The Geographical Distribution of Mixed-Income Housing in Low-Income Housing Tax Credit Developments

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Abstract

This paper examines how market forces interact with the provisions of the Low Income Housing Tax Credit and with the incentives developed by New York City’s housing agencies to determine the siting of subsidized properties that include market-rate units. Due to higher potential income from market-rate rents, especially in higher rent neighborhoods, market forces should direct more mixed-income property development to these neighborhoods, potentially exposing their subsidized tenants to greater access to opportunity. Instead I find that the objectives of housing agencies—particularly HPD’s effort to rehabilitate distressed properties and neighborhoods—overwhelm these market forces and that mixed-income properties largely were developed in neighborhoods similar to those where 100% affordable properties were developed.
Introduction

The Low Income Housing Tax Credit (LIHTC) is the largest federal program currently subsidizing the production of affordable housing. It was designed to provide incentives to private developers to produce housing targeted toward households with incomes at 50 or 60 percent of area median incomes. The Internal Revenue Service administers the LIHTC program, but the priorities and criteria for allocating a state’s supply of tax credits are set forth by the states’ designated housing credit agencies (Guggenheim, 2006). These agencies, through a competitive process, allocate a limited annual supply of tax credits to developers that meet the agencies’ criteria.

Among the outcomes over which housing agencies have influence through their power of setting competitive criteria are the locations of the properties—that is, whether they are in relatively higher or lower poverty neighborhoods—and whether or not the properties are developed with a mix of market-rate and affordable units. Critics and advocates of affordable housing charge that properties funded through the LIHTC program are disproportionately being developed in higher-poverty neighborhoods, concentrating the poor in developments and in neighborhoods with limited access to opportunity (Horn and O’Regan, 2011). Some have welcomed mixed-income housing as a way to break up concentrations of poverty, and some have examined the benefits of siting subsidized properties in lower poverty, higher opportunity neighborhoods.

Fewer have looked at the prospects of siting mixed-income LIHTC properties in lower poverty neighborhoods. The LIHTC program might be particularly well
suited for this combination because of its funding structure: only affordable units are eligible for the tax credit subsidy. Higher incomes received from market-rate rents in high-rent neighborhoods compared to market-rate rents in low-rent neighborhoods can offset possibly higher acquisition costs making such projects more financially feasible.

However, despite potential financial benefits of siting mixed-income properties in low-poverty neighborhoods, allocating agencies may give priority to mixed-income development in high-poverty neighborhoods through incentives or other program criteria in order to advance other city housing goals such as rehabilitating distressed neighborhoods. In New York City, one such program is the award-winning Neighborhood Entrepreneurs Program, described below, that aims to turn city-owned properties over to private, for-profit owner-managers.

Using data from a new database at NYU’s Furman Center for Real Estate and Urban Policy that merges data from several housing agencies active in New York City supplemented with U.S. Census data on neighborhoods, this paper aims to examine the mixed-income segment of the LIHTC market in New York City to see if distinct patterns exist: whether mixed-income LIHTC properties are more likely to develop in higher income neighborhoods; whether affordable LIHTC units in mixed-income properties are geographically segregated from affordable units in 100% affordable properties; and if so, how do neighborhoods where units in mixed-income properties are overrepresented compare to neighborhoods where units in 100% affordable properties are overrepresented.
I begin this paper by describing the Low Income Housing Tax Credit Program and New York City’s Neighborhood Entrepreneurs Program. I then review the literature on past housing policies and some of the problems of legacy programs—especially those associated with concentration of poverty. I review the literature on several theories about how mixed-income housing can help to improve outcomes for low-income families, also looking at prior empirical evidence supporting or undermining these theories.

I will then turn to the empirical questions about the distribution of market-rate units in LIHTC developments. Because of previous difficulty in assembling the needed data for this question, no literature yet exists examining these influences and outcomes. This analysis will look exclusively at the competitive LIHTC “9%” developments in the five boroughs of New York City that were placed in service since the beginning of 2000, using data from city, state, and federal housing agencies that have been consolidated into the Subsidized Housing Information Project (SHIP) database at New York University’s Furman Center for Real Estate and Urban Policy.\(^1\)

**The LIHTC Program in New York City**

LIHTC, since its inception in 1986, has contributed funding to the development of 1678 properties in New York City, 197 through its 4% tax credits and 1481 through 9% “competitive” tax credits. These properties comprise 86,130

\(^1\) See the appendix for a more detailed description of the SHIP project and database.
units, 65,105 (75.6%) of which have subsidized rents for households at various qualifying income levels and 20,556 (23.9%) of which are market-rate rentals.  

Tax credits that are awarded competitively have a present value worth approximately 70% of the rehabilitation or new construction costs of the portion of a project dedicated to affordable housing. The credit holder receives a federal income tax credit worth about 9% of the costs for each of the first 10 years of the project, while the project must provide affordable housing for at least 15 years—and up to 30 years if the city or state stipulates extended affordability in its criteria.  

In New York City, the agencies awarding the LIHTC program’s competitive (9%) credits are New York State’s Homes and Community Renewal (HCR) and New York City’s Department of Housing Preservation and Development (HPD).  

