.

The effectiveness of this K-nearest neighbor (KNN) matching method in balancing covariates is visually demonstrated by the blue dots in Figure 5. [6][7] The matching has significantly improved the balance for the proportion of the white population and the share of renters—two variables that could influence land use restrictiveness. The proximity of the standardized mean differences to zero post-matching indicates that the matched samples are now more comparable, reducing the risk of bias in subsequent analysis of direct democracy's effects. By correcting these imbalances, the study can yield a more accurate estimate of how direct democracy shapes land use restrictiveness.

Given that H3 and H4 investigate the conditional effects of direct democracy on the restric-

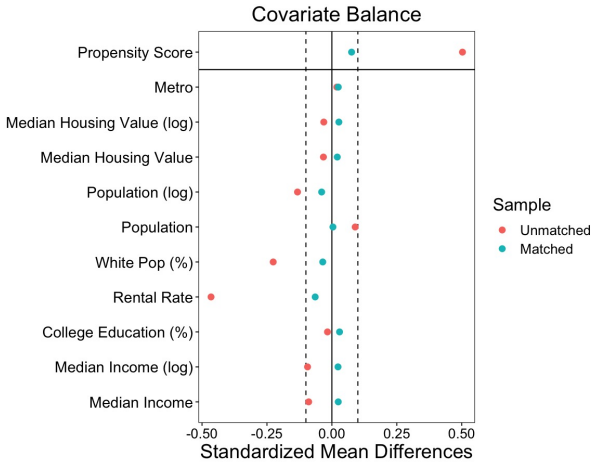

Figure 5: Covariate Balance for KNN (K=1)

Note: Figure 5 demonstrates that the matching process has effectively minimized disparities between the treatment and control groups across various dimensions.

tiveness of land use regulations, I also conduct matching on subgroups.[8] Specifically, I analyze how the effect of direct democracy on land restrictivness varies with a city's share of renters and among both lower- and higher- income cities. To do so, I first compute the mean median income value for each city. I then define the threshold for inclusion in the "high-income" group based on the median income value among treated units. I implement KNN matching (k=1) without replacement within each subgroup to ensure comparability among cities. Subsequently, while adhering to the same Difference-in- Differences (DiD) approach, I investigate the heterogeneous effects of direct democracy on the proportion of renters, distinguishing between high-income and low-income cities. This analysis is enhanced by introducing an interaction term between the renters' share and the primary independent variable.

In the next section, I first present results from the simple linear regression for H1. I then show the difference-in-differences approach on the matched sample. I first use this method to examine the overall impact of direct democracy on the restrictiveness of land use policies (H2). The primary objective of this investigation is to determine how direct democracy influences the regulatory environment governing land use in cities. Using the same strategy, I then explore the influence of direct democracy on the bureaucratic processes governing new construction, my second dependent

variable. My primary aim with this dependent variable was to discern whether the introduction of direct democracy has tangible ramifications on the bureaucratic layers within a city. By introducing a separate DiD estimator, this paper sheds light on how direct democracy might lead cities to streamline or complicate approval processes, thereby influencing the pace and nature of urban development. I then go into studying H3 and H4 following the methodology described above and present results from the DiD estimates on subgroup matched samples.

To ensure the reliability of my findings, I conduct a robustness check section. I switch to using the doubly robust estimator instead of the DiD estimator. This choice is motivated by the doubly robust estimator's advantage of needing only one of two models—either the outcome regression or the propensity score model—to be correctly specified to provide consistent estimates. Additionally, to verify the stability of the interaction effects critical for testing Hypotheses 3 and 4, I examine these interactions more closely. Recognizing that an interaction model presumes a linear relationship between independent and dependent variables, I adopt a binning estimation technique. This approach allows for examining the impact of direct democracy on land use restrictiveness without assuming a linear relationship, accommodating varying effects across different socioeconomic and demographic contexts.

6 Results

6.1 Effects of Direct Democracy on Land Restrictivness

The results from the linear regression presented in Table 2 support H1, indicating that an increase in the proportion of renters within a city leads to more lenient local land regulations. This trend aligns with the policy preferences of renters.

