Is More Affordable Housing Better?
The Housing Price Effects of Concentrating LIHTC Developments in Los Angeles

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Abstract: While there is widespread agreement about the importance of the Low-Income Housing Tax Credit (LIHTC) in addressing the country's affordable housing needs, there is less certainty about the effects of LIHTC-financed properties on their surrounding neighborhoods. A growing body of research has largely refuted the argument that affordable housing properties in and of themselves have negative effects on local property values and increase crime rates. Several key questions remain essentially unanswered, however. First, for how long do the observed spillover benefits of LIHTC construction last? Second, does the development of multiple LIHTC properties in a neighborhood have an additive, supplemental effect on surrounding conditions, or is there a threshold at which the concentration of such properties – and the predominantly low-income individuals they house – negatively affects the neighborhood?

In this paper, we focus on Los Angeles County, a large, diverse urban area with significant affordability challenges. Drawing upon both public and proprietary property sales data, we conduct interrupted time series analyses to ascertain whether property value trends differed prior and subsequent to the introduction of a LIHTC-financed property in the community. We find that LIHTC properties positively impact surrounding housing values across the spectrum of Los Angeles' neighborhoods. Further the concentration of multiple LIHTC properties in a neighborhood additively increases housing prices up to ½ mile away. Finally, these effects though of greater magnitude in lower-income neighborhoods, are fully present in high-income neighborhoods.

Keywords: LIHTC, affordable housing, housing prices, spatial persistence, neighborhood change

JEL Codes: R31, R38, R21, H23, H42, G12

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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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Introduction

Most community development advocates and practitioners view the creation or rehabilitation of affordable housing as a critical component of an effective neighborhood revitalization strategy. Such developments help address the widespread shortage of housing affordable to lower-income families. They also bring new financial and human resources into areas that often have suffered from substantial disinvestment and de-population.

The federal Low-Income Housing Tax Credit has been instrumental in facilitating such projects. Since its establishment in 1986, the credit has helped attract hundreds of billions worth of investment dollars into affordable housing projects. These projects have created, improved, and/or preserved approximately 3 million residential units, the vast majority of which have been affordable to households earning 60% or less of the prevailing area median income.

Like any development, these affordable housing properties have had ripple effects in their surrounding neighborhoods. Considerable research has documented the effects of LIHTC developments on surrounding home prices. To a lesser extent, researchers have examined the effects of the properties on the rate and type of criminal activity in the surrounding area. For the most part, the observed effects have been positive: LIHTC properties generally have contributed to stable or increased home values and lower violent crime rates in their communities.

What remains unclear is the effect that multiple LIHTC properties have within a neighborhood. The introduction of one such property tends to have a beneficial, or at least neutral, effect. Does the development of a second property augment that initial impact, or does it counteract some of the initial benefits? The concentration of poverty within public housing complexes was a major contributor to the negative effects many of those properties had on their communities. Indeed, de-concentrating poverty was one of the primary missions of the HOPE VI public housing redevelopment program. Does the concentration of lower-income people within multiple nearby LIHTC properties have a similarly negative spillover effect on the neighborhood?

This study represents one of the few attempts to date to answer these questions. Virtually all of the research on LIHTC properties' spillover effects has examined those effects

independently of other LIHTC developments. Yet there is every reason to believe that subsequent developments are both influenced by and augment (or counteract) the effects of the previous property. Only by teasing out the interactive effects of each development can we understand the benefits and limitations that concentrated LIHTC projects have on communities. This more nuanced understanding of spillover dynamics is critical as policymakers grapple with the challenges of how and where to help alleviate the national affordable housing shortage.

We analyzed the short-and long-term effects of LIHTC developments on surrounding home prices from 1987 through 2017. Consistent with other findings, the introduction of a LIHTC property had positive and lasting spillover price effects. The development of subsequent LIHTC properties within a community augmented the positive effects of the initial property. The impact on surrounding prices increased with each additional LIHTC development placed in service, particularly in low-income communities, and those price effects proved durable over time. Among other implications, these findings suggest that affordable housing can help attract investment to a struggling community and is not the destabilizing factor that some have claimed.

Context

Public programs to support the development or preservation of affordable housing have focused primarily on urban areas. Indeed, the vast majority of LIHTC, public housing, Section 8, and other subsidized developments are located in the nation's cities. Yet the degree of LIHTC property concentration is notably greater than that of other subsidized affordable housing properties (Oakley 2008). LIHTC developments placed in service from 1996 to 2005 in the country's 10 largest metropolitan areas were far more geographically concentrated than any other type of residential unit. 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 2020).

LIHTC properties tend to be concentrated in relatively distressed areas. Nationally, 32.1% of LIHTC units placed in service prior to 2011 were located in census tracts with poverty rates of at least 30% in 2010. 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). In addition to higher poverty, LIHTC communities tended to have higher concentrations of people of color, lower household incomes, poorer educational opportunities, and higher crime rates (Van Zandt & Mhatre 2009).