According to federal guidelines, to be eligible for 9% tax credits a project must have a minimum of either 20 percent of its units occupied by low income households with incomes less than 50 percent of area median income (AMI), or 40 percent of its units occupied by low income households with incomes less than 60 percent of area median income (Guggenheim, 2006). The guidelines provide a lot of flexibility to housing agencies and developers, allowing for small, large, or scattered

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2 Subsidized and market-rate unit counts do not add up to the total unit count because the total includes “super” (building superintendent) units.  
3 Projects with tax-exempt financing under a state’s private activity bond cap can receive tax credits with a present value worth approximately 30% of development costs (Guggenheim, 2006). These are outside of the state allocation limit and are awarded as 4% annual tax credits for ten years. The two different types of awards are commonly referred to as “4%” and “9%” tax credits. This paper will focus on “9%” or “competitive” tax credits.  
4 In 2010, the New York State Division of Housing and Community Renewal (DHCR) and New York State Housing Finance Agency (HFA) were combined, along with other agencies, into HCR.
site projects; non-profit or for-profit developers;\(^5\) new construction or substantial rehabilitation\(^6\); and mixed-income or 100% affordable housing.

The federal law creating the LIHTC allows for the inclusion of market-rate units in LIHTC-supported developments, but provides no guidelines for the circumstances in which including market-rate units is warranted. Guidelines for LIHTC allocation at the federal level are in fact deliberately vague on most qualifying criteria. Instead, responsibility for allocating tax credits in the 9% program devolves to the local housing administrators, effectively decentralizing the decisions about how to structure tax credit allocations to advance local housing goals. Through Qualified Allocation Plans (QAPs), housing agencies set competitive criteria, awarding points to projects for including features designed to meet local housing needs.

Subsidized rents are based on unit size and AMI so, within qualifying income ranges and unit sizes, they are uniform across the city; they do not vary by individual households’ income levels or by prevailing neighborhood rents. Because subsidized rents are uniform across the city and market-rate rents vary by neighborhood, the difference between market rents and subsidized rents should be greater in low-poverty, high-income neighborhoods than in high-poverty, low-income neighborhoods, meaning that the increased income from market-rate units in higher rent neighborhoods can be used to offset higher acquisition costs or to subsidize operating costs. The prospect of market rents for the subsidized units

\(^5\) A minimum of ten percent of credits in each state are reserved for non-profit organizations.

\(^6\) Property acquisition is eligible for 4% tax credits.
after the restricted period ends increases the value to the developer of market-rate units in neighborhoods with higher prevailing rents.

**Neighborhood Entrepreneurs Program**

In 1994 New York City’s Department of Housing Preservation and Development created the Neighborhood Entrepreneurs Program, which it now administers with the non-profit Enterprise Foundation. The program enlists for-profit neighborhood entrepreneurs to undertake the rehabilitation, management, and eventual ownership of occupied or vacant, distressed city-owned buildings, thereby accelerating the process of returning these properties to private ownership. Entrepreneurs finance rehabilitation and operations through a mix of commercial loans and public subsidies, including competitive 9% Low Income Housing Tax Credits. The NEP received the 1999 Innovations in American Government Award from the Ford Foundation and Harvard University.

Under the program, clusters of city-owned apartment buildings are targeted for renovation. The program’s aim is to reestablish healthy real estate markets in low-income, urban areas and spur community revitalization in distressed neighborhoods. By focusing on entire city blocks rather than isolated buildings, improvements reach whole neighborhoods, potentially spurring further private investment (HPD, 2002).

Projects receive a portion of their rental income by renting vacant units at area market rates. But even market-rate units may be rented to families earning no more than 165% of the current area median income (AMI) adjusted for family size.
Support from Low Income Housing Tax Credits prevents displacement of existing legal tenants. Tenants returning to rehabilitated properties are eligible for LIHTC-mandated affordable rent limits. Because of the inclusion of market-rate units, NEP developments are counted as mixed-income properties in this analysis.

Literature Review

Legacy Programs and Concentration of Poverty

Federal housing programs from the past, starting with public housing and continuing through programs such as project-based Section 8 and Section 236 that supplanted public housing in the middle of the twentieth century, have a well documented history of exacerbating the plight of their tenants by concentrating poverty into distressed neighborhoods. Public housing, originally developed as temporary residences for struggling families became permanent homes for increasingly poor and minority residents (Freeman, 2004). Since the late sixties, housing authorities, responding to political pressure and resistance to low-income housing in low-poverty neighborhoods, concentrated the poor in existing projects in inner cities rather than attempting to integrate races or income levels (Orfield, 2006). During the same period, stable living-wage jobs in inner cities disappeared to be replaced by low-wage service sector jobs as the U.S. economic base shifted from manufacturing to services. Middle-class families followed better jobs into the suburbs further isolating the remaining families from economically successful neighbors (Joseph, 2007).
Siting housing in poor neighborhoods where jobs are scarce, schools are poor, and social resources are minimal reduces opportunities for residents (Freeman, 2004). Residents in projects developed through these programs live in worse neighborhoods than comparable poor families not in subsidized housing projects (McClure, 2007). In environments of concentrated poverty, children have higher barriers to success, lower graduation rates, and higher teen pregnancy rates than their peers outside of such environments (Orfield, 2006). Neighborhoods with concentrated poverty have higher crime rates and substantial health disparities due to environmental hazards, stress, and poorer access to adequate health care and good food. Long-term social isolation can lead to “oppositional social identities” due to lack of mainstream opportunities (Orfield, 2006).

Integration of neighborhoods alone is not enough to improve the outcomes of relocated poor families (Khadduri and Wilkins, 2006; McClure, 2007). Locating projects (and tenants) in low-poverty neighborhoods may not eliminate the social isolation problem if poor residents occupy an entire project. Formation of social connections and informal networks that can lead to access to jobs and services is one of the keys to improving outcomes for poor families. Benefits come when poor residents form social networks with neighbors living outside the project. If residents fail to build such networks, the benefit of living in a better neighborhood is outweighed by continued social isolation within the confines of the development (McClure, 2007). Valuable connections and networks are more readily formed in more intimately integrated environments, i.e. where income diversity exists within a development, not just a neighborhood. Absent opportunities to form networks,
poor families may not realize the benefits of living among less-poor neighbors, while also experiencing the stress of moving away from homogenous but familiar neighborhoods with greater social cohesiveness. Khadduri and Wilkins (2006) conclude that incremental changes from very high-poverty neighborhoods to merely high-poverty neighborhoods may be sufficient to improve outcomes for some families so long as such migration doesn’t push a neighborhood into threshold levels of poverty.