The results of my following analyses demonstrate that the adoption of direct democracy significantly increases land-use restrictiveness. Further, the transition to direct democracy appears to lead to more complex approval processes for new development. I find that the impact of direct democracy on land restrictiveness is consistent among high-income cities regardless of the ratio

Dependent variable:	Land Restrictiveness
Share of Renters	-0.65**
	(0.29)
Median Income (log)	0.85***
	(0.15)
Constant	-7.08***
	(2.30)
Observations	1,410
R^2	0.17
Adjusted R^2	0.16
Residual Std. Error	0.82 (df = 1399)
F Statistic	28.20*** (df = 10; 1399)

Table 2: Effects of Share of Renters on Land Restriction

Note: Robust standard errors are in parentheses. Table 2 indicates that cities with higher share of renters tend to adopt less restrictive land use policies.

$p < 0.1$; [**] $p < 0.05$; [***] $p < 0.01$.

of renters to homeowners. However, I observe a different effect in low-income cities with fewer renters. In particular, in lower-income cities the effect of direct democracy decreases as the share of renters grows.

The positive effect of direct democracy on land-use restrictiveness estimated from my first DiD model supports my first hypotheses. Table 3 below summarizes the results of this model.[9] The positive coefficient in the left-hand column in Table 3 indicates that after the introduction of direct democracy, the land-use restrictiveness score of the city increased by 0.49 of a standard deviation. When I add controls, this effect is unchanged.

The predicted value of land-use restrictiveness increases from -0.24 to over -0.09 when a city switches to direct democracy. What happens when a city's restrictiveness score increases from -0.24 to -0.09? Substantively, in the absence of zoning changes, cities become 6% more likely to require approval from three local entities. Typically, projects requiring rezoning in a city with a -0.24 score need approval from fewer than three entities. However, in a city with a -0.09 score, more than three entities are involved in the approval process. Furthermore, density restrictions, in the form of minimum lot sizes, increase from 2 to over 2.3 acres. Additionally, the overall

time delay between submitting a project approval request and receiving a decision increases by 60 days. These substantive examples illustrate that the transition to democracy can result in increased challenges for developers of a local project.

	Restrictiveness Score	
	No controls (1)	Controls (2)
DiD Estimator		
Post-Switch	0.49***	0.49***
*Direct Democracy	(0.11)	(0.10)
Direct Democracy	-0.09	-0.1
	(0.08)	(0.07)
Year	-0.14*	-0.14*
	(0.08)	(0.08)
Control Variables	No	Yes
Constant	-0.1	-10.35***
	(0.09)	(3.22)
Adjusted R2	0.03	0.17
Observations	970	970

Table 3: Effects of Direct Democracy on Restrictiveness with Matched Samples

*Note: Robust standard errors are in parentheses. The main independent variable of interest is the DiD estimator calculated by Post-Switch*Direct Democracy which captures the effect of switching to direct democracy. The outcome variable is Restrictiveness Score measured by the WRLURI Index.*

$p < 0.1$; [**] $p < 0.05$; [***] $p < 0.01$.

Beyond demonstrating that the adoption of direct democracy is associated with heightened land-use restrictiveness, my results in Table 4 suggest it also results in a more intricate approval process.[10] Specifically, proponents of such projects find themselves navigating permissions from an increased number of local bureaucracies. Further, the thresholds for obtaining these permissions are more stringent, suggesting greater scrutiny that a project must undergo before receiving a green light. This heavier regulatory environment underscores the amplified bureaucratic challenges developers face in cities where direct democracy is practiced.

	Number of Regulatory Approvals Required for New Projects	
	No controls	Controls
	(1)	(2)
DiD Estimator		
Post-Switch	0.66***	0.67***
∗Direct Democracy	(0.23)	(0.23)
Constant	3.54***	8.115
	(0.11)	(7.33)
Adjusted R2	0.11	0.11
Observations	970	970

Table 4: Effects of Direct Democracy on Bureaucracies Required for New Projects

*Note: Robust standard errors are in parentheses. The main variable of interest is the DiD estimator calculated by Post-Switch*Direct Democracy. The outcome variable is Bureaucracies Required for New Projects measured by the disaggregate WRLURI index.*

$p < 0.1$; [**] $p < 0.05$; [***] $p < 0.01$.

