Factors Affecting Spillover Impacts of LIHTC Developments: An Analysis of Los Angeles

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Abstract

The Low-Income Housing Tax Credit program is one of the largest sources of financing for affordable housing in the United States. Contrary to many residents' fears, research typically shows that LIHTC-financed properties generate positive spillover impacts in their surrounding communities in the form of increased housing prices. Yet some critics suspect that the overall positive effects obscure the properties' negative impacts for a significant subset of neighborhoods. We examine these concerns by assessing the housing price effects of LIHTC properties in Los Angeles. We explore how the effects differ based on various characteristics of the LIHTC property as well as various characteristics of the surrounding neighborhood. We supplement these statistical analyses with interviews of key affordable housing developers to understand their decision-making process regarding the siting and structuring of LIHTC properties. We find that, regardless of the property or neighborhood characteristics, LIHTC developments in the region have positive spillover price effects. Our findings can help inform policymakers who strive to maximize the secondary benefits of affordable housing developments.

Introduction

The country continues to suffer from a significant shortage of affordable rental housing, a problem that has worsened since the onset of the pandemic. Households that struggle to pay the rent tend to be more likely to suffer from poor health and chronic illness. They are more likely to experience food insecurity, and their children are more likely to struggle academically. Perhaps not surprisingly, many developers view the creation and rehabilitation of affordable housing not only as an end in and of itself, but also as a central component of a strategy to stabilize and revitalize lower-income communities.

At the same time, many homeowners continue to have a negative perception of affordable rental housing properties. Influenced in part by demagogic politicians and well-publicized concerns about crime, these homeowners fear that the presence of a publicly subsidized rental housing development in their community will have negative effects on local property values and public safety. This "Not in My Back Yard" sentiment has been most evident in middle- to upper-income neighborhoods, and it frequently has racial or ethnic overtones. (Interestingly, the sentiment typically represents itself simply as opposition to a proposed project, not necessarily as a preference for another use of the property.)

A growing body of research has offered evidence that rebuts the negative perception of affordable housing properties. The largest public subsidy in the country, the federal Low-Income Housing Tax Credit (LIHTC), has facilitated equity investments in properties that collectively have created and/or rehabilitated more than 3 million affordable rental units since 1986. Researchers have found that LIHTC-financed developments generally have neutral to positive effects on surrounding property values. Several studies have documented the relatively long-lasting nature of these spillover effects.

The research also has documented considerable variation in the extent and duration of the property value effects – not only across metropolitan areas, but also within individual cities. Neighborhoods are inherently dynamic environments, with multiple internal and external factors that affect local real estate values and quality of life indicators. Some of those factors affect multiple communities; some are idiosyncratic in nature. It is not surprising, therefore, that developments in different neighborhoods could or would have different spillover effects. Unfortunately, we do not yet know enough about the causes of these variations.

A better understanding of the factors that most influence the spillover effects of affordable housing developments is important for several reasons. It can help policymakers better allocate and target comparatively scarce housing and neighborhood development resources. It can help developers focus activity in areas where the local dynamics create a more favorable environment for positive project spillover. A greater understanding of the interplay between affordable housing developments and local dynamics also can help inform – and ideally alleviate – the persisting opposition to subsidized rental housing.

Of course, all these outcomes are in addition to the primary focus and benefit of the LIHTC and other affordable housing programs: the creation of quality homes that do not impose cost burdens on their residents. We are not looking to change the LIHTC program into something for which it was not intended. Rather, we seek to determine how various actors can create and/or preserve affordable housing in a way that best contributes to the stabilization, enhancement, or revitalization of the surrounding community.

Our study begins to tease out the factors that influence the type and extent of a LIHTC property's effects on its neighborhood. We use changes in residential home values as a proxy for improvements in the area. If a community become more attractive, it should increase the willingness and desire of people to live there. That increased interest should translate into increased demand for local property, which will bid up local real estate values. In our model, therefore, the "treatment effect" is the percent change in nearby prices that occurs after a new LIHTC development is completed, relative to the change in comparable non-LIHTC neighborhoods.

We examine LIHTC price effects while controlling for a range of project-specific and neighborhood-level factors. On the project side, we consider the role that the size of the development (i.e. its number of units) plays in changing local values. We assess whether spillover effects are greater around entirely subsidized LIHTC properties or around those developments with a mix of subsidized and market-rate units. We also assess whether the corporate structure of the developer itself has an effect: do for-profit sponsored projects have a different effect on the surrounding area's property values than those sponsored by nonprofit organizations?

With respect to neighborhood dynamics, we examine whether LIHTC developments have greater spillover effects in low-income, high-income, or more moderate-income communities. We examine property effects in communities with higher and lower proportions of people of color, as

well as in predominantly Black, Latino, and/or Asian neighborhoods. We also analyze whether the concentration of LIHTC properties in a community enhances or limits local property value appreciation.

We focus on Los Angeles, a city with an extreme shortage of affordable housing and very strong competition for relatively scarce LIHTC allocations. We find that, across each of the different property- and neighborhood-level dimensions, the average LIHTC property contributes to a meaningful increase in surrounding property values. Not surprisingly, some factors lead to more significant property value increases than others. While the market and political dynamics in Los Angeles may limit the generalizability of some of these findings to other markets, we believe that several of the findings are actionable for both developers and policy makers.

Contribution to the Literature

Our analysis focuses on the spillover effects of LIHTC-financed properties that involve either new construction or rehabilitation (and potential expansion) of existing properties. There is substantial evidence that both types of residential projects positively influence local property values. In Cleveland, for instance, new construction in the 1980s and 1990s increased the sale price of nearby homes by about $5,000, while significant rehabilitation had a positive $4,000 effect (Simons, Quercia, & Maric 1998; Ding, Simons, & Baku 2000; Ding & Knaap, 2002). One therefore would expect similar outcomes for LIHTC developments, as they typically involve either new construction on a previously vacant lot or the often significant enhancement of one or more existing residential, commercial, or mixed-use properties. Since a typical LIHTC development contains 60 to 80 units, it has a large enough physical footprint to have a noticeable impact on its surrounding area.

Indeed, a growing body of research has documented that LIHTC properties have neutral to positive effects on surrounding real estate prices. Table 1 summarizes several of these analyses.

Table 1: Selected Analyses of LIHTC Properties' Effects on Home Prices

Study	Market	Basic Spillover Findings
Green, Malpezzie, & Seah (2002)	Madison & Milwaukee (WI)	No evidence that LIHTC properties depressed surrounding home sale prices; some evidence that properties near LIHTC developments in Madison appreciated more rapidly than those elsewhere in the city.

Johnson & Bednarz (2002)	Cleveland (OH); Portland (OR); Seattle (WA)	Property values increased within a few blocks of LIHTC developments after the developments had been placed in service
Schwartz et al (2006) Furman Center (2006) Ellen & Voicu (2007) Ellen et al (2007)	New York City	Property values surrounding LIHTC buildings increased by as much as 9% in the five years after the LIHTC property's opening.
Ezzet-Lofstrom and Murdoch (2007)	Dallas (TX)	LIHTC developments had a small, positive effect on surrounding single-family house prices.
Baum-Snow & Marion (2009)	National	Home prices increased by an average 14.9% in census block groups within one kilometer of a LIHTC property
Woo, Joh, & Van Zandt (2016)	Cleveland (OH)	Home values near LIHTC developments increased by 15.4% relative to price trends elsewhere in the city.
Young (2016)	National (20 highest-cost markets)	Proximity to LIHTC property had no significant effect on home values.
Edmiston (2018)	Kansas City (MO)	LIHTC properties had little positive or negative effect on surrounding property conditions.
Bostic et al (2019)	Cook County (IL)	Home values within 1/8 mile of a LIHTC development experienced a 10.8 percentage point increase relative to the county-wide average.

While the average spillover price effects of LIHTC developments are generally positive, the averages mask considerable variation within and across regions. Such variations are not surprising, given the often-substantial differences in amenities and real estate trends affecting even adjacent neighborhoods within the same city. Several researchers have taken specific local factors into account in their analyses of affordable housing developments' spillover effects. Others have examined some of the factors specific to the affordable housing properties themselves. The following subsections highlight some of their key findings.

Project Size

Intuitively, one would expect larger residential developments to have commensurately larger effects – either positive or negative – on surrounding neighborhood conditions than smaller developments. Larger developments occupy more physical space and are consequently more visible within an area. They also house more people and therefore increase the community's population density.

Multiple studies of affordable housing developments have found that larger projects tend to have greater spillover effects, as summarized in Table 2.

Table 2: Selected Analyses of the Size Effects of LIHTC Properties

Study	Market	Key Project Size Findings
Ellen (2007)	New York City	Affordable housing properties with more units generally generated more positive spillover price effects, although the marginal benefit decreased with project size.
Deng (2011a)	Santa Clara County (CA)	LIHTC properties with 50+ units boosted surrounding home values by 5-6%; smaller properties had no significant spillover effect.
Dillman, Horn, & Verilli (2017)	Review of 24 separate studies across multiple markets	Larger, well-managed affordable housing properties tend to generate more significant spillover price effects, and they also contribute to reductions in local violent crimes.

At the same time, larger projects can be problematic in certain markets. Several analyses documented the potential for poorly managed developments of scale to exacerbate local crime issues and contribute to neighborhood decline (Dillman, Horn, & Verilli 2017). Mid- to large-sized multifamily properties placed in service in low-density areas can negatively affect surrounding home prices, especially in more affluent communities (Ericksen & Yang, 2022). Even in areas with relative high population densities such as New York City, spreading affordable units across multiple properties instead of concentrating them in one or two developments can result in greater and more positive overall property value effects (Ellen & Voicu 2007). Density concerns drive much of the "NIMBY" opposition to affordable housing. Local residents fear that the increased population density associated with a larger development will irrevocably alter the existing community dynamics.

Extent of Project Subsidization

The LIHTC program does not require that all units within a tax credit financed property be affordable to low-income households. In fact, the income mandates can appear comparatively modest. Statutorily, developers must commit to creating properties that meet one of three income thresholds: 1) At least 20% of the units are occupied by households earning 50% or less of the area median income (AMI). 2) At least 40% of the units are occupied by households earning 60% or

less of AMI. 3) At least 40% of the units are occupied by households earning an average of 60% or less of AMI, and no household in the property makes more than 80% of AMI.

The regulations therefore give developers flexibility. A developer can opt to create a facility in which a portion of the units are rented at market rates. Alternatively, the developer can elect to have all the units be affordable to households making 60% or less of AMI – in which case the property becomes eligible for the maximum LIHTC subsidy. Historically, LIHTC developers have tended to focus primarily on creating income-restricted units, in part as a way of increasing their competitiveness in the tax credit allocation process. An analysis of 12,228 LIHTC properties containing more than 760,000 units in 16 different states found that 93% of the units were occupied by households earning 60% or less of the prevailing AMI (Furman Center 2012). Similarly, an examination of LIHTC properties in 18 states found that 81% of the properties' tenants made 50% or less of AMI (O'Regan & Horn 2013).

Still, certain areas contain a fair number of LIHTC properties with market-rate units. In Chicago, for instance, 19.3% of the non-elderly LIHTC properties placed in service between 1987 and 2016 contained at least five market-rate units. In those properties, unsubsidized units accounted for an average 27% of all units (Bostic et al 2019).

Both fully subsidized LIHTC properties and those with a mix of subsidized and market-rate units have generated positive spillover property value effects. Table 3 summarizes the key findings of several studies of "mixed-income" and fully subsidized properties financed in part with LIHTC and/or federal HOPE VI monies.

Table 3: Selected Analyses of Fully Subsidized v. Partially Subsidized Affordable Housing Developments' Spillover Property Value Effects

Study	Market	Key Subsidy-Related Findings
Turbov & Piper (2005)	Atlanta (GA), Louisville (KY), Pittsburgh (PA), St. Louis (MO)	Home values in the areas surrounding the mixed-income HOPE VI developments increased more quickly than elsewhere in the respective cities.
Castells (2010)	Baltimore (MD)	Of 3 HOPE VI communities analyzed, only the more mixed-income one demonstrated positive and significant spillover property value increases; there were no observed spillover effects surrounding the fully subsidized HOPE VI developments.
Funderberg & MacDonald (2010)	Polk County (IA)	Property value appreciation near fully subsidized family LIHTC developments was 2-4% lower than elsewhere in the county;

		partially subsidized LIHTC properties had no significant effects on price trends.
Zielenbach & Voith (2010)	Boston (MA), Washington (DC)	Both partially subsidized & fully subsidized HOPE VI developments had positive property value effects, with the greatest values in areas already experiencing development pressures.
Cloud & Roll (2011)	Denver (CO)	The ¼ mile area around the downtown mixed-income HOPE VI site had a greater increase in property values and home buying, a greater reduction in blight, and a greater increase in other investments than other similar areas in city
Bostic et al (2019)	Cook County (IL)	Spillover price effects for LIHTC properties with at least 5 market-rate units were higher than the effects of properties consisting entirely of subsidized units; the price effects were positive in both cases.

The relatively limited literature exploring differences in property value spillover effects of partially versus fully subsidized affordable housing developments suggests that complexes that include market-rate units have more positive effects on local home prices. It is important not to draw hard conclusions at this stage, however. The most in-depth examination of the issue, by Bostic et al (2019) in Chicago, found that LIHTC properties with market-rate units had a disproportionately high effect on nearby home prices in higher-income areas. In lower-income communities, home values appreciated more near fully subsidized LIHTC properties than near partially subsidized ones.

For-Profit v. Non-Profit Developer

The LIHTC statute requires that at least 10% of all tax credit allocations go to projects sponsored by nonprofit developers. Several states and localities have allocated higher proportions of their credits to these organizations. Overall, nonprofits were responsible for about 22% of the LIHTC properties placed in service between 1987 and 2004, though that proportion may have declined since (Bratt 2007). A 2015 national survey of 100 affordable housing developers found that, among the 52 most active entities, for-profits were responsible for starting 89% and completing 86% of the affordable units produced during the year (Bratt & Lew 2016).

Several analyses have documented the differences between nonprofit and for-profit developers. Not surprisingly, the fundamentally disparate goals of the two types of entities help

explain much of the variation. The quest for financial returns drives most for-profit activity, as the developers need to generate profits for their shareholders. In contrast, nonprofit developers tend to be more focused on neighborhood improvements and affordable housing provision. Nonprofits consequently are more likely to develop properties in poorer areas. Their properties frequently target lower-income households, and they also are more likely to target the disabled, the homeless, the elderly, and other "special" populations (Silverman & Patterson 2011; Johnson 2012). Because they serve more disadvantaged populations, nonprofit properties often charge lower rents. Rachel Bratt and Irene Lew (2016), for instance, found that nonprofit-sponsored LIHTC developments had a higher proportion of units with a low rent / fair market rent ratio than for-profit developments.