Poverty concentration can be abated by developing subsidized housing in neighborhoods of high poverty concentration as long as such developments include amenities beyond housing that provide services to tenants and neighbors of the project. Housing programs that aim to improve outcomes for their tenants need to provide decent living conditions that extend beyond the housing units to include the neighborhood, boosting access to opportunities for upward mobility (Freeman, 2004).

*Theories of Mixed-Income Housing*

Joseph et al. (2006, 2007, 2010) looked specifically at how mixed-income housing affects outcomes for poor families, and found mixed results. Joseph (2007) identified different mechanisms by which mixed-income housing could affect different challenges faced by poor families, and found more positive outcomes for mechanisms that merely required the *presence* of higher income families, and fewer positive outcomes for mechanisms that required *interaction* between poor and non-poor families—mostly due to the failure of strong interactions to form.
Specifically, Joseph found evidence of greater enforcement of social norms and accountability in mixed-income housing. He attributes the increase to greater social organization and collective efficacy, which in turn are associated with the presence of higher-income residents. According to Joseph, socioeconomic status is positively correlated with social organization, and social organization is negatively correlated with delinquency and violence. Higher SES households can also serve as role models for lower SES households where the latter may over time adapt more socially acceptable and constructive behavior through exposure to the former. The argument is that simply being in an environment where others are acting a certain way may provide motivation to adapt ones behavior. Role modeling can be effective without direct interpersonal connections. The strongest research findings have documented influence from affluent adults to lower-income children and adolescents rather than adult-to-adult influence.

Joseph’s “political economy of place” mechanism posits that higher income families who wield greater influence on property management and neighborhood economy bring about positive outcomes that accrue to all residents. In poor areas, the absence of higher-income residents who can advocate effectively on behalf of the community means less demand for high-quality goods and services and less neighborhood influence on public policy. In mixed-income properties, a higher proportion of higher-income residents will theoretically increase willingness and ability to advocate for better performance from neighborhood schools. However where interests of high- and low-income residents diverge, the greater influence of
higher-income residents on benefits that accrue to the community might lead to outcomes not equally realized by all income levels.

Each of these mechanisms—social control, role modeling, and political economy of place—merely require the presence of non-poor households, and not the existence of strong interpersonal ties between affluent and poor residents. The distinction is important because of the low likelihood and slow pace of development of interpersonal ties. Interpersonal ties are necessary for the development of social networks. Joseph (2007) agrees with the theoretical basis of the advantage of social networks, but finds that interpersonal ties are slow to develop in mixed-income environments. Interpersonal ties and social networks are most likely to form in more homogeneous environment—those where the differences in income between the higher and lower earners are not large—when the benefits of the ties are lowest, and least likely to form in heterogeneous environments when the benefits are the highest. Heterogeneity can act as a barrier to social interaction (Joseph 2007).

Shared space and other shared attributes such as ethnicity, language, or housing tenure can also facilitate interpersonal ties. The ratio of high and low SES residents also can influence the development of interpersonal ties: when higher-SES residents exist in higher proportions, they are more likely to form ties with lower-SES families.

The theoretical pathways such as social control or role-modeling that don’t require interpersonal ties are more likely to deliver positive outcomes. The greatest contribution of higher-income households will be to help maintain order in the development and to attract external resources to the community. And while social
networks that depend on interpersonal ties may deliver the most valuable outcomes such as access to information about jobs, these ties and networks may need special consideration in program designs in order to be nurtured to their fullest potential.

Joseph's focus, however, was more on mixed-income developments in low-opportunity neighborhoods. He also looks at spillover effects from higher SES households moving to low-opportunity neighborhoods. He doesn't discuss outcomes associated with placing mixed-income properties in low-poverty neighborhoods, which would allow poor families to live in high-opportunity neighborhoods. These properties would potentially provide greater access to opportunity to poor households in addition to the benefits of living in mixed-income properties. These are the properties that may be more likely to be developed in higher rent neighborhoods because of the additional rent revenue from higher market-rate rents.

Schwartz and Tajbakhsh (1997) also focus on mixed-income housing that is designed for low-opportunity neighborhoods that aims to attract higher-income families to the market-rate units. They examine the financial and neighborhood conditions in which such developments would be successful. Projects are expected to be more successful at attracting market-rate tenants when the housing market is strong and the property includes desirable features along such dimensions as design, amenities, condition and demographics. They observe that market-rate tenants have more housing options, so when the desirable conditions don’t exist (e.g. if the property or neighborhood deteriorate, or if the housing market weakens), then the property may struggle to retain market-rent paying tenants, possibly
leading to financial difficulties. Properties developed in more desirable
neighborhoods with greater property and neighborhood amenities should be more
successful at retaining market-rate tenants and realizing higher rents leading to
greater project stability (Schwartz and Tajbakhsh, 1997).

**LIHTC and Neighborhood Outcomes**

The expected impacts of LIHTC developments depend on multiple factors
including characteristics of both the development and of the receiving
neighborhood. Properties with additional services or with higher average incomes
can be expected to contribute more to neighborhood improvement than properties
without these services or with lower average incomes, holding all else equal.
Adding low-income housing to poor neighborhoods will increase poverty
concentration more (or decrease poverty concentration less) than adding low-
income housing to high-income neighborhoods. Little research exists explaining
location choices for various features of LIHTC, although some authors have found
relationships between the existence of LIHTC units and neighborhood outcomes
(Ellen and Voicu, 2006, Ellen et al., 2009, Horn and O’Regan, 2010).