6.2 Direct Democracy Effects by Renters' Share and City Income

My theoretical expectations were that the effects of direct democracy might be conditioned on the share of renters in the city, and that this relationship might vary between high- and low-income cities. My empirical results corroborate several of these expectations. The left-hand column in Table 5 adds the interaction between direct democracy and the share of renters in a city. The coefficient for this interaction term is positive —suggesting that direct democracy's effects increase with the share of renters. However, this effect is not significant. Figure 6 presents the marginal effect of transitioning to direct democracy across varying levels of renters in cities. The graph's trend line is relatively flat, indicating that the effect of direct democracy on land restrictiveness do not vary much with the proportion of renters. The shaded area around the line, representing the confidence interval, further underscores the uncertainty of this effect, as it spans both positive and negative values across the spectrum of rental rates. The distribution plots at the top and bottom of Figure 6 denote the frequency of treatment and control observations, respectively, across the share of renter spectrum. Their placement above and below the central plot emphasizes the spread and density of rental rate values within the sampled cities. The lack of a pronounced slope in the

treatment effect line, coupled with a wide confidence interval, suggests that the effect of direct democracy on land use restrictiveness is relatively invariant to changes in rental rates within the full sample of cities examined.

This relatively flat relationship, however, might mask heterogeneity among cities. To examine this possibility, I estimate the model separately for higher-and lower-income cities.[11] The middle column of Table 5 presents the results for high-income cities. The coefficient on the interaction term is not significant, which is consistent with H3b. In higher-income cities, the influence of direct democracy on land restrictiveness is not affected by homeowners' and renters' relative share. Figure 7 illustrates the marginal treatment effect, which shows that the effect remains unchanged regardless of the rental share in the city. This result jibes with my argument that for high-income cities, direct democracy is relatively superfluous. Considering that high-income cities typically demonstrate more stringent land-use policies compared to their counterparts, residents may not feel the need to resort to direct democracy measures to further strengthen land use regulations.[12]

Table 5: Effects of Direct Democracy on Restrictiveness (Heterogeneous Effects)

	Dependent Variable: Restrictiveness Score		
	Full sample	High-Income	Low-Income
	(1)	(2)	(3)
DiD Estimator Post-Switch	0.38***	0.16	0.98***
	(0.15)	(0.18)	(0.28)
Rental Rate	-0.49	-0.74	0.34
	(0.37)	(0.52)	(0.52)
DiD*Rental Rate	0.15	1.15	-1.64**
	(0.44)	(0.73)	(0.0.66)
Adjusted R2	0.17	0.14	0.14
Observations	970	432	538
Controls	yes	yes	yes

*Note: Robust standard errors are in parentheses. The main variable of interest is the DiD estimator calculated by Post-Switch*Direct Democracy. The outcome variable is Restrictiveness Score measured by the WRLURI Index.*

$p < 0.1$; [**] $p < 0.05$; [***] $p < 0.01$.

I find a much different relationship among low-income cities. The right-hand column of Table

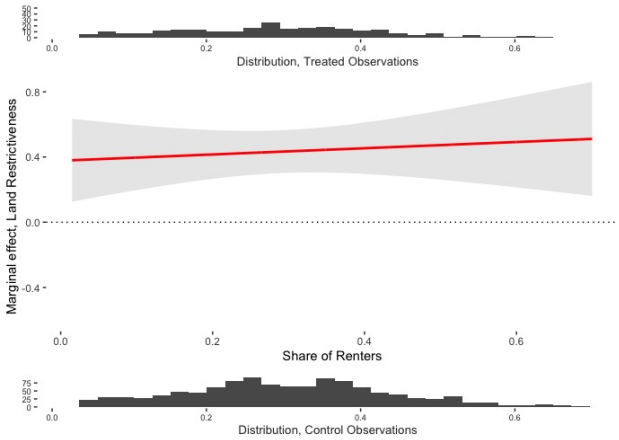

Figure 6: Marginal Effects of Conversion to Direct Democracy on Land Restrictiveness, Full Sample

Note: The x-axis encompasses the observed distribution of rental rates in the data, and the histograms at the top and bottom depict these distributions in the treatment and control groups, respectively.

5, which contains the results of my estimates for low-income cities, indicates that the effects of direct democracy on land use restrictiveness vary with the proportion of renters in the city. This result corroborates H4a and H4b. Figure 8 displays this relationship.

As the steep and downward sloping marginal effect suggests, direct democracy's restrictive impact on land use polices is most pronounced in low-income cities with fewer renters. The effect size is substantial, exceeding a value of 0.8 in areas with a low proportion of renters. For example, in cities where only 20% of the population are renters, the introduction of direct democracy is associated with an increase in land use restrictiveness by more than 0.5. Such large effects are emblematic of the dynamics in swiftly expanding cities, where considerable land availability may lead to increased efforts by local residents to enact restrictive land use policies. In such contexts, direct democracy can be a potent instrument for homeowners to channel their preferences, thereby significantly influencing land use regulations.

