ADUs in Los Angeles: Where Are They Located and By How Much Do They Raise Property Value?

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Abstract

Using data from Los Angeles, this paper explores the locational determinants as well as the assessed-value effects of the presence of ADUs. The results show that ADUs (accessory dwelling units) are less likely to be found on large parcels containing newer houses and at dense locations near the CBD, the LAX airport, and beaches. ADU presence is more likely close to commercial districts, light-rail stations and educational establishments but less likely in higher-income areas and Black neighborhoods, although parcels in Latino neighborhoods are more likely to contain ADUs. The assessed-value regressions show that ADU presence raises a parcel's assessed value by 7-9%, while also accurately capturing the unusual rules for property assessments under California's Proposition 13.

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Jan K. Brueckner and Sarah Thomaz[†]

1. Introduction

California has been experiencing a housing shortage and limited housing affordability for several decades. The cost of a typical home in California is currently over $760,000, more than twice the national average.[1] Homelessness is also disproportionately high, with California having 30% of the US homeless but only 12% of the national population.[2] Housing unaffordability is a problem that extends beyond California, and its causes along with potential remedies were the focus of a recent journal special issue, with topics summarized by Ben-Shahar, Gabriel and Oliner (2020). One prominent cause is limitations on housing supply, which are often rooted in local land-use regulations, as explained by Molloy (2020) in her contribution to the special issue. Recognizing that such regulations contribute to housing unaffordability, the California legislature in recent years has taken several dramatic steps to override local land-use regulations, with the goal of increasing housing supply. This kind of intervention appears to be historically unprecedented, with land-use regulation in the US having been the province of local governments for over a hundred years (see Ellickson (2022)).

The first of California's interventions loosened local restrictions on the construction of accessory dwelling units, or ADUs. ADUs are small housing structures constructed by homeowners on the same lot as a larger primary dwelling. Historically, they have been known as "granny flats" or "in-law suites" since many were built to house aging family members.[3]

[†] This paper is an improved version of the first author's job-market paper, Thomaz (2020). We thank a referee and Stephan Heblich for helpful comments and suggestions, although the usual disclaimer applies.

[1] According to Zillow, the typical home value in the US was $356,819 as of December 2022, while the typical value in California was $760,644.

[2] See Hoeven (2022).

[3] If these relatives are relocating from the main house to an ADU, housing-market tightness is unaffected. But if they are vacating an outside dwelling unit, that unit is then available to other occupants.

ADUs offer an easy way to increase housing supply in neighborhoods that are already developed, yielding more housing space without the need for wholesale redevelopment of an area. With single-family homes making up 62% of the US housing stock, a wave of ADU construction would yield a notable increase in housing supply, without additional urban sprawl, while generating rental income for homeowners. With densities not rising dramatically, this supply increase could be achieved without the upgrading of public infrastructure that might be required by a widespread replacement of single-family houses with apartment buildings. In 2016, two bills were signed into law in California that made construction of ADUs notably easier, and 2017 saw a sudden surge in issuance of ADU building permits. As explained further below, the city of Los Angeles saw almost thirty times the number of ADU permits issued in 2017 as it did in 2016.

A more recent state-level intervention in California, which became law after a prolonged political struggle, allows the owner of a single-family parcel to replace the existing structure with two duplexes, or if the lot is subdivided, to build two duplexes on each part, thus allowing up to four new dwelling units on the parcel.[4] A proviso, however, is that the owner continue to reside on the site. A recent study by Garcia and Alameldin (2023) shows that permit issuance following the duplex law's early 2022 starting date has been disappointingly low. One possible reason is that the residence requirement, imposed to defuse political opposition, prevents the owner from simply selling the parcel to a developer, who would then create the new housing. As a result, it appears that the California legislature's effort to spur ADU construction is, for now, the more effective way of increasing housing supply, a view that a possible loosening of the duplex law could alter. Therefore, a new study of the evolution of ADUs in California deserves high priority. This paper fills that need by asking where ADUs in the city of Los Angeles are being built and by gauging an ADU's effect on the value of the parcel containing it.

Among earlier studies, Chapman and Howe (2001) and Liebig, Koenig, and Pynoos (2006) investigate the use of ADUs as a place for the elderly to age in place, while Wegmann and

[4] Somewhat earlier (in 2019), Oregon passed a similar law that allows construction of duplexes on lots zoned for single-family housing, with triplexes and fourplexes also allowed in cities with populations of at least 25,000. See Shumway (2021).

Nemirow (2011) provide a review of the literature on secondary units and urban infill. Brueckner, Rabe and Selod (2018) analyze the South African version of ADUs, where homeowners construct a backyard shack and rent it out, with access to the main house's water, electricity, and toilet included (they show that these ADUs tend to be located near jobs). Unpublished work by Krass (2013) investigates neighborhood factors that contribute to ADU density in the state of Washington, finding that a main factor is the percentage of households containing a relative other than children. Krass's results also indicate no relationship between ADU density and residential lot size or unit density. The present analysis, while similar to that of Krass, relies on a much larger longitudinal parcel-level data set, while controlling for local amenities and house characteristics in addition to census demographics. Recent contributions by Tanrisever (2022), who also uses a large Los Angeles data set, and Davidoff, Pavlov and Summerville (2022) investigate the spillover impact of ADU presence on neighboring property values, finding a negative effect.[5]

The present paper begins by investigating the housing characteristics and locational factors that are associated with ADU presence on a single-family parcel, focusing on the year 2019. Using this information, planners could identify neighborhoods that are ripe for ADU development and even target possible inducement policies (such as construction subsidies) toward such neighborhoods. The study makes use of tax-assessor data for the city of Los Angeles, which contains the universe of housing in the city. The results show that ADUs are more likely to be built on parcels with older, smaller houses that are near a commercial district or LA's light-rail line or near an educational establishment. Proximity to LA's CBD and the LAX airport or proximity to the beach reduces the likelihood of ADU presence, as does high population density or high neighborhood median income. ADUs are more likely to be found in neighborhoods with high percentages of Latino residents, but are less likely in Black areas. To address the question of whether ADUs are located in areas where housing is unaffordable, these comprehensive regressions are supplemented by two simple bivariate regressions where the covariates are median rent and the rent-to-income share, respectively, with the latter regression

[5] After this work was completed, we became aware of a related working paper by Marantz, Elmendorf and Kim (2003), which uses data for the entire state of California to study factors influencing ADU presence.

showing the expected positive effect.

Another question of interest is how presence of an ADU affects both the assessed value and selling price of a single-family parcel, which is crucial information for homeowners considering ADU construction. Assessed value data can be used for both purposes, recognizing that the assessed value for just-sold properties is set equal to the transaction price. For properties that have not recently sold, the increment to assessed value may instead rely on the assessor's estimate of the construction cost of the ADU, which may not correspond to the incremental value upon sale. The results for the entire sample, including properties that have and have not just sold, show that an ADU raises assessed value by 7–8%. For just-sold properties, where the results give a more-reliable picture of an ADU's sales-price impact, the results show an assessed-value effect of almost 9%. While these are OLS estimates that treat ADU presence as exogenous, an alternate but unsuccessful IV approach uses as an instrument *after_law*, a dummy indicating that the assessment year is after the 2016 passage of the ADU-enabling law. This instrument, while strong, yields an implausibly large value effect, making the OLS estimates preferable.

Section 2 of the paper gives a brief introduction to ADUs, and Section 3 describes the data used in the analysis. Section 4 explores the factors affecting the location of ADUs, while Section 5 measures the effect of ADUs on assessed property values. Section 6 concludes.

2. Background

An accessory dwelling unit, or ADU, is a small secondary housing structure located on the lot of a larger primary dwelling. Although they can be known by other names such as granny or in-law flat, carriage house, or laneway house, among others, ADUs are distinguished from other types of accessory units in that they must have a separate kitchen, living space, and entrance. Figure 1 shows examples of different ADU types.[6] They can be detached structures, such as backyard cottages, depicted by building (C) in Figure 1, or part of the primary dwelling can be converted into an attached ADU, depicted in buildings (A) and (B).