Neighborhoods in which more the 50% of the households have incomes
below 60% of the area median income are designated Qualified Census Tracts (QCT)
and receive both preferential scoring in LIHTC competition and additional credits.
Baum-Snow and Marion (2008) found that QCTs do in fact attract a greater share of
LIHTC units. Although adding subsidized housing units that are reserved for low-
income households can increase the concentration of poverty in poorer
neighborhoods, negative outcomes for the neighborhood can be mitigated by
characteristics of the development, such as the relative income levels of subsidized families, the presence of market-rate units, and the degree to which the development and services associated with it lead to positive neighborhood spillovers (Ellen et al., 2009).

In an examination of LIHTC developments in high-poverty neighborhoods, Ellen et al. (2009) used hedonic regression to explain sales prices of properties as a function of structural characteristics, neighborhood surroundings, and proximity to subsidized housing. They compare prices close to the site of an LIHTC development to prices further away, but in the same neighborhood. They then compare the differences before and after development of the property to determine if the magnitude of the difference changes after the LIHTC property is complete. They found significant spillover effects and concluded that construction of LIHTC properties in high-poverty tracts is associated with reduction in poverty rates. Despite creating additional housing for poor families in these neighborhoods, which might initially increase poverty concentration, the developments contributed to neighborhood revitalization and reduced poverty concentration over time. The authors found that positive spillovers increase over time and that a greater number of units have a greater impact, although at a diminishing rate (Ellen et al., 2009).

The long history of publicly funded housing leading to concentration of poverty has been well documented, as have the harms to tenants this concentration has caused. Since the 1980s, affordable housing production programs such as the Low Income Housing Tax Credit have been designed to, amongst other goals,
alleviate concentration of poverty by allowing for mixed-income housing developments, i.e. properties with multiple levels of subsidies for different degrees of need, and properties with market-rate rental units. Mixed-income properties can be developed in either high-income or low-income neighborhoods alleviating poverty concentrations either by moving poor families to less poor neighborhoods, or by moving non-poor families into neighborhoods that previously were disproportionately poor.

Producing mixed-income properties in poor neighborhoods could also create positive spillovers to the surrounding neighborhood, improving opportunities to neighborhood residents outside the development. But mixed-income properties in non-poor neighborhoods might be more financially stable than mixed-income properties in poor neighborhoods due to higher market rents and lower difficulty of keeping market-rate units occupied.

Previous studies have established theoretical frameworks describing the mechanisms by which mixed-income housing could help poor tenants (Joseph, 2007) and by which mixed-income properties might be more financially stable in more desirable neighborhoods (Schwartz and Tajbakhsh, 1997), but little empirical work has been published in these areas. Looking at the LIHTC program in New York City, I first aim to determine if the desirability of neighborhoods is correlated with the prevalence of mixed-income properties. I then compare the units in mixed-income properties with those in 100% affordable properties to see if they are substantially segregated from each other, and if so, if the neighborhoods are
qualitatively different from one another in measures of housing values, incomes, and poverty.

Data

Data on LIHTC properties are drawn from the Subsidized Housing Information Project (SHIP) database at New York University's Furman Center for Housing and Urban Policy. The project brought together data from several governmental administrative datasets to create a single database that became the repository of properties in New York City's largest subsidized housing programs—programs that were administered from city, state, and federal levels of government.

One of the most valuable contributions of the SHIP project was to combine the records from the many contributing datasets in a way that would eliminate any double counting of properties. A single property could possibly be tracked in more than one of the contributing databases if more than one program contributed to its financing. If the two contributions were not recognized to be for the same property, the database risked counting the number of affordable units the property provided more than once or of incorrectly reporting the duration of affordability. The SHIP project merged such records by matching their addresses against New York City's buildings database to assign unique borough-block-lot (BBL) numbers to each property, then combining records with the same BBLs, tracking their unit counts only once and maintaining a record of all subsidies.

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7 See the appendix for more detail on the Subsidized Housing Information Project.
For my empirical analysis, I extracted all properties from the SHIP database for which LIHTC had contributed financing. Records for these properties originally came from databases from New York State’s Division of Housing and Community Renewal (DHCR) and New York City’s Department of Housing Preservation and Development (HPD), the two agencies charged by the federal government with allocating competitive Low Income Housing Tax Credits in New York City. Each record in my data represents one property and tracks information on its ownership (for-profit or non-profit), the agency (DHCR or HPD) that allocated the tax credits, and counts of both subsidized units and market-rate units in the property. Each record also holds the U.S. Census tract number for the property. According to the Census, tracts are geographically contiguous areas that have a population between 1200 and 8000, with an optimum size of 4000 people.

The Census tracks many aggregate statistics at the tract level in New York City. By using a tract to represent a neighborhood, and by attaching Census tract data to each property observation, I am able to examine correlations between neighborhood characteristics and the features of the properties developed in those neighborhoods. For my analysis, I included a measure of the median value of owner-occupied housing units, a measure of the poverty rate, i.e. the percent of families living below the poverty level, two measures of median household income, one for all households and one for renters only, and measures of the share of the population by race of householder.