As Figure 8 shows, as the share of renters increases, the impact of direct democracy begins to weaken. As I showed earlier, renters, whose financial well-being is directly impacted by the volatility of the housing and rental markets, tend to be acutely aware of and responsive to shifts

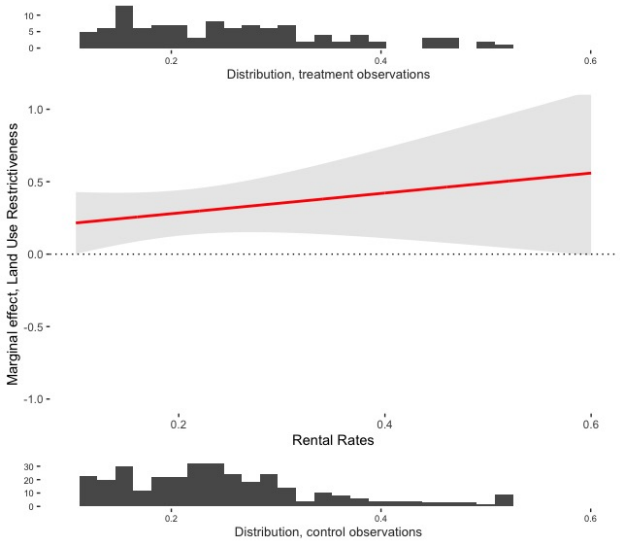

Figure 7: Marginal Treatment Effect for High-Income Cities

Note: The x-axis encompasses the observed distribution of rental rates in the data, and the histograms at the top and bottom depict these distributions in the treatment and control groups, respectively. Figure 7 demonstrates that within cities characterized by higher income levels, the impact of direct democracy remains consistent, regardless of variations in the share of renters.

in these sectors. Their vested interest in affordability often translates into strong support for development initiatives, motivated by the prospect that an uptick in housing availability could ease the financial pressures of high rental costs. This group of residents may see new development as positive and a possible solution to the challenge of finding affordable housing. In cities with direct democracy, these renters are often influential. They can channel their concerns into political action, rallying against entrenched anti-growth stances. As the share of such politically active renters grows, the landscape of land-use policy begins to shift. As depicted in Figure 8, where renters constitute more than 55% of the city's population, we observe a pivotal change whereby cities begin to relax land-use restrictiveness. Direct democracy, in such contexts, can empower supporters of new development and lead to more liberal land-use policies.

Overall, these findings reveal a nuanced relationship between direct democracy and local land-use policies. Specifically ,direct democracy's effects are moderated by the socio-economic character of the city. In high-income cities, direct democracy does not significantly alter the restrictiveness of land-use policies, likely due to preexisting stringent regulations. Conversely, in low-income

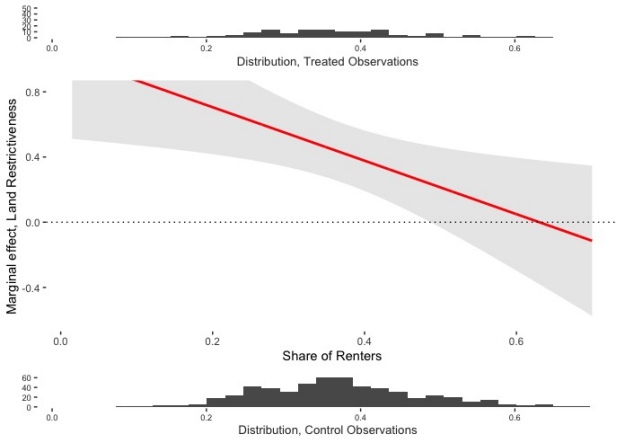

Figure 8: Marginal Treatment Effect for Low-Income Cities

Note: The x-axis encompasses the observed distribution of rental rates in the data, and the histograms at the top and bottom depict these distributions in the treatment and control groups, respectively. Figure 8 illustrates that in low-income cities, an increasing proportion of renters leads to a diminishing positive impact of democracy on land use restrictiveness.

cities, direct democracy has its greatest effect where homeowners hold sway. At higher percentages of renters correlates, I observe a decrease in the restrictive influence of direct democracy on land-use policies, reflecting a shift towards more growth-oriented city planning as renters advocate for policies that address their housing affordability concerns.