ADUs were common in the early 1900s, but fell out of favor after World War II when

[6] The diagram is from Boulder Housing Programs and Initiatives (bouldercolorado.gov/housing/adu).

the popularity of suburbs began to rise. Given the resulting demand for low-density housing, local governments began to regulate or prohibit the construction of ADUs.[7] Moreover, in the following decades (especially in California), a combination of environmental concerns and community-level involvement in land-use decisions began to limit the expansion of housing supply. Limitations on new construction and housing density, driven by NIMBY concerns, were accompanied in California by strict environmental regulations under the state's Environmental Quality Act, which required extensive and time-consuming analysis of a potential project's environmental impacts while providing an avenue for litigation to block development. California land-use regulations were also exclusionary, with the state constitution requiring community approval to develop low-income housing projects.[8]

After decades of limitations on development, California found itself in an affordable-housing crisis. While some homeowners built ADUs illegally to supplement their incomes, the increasing severity of the housing shortage eventually spurred some organizations and researchers to advocate for more ADU construction.[9] California took a first step in favor of ADUs by mandating that every local jurisdiction ease permitting of the units.[10] However, the local provisions often included extremely burdensome permit processes, preventing a meaningful construction response.[11]

In response to these limitations, two California bills were signed into law in September 2016 making ADU development much easier for California residents.[12] Going into effect on January 1, 2017, the wide-ranging changes removed significant barriers that kept homeowners from investing in ADUs, such as the difficulty of obtaining building permits and the existence of off-street parking requirements. Under this new law, building permits must be approved or

[7] For more information on the history of ADUs, see US Department of Housing and Urban Development (2008).

[8] See Jackson (2020) for an overview of California's land-use regulations.

[9] Gellen (1985) estimated the total amount of excess space in American homes and advocated for the conversion of this space into ADUs.

[10] See Brinig and Garnett (2013) for a legal analysis of ADU regulations.

[11] Ramsey-Musolf (2018) discusses other legislation allowing ADUs to be considered low-income housing. Additionally, legislative attempts in Florida to expand the use of ADUs faced a similarly disappointing outcome. See Gottlieb (2017) for an overview of that legislation and outcomes.

[12] Summaries of the two bills, SB 1069 and AB 2299, are provided in the Appendix.

denied within 120 days and are considered non-discretionary permits, meaning that they are automatically granted after meeting objective requirements rather than requiring committee review and approval. The law relaxes off-street parking requirements for homes within half a mile of public transit, homes in historical districts, or when the ADU is attached to an existing unit.

The response to the reform was dramatic, as seen in Figure 2. In 2016, 54 permits were issued for ADU development in Los Angeles. In 2017, that number grew to 1,693, more than thirty times the previous year's amount, and permits rose to 3,193 in 2018 and 2,888 in 2019, so that 8,097 permits had been issued by 2019.

3. Data

Parcel Data. An observation in this study is a tax parcel in a residential zone in the city of Los Angeles. Parcel data from 2013 to 2019 are gathered from the Los Angeles Open Data Catalog. Each of the observations contains housing and lot characteristics as determined by the Los Angeles County Office of the Assessor, including house and lot square footage, the year of construction of the main house, the numbers of bedrooms and bathrooms, total assessed property value, and the year the property was last sold.

Building Permit Data. Permit data are collected from the Los Angeles Department of City Planning. The data include building-permit records for ADU construction, showing the permit number, issue date, homeowner address, and project description. In order to link the permit records with the tax parcels, the assessor identification number for each permit was scraped from the Los Angeles Department of Building and Safety. To see where in Los Angeles ADUs are constructed, each address from the building permit records is plotted on a heat map using GIS software (see Figure 3).

Census Data. Census-tract demographic information from the 2010 Census is merged with the parcel data. Using the parcel's coordinates, GIS software from the company ESRI assigns the demographics from the appropriate census tract to the parcel. The variables included are the Black and Latino percentages of the tract population and median household income. The local population density, measured at the Census block-group level, is also assigned to the parcel.

Other GIS-derived Data. Other locational factors include the proximity of parcels to various landscape features. The locations of educational establishments, light-rail stops, and beaches are supplied by ESRI. The GIS software then calculates the distance in miles between each tax parcel and the nearest of each of the above amenities, while also computing distance to the CBD, the LAX airport, and the nearest commercial zone.

In order to focus on the tax parcels where policy makers envisioned construction of ADUs, only those residential parcels containing single-family houses are included in the dataset. In addition, to eliminate atypical houses, observations are excluded if the number of bedrooms exceeds 6, if the number of bathrooms exceeds 5, if floor space exceeds 8300 square feet, if lot size exceeds 123,000 square feet, and if assessed value exceeds $3,000,000. These values are roughly at the 95th percentile for each variable. Houses with atypically small values of these characteristics are also excluded.[13]

Table 1 shows summary statistics, focusing just on the sample year 2019 to give a sense of cross-sectional variation. The first panel shows statistics for the time-invariant variables, which all take the same values in haall sample years. The first variable, *hasADU*, is a dummy variable that assumes the value 1 if an ADU construction permit was issued in the current year or a prior year (thus anytime in 2013-2019 for the 2019 subsample). As can be seen, the mean value of 0.016 shows that slightly less than 2% of parcels in the sample had received ADU permits by 2019. The variables *lot_area*, *floor_space* (both measured in 1000 sqft), *bedrooms*, *bathrooms*, and *year_built* give the key structural characteristics of the house. The variables *CBD_miles*, *LAX_miles*, *educ_estab_miles*, *commercial_miles*, and *transit_miles* give distances to the CBD, the LAX airport, the nearest college, university, or other post-secondary educational establishment,[14] the nearest commercial district, or the nearest light-rail stop.[15] The variable

[13] Houses with 0 bedrooms or 0 bathrooms are excluded, as are houses with floor space less than 600 square feet, lot area less than 2500 square feet, or assessed value less than $72,000. In addition, houses built before 1903 are excluded.

[14] Such establishments are broadly construed, so as to include beauty schools, schools of oriental medicine, and similar entities.

[15] To indicate CBD proximity, a cordon is drawn around the downtown CBD, with distance to the cordon measured. For parcels inside the cordon, *CBD_miles* is set equal to zero, leading to the zero minimum value shown in Table 1.

beach is a dummy variable indicating that the parcel is within 2 miles of a beach. The selected demographic characteristics are captured by *black_pct*, *latino_pct* and *med_income*, which are 2010 values for the Census tract containing the parcel (median income is measured in $1000). Population density, represented by *pop_density*, is measured at the level of the 2010 Census block group containing the tract. Use of the *med_rent* and *med_rent_shr* variables is explained below.

The regressions that focus on the locations of ADU parcels, which capture cross-sectional variation, use the year-2019 subsample and the variables shown in the first panel of Table 1. The regressions measuring the contribution of ADUs to property value, which rely on the full panel data set, make use in addition of the last set of variables in Table 1, which are mostly time-varying. The assessed value of the parcel is given by *totval*, which is used in log form. The variable *base_year* is equal to the year in which the property was last sold or the year 1975, whichever is more recent.[16] The variable *yrs_since_sold* is equal to the current year minus *base_year*. The variable *after_law* is a dummy variable indicating the years 2017, 2018, and 2019, which come after the 2016 passage of the ADU enabling bills. The use of these variables is explained in section 5 below prior to the presentation of the property-value regressions.

While data on actual construction of ADUs does not exist, the permit-based variable *hasADU* functions as a proxy for the existence of an ADU. Since issuance of a permit does not necessarily imply eventual construction of the unit, the variable is likely to overestimate ADU presence. However, since Peterson (2017) shows that the conversion rate from ADU permitting to construction in Portland, Oregon, is about 85%, it follows that, with some degree of error, the variable *hasADU* is a reasonable proxy for the existence of an ADU. Even if a permitted ADU is built, a further issue concerns construction timing. If a permit is issued toward the end of the year, construction would likely not be completed until the following year, assuming it commenced immediately. This timing issue is thus another reason why the permit-based *hasADU* variable may overstate ADU presence in a given year. While this limitation is less problematic in the last year (2019) of the sample, which is used for the locational regressions,

[16] For parcels last sold before 1975 (one year prior to the passage of Proposition 13), the base year was set at 1975 and the subsequent 2% escalator was applied to the assessed value in that year. Note that *base_year* corresponds to the assessor's "land base year."

it is more of an issue in the property-value regressions, where the full panel data set is used. See section 5 below for further discussion.

4. Locational regressions

Table 2 shows the estimated coefficients for the locational ADU regressions. Column 1 shows the results for a Probit regression, column 2 shows OLS results for a linear probability model, and column 3 shows OLS results using block-group fixed effects, where the demographic and population-density variables are suppressed. In all the regressions, the standard errors are clustered by block group. As can be seen, the qualitative results are very similar across regressions.