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8 Although many properties in the SHIP database received funding from multiple programs, no property received LIHTC funding from both HPD and DHCR. The Agency variable in my dataset was essentially a binary variable with one of these two values.
Empirical Analysis

Table 1 presents counts of LIHTC properties and units by allocating agency, ownership type (for-profit v. non-profit), and whether the properties are 100% affordable or they mix affordable and market-rate units. The data show that since the beginning of 2000, for-profit developers have produced 535 of the mixed-income LIHTC properties developed under HPD auspices. On average, 74% of the units in these properties are affordable. Non-profits with HPD allocated credits have produced only 87 mixed-income properties with an average of 73% affordable units. Only 3 mixed-income properties have been produced using DHCR (now HCR) tax credits, but one of those is a large 484-unit property in Coney Island.

<table>
<thead>
<tr>
<th>Agency</th>
<th>Ownership</th>
<th>Properties</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>100% Aff.</td>
</tr>
<tr>
<td>DHCR</td>
<td>For-Profit</td>
<td>53</td>
<td>52</td>
</tr>
<tr>
<td>DHCR</td>
<td>Non-Profit</td>
<td>34</td>
<td>32</td>
</tr>
<tr>
<td>HPD</td>
<td>For-Profit</td>
<td>604</td>
<td>69</td>
</tr>
<tr>
<td>HPD</td>
<td>Non-Profit</td>
<td>166</td>
<td>79</td>
</tr>
</tbody>
</table>

Despite the large difference between the number of HPD LIHTC mixed-income properties developed by for-profits and the number developed by non-profits, the difference in the number of units produced by each is much smaller, with for-profits producing 6561 (4830 affordable) units and non-profits producing 5613 (3789 affordable) units. The average number of units per for-profit mixed-income property is only 12.3\(^9\) while the average number of units per non-profit mixed-

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\(^9\) Note that the SHIP database shows 69 100%-affordable properties developed with HPD tax credits by for-profit developers, with an average unit count of 13.3. Some of these could be mis-categorized NEP mixed-income properties. The NEP program allowed for scattered-site development where non-contiguous buildings could be
income property is 59.3. The differences are driven by the parameters of HPD’s Neighborhood Entrepreneurs Program (NEP) program, which invited developers with less large-scale development experience to develop smaller properties in neighborhoods with which they were familiar and required those properties to contain some market-rate units. These data suggest that NEP is an important driver in the development of mixed-income LIHTC properties; all NEP properties are mixed-income, have for-profit developers, and are allocated tax credits from HPD. While not all of the properties with this combination are necessarily part of the NEP program, all NEP properties are included in this count.

Table 2: HPD For-Profit Properties

<table>
<thead>
<tr>
<th>Boro</th>
<th>SBA</th>
<th>Properties</th>
<th>Total Units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>100% Aff.</td>
<td>Mixed</td>
</tr>
<tr>
<td>MN</td>
<td>Central Harlem</td>
<td>4</td>
<td>144</td>
</tr>
<tr>
<td>BK</td>
<td>Brownsville/Ocean Hill</td>
<td>10</td>
<td>32</td>
</tr>
<tr>
<td>BK</td>
<td>Bushwick</td>
<td>17</td>
<td>79</td>
</tr>
<tr>
<td>BX</td>
<td>Morrisania/East Tremont</td>
<td>0</td>
<td>39</td>
</tr>
<tr>
<td>BK</td>
<td>Bedford-Stuyvesant</td>
<td>9</td>
<td>65</td>
</tr>
<tr>
<td>BX</td>
<td>Mott Haven/Hunts Point</td>
<td>5</td>
<td>37</td>
</tr>
<tr>
<td>BX</td>
<td>Highbridge/S. Concourse</td>
<td>3</td>
<td>19</td>
</tr>
<tr>
<td>MN</td>
<td>Morningside Heights/Hamilton Heights</td>
<td>3</td>
<td>23</td>
</tr>
<tr>
<td>MN</td>
<td>East Harlem</td>
<td>1</td>
<td>24</td>
</tr>
<tr>
<td>BK</td>
<td>University Heights/ Fordham</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>BK</td>
<td>North Crown Heights/Prospect Heights</td>
<td>0</td>
<td>25</td>
</tr>
<tr>
<td>BK</td>
<td>East New York/Starret City</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>BK</td>
<td>South Crown Heights</td>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td>BX</td>
<td>Soundview/Parkchester</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>MN</td>
<td>Washington Heights/Inwood</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>MN</td>
<td>Chelsea/Clinton/Midtown</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>BK</td>
<td>Brooklyn Heights/Fort Greene</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>BX</td>
<td>Kingsbridge Heights/Mosholu</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>69</td>
<td>535</td>
</tr>
</tbody>
</table>

Table 2 shows that all of the HPD tax credit properties developed by for-profits are found in only 18 sub-borough areas (SBAs) in the Bronx, Manhattan, and developed as part of one project and where each site could be placed in service on a different date than others of the same project. The HPD databases held one record for each building site, not for each property, and did not have a clear way of indicating that two sites were part of the same property. The SHIP database would list two such sites as two distinct properties if no other clear merge criteria were found.
Brooklyn, with the vast majority in only 12 of those. This pattern also reflects the concentration of NEP properties in neighborhoods with large numbers of distressed city-owned buildings.

**Mixed-income v. 100% Affordable.** When beginning the process of developing a property using LIHTC funding, developers must decide whether they are going to create mixed-income or 100% affordable housing, and in what neighborhood they will develop the property. The determinations could be made independently of each other or they could be made jointly, with the decision at least partly based on features of the neighborhoods that are related to opportunities for the poor. However, even if the choice of neighborhood and whether or not to create mixed housing are correlated, it would not be clear whether the choice of neighborhood followed or preceded the choice of housing type.