7 Robustness Check

To examine the reliability of my DiD estimator, I undertake an analysis using a doubly robust estimation. This method combines elements of both outcome regression and propensity score weighting, offering a safeguard against model misspecification. Essentially, the doubly robust estimator requires only one of the two models—either the outcome regression or the propensity score model—to be correctly specified in order to yield consistent estimates. This dual-layer approach enhances the validity of the findings by providing an additional check against potential biases in the estimation process. Table 6 presents the results of this doubly robust estimation analysis. The coefficient of direct democracy predictor—indicating whether a city transitioned to a direct democracy framework by the year 2018—continues to exhibit a positive and statistically significant impact

on land restrictiveness. The robustness of direct democracy's effect, even when accounting for potential deviations in either the outcome model or the propensity score model, lends confidence to my main results.

In examining the impact of the proportion of renters on land-use restrictiveness, I employed interaction models that include multiplicative terms. This approach allows the influence of my primary independent variable—the adoption of direct democracy—to vary in relation to the percentage of renters within a city. However, a critical assumption underpinning this model is the linearity of the interaction effect. Simply put, this assumption posits that for every unit increase in the share of renters, the impact of direct democracy on land restrictiveness alters by a consistent amount. It is plausible that the effect of direct democracy may vary in a non-linear or irregular manner, not adhering to a simple one-directional trend across different levels of the renter population (Hainmueller, Mummolo and Xu 2018).

Table 6: Robustness Check: Doubly Robust Estimator

	No controls (1)	Controls (2)
DR Estimator Post-Switch	0.46***	0.48***
	(0.12)	(0.10)
Direct Democracy	-0.08	-0.09
	(0.08)	(0.08)
Year	-0.12	-0.13
	(0.09)	(0.09)
Constant	-0.09	-8.26***
	(0.07)	(3.36)
Adjusted R2	0.03	0.15
Observations	970	970

Table 6 demonstrates the robustness of the Difference-in-Differences (DiD) estimator, as evidenced by the continued significance of the Doubly Robust (DR) estimator.

*p¡0.1; **p¡0.05; ***p¡0.01.

To explore the validity of the linearity assumption and enhance the robustness of my findings, I use the binning estimator methodology developed by Hainmueller and colleagues. This technique accommodates the possibility of non-uniform changes in the conditional marginal effect of direct democracy on land restrictiveness across different levels of the renter share. This method involves

segmenting the continuous variable—here, the share of renters—into discrete categories or bins. Each bin is then converted into a separate dummy (indicator) variable. These dummy variables are subsequently interacted with the treatment indicator, allowing for a more nuanced exploration of the relationship between the renter share and the treatment effect, without the constraint of assuming a linear interaction.

Figure 9 and 10 display the results derived from the binning estimators. One important takeaway from these graphs is that the effect of direct democracy on land-use restrictiveness is not uniform across the spectrum of renter shares. This non-linear relationship can be observed via changes in the slope of the line across the bins. For instance, the slope may be steeper in one bin and flatter in another, suggesting that the impact of direct democracy on land restrictiveness varies depending on the share of renters in the city. A second key takeaway is that my main findings persist without the constraint of a linear model. In cities with higher incomes, the restrictive impact of direct democracy on land restrictiveness remains largely unaffected by variations in the renter population. This indicates a degree of stability in the relationship between direct democracy practices and the implementation of land policies, regardless of the proportion of renters. Additionally, as indicated by the results depicted in Figure 12, the efficacy of direct democracy in influencing land restrictiveness diminishes in low-income cities with a growing share of renters. This trend underscores a potential inverse relationship, where low-income cities with higher percentages of renters experience a decreased effect of direct democracy on the stringency of land-use regulations.