Multiple factors help explain the spatial concentration of LIHTC properties. Since the rents for LIHTC-subsidized units generally have to be affordable to households earning 60% or less of the area median income, developers have a strong economic incentive to build or rehabilitate properties on low-cost land. Land prices generally are much lower in poorer communities. Perhaps more importantly, state and local housing authorities allocate LIHTCs to projects on a competitive basis. The allocation criteria give preference to properties located in qualified census tracts (QCTs) and difficult development areas (DDAs), areas characterized by general economic distress and low incomes relative to housing costs. LIHTC location decisions have reflected the additional tax credit benefit associated with QCTs; on average, LIHTC properties in those tracts contain six more units than properties in tracts just below the QCT threshold (Baum-Snow & Marion 2009).

Largely by design, LIHTC properties tend to attract disproportionately poor households. In 2009-2010, about 45% of tenant households in LIHTC properties qualified as extremely low-income, earning 30% or less of the area median. Another 36% qualified as very low-income, earning between 31% and 50% of the area median (O'Regan & Horn 2013). The proportions do not appear to have changed that much since, at least for properties in low-income communities. Bostic et al (2019) found, for instance, that nearly 78% of tenant households living in LIHTC properties in low-income Chicago neighborhoods in 2016 earned 50% or less of the area median income. Yet while these properties have high concentrations of poor people, their tenants are not as economically distressed as either those living in public housing or those households receiving Section 8 housing choice vouchers (O'Regan & Horn 2013).

There is considerable evidence that new residential construction has positive effects on surrounding property values, even in lower-income, comparatively weak-market locations. In Cleveland, for instance, new construction increased the sale price of nearby homes by about $5,000, and while significant rehabilitation had a positive $4,000 effect. The positive price effects dissipated with distance from the new/rehabbed property (Ding, Simons, & Baku 2000; Simons, Quercia, & Maric 1998; Ding & Knaa, 2002). LIHTC developments usually involve either new construction on a previously vacant lot or (often significant) rehabilitation of one or

more existing residential properties. A typical development contains about 75 units and therefore has a large enough physical footprint to have a noticeable impact on its surrounding area.

A growing body of research has documented the neutral to positive real estate effects of LIHTC developments. Several studies documented the non-adverse effects of LIHTC properties on surrounding property values and physical conditions. (Green, Malpezzi, & Seah 2002; Young 2016; Edmiston 2018). Other analyses have found positive and often sustained spillover effects. For example, using data from the mid-1990s, HUD researchers found that property values increased within a few blocks of LIHTC developments in Cleveland, Portland (OR), and Seattle in the years after the developments had been placed in service (Johnson and Bednarz 2002). Multiple analyses of New York City real estate transactions prior to 2002 found that the values of properties surrounding LIHTC buildings increased by as much as 9% in the five years subsequent to the LIHTC property's opening (Schwartz et al 2006; Furman Center 2006; Ellen & Voicu 2007; Ellen et al 2007). LIHTC developments in Dallas have had a small, positive effect on surrounding single-family house prices (Ezzet-Lofstrom and Murdoch 2007). In Cleveland, LIHTC developments helped increase surrounding home values by 15.4% relative to price trends elsewhere in the city (Woo, Joh, & Van Zandt 2016).

The size and reach of the spillover effects have varied across neighborhoods. A national analysis of price trends of homes within one kilometer of LIHTC developments placed in service from 1987 through 2005 found that, overall, median home prices increased by 14.9% subsequent to the introduction of the LIHTC property. Yet prices increased at much lower rates in stable (10.6%) and gentrifying (5.6%) communities (Baum-Snow & Marion 2009). More recently, an analysis of price trends in 129 counties across 15 states found similar disparities. In low-income neighborhoods (median income <$26,000), property values within 1/10 mile of newly constructed or rehabilitated LIHTC developments increased by 6.5% over 10 years. In contrast, LIHTC projects depressed nearby values by 2.5% over 10 years in majority-white communities whose median income was at least $54,000 (Diamond & McQuade 2019). Analyses of other affordable housing programs have identified similar inter-neighborhood variations (see Koschinsky 2009, for example).

Such variations are not surprising, given the often-substantial differences in amenities and real estate trends affecting neighborhoods within the same city. Similarly, we would expect

that the characteristics of the LIHTC properties themselves could influence the type and extent of spillover impacts. An early 2000s analysis of parts of Polk County, IA found that property values appreciated two to four percent more slowly near fully subsidized family LIHTC developments than they did elsewhere in the county. In contrast, mixed-income LIHTC properties had no significant effects, whereas home values around LIHTC properties for elderly households appreciated at an above-average rate (Funderberg & MacDonald 2010). A 2016 Chicago-based analysis found that mixed-income LIHTC properties – those with five or more market-rate units – had larger effects on surrounding homes prices within ¼ mile than LIHTC properties with only subsidized units (Bostic et al 2019).

Urban neighborhoods are inherently dynamic environments. The infusion of new capital – be it in the form of new restaurants or other amenities, a large multi-family development, or substantial improvements to existing single-family homes – frequently affects local real estate price trends and the perspectives of the community on the part of prospective investors. Similarly, the loss of key local assets, be they people, institutions, or properties, can have ripple effects on local values. In short, a particular event / intervention can set other events in motion. The success of one residential development can lead to the development of another, and so forth. And those subsequent developments either amplify or potentially depress the impact of the first project.