The Probit regression in column 1 shows that parcels with large lot areas and large amounts of floor space are less likely to contain ADUs than are other parcels. Note that, while a large lot would make accommodation of an ADU easier, the effect of lot area runs in the opposite direction. The message is thus that ADUs are less likely to be found on large properties despite this accommodative possibility.[17] While this conclusion may reflect the high incomes of the occupants of such properties, which obviate any need for ADU rental income, the median income of the parcel's Census tract has a separate negative impact on ADU presence, as seen at the near the bottom of the column. Column 1 also shows that parcels with newer houses are less likely to contain ADUs, as are parcels that are close to the Los Angeles CBD or to the LAX airport. While the CBD effect may reflect the effect of high densities near the city center, population density has a separate negative effect on ADU presence, as seen near the bottom of the column. Other coefficients show that ADUs are more likely to be found on parcels that are near educational establishments, near commercial districts, or near light-rail stations, but less likely to be found near the beach. The racial-mix coefficients show that ADUs are more likely to be found in tracts with high Latino population shares, but less likely to be present in tracts with high Black shares. This pattern may partly reflect a cultural difference, with Latino households perhaps containing older generations of family members that could be housed in ADUs.

[17] Paradoxically, when *bedrooms* is used in place of $floor\_space$, the variable's coefficient is significantly positive instead of negative. Since $floor\_space$ seems to be a superior house-size measure, its use is preferred.

The Probit marginal effects are shown in Table A1 in the appendix. For example, increasing *transit_miles* by 1 mile reduces the probability of ADU presence by 1.3 percent points, a very large effect given that the average of *hasADU* is 0.016 (1.6%). Similarly, a 10 percent point increase in *latino_pct* raises the probability of ADU presence by 1.8 percent points, again a large effect.

The results for the linear probability model in column 2 of Table 2 are qualitatively almost identical to the Probit results in column 1, with one exception being the loss of statistical significance of the positive *LAX_miles* coefficient. In the linear-probability model of column 3, which includes block-group fixed effects, many locational effects become statistically insignificant, as expected given that the variation within block groups of some variables is limited.[18] Among the distance variables, the only coefficient that retains significance is that of *commercial_miles*, whose significance level is now 5% instead of the previous 1%. The coefficients of *lot_area*, *floor_space* and *year_built* are still negative and significant, and the similarity of their magnitudes (as well as that of *commercial_miles*) compared to column 2 shows that little bias from omitted block-group characteristics was present in column 2. Despite the many significant coefficients in Table 2, the R^2 values for the OLS regressions are quite low, reflecting the difficulty of accurately predicting the rare presence of an ADU.[19]

These locational results are interesting in and of themselves, but they could provide possible guidance to policy-makers. For example, the new mayoral administration of Karen Bass in Los Angeles is currently launching a concerted attack on the city's severe homelessness problem, which will involve substantial spending. While funds may be spent in converting vacant office buildings or old hotels into space for the homeless or in constructing collections of small, stand-alone dwelling units on vacant land, stimulation of private ADU construction could also

[18] The slight reduction in sample size in column 3 is due to dropping of singleton observations, an effect that also occurs in Table 4 below.

[19] A different way to gauge this difficulty is to return to the probit specification and retrieve the fitted probabilities. A dummy variable *threshold_x* can then be created indicating that the predicted probability is above some threshold value x. Next, the correlation between *threshold_x* and *hasADU* can be computed, and the value of x chosen to make this correlation as large as possible. This value turns out to be 0.014, which leads to a correlation between *threshold_x* and *hasADU* of 0.0763, almost 8%, which is statistically significant at the 1% level. Therefore, as a predictor of ADU presence, a parcel's predicted value being above 0.014 performs best. The resulting correlation with ADU presence is not large, but it looks more favorable than the low R^2 values in Table 2.

help to reduce the city's housing shortage and thus address its homelessness problem. Such stimulation could come in the form of subsidies for ADU construction, which would be most effective in areas where ADUs are most likely to be found currently. Thus, a $10,000 subsidy for ADU construction in neighborhoods close to commercial districts or to light-rail stops, where ADU presence is more likely currently, might have salutary effects. Receipt of a subsidy, however, would come with requirement that the unit be rented to a paying tenant and not to a non-paying family member.[20]

A question is whether the locational ADU effects seen in Table 2 are equally felt across parcels of different assessed values. Accordingly, the 2019 subsample is divided into four quartiles, whose assessed-value boundaries are $240,000, $403,000, and $647,000. The means of *hasADU* in these four quartiles are 0.008, 0.015, 0.025, and 0.018, showing that ADU presence is about half as likely in the lowest quartile as in quartiles 2 and 4, with quartile 3 having the largest share of parcels with ADUs.[21] The quartile-specific regression results, which are shown in Table 3, use the linear probability model without block-group fixed effects. As can be seen, the negative effects of *floor_space*, *year_built* and beach proximity and the positive effect of *CBD_miles* are felt in each assessed-value quartile, while the negative lot-size effect is present in all but the top quartile. Proximity to a commercial zone or a light-rail line makes ADU presence more likely only in two highest assessed-value quartiles. Among the demographic variables, the *latino_pct* effect is felt across all the quartiles while the *black_pct* effect is now entirely absent. In addition, a higher tract median income reduces ADU presence only in the two highest quartiles. The overall message is that, while some of the locational effects seen in Table 1 are qualitatively independent of assessed value, others tend to be driven by locational effects that are present only in the higher assessed-value quartiles.

While the locational results are informative, they do not shed light on a simple question: are ADUs built in areas of Los Angeles with the lowest housing affordability? This question can be answered by running two simple bivariate regressions relating the *hasADU* dummy for

[20] Using another approach, Portland waived development charges for ADUs intended for long-term housing as an incentive to prevent their use as Airbnb (or other short-term) rentals. Los Angeles bans all ADUs from being used as short-term rentals.

[21] Since the standard deviations of *hasADU* are large relative to these mean values, the differences between them are not statistically significant.

2019 to median gross rent (including utilities), denoted *med_rent*, and to the median share of income devoted to gross rent, denoted *med_rent_shr*. These variables, which are measured at the block-group level, are taken from the American Community Survey 5-year estimates for the period 2015-2019.

The regression results are shown in Table 4. In the first regression, the coefficient of *med_rent* is significantly negative, indicating that ADUs tend to be constructed in lower rent areas, perhaps contrary to expectations. But in the second regression, the coefficient of *med_rent_shr* is significantly positive, indicating that ADUs tend to be constructed in areas where rent consumes a large share of income. Since these are areas where rents are least affordable, the positive coefficient shows that ADU construction appears to respond to low affordability of rental housing. The R^2 values for these regressions are naturally even lower than those in Table 2 (equal to 0.0007 and 0.0004, respectively). Moreover, since the regressions ignore possible reverse causation running from ADU construction over the 2017-2019 period to 5-year ACS rents in the 2015-2019 period, they are at best suggestive. Note that when *med_rent_shr* is included as a covariate in the regressions from column 2 of Table 2, its coefficient is insignificant, with its effect presumably captured by the other covariates.

5. Assessed-value regressions

5.1. Framework

This section presents the results of regressions relating a parcel's assessed value to ADU presence and other covariates, using the 2013-2019 panel. A homeowner may wish to know by how much the presence of an ADU will raise the assessed value of their property and thus its property-tax liability. They may also like to know the effect of an ADU on the property's potential selling price. The second question can be answered by using a subsample of just-sold properties, exploiting the fact that assessed value is set at the transactions price immediately following a sale. To answer the first question, the entire sample of properties, just-sold and otherwise, is used while taking account of rules for assessment under California's Proposition 13.

For properties not recently sold, the assessor may set the increment to assessed value from an ADU based on an estimate of construction cost, which may not reflect incremental sales value. This outcome is likely despite the claim on the Los Angeles County Assessor's website that a new ADU on a parcel is assessed at "market value."[22] Presumably, however, the assessor will gain experience as the volume of transactions of ADU-inclusive parcels grows, thus reducing any need to rely on construction-cost estimates. In any case, the assessed-value regression for all properties provides useful information that is relevant for judging an ADU's property-tax impact. This regression is presented first, with the regression using just-sold properties presented subsequently.