Overall, the cost of developing a LIHTC project tends to be higher for a nonprofit developer than for its for-profit counterparts. Some of that difference can be attributed to nonprofits being more likely to engage in the rehabilitation of existing properties and offering more services to tenants. Whereas for-profit developers are more likely to engage in new construction, with models that can be replicated across sites, nonprofits often need to develop project-specific designs for existing properties (Silverman & Patterson 2011). At least in metropolitan Richmond, VA, nonprofit developers of LIHTC properties have been more likely to incorporate rehabilitation, certified property management, and standard use terms in their properties than their for-profit counterparts (Johnson 2012). These factors can contribute to greater operating costs. Many nonprofit developers also struggle to obtain capital from conventional lenders and therefore are forced to piece together different subsidies, particularly if they are trying to serve very low-income households. This process can take time and ultimately drive up overall project costs.

Development costs notwithstanding, there is some evidence that nonprofit-developed affordable housing complexes have at least similar, and potentially more positive, effects on surrounding home values than properties developed by for-profit firms. Table 4 summarizes the relatively sparse literature on the issue.

Table 4: Selected Analyses of Spillover Price Effects from Nonprofit & For-Profit Affordable Housing Developments

Study	Market	Key Developer-Related Findings
Goetz, Lam, & Heitlinger (1996)	Minneapolis (MN)	Subsidized multi-family properties developed by nonprofit CDCs enhanced the value of surrounding market-rate homes by 86 cents per square foot. Publicly subsidized housing

		owned by private for-profits had a negative 82 cent/square foot effect on surrounding home prices.
Smith (2003)	Indianapolis (IN)	Over 13 years, home prices in areas with significant CDC activity increased by 7.14% relative to homes in non-CDC neighborhoods.
Ellen & Voicu (2006)	New York City	Nonprofit-developed, smaller affordable housing properties had larger home price spillover effects than similar for-profit developed properties. The price value effects associated with nonprofit-developed projects were more stable over time.
Deng (2011)	Santa Clara County (CA)	LIHTC projects developed by HPN-member* nonprofits had 4-6 percentage point higher effects on surrounding values than properties developed by for-profits or by non-HPN member nonprofits.
Edmiston (2012)	Kansas City (MO)	CDC investments in owner-occupied, single-family homes contributed to an 11.8% increase in home prices within 500 feet of the targeted properties.

* The Housing Partnership Network (HPN) is a national network of high-capacity nonprofit developers.

Neighborhood Income Level

Residential developments do not take place in a vacuum. Their ability to attract and retain tenants, generate revenue streams, and improve (or worsen) conditions in the surrounding area depends not only on their size, management, structure, and other characteristics, but also on the dynamics of the neighborhood itself. A development's capacity to generate spillover effects can be augmented or constrained by, among other factors, the physical geography of its surroundings, the strength or weakness of the local economy, the extent of real estate development activity, local public safety issues, and various local demographic and socio-economic characteristics. Not surprisingly, studies of LIHTC and other affordable housing developments' spillover have found significant differences in the direction and extent of property value effects across communities.

In general, research has documented more positive spillover price effects from LIHTC developments located in lower-income areas than in middle- to upper-income communities. Table 5 summarizes the findings of several studies that examined impacts across different communities.

Table 5: Selected Analyses of LIHTC Developments' Spillover Price Effects by Neighborhood Income Level

Study	Market	Key Findings by Income Level
Baum-Snow & Marion (2009)	National	Median home prices increased by 14.9% within 1 kilometer of a LIHTC property, but the price increases were noticeably lower in stable (10.6%) and gentrifying (5.6%) communities.
Deng (2011a)	Santa Clara County (CA)	LIHTC developments in low-income neighborhoods had positive price effects, but the effects for the county overall were statistically insignificant.
Deng (2011b)	Miami-Dade County (FL)	Price effects were most positive around LIHTC developments in high-poverty neighborhoods and most negative around developments in middle-class communities.
Woo, Joh, & Van Zandt (2017)	Charlotte (NC)	LIHTC properties had negative effects on surrounding values, but the effects were much more noticeable in moderate- and upper-income areas than in lower-income ones.
Woo, Joh, & Van Zandt (2017)	Cleveland (OH)	The home price effects of LIHTC properties were much lower in lower-income areas than in more moderate- and upper-income communities.
Dillman, Horn, & Verilli (2017)	Summary of 24 studies spanning the country	LIHTC and other affordable housing properties generally boosted values in low-income areas but had more mixed effects in moderate and high-opportunity areas.
Diamond & McQuade (2019)	Multi-state	Home prices within 1/10 mile of a LIHTC property increased by 6.5% over 10 years in low-income neighborhoods but declined by nearly 2.5% in higher-income areas.

LIHTC properties tend to be developed in relatively distressed areas. Nationally, 32% of LIHTC units placed in service prior to 2011 were in census tracts with poverty rates of at least 30% in 2010, and another 23% were in tracts with poverty rates between 20% and 30%. In 12 sampled states, the average LIHTC unit sat in a tract whose poverty rate was six percentage points

higher than that of a tract housing a typical unsubsidized rental unit in the same metropolitan area (Ellen, Horn, & Kuai 2018). The concentration of properties in weaker markets reflects both LIHTC allocation criteria – which frequently give projects greater points for being in more distressed communities – and some developers' desire to use the LIHTC developments to help catalyze other investment in the area.

The relatively greater spillover benefits of LIHTC properties in lower-income communities should not mask the positive effects that these developments often have in more affluent areas, however. For instance, an analysis of Cleveland in the 1990s and early 2000s found positive price effects of LIHTC developments in moderate- and upper-income communities; in fact, the effects were greater in those areas than in the city's more distressed markets (Woo, Joh, & Van Zandt 2017). An evaluation of Chicago trends encompassing the same period found strong and enduring LIHTC price effects in both lower- and upper-income neighborhoods (Voith et al 2022).

It is also possible that the observed negative effects of LIHTC properties in some higher-income neighborhoods may result less from the introduction of affordable housing per se and more from the introduction of comparatively dense multi-family properties in lower-density areas with a preponderance of single-family homes. A recent study (Eriksen & Yang, 2022) re-ran the non-parametric models that Rebecca Diamond and Timothy McQuade used in their 2019 analysis (see Table 5 above), adding unsubsidized multi-family developments as well as LIHTC properties to the analysis. The new study found that all types of multi-family developments depressed surrounding property values in higher-income areas. Yet once they controlled for population density, the authors found the negative effects of LIHTC properties dissipated and even became moderately positive.

Neighborhood Racial and Ethnic Composition

Most research on LIHTC spillover price effects has taken the subject neighborhoods' racial and ethnic composition into account as part of the evaluation structure. Because of the strong inverse correlation between neighborhood incomes and the communities' proportions of individuals of color, the observed effects of racial or ethnic composition largely have tracked the observed income-related effects. Spillover price effects tend to be greater in predominantly Black and/or Latino communities.

There has been comparatively little analysis of different effects in higher versus lower-income communities of color – Bostic et al's 2019 analysis of mixed-income properties in Chicago being a notable exception. Similarly, there has been little in-depth examination of spillover effects in different types of majority-minority neighborhoods. It is not clear, for instance, whether LIHTC properties have different price effects in predominantly Black, predominantly Latino, or predominantly Asian-American neighborhoods.

LIHTC Project Concentration

One of the challenges in assessing the spillover impact of LIHTC developments is that the properties tend to be geographically concentrated. Quite often, there is some overlap among the distance bands surrounding individual LIHTC properties. A home sale transaction therefore may be included in multiple analyses, which can complicate the assessment of any single LIHTC development's true impact. Such an issue affects evaluations of many affordable housing properties, but LIHTC developments especially – as they tend to be much more concentrated than other subsidized housing properties (Oakley 2008). In New York, for example, 71% of LIHTC properties were clustered; in Boston, the proportion was 50% (Dawkins 2013). More than 90% of the non-elderly LIHTC properties placed in service in Cook County, IL between 1987 and 2016 were located within ½ mile of at least one other LIHTC development (Voith et al 2022).

To date, few analyses have addressed the effects of this concentration directly. Lan Deng's analysis of LIHTC-related effects in south Florida (Deng 2011b) found mixed effects of concentrated development in Miami-Dade County. Some areas with multiple LIHTC properties showed improvement, but the presence of multiple LIHTC developments was potentially worsening conditions in certain suburbs. Two reviews of the affordable housing assessment literature (Nguyen 2005; Dillman, Horn, & Verilli 2017) raised concerns about the property value implications of geographically concentrated subsidized housing and the low-income households such complexes support. Yet those concerns were not based on LIHTC-specific findings. Moreover, there is some evidence that clustering affordable housing properties can have more beneficial effects on a community than introducing a single property, based on an analysis of a scattered-site public housing program in Denver (Santiago, Galster, & Tatian 2001).

The one study to date that deliberately addressed the impacts of LIHTC project clustering focused on Chicago. Richard Voith and his colleagues (2022) found that the introduction of a

single LIHTC property to a community had positive and sustainable impacts on surrounding home prices. They did not find any evidence that placing subsequent LIHTC developments in the neighborhood detracted from the positive benefits associated with the initial property. In some cases, the subsequent LIHTC properties had positive and additive effects on surrounding values.

Working Hypotheses

As described above, a range of studies have documented the generally positive (or at least neutral) overall effects of LIHTC developments on surrounding home prices – findings that rebut the perception that such developments have inherently negative effects on communities. At the same time, they have demonstrated the range of project-specific and neighborhood-level factors that can influence such developments' spillover impacts. Most analyses have incorporated only a few of these independent variables, generally ignoring the complexities associated the tendency of LIHTC properties to be geographically concentrated. Our study represents an initial attempt to account for this wider range of factors in a single analysis.

Based on previous findings, we expect that the introduction of a LIHTC property in a community typically will have a positive and lasting effect on surrounding home prices. That positive effect is likely to be more pronounced in low-income communities than in more affluent areas, and it is likely to be augmented by the introduction of one or more subsequent LIHTC properties nearby.

We posit that larger LIHTC properties and those developed by nonprofits entities are likely to have somewhat greater spillover price effects than smaller properties and those developed or rehabilitated by for-profit firms. (These relationships should hold even after controlling for the fact that larger, nonprofit-sponsored properties are more prevalent in lower-income communities.) We also anticipate that partially subsidized LIHTC properties – those containing a mix of market-rate and income-restricted units – will have somewhat greater spillover effects on area prices than fully subsidized properties, in part because the higher-income residents' additional purchasing power will contribute to the attraction and retention of a wider range of local retail and other amenities. We do not expect to see any meaningful difference in price effects across neighborhoods that are predominantly Black, Latino, or Asian-American (again controlling for neighborhood income level).

LIHTC Developments in Los Angeles

To understand better the variations in the spillover effects of LIHTC properties, we examine both property and neighborhood characteristics in Los Angeles County, CA. Los Angeles is the country's largest county and contains 833 LIHTC properties. It has a widespread and widely acknowledged need for affordable housing, with several public, private, and philanthropic initiatives working to alleviate the shortage. It has considerable demographic and socio-economic diversity, and it continues to be one of the country's strongest real estate markets. It also has strong political support for creating and preserving affordable housing. A Los Angeles-based analysis therefore can be beneficial for developers and policy makers looking to address affordable housing needs in other large cities with strong real estate markets, diversity of population and income, and a political commitment to helping address residents' housing cost burdens.

Data

Our study analyzes the spillover effects of LIHTC developments placed in service in Los Angeles County between 1987 and 2015. We compare pre- and post-development prices in the neighborhoods with one or more LIHTC developments to price trends during the period in neighborhoods with no LIHTC properties.

We obtained data from HUD for each of the 833 LIHTC properties placed in service during that period. The information includes the property's street address, the year it was placed in service, and its total number of units. We obtained data on all Los Angeles residential property sales from 1987 to 2015 (more than 1.8 million arm's length transactions) from DataQuick Information Systems and CoreLogic, geo-coded the transactions, and then calculated the distance between each sold home and nearby LIHTC developments. Over the 28-year period, there were 145,056 transactions within 1/4 mile of a LIHTC property and 362,811 transactions within a 1/4 to 1/2 mile band.

Table 6 highlights the differences between Los Angeles County census tracts that contain at least one LIHTC development and those without any such properties during our study period. As shown in the table, Los Angeles's LIHTC properties tend to be in disproportionately low-income areas.

Table 6 – Characteristics of LA Median LIHTC and non-LIHTC Census Tracts

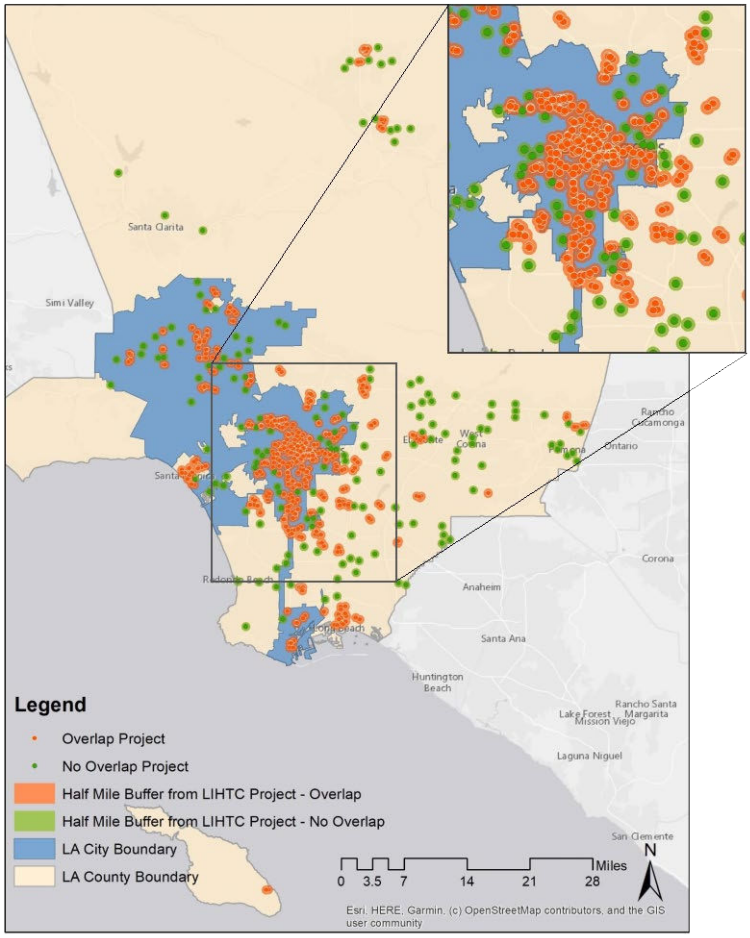
	Median LIHTC Tract	Median Non-LIHTC Tracts
Household Income	$46,883	$71,750
Population	4,362	4,182
White non-Hispanic Residents	9.6%	19.5%
Black non-Hispanic Residents	5.6%	3.1%
Asian non-Hispanic Residents	7.9%	9.8%
Hispanic Residents	58.9%	41.5%
Poverty Rate	21.1%	11.0%
Unemployment Rate	6.4%	5.5%
Residential Vacancy Rate	5.3%	4.9%
Median Gross Rent	$1,259	$1,544
Median Home Value	$473,250	$545,400

Notes: Data from 2016 American Community Survey 5-year estimates.