The LIHTC studies to date have focused on the spillover effects of individual properties independent of each other. With the exception of an analysis we recently completed in Chicago (currently in review), we do not know of any studies that looked specifically at the sequential or additive effects of clustering LIHTC developments within a neighborhood. Given the widespread concentration of these properties in low-income urban neighborhoods, as well as the changes that many of these communities have experienced during the past 20 years, it is important to understand the extent to which additional LIHTC investment has a positive or negative effect on the neighborhoods.

Without assessing the effect of concentrating properties, several researchers have examined the neighborhood implications of the number of units within a given LIHTC property. In many cases, "bigger is better" with respect to neighborhood revitalization, although large developments can have negative effects in particular areas (Dillman, Horn, & Verrilli 2017). Researchers have expressed concern about the potentially negative price effects of over-

concentrating subsidized housing in certain communities, particularly those in the suburbs (Deng 2010; Dillman, Horn, & Verilli 2017). At the same time, a Denver-based study found that higher numbers of small, scattered-site public housing developments within a neighborhood contributed to increased surrounding home values (Santiago et al 2001).

Methodological Challenges

Several factors complicate an examination of properties' additive effects. LIHTC properties are not dispersed randomly across a metropolitan area, but rather tend to be disproportionately located in lower-income communities. The presence of one or more successful, existing LIHTC properties in an area likely influences the location and effects of subsequent LIHTC properties. There is some evidence that developers are more likely to locate their properties in areas with appreciating property values (Baum-Snow & Marion 2009). As a result, it can be hard to determine whether an observed change in area values following the development of a second (or third) LIHTC property in a community is a result of the subject property or merely a continuation of the existing trend. (That existing trend presumably has been affected in some way by the development of the prior LIHTC property.)

The characteristics of the study area also change over time. Most fundamentally for our issue, a given property ultimately may fall within the sphere of influence of multiple LIHTC developments. It initially may have been within a quarter-mile, for instance, of one property. But with subsequent development, that property may now sit within an eight-mile of one LIHTC building and within a quarter-mile of two others. These overlapping spheres of influence can skew the results of a traditional pre-post trend analyses and nonparametric, distance-based modeling approaches.

It also is unclear for how long a LIHTC property's spillover effects are noticeable. Its influence on nearby property values may be comparatively short-lived, or it may extend for multiple years. It may be relatively constant, or it may fluctuate over time. Determining the additive effects of a subsequent project requires an understanding of the duration of the previous project's effects. With a few exceptions (see Ellen & Voicu 2007 and Diamond & McQuade 2019), most analyses have tracked surrounding property values for only about three years after the LIHTC development was placed in service.

Our Approach

Focusing on the City of Los Angeles, we track movements in average home prices in the areas surrounding LIHTC properties ("LIHTC neighborhoods") before and after those properties were placed in service. We compare those price movements to the price movements in communities elsewhere in the city that do not have any LIHTC developments ("non-LIHTC neighborhoods"), controlling for various neighborhood and property-specific factors. Unlike other researchers, we specifically address the reality that subsequent development may result in certain properties falling within given distance bands of multiple LIHTC properties over time. Failing to incorporate the potential impacts of this subsequent concentration of LIHTC properties likely results in flawed measurements of those properties' true effects on neighborhood prices.

We consequently developed a hybrid interrupted time series / difference within difference (ITS/DID) model to identify pre and post development price effects for LIHTC investments. We estimated the properties' impacts on house prices within a 1/8 mile radius, within a 1/8 to 1/4 mile band, and within a 1/4 to 1/2 mile band.[9] Our estimated parameters of pre-development and post-development variables measure neighborhood price differences before and after the LIHTC development(s) was/were placed in service. We modified the strict ITS model by imposing the restriction that the pre-development and post-development impacts are equal across project areas. We also simplified the DID model by assuming that the magnitudes of the initial developments' impacts within a given distance are the same for all initial developments within that distance. We assumed the impacts of a second development are the same across areas with two developments, and so forth. Our model therefore focuses on average differences in prices across distance bands, both prior and subsequent to the introduction of a LIHTC property. In addition, the framework provides estimates of the average price impacts associated with the first, second, and third (or more) LIHTC development within each distance band.

Equation (1) shows our hybrid ITS/DID specification:

[9] We investigated other distance bands and found that alternative specifications did not change our basic conclusions.

(1) $\ln(P_{itl}) = \sum_{d=1}^{D} \alpha_{od} Pre_{ijdt} + \alpha_{1d} Post1_{ijdt} + \alpha_{2d} Post2_{ijdt} + \alpha_{3d} Post3_{ijdt} + \beta X_{it} + \varepsilon_k + \tau_t + \mu_{itl}$

Where:

$\ln(P_{itl})$	is the natural log of the price of house i at time t;
X_{it}	is a vector of property traits of house i at time t;[10]
Pre_{ijdt}	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 project j;
$Post_{ijdt}$	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 project j. Post1 represents the initial LIHTC development, Post2 represents the second LIHTC development, and Post3 represents third or later development;
β	is a vector of parameters capturing the value of the elements of X_{it};
ε_k	is a vector of k tract-specific fixed effects[11];
τ_t	is a vector of t year-specific fixed effects;
μ_{it}	is a vector of random error terms;
D	is a set of distance bands d, where d = {0-1/4 miles, 1/4 -1/2 miles};
l	denotes whether the transaction is near the 1st, 2nd, or 3rd or more LIHTC property within the distance band;
D	is a set of distance bands d, where d = {0-1/8 miles, 1/8-1/4 miles, ¼-1/2 miles}.