I ran a series of logistic regressions looking at the connection between three neighborhood indicators of access to opportunity – income, poverty, and home prices\(^\text{10}\) – and the property-level decision to develop mixed-income or 100% affordable properties. The dichotomous dependent variable takes a value of 1 if the property is mixed and 0 otherwise. When the dependent variable is dichotomous, the logistic regression produces a model that can be used to calculate predicted probabilities of the outcome from different values of the independent variables. The logistic regression fits values to the logistic cumulative distribution function, which

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\(^{10}\) From the U.S. Census FactFinder site: median value for all owner-occupied housing units in 2000; percent of families below poverty level in 2000; median household income in 1999—owner occupied; percent of householders who are not non-Hispanic white in 2000.
constrains predicted probabilities to values between zero and one. The general form of my model is:

\[ Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_1 X_2 \]

Because the coefficients from a logistic model do not have simple interpretations, I instead calculate a series of predicted probabilities using the formula (Stock and Watson, 2007):

\[
\frac{1}{1 + e^{-(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_1 X_2)}}
\]

In the model, I include a binary variable, \( X_1 \), indicating whether or not the developer is non-profit, one of three different continuous neighborhood indicators, \( X_2 \), and the interaction between these two. By including an interaction between a binary variable and a continuous variable, I am able derive two simple models to interpret the results. When \( X_1 \) is 0, my general model simplifies as:

\[ Y = \beta_0 + \beta_2 X_2 \]

And when \( X_1 \) is 1, my general model simplifies as:

\[ Y = (\beta_0 + \beta_3) + (\beta_2 + \beta_3) X_2 \]

The models use values from the 2000 U.S. Census to better represent conditions in the neighborhoods prior to development. I estimate three specific models based on the general model described above with the following specifications:

\[
\text{mixed} = \beta_0 + \beta_1 \text{nonpr} + \beta_2 \text{medval} + \beta_3 (\text{nonpr} \times \text{medval}) + \epsilon
\]

\[
\text{mixed} = \beta_0 + \beta_1 \text{nonpr} + \beta_2 \text{poverty} + \beta_3 (\text{nonpr} \times \text{poverty}) + \epsilon
\]

\[
\text{mixed} = \beta_0 + \beta_1 \text{nonpr} + \beta_2 \text{medinc} + \beta_3 (\text{nonpr} \times \text{medinc}) + \epsilon
\]
where mixed is 1 when the property is mixed-income and nonpr is 1 when the developer is non-profit. Medval is median housing value in thousands of dollars, poverty is poverty rate, and medinc is median income in thousands of dollars, all for the census tract of the property.

Table 3 presents the results for the subset of properties for which HPD was the allocating agency. I find a small positive correlation between median home values and mixed-income properties, but only for for-profit developers. I find virtually no evidence of a link between the other neighborhood indicators and the choice of mixed-income v. 100% affordable at the property level.

| Table 3: Logistic Regression, LHS is "Property is Mixed-Income", HPD only |
|---------------------------------|------|------|------|
|                                | (1)  | (2)  | (3)  |
| Intercept                       | 1.497| 2.240| 2.496|
|                                 | 0.292| 0.482| 0.482|
| Non-Profit                      | -1.407**| -1.493**| -2.199***|
|                                 | 0.396| 0.627| 0.620|
| Median Home Value ($1000)       | 0.0026*|      |      |
|                                 | 0.0013|      |      |
| Non-Profit*Median Home Value    | -0.0027*|      |      |
|                                 | 0.0016|      |      |
| Poverty Rate                    |       | -0.5600|      |
| Non-Profit*Poverty Rate         |       | 0.0135|      |
| Median Income ($1000)           |       | -0.0137| -0.0199|
| Non-Profit*Median Income        |       | 0.0174| 0.0219|
|                                 |       |       | 0.0132|
|                                 |       |       | 0.0257|

The coefficients on the intercept and nonpr are statistically significant in all results. Looking only at column (1) we can derive two models estimating the effect of median home values: one for for-profits and one for non-profits. By ignoring the
two terms where non-profit is a factor (because nonpr = 0 when the property is for-profit), the model for for-profits is:

\[
mixed = 1.497 + 0.0026\text{medval} + \varepsilon
\]

Likewise for non-profits, we can combine the first two terms to derive a non-profit intercept, and the last two terms to derive a non-profit coefficient on median home value, with the following result:

\[
mixed = 0.090 - 0.0002\text{medval} + \varepsilon
\]

Using these results, I calculate the predicted probabilities of a property being mixed-income for various combinations of ownership and median home values for projects using HPD allocated tax credits. The results are shown in Table 4. In each column, the probabilities cluster around the overall distribution of mixed-income properties with HPD tax credits that can be derived from Table 1:

The predicted probabilities for model (1) indicate that census tract median home value had a small positive effect for for-profits and a negative, but negligible, effect for non-profits on whether the property is mixed or 100% affordable. For models (2) and (3), the coefficients on poverty and income and their interactions with a non-profit developer are not significant.

| Table 4: Predicted Probabilities for Properties with HPD Allocated Tax Credits |
|-------------------------------|-------------------------------|
| Median Home Value ($1000) | Predicted Probability of being Mixed-Income |
|                             | For-Profit | Non-Profit |
| 100                         | 0.852      | 0.518      |
| 200                         | 0.882      | 0.514      |
| 300                         | 0.906      | 0.510      |
| 400                         | 0.925      | 0.506      |
I estimated models like those in Table 3, but also including Agency (HPD or DHCR) and the interaction of Agency with the neighborhood indicators, but found no significant results. I also estimated models like those above, but only looking at the subset of properties for which DHCR was the allocating agency, but again, found no significant results. Only model (1) in Table 3 showed an effect between a neighborhood indicator and a property being developed as mixed-income.\textsuperscript{11}