8 Conclusion and Discussion

In a nation grappling with a housing crisis marked by an alarming deficit of millions of units, skyrocketing housing prices, escalating rental burdens on average households, and a serious and burgeoning homelessness dilemma, understanding the dynamics of land use policies is more than an academic endeavor—it is imperative for societal progress. This study's exploration of the interplay between direct democracy and land use policy frameworks becomes particularly important in

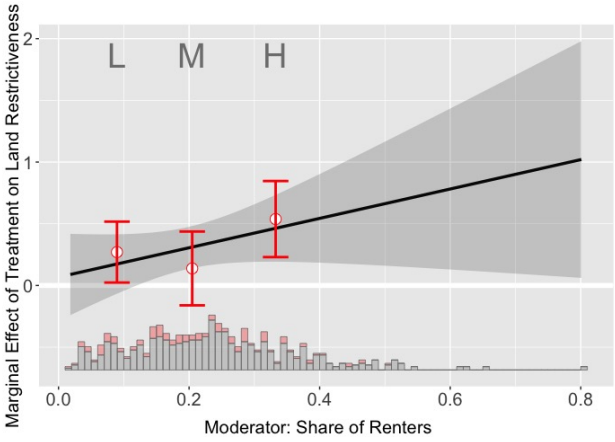

Figure 9: Marginal Treatment Effect for High-Income Cities

Note: The x-axis encompasses the observed distribution of rental rates in the data, and the histograms at the top and bottom depict these distributions in the treatment and control groups, respectively. Figure 9 reveals that, upon relaxing the linearity assumption within an interaction model, H3b still holds.

this regard.

This study offers an in-depth exploration of the effect of direct democracy within American cities. Utilizing an expansive dataset and harnessing the strengths of DiD and nonparametric matching techniques, it offers a rigorous analysis of the relationship between local political institutions and land use directives. One central finding is that the adoption of direct democracy generally steers cities towards more stringent land use policies. This underscores the impact that political institutions can exert on local policies. The finding is also instrumental in understanding the structural impediments to addressing housing shortages. Such restrictive regulations, often supported by local residents and entrenched special interests, fuel the flames of the housing crisis, making it tougher to respond to the housing demands.

Delving deeper, my analysis identifies heretofore unstudied relationship between direct democracy and key socioeconomic indicators, such as rental rates and income. In this study, I also explore the distinct features of cities with high incomes. Predominantly, these cities, catering to upper-middle-class habitants, are characterized by zoning regulations that favor large-lot, single family homes. Such cities, with their inherent restrictive land regulations and nearing developmental

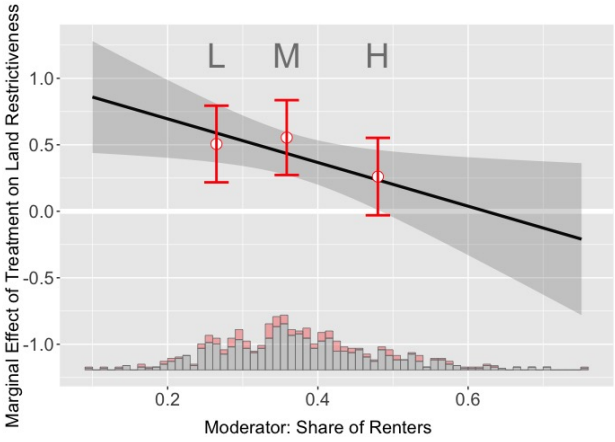

Figure 10: Marginal Treatment Effect for High-Income Cities

Note: The x-axis encompasses the observed distribution of rental rates in the data, and the histograms at the top and bottom depict these distributions in the treatment and control groups, respectively. Figure 9 reveals that, upon relaxing the linearity assumption within an interaction model, H4 still holds.

capacities exemplify why renter dynamics do not drastically impact land restrictiveness.

Furthermore, another important revelation is the diminishing influence of direct democracy on land-use restrictiveness as the share of renters grows in low-income cities. In an era where housing affordability is a national concern and rental burdens are squeezing middle- class families, understanding these dynamics are paramount. That the influence of direct democracy on land use may diminish in cities with a large presence of renters, especially in lower-income cities, highlights the ever evolving tug-of-war between two groups of electorates, namely, homeowners and renters. The discovery also suggests a glimmer of hope wherein direct democracy could serve to relax the constraints on land development, aligning with the preferences of low-income renters.

This research opens several avenues for further investigation into the influence of local political institutions on housing policies. For instance, future research could explore the mechanisms through which direct democracy influences local land use policies. It would be valuable to examine whether cities are actively using direct democracy to decide on housing developments, or if direct democracy instead exerts an indirect influence. This indirect influence could act as a deterrent, compelling city council members to align their votes with the preferences of their constituents to

avoid potential repercussions. Additionally, future work could extend to beyond the scope of direct democracy to explore other forms of local governance structures, such as city councils or mayoral systems, and their interaction with varied political and socio-economic landscape. By examining these different institutions, researchers and policy makers can gain a deeper understanding of their efficacy in addressing housing issues.