To understand the structure of the assessed-value regression using all properties, the rules for property-tax assessment under California's Proposition 13 must be understood. When a house is sold, its assessed value is set at the selling price, and the initial property-tax payment is set at 1% of this value. As time progresses following the sale, the increase in the assessed value, and hence the increase in the tax payment, is capped at 2% per year unless construction has occurred, in which case the assessed value is increased by the estimated increment to value from the construction. The present focus is on this assessed-value increment for an ADU. Following construction, the assessed value again increases by 2% per year until the property is sold.

In a given year, the assessor data shows the "land base year," which is the year in which the property last sold (shortened to *base_year*). Let t denote the current year, and let $t_{i,base}$ denote the *base_year* for parcel i (which would equal t if the property has just sold), and let $P_{i,base}$ denote the base-year selling price. In addition, let $t_{i,permit}$ equal the year in which an ADU permit was issued, which is a proxy for the construction year. Then, using the previous information, parcel i's assessed value in year t can be written as

$$\ln A_{i,t} \;=\; \ln\left(P_{i,base}\; e^{0.02(t\;-\;t_{i,base})}\right) \;+\; \theta\, hasADU_{i,t} e^{0.02(t\;-\;t_{i,permit})}, \tag{1}$$

where $hasADU_{i,t}$ is the $hasADU$ value for parcel i in year t, indicating whether an ADU permit was issued in year t or before. The first term on the RHS of (1) equals the log of the

[22] See the FAQ page at `https://assessor.lacounty.gov/homeowners/adu`.

base-year price inflated by 2% for each of the years following the base year. The second term equals θ, the unknown ADU valuation parameter, times the indicator of ADU presence inflated by 2% for each of the years since the parcel's ADU permit was issued.

Evaluating the log term on the RHS of (1), the equation can be written as

$$\ln A_{i,t} \ - \ 0.02(t - t_{i,base}) \ = \ \ln P_{i,base} \ + \ \theta \, hasADU_{i,t} \ e^{0.02(t \ - \ t_{i,permit})}. \tag{2}$$

$P_{i,base}$ in (2) will depend on $t_{i,base}$ as a result of yearly house-price inflation, it will also depend on the characteristics of parcel i aside from any ADU presence, denoted by the time-invariant row vector X_i. Then, (3) can be written as[23]

$$\ln A_{i,t} \ - \ 0.02(t - t_{i,base}) \ = \ X_i \, \gamma \ + \ \beta \, t_{i,base} \ + \ \theta \, hasADU_{i,t} e^{0.02(t \ - \ t_{i,permit})}, \tag{3}$$

where γ is a column vector of implicit prices for parcel characteristics and $\beta > 0$ captures the average annual rate of sales-price inflation.

Rather than subtracting it off from $\ln A_{i,t}$, the $t - t_{i,base}$ term could be left on the RHS of (2) and given a coefficient α to estimate, so that (3) becomes

$$\ln A_{i,t} \ = \ \alpha(t - t_{i,base}) \ + \ X_i \, \gamma \ + \ \beta \, t_{i,base} \ + \ \theta \, hasADU_{i,t} \ e^{0.02(t \ - \ t_{i,permit})}, \tag{4}$$

with the expectation that the estimate $\widehat{\alpha}$ would be close to 0.02 (an outcome that would validate the present framework). In the regressions, the variable denoting $hasADU_{i,t} \ e^{0.02(t - t_{i,permit})}$ is *hasADU_adj* (indicating adjustment), the variable denoting $t - t_{i,base}$ is *yrs_since_sold*, and the variable denoting $t_{i,base}$ is *base_year*.

A concern in estimating (3) and (4) is that *has_ADU* and, thus *hasADU_adj*, is endogenous, being correlated with the regression error term. Such correlation would arise if unobservable parcel characteristics make addition of an ADU more or less likely while also

[23] Treating X_i as time invariant ignores remodeling construction, an approximation that allows a sole focus on ADUs.

independently affecting property value. The expected direction of any bias, however, is unclear. To address this concern, we attempted to estimate (3) using an instrumental variable approach, where the instrument for *hasADU_adj* is *after_law*, a dummy variable that takes the value 1 in the years 2017, 2018 and 2019 following the 2016 passage of the ADU-enabling bills. However, the results of this exercise were implausible, with the *hasADU_adj* coefficient much too large. With no other instrument available, we must rely on the OLS results, hoping that the extensive set of controls will tend to eliminate any omitted-variable bias.

5.2. Regression results using all properties

Results for the all-properties regressions are presented in Table 4. Columns 1 and 3 estimate the model version in equation (3), with and without block-group fixed effects, while columns 2 and 4 estimate the model version in (4), again with and without block-group fixed effects. Since the regressions now use the panel structure of the data set, the standard errors are clustered by parcel, using the *assessor_id* variable for the clustering. Rather than using *lot_area* and *floor_space* as parcel size characteristics, the regressions use more-traditional hedonic variables: *bedrooms* and *bathrooms*.

The regression in column 1, which is based on equation (3), shows that the presence of an ADU raises assessed value by 7.86%, a notable but not substantial increment. The coefficient of *base_year* shows an annual rate of increase of Los Angeles property values of 5.72% in the Proposition-13 era, a plausible magnitude. The remaining coefficients show implicit prices for various parcel attributes, which are familiar from the hedonic-pricing literature. Extra bedrooms and bathrooms raise assessed value, while proximity to the CBD, to LAX, to educational establishments, and to the beach raises value. Proximity to commercial areas and to a light-rail station reduces assessed value, with both effects perhaps reflecting concerns that are sometimes voiced about easy access of outsiders to the neighborhood. Assessed value is higher in areas with high median income, but minority presence (either Black or Latino) reduces value, as does high population density.[24]

[24] The regressions in Table 5 do not include *year_built* as a covariate. When included, it counterintuitively has a small negative coefficient (indicating that higher construction years reduce value), while leading to a collinearity problem in the regression of column 4, which becomes unusable. The variable's presence in columns 1-3 has only a slight effect on the coefficients of *hasADU_adj*, while leaving those of *base_year* and

Turning to column 2, which is based on equation (4), the *hasADU_adj* coefficient, equal to 0.0746, is close to that in column 1, while the *base_year* coefficient is also close to its column-1 value. Interestingly, the coefficient of *yrs_since_sold* is 0.022, indicating a 2.2% annual increase in assessed value after the base year. Being very close to the anticipated value of 2%, this estimate offers a striking validation of the current framework. The remaining coefficients in column (2) differ little if at all from those in column 1.

In the regressions of columns 3 and 4, which use block-group fixed effects, ADU presence has a somewhat smaller effect on assessed value than in columns 1 and 2, with an ADU raising value by 5.39% in column 3 and 4.97% in column 4. Given that the fixed effects control for unobservable block-group characteristics that may affect a parcel's value, these smaller numbers may also be more accurate than the larger values in columns 1 and 2. Despite this difference, the *base_year* coefficients are very similar in size to those in columns 1 and 2 (around 5.8%), while the *yrs_since_sold* coefficient in column 4 is nearly identical to that in column 2. The presence of fixed effects leads to only small changes in the coefficients of *bedrooms* and *bathrooms*, while some of the proximity coefficients become insignificant (or flip signs, as in the case of *transit_miles*).[25] [26]

As noted above, issuance of an ADU permit may not lead to immediate construction of an ADU in the same year. While this possible discrepancy is not crucial for the locational regressions in section 4, it matters more for the assessed-value regressions, where an indicator of actual ADU presence is preferable. In the absence of such a variable, an alternate is to use the

yrs_since_sold virtually unaffected.

[25] An alternative version of the estimating equation can be generated by removing the natural logs in (1), making the equation more nearly linear. When X_i is substituted in place of $P_{i,base}$, each element of X_i then must be multiplied by the exponential term in the equation. Running the resulting regression yields results that are less plausible than those in Table 5. Most importantly, using a fixed-effects regression like that in column (3) of Table 5, the coefficient of the *hasADU_adj* term from (1) equals a highly significant 103075.2, indicating that the presence of an ADU raises property value by over $100,000. Since this magnitude is almost 25% of average value (recall Table 1), the estimate is far too large, making the regressions in Table 5 preferable.