**Siting Comparison—Dissimilarity.** To continue the exploration into whether the living circumstances for households living in 100% affordable properties are different from those of households living in mixed-income properties, I use a dissimilarity index to determine if units in these two types of properties are substantially segregated from each other. The dissimilarity index is a tool more commonly used to measure segregation amongst races or ethnicities. It measures the extent to which two groups sort among neighborhoods in a metropolitan area. The index can be interpreted as the share of one group that would have to be relocated—from neighborhoods where they are overrepresented to neighborhoods where they are underrepresented—in order to have the same distribution as the other group (Horn and O'Regan, 2011).\textsuperscript{12}

\[ D = \frac{1}{2} \sum_{i} \left| \frac{N_{ki}}{N_k} - \frac{N_{ji}}{N_j} \right|, \]

\textsuperscript{11} Depending on the extent of the data problem described in footnote 9, even this outcome is suspect as it focuses on properties for which the dependent variable may be mis-categorized.

\textsuperscript{12} The formula for the dissimilarity index is: $D = \frac{1}{2} \sum_{i} \left| \frac{N_{ki}}{N_k} - \frac{N_{ji}}{N_j} \right|$, where $N_{ki}, N_{ji}$ are the unit counts for groups $k$ and $j$ in neighborhood $i$, and $N_k, N_j$ are the city-wide unit counts for groups $k$ and $j$. This formula will always yield a value between 0 and 1 with higher values indicating greater segregation.
Rather than ethnicities, the two groups I want to compare are affordable housing units in 100% affordable properties, and affordable housing units in mixed-income properties. My aim is to determine if these two groups are segregated from each other by neighborhood, and if so, to determine if the neighborhoods where one type of unit predominates offer better opportunities to the households living in these units. Market-rate units in mixed-income properties are not a concern for policy makers interested in opportunities for low-income families in subsidized housing, so I do not include them in the index.

Using U.S. Census tracts to delineate neighborhoods, I derived a dissimilarity index of .77 indicating that 77% of one type of unit would have to be moved from neighborhoods where they are overrepresented to neighborhoods where they are underrepresented in order to match the distribution of the other group. Because the index is sensitive to the size of the geographical areas being compared, I also derived the index for U.S. Census sub-borough areas (SBAs). As expected, the SBA index is smaller than the census tract index, but with a value of .35, still suggests substantial segregation amongst the SBAs.

Siting Comparison—Comparison of Means. Segregation of the two different types of affordable units—those in 100% affordable developments and those in mixed-income developments—does not by itself indicate differences in

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13 In New York City, there are 55 sub-borough areas. They are constructs of the U.S. Census and are designed to approximate the city’s 59 community districts (CDs). SBAs are constructed from census tracts so have slightly different borders from the CDs. Because of small populations in some CDs, the Census combined 4 pairs of CDs in Manhattan and the Bronx into 4 SBAs, accounting for the different number. SBAs are comprised of anywhere from 23 to 83 tracts, depending on the population of the SBA.
opportunity for households living in affordable units. If the different neighborhoods where one or the other type of housing is overrepresented are qualitatively similar in measures of access to opportunity, then neither type of housing creates more favorable conditions than the other.

I attempt to quantify the differences in access to opportunity by comparing the means of four measures: property values, incomes, poverty rates, and racial composition. For each mean, I use census tract data from the U.S. Census’s FactFinder website. I calculate a weighted average of indicators, weighting each by the number of subsidized affordable LIHTC units in either 100% affordable properties or in mixed-income properties for each tract.

Table 5 displays these means comparisons. The results do not lead to unambiguous conclusions regarding access to opportunity. Subsidized units in mixed-income properties are in neighborhoods where the weighted average of median home values is higher than the same average for units in 100% affordable properties. However, the reverse is true for median household incomes: averages are higher for 100% affordable properties, both when considering incomes for all households and when considering incomes for renters only. The average poverty rates for each group are virtually the same. The average share of the population that is non-white (counting white Hispanics as non-white) for both groups is high, but notably higher for the units that are in mixed-income properties.
The lower average incomes and higher non-white population for the units in mixed-income properties are likely a consequence of the selection process for properties that participated in the NEP program. The program was created to enlist private developers who had ties to the neighborhoods to rehabilitate deteriorated, occupied buildings that had come to be owned by HPD after having been abandoned by their previous owners. As such, the primary objective of the program was to rehabilitate buildings and neighborhoods, not to move poor families to neighborhoods of greater opportunity. HPD selected the neighborhoods with the most distressed buildings to be rehabilitated.

However, despite selecting distressed neighborhoods that initially may have provided less access to opportunity for poor families, an important goal of the NEP program was to bring about the rehabilitation of many properties in these neighborhoods thereby leading to the rehabilitation of the entire neighborhood—for example by attracting stores to new storefronts and improving security (HPD, 2002). In their examination of spillover effects from rehabilitation of vacant and occupied, distressed, city-owned buildings, Ellen and Voicu (2006) found that small, for-profit projects, such as those developed through NEP generated positive and
significant external benefits to nearby properties. Their study found that sales prices increased more rapidly for properties close to recent developments and that the effect diminished with distance.

**Analysis and Conclusion**

The empirical analysis in this paper is a first attempt to look at the connection between neighborhood economics and siting of mixed-income housing developed with LIHTC subsidies. While the structure of LIHTC financing favors development of mixed-income housing in higher rent neighborhoods, the financial incentives are only few of many factors that contribute to siting decisions. Local housing agencies have a great deal of flexibility to create LIHTC competitive parameters to encourage developments that meet local housing goals. These parameters can easily confound the influence of the financial incentives. The empirical process in this paper cannot produce an unbiased estimate of the financial effect without data identifying other factors influencing siting decisions—in particular which properties were developed through the NEP program.