9 References

Alchian, Armen A., and Harold Demsetz. 1973. "The property right paradigm." The journal of economic history, 33(1), 16-27.

Berry, William D., Evan J. Ringquist, Richard C. Fording, and Russell L. Hanson. 1998. "Measuring citizen and government ideology in the American states, 1960-93." American Journal of Political Science, 327-348.

Blom-Hansen, Jens, Kurt Houlberg, and Soren Serritzlew. 2014. "Size, democracy, and the economic costs of running the political system." American Journal of Political Science, 58(4), 790-803.

David R. Bowes, and Keith R. Ihlanfeldt. 2001. "Identifying the impacts of rail transit stations on residential property values." Journal of urban Economics, 50(1), 1-25.

de Benedictis-Kessner, Justin, Daniel Jones., and Christopher Warshaw. 2022. "How partisanship in cities influences housing policy." RWP21-035.

Denise DiPasquale, and Edward L. Glaeser. 1999. "Incentives and social capital: Are homeowners better citizens?" Journal of urban Economics, 45(2), 354-384.

Dougherty, Conor. 2020. Golden gates: Fighting for housing in America. Penguin.

Einstein, Katherine L., Maxwell Palmer, and David M. Glick. 2019. "Who participates in local government? Evidence from meeting minutes." Perspectives on politics, 17(1), 28-46.

Fischel, William A. 2001. "Homevoters, municipal corporate governance, and the benefit view of the property tax." National Tax Journal, 54(1), 157-173.

Gerber, Elizabeth R. 1996. “Legislative response to the threat of popular initiatives.” American Journal of Political Science, 99-128.

Gerber, Elisabeth R., and Justin H. Phillips. 2004. “Direct democracy and land use policy: exchanging public goods for development rights.” Urban Studies, 41(2), 463-479.

Gyourko, Joseph., and Raven Molly. 2015) Regulation and housing supply. In Handbook of regional and urban economics (Vol. 5, pp. 1289-1337). Elsevier.

Hainmueller, Jens, Jonathan Mummolo, and Yiqing Xu. 2019. “How much should we trust estimates from multiplicative interaction models? Simple tools to improve empirical practice.” Political Analysis, 27(2), 163-192.

Hankinson, Michael. 2018. “When do renters behave like homeowners? High rent, price anxiety, and NIMBYism.” American political science review, 112(3), 473-493.

Hankinson, Michael, and Asya Magazinnik. 2023. “The supply-equity trade-off: The effect of spatial representation on the local housing supply.” The Journal of Politics, 85(3), 1033-1047.

Hills Jr, Roderick M., and David Schleicher. 2023. “What Is Property Law in an Age of Statutes and Regulation?: A Review of Property: Principles and Policies.” NYU Ann. Surv. Am. L., 79, 89.

King, Gary, and Langche Zeng. 2006. “The dangers of extreme counterfactuals.” Political analysis, 14(2), 131-159.

Lewis, Paul G. 1996. Shaping suburbia: How political institutions organize urban development. University of Pittsburgh Press.

Libecap, Gary D. 1989. “Distributional issues in contracting for property rights.” Journal of Institutional and Theoretical Economics, 6-24.

Lubell, Mark., Richard C. Feiock, and Edgar E. Ramirez De La Cruz. 2009. “Local institutions and the politics of urban growth.” American Journal of Political Science, 53(3), 649-665.

Maser, Steven M., William H. Riker, and Richard N. Rosett. 1977. “The effects of zoning and externalities on the price of land: An empirical analysis of Monroe County, New York.” The Journal of Law and Economics, 20(1), 111-132.

Matsusaka, John G. 2000. “Fiscal effects of the voter initiative in the first half of the twentieth century.” The Journal of Law and Economics, 43(2), 619-650.

Matsusaka, John G. 2010. “Popular control of public policy: A quantitative approach.” Quarterly Journal of Political Science, 5(2), 133-167.

Matsusaka, John G., and Nolan M. McCarty. 2001. “Political resource allocation: Benefits and costs of voter initiatives.” Journal of Law, Economics, and Organization, 17(2), 413-448.