[26] Use of X_i in (3) implicitly assumes that the valuations of housing attributes, as reflected in $P_{i,base}$, are independent of the base year, an assumption that will be incorrect if these attribute valuations change over time with market conditions. This possibility can be addressed by adding interactions between *bedrooms* and *bathrooms* times the base year divided by 2019 to the regressions reported below. In these regressions, the effects of *bedrooms* and *bathrooms* are positive for all base years, with the valuation of bedrooms increasing with the base year and the valuation of bathrooms decreasing. Most importantly, the coefficients of *hasADU_adj* are similar to those in Table 5 across the four columns, equal to 0.0727, 0.0682, 0.0499, and 0.0453, respectively.

lagged value of *has_ADU* to capture possible delays in construction. Appropriately altering the *hasADU_adj* variable, it now becomes $hasADU_{i,t-1}\ e^{0.02(t-(t_{i,permit}+1)}$ and is denoted *hasADU_adj_lag*.[27]

Table 6 shows the all-properties assessed-value regressions with lagged ADU presence. The notable changes are the increase in the size of the ADU effect, which is now greater than 10% in columns 1 and 2 (as compared to less than 8% in Table 6) and greater than 7% in columns 3 and 4 (as compared to near 5% in Table 6). These somewhat larger coefficients make sense if the lagged ADU variable more effectively captures actual ADU presence than the unlagged indicator. Note that the lagged approach has little effect on the remaining regression coefficients.

5.3. Regression results using just-sold properties

While the results in Tables 5 and 6 are useful, a more important question concerns the sales-price impact of an ADU. As explained above, this impact can be estimated using observations on just-sold properties, for which *base_year* equals the current year. The sample contains almost 100,000 such properties, spread roughly evenly over the sample years. The share of just-sold properties containing ADUs is negligible before 2017, but the share rises from 1% in 2017 to 3% in 2018 and reaches 5% in 2019. To derive the just-sold estimating equation from the specification in (4), only those observations where the current year t is equal to the base year $t_{i,base}$ are included, which eliminates the first term in (4) and turns $t_{i,base}$ term into a fixed effect for year t. In addition, the exponential expression in the last term in (4) vanishes.

The regressions for the just-sold sample are presented in Table 7, with the year fixed effects (which were unneeded in Tables 5 and 6) not shown. Results using the unlagged *has_ADU* variable are shown in columns 1 and 2 (with and without block-group fixed effects), while results using *has_ADU_lag* are shown in columns 3 and 4.

The estimated *has_ADU* coefficients in columns 1 and 2 (0.0872 and 0.0418) straddle the corresponding values in the four columns of Table 5, suggesting that, when unlagged ADU presence is used, the assessed-value impact from the all-properties regressions is similar to that in the just-sold subsample. The apparent implication would be that, in assessing all

[27] Note the lagged time index on *hasADU* and the increment to $t_{i,permit}$ in the exponential term.

properties, the assessor is doing a reasonable job of capturing the actual sales-price impact of ADU presence, as seen in just-sold properties. But this pattern is slightly altered in the results using *has_ADU_lag*, with the estimated coefficients in both columns 3 and 4 of Table 7 (0.135 and 0.0883) somewhat larger than the values in the four columns of Table 6. This pattern suggests that, in looking across all properties, including those not just sold, the assessor somewhat underestimates an ADU's impact on selling price. This conclusion seems natural given the limited experience so far with ADU transactions.

The tables include a range of assessed value impacts, but the results using lagged ADU presence along with block-group fixed effects are perhaps most credible. Thus, from columns 3 and 4 of Table 6, an ADU's assessed-value impact among all properties, just-sold and otherwise lies between 7 and 8%, while the impact among just-sold properties (which captures the sales-price effect) is somewhat larger, being close to 9%. These numbers could help homeowners gauge the impact of an ADU on their property-tax liability as well as the sales-price gain from having constructed an ADU.

6. Conclusion

Using data from Los Angeles, this paper has explored the locational determinants as well as the assessed-value effects of ADU presence. The results show that ADUs are less likely to be found on large parcels containing newer houses and at dense locations near the CBD, the LAX airport, and beaches. ADU presence is more likely close to commercial districts, light-rail stations and educational establishments but less likely in higher-income areas and Black neighborhoods, although parcels in Latino neighborhoods are more likely to contain ADUs. The assessed-value regressions show that ADU presence raises a parcel's assessed value and selling price by around 7–9%, while also accurately capturing the unusual rules for property assessments under California's Proposition 13.

The paper's locational results could provide a guide to Los Angeles policy-makers if they wish to include stimulation of ADU construction in their efforts to address the city's housing shortage as well as its homelessness problem. Subsidization of construction of ADUs in areas that are already likely to accommodate them, including near commercial districts and light-rail stations, may offer a useful way to increase housing supply. In addition, the measured impacts on assessed value could give existing homeowners contemplating ADU construction a sense of potential capital gains as well as the extra property taxes they may pay. Greater clarity on these points, if it were widely available, may also help stimulate ADU construction.

Table 1: Summary statistics

VARIABLES	*Obs.*	*Mean*	*Std. Dev.*	*Min*	*Max*
2019 SUBSAMPLE					
hasADU	492,181	0.0164	0.127	0	1
lot_area (1000 sqft)	492,181	14.366	18.959	2.5	122.991
floor_space (1000 sqft)	492,181	1.723	762.524	0.6	8.297
bedrooms	492,181	2.995	0.954	1	6
bathrooms	492,181	2.211	0.914	1	5
year_built	492,181	1956.631	24.272	1903	2019
CBD_miles	492,181	12.328	6.470	0	24.812
LAX_miles	492,181	14.906	6.421	0.924	26.757
educ_estab_miles	492,181	1.389	0.905	0.00545	5.499
commercial_miles	492,181	0.235	0.266	0	2.454
transit_miles	492,181	2.735	2.104	0.00975	10.393
beach	492,181	0.0800	0.271	0	1
black_pct	492,181	7.255	14.460	0	93.439
latino_pct	492,181	36.149	27.569	0	100
pop_density	492,181	11333.620	8909.397	1.7	114948.5
med_income ($1000)	492,181	71.950	33.227	10.671	227.014
med_rent	436,303	1909.11	671.31	425	3501
med_rent_shr	446,694	35.82	9.62	9	51
FULL SAMPLE					
totval	3,400,096	457153.6	389579.4	72000	3000000
yrs_since_sold	3,400,096	16.253	12.55033	0	44
base_year	3,400,096	1999.768	12.59133	1975	2019
after_law	3,400,096	0.4329725	0.495487	0	1

Table 2: Determinants of ADU presence, 2019

VARIABLES	(1) *Probit*	(2) *OLS*	(3) *OLS, block-group FE*
lot_area	-0.0113**	-0.000146**	-0.000121**
	(0.000791)	(1.04e-05)	(1.26e-05)
floor_space	-0.0287**	-0.00143**	-0.000632*
	(0.00985)	(0.000309)	(0.000302)
year_built	-0.00847**	-0.000248**	-0.000256**
	(0.000391)	(1.09e-05)	(1.21e-05)
CBD_miles	0.0207**	0.000629**	-0.00113
	(0.00209)	(8.15e-05)	(0.00155)
LAX_miles	0.00612*	0.000169	-0.000917
	(0.00278)	(9.75e-05)	(0.00126)
educ_estab_miles	-0.0206*	-0.000926*	-0.00165
	(0.0102)	(0.000398)	(0.00132)
commercial_miles	-0.216**	-0.00545**	-0.00357*
	(0.0407)	(0.00115)	(0.00173)
transit_miles	-0.0128**	-0.000568**	0.000542
	(0.00442)	(0.000183)	(0.00129)
beach	-0.196**	-0.00447**	0.000758
	(0.0542)	(0.00147)	(0.00401)
black_pct	-0.00296**	-0.000123**	
	(0.000655)	(2.12e-05)	
latino_pct	0.00182**	9.65e-05**	
	(0.000416)	(1.69e-05)	
pop_density	-1.02e-05**	-2.45e-07**	
	(1.27e-06)	(3.41e-08)	
med_income	-0.00252**	-6.78e-05**	
	(0.000427)	(1.32e-05)	
Constant	14.56**	0.506**	0.549**
	(0.755)	(0.0214)	(0.0286)
Observations	492,187	492,187	492,149
R^2		0.007	0.018

Dependent variable is *hasADU*.

Standard errors clustered by block group are in parentheses.