Census tract fixed-effects capture other neighborhood-level differences that could not easily be identified or quantified, and yearly fixed effects capture common shocks in the overall Los Angeles residential real estate market. We clustered standard errors based on the 114

[10] Property traits include total square footage, living area square footage, lot size square footage, floor-area ratio (FAR), age at sale, air conditioning (dummy), fireplace (dummy), number of stories, building structure, and seasonal dummies (spring, summer, fall).

[11] Tract specific fixed effects are not included when the model includes project specific pre and post development effects.

community areas in Los Angeles, recognizing that the residuals may potentially be correlated by geography.

Note that we have not included variables reflecting either community-level demographic or income characteristics in our model. Instead, we conducted a separate analysis of LIHTC price effects in upper- and lower-income communities (defined as census tracts whose median incomes were in the top and bottom third, respectively, of all tracts in Los Angeles County). We also analyzed differences in effects in census tracts in which more / less than 50% of residents were Black. Through this approach, we sought to identify any systematic differences in impact between high- and low-income communities and between Black and non-Black communities.

Data

Using data for the City of Los Angeles, prices in neighborhoods that had one or more LIHTC developments placed in service between 1987 and 2015 are compared those changes to corresponding price changes in non-LIHTC neighborhoods.

LIHTC Properties

Data from HUD for each of the 550 LIHTC properties placed in service during that period includes the LIHTC property's street address, the year it was placed in service, and its total number of units, 534 of which are located within ½ mile of at least one other LIHTC property. Table 1 provides a basic overview of the characteristics of these properties and their neighborhoods, distinguishing between areas with only one LIHTC property and those with multiple developments.

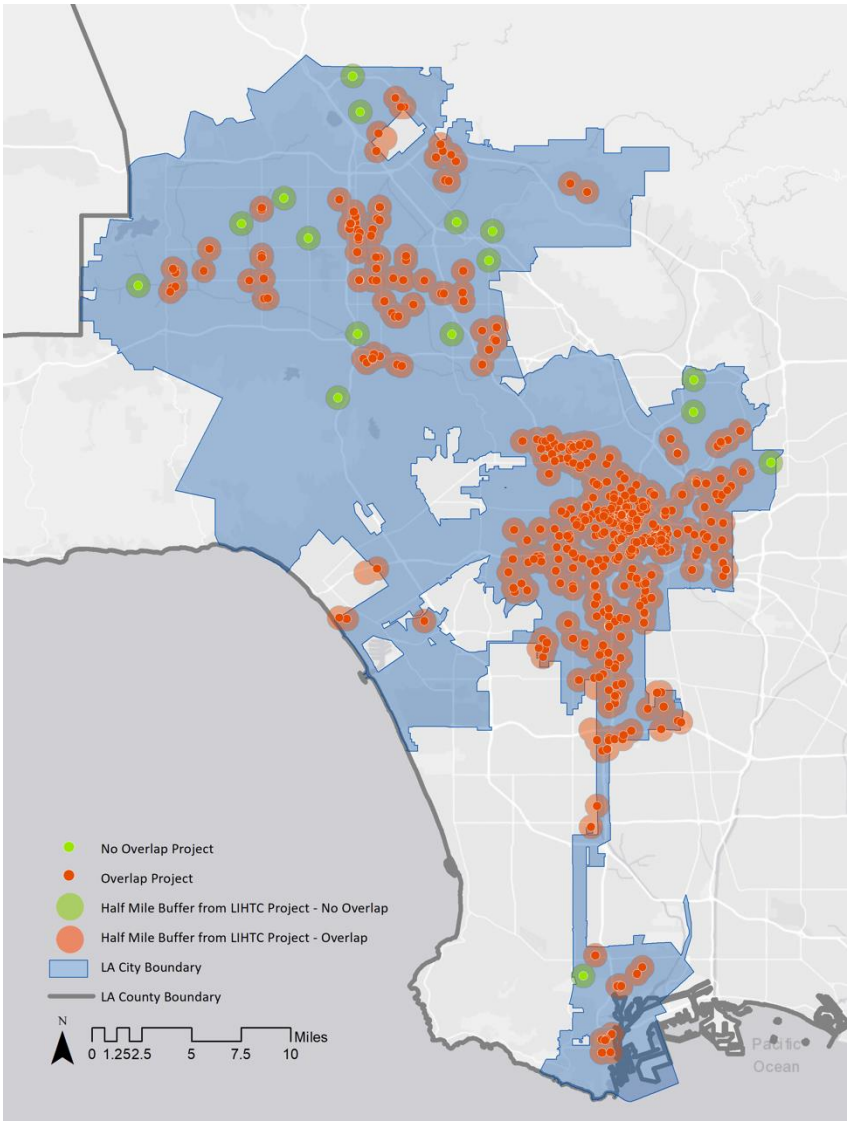
Table 1: Key Characteristics of Sampled LIHTC Developments & Their Census Tracts