These characteristics are similar to those identified by Victoria Basolo, Edith Huarita, and Johngho Won in their recent (2022) analysis of LIHTC developments in the county. They found that, relative to residential properties generally, LIHTC properties tend to be in neighborhoods that have more economic hardship, higher population density, a higher proportion of renter-occupied units, and more racial and ethnic diversity.

LIHTC properties in Los Angeles also tend to be clustered geographically. Of the county's 833 properties, 679 are located within 1⁄2 mile of at least one other LIHTC property. The greatest concentration of these developments is in south-central Los Angeles, as illustrated in Figure 1. The green dots mark non-overlapping properties in the city, and the orange dots indicate the overlapping ones.

Figure 1 - Map of Sampled LIHTC Properties and Surrounding ½-Mile Radii



Methodology

We aim to illuminate the roles that different project- and neighborhood-level characteristics play in influencing the spillover property value effects of LIHTC development. We focus on six different characteristics: (1) development size (small, medium, and large); (2) proportion of subsidized units (all v. some); (3) developer type (for-profit vs. non-profit); (4) neighborhood income level; (5) neighborhood racial and ethnic composition; and (6) the number of existing LIHTC developments within the neighborhood. We examine these differences both quantitatively and qualitatively to understand how the various factors influence both the developers' decision-making and the ultimate spillover impacts.

Quantitative Approach

For the quantitative methods, we build upon the standard difference-in-differences (DID) regression models typically used in program evaluation studies of this kind (e.g., Butts 2022; Chen et al 2022; Keeler & Stevens 2022; Voith et al 2022). We initially create the typical model used in the literature, focusing on the difference in residential prices after the construction of a LIHTC project between houses near the completed project and houses located farther away. We look at two distance bands: one within ¼ mile of the LIHTC project and the second in the area between ¼ mile to ½ mile from the LIHTC project.[1] This model is illustrated in Equation 1 below:

$$(1)\ \ln(P_{itk}) = \sum_{d\in D} \alpha_{0d} Pre_{idt} + \sum_{d\in D} \alpha_{1d} Post_{idt} + \beta X_{it} + \varepsilon_k + \tau_t + \mu_{itk}\ ,$$

where

$\ln(P_{itk})$	is the natural log of the price of house *I* at time *t* in Census tract *k*;
D	is a set of distance bands *d*, where *D* = {0-1/4 miles, 1/4-1/2 miles}
Pre_{idt}	is a dummy variable equal to 1 if the transaction of house *i* in distance band *d* at time *t* is prior to the construction of a LIHTC project;
$Post_{idt}$	is a dummy variable equal to 1 if the transaction of house *i* in distance band *d* at time *t* is after the construction of a LIHTC project;
X_{it}	is a vector of hedonic characteristics of house *i* at time *t*;[2]
ε_k	is a vector of *k* tract-specific fixed effects;
τ_t	is a vector of *t* year-specific fixed effects;[3] and
μ_{itk}	is a random error variable.

[1] These are common distance bands in the literature (e.g., Diamond & McQuade 2019, Orlando & Welke 2022). We tested other distance bands and obtained very similar results.

[2] These hedonic characteristics include living area square footage, lot size square footage, floor-area ratio (FAR), age at sale, number of stories, distance to central business district (CBD), seller type, and seasonal dummies (spring, summer, fall).

[3] Time-specific fixed effects control for market-wide inflation, allowing us to use nominal house prices as the outcome variable.

We include all transactions – those within and outside of the distance bands – to provide a better estimate of the price trends within the overall market and to provide more data on the value of individual housing and neighborhood traits. The "average treatment effect"[4] is the difference between the pre-treatment and post-treatment coefficients ($\alpha_{1d} - \alpha_{0d}$) for a given distance band d.[5] We include the pre-treatment baseline explicitly to show how the LIHTC neighborhoods were different from the control neighborhoods before the introduction of the affordable housing property.

The resulting treatment effect compares the average change in property values of properties within the distance band with the average change in values of homes located more than ½ mile away, controlling for overall market-wide changes in prices. This control group offers a counterfactual for the average pre-post LIHTC change in property values of homes outside the distance bands. This is a typical counterfactual for spatial difference-in-differences studies, as these neighborhoods are located within the same metropolitan area and experience many of the same supply and demand shocks, especially after controlling for hedonic characteristics, tract-specific fixed effects, and year-specific fixed effects. Our approach focuses on the difference in levels before and after development, rather than the difference in trends, because previous research (e.g., Voith et al 2022) has demonstrated that level changes are the dominant impact. Assessing changes in levels also allows for a less complicated exposition of each model described below.

Having mirrored the standard model, we expand upon it by incorporating different factors associated with the treatment effect. One by one, we consider each of the six subcategorizations across which we expect to find different LIHTC effects.

When assessing the importance of neighborhood income and race/ethnicity composition, we subdivide the sample and run separate regressions for the different groups of neighborhoods. For income, we look at trends in low-income communities (those census tracts whose median household incomes fell in the bottom third of all Los Angeles tracts per the 2016 American Community Survey's 5-year estimates) and medium-to-high-income communities (the remaining tracts). For race/ethnicity, we use the same census tract tercile approach to analyze communities with high proportions of Black, Latino, Asian, and non-White residents, respectively. In each case,

[4] In other words, the typical price effect associated with a LIHTC development being placed in service.

[5] As with any difference-in-differences analysis with treatments in multiple periods, the amount of "pre" and "post" years available for each treatment depends on the timing of the treatment (i.e. the introduction of the LIHTC property).

the remaining two-thirds of the tracts serve as our "control group" for the analysis. We then estimate Equation 1 separately for each subsample.

Note that a single LIHTC development can have both high- and low-income neighborhoods within ½ mile of the development. Our split-sample subgroup approach is a clean way of estimating different LIHTC impacts in communities with different incomes and demographics.

Table 7 shows the differences in sample sizes for each category of analysis. Of the 1.8 million transactions in our whole sample, approximately 26% are located within ½ mile of a LIHTC development, as shown in column 2 (487,453). This ratio ranges from 10% for the low-income subsample to 45% for the high-Hispanic subsample. Even where it is lowest, however, we still have over 75,000 transactions, ensuring enough statistical power to detect significant effects.

Table 7 – Number of Transactions Near LIHTC by Racial / Ethnic Subsample

Sample	Transactions Within ½ Mile of LIHTC	Transactions More Than ½ Mile Away	Total Transactions
Whole Sample	487,453	1,355,272	1,842,725
Low % Non-White	282,395	1,059,632	1,342,027
High % Non-White	205,058	295,640	500,698
High % Black	252,599	342,078	594,677
Low % Black	234,854	1,013,194	1,248,048
High % Asian	111,384	473,298	584,682
Low % Asian	376,069	881,974	1,258,043
High % Hispanic	200,613	250,017	450,630
Low % Hispanic	286,840	1,105,255	1,392,095
Low Income	75,459	663,251	738,710
High Income	411,994	692,021	1,104,015

We cannot subdivide the sample easily to analyze the property value effects associated with different property-specific characteristics or for neighborhoods with multiple LIHTC developments. Too many transactions involve properties that fall within distance bands of different properties developed at different times. For these factors, we run a regression with the entire sample, each time focusing on the subcategory under consideration by adding a new, factor-specific variable as well as two different dummy variables. This approach allows for the examination of effects associated with each characteristic while controlling for nearby properties. See Equation 2 below:

$$(2)\ \ln P_{itk} = \sum_{d\in D} \alpha_{0d} Pre_{idt} + \sum_{s\in S}\sum_{d\in D} \alpha_{1ds} Post_{idst} + \beta X_{it} + \varepsilon_k + \tau_t + u_{idstk}\ ,$$

where:

Pre_{idt} is a dummy variable equal to 1 if the transaction of house *i* in distance band *d* at time *t* is prior to the construction of a LIHTC project; and

$Post_{idst}$ is a dummy variable equal to 1 if the transaction of house *i* in distance band *d* at time *t* is after the construction of a LIHTC project with either neighborhood or property characteristic *s*.

S is defined as one of the following sets of neighborhood or property characteristics:

1. *S* = {1 LIHTC project nearby, 2 LIHTCs projects nearby, 3+ LIHTC projects nearby};
2. *S* = {small LIHTC project, medium LIHTC project, large LIHTC project};
3. *S* = {mixed-income LIHTC project, fully subsidized LIHTC project}; or
4. *S* = {for-profit LIHTC developer; non-profit LIHTC developer}.

Table 8 – Number of Transactions Near LIHTC by Interaction Variable

Interaction Variable	For-Profit vs. Non-Profit	Subsidy	Project Size	Project Concentration
½+ Mile Away *	1,628,449	1,628,449	1,628,449	1,628,449
For-Profit	130,312			
Non-Profit	83,964			
Partially Subsidized		56,845		
Fully Subsidized		196,431		
Small Property			93,601	
Medium Property			70,935	
Large Property			49,740	
1 LIHTC Project				214,276
2 LIHTC Projects **				55,791
3+ LIHTC Projects **				18,058

* includes transactions of homes located more than ½ mile from a LIHTC property at the time of sale
** figures represent subsets of transactions located with ½ mile of a single property

Potential Endogeneity Issues

Our findings could reflect some implicit site selection bias, if developers have chosen to locate the LIHTC properties in neighborhoods whose values are already trending upward. We could potentially be observing existing appreciation trends, not changes associated with the introduction of the LIHTC property.

Two factors lend credence to the selection bias concern. First, developers are inherently more likely to locate properties in areas where they can obtain the greatest tax credit benefit. In their national analysis, Baum-Snow and Marion (2009) found that LIHTC properties in program-designated qualified census tracts (QCTs) had an average 6 more units than properties in tracts that fall just below the QCT eligibility threshold. Basolo, Huarita, and Won (2022) found a positive, statistically significant association between LIHTC neighborhoods and QCTs in Los Angeles County. Second, private developers are more likely to select properties in gentrifying – or at least appreciating – neighborhoods than in stable or declining ones (Baum-Snow & Marion 2009; Ellen & Voicu 2006).

To the extent that developers are seeking to maximize profits from rents or property appreciation, there is an incentive for them to build or rehabilitate properties in improving neighborhoods. While they may earn additional points in the LIHTC allocation process for targeting properties in QCTs or difficult development areas, they could deliberately target properties in distressed areas displaying clear signs of improvement. And if property values are already trending upward in these areas, it becomes harder to demonstrate convincingly that the LIHTC development is responsible for the observed appreciation of the local market. Well-crafted statistical models may be able to document a post-development trend in values that is steeper than the pre-development trend, but such findings prove inherently less noteworthy than those that document a distinct change in trends. Without knowledge of the developers' particular location decisions, it is hard to determine the extent to which observed neighborhood impacts should be attributed to the initial selection of the site.

Following standard DID methodology, we test for any observable evidence of such behavior by including a linear "pre-trend" (i.e. price trends prior to the LIHTC development) in the model. Within both the ¼-mile and ½-mile distance bands, the coefficient on this pre-trend is statistically insignificant—and within the ½-mile band, it is even negative. Thus, there is no empirical evidence indicating that price trends in the areas around LIHTC developments were any different from trends elsewhere in the market prior to the LIHTC development being completed.

Qualitative Approach

We supplement our quantitative analysis with interviews with LIHTC developers active in the Los Angeles market. Using our collective network of developers, lenders, public officials, and affordable housing advocates, we identified a list of individuals who had extensive experience developing LIHTC properties in the region. We specifically sought individuals who had experience with both for-profit and nonprofit developers – either by virtue of their work in both types of firms and/or through their interactions and joint ventures on particular projects. We ultimately were able to schedule interviews with six separate developers. While we cannot claim that these individuals speak for all developers in the market, our conversations with individuals throughout our various networks give us confidence that our interviewees are generally representative of Los Angeles area LIHTC developers.

We conducted our quantitative analyses prior to interviewing the developers. This approach gave us the opportunity to obtain context and some interpretation of our findings. We asked each developer standard questions about the six subcategorizations identified above, using the questionnaire included in Appendix A. As a way of teasing out the extent to which our findings merely captured pre-existing price trends (and thus were skewed by endogenous factors), we specifically asked each interviewee about the factors underlying different developers' site selection decisions. We incorporate the results of those interviews into our discussion of the findings.

Findings

We have divided this section into sub-parts, each of which contains our analysis of one of the specific project- or neighborhood-level factors described earlier. Within each subsection, we first provide a summary of our quantitative findings and then incorporate key insights from our developer interviews. By doing so, we work to provide a more nuanced understanding of the mechanisms underlying the observations.

LIHTC Spillover Effects in Los Angeles

To create a baseline set of housing price spillover effects, we use our simplest difference-in-differences model as a baseline (i.e. Equation 1 earlier). This model identifies the average effect of all LIHTC developments on surrounding home values. We show the key results in the "Neighborhoods with Any LIHTC Properties" columns of Table 9 below. (The full regression results—with all hedonic coefficients—are available in Appendix B.) Here we do not account for the implications of having LIHTC projects geographically concentrated and individual home sales falling within multiple distance bands. Instead, we designate a home sale as a "Pre" transaction if it occurs before the first LIHTC project is built in the area and a "Post" transaction if it occurs after that initial project is placed in service.