** p<0.01, * p<0.05

Table 3: Determinants of ADU presence by value quartile, 2019

VARIABLES	(1) *Quartile 1*	(2) *Quartile 2*	(3) *Quartile 3*	(4) *Quartile 4*
lot_area	-0.000101**	-0.000125**	-0.000148**	-3.01e-05
	(8.78e-06)	(1.11e-05)	(1.98e-05)	(2.29e-05)
floor_space	-0.00321**	-0.00475**	-0.00944**	-0.00383**
	(0.000499)	(0.000659)	(0.000870)	(0.000483)
year_built	-0.000109**	-0.000241**	-0.000393**	-0.000337**
	(1.41e-05)	(1.65e-05)	(2.36e-05)	(1.71e-05)
LAX_miles	-1.53e-05	0.000175	0.000533**	-0.000272
	(8.34e-05)	(0.000139)	(0.000174)	(0.000175)
educ_estab_miles	0.000118	0.000241	0.000475	-0.00232**
	(0.000372)	(0.000548)	(0.000871)	(0.000673)
CBD_miles	0.000376**	0.000481**	0.00116**	0.00133**
	(6.97e-05)	(0.000110)	(0.000154)	(0.000156)
commercial_miles	-0.00216	-0.00325	-0.00635*	-0.00512**
	(0.00118)	(0.00185)	(0.00258)	(0.00158)
transit_miles	-0.000158	-0.000211	-0.00146**	-0.00115**
	(0.000166)	(0.000236)	(0.000363)	(0.000413)
beach	-0.00430**	-0.00568**	-0.0107**	-0.00760**
	(0.00103)	(0.00187)	(0.00269)	(0.00225)
black_pct	1.68e-05	-2.55e-05	-7.55e-05	2.81e-05
	(1.91e-05)	(3.21e-05)	(4.45e-05)	(7.52e-05)
latino_pct	7.71e-05**	0.000182**	0.000345**	0.000464**
	(1.38e-05)	(2.19e-05)	(3.71e-05)	(5.21e-05)
pop_density	-3.52e-08	-1.32e-07**	-2.20e-07**	-3.18e-07**
	(2.90e-08)	(4.19e-08)	(6.89e-08)	(6.92e-08)
med_income	1.35e-06	-3.15e-05	-6.29e-05*	-7.21e-05**
	(1.45e-05)	(2.33e-05)	(3.01e-05)	(1.88e-05)
Constant	0.219**	0.483**	0.791**	0.688**
	(0.0276)	(0.0322)	(0.0463)	(0.0341)
Observations	123,039	122,778	122,904	123,406
R^2	0.003	0.007	0.016	0.014

Dependent variable is *hasADU*.

Standard errors clustered by block group are in parentheses.

** p<0.01, * p<0.05

Table 4: Housing affordability and ADU presence, 2019

VARIABLES	(1) hasADU	(2) hasADU
med_rent	-4.96e-06**	
	(5.33e-07)	
rent_shr		0.000253**
		(4.10e-05)
Constant	0.0259**	0.00742**
	(0.00109)	(0.00147)
Observations	436,303	446,694
R^2	0.0007	0.0004

Standard errors clustered by block group are in parentheses.
** p<0.01, * p<0.05

Table 5: Assessed-Value Regressions

VARIABLES	(1) *no FE*	(2) *no FE*	(3) *block-group FE*	(4) *block-group FE*
yrs_since_sold		0.0219**		0.0220**
		(5.97e-05)		(5.75e-05)
hasADU_adj	0.0786**	0.0746**	0.0539**	0.0497**
	(0.00373)	(0.00375)	(0.00341)	(0.00342)
base_year	0.0572**	0.0591**	0.0578**	0.0598**
	(4.33e-05)	(6.07e-05)	(4.16e-05)	(5.94e-05)
bedrooms	0.110**	0.110**	0.111**	0.111**
	(0.000759)	(0.000759)	(0.000775)	(0.000775)
bathrooms	0.163**	0.163**	0.139**	0.139**
	(0.000817)	(0.000817)	(0.000835)	(0.000835)
CBD_miles	-0.0133**	-0.0133**	0.00257	0.00262
	(0.000147)	(0.000147)	(0.00455)	(0.00455)
LAX_miles	-0.0159**	-0.0159**	0.0328**	0.0328**
	(0.000185)	(0.000185)	(0.00413)	(0.00413)
educ_estab_miles	-0.0104**	-0.0104**	0.00821*	0.00821*
	(0.000663)	(0.000663)	(0.00367)	(0.00367)
commercial_miles	0.126**	0.126**	0.220**	0.220**
	(0.00262)	(0.00263)	(0.00463)	(0.00463)
transit_miles	0.0113**	0.0113**	-0.00129	-0.00129
	(0.000328)	(0.000328)	(0.00379)	(0.00379)
beach	0.0918**	0.0918**	0.00773	0.00776
	(0.00280)	(0.00280)	(0.0121)	(0.0122)
black_pct	-0.00838**	-0.00839**		
	(4.49e-05)	(4.49e-05)		
latino_pct	-0.00588**	-0.00588**		
	(2.85e-05)	(2.85e-05)		
pop_density	-7.13e-06**	-7.13e-06**		
	(7.93e-08)	(7.93e-08)		
med_income	0.00277**	0.00277**		
	(3.18e-05)	(3.18e-05)		
Constant	-102.1**	-105.9**	-104.5**	-108.5**
	(0.0867)	(0.122)	(0.0962)	(0.129)
Observations	3,400,096	3,400,096	3,400,095	3,400,095
R^2	0.820	0.729	0.850	0.774

Dependent variable in columns 1 and 3 is *ltotval - 0.02×yrs_since_sold*.
Dependent variable in columns 2 and 4 is *ltotval*.
Standard errors clustered by assessor_id are in parentheses.
** p<0.01, * p<0.05

Table 6: Assessed-Value Regressions with Lagged ADU Presence

VARIABLES	(1) *no FE*	(2) *no FE*	(3) *block-group FE*	(4) *block-group FE*
yrs_since_sold		0.0220**		0.0221**
		(5.93e-05)		(5.71e-05)
hasADU_adj_lag	0.107**	0.103**	0.0780**	0.0733**
	(0.00535)	(0.00536)	(0.00493)	(0.00494)
base_year	0.0572**	0.0592**	0.0579**	0.0599**
	(4.33e-05)	(6.00e-05)	(4.16e-05)	(5.88e-05)
bedrooms	0.110**	0.110**	0.111**	0.111**
	(0.000759)	(0.000759)	(0.000775)	(0.000775)
bathrooms	0.163**	0.163**	0.139**	0.139**
	(0.000817)	(0.000817)	(0.000835)	(0.000835)
CBD_miles	-0.0133**	-0.0133**	0.00257	0.00262
	(0.000147)	(0.000147)	(0.00455)	(0.00455)
LAX_miles	-0.0159**	-0.0159**	0.0328**	0.0328**
	(0.000185)	(0.000185)	(0.00413)	(0.00413)
educ_estab_miles	-0.0104**	-0.0104**	0.00820*	0.00821*
	(0.000663)	(0.000663)	(0.00367)	(0.00367)
commercial_miles	0.126**	0.126**	0.220**	0.220**
	(0.00262)	(0.00263)	(0.00463)	(0.00463)
transit_miles	0.0113**	0.0113**	-0.00131	-0.00130
	(0.000328)	(0.000328)	(0.00379)	(0.00379)
beach	0.0918**	0.0917**	0.00772	0.00775
	(0.00280)	(0.00280)	(0.0121)	(0.0122)
black_pct	-0.00839**	-0.00839**		
	(4.49e-05)	(4.49e-05)		
latino_pct	-0.00588**	-0.00588**		
	(2.85e-05)	(2.85e-05)		
pop_density	-7.14e-06**	-7.13e-06**		
	(7.93e-08)	(7.93e-08)		
med_income	0.00277**	0.00277**		
	(3.18e-05)	(3.18e-05)		
Constant	-102.2**	-106.1**	-104.5**	-108.5**
	(0.0867)	(0.121)	(0.0962)	(0.128)
Observations	3,400,096	3,400,096	3,400,095	3,400,095
R^2	0.820	0.729	0.850	0.774