McCabe, Brian J. 2018. “Why buy a home? Race, ethnicity, and homeownership preferences in the United States.” Sociology of Race and Ethnicity, 4(4), 452-472.

Molotch, Harvey, and John R. Logan. 1985. “Urban dependencies: new forms of use and exchange in US cities.” Urban Affairs Quarterly, 21(2), 143-169.

Oliver, J. Eric., and Shang E. Ha. 2007. “Vote choice in suburban elections.” American Political Science Review, 101(3), 393-408.

Peterson, Paul. E. 2012. The price of federalism. Rowman Littlefield.

Romer, Thomas, and Howard Rosenthal. 1979. “Bureaucrats versus voters: On the political economy of resource allocation by direct democracy.” The Quarterly Journal of Economics, 93(4), 563-587.

Rosenthal, Stuart. S., and William C. Strange. 2008. “The attenuation of human capital spillovers.” Journal of Urban Economics, 64(2), 373-389.

Saiz, Albert. 2010. “The geographic determinants of housing supply.” The Quarterly Journal of Economics, 125(3), 1253-1296.

Schuetz, Jenny. 2022. Fixer-upper: How to repair America’s broken housing systems. Brookings Institution Press.

Todd Donovan, and Max Neiman 1992. “Citizen mobilization and the adoption of local growth control.” Western Political Quarterly, 45(3), 651-675.

Trounstine, Jessica. 2020. “The geography of inequality: How land use regulation produces segregation.” American Political Science Review, 114(2), 443-455.

Yoder, Jesse. 2020. “Does property ownership lead to participation in local politics? Evidence

from property records and meeting minutes." American Political Science Review, 114(4), 1213-1229.

Notes

1. These figures are drawn from S&P CoreLogic Case-Shiller Home Price Indices, available at https://www.spglobal.com/spdji/en/index-family/indicators/sp-corelogic-sp-corelogic-case-shiller-composite/#overview.

2. The assessment encompasses eight local boards: the local planning commission, local zoning board, local council and managers, county board of commissioners, county zoning board, environmental review board, public health office, and the design review board.

3. In the control group, there were 410 cities in 2003, 412 in both 2004 and 2005, and 411 in 2006. For the treatment group, there were 250 cities in 2002, 248 in both 2004 and 2005, and 247 in 2006.

4. 39 states employ Dilon's rule to all municipalities: Arizona, Arkansas, Connecticut, Delaware, Georgia, Hawaii, Idaho, Kentucky, Maine, Maryland, Michigan, Minnesota, Mississippi, Missouri, Nebraska, Nevada, New Hampshire, New York, North Carolina, North Dakota, Oklahoma, Pennsylvania, Rhode Island, South Dakota, Texas, Vermont, Virginia, West Virginia, Washington, Wisconsin and Wyoming. The following eight states employ the rule for certain municipalities: Alabama, California, Colorado, Illinois, Indiana, Louisiana and Tennessee.

5. Researchers often address the problem nonrandom assignment by employing a Heckman selection model. Researchers create a model of the treatment-assignment (selection process), use that model to generate predictions of counterfactuals and them compares the factual cases to these predicted counterfactuals. When using such a technique, researchers implicitly assume that they can account for nonrandom assignment by means of a single estimable selection equation that accurately predicts the presence of the nonrandomly assigned treatment—in the case a city turning into direct democracy. Furthermore, in order to operationalize such a procedure, researchers must find an instrument—a variable that influences

whether a city has direct democracy but does not influence the level of land restrictiveness.

6. Table A2 in the Appendix also reports the closeness of the matched groups using three different statistical balance tests: standardized mean difference (SMD), Kolmogorov-Smirnov statistics and variance ratio.

7. As part of a robustness check, I experimented with K values of 2 and 3. The outcomes remained consistent. Detailed balance assessments are available in the Appendix, specifically in Figure A1 and Figure A2.

8. The matching outcomes for cities with high and low income levels are detailed in Figures A3 and A4 in the Appendix, respectively.

9. Full regression results with all control variables could be found in the Appendix Table A5.

10. Before modeling higher-and lower-income cities, I also conduct the event study as a support for the common trends assumption specifically for higher-income cities. Again, this step ensures that the subsequent results are grounded in a robust comparative framework. Please refer to the Appendix for full results.

11. Figure 5 in the Appendix depicts the initial disparity in land-use policies between high- and low-income cities, with the former exhibiting a higher degree of restrictiveness from the outset.