	Tracts with Any LIHTC Properties	Tracts with Only 1 LIHTC Property	Tracts with 2+ LIHTC Properties	Tracts with No LIHTC Properties
Total Census Tracts	287	170	117	712
Tract Median HH income	$39,538	$43,439	$33,869	$63,469
Tract Median Vacancy Rate	6.20%	5.94%	6.59%	6.18%
Tract Median % Hispanic	59.0%	57.5%	61.3%	43.4%
Tract Median % African-American	10.9%	11.2%	10.4%	7.7%
Tract Median Home Value	$394,300	$438,100	$330,600	$556,900
Average Number of Units within LIHTC Properties	73	63	77	N/A

Note: Census tract data are based on American Community Survey 2012-2016 5-year Estimates

The areas with multiple LIHTC properties tend to be in neighborhoods with comparatively high poverty rates, high proportions of Hispanic and African American residents, and low household incomes. Figure 1 maps the location of all 550 LIHTC properties, with the green dots marking the non-overlapping properties and the orange dots indicating the overlapping ones.

Figure 1: Map of Sampled LIHTC Properties and Surrounding 1/2 Mile Radius



Residential Sales

Data for all Los Angeles City residential property sales from 1987 to 2015 were obtained from DataQuick Information Systems. These data included around 527,370 arm's length sales during that period. Each transaction is geo-coded and the distance between the sold home and nearby LIHTC developments calculated. Over the 28-year period, there were nearly 19,460 transactions within 1/8 mile of a LIHTC property, more than 63,100 transactions within a 1/8 to 1/4 mile band, and around 151,370 transactions within a 1/4 to 1/2 mile band. There were at least 50 transactions within 1/8 mile of a LIHTC property each year. Table 2 provides the means and

standard deviations of sale prices within the various distance bands, as well as characteristics of the typical sold properties.

Table 2: Sale Prices and Selected Characteristics of Homes in Sample

Distance from LIHTC Development	Number of Transactions	Mean Price	Standard Deviation	Average Total Square Footage	Average Number of Bathrooms
0 - 1/8 Mile	19,460	$324,943	$665,719	2,663	3.54
1/8 Mile - 1/4 Mile	63,166	$290,875	$450,971	2,297	2.96
1/4 Mile - 1/2 Mile	151,370	$312,239	$432,957	2,172	2.79
> 1/2 Mile	338,171	$499,676	$732,723	2,170	2.67
Total	**527,370**	**$428,124**	**$647,844**	**2,150**	**2.69**

Table 3 displays numbers of sales by number of LIHTC properties within 1/2 mile of a LIHTC property. About 2.5% of all property sales took place within 1/2 mile of a non-overlapping LIHTC development, whereas 30% occurred within 1/2 mile of overlapping developments. Note that many LIHTC developments were placed in service subsequent to a given sale, so that the sold property may initially have fallen within the ½ mile ring of only one LIHTC development but ultimately ended up within the rings of multiple LIHTC projects.

Table 3: Median Home Sale Price by Number of LIHTC Developments within ½ Mile

# of LIHTC Developments	Number of Total Observations	Mean Price	Standard Deviation
0	338,171	$499,676	$732,723
1 (No Overlap)	13,267	$339,640	$322,518
2 or more (Overlap)	155,013	$308,598	$439,457
Total	**527,370**	**$428,124**	**$647,844**

Summary of Findings

Estimates of the model displayed in equation (1) using data for Los Angeles yield four overarching findings[12]:

- Neighborhoods with LIHTC investments experience statistically significant, positive increases in neighborhood residential property prices;
- The magnitudes of the positive increases are significantly larger in communities with a larger number of LIHTC investments;
- Price impacts associated with LIHTC investments diminish with distance from LIHTC properties when the specification incorporates LIHTC concentration; and
- The magnitudes of the positive price impacts tend to be higher in lower-income neighborhoods, though they are still positive in higher-income neighborhoods.

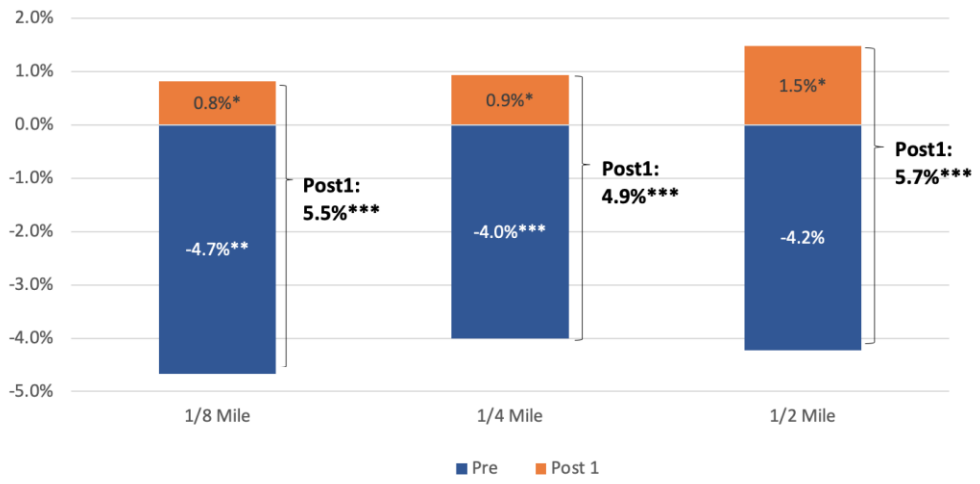
These findings, as well as others are discussed below.