Table 9 - Baseline Model for LIHTC Price Effects in Los Angeles County

	Distance from LIHTC Property	**Neighborhoods with Any LIHTC Properties**	
		Coefficient	**T Stat (coefficients) / F Stat (treatment effects)**
Pre	0 – ¼ Mile	-0.037***	-5.37
Post		-0.004	-0.66
Effect		**0.034*** **	**15.96**
Pre	1/4 Mile – 1/2 Mile	-0.033***	-5.68
Post		-0.003	-0.51
Effect		**0.030*** **	**11.23**
Observations		1,842,725	
$\bar{R}^2$		0.7242	

Notes: Regressions control for Census tract fixed effects, year fixed effects, and the following property traits: living area square footage, lot size square footage, floor-area ratio (FAR), age at sale, number of stories, distance to central business district (CBD), seller type, and seasonal dummies (spring, summer, fall). Full results (with all hedonic coefficients) are available in Appendix B. Treatment effect is calculated manually from the differences in the regression coefficients, as described in the Methodology section. T-statistics are used for regression coefficients, and F-statistics are used for treatment effects. +p<0.1, *p<0.05, **p<0.01, ***p<0.001

Reading the table from top to bottom, the first set of estimates focuses on the transactions within ¼-mile of the LIHTC development. The "Pre" coefficient, -0.037, indicates that average home sale prices in the LIHTC neighborhoods were 3.7% lower than comparable transactions in non-LIHTC neighborhoods before the LIHTC development was completed. After a given LIHTC project was built, the "Post" coefficient, -0.004, indicates that average sale prices near the LIHTC

development were only 0.4% lower than comparable sale prices in non-LIHTC neighborhoods. Thus, the treatment "effect" is 0.034, the difference between Post and Pre, indicating that prices rose 3.4% more in LIHTC neighborhoods.

This positive, statistically significant effect is consistent with many of the studies cited earlier—and it is similar in magnitude to the most recent estimates, such as Diamond and McQuade (2019) and Voith et al (2022). If there is a negative, supply-driven effect as suggested by Eriksen and Yang (2022), it is significantly outweighed by the positive spillover effect of the high-quality LIHTC investment. While it is not possible to disentangle these two competing effects, we can conclude that these results represent a lower bound on the positive effects of the LIHTC investment itself, as it may or may not be attenuated by unobservable supply effects.

Moving farther down the table, the second set of estimates focuses on transactions within the ¼-to-½-mile band, where prices increased by 3.0% after the LIHTC development. Again, this result reflects the difference between the Post (-0.003) and Pre (-0.033) estimates, indicating that LIHTC neighborhoods had 3.3% lower prices before development and only 0.3% lower prices after development. In other words, once the LIHTC development was in service, the relative price differences nearly disappeared.

In our discussion below, the regression tables have a similar format. They incorporate more Post and Effect categories to document our estimates of LIHTC effects associated with each category of factors.

Project Size

Regardless of their size, LIHTC properties in Los Angeles County have generated positive effects on surrounding home values. In fact, the effects progressively have increased with the size of the LIHTC property, at least within the smallest distance band. We present our findings in Table 10 below. "Small" developments are those with 50 or fewer units, "medium" developments have between 51 and 100 units, and "large" developments have 101 or more units. Among the 833 Los Angeles properties in our sample, 381 qualify as small, 266 qualify as medium-sized, and 186 qualify as large. We indicate specific Post variables for "small" and "large" because "medium" is the reference category. In other words, the standard "Post" coefficient captures the "medium" project size, and the "Small Post" or "Large Post" coefficient must be added to "Post" to calculate the effect of small or large properties.

Table 10 - Property Value Effects of Different Size LIHTC Developments

	Distance from LIHTC Property	Coefficient	T Stat (coefficients) / F Stat (treatment effects)
Pre	0 – ¼ Mile	-0.037***	-5.37
Post		0.002	0.19
Small Post		-0.015	-1.38
Large Post		0.005	0.42
Small Property Effect		**0.024***	**5.75**
Medium Property Effect		**0.039*****	**13.34**
Large Property Effect		**0.044*****	**13.32**
Pre	1/4 Mile - 1/2 Mile	-0.033***	-5.67
Post		0.005	0.80
Small Post		-0.018	-1.56
Large Post		-0.003	-0.22
Small Property Effect		**0.021+**	**3.23**
Medium Property Effect		**0.038*****	**28.56**
Large Property Effect		**0.036****	**7.34**
Observations		1,842,725	
$\bar{R}^2$		0.7242	

Notes: The regression controls for Census tract fixed effects, year fixed effects, and the following property traits: living area square footage, lot size square footage, floor-area ratio (FAR), age at sale, number of stories, distance to central business district (CBD), seller type, and seasonal dummies (spring, summer, fall). Full results (with all hedonic coefficients) are available in Appendix B. Treatment effect is calculated manually from the differences in the regression coefficients, as described in the Methodology section. T-statistics are used for regression coefficients, and F-statistics are used for treatment effects. +p<0.1, *p<0.05, **p<0.01, ***p<0.001.

Regression results indicate a greater LIHTC spillover effect from medium and large properties than from small ones. Within ¼ mile of the LIHTC project, the largest properties have the highest spillovers, but in the ¼ to ½ distance band, the medium properties' effect surpasses that of large ones. And within both distance bands, the difference in spillover effects between small and medium sized LIHTC properties is greater than the difference between medium and large developments. That suggests that, while larger projects generally have a larger effect, the marginal benefit decreases – and potentially even stops or reverses – once the project reaches a certain size. Because we did not include a continuous unit number variable in our analysis, we cannot comment on what that threshold might be.

Importantly, we found no negative price effects associated with the introduction of larger LIHTC properties into a neighborhood. This finding refutes the perception – identified in a few previous studies – that larger properties could have deleterious neighborhood impacts. That said, the "success" of a larger project cannot be taken for granted. Several developers with whom we spoke emphasized the importance of addressing community concerns about larger LIHTC developments early in the planning process. The developers frequently encountered resistance to larger planned projects from area residents concerned about the additional traffic and parking difficulties that increased population density could bring. Some residents also had concerns about increased crime and other negative stereotypes associated with "those people" – the low-income people of color that tend to occupy many of the region's LIHTC properties.

Alleviating the concerns often required conscious and concerted efforts on the part of the developers to address and ameliorate local residents' reservations. Contending that a "thoughtful LIHTC project only enhances a neighborhood," several interviewees described their emphasis on extensive community programming when designing and carrying out a development. They engage regularly with local residents to help them understand and (ideally) benefit from the new housing. The developers believe that a project's success depends in large part on the quality of its construction and management, its architectural design, and the supportive services provided to its tenants. Another interviewee noted that "we've only ever had positive impacts" for his firm's projects, attributing the positivity to the considerable time spent during the development process educating nearby residents about "them" (the likely tenants) and the steps the developer takes to help the tenants and the development integrate seamlessly within the community.

Fully v. Partially Subsidized Developments

Both fully subsidized and partially subsidized LIHTC developments have positive and often significant effects on surrounding property values.[6] We define partially subsidized or "mixed" developments as those with six or more market-rate units. In Los Angeles, 6.72% of the LIHTC developments placed in service between 1987 and 2016 meet this "mixed" criterion.[7] We treat

[6] We cannot rule out the possibility that the low significance for the partially subsidized properties is a result of the limited number of such properties.

[7] As discussed in more detail later, the severe shortage of affordable housing in southern California contributes to the relatively low proportion of partially subsidized properties in the Los Angeles market. Recent changes to the LIHTC allocation process in the state have created additional incentives for developers to maximize the number of affordable units in their properties.

these mixed developments as the default "Post" variable in our analysis and add another dichotomous variable for properties with fewer than six market rate units (i.e. fully subsidized developments). Again, the effect of fully subsidized properties on surrounding property values can be determined by adding the coefficient of this dichotomous variable to the "Post" variable. For example, reading the coefficients from top to bottom in Table 11, the Pre variable indicates that property prices were 3.7% lower in LIHTC neighborhoods than non-LIHTC neighborhoods before the LIHTC development was completed, the Post variable indicates that they were 1.6% higher after a partially subsidized development, and therefore the Partially Subsidized Property Effect was an increase of 5.4%. By comparison, property prices were 2.2% lower after a fully subsidized development ("Fully Subsidized Post" coefficient), and therefore the Fully Subsidized Property Effect was an increase of 3.2%.

Table 11 - Property Value Effects of Partially vs. Fully Subsidized LIHTC Developments

	Distance from LIHTC Property	**Coefficient**	**T Stat (coefficients) / F Stat (treatment effects)**
Pre	0 – ¼ Mile	-0.037***	-5.37
Post		0.016	0.57
Fully Subsidized Post		-0.022	-0.74
Partially Subsidized Property Effect		**0.054+**	**3.17**
Fully Subsidized Property Effect		**0.032*** **	**15.36**
Pre	1/4 Mile – 1/2 Mile	-0.033***	-5.70
Post		0.005	0.22
Primarily Subsidized Post		-0.008	-0.40
Partially Subsidized Property Effect		**0.038**	**2.24**
Fully Subsidized Property Effect		**0.029*** **	**12.82**
Observations		1,842,725	
$\bar{R}^2$		0.7242	

Notes: Regression controls for Census tract fixed effects, year fixed effects, and the following property traits: living area square footage, lot size square footage, floor-area ratio (FAR), age at sale, number of stories, distance to central business district (CBD), seller type, and seasonal dummies (spring, summer, fall). Full results (with all hedonic coefficients) are available in Appendix B. Treatment effect is calculated manually from the differences in the regression coefficients, as described in the Methodology section. T-statistics are used for regression coefficients, and F-statistics are used for treatment effects. +p<0.1, *p<0.05, **p<0.01, ***p<0.001.

Partially subsidized developments have a larger, but not necessarily statistically significant effect in both distance bands. This suggests that including some market-rate units within a

development is likely to generate greater spillover effects within the surrounding neighborhood. Yet in Los Angeles, the competition for tax credits has led developers to move away from such "mixed" properties. Each developer with whom we spoke now focuses primarily on fully subsidized properties serving very low-income households. Several nonprofit developers always have focused on providing housing to tenants well down the income ladder. Two of our interviewees' current firms have in their portfolios substantial numbers of supportive housing units affordable to tenants earning 40% or less of AMI. One of the region's larger nonprofit developers typically serves households earning less than 50% of AMI in developments it has financed with 9% LIHTCs, while primarily housing tenants with incomes closer to 60% of AMI in properties financed with the shallower 4% credits.

One of the for-profit interviewees emphasizes that the competitiveness of the LIHTC program drives developers' decisions around unit affordability. His firm would prefer to develop properties that primarily serve households earning between 50 and 60% of AMI, because the profit margins are much tighter when units are set aside for tenants earning closer to 30% of AMI (especially if those tenants do not have vouchers to help subsidize their rents). Yet to receive maximum points on a tax credit application, the firm needs to commit to serving households earning as little as 30% of AMI.

The high costs of land and construction in the Los Angeles area make it difficult to finance LIHTC properties containing market-rate units. Non-LIHTC public funds generally cannot be used for market-rate units, so the development of a mixed property inevitably involves separating the market-rate and affordable units into distinct condominium-like entities. It becomes necessary to attract private, non-LIHTC related equity to finance the market-rate properties.

The California Housing Finance Authority operates a Mixed Income Program that helps support properties serving renters earning between 30 and 120 percent of AMI. Yet for all practical purposes, the program is useful only for properties with a relatively small proportion of affordable units. Many municipalities in the state now have inclusionary zoning ordinances that require market-rate apartment properties to set aside at least 15% of their units for low-income households. According to one interviewee, including much more than the minimum requirement subjects the developer to financing constraints. "There's a real sensitivity among [conventional] lenders and investors once a project has more than 20% affordable units," and that sensitivity leads to a reluctance to commit capital.

Another interviewee explains that "the economics don't really support a mixed-income approach." In Los Angeles, the costs of development exceed the rents that are affordable to low- and moderate-income households – even for households making as much as 140% of AMI. As a result, all units in a development effectively need to be subsidized to be affordable. Given the limited amounts of public subsidy available, it makes more sense financially to maximize the number of units that can receive LIHTC-related capital. Moreover, property owners generally are exempt from property taxes on units designated as affordable to households making 80% or less of AMI; that exemption disappears for units renting to households above the 80% threshold. Not surprisingly, LIHTC developers in the region now tend to undertake partially subsidized projects only if they are large, part of a broader development, and present an opportunity for a substantial financial return.

For-Profit vs. Non-Profit Developer

While both for-profit and nonprofit sponsored LIHTC developments have positive effects on surrounding home values, the effects of the for-profit projects appear to be greater. Within ¼-mile of a for-profit LIHTC property, the observed increase in home values is nearly twice as large as the effect on homes near a nonprofit development (4.0% v. 2.1%).[8] Similarly, for-profit properties have a greater effect on properties located between ¼ and ½ mile from the LIHTC site. Table 12 presents the results, with the Post coefficient representing nonprofit sponsored developments.

Table 12 - Property Value Effects of Non-Profit vs. For-Profit Sponsored LIHTC Developments

	Distance from LIHTC Property	Coefficient	T Stat (coefficients) / F Stat (treatment effects)
Pre	0 – ¼ Mile	-0.038***	-5.43
Post		-0.017	-1.35
For-Profit Post		0.019	1.42
Non-Profit Treatment		**0.021+**	**2.84**
For-Profit Treatment		**0.040*** **	**15.51**
Pre	1/4 Mile – 1/2 Mile	-0.033***	-5.72

[8] Throughout this paper, we interpret the coefficients as percentages, which is the common protocol in the literature when the outcome variable is a natural logarithm. We could be slightly more precise by converting all coefficients using exponential functions, but readers often find this approach more confusing when they try to compare the table to the text.

Post		-0.014	-1.31
For-Profit Post		0.013	1.36
Non-Profit Treatment		**0.019**	**2.42**
For-Profit Treatment		**0.032*** **	**11.84**
Observations		1,842,725	
$\bar{R}^2$		0.7242	

Notes: Regression controls for Census tract fixed effects, year fixed effects, and the following property traits: living area square footage, lot size square footage, floor-area ratio (FAR), age at sale, number of stories, distance to central business district (CBD), seller type, and seasonal dummies (spring, summer, fall). Full results (with all hedonic coefficients) are available in Appendix B. Treatment effect is calculated manually from the differences in the regression coefficients, as described in the Methodology section. T-statistics are used for regression coefficients, and F-statistics are used for treatment effects. +p<0.1, *p<0.05, **p<0.01, ***p<0.001.

What accounts for the observed difference between for-profit and nonprofit-developed properties? One of the interviewees, who has worked for both nonprofit and for-profit development firms, contends that a "decent LIHTC deal is no different from any other multifamily property," at least not architecturally. He believes that a well-designed and well-managed LIHTC property should have the same effect as any other residential development on the surrounding community. Yet developers have different goals when building or rehabilitating a property, and those differing motivations likely influence both the extent and type of their spillover potential.

