Revitalizing Inner-City Neighborhoods: New York City's Ten-Year Plan

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Abstract

This article examines the impact of New York City's Ten-Year Plan on the sale prices of homes in surrounding neighborhoods. Beginning in the mid-1980s, New York City invested $5.1 billion in constructing or rehabilitating over 180,000 units of housing in many of the city's most distressed neighborhoods. One of the main purposes was to spur neighborhood revitalization.

In this article, we describe the origins of the Ten-Year Plan, as well as the various programs the city used to implement it, and estimate whether housing built or rehabilitated under the Ten-Year Plan affected the prices of nearby homes. The prices of homes within 500 feet of Ten-Year Plan units rose relative to those located beyond 500 feet, but still within the same census tract. These findings are consistent with the proposition that well-planned project-based housing programs can generate positive spillover effects and contribute to efforts to revitalize inner-city neighborhoods.

Keywords: Community; Development/revitalization; Housing; Neighborhood

Introduction

For the first time in over a decade, policy makers in Washington, DC, are seriously considering creating a new subsidized housing production program. Since the mid-1970s, housing analysts and most government officials have taken a dim view of government interventions to subsidize housing construction, preferring instead to use demand-side programs such as housing vouchers (Olsen 2001). However, one theoretical advantage of production programs that is often overlooked is that they may help eliminate negative externalities created by deteriorated housing and, in some instances, generate positive spillover effects. Up to now, relatively few studies have explored whether this theoretical advantage of production subsidies is actually borne out by the facts, and the results of the studies that have been done typically are inconclusive.

Over the past 15 years, New York City has engaged in the largest municipally supported housing production program in the history of the United States. Announced in 1985 by former Mayor Edward I. Koch (1985), this commitment of over $4 billion to build or renovate

more than 100,000 housing units over a five-year period has grown today to over $5 billion and 182,000 housing units. The Ten-Year Capital Plan, a misnomer for a program that already has lasted over 14 years, encompasses a wide variety of programs to stimulate the production or rehabilitation of housing, many of which evolved over time in the face of political and economic constraints. In this article, we will examine this unprecedented program, describing the types of housing produced, where it was sited, and its impacts on the city's neighborhoods. We particularly focus on whether Ten-Year Plan production subsidies generated positive spillover effects.

In the first part, we maintain that production programs like the Ten-Year Plan are in theory more likely than demand-oriented programs, such as housing vouchers, to generate positive spillover effects in distressed neighborhoods. We then go on in the second part to recount the history of the Ten-Year Plan in an effort to describe how it came into being and to provide a comprehensive picture of the housing that was produced, the neighborhoods in which it was located, and the households that it served. In the third part, we examine the question we alluded to earlier, namely whether housing built under the Ten-Year Plan generated positive externalities for the neighborhoods in which it was located. While we do not directly test whether the spillover effects associated with the Ten-Year Plan are greater than those that might be generated by housing vouchers, our results do suggest that this theoretical advantage of production programs may indeed be real.

Production programs and neighborhood spillovers

After a lively debate in the late 1980s and early 1990s (for example, Apgar 1990; Weicher 1990), most housing policy analysts have come to favor housing vouchers as the nation's main approach for delivering housing assistance to low- and moderate-income households. Among the virtues of housing vouchers relative to programs that subsidize developers directly are their greater efficiency and cost-effectiveness, the choice they allow recipients, and the generally superior neighborhoods in which assisted families ultimately settle.[1] Nevertheless, production subsidies may have one comparative advantage over vouchers: such programs may be better suited to achieving targeted neighborhood revitalization objectives.

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[1] The literature on the advantages of vouchers is voluminous, and we summarize it in Ellen et al. (2002). For recent cost comparisons between vouchers and production programs, see U.S. General Accounting Office (2002).

Neighborhood revitalization is a concept with no precise definition. Instead, a variety of efforts come under the rubric of revitalization strategies, and a number of possible outcomes might reflect success. For example, community development efforts typically seek to improve both the physical and the social condition of neighborhoods. Positive outcomes can include improved schools, lower crime rates, increased commercial activity, and removal of physical decay. Because land is immobile, to the extent that any of these positive outcomes occur, they also should be capitalized into higher property values.

One of the ways housing programs might promote neighborhood revitalization is by replacing blighted properties or land with new structures or by improving existing structures in need of rehabilitation. In addition to improving the structure and land on which the housing itself is located, it is quite plausible that the enhanced physical appearance of the housing produced or rehabilitated will generate a positive spillover effect on nearby properties. The values of these properties might rise as a result of being in close proximity to the housing development. They might also rise as nearby owners rehabilitate their properties because they realize that the neighborhood's greater physical attractiveness means that they will be able to recoup any additional investments in upkeep.

Besides physical regeneration, the rehabilitation of abandoned and deteriorated properties may also reduce neighborhood crime rates. Structures that once provided shelter for prostitution and the use and sale of drugs can be transformed into secure, fully occupied family housing. To the extent that disorder itself leads to increased crime levels, as sociological literature seems to indicate (Skogan 1990), housing rehabilitation and construction may have an indirect effect on property values as well. Removing physical blight may contribute to safer neighborhoods, which, in turn, lead to higher property values. Furthermore, where programs actually create new housing, population may grow, promoting new commercial activity, a greater sense of safety, and general economic growth.