Simplest Model

The simplest empirical specification focuses only on differences in prices pre and post LIHTC investment without addressing concentration of LIHTC properties. The pre and post differences, shown in Table 4, are allowed to differ across three concentric distance bands: 0 to 1/8 mile, 1/8 to 1/4 mile and 1/4 to 1/2 mile.[13]

Figure 2: Observed Effects of Initial LIHTC Development on Surrounding Home Values
Note: the "Pre" series indicates average price trend before LIHTC project placed in service; the "Post1" series indicates the average price trend after LIHTC project is placed in service

[12] These findings are also replicated in Voith et al. for Chicago.
[13] Specifically, a sales transaction is designated as a "pre-LIHTC" transaction if there are no LIHTC developments within 1/2 mile of the property at the date of sale. Note that the designation of "pre-LIHTC" does not imply that there will be LIHTC developments within that same radius in the future.



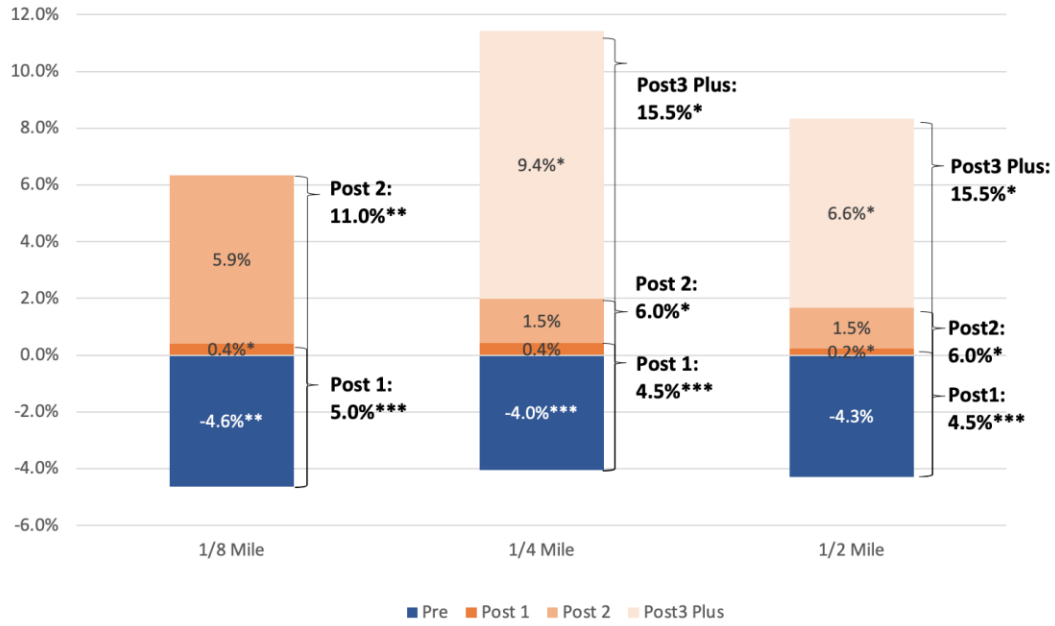
LIHTC developments have small positive impacts on nearby residential property values.[14] In this simple model, property prices do not diminish across the three bands in the simplest model. The fact that impacts do not diminish with distance raises two issues: 1) whether the correlations are spurious since one would expect any impacts, whether causal or not to diminish with distance and 2) whether the distance bands are cover sufficient area to capture any decline in impact.

Model Including LIHTC Concentration

More complex models, which include information about the number LIHTC properties within each band, allow the examination the effects of concentration of LIHTC developments on nearby residentially properties. The specification allows differential impacts of a single LIHTC development, two LIHTC Developments, and three or more LIHTC developments nearby. The model is specified in such a way that the effects of LIHTC on neighborhood property values are cumulative. That is, the effects of two properties is the sum of impacts of the first (Post1) and second (Post 2) development. Similar for the 3rd or more development: the effective is additive (Post1 + Post2 + Post3). The estimated impacts for this model are shown in Table 5.

Figure 3: Observed Effects of Multiple LIHTC Developments on Surrounding Values

[14] Property value impacts are less than half of those measured in for Chicago using an analogous approach.



While the positive impacts of the first LIHTC development on nearby residential property values are slightly smaller than the simplest model, the impacts increase considerably if there are two LIHTC developments and even more if there are three or more LIHTC developments. Notably, the impacts also fall as distance from the projects increases.[15] Unlike the simplest model that did not disaggregate the effects of concentration, positive impacts also are also more pronounced in the closer-in bands.