According to the nonprofit developers with whom we spoke, stabilizing or revitalizing the surrounding community often is at best a secondary goal for a project. Their overriding interest lies in ensuring that cost-burdened households have an affordable and safe place to live. One organization, for example, focuses primarily on alleviating and preventing homelessness. It looks for sites that can support both affordable housing units and a range of ancillary human services for its targeted very low-income population; its principal (or even sole) concern is its clientele, not the broader neighborhood. Given space needs, its projects frequently are in less residential neighborhoods, areas where there is less obvious opportunity for influence single-family home prices. Another nonprofit development organization focuses chiefly on properties that can help alleviate the region's affordable housing shortage. While the organization aspires to help facilitate community development, it realizes that many of its projects are unlikely to have much catalytic spillover impact. "Some developments are just developments – most, in fact – while others have more possibility for catalyzing neighborhood revitalization," explains the firm's President and CEO. Some properties are inherently more self-contained by virtue of their location or population

(those serving senior citizens or the disabled, for instance), while others are more clearly part of a neighborhood.

In contrast, the economic considerations underlying for-profit developments appear to lead such developers to focus more consistently on the ramifications of their properties on the local market. A typical for-profit firm frequently looks to secure properties – especially vacant sites – whose development can help catalyze investment in the surrounding area. Development team members join local community crime watch groups, erect fencing around the site, hire security, and generally work to ensure a safe environment. Post-construction, the firm imposes very strict rules on who can live in or visit the property, employs national property management companies and offers extensive programming for tenants' children. These steps help ensure that the development is well-received within the community and contributes to its overall improvement. Ideally, that positive experience can help translate into political support for subsequent developments by the firm – either in that community or in others nearby. For-profit LIHTC developers often are engaged in non-LIHTC development as well and are routinely seeking out sites for their next projects. In the competitive real estate environment that is Los Angeles, strong community support can make the difference in bids for desirable sites.

Neighborhood Income Level

LIHTC developments have had positive price effects across both lower and higher-income neighborhoods throughout Los Angeles. We define "low-income" communities as those census tracts whose median household incomes were in the bottom third of all census tracts throughout Los Angeles. "Medium- and high-income" tracts are those in the top two thirds. We base the incomes on the 5-year estimates in the 2016 American Community Survey. We present the findings for both sets of neighborhoods in Table 13 below.

Table 13 - Neighborhood Income Models

	Distance from LIHTC Property	All Neighborhoods		Low Income		Medium-to-High Income	
		Coefficient	T/F Stat	Coefficient	T/F Stat	Coefficient	T/F Stat
Pre	0 – 1/4 Mile	-0.037***	-5.37	-0.099***	-6.20	-0.032***	-4.91
Post		-0.004	-0.66	-0.021	-1.35	0.012*	2.05

Effect		**0.034*** **	15.96	**0.078*** **	**18.91**	**0.044*** **	**29.08**
Pre	1/4 Mile - 1/2 Mile	-0.033***	-5.68	-0.077***	-5.42	-0.030***	-5.61
Post		-0.003	-0.51	0.004	0.22	0.009+	1.77
Effect		**0.030*** **	**11.23**	**0.080*** **	**21.25**	**0.039*** **	**23.47**
Observations		1,842,725		738,710		1,104,015	
$\bar{R}^2$		0.7242		0.7033		0.6237	

Notes: Regressions control for Census tract fixed effects, year fixed effects, and the following property traits: living area square footage, lot size square footage, floor-area ratio (FAR), age at sale, number of stories, distance to central business district (CBD), seller type, and seasonal dummies (spring, summer, fall). Full results (with all hedonic coefficients) are available in Appendix B. Treatment effect is calculated manually from the differences in the regression coefficients, as described in the Methodology section. T-statistics are used for regression coefficients, and F-statistics are used for treatment effects. +p<0.1, *p<0.05, **p<0.01, ***p<0.001.

The effects are greater in low-income communities, where values have increased by between 7.7% and 8.0% relative to similar neighborhoods with no LIHTC developments. These effects are roughly twice the size of those in more affluent communities. Yet even in these medium- and high-income neighborhoods, the presence of a LIHTC development increases surrounding home values by about 4%. In Los Angeles, fears that LIHTC properties will depress local home values do not conform to the data.

Neighborhood Race and Ethnicity

We find little difference in the direction or size of LIHTC price effects in predominantly White and predominantly non-White neighborhoods.[9] Drawing upon the 2016 American Community Survey data, we define "High Non-White" tracts as those whose proportion of minorities is among the top third of all Los Angeles census tracts. Conversely, "Low and Medium Non-White" tracts are those in the bottom two thirds of the distribution. In both types of neighborhoods, LIHTC properties have positive effects on surrounding house prices, with the effects dissipating slightly as the distance from the LIHTC site increases. While we observe slightly higher price effects in communities with higher proportions of White residents, those differences are not statistically significant. Table 14 presents the findings.

Table 14 - Neighborhood Race / Ethnicity Models (1)

[9] "White" is defined as those who identify as White regardless of ethnicity; non-White is everyone else.

	Distance from LIHTC Property	All Neighborhoods		High Non-White		Low-to-Medium Non-White	
		Coefficient	T/F Stat	Coefficient	T/F Stat	Coefficient	T/F Stat
Pre	0 – ¼ Mile	-0.037***	-5.37	-0.024**	-3.21	-0.048***	-4.86
Post		-0.004	-0.66	0.008	1.12	-0.010	-1.15
Treatment		**0.034*** **	**15.96**	**0.032*** **	**15.56**	**0.038** **	**7.33**
Pre	1/4 Mile - 1/2 Mile	-0.033***	-5.68	-0.026***	-4.96	-0.038***	-3.85
Post		-0.003	-0.51	0.004	0.76	-0.005	-0.56
Treatment		**0.030*** **	**11.23**	**0.030*** **	**29.68**	**0.033***	**3.91**
Observations		1,842,725		500,698		1,342,027	
$\bar{R}^2$		0.7242		0.6872		0.7273	

Notes: Regressions control for Census tract fixed effects, year fixed effects, and the following property traits: living area square footage, lot size square footage, floor-area ratio (FAR), age at sale, number of stories, distance to central business district (CBD), seller type, and seasonal dummies (spring, summer, fall). Full results (with all hedonic coefficients) are available in Appendix B. Treatment effect is calculated manually from the differences in the regression coefficients, as described in the Methodology section. T-statistics are used for regression coefficients, and F-statistics are used for treatment effects. +p<0.1, *p<0.05, **p<0.01, ***p<0.001.

We take a similar methodological approach to identify any differences in price effects across communities with high proportions of Asian, Black, and Hispanic residents. Again, we use Census data to determine the proportion of each population group within a census tract and then run our model with the top third and bottom two-thirds (by proportion) of tracts within the county. We present these findings in Table 15.

Table 15 – Neighborhood Race / Ethnicity Models (2)

	Distance from LIHTC Property	High Asian		Low-to-Medium Asian	
		Coefficient	T/F Stat	Coefficient	T/F Stat
Pre	0 – ¼ Mile	-0.050***	-4.07	-0.035***	-4.44
Post		0.011	1.16	-0.006	-0.88
Treatment		**0.061*** **	**20.36**	**0.028** **	**9.56**
Pre	1/4 Mile - 1/2 Mile	-0.033***	-4.31	-0.034***	-5.00
Post		0.006	0.81	-0.005	-0.69
Treatment		**0.039*** **	**11.63**	**0.029** **	**7.91**
Observations		584,682		1,258,043	
$\bar{R}^2$		0.7249		0.7194	

	Distance from LIHTC Property	High Black		Low-to-Medium Black	
		Coefficient	T/F Stat	Coefficient	T/F Stat
Pre	0 – ¼ Mile	-0.032**	-3.16	-0.049***	-4.75
Post		0.008	0.98	-0.002	-0.27
Treatment		**0.039*** **	**13.10**	**0.047** **	**10.43**
Pre	1/4 Mile - 1/2 Mile	-0.042***	-6.32	-0.032***	-4.03
Post		0.001	0.11	0.005	0.60
Treatment		**0.043*** **	**18.10**	**0.037** **	**10.22**
Observations		594,677		1,248,048	
$\bar{R}^2$		0.6476		0.7356	
	Distance from LIHTC Property	**High Hispanic**		**Low-to-Medium Hispanic**	
		Coefficient	**T/F Stat**	**Coefficient**	**T/F Stat**
Pre	0 – ¼ Mile	-0.022*	-2.43	-0.055***	-5.91
Post		0.019**	2.94	-0.007	-0.80
Treatment		**0.040*** **	**11.74**	**0.047*** **	**12.45**
Pre	1/4 Mile - 1/2 Mile	-0.023***	-4.55	-0.043***	-4.33
Post		0.017*	2.48	-0.006	-0.60
Treatment		**0.040*** **	**18.26**	**0.037***	**5.13**
Observations		450,630		1,392,095	
$\bar{R}^2$		0.5930		0.7221	

Notes: Regressions control for Census tract fixed effects, year fixed effects, and the following property traits: living area square footage, lot size square footage, floor-area ratio (FAR), age at sale, number of stories, distance to central business district (CBD), seller type, and seasonal dummies (spring, summer, fall). Full results (with all hedonic coefficients) are available in Appendix B. Treatment effect is calculated manually from the differences in the regression coefficients, as described in the Methodology section. T-statistics are used for regression coefficients, and F-statistics are used for treatment effects. +p<0.1, *p<0.05, **p<0.01, ***p<0.001.

Generally, the more race- and ethnicity-specific models follow the same pattern as the initial non-White model. Regardless of the race or ethnicity used to classify Census tracts, we find that LIHTC projects have a significant positive effect on surrounding house prices within both the 0-to-1/4-mile band and the 1/4-to-1/2-mile band. In the narrowest band where houses are most likely to be affected by LIHTC investment, within ¼ mile of a development, the LIHTC price effect is largest for neighborhoods with a high proportion of Asian residents (6.1%) and second largest for areas with a low-to-medium proportion of Black and Hispanic residents (4.7% in both cases). The

latter statistic is particularly important, as it contradicts the common concern that LIHTC investment will be less advantageous to neighborhoods with predominantly White residents.

LIHTC Project Concentration

The introduction of subsequent LIHTC properties in a neighborhood tends to build on the positive price effects associated with the initial LIHTC development. We incorporate multiple "Post" variables for each distance band, with each such variable representing whether there are 1, 2, or 3 or more LIHTC projects present nearby when a given transaction occurs. The coefficients in the "Neighborhoods with 1, 2, or 3 LIHTC Properties" columns in Table 16 reflect the marginal effect of each successive LIHTC project on homes within the overlapping distance band areas. (We present the original price effect model findings in the "Neighborhoods with Any LIHTC Properties" columns as points of reference.)

The coefficient for the Pre variable in the ¼-mile band indicates that home prices are 3.5% lower in the LIHTC neighborhoods relative to non-LIHTC neighborhoods, prior to the completion of any LIHTC projects. After the first LIHTC property is placed in service (Post1), average prices in the LIHTC communities are only about 0.6% lower than those in the non-LIHTC areas. Therefore, the first LIHTC project leads to a 3.0% (with rounding) increase in home prices. Adding a second project to the neighborhood does not significantly change the impact observed from the first project. Yet the addition of a third LIHTC development in the area significantly increases the overall spillover price effect. It is unclear why the introduction of a third LIHTC property has a greater (and more positive) effect than the introduction of a second such property, but these results are consistent with the recent study of Chicago LIHTC price effects (Voith et al. 2022), which took a similar modeling approach.

Table 16 - Baseline Model vs. Neighborhood LIHTC Concentration (Overlap) Model

	Distance from LIHTC Property	Neighborhoods with Any LIHTC Properties		Neighborhoods with 1, 2, or 3 LIHTC Properties	
		Coefficient	T/F Stat	Coefficient	T/F Stat
Pre	0 – ¼ Mile	-0.037***	-5.37	-0.035***	-5.16
Post1		-0.004	-0.66	-0.006	-0.95
Post2				-0.002	-0.24

Post3				0.074**	2.70
Effect1		**0.034*** **	15.96	**0.030*** **	**13.31**
Effect2				**0.027***	**5.30**
Effect3				**0.101*** **	**12.07**
Pre	1/4 Mile - 1/2 Mile	-0.033***	-5.68	-0.032***	-5.64
Post1		-0.003	-0.51	-0.006	-1.12
Post2				0.001	0.07
Post3				0.049***	4.70
Effect1		**0.030*** **	**11.23**	**0.026*** **	**11.11**
Effect2				**0.027+**	**3.69**
Effect3				**0.076*** **	**20.86**
Observations		1,842,725		1,842,725	
$\bar{R}^2$		0.7242		0.7242	

Notes: The regressions control for Census tract fixed effects, year fixed effects, and the following property traits: living area square footage, lot size square footage, floor-area ratio (FAR), age at sale, number of stories, distance to central business district (CBD), seller type, and seasonal dummies (spring, summer, fall). Full results (with all hedonic coefficients) are available in Appendix B. Treatment effect is calculated manually from the differences in the regression coefficients, as described in the Methodology section. T-statistics are used for regression coefficients, and F-statistics are used for treatment effects. +p<0.1, *p<0.05, **p<0.01, ***p<0.001

The positive price effects from adding subsequent LIHTC properties to a neighborhood apply up to ½ mile from the LIHTC sites. Not surprisingly, the price effects within ¼ mile from the LIHTC sites are greater than those between ¼ and ½ mile from the properties.[10]

Project Siting

We find consistently positive price effects associated with LIHTC developments in Los Angeles – regardless of the characteristics of the properties or the surrounding neighborhoods. What remains somewhat unclear are the underlying factors that are helping to bring about these improvements.

As we noted earlier, one possible explanation for some of the observed effects is simple endogeneity: developers are choosing to build or rehabilitate properties in neighborhoods whose prices already are trending upward. We might simply be measuring baked-in effects. Yet each

[10] The actual price effects could be greater than those we have reported. It is possible that prices may begin trending upward once plans for the development are announced, when the developer receives a formal allocation of tax credits, and/or when ground is broken on the project. Thus the actual pre-development, pre-announcement home values in the LIHTC neighborhoods may be lower than the reported average.

developer with whom we spoke downplayed the role local real estate market factors play in the selection of LIHTC project sites. One of our interviewees has spent multiple decades in the affordable housing industry as an investor, developer, and advocate. To him, the local market is "irrelevant" when considering sites for prospective LIHTC development, saying "it doesn't help the project in any way." Another agrees that "local price trends don't come into play because [LIHTC unit] rents are too deeply subsidized."

Since rents in LIHTC-subsidized units are tied to area median incomes, the only way a developer can realize additional revenues from those units is through an overall increase in AMI. An increase in local market rents has no effect on the economic returns from subsidized units. Furthermore, the rent restrictions last for at least 15 years, well beyond the point at which current trends can predict future rents and land values. LIHTC developments receiving certain state subsidies are subject to California's 55-year affordability requirements.