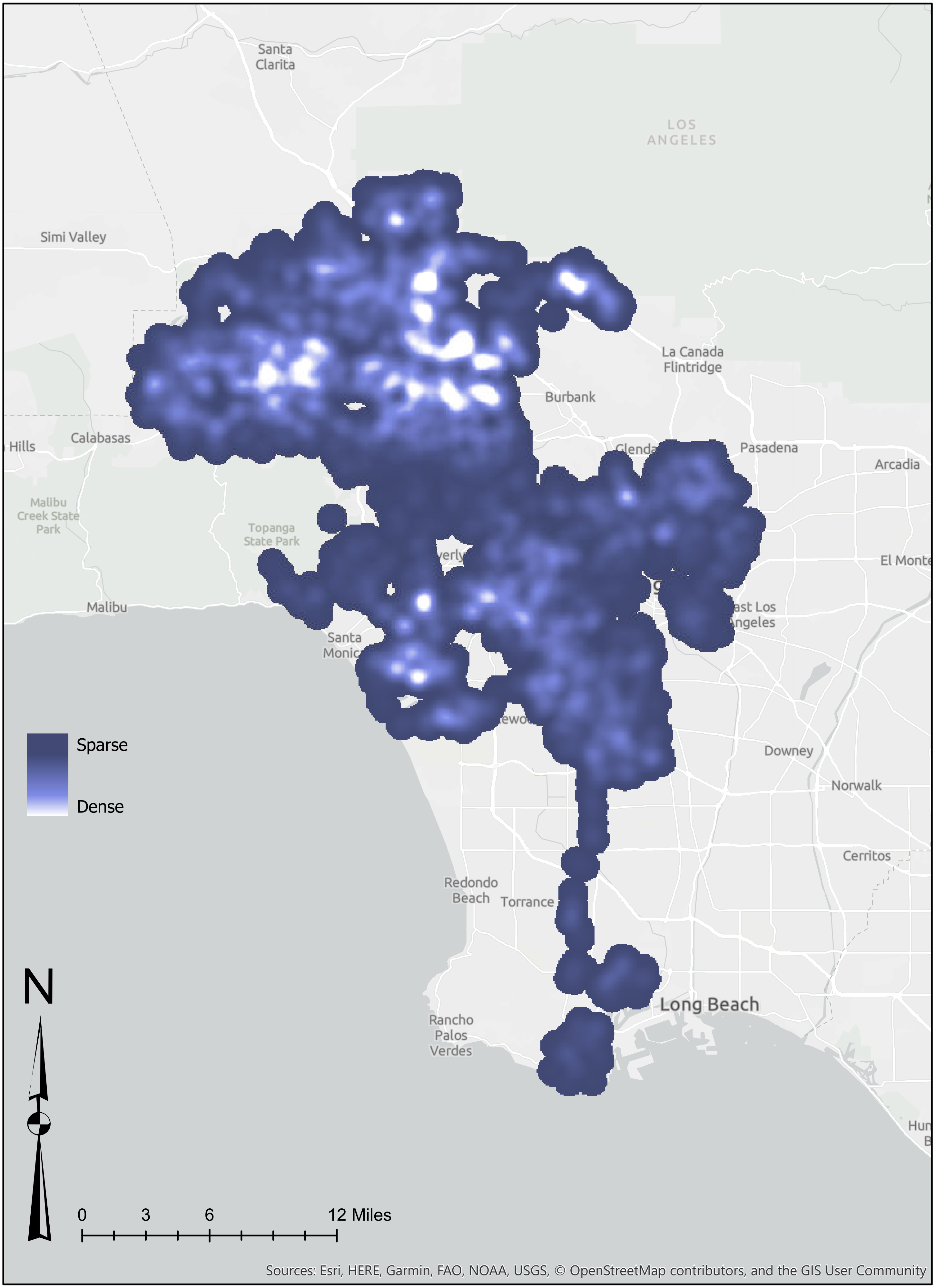
Dependent variable in columns 1 and 3 is *ltotval - 0.02×yrs_since_sold*.
Dependent variable in columns 2 and 4 is *ltotval*.
Standard errors clustered by assessor_id are in parentheses.
** p<0.01, * p<0.05

Table 7: Assessed-Value Regressions for Just-Sold Properties

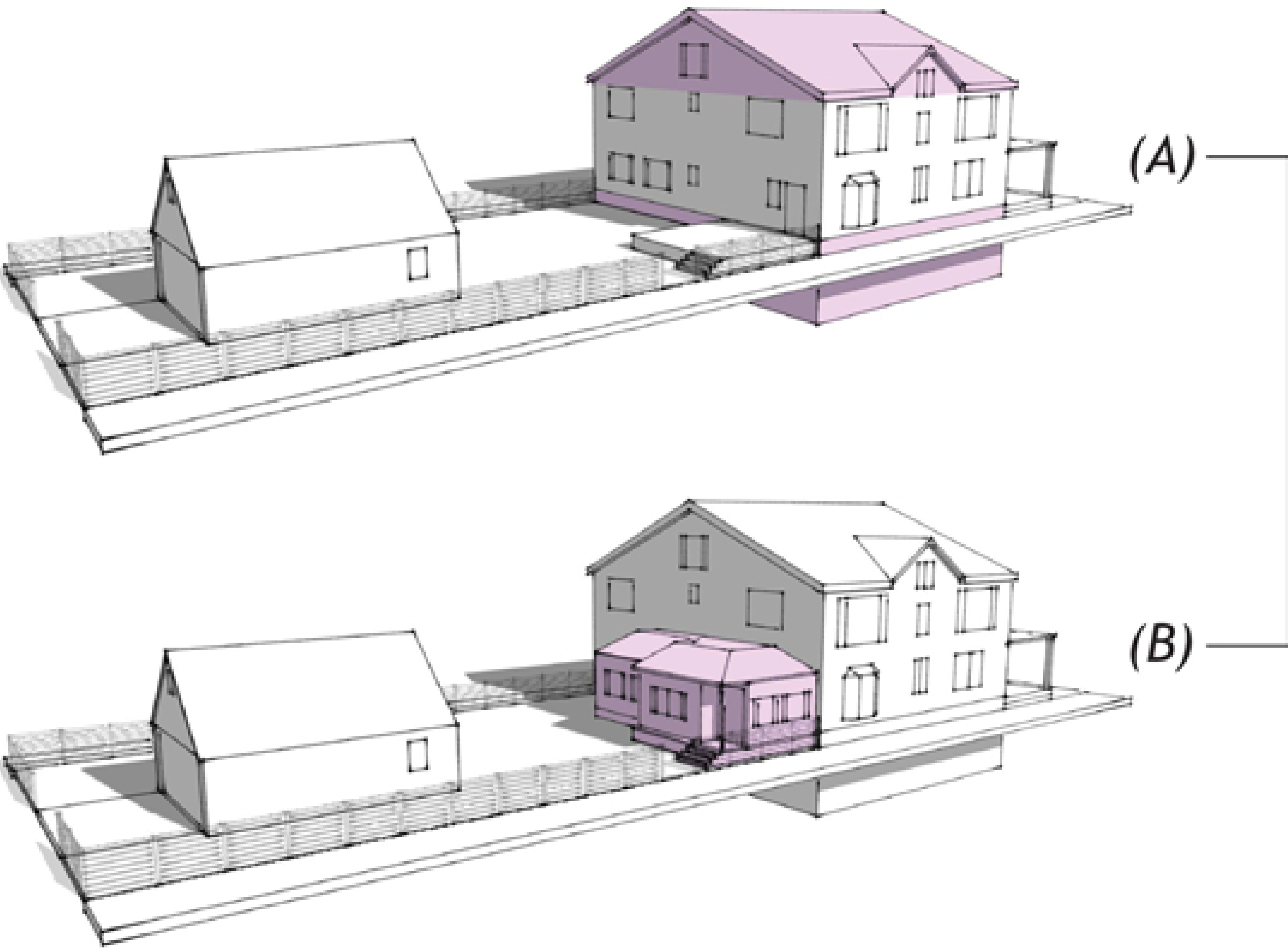
VARIABLES	(1) *no FE*	(2) *block-group FE*	(3) *no FE*	(4) *block-group FE*
hasADU	0.0872**	0.0418**		
	(0.00791)	(0.00627)		
hasADU_lag			0.135**	0.0883**
			(0.0156)	(0.0125)
bedrooms	0.142**	0.133**	0.142**	0.133**
	(0.00162)	(0.00152)	(0.00178)	(0.00170)
bathrooms	0.0983**	0.0847**	0.0920**	0.0781**
	(0.00162)	(0.00155)	(0.00178)	(0.00172)
CBD_miles	-0.0260**	-0.0217*	-0.0265**	-0.0102
	(0.000297)	(0.00853)	(0.000327)	(0.00961)
LAX_miles	-0.0167**	0.0329**	-0.0171**	0.0309**
	(0.000393)	(0.00759)	(0.000430)	(0.00860)
educ_estab_miles	-0.0246**	0.0245**	-0.0231**	0.0191*
	(0.00133)	(0.00695)	(0.00148)	(0.00774)
commercial_miles	0.119**	0.249**	0.114**	0.248**
	(0.00531)	(0.00862)	(0.00566)	(0.00949)
transit_miles	0.00680**	-0.00631	0.00648**	-0.00694
	(0.000674)	(0.00706)	(0.000721)	(0.00779)
beach	0.191**	-0.00733	0.181**	-0.00767
	(0.00600)	(0.0233)	(0.00660)	(0.0257)
black_pct	-0.0108**		-0.0107**	
	(9.92e-05)		(0.000117)	
latino_pct	-0.00727**		-0.00685**	
	(6.05e-05)		(6.70e-05)	
pop_density	-7.77e-06**		-7.81e-06**	
	(1.68e-07)		(1.80e-07)	
med_income	0.00330**		0.00325**	
	(6.67e-05)		(7.17e-05)	
Constant	13.05**	12.06**	13.26**	12.20**
	(0.00974)	(0.0878)	(0.0104)	(0.0968)
Observations	99,790	99,724	75,842	75,762
R^2	0.735	0.833	0.718	0.824