Allowing for the differential effects of LIHTC concentration provides a picture of LIHTC that reflects the changing baseline comparisons inherent in multiple LIHTC property impacts. It also results in distance-related estimates that are more consistent with the expectation that impacts should decline with distance. Finally, the findings find no support for the contention that LIHTC properties have negative externalities on housing price that increase with concentration.

Duration of LIHTC Impacts

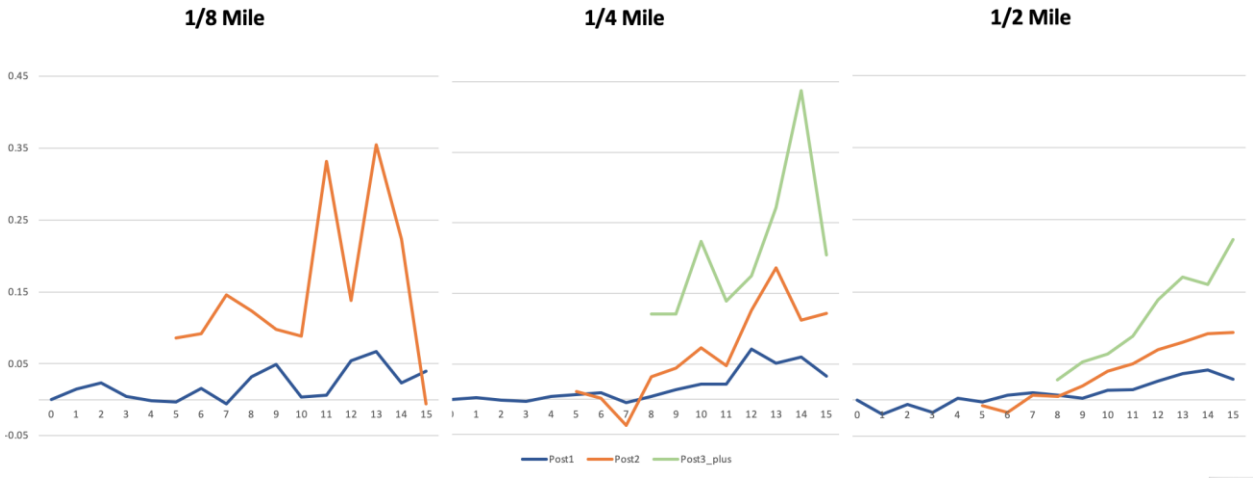
As illustrated in Figure 4, the price effects of the LIHTC developments generally remain positive going forward. In each graph of Figure 4, the X-axis represents the number of years since

[15] Note that transactions of properties near multiple LIHTC developments tend to occur later in the sample as more LIHTC projects are brought on line, but our estimation methods control for market-wide temporal shifts.

the first LIHTC development was placed in service. The Y-axis reflects observed average home prices relative to their expected values. There is naturally some year-to-year variation – greater within the 1/8-mile band because of its smaller number of transactions – but the effects remain noticeable and sustainable well into the future. Simply put, the first LIHTC project improves the neighborhood's relative price performance, and subsequent projects augment that initial improvement. The beneficial price effects of introducing additional LIHTC properties extend out to ½ mile from the properties.[16]

[16] Within the clustered LIHTC neighborhoods, the second LIHTC property generally has gone into service five years after the first, and subsequent properties have been introduced three years after that. Our figures reflect these timing averages.