In theory, developers could undertake LIHTC projects with the expectation of selling their interest after 15 years and realizing a significant capital gain from the property's appreciated value. Yet nonprofit developers frequently have no intention of ever selling their LIHTC properties; some impose ground leases that ensure the properties' affordability for up to 99 years. Many for-profits developers take a similar "long-term hold" approach, meeting their economic return thresholds from developer fees and ongoing rents.

Local market conditions factor into site selection decisions for projects with a mix of subsidized and market-rate units. Such projects tend to involve for-profit developers (either alone or in a joint venture with a nonprofit), and those firms certainly look for properties that can command higher rents for their market-rate units. Yet because of the intensity of the competition for LIHTC allocations and related public bond financing, and the reality that applicants generally receive more points in the allocation process for promising higher proportions of affordable units, new mixed-income affordable housing developments are relatively rare now in Los Angeles. (They were more prevalent 8-10 years ago, when competition for allocations was less severe.) In the current environment, such projects tend to occur only when necessary to satisfy local zoning regulations. In effect, a mixed-income property is "really a market-rate deal with a small amount of affordability for political or financing reasons," according to one of our interviewees.

Nonprofit developers also may deliberately target properties in gentrifying areas such as Boyle Heights neighborhood and the low-income communities near the University of Southern

California. They do so not for the property's appreciation potential, but rather as a way of preserving existing affordable housing and preventing the displacement of lower-income residents. LIHTC financing becomes a tool to help residents afford to continue living in their communities.

If developers are not basing their site decisions on local market trends, what are their primary considerations? Four key factors influence the location of LIHTC developments in greater Los Angeles:

1. Site Availability

Although Los Angeles does not have the development density of some other markets, it has relatively few sites available for multi-family rental properties. Some developers undertake projects primarily in response to specific requests for proposals (RFPs) issued by local housing agencies. The agency typically has control of one or more specific parcels of land and is searching for the best strategy for developing it as affordable housing. RFP respondents therefore have limited, if any, flexibility in the location of their proposed development.

Other developers pro-actively seek out properties for construction or rehabilitation, often in partnership with a local community organization. The challenge, of course, is that many desirable properties either are not up for sale or are too costly for an affordable housing development. Few developers have the financial luxury of waiting indefinitely for a favored site to come on-line. Some for-profit firms will pay a premium for a desirable property, but the success of that approach still depends on the willingness of the existing landowner to work with the developer. For every property a typical firm acquires, it analyzes between 25 and 50 potential sites.

2. Project's Economic Feasibility

A potential site and the desired development must be both physically and economically feasible. Each of the developers with whom we spoke emphasized that "the deal has to pencil out financially" to be considered. Among the factors developers must account for are the shape and contours of the site, which help determine the potential size of the building(s) and the difficulty of the construction or rehabilitation process. They also need to weigh the costs of gaining control of the property, carrying out any necessary environmental remediation, and (potentially) relocating tenants during the construction period.

Separate from the actual development costs are zoning considerations. Local land use plans must already allow for multi-family development or be flexible enough to incorporate such activities. Moreover, developers need to identify any existing entitlements or other constraints that could affect the proposed project. Not surprisingly, many potential properties are not suitable or feasible for affordable multi-family housing.

3. Extent of Local Political Support

Perhaps the most salient factor when considering sites for LIHTC projects is the extent of local support for the proposed development. The developers we interviewed noted that they "almost always" encounter some community opposition to a proposed affordable housing project. Developments targeting seniors and working adults generate less concern than those designed for the homeless and families with children, but virtually every proposed project generates some local opposition. For nonprofit organizations developing "special needs housing," achieving 70% or greater local support represents the targeted benchmark. They consequently devote considerable time and energy to local outreach during a project's pre-development stage to help assuage resident concerns and alleviate local opposition.

The support – or at least neutrality – of local public officials is critical for a project to move forward in Los Angeles, particularly if the developer is pursuing any public funding for the project. This effectively applies to all projects, since a commitment of local funding enhances a project's competitiveness for tax credits. As one of our interviewees attested, "political support is mandatory" for a LIHTC development to be successful. "You don't want to drive a square peg into a round hole … and you're looking for the least amount of resistance to complete a project in a reasonable time frame."

Local political support is not always forthcoming, however, even in communities with an objective need for more affordable housing. One of the nonprofit developers interviewed contends that Angelenos generally are "very aware of the lack of affordable housing" in the city but have limited knowledge of the steps that need to be taken to address the problem. Educating them about the importance of taking advantage of favorable properties can be "difficult." For an organization that focuses primarily on housing for the homeless, the fate of its developments depends almost entirely on the support of the local city council member. These individuals are not always supportive, and if they are not, their colleagues will not over-rule them. Various local dynamics

play into council members' decisions. One current council member, for instance, historically has been supportive of affordable housing development but has imposed an unofficial moratorium on new such developments in his neighborhood because he feels that it has too much affordable housing right now.

4. Competitiveness for LIHTCs & Other Public Resources

In California, competition for LIHTC allocations, state affordable housing bonds, and various other public subsidies has become hyper-competitive due to the broad acknowledgement of the imperative to address the state's growing homeless population and its expanding deficit of affordable housing. The increased competition has changed the dynamics surrounding project selection and prioritization, with developers increasingly focused on structuring planned developments in ways that can maximize their likelihood of scoring well in the application review. With finite resources available and a limited number of application periods, developers must be ready to make their best presentations during those application windows.

Applicants receive additional points for projects located in designated areas such as QCTs and difficult to develop areas (DDAs) – communities with high land, construction, and utility costs relative to the median income. Allocators also look more favorably on proposed developments near amenities such as public transit and grocery stores. Developments whose financing limits the use of state bond proceeds to the portion of the property serving the lowest-income renters also tend to score higher.

Implications for Policy & Future Research

Our analysis demonstrates the widespread, positive spillover price effects associated with LIHTC properties in Los Angeles. It explicitly refutes the pervasive perception among certain politicians and policy makers that such developments somehow worsen neighborhood economic conditions. Even in predominantly White, middle- to upper-income neighborhoods, LIHTC developments have positive effects on local home values. Moreover, residents should not be concerned about the introduction of a subsequent LIHTC property in the community; the concentration of such properties typically has an additive effect on values. We find that larger-scale LIHTC projects and fully subsidized developments tend to bring about greater spillover

benefits to the surrounding neighborhoods, and such positive effects are not only found in projects sponsored by non-for-profit developers, but also by for-profit developers.

From a policy perspective, the key takeaway is that LIHTC developments, in addition to creating and preserving badly needed housing that is affordable to low-income households, have consistently positive effects on surrounding property values. There is not a "bad" place for such properties to be developed, nor is there a "bad" type of LIHTC development. Regardless of the development's size or the neighborhood in which it is placed into service, a LIHTC property is likely to have a positive spillover effect on its neighborhood.

Are there types of properties or types of neighborhoods that are likely to produce more positive spillover effects than others? Perhaps – we identified some differences in spillover price effects associated with some project- and neighborhood-level factors. Yet it is important to note that these differences, while potentially significant statistically, are not meaningfully different economically. At most, they may reflect a percentage point or two difference. While not insignificant, the variation is hardly enough to spend considerable time and energy searching for the "best" fit of development and neighborhood. After all, the property value effects ultimately are a secondary benefit of the LIHTC development; the primary benefit remains the affordable housing it supplies for low-income people.

Moreover, trying to identify the ideal project and neighborhood rarely is realistic, given the inherent political and economic constraints developers must negotiate. In a city such as Los Angeles with relatively little land available for development, finding a suitable property in an area whose residents are supportive of affordable housing is its own challenge. Developers often have to take advantage of whatever opportunities are available; they do not have the luxury of waiting for the highest-impact scenario, particularly since there is no guarantee that a given development will obtain an allocation of LIHTCs and other subsidies.

Of course, some of these findings and accompanying conclusions could be specific to Los Angeles. The city's well-publicized problem with homelessness and its severe – and widely acknowledged – shortage of affordable housing have resulted in the passage of several public ordinances to encourage more LIHTC and other affordable housing development. Los Angeles continues to be one of the country's strongest real estate markets, with many of its neighborhoods experiencing substantial home price appreciation in the past few years. These and other factors

create an environment that is conducive to positive LIHTC spillover price effects. It is important to see if our findings can be replicated in weaker and smaller urban markets throughout the country.

We have presented rising property values as inherently beneficial for a community. They certainly benefit local property owners, but they simultaneously can disadvantage local renters. Rising values typically translate into higher rents; like many other cities throughout the country, Los Angeles has experienced double-digit average annual rent increases in the past few years. Ironically, the introduction of a LIHTC property in a community could conceivably reduce the housing affordability for other renters in the area. To date, there has been little research – in Los Angeles or elsewhere – on the spillover rental ramifications of creating affordable housing in a neighborhood.

More generally, it is important to understand the precise mechanisms that contribute to the observe price appreciation around LIHTC properties. If site selection itself is not contributing significantly to the observed changes – as our quantitative and qualitative research suggests – then we need to identify the factors that are driving the change. How much is a result of additional population density in the community – density that can shape investors' perception of the community's appeal? To what extent is the improvement driven by the replacement of a vacant or under-utilized, potentially deteriorating property into a more positive community asset? How much of the effect results from active and capable property management? Answering these questions provides fruitful avenues for future research.

Declarations of Interest

Andrew Jakabovics is employed by Enterprise Community Partners, whose subsidiary, Enterprise Community Investments (ECI), syndicates LIHTCs. While ECI may have syndicated tax credits attached to properties analyzed in this study, all our data came from public datasets and independent proprietary sources. No ECI employees or resources participated in the research.

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Appendix A. Los Angeles LIHTC Developer Questions

1. **First, how did you choose the particular location for your LIHTC development?**

    a. How did the LIHTC allocation criteria affect your decision?

    b. How difficult was it to find available land / properties?

    c. What local market dynamics affected your decision? For instance, did you take into account local crime rates? Did you focus more on areas with appreciating property values? Did you focus on areas where community organizations were actively encouraging affordable housing development?

    d. How supportive was the community of your planned development? Did their support / opposition affect your decision to develop the property – or the characteristics of the development?

2. **What was your targeted mix of tenant incomes in the property?**

    a. What was the financial / mission rationale behind that goal?

    b. Were you successful in achieving the desired mix? Why or why not?

    c. Since the building has been operational, how has the tenant mix changed? What has been the rate of tenant turnover?

    d. Has the turnover rate been about what you expected? What factors have you found to be most important in attracting and keeping tenants?

3. **How (if at all) has the property affected the dynamics of the surrounding neighborhood?**

    a. How has the community's opinion of the project evolved since the property was placed in service?

    b. How has the neighborhood changed since you broke ground? Has it become more or less appealing for investment?

    c. Do you believe that the LIHTC property has had a significant effect on the surrounding community? If so, what kind of effect? And why?

    d. Have you contemplated or undertaken subsequent LIHTC developments in this neighborhood? If so, are there other / different factors that you are considering now than you did prior to the first LIHTC investment in the area?

Appendix B. Full Regression Results

Table B1 - Baseline Model for LIHTC Price Effects in Los Angeles County

	Distance from LIHTC Property	Neighborhoods with Any LIHTC Properties	
		Coefficient	T Stat (coefficients) / F Stat (treatment effects)
Pre	0 – ¼ Mile	-0.037***	-5.37
Post		-0.004	-0.66
Effect		**0.034*** **	**15.96**
Pre	1/4 Mile – 1/2 Mile	-0.033***	-5.68
Post		-0.003	-0.51
Effect		**0.030*** **	**11.23**
Lot Size		0.000***	4.04
Lot Size^2		-0.000***	-4.40
Living Area		0.000***	35.86
Living Area^2		-0.000***	-24.06
FAR		-0.004	-1.35
Age		-0.001	-0.54
Age^2		0.000	0.60
2 Stories		0.019**	2.84
3 Stories		0.067**	3.17
Spring		0.004	1.63
Summer		0.037***	14.88
Fall		0.045***	19.79
Distance to CBD		-0.010	-1.06
Government Seller		-0.176***	-4.21
Bank Seller		-0.141***	-9.95
1989		0.168***	21.45
1990		0.193***	28.68
1991		0.202***	17.39
1992		0.208***	7.66
1993		0.124***	8.42
1994		0.103***	5.49
1995		0.039***	4.05
1996		0.041***	4.47
1997		0.078***	7.45
1998		0.174***	19.86
1999		0.270***	28.36

2000	0.347***	37.47
2001	0.446***	46.47
2002	0.585***	59.70
2003	0.764***	72.21
2004	1.009***	88.21
2005	1.198***	100.99
2006	1.267***	96.35
2007	1.012***	84.16
2008	0.801***	38.30
2009	0.801***	19.29
2010	0.846***	26.53
2011	0.811***	24.84
2012	0.850***	26.20
2013	1.017***	35.33
2014	1.135***	40.76
2015	1.217***	40.76
2016	1.291***	45.13
Constant	11.439***	71.77
Observations	1,842,725	
$\bar{R}^2$	0.7242	

Notes: Regressions also control for Census tract fixed effects, which are not listed due to the large number of tracts. Treatment effect is calculated manually from the differences in the regression coefficients, as described in the Methodology section. T-statistics are used for regression coefficients, and F-statistics are used for treatment effects. +p<0.1, *p<0.05, **p<0.01, ***p<0.001

Table B2 - Property Value Effects of Different Size LIHTC Developments

	Distance from LIHTC Property	Coefficient	T Stat (coefficients) / F Stat (treatment effects)
Pre	0 – ¼ Mile	-0.037***	-5.37
Post		0.002	0.19
Small Post		-0.015	-1.38
Large Post		0.005	0.42
Small Property Effect		**0.024***	**5.75**
Medium Property Effect		**0.039*****	**13.34**
Large Property Effect		**0.044*****	**13.32**
Pre	1/4 Mile - 1/2 Mile	-0.033***	-5.67
Post		0.005	0.80
Small Post		-0.018	-1.56
Large Post		-0.003	-0.22
Small Property Effect		**0.021+**	**3.23**

Medium Property Effect	**0.038*** **	**28.56**
Large Property Effect	**0.036** **	**7.34**
Lot Size	0.000***	4.04
Lot Size^2	-0.000***	-4.40
Living Area	0.000***	35.86
Living Area^2	-0.000***	-24.06
FAR	-0.004	-1.35
Age	-0.001	-0.54
Age^2	0.000	0.60
2 Stories	0.019**	2.84
3 Stories	0.067**	3.17
Spring	0.004	1.63
Summer	0.037***	14.88
Fall	0.045***	19.79
Distance to CBD	-0.010	-1.06
Government Seller	-0.176***	-4.21
Bank Seller	-0.141***	-9.95
1989	0.168***	21.45
1990	0.193***	28.68
1991	0.202***	17.38
1992	0.208***	7.66
1993	0.124***	8.42
1994	0.103***	5.49
1995	0.039***	4.06
1996	0.041***	4.47
1997	0.078***	7.45
1998	0.174***	19.85
1999	0.270***	28.36
2000	0.347***	37.46
2001	0.446***	46.48
2002	0.585***	59.69
2003	0.764***	72.22
2004	1.009***	88.23
2005	1.198***	100.96
2006	1.267***	96.33
2007	1.012***	84.16
2008	0.801***	38.30
2009	0.801***	19.28
2010	0.846***	26.53
2011	0.811***	24.82
2012	0.850***	26.19
2013	1.017***	35.35

2014	1.135***	40.78
2015	1.217***	40.76
2016	1.291***	45.13
Constant	11.439***	71.86
Observations	1,842,725	
$\bar{R}^2$	0.7242	

Notes: Regressions also control for Census tract fixed effects, which are not listed due to the large number of tracts. Treatment effect is calculated manually from the differences in the regression coefficients, as described in the Methodology section. T-statistics are used for regression coefficients, and F-statistics are used for treatment effects. +p<0.1, *p<0.05, **p<0.01, ***p<0.001.