Regressions include year fixed effects.
Standard errors clustered by assessor_id are in parentheses.
** p<0.01, * p<0.05

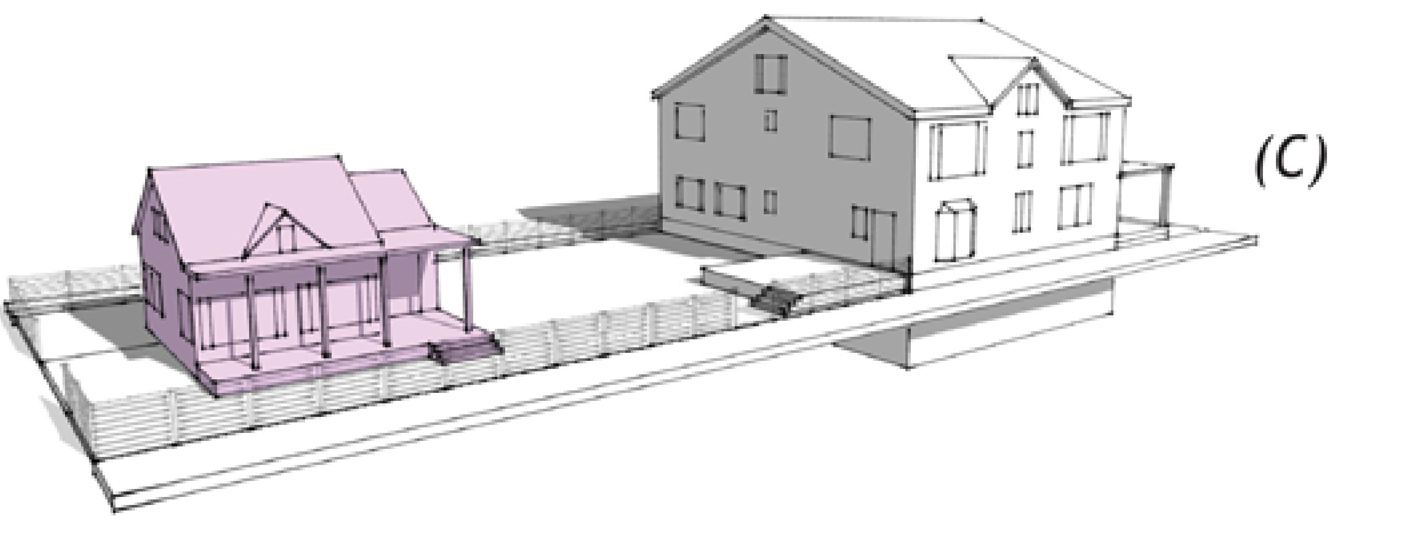
Figure 1: Density of ADUs in Los Angeles



1. Attached Accessory Dwelling Unit (ADU)



2. Detached Accessory Dwelling Unit (ADU)



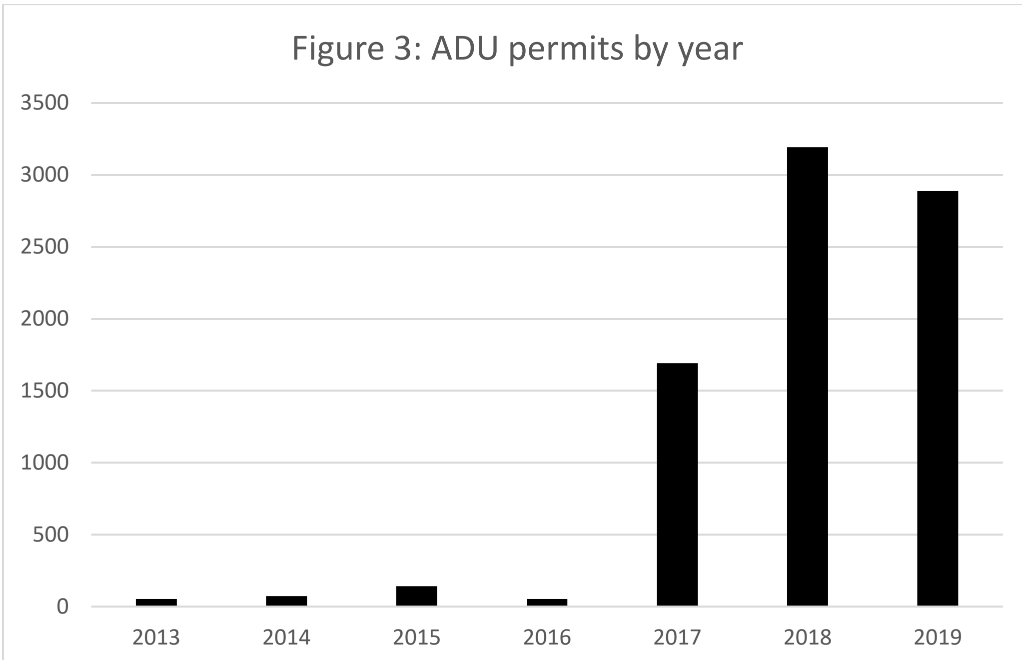


Figure 3: ADU permits by year
3500
3000
2500
2000
1500
1000
500
0
2013
2014
2015
2016
2017
2018
2019

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Appendix

Senate Bill 1069 and Assembly Bill 2299 were both signed by Governor Jerry Brown on September 27th, 2016, to be implemented January 1st, 2017. The following provisions were detailed in these bills to relieve barriers to ADU construction:

- No local ordinance can be the basis for denial of an ADU building permit.

- ADU permits must be considered ministerial, nondiscretionary permits, and must be approved or denied within 120 days of application.

- No passageway may be required with new ADU construction.

- No setback may be required for a garage that is converted to an ADU.

- A setback of maximum five feet from side and rear lot lines may be required for an ADU constructed above a garage.

- A local agency may establish minimum and maximum unit size requirements for ADUs.

- ADUs may not be required to provide fire sprinklers if they are not required for the primary residence.

- A local agency may reduce or eliminate parking requirements for ADUs.

- Local law may not impose parking standards for ADUs that are
  - –located within one half-mile of public transit.
  - –located within an historic district.
  - –part of the existing primary residence or existing accessory structure.
  - –within one block of a car-share vehicle lot.

- ADUs shall not be considered new residential uses for the purposes of calculating local agency connection fees or charges for utilities.

- Detached ADUs have a cap of floorspace at 1,200 square feet. Attached ADUs that are an addition to the main house have a cap of floorspace at 1,200 or 50% of main house square footage, whichever is less. ADUs built entirely inside the main house have no size limit.

Table A1: Probit marginal effects

VARIABLES	*Marginal effects*
lot_area	-0.0113**
	(0.000791)
floor_space	-0.0287**
	(0.00985)
year_built	-0.00847**
	(0.000391)
CBD_miles	0.0207**
	(0.00209)
LAX_miles	0.00612*
	(0.00278)
educ_estab_miles	-0.0206*
	(0.0102)
commercial_miles	-0.216**
	(0.0407)
transit_miles	-0.0128**
	(0.00442)
beach	-0.196**
	(0.0542)
black_pct	-0.00296**
	(0.000655)
latino_pct	0.00182**
	(0.000416)
pop_density	-1.02e-05**
	(1.27e-06)
med_income	-0.00252**
	(0.000427)
Constant	14.56**
	(0.755)
Observations	492,187

Dependent variable is *hasADU*.
Standard errors clustered by block group
are in parentheses.
** p<0.01, * p<0.05