Figure 4: Temporal Patterns of Impact in Different Distance Bands

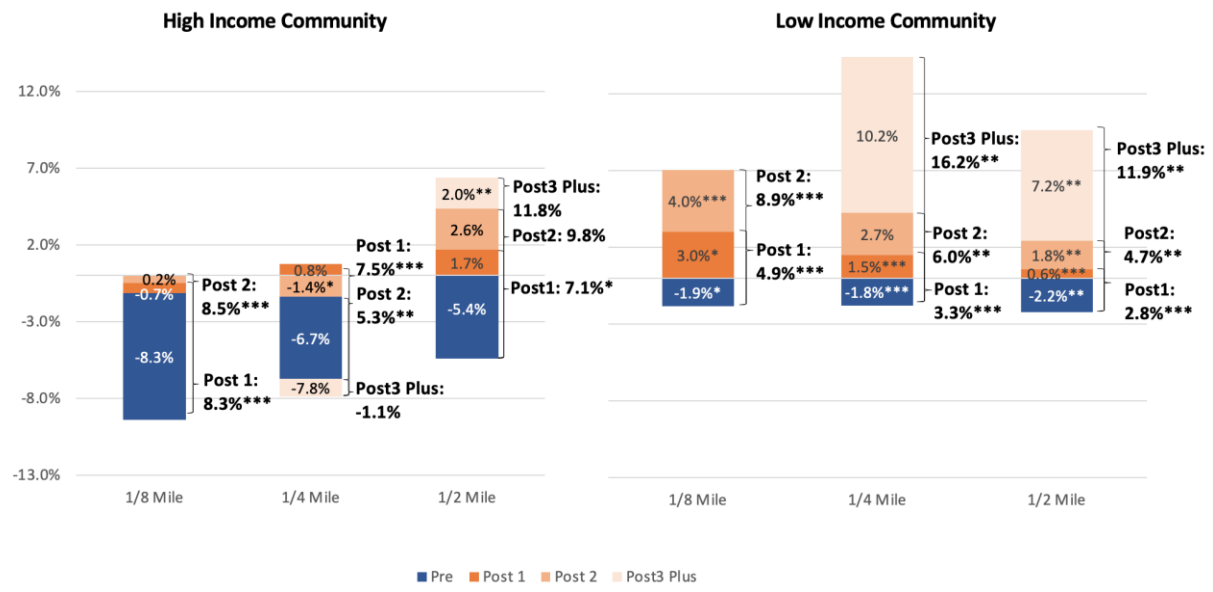


Higher v. Lower Income Communities

Based upon the findings of other LIHTC and affordable housing research, we expected to find different price effects across different categories of neighborhoods. Like Baum-Snow and Marion (2009), we found that the introduction of a LIHTC property had a significant and positive effect on surrounding home prices in both higher-income and lower-income communities. The effect of clustering multiple developments was substantially more positive in lower-income neighborhoods, however. The introduction of a second LIHTC property in a low-income area increased home values within the surrounding 1/8 mile by 8.9 percentage points relative to expectations, adding 4 more percentage point of positive impact comparing to introducing the first LIHTC property. In contrast, the addition of a second LIHTC property in a higher-income area increased nearby values by only extra 0.2 percentage points.

The introduction of the first LIHTC property in a high-income area increased home values within the surrounding 1/4 mile by 7.5 percentage points relative to expectations. However the introduction of the second LIHTC project decreased the positive impact by 2.2 percentage points, increasing the home values within the area by 5.3 percentage points on average. On the contrary, in low-income areas, the presence of the second, and the third or more LIHTC properties within ¼ mile generated an aggregate 16.2 percentage point increase in home values, which is around 13 percentage points more than having only one LIHTC project.

Figure 5: Observed Effects of LIHTC Clustering in Higher- versus Lower-Income Neighborhoods



Comparing two cases: Los Angeles and Chicago

This paper's analysis represents an evolving methodology on measuring concentration impacts of LIHTC projects on surrounding housing prices. Voith et al. (2020) presents details on the Chicago case and provides a detailed review of the methodology. This paper focuses on applying and amending that methodology to a less monocentric city, Los Angeles, to compare the direction and magnitude of effects.

The basic findings hold for both geographies, despite their geographic, economic, and sociocultural differences. In both Chicago and Los Angeles, neighborhoods surrounding LIHTC investments see increases in neighborhood residential property prices following project openings. This is true of both low-income and high-income areas, but magnitudes are greater in lower-income neighborhoods. Additionally, concentration furthers these price increases. Price impacts diminish with distance in both cases. Further, the temporal patterns of impacts of LIHTC by number of projects is remarkably consistent across the two cases for each distance band.

There are several, more detailed, differences between the cases. The price impact of the initial development (Post1) in Chicago are greater in small distance bands and decay at half-mile, while in Los Angeles they remain consistent up through the half-mile distance band. For concentration effects, in both cases the price increases are greatest within the 1/8 to ¼ mile distance band from the project. However, in Los Angeles the largest concentration effect is from the 3rd and subsequent projects, whereas in Chicago it is relatively evenly split between the first, second, and third and subsequent projects. The magnitudes of price impacts of LIHTC

concentration in low-income neighborhoods are nearly twice as large as in Los Angeles. This may be owing to the generally higher mean prices for residential property in Los Angeles, even in its lower-income neighborhoods.

Appendix

Key Regression Coefficients for Overlap LIHTC Pricing Model Without Time Varying Impacts

Appendix Table 1: Observed Effects of Initial LIHTC Development on Surrounding Home Values

Distance Band	Pre	Post 1	Post-Pre
0- 1/8 Mile	-0.047***	0.008	0.055***
1/8 - 1/4 Mile	-0.040***	0.009	0.049***
1/4 - 1/2 Mile	-0.042***	0.015	0.057***

Appendix Table 2: Observed Effects of Multiple LIHTC Developments on Surrounding Values

Distance Band	Post1-Pre	Post1 + Post 2 – Pre	Post1 + Post 2 + Post 3Plus - Pre
0- 1/8 Mile	**0.050*** **	**0.110** **	**NA**
1/8 - 1/4 Mile	**0.045*** **	**0.060***	**0.155***
1/4 - 1/2 Mile	**0.045*** **	**0.060***	**0.126***

Appendix Table 3: Observed Effects of LIHTC Clustering in Higher- versus Lower-Income Neighborhoods

	High Income			Low Income		
Distance Band	**Post1-Pre**	**Post1 + Post 2 - Pre**	**Post1 + Post 2 + Post 3Plus – Pre**	**Post1-Pre**	**Post1 + Post 2 - Pre**	**Post1 + Post 2 + Post 3Plus - Pre**
0- 1/8 Mile	**0.083*** **	**0.085*** **	**NA**	**0.049*** **	**0.089** **	**NA**
1/8 - 1/4 Mile	**0.073*** **	**0.053** **	**-0.011**	**0.033*** **	**0.060** **	**0.162***
1/4 - 1/2 Mile	**0.077***	**0.098**	**0.118**	**0.028*** **	**0.047** **	**0.119** **

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