Table B3 - Property Value Effects of Partially vs. Fully Subsidized LIHTC Developments

	Distance from LIHTC Property	Coefficient	T Stat (coefficients) / F Stat (treatment effects)
Pre	0 – ¼ Mile	-0.037***	-5.37
Post		0.016	0.57
Fully Subsidized Post		-0.022	-0.74
Partially Subsidized Property Effect		**0.054+**	**3.17**
Fully Subsidized Property Effect		**0.032*** **	**15.36**
Pre	1/4 Mile – 1/2 Mile	-0.033***	-5.70
Post		0.005	0.22
Primarily Subsidized Post		-0.008	-0.40
Partially Subsidized Property Effect		**0.038**	**2.24**
Fully Subsidized Property Effect		**0.029*** **	**12.82**
Lot Size		0.000***	4.04
Lot Size^2		-0.000***	-4.40
Living Area		0.000***	35.86
Living Area^2		-0.000***	-24.06
FAR		-0.004	-1.35
Age		-0.001	-0.54
Age^2		0.000	0.60
2 Stories		0.019**	2.85
3 Stories		0.067**	3.17
Spring		0.004	1.63
Summer		0.037***	14.88
Fall		0.045***	19.79
Distance to CBD		-0.010	-1.05
Government Seller		-0.176***	-4.21
Bank Seller		-0.141***	-9.95
1989		0.168***	21.45
1990		0.193***	28.67
1991		0.202***	17.37

1992	0.208***	7.66
1993	0.124***	8.42
1994	0.103***	5.49
1995	0.039***	4.05
1996	0.041***	4.46
1997	0.078***	7.44
1998	0.174***	19.84
1999	0.270***	28.36
2000	0.347***	37.47
2001	0.446***	46.46
2002	0.585***	59.67
2003	0.764***	72.18
2004	1.009***	88.16
2005	1.198***	100.95
2006	1.267***	96.29
2007	1.012***	84.13
2008	0.801***	38.30
2009	0.801***	19.29
2010	0.846***	26.53
2011	0.811***	24.83
2012	0.850***	26.20
2013	1.017***	35.33
2014	1.135***	40.77
2015	1.217***	40.77
2016	1.291***	45.15
Constant	11.439***	71.74
Observations	1,842,725	
$\bar{R}^2$	0.7242	

Notes: Regressions also control for Census tract fixed effects, which are not listed due to the large number of tracts. Treatment effect is calculated manually from the differences in the regression coefficients, as described in the Methodology section. T-statistics are used for regression coefficients, and F-statistics are used for treatment effects. +p<0.1, *p<0.05, **p<0.01, ***p<0.001.

Table B4 - Property Value Effects of Non-Profit vs. For-Profit Sponsored LIHTC Developments

	Distance from LIHTC Property	Coefficient	T Stat (coefficients) / F Stat (treatment effects)
Pre	0 – ¼ Mile	-0.038***	-5.43
Post		-0.017	-1.35
For-Profit Post		0.019	1.42
Non-Profit Treatment		**0.021+**	**2.84**
For-Profit Treatment		**0.040*** **	**15.51**
Pre	1/4 Mile – 1/2 Mile	-0.033***	-5.72

Post		-0.014	-1.31
For-Profit Post		0.013	1.36
Non-Profit Treatment		**0.019**	**2.42**
For-Profit Treatment		**0.032*** **	**11.84**
Lot Size		0.000***	4.04
Lot Size^2		-0.000***	-4.40
Living Area		0.000***	35.85
Living Area^2		-0.000***	-24.06
FAR		-0.004	-1.35
Age		-0.001	-0.55
Age^2		0.000	0.61
2 Stories		0.019**	2.84
3 Stories		0.067**	3.17
Spring		0.004	1.63
Summer		0.037***	14.91
Fall		0.045***	19.80
Distance to CBD		-0.010	-1.06
Government Seller		-0.176***	-4.21
Bank Seller		-0.141***	-9.95
1989		0.168***	21.46
1990		0.193***	28.71
1991		0.202***	17.40
1992		0.208***	7.67
1993		0.124***	8.42
1994		0.103***	5.49
1995		0.039***	4.06
1996		0.041***	4.48
1997		0.078***	7.45
1998		0.174***	19.82
1999		0.270***	28.31
2000		0.347***	37.33
2001		0.446***	46.36
2002		0.585***	59.54
2003		0.764***	72.12
2004		1.009***	88.16
2005		1.198***	100.93
2006		1.267***	96.25
2007		1.012***	84.11
2008		0.801***	38.31
2009		0.801***	19.29
2010		0.846***	26.54
2011		0.811***	24.83
2012		0.850***	26.20

2013	1.017***	35.33
2014	1.135***	40.79
2015	1.217***	40.81
2016	1.291***	45.19
Constant	11.439***	71.69
Observations	1,842,725	
$\bar{R}^2$	0.7242	

Notes: Regressions also control for Census tract fixed effects, which are not listed due to the large number of tracts. Treatment effect is calculated manually from the differences in the regression coefficients, as described in the Methodology section. T-statistics are used for regression coefficients, and F-statistics are used for treatment effects. +p<0.1, *p<0.05, **p<0.01, ***p<0.001.

Table B5 - Neighborhood Income Models

	Distance from LIHTC Property	**All Neighborhoods**		**Low Income**		**Medium-to-High Income**	
		Coefficient	**T/F Stat**	**Coefficient**	**T/F Stat**	**Coefficient**	**T/F Stat**
Pre	0 – 1/4 Mile	-0.037***	-5.37	-0.099***	-6.20	-0.032***	-4.91
Post		-0.004	-0.66	-0.021	-1.35	0.012*	2.05
Effect		**0.034*** **	15.96	**0.078*** **	**18.91**	**0.044*** **	**29.08**
Pre	1/4 Mile - 1/2 Mile	-0.033***	-5.68	-0.077***	-5.42	-0.030***	-5.61
Post		-0.003	-0.51	0.004	0.22	0.009+	1.77
Effect		**0.030*** **	**11.23**	**0.080*** **	**21.25**	**0.039*** **	**23.47**
Lot Size		0.000***	4.04	0.000***	4.82	-0.000	-0.36
Lot Size^2		-0.000***	-4.40	-0.000***	-4.63	0.000	0.09
Living Area		0.000***	35.86	0.000***	26.27	0.000***	28.95
Living Area^2		-0.000***	-24.06	-0.000***	-19.10	-0.000***	-17.65
FAR		-0.004	-1.35	-0.002	-1.27	-0.356***	-10.35
Age		-0.001	-0.54	0.002	1.51	-0.004	-1.40
Age^2		0.000	0.60	-0.000	-0.66	0.000	1.16
2 Stories		0.019**	2.84	0.004	0.56	0.029***	3.56
3 Stories		0.067**	3.17	0.052*	2.30	0.102+	1.86
Spring		0.004	1.63	0.015***	4.35	-0.002	-0.62
Summer		0.037***	14.88	0.047***	13.01	0.029***	10.00
Fall		0.045***	19.79	0.051***	15.07	0.041***	10.80
Distance to CBD		-0.010	-1.06	-0.006	-0.51	-0.013	-1.04
Government Seller		-0.176***	-4.21	-0.317**	-2.93	-0.128**	-2.94
Bank Seller		-0.141***	-9.95	-0.123**	-3.07	-0.126***	-18.49
1989		0.168***	21.45	0.179***	18.20	0.160***	22.52

1990	0.193***	28.68	0.176***	17.87	0.202***	29.48
1991	0.202***	17.39	0.178***	11.86	0.220***	15.49
1992	0.208***	7.66	0.146***	9.82	0.251***	7.22
1993	0.124***	8.42	0.072***	5.08	0.165***	8.50
1994	0.103***	5.49	0.054***	3.84	0.144***	5.15
1995	0.039***	4.05	0.008	0.79	0.064***	5.05
1996	0.041***	4.47	0.022*	1.99	0.059***	4.82
1997	0.078***	7.45	0.087***	6.81	0.073***	5.03
1998	0.174***	19.86	0.201***	16.68	0.151***	13.90
1999	0.270***	28.36	0.298***	21.01	0.249***	23.95
2000	0.347***	37.47	0.381***	25.65	0.324***	32.82
2001	0.446***	46.47	0.464***	31.37	0.435***	37.03
2002	0.585***	59.70	0.586***	40.22	0.585***	49.01
2003	0.764***	72.21	0.749***	51.41	0.774***	57.59
2004	1.009***	88.21	0.965***	62.05	1.036***	73.62
2005	1.198***	100.99	1.135***	69.04	1.242***	91.63
2006	1.267***	96.35	1.205***	72.48	1.320***	79.23
2007	1.012***	84.16	1.204***	71.51	1.338***	60.39
2008	0.801***	38.30	1.056***	51.46	0.985***	27.57
2009	0.801***	19.29	0.942***	48.34	0.736***	14.08
2010	0.846***	26.53	0.944***	48.29	0.795***	19.25
2011	0.811***	24.84	0.902***	39.93	0.761***	18.01
2012	0.850***	26.20	0.936***	38.18	0.800***	18.68
2013	1.017***	35.33	1.078***	44.68	0.975***	25.51
2014	1.135***	40.76	1.186***	45.80	1.100***	30.16
2015	1.217***	40.76	1.258***	44.97	1.187***	30.19
2016	1.291***	45.13	1.316***	47.34	1.273***	33.79
Constant	11.439***	71.77	11.425***	62.24	11.649***	54.78
Observations	1,842,725		738,710		1,104,015	
$\bar{R}^2$	0.7242		0.7033		0.6237	

Notes: Regressions also control for Census tract fixed effects, which are not listed due to the large number of tracts. Treatment effect is calculated manually from the differences in the regression coefficients, as described in the Methodology section. T-statistics are used for regression coefficients, and F-statistics are used for treatment effects. +p<0.1, *p<0.05, **p<0.01, ***p<0.001.

Table B6 - Neighborhood Race / Ethnicity Models (1)

	Distance from LIHTC Property	All Neighborhoods		High Non-White		Low-to-Medium Non-White	
		Coefficient	T/F Stat	Coefficient	T/F Stat	Coefficient	T/F Stat
Pre	0 – ¼ Mile	-0.037***	-5.37	-0.024**	-3.21	-0.048***	-4.86
Post		-0.004	-0.66	0.008	1.12	-0.010	-1.15
Treatment		**0.034*** **	**15.96**	**0.032*** **	**15.56**	**0.038** **	**7.33**
Pre	1/4 Mile - 1/2 Mile	-0.033***	-5.68	-0.026***	-4.96	-0.038***	-3.85
Post		-0.003	-0.51	0.004	0.76	-0.005	-0.56
Treatment		**0.030*** **	**11.23**	**0.030*** **	**29.68**	**0.033** **	**3.91**
Lot Size		0.000***	4.04	0.000***	3.04	0.000***	3.44
Lot Size^2		-0.000***	-4.40	-0.000*	-2.38	-0.000***	-3.80
Living Area		0.000***	35.86	0.000***	31.61	0.000***	29.85
Living Area^2		-0.000***	-24.06	-0.000***	-18.00	-0.000***	-20.85
FAR		-0.004	-1.35	-0.206**	-3.19	-0.003	-1.33
Age		-0.001	-0.54	-0.001	-0.48	-0.001	-0.53
Age^2		0.000	0.60	0.000	0.36	0.000	0.65
2 Stories		0.019**	2.84	0.049***	6.43	0.010	1.16
3 Stories		0.067**	3.17	0.048	0.87	0.062**	2.78
Spring		0.004	1.63	-0.009	-1.31	0.010***	3.98
Summer		0.037***	14.88	0.025***	3.70	0.041***	16.37
Fall		0.045***	19.79	0.036***	4.20	0.049***	23.84
Distance to CBD		-0.010	-1.06	0.021	1.25	-0.014	-1.39
Government Seller		-0.176***	-4.21	-0.054	-0.58	-0.234***	-4.88
Bank Seller		-0.141***	-9.95	-0.141***	-9.27	-0.141***	-7.88
1989		0.168***	21.45	0.173***	8.86	0.166***	24.13
1990		0.193***	28.68	0.188***	20.93	0.195***	23.56
1991		0.202***	17.39	0.206***	17.94	0.201***	12.88
1992		0.208***	7.66	0.198***	13.92	0.212***	5.95
1993		0.124***	8.42	0.149***	9.91	0.115***	6.16
1994		0.103***	5.49	0.138***	5.16	0.091***	5.10
1995		0.039***	4.05	0.067***	5.18	0.029**	2.63
1996		0.041***	4.47	0.063***	4.24	0.034***	3.44
1997		0.078***	7.45	0.087***	4.16	0.075***	7.36
1998		0.174***	19.86	0.164***	13.37	0.178***	17.76
1999		0.270***	28.36	0.240***	15.43	0.281***	25.76
2000		0.347***	37.47	0.326***	27.68	0.355***	32.96
2001		0.446***	46.47	0.430***	31.06	0.453***	43.15
2002		0.585***	59.70	0.569***	44.58	0.592***	53.60

2003	0.764***	72.21	0.751***	54.70	0.770***	65.36
2004	1.009***	88.21	1.016***	67.68	1.007***	76.51
2005	1.198***	100.99	1.226***	67.86	1.188***	86.60
2006	1.267***	96.35	1.299***	56.02	1.257***	90.50
2007	1.012***	84.16	1.324***	50.12	1.268***	80.84
2008	0.801***	38.30	1.013***	25.62	1.013***	39.27
2009	0.801***	19.29	0.778***	12.15	0.812***	19.36
2010	0.846***	26.53	0.831***	17.42	0.854***	26.62
2011	0.811***	24.84	0.810***	16.57	0.812***	24.66
2012	0.850***	26.20	0.853***	17.37	0.851***	26.21
2013	1.017***	35.33	1.021***	23.45	1.017***	35.59
2014	1.135***	40.76	1.145***	27.03	1.133***	40.29
2015	1.217***	40.76	1.237***	28.09	1.211***	40.29
2016	1.291***	45.13	1.317***	31.51	1.283***	44.69
Constant	11.439***	71.77	11.428***	25.64	11.496***	65.75
Observations	1,842,725		500,698		1,342,027	
$\bar{R}^2$	0.7242		0.6872		0.7273	

Notes: Regressions also control for Census tract fixed effects, which are not listed due to the large number of tracts. Treatment effect is calculated manually from the differences in the regression coefficients, as described in the Methodology section. T-statistics are used for regression coefficients, and F-statistics are used for treatment effects. +p<0.1, *p<0.05, **p<0.01, ***p<0.001.