I began this paper intending to explore how the interplay between market forces and the structure of the LIHTC program affected the distribution of subsidized affordable units in either mixed-income properties or 100% affordable properties across New York City. Subsidized rents in LIHTC properties are a function of unit size, the targeted income range for eligible families, and the area median income. The areas for area median incomes, however, are quite large geographically; the area median income for all five counties in New York City in
2011 – 2012 is $78,300 according to Fannie Mae. This clearly doesn’t reflect the large neighborhood variations in incomes throughout the city. According to the formula, a subsidized three-bedroom unit for a family below 60% of AMI in a lower income neighborhood generates the same rental income as a similar unit in a higher income neighborhood. The rent does not vary based on the actual incomes of the families or on the prevailing rents in the neighborhoods. Rents of market-rate units, however, by definition, vary by market. The difference between a market-rate rent and a subsidized rent in a lower rent neighborhood could be quite small whereas the same difference in a higher rent neighborhood could be substantial.

Because of this differential I hypothesized that mixed-income LIHTC properties would more likely be developed in higher rent neighborhoods—or possibly that LIHTC properties developed in higher rent neighborhoods were more likely to be mixed-income, or to have more market-rate units than properties developed in lower rent neighborhoods. This dynamic should be interesting to policy makers. By allowing more market-rate units in LIHTC properties, planners could encourage development of more subsidized units in neighborhoods with greater access to opportunities for poor families.

What I found was that, at least in the time frame I examined, market forces seemed to be overwhelmed by other forces. Federal guidelines for LIHTC allow a great deal of latitude to the state and city housing agencies to design tax credit allocation criteria to meet local needs. The Neighborhood Entrepreneurs Program in New York City is an important case of local criteria for property location overwhelming market forces. Although increasing the availability of affordable
housing was an important goal of this program, the main objectives were to rehabilitate distressed city-owned properties and to turn their ownership and management over to private investors. All of the buildings rehabilitated through NEP already existed so their locations were predetermined—and they were in poorer neighborhoods, contrary to where a market-based theory would predict mixed-income properties be developed. Moving poor families to neighborhoods of opportunity was not an important criterion of NEP, although the program designers did expect opportunities to grow in the selected neighborhoods as a consequence of neighborhood revitalization.

I did find that units in mixed-income housing were substantially segregated by neighborhood from units in 100% affordable housing. But the qualitative differences between the neighborhoods were small. Both types of properties tended to be developed in neighborhoods of greater need rather than in neighborhoods that could provide greater access to opportunity. This might reflect how non-profit organizations choose locations for LIHTC developments. Non-profit organizations developed substantially more 100% affordable properties than for-profits. Like the city, they might prefer to develop in neighborhoods where the addition of their (usually larger) properties could lead to revitalization of distressed neighborhoods. Alternatively, non-profits might, by mission, endeavor to maximize the number of affordable units they produce and always design 100% affordable properties. This would preclude any excess revenues generated by market-rate rents and reduce the financial viability of projects in high-cost neighborhoods.
The NEP program is now closed, so the New York housing agencies’ LIHTC allocating criteria will be less driven by the existence of a set of properties already tied to specific locations. Should the agencies’ future policies include goals of moving poorer families to neighborhoods of opportunity, they may be well served by encouraging a greater number of market-rate units in future projects. In such a case, the framework developed in this paper could be applied to determine the degree to which neighborhood characteristics determine whether properties include market-rate units, and how much exposure to opportunity for subsidized residents of mixed-income properties differs from residents of 100% affordable housing.
Appendix: About the SHIP Database

The primary source of data for this paper is a database that I built as part of the Subsidized Housing Information Project (SHIP) for the Furman Center of Real Estate and Urban Policy, a joint research center of New York University's schools of law and public service. The objective of this database – often referred to as the "Preservation Database" – is to consolidate many different administrative sources of data about privately owned, publicly subsidized, affordable housing in New York City. The word "preservation" in its working name refers to the fact that all of the rent restrictions on the properties in the database are temporary—with expiration dates on which the owners may convert the units from restricted to market-rate rents—a phenomenon often called "expiring use". Government agencies and the private housing advocates they work with need an accurate record of the properties and their expiring use in order to target their efforts at preserving affordability.

The demand for this database arises from the inability of the government agencies involved to use their own data to understand the expiring use problem. Any one property may receive subsidies from multiple programs, from multiple agencies, and at multiple times (for construction, rehabilitation, capital improvements, etc.) during its existence. Each of these subsidies imposes different restrictions with different expiration dates; and each agency largely only tracks the subsidies they administer, often within different databases for different programs within an agency. Until the SHIP Database was built, there was no way to fully understand the landscape of properties supported by the subsidies in its mandate.
The database focuses on four different portfolios of subsidies: HUD insured mortgages, HUD project-based Section 8 rent assistance, the New York State Mitchell-Lama program for middle income housing, and the federal low income housing tax credit (LIHTC). All except the Section 8 program are supply-based subsidies, where developers and owners receive assistance from the government in exchange for committing to restricted rents for eligible tenants. The Section 8 program, by contrast, provides assistance to tenants paying market rate rents, but only in properties participating in the program. Only the LIHTC is still actively funding new development.

The data come from five different agencies responsible for administering these programs in New York City: the U.S. Department of Housing and Urban Development (HUD), The New York State Division of Housing and Community Renewal (DHCR), the New York State Housing Finance Agency (HFA), the New York City Department of Housing Preservation and Development (HPD), and the New York City Housing Development Corporation (HDC). In 2010, DHCR and HFA were combined along with other state-level agencies into New York State Homes and Community Renewal (HCR).
References