If housing programs are indeed capable of catalyzing neighborhood revitalization, it would seem that production subsidies rather than vouchers would be more likely to achieve this objective. Indeed, the key shortcoming of production subsidies—their concentration in spatially defined areas—becomes an advantage when it comes to neighborhood revitalization. Although vouchers increase demand and may well stimulate a supply response (including both new units and/or housing rehabilitation to meet minimum standards), the fact that they rely on individual decision making limits their effectiveness in achieving spatially targeted goals. In choosing where to rent housing, individual

recipients of vouchers do not take into account the effect their choices will have on the surrounding neighborhood and thus are unlikely to choose the locations that maximize external benefits. Housing agencies and community-based nonprofit organizations responsible for locating and implementing production programs, however, are more likely to consider the interests and needs of entire communities rather than just individual tenants.

Of course, not all production programs are the same. Therefore, it is very possible that different types of programs might generate different impacts on their surrounding communities. For example, impacts may depend on the scale of the investment. It seems reasonable, for instance, to expect that the impact of 300 units within a given distance from a property would be greater than the impact of a single unit. At the same time, the marginal effects of additional units of housing investment are likely to be nonlinear. While extremely small investments may be unlikely to have a major impact on a neighborhood, once a sufficient scale is reached, each dollar of investment may generate significantly larger benefits. At a certain level of housing investment, however, additional investments may evince diminishing returns because the community already has improved significantly and has less potential for future increases in property values. Finally, if demand were to remain constant or grow slowly in a spatially segmented housing market, substantially increasing the supply of units in one community could reduce prices and thus actually lead to vacancies and disinvestment.

There is also reason to expect that homeownership programs might generate larger benefits than rental programs, possibly as a result of the greater financial incentives homeowners have to maintain their homes. Similarly, homeowners may be more involved in local organizations and activities either because of their financial stake or because homeowners tend to remain in their homes longer. In any event, greater participation may improve the quality of life in a community, again raising property values. (See DiPasquale and Glaeser 1999 and Rohe, Van Zandt, and McCarthy 2000 for evidence and discussion.)

It is also possible that homeownership and rental programs may generate different impacts, not because of inherent differences in the tenures themselves, but because owner-occupied homes tend to be smaller scale (one- to four-family buildings versus apartment buildings) and because homeowners tend to have higher incomes than renters. Indeed, as noted later, several of the rental programs implemented as part of New York City's Ten-Year Plan provided for a 30 percent set-aside of units for homeless families. Ownership programs also could have greater spillover effects on neighborhoods if the scope of the work is different (new construction versus rehabilitation).

The Ten-Year Plan

In the third part of this article, we will examine empirically whether one city's (New York's) ambitious housing production program—the Ten-Year Plan—generated the types of spillover effects associated with our earlier theoretical discussion. Before we turn to this analysis, however, we provide a detailed description of the various programs that were part of the initiative.

In 1985, New York City was a very different place from the city that could not pay its teachers and policemen in 1974.[2] The city had put its fiscal house in order and was once again able to borrow in the capital markets. The revival of the city's economy was accompanied by a rapid escalation of house values and rents. In addition to extremely low vacancy rates and high rent-to-income burdens, homelessness had become a persistent problem. As a result of a series of consent decrees in the early 1980s, city officials were under pressure to provide housing to all homeless individuals and families (Culhane, Metraux, and Wachter 1999). Despite the increased need for housing assistance, cutbacks in federal subsidies by the Reagan administration substantially reduced the resources on which the city had historically relied.

Although the city's fiscal health and the real estate markets in much of Manhattan had recovered since the mid-1970s, other Manhattan neighborhoods (north of 96th Street), the Bronx, southeast Queens, and central Brooklyn were still feeling the effects of the crisis of the 1970s. As the city lost population throughout the 1960s and especially the 1970s, entire neighborhoods in these parts of the city were devastated by waves of abandonment and arson.

By 1979, the city had taken ownership of approximately 60,000 vacant and 40,000 occupied apartments as a result of tax foreclosures. The tenants of the occupied apartments typically had very low incomes and often lived in extremely poor quality housing. The city's housing agency, the Department of Housing Preservation and Development (HPD), was unprepared to become the second-largest landlord in the city after the New York City Housing Authority. Despite consuming immense amounts of HPD's annual operating budget, this so-called *in rem* housing, named after the legal action that vested title in the city, continued to deteriorate in public hands.

In the end, the city's experience with abandonment, together with its reemergence from insolvency, created three preconditions for the

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[2] For other discussions of the origins of the Ten-Year Plan, see Schwartz (1999) and Van Ryzin and Genn (1999).

development of the Ten-Year Plan. The need for public intervention in stemming the deterioration of neighborhoods was evident to virtually everyone. At the same time, the city's stock of *in rem* housing resulting from abandonment and devastation proved to be a resource that enabled the city to promote housing construction without having to acquire one of its most expensive inputs—land. Last, the city's new ability to access capital markets provided it with the capacity to fund what would become the largest municipal housing program in the nation's history.

The rough contours of the Ten-Year Plan were first announced in Mayor Koch's State of the City speech in 1985.[3] In that speech, he announced a "five-year $4.4 billion program to build or rehabilitate around 100,000 housing units for middle class, working poor and low-income families and individuals" (Koch 1985, 8). To fund the program, he proposed using money from the World Trade Center to finance approximately $1 billion in bonds. Other revenues would come from the city's Housing Development Corporation and its capital budget. One of the main purposes of the program was to address the shortage of affordable housing. A second focus—neighborhood revitalization—was evident from the beginning. According to the mayor, "[F]irst, we intend to undertake a major effort to rebuild entire neighborhoods of, perhaps 15 to 25 square blocks throughout the City.…[I]t is anticipated that such concentrated revitalization would provide the hub for further development" (Koch 1985, 11).

Three years later, the mayor would announce an expansion of the city's financial commitment to $5.1 billion (City of New York, Office of the Mayor 1988). Since the State of the City speech in 1985, the numerical goal had increased to 253,000 units. The city would renovate 82,000 units in occupied *in rem* buildings, rebuild 47,000 units in vacant *in rem* buildings, build 37,000 new units, and upgrade 87,000 apartments in privately owned buildings. Neighborhood revitalization remained an important feature. According to a press release announcing the expansion of the Ten-Year Plan, "[V]acant buildings are a blot on our landscapes and our lives" (City of New York, Office of the Mayor 1988, 1). A document produced by HPD the next year made the point even more explicitly: "We're creating more than just apartments—we're re-creating neighborhoods. We're revitalizing parts of the city that over the past two decades had been decimated by disinvestment, abandonment, and arson" (City of New York, HPD 1989, 3).

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[3] Mayor Koch's announcement of the Ten-Year Plan in 1985 was not entirely unprecedented. Indeed, many of the programs that would be encompassed in the Ten-Year Plan were already in existence in 1985, albeit at substantially lower levels of activity.

Over time, HPD created a vast array of programs that enlisted a wide variety of actors. Since neighborhood preservation and revitalization were important objectives, the city implemented a number of programs that made community-based nonprofit organizations the major stakeholders in housing production. According to Felice Michetti, a former HPD commissioner, "When the Ten Year Plan began, there were about twelve not-for-profits in the City of New York that were actively involved in housing….By the time I left HPD, there were over a hundred not-for-profits involved in the Ten-Year Plan, and involved not in the traditional federal role of sponsoring projects, but actively involved [in development]" (City of New York, HPD 2000, 25). Community development corporations (CDCs) were by no means alone in building and rehabilitating housing. Profit-motivated developers of affordable housing were attracted to a number of development programs either by the promise of long-term appreciation in property values or by development fees.

The Ten-Year Plan also depended on the active participation of local financial institutions and intermediaries. Banks and bank consortia such as the Community Preservation Corporation (CPC) not only provided the financing for much of the construction but also added to HPD's capacity to supervise construction expenditures (Wylde 1999). In an unprecedented arrangement, both the Local Initiatives Support Corporation (LISC) and the Enterprise Foundation provided technical support to CDCs as well as access to equity from Low-Income Housing Tax Credits (LIHTC). In one of the more innovative programs developed, the New York City Housing Partnership, a corporation created by the city's business elite, managed a program that would lead to the construction of over 13,000 new homes for aspiring homeowners.

Expenditures under the Ten-Year Plan

Because the Ten-Year Plan encompassed both old and new programs and because housing construction and rehabilitation typically take several years to complete, determining what expenditures and which units are specifically attributable to the plan is somewhat arbitrary. In terms of dollars spent, we characterize capital expenditures beginning in fiscal year (FY) 1987 as part of the Ten-Year Plan. New York City's fiscal year begins on July 1 of the previous year. According to this convention, through the end of FY 2000, New York City spent $5.1 billion on the Ten-Year Plan (Niblack 2001), 81.7 percent of which came from the city's capital budget. The remaining funds were from state and federal sources.

Table 1 and figure 1 depict the city's annual capital expenditures on housing from FY 1983 through FY 2000. Expenditures almost doubled between FY 1986 and FY 1987 and then more than tripled between FY 1987 and FY 1988. The peak expenditure was in FY 1992, when the city spent over $660 million on housing production and development. Since FY 1992, spending has tended to decline. Even so, the $269 million the city devoted to housing in FY 2000 was roughly 10 times its average capital expenditure before the Ten-Year Plan, an increase substantially in excess of the cumulative inflation between 1983 and 2000, which totaled 72.7 percent.

Table 1. **HPD Capital Expenditures (FY 1983 to FY 2000)**

Fiscal Year	City Capital Budget	Other Sources	Total
1983	$10,756,429	$4,909,214	$15,665,643
1984	18,765,843	2,809,800	21,575,643
1985	26,510,969	3,291,116	29,802,085
1986	33,448,228	3,525,946	36,974,174
1987	60,924,135	1,234,256	62,158,391
1988	188,452,619	5,046,616	193,499,235
1989	305,451,709	34,578,682	340,030,391
1990	439,542,852	95,318,454	534,861,306
1991	618,056,570	24,546,074	642,602,644
1992	572,571,190	89,323,947	661,895,136
1993	367,594,960	81,702,211	449,297,171
1994	472,260,878	74,663,472	546,924,350
1995	211,287,661	70,020,705	281,308,366
1996	183,128,389	84,472,936	267,601,325
1997	167,687,338	76,835,491	244,522,829
1998	170,049,287	66,017,644	236,066,932
1999	270,788,752	139,088,432	409,877,184
2000	173,551,764	95,507,911	269,059,675
Total Ten-Year Plan (FY 1987 to FY 2000)	$4,201,348,106	$938,356,830	$5,139,704,935
Total FY 1983 to FY 2000	$4,290,829,574	$952,892,906	$5,243,722,480

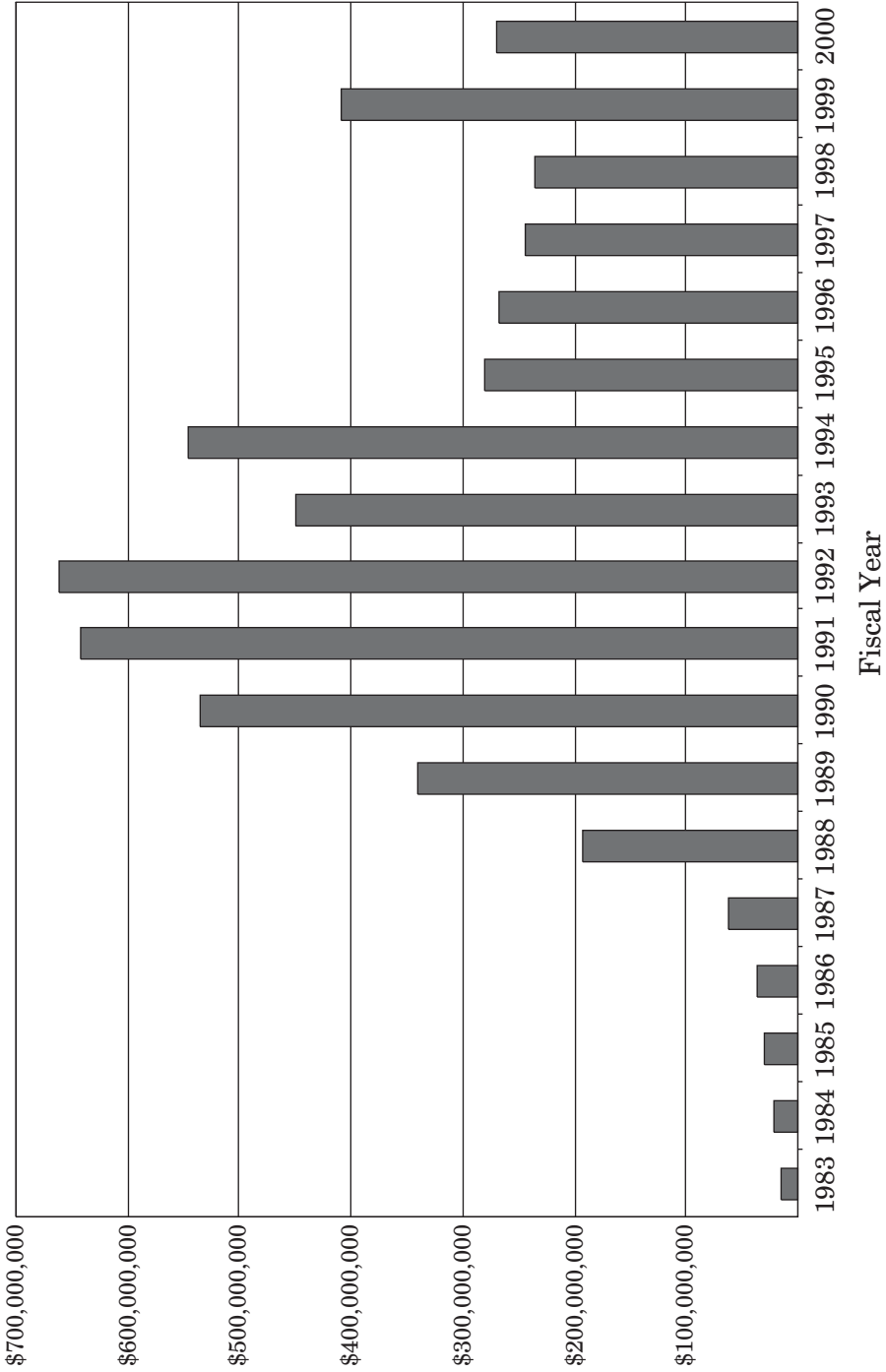*Source:* Preston Niblack 2001.
Note: The figures in this table represent nominal dollars. Numbers may not total exactly because of rounding.

The programs of the Ten-Year Plan

For the purposes of this article, units built or rehabilitated under the Ten-Year Plan are defined to include only those projects completed between January 1987 and June 2000. The January 1987 beginning date was selected because of the long lag time associated with housing construction. It is likely that buildings completed in 1986 were planned

Figure 1. **Annual Capital Expenditures for Housing (FY 1983 to FY 2000)**

Source: Preston Niblack 2001.

and financed long before the announcement of the Ten-Year Plan. In addition, when we count units produced, we do not include those built under federal programs such as Public Housing, Section 8, and Section 202 Housing. In certain respects, our definition of the Ten-Year Plan is therefore both under- and overinclusive. Federal housing programs that used city resources such as city-owned land would not be included in our totals. In addition, it is possible that completions after 1986 would be included even though planning for the developments may have begun and funding commitments may have been made before the announcement of the plan in 1985.

Given this definition, the city used at least 105 different programs over the course of the Ten-Year Plan, many of which produced only a handful of units. We place these programs into eight categories depending on whether the assisted housing was slated for homeownership or rental use; whether it involved the rehabilitation of occupied buildings, the rehabilitation of vacant buildings, or new construction; and last, for the vacant rehabilitation programs, whether the buildings were in private hands or were owned by the city.[4] In most instances, the city's subsidy for housing is not limited to capital dollars. Most newly constructed or rehabilitated housing also qualifies for property tax abatements or exemptions (or both), as well as a reduced or nominal acquisition cost.

Homeownership programs. As table 2 indicates, between 1987 and 2000, 34,720 homeowner units—approximately 19 percent of the total number of units built or renovated under the Ten-Year Plan—were constructed or rehabilitated.

1. *Rehabilitation of private owner-occupied units.* Under the Ten-Year Plan, over 6,000 occupied units of private housing (3.3 percent of the total number of units) were rehabilitated for homeowners. The largest program by far is the Housing Improvement Program (HIP), under which loans are made to assist owner-occupants of one- to four-family homes make repairs to masonry, roofs, plumbing, and other building systems. City financing at 0 percent interest is blended with bank financing to yield loans with interest rates that range between 2.5 percent for a family of four with an income under $45,000 and 5 percent for a family with an income as high as $78,660. The maximum loan amount is currently $20,000.

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[4] Data on the housing built or rehabilitated through the Ten-Year Plan was obtained from HPD. For each housing project, this data set includes the program that funded the rehabilitation or construction, the year the project was completed, the number of units that were built or rehabilitated, and, in most instances, its geographic location.

2. *Rehabilitation of* in rem *occupied units for homeownership.* Over 9,000 units of housing in formerly *in rem* buildings have been renovated for homeownership with city capital. The largest program in this category, the Tenant Interim Lease Program (TIL), funds the renovation of buildings while they are still in city ownership. Existing tenants of buildings that participate in the program are required to participate in building management education programs, and rents are restructured to enable the eventual cooperative to cover ongoing expenses. After several years, the properties are transferred to tenants as cooperatives for $250 per apartment. Since 1994–95, owners who sell their units have been required to give the cooperative corporation half of the net proceeds from the sale. Until 1995, Section 8 certificates were sometimes used to enable very low income tenants to afford the costs of operating and maintaining the buildings. The scope of work under TIL has changed substantially over time. At the beginning of the Ten-Year Plan, the work generally cost between $10,000 and $20,000 per unit (Schwartz 1999). By 2001, this had increased to more than $68,000.

3. *Rehabilitation of vacant buildings for homeownership.* Some 2,800 housing units in vacant *in rem* housing have been rehabilitated for homeownership. One of the largest programs is CityHome, an effort that is administered by the Enterprise Foundation and the CPC. Vacant city-owned buildings are completely rehabilitated to create one- to three-family homes for owner-occupants with household incomes between $35,000 and $90,000. Owners can use the income from the rental units to offset ownership costs. The city subsidy, which averaged $46,600 per home over the life of the program, is in the form of a second mortgage loan that evaporates over a 25-year period. The first mortgage loan is obtained from participating banks at market rates.

4. *New construction of homes for ownership.* The largest category of homeownership initiatives under the Ten-Year Plan is the one that includes new construction programs. Over 16,800 units of housing have been created, 13,000 alone under the New Homes Program of the New York City Housing Partnership. Under this program, the city contributes vacant land for only $500 per lot, as well as a $10,000 per unit subsidy; the state contributes an additional $15,000 per unit. In some instances where the market would support higher sales prices, these subsidies might be less. Private developers under the supervision of the New York City Housing Partnership and commercial bank construction lenders originally built single-family and now build two- to three-family houses for purchasers with incomes ranging from $32,000 to $75,000 per year. Again, the subsidy is in the form of a loan from the city that evaporates over a 25-year

period. Partnership projects are typically modest; most are now built on infill sites and have less than a hundred housing units.

Table 2. **Distribution of Ten-Year Plan Units by Program Class**

	Units	
Program Classification	Number	Percentage of Total
Owner-oriented programs		
Rehabilitation: Occupied, private	6,077	3.3
Occupied, *in rem*	9,029	4.9
Vacant	2,801	1.5
New construction	16,813	9.2
Total owner-oriented programs	34,720	18.9
Renter-oriented programs		
Rehabilitation: Occupied, private	73,670	40.3
Occupied, *in rem*	27,938	15.3
Vacant	41,484	22.7
New construction	5,049	2.8
Total renter-oriented programs	148,141	81.1
Total all classes	182,861	100.0

Note: The statistics in this table include all the Ten-Year Plan housing projects in the HPD data set.

Rental programs. Programs that funded the rehabilitation and construction of rental housing form the bulk of the Ten-Year Plan. As of the close of FY 2000, over 148,000 units had been built or rehabilitated. This represents 81 percent of the total number of units produced by or assisted under the Ten-Year Plan.

1. *Rehabilitation of occupied private rental housing.* The single largest category of programs is the one that focuses on rehabilitating private occupied rental housing. Over 73,600 units have been improved. The largest program by far is the Article 8–A loan program, which provides loans at 3 percent interest to owners of multiple dwellings for upgrading or replacing major building systems. The upper limit of the loans ($25,000 per unit) reflects the relatively modest scope of work that can be done under the program. For somewhat more extensive work, the city makes loans available under the Participation Loan Program (PLP). City money lent at 1 percent interest is combined with market-rate financing to create a below-market interest rate loan.

2. *Rehabilitation of occupied* in rem *rental housing*. Through the end of FY 2000, just under 28,000 units of occupied city-owned housing had been rehabilitated and transferred to a variety of private owners. Some of the buildings underwent modest renovation, but many had more substantial work performed. Because the buildings were occupied, those that had extensive work done required tenant relocation. In some of the early programs such as the Capital Improvement Program (CIP), the city itself contracted and oversaw the rehabilitation. In more recent programs such as the Neighborhood Entrepreneurs Program (NEP) and the Neighborhood Redevelopment Program (NRP), buildings are transferred to either for-profit or nonprofit owners that contract to do the work. The scope of work, which is typically more extensive than under CIP, ranges from $70,000 to $80,000 per unit. Rents are restructured for existing tenants, and the amount of the city capital subsidy is calculated to fill the gap between the total cost of rehabilitation and the debt service that can be covered by the rent roll. NEP expenditures are monitored by construction lenders; NRP work is monitored by the city. The city's subsidy is in the form of a second mortgage that typically carries a 1 percent interest rate. In addition, equity investors in the developments receive the LIHTC where available.

3. *Rehabilitation of vacant rental housing*. Almost 41,500 units of vacant, city-owned rental housing were rehabilitated as part of more than 35 separate programs. Some programs rehabilitate housing for homeless families or special-needs households. Several others require that a certain proportion of the tenants (ranging from 10 percent to 85 percent) be composed of formerly homeless households. In most instances, buildings undergo gut rehabilitation. The Vacant Building Program (11,500 units) was one of the earliest of the Ten-Year Plan programs. Buildings were transferred in clusters to private developers. City subsidies, in the form of 1 percent interest rate mortgages, were capped at approximately $37,000 per unit. Rents were set in consultation with HPD to be affordable to low- and moderate-income families. Later programs such as the LISC and Enterprise Vacant Building Programs (3,666 and 3,258 units, respectively) used the expertise of these two national intermediaries to generate equity from the LIHTC for housing that was transferred to and rehabilitated by nonprofit CDCs. The scope of work on these projects ranged from $66,000 per unit in 1989 to $77,725 in the mid-1990s.

4. *Construction of new rental housing*. New construction is the smallest component of the Ten-Year Plan rental programs: Slightly

more than 5,000 new rental units were built. Some of the programs in this category do not technically receive city capital money. For example, under the 421–a Affordable Housing Program, developers of housing for low- and moderate-income households receive certificates from the city that entitle the holders to a property tax exemption. Owners of newly constructed market-rate housing typically south of 96th Street in Manhattan purchase these certificates, thereby offsetting some of the costs of affordable housing development. Other new construction programs include SRO buildings and housing for people with special needs.

Figures 2 and 3 show the mix of programs from 1987 to 2000. With respect to the homeownership programs, new construction consistently dominated the other programs, reaching a peak in 1990 with over 2,500 homes completed. The annual pattern of completions among rental programs was a bit more varied. During the early years, the rehabilitation of occupied units far outnumbered all other initiatives, probably because the work was relatively modest and could be completed rapidly. However, between 1991 and 1993, the rehabilitation of vacant buildings predominated. After 1993, as overall production numbers declined along with expenditures, the mix of program completions tended to converge.

Figure 2. **Dynamics of Ten-Year Plan Owner-Oriented Programs by Type of Intervention**
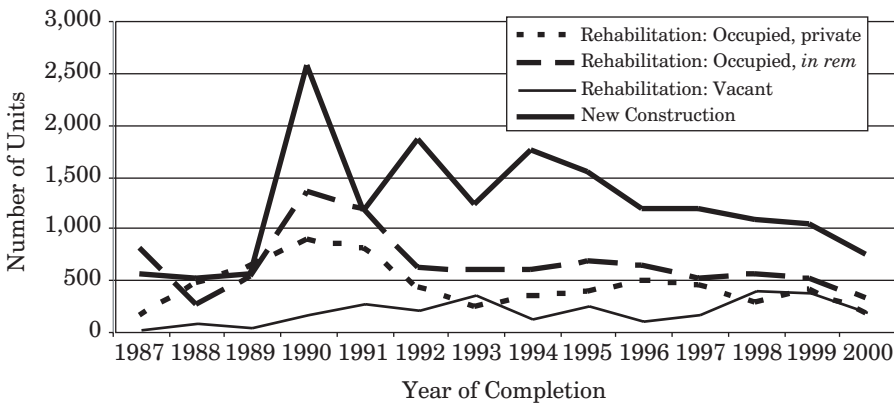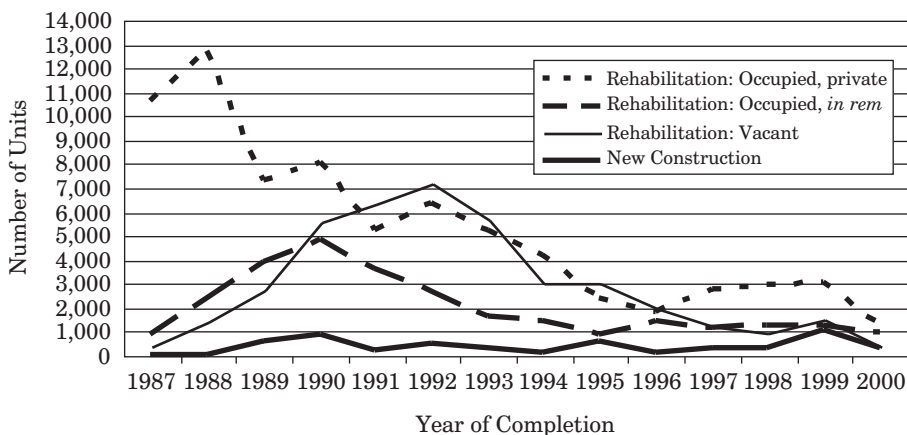
Figure 3. **Dynamics of Ten-Year Plan Renter-Oriented Programs by Type of Intervention**

Siting of Ten-Year Plan housing

Where housing was built or rehabilitated, as well as the type of work performed, was in large part determined by the existing housing stock and its condition. Since most of the housing built or rehabilitated under the Ten-Year Plan used land or buildings that the city had taken either under urban renewal or for delinquent taxes, it tended to be located in extremely depressed neighborhoods. These communities were largely located in three of the city's five boroughs—the Bronx, Brooklyn, and Manhattan. Indeed, as table 3 indicates, the greatest number of units were located in the Bronx, mainly because of the widespread devastation that took place there in the 1960s and 1970s. Of all the boroughs, the Bronx had the greatest share of occupied rental units in *in rem* buildings that were rehabilitated. Manhattan had slightly more vacant *in rem* units that were rehabilitated and many more occupied, city-owned homeownership units. Brooklyn led the other boroughs in the share of new construction and rehabilitation of occupied, private owner-occupied units.

The concentration of Ten-Year Plan housing rehabilitation and new construction is especially evident in figure 4. Over 50 percent of all housing units built or rehabilitated under the Ten-Year Plan were located in just 10 of the city's 59 community districts, concentrated in the South Bronx, Harlem, and Central Brooklyn.

Data from the 1990 Census of Population and Housing (U.S. Bureau of the Census 1991) illustrate just how distressed the neighborhoods that

Table 3. **Distribution of Ten-Year Plan Units by Borough**

	Owner-Oriented Programs				Renter-Oriented Programs				
	Rehabilitation				Rehabilitation				
	Occupied Units		Vacant Units	New Construction	Occupied Units		Vacant Units	New Construction	Total
Borough	Private	*In Rem*			Private	*In Rem*			
Manhattan	48	4,598	725	1,486	24,389	7,957	16,528	1,228	56,959
Bronx	1,066	3,022	339	6,260	23,675	13,501	16,128	1,314	65,305
Brooklyn	3,058	1,393	1,661	6,905	21,485	6,278	8,695	1,525	51,000
Queens	1,189	16	68	1,222	4,005	172	54	379	7,105
Staten Island	716	0	8	940	116	30	79	603	2,492

Note: The statistics in this table include all the Ten-Year Plan housing projects in the HPD data set.

Figure 4. **Distribution of Ten-Year Plan Units by Community District**
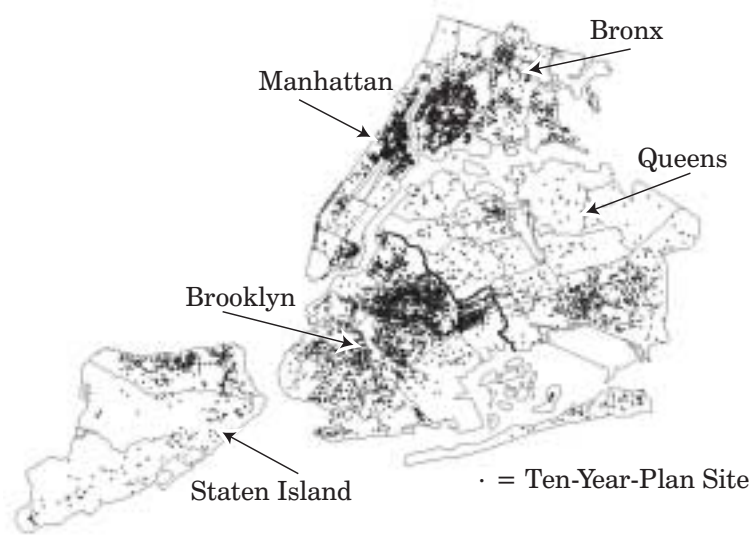
received city capital were. In table 4, we calculate the average characteristics of census tracts in which units were built or rehabilitated under the Ten-Year Plan and compare those figures with averages for the city as a whole.[5] Overall, the average income for census tracts in which units are located was $28,726, 38 percent below the citywide average of $46,665. Among the various categories of programs, those that rehabilitated private owner-occupied units were located, on average, in the highest-income tracts ($40,940), while those that focused on the rehabilitation of occupied *in rem* rental units were in the lowest-income communities ($23,538). Other programs that used city-owned land or buildings also operated in tracts that had average family incomes of less than $30,000.

Similar patterns emerge with respect to poverty rates. Overall, the average census tract poverty rate for all housing built or rehabilitated under the Ten-Year Plan was 34.4 percent, almost twice as high as the citywide average of 18.4 percent. Programs that rehabilitated private owner-occupied housing operated in neighborhoods with a poverty

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[5] The weighted average of the tract characteristic X for a sample of N tracts was computed using the following formula: $X_{avg} = \Sigma_i X_i u_i / \Sigma_i u_i$, where u_i (i=1,..,N) is the number of project units in a given category in tract i, and X_i is the value of characteristic X for tract i. Project units for which no geography is ascertainable are excluded from this calculation.

Table 4. **1990 Characteristics of Census Tracts in Which Ten-Year Plan Units Are Located**

	Tracts with any Ten-Year Plan Units	Tracts with Owner-Oriented Units				Tracts with Renter-Oriented Units				All Tracts in New York City	
		Rehabilitation				Rehabilitation					
		Occupied Units		Vacant Units	New Construction	Occupied Units		Vacant Units	New Construction	Value	N
		Private	*In Rem*			Private	*In Rem*				
Mean family income	$28,726	$40,940	$27,493	$25,171	$25,720	$32,177	$23,538	$26,709	$29,620	$46,665	2,122
Mean poverty rate	34.4%	17.5%	36.8%	37.3%	38.4%	27.8%	41.3%	40.2%	33.4%	18.4%	2,131
Mean percentage of non-Hispanic blacks	41.7%	35.8%	46.6%	67.2%	46.8%	32.0%	46.3%	50.2%	37.5%	26.2%	2,138
Mean percentage of Hispanics	38.0%	18.4%	37.8%	27.9%	40.8%	36.8%	44.2%	38.0%	40.2%	21.9%	2,138
N	1,510	1,112	218	252	240	542	376	384	60		

Note: The statistics in this table, except those for all New York City tracts, are weighted by the number of tract-level Ten-Year Plan units in the relevant category. Tracts with fewer than 200 persons are excluded from the samples on which these statistics are based.

rate that was even lower than the citywide average (17.5 percent), while those that rehabilitated occupied *in rem* rental housing were located in the neighborhoods with the highest poverty rates (41.3 percent). It is interesting to note that with the exception of the private occupied rehabilitation programs, the other homeownership programs, for the most part, operated in quite poor neighborhoods. For example, the average poverty rate of census tracts for new construction programs was 38.4 percent, only 3 percentage points less than the occupied *in rem* rental housing programs and more than double the citywide average.[6]

In terms of racial and ethnic composition, the Ten-Year Plan operated in neighborhoods with relatively high proportions of minority residents. Overall, the average proportion of non-Hispanic blacks in census tracts with Ten-Year Plan investments was 41.7 percent, compared with a citywide average of 26.2 percent. Similarly, the average proportion of Hispanics in tracts with Ten-Year Plan housing units was 38 percent, compared with the citywide average of 21.9 percent.

Over time, as the Ten-Year Plan evolved and as more and more of the city's stock of *in rem* properties was developed, changes to the programs occurred. For example, in the early years of the plan, efforts were made to maximize production numbers. Large clusters of vacant buildings were developed together. In addition, efforts were made to attack some of the most visible neighborhood blight. By the mid-1990s, the city's stock of vacant *in rem* buildings was beginning to be depleted, as was its supply of vacant land. Infill housing and rehabilitation of occupied, city-owned buildings became, of necessity, the predominant approach. At the same time, the Giuliani administration announced a new initiative named "Building Blocks!" to cluster investments in housing so as to maximize their cumulative impact on neighborhoods and coordinate disparate programs (City of New York, HPD 2000).

The impact of Ten-Year Plan housing on nearby property values

One of the objectives of the Ten-Year Plan was to promote neighborhood revitalization. This improvement would take place as a result of the repopulation of previously abandoned neighborhoods and the replacement of abandoned or derelict buildings and garbage-strewn lots with newly constructed or rehabilitated housing. It was also hoped that public investment would catalyze private, unsubsidized development nearby. In

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[6] The reason new homeownership construction was sited in such poor neighborhoods was that it was there that the city owned land.

this part of the article, we examine the extent to which one indicator of neighborhood welfare—the sale price of homes—was affected.

Evidence from the literature

Prior studies offer conflicting evidence about the nature of the spillover effects generated by investments in affordable housing. Nourse (1963) and Rabiega, Lin, and Robinson (1984) find that newly developed public housing can have modest, positive impacts on neighboring property values. By contrast, Lyons and Loveridge (1993), Goetz, Lam, and Heitlinger (1996), and Lee, Culhane, and Wachter (1999) all find small, statistically significant negative effects on property values associated with the presence of certain types of federally subsidized housing in a neighborhood. For example, the latter authors find that proximity to public housing (both project based and scattered site) and housing subsidized by Section 8 vouchers and the LIHTC was associated with reduced sale prices in Philadelphia. In all of these studies, however, data limitations make it difficult to pinpoint the direction of causality. Are subsidized sites systematically located in weak neighborhoods, or does subsidized housing lead to neighborhood decline?

A few more recent studies have made strides in overcoming the causality problem. Briggs, Darden, and Aidala (1999), for instance, use a pre/post design with census tract–fixed effects to examine the early effects of seven scattered-site public housing developments on property values in Yonkers, NY. They find little effect on the surrounding area. Cummings, DiPasquale, and Kahn (2001) examine the impact of two place-based homeownership developments in Philadelphia by comparing the price increases in the two census tracts that had homeownership developments with (1) price increases in similarly distressed tracts elsewhere in the city and (2) price increases in neighboring census tracts. Like Briggs, Darden, and Aidala (1999), they find little evidence of spillover effects, though in both cases, the sample of projects and comparison areas is small.

Santiago, Galster, and Tatian (2001) use a pre/post design with localized fixed effects to study whether the acquisition and rehabilitation of property by the Denver Housing Authority, and its occupancy by subsidized tenants, influenced the sale price of surrounding single-family homes. Unlike the other two works, Santiago, Galster, and Tatian (2001) also control for past *trends* in housing prices in the immediate vicinity of a project so they test for both changes in price levels and trends after completion.[7] They find that proximity to dispersed public

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[7] This method is first presented in Galster, Tatian, and Smith (1999).

housing units is, if anything, typically associated with an increase in the price of single-family homes. Finally, Ellen et al. (2001) adapt the Santiago, Galster, and Tatian (2001) model to study the impact of two of New York City's homeownership programs, and they too find evidence of significant, positive spillover effects. Their difference-in-difference estimates indicate that prices of properties in the immediate vicinity of Nehemiah Plan or Partnership New Homes projects rose relative to comparable properties in the same ZIP codes over the past two decades, and they attribute part of this rise to the completion of these projects.

In short, while there is little consensus about the effects of subsidized housing investments on nearby properties, these recent works seem to emerge with somewhat more optimistic findings. Two of the studies (Briggs, Darden, and Aidala [1999] and Cummings, DiPasquale, and Kahn [2001]) find little evidence of any spillover effects, while the other two (Ellen et al. [2001] and Santiago, Galster, and Tatian [2001]) find evidence of positive spillovers.

As for scale, past work seems to suggest that scale matters and magnifies impacts. Lyons and Loveridge (1993), for instance, find that greater numbers of units are associated with greater reductions in property values. On the positive side, Santiago, Galster, and Tatian (2001) find that the greater the number of scattered-site public housing sites within 1,001 to 2,000 feet of a property, the more positive the initial boost in the sale price. Similarly, Ellen et al. (2001) find that larger projects (measured by the number of units) appear to generate significantly larger impacts.

There are exceptions, however. Briggs, Darden, and Aidala (1999) find little evidence that the size of a development affects impacts. (Notably, the authors examine just seven different public housing sites in Yonkers (NY), which range in scale from only 14 to 48 units each, so they in fact have little room to explore the impact