Table B7 – Neighborhood Race / Ethnicity Models (2)

	Distance from LIHTC Property	**High Asian**		**Low-to-Medium Asian**	
		Coefficient	**T/F Stat**	**Coefficient**	**T/F Stat**
Pre	0 – ¼ Mile	-0.050***	-4.07	-0.035***	-4.44
Post		0.011	1.16	-0.006	-0.88
Treatment		**0.061*** **	**20.36**	**0.028** **	**9.56**
Pre	¼ Mile – ½ Mile	-0.033***	-4.31	-0.034***	-5.00
Post		0.006	0.81	-0.005	-0.69
Treatment		**0.039*** **	**11.63**	**0.029** **	**7.91**
Lot Size		0.000***	7.67	0.000*	2.49
Lot Size^2		-0.000***	-7.00	-0.000**	-2.86
Living Area		0.000***	27.40	0.000***	30.76
Living Area^2		-0.000***	-17.92	-0.000***	-19.76
FAR		-0.001	-0.81	-0.006	-0.97
Age		0.000	0.14	-0.002	-0.60
Age^2		-0.000	-0.84	0.000	0.705

2 Stories	0.031***	4.53	0.014	1.59
3 Stories	0.048	1.44	0.071*	2.54
Spring	0.010***	3.84	0.002	0.65
Summer	0.042***	16.13	0.034***	10.49
Fall	0.050***	22.11	0.043***	13.72
Distance to CBD	0.022*	2.54	-0.017	-1.61
Government Seller	-0.147	-1.32	-0.175***	-3.83
Bank Seller	-0.106***	-15.11	-0.144***	-9.56
1989	0.178***	18.87	0.164***	18.17
1990	0.189***	18.70	0.197***	24.75
1991	0.170***	17.58	0.219***	14.17
1992	0.133***	10.45	0.245***	6.78
1993	0.068***	5.34	0.153***	7.98
1994	0.055***	3.54	0.127***	5.11
1995	0.001	0.07	0.057***	4.58
1996	0.012	0.94	0.057***	4.68
1997	0.051***	3.50	0.092***	6.67
1998	0.150***	14.44	0.186***	15.42
1999	0.231***	19.48	0.290***	22.98
2000	0.316***	29.34	0.363***	27.72
2001	0.418***	37.97	0.461***	33.39
2002	0.555***	49.28	0.600***	43.29
2003	0.735***	61.72	0.779***	52.84
2004	0.969***	70.78	1.027***	68.71
2005	1.145***	73.37	1.222***	81.35
2006	1.203***	77.87	1.298***	74.19
2007	1.214***	78.68	1.313***	58.69
2008	1.017***	79.89	1.011***	26.17
2009	0.903***	65.34	0.763***	14.10
2010	0.919***	68.98	0.819***	18.93
2011	0.871***	60.49	0.789***	17.55
2012	0.905***	57.87	0.829***	18.37
2013	1.055***	64.63	1.001***	24.76
2014	1.165***	64.53	1.123***	28.77
2015	1.234***	66.48	1.211***	28.85
2016	1.293***	70.44	1.292***	31.82
Constant	10.952***	82.04	11.548***	60.85
Observations	584,682		1,258,043	

$\bar{R}^2$		0.7249		0.7194	
	Distance from LIHTC Property	**High Black**		**Low-to-Medium Black**	
		Coefficient	**T/F Stat**	**Coefficient**	**T/F Stat**
Pre	0 – ¼ Mile	-0.032**	-3.16	-0.049***	-4.75
Post		0.008	0.98	-0.002	-0.27
Treatment		**0.039*** **	**13.10**	**0.047** **	**10.43**
Pre	¼ Mile – ½ Mile	-0.042***	-6.32	-0.032***	-4.03
Post		0.001	0.11	0.005	0.60
Treatment		**0.043*** **	**18.10**	**0.037** **	**10.22**
Lot Size		-0.000	-1.19	0.000***	6.54
Lot Size^2		0.000	1.17	-0.000***	6.64
Living Area		0.000***	22.66	0.000***	36.78
Living Area^2		-0.000***	-12.30	-0.000***	-24.06
FAR		-0.314***	-4.88	-0.002	-1.29
Age		-0.007+	-1.69	0.002*	2.21
Age^2		0.000+	1.69	-0.000*	-2.31
2 Stories		0.018	1.36	0.018***	3.41
3 Stories		0.197**	2.67	0.057**	2.68
Spring		-0.006	-0.88	0.010***	4.62
Summer		0.026***	4.48	0.042***	18.25
Fall		0.039***	5.78	0.048***	22.77
Distance to CBD		-0.023+	-1.69	-0.003	-0.28
Government Seller		-0.104*	-2.19	-0.208**	-2.90
Bank Seller		-0.143***	-17.75	-0.113***	-5.84
1989		0.154***	13.88	0.172***	30.50
1990		0.184***	21.93	0.196***	26.67
1991		0.233***	9.46	0.188***	19.04
1992		0.300***	5.23	0.164***	16.07
1993		0.193***	5.83	0.093***	9.42
1994		0.162***	3.34	0.077***	6.96
1995		0.053**	2.75	0.031***	3.30
1996		0.047*	2.41	0.039***	4.26
1997		0.077**	3.24	0.078***	7.97
1998		0.166***	9.57	0.176***	19.55
1999		0.261***	17.48	0.273***	25.47
2000		0.338***	20.09	0.351***	34.61
2001		0.438***	20.37	0.448***	46.00

2002		0.585***	28.26	0.583***	58.18
2003		0.770***	33.15	0.759***	75.53
2004		1.025***	43.69	0.996***	89.97
2005		1.233***	50.46	1.175***	96.74
2006		1.308***	44.63	1.243***	95.68
2007		1.322***	33.05	1.256***	92.46
2008		0.949***	15.39	1.041***	74.19
2009		0.654***	8.62	0.890***	61.10
2010		0.731***	11.38	0.910***	63.92
2011		0.705***	9.98	0.866***	55.86
2012		0.741***	10.46	0.905***	53.48
2013		0.923***	15.02	1.061***	62.01
2014		1.048***	18.19	1.177***	64.78
2015		1.141***	18.30	1.253***	64.98
2016		1.234***	20.83	1.318***	67.33
Constant		11.812***	36.64	11.271***	72.44
Observations		594,677		1,248,048	
$\bar{R}^2$		0.6476		0.7356	
	Distance from LIHTC Property	**High Hispanic**		**Low-to-Medium Hispanic**	
		Coefficient	**T/F Stat**	**Coefficient**	**T/F Stat**
Pre	0 – ¼ Mile	-0.022*	-2.43	-0.055***	-5.91
Post		0.019**	2.94	-0.007	-0.80
Treatment		**0.040*** **	**11.74**	**0.047*** **	**12.45**
Pre	¼ Mile – ½ Mile	-0.023***	-4.55	-0.043***	-4.33
Post		0.017*	2.48	-0.006	-0.60
Treatment		**0.040*** **	**18.26**	**0.037***	**5.13**
Lot Size		0.000*	2.19	0.000***	3.69
Lot Size^2		-0.000*	-2.00	-0.000***	-4.03
Living Area		0.000***	31.05	0.000***	28.99
Living Area^2		-0.000***	-18.11	-0.000	-21.06
FAR		-0.282***	-9.31	-0.003	-1.33
Age		-0.001	-0.25	-0.001	-0.78
Age^2		0.000	0.15	0.000	0.94
2 Stories		0.043***	5.28	0.012	1.34
3 Stories		0.113	0.91	0.061**	2.80
Spring		-0.015*	-2.30	0.011***	4.67
Summer		0.018*	2.52	0.043***	17.99
Fall		0.032***	5.16	0.050***	27.21

Distance to CBD	-0.010	-0.50	-0.009	-0.94
Government Seller	-0.106	-1.45	-0.228***	-4.90
Bank Seller	-0.119***	-11.37	-0.143***	-7.39
1989	0.168***	9.88	0.168***	22.38
1990	0.219***	25.21	0.183***	23.43
1991	0.238***	23.32	0.190***	12.79
1992	0.269***	8.67	0.188***	6.27
1993	0.180***	15.95	0.107***	5.70
1994	0.182***	8.49	0.080***	4.33
1995	0.114***	6.07	0.016+	1.70
1996	0.098***	5.26	0.025**	2.72
1997	0.103***	4.87	0.071***	6.88
1998	0.170***	12.78	0.174***	18.46
1999	0.253***	13.61	0.274***	24.33
2000	0.327***	24.72	0.352***	34.52
2001	0.435***	25.76	0.449***	44.72
2002	0.581***	32.76	0.585***	56.80
2003	0.767***	39.74	0.763***	70.08
2004	1.044***	51.96	0.995***	79.87
2005	1.277***	69.63	1.172***	86.28
2006	1.376***	51.35	1.236***	91.58
2007	1.397***	37.55	1.246***	87.65
2008	0.991***	19.42	1.017***	43.60
2009	0.713***	10.54	0.838***	19.87
2010	0.780***	14.31	0.873***	28.11
2011	0.760***	13.42	0.830***	26.12
2012	0.800***	13.54	0.867***	28.39
2013	0.963***	17.78	1.031***	38.73
2014	1.101***	20.80	1.143***	43.51
2015	1.197***	21.11	1.219***	43.55
2016	1.287***	23.34	1.289***	48.65
Constant	11.474***	32.36	11.434***	65.86
Observations	450,630		1,392,095	
$\bar{R}^2$	0.5930		0.7221	

Notes: Regressions also control for Census tract fixed effects, which are not listed due to the large number of tracts. Treatment effect is calculated manually from the differences in the regression coefficients, as described in the Methodology section. T-statistics are used for regression coefficients, and F-statistics are used for treatment effects. +p<0.1, *p<0.05, **p<0.01, ***p<0.001.

Table B8 – Baseline Model vs. Neighborhood LIHTC Concentration (Overlap) Model

	Distance from LIHTC Property	Neighborhoods with Any LIHTC Properties		Neighborhoods with 1, 2, or 3 LIHTC Properties	
		Coefficient	T/F Stat	Coefficient	T/F Stat
Pre	0 – ¼ Mile	-0.037***	-5.37	-0.035***	-5.16
Post1		-0.004	-0.66	-0.006	-0.95
Post2				-0.002	-0.24
Post3				0.074**	2.70
Effect1		**0.034*** **	15.96	**0.030*** **	**13.31**
Effect2				**0.027***	**5.30**
Effect3				**0.101*** **	**12.07**
Pre	¼ Mile – ½ Mile	-0.033***	-5.68	-0.032***	-5.64
Post1		-0.003	-0.51	-0.006	-1.12
Post2				0.001	0.07
Post3				0.049***	4.70
Effect1		**0.030*** **	**11.23**	**0.026*** **	**11.11**
Effect2				**0.027+**	**3.69**
Effect3				**0.076*** **	**20.86**
Lot Size		0.000***	4.04	0.000***	4.04
Lot Size^2		-0.000***	-4.40	-0.000***	-4.40
Living Area		0.000***	35.86	0.000***	35.87
Living Area^2		-0.000***	-24.06	-0.000***	-24.06
FAR		-0.004	-1.35	-0.004	-1.35
Age		-0.001	-0.54	-0.001	-0.53
Age^2		0.000	0.60	0.000	0.58
2 Stories		0.019**	2.84	0.019**	2.85
3 Stories		0.067**	3.17	0.067**	3.16
Spring		0.004	1.63	0.004	1.63
Summer		0.037***	14.88	0.037***	14.88
Fall		0.045***	19.79	0.045***	19.79
Distance to CBD		-0.010	-1.06	-0.009	-1.05
Government Seller		-0.176***	-4.21	-0.177***	-4.21
Bank Seller		-0.141***	-9.95	-0.141***	-9.95
1989		0.168***	21.45	0.168***	21.45
1990		0.193***	28.68	0.193***	28.69
1991		0.202***	17.39	0.202***	17.39
1992		0.208***	7.66	0.208***	7.66
1993		0.124***	8.42	0.124***	8.42
1994		0.103***	5.49	0.103***	5.49

1995	0.039***	4.05	0.039***	4.06
1996	0.041***	4.47	0.041***	4.48
1997	0.078***	7.45	0.078***	7.48
1998	0.174***	19.86	0.174***	19.90
1999	0.270***	28.36	0.270***	28.39
2000	0.347***	37.47	0.347***	37.51
2001	0.446***	46.47	0.446***	46.51
2002	0.585***	59.70	0.585***	59.71
2003	0.764***	72.21	0.764***	72.22
2004	1.009***	88.21	1.009***	88.19
2005	1.198***	100.99	1.198***	100.90
2006	1.267***	96.35	1.267***	96.24
2007	1.012***	84.16	1.282***	84.09
2008	0.801***	38.30	1.012***	38.30
2009	0.801***	19.29	0.801***	19.29
2010	0.846***	26.53	0.846***	26.52
2011	0.811***	24.84	0.810***	24.81
2012	0.850***	26.20	0.850***	26.17
2013	1.017***	35.33	1.017***	35.29
2014	1.135***	40.76	1.135***	40.74
2015	1.217***	40.76	1.216***	40.74
2016	1.291***	45.13	1.290***	45.10
Constant	11.439***	71.77	11.437***	71.70
Observations	1,842,725		1,842,725	
$\bar{R}^2$	0.7242		0.7242	

Notes: Regressions also control for Census tract fixed effects, which are not listed due to the large number of tracts. Treatment effect is calculated manually from the differences in the regression coefficients, as described in the Methodology section. T-statistics are used for regression coefficients, and F-statistics are used for treatment effects. +p<0.1, *p<0.05, **p<0.01, ***p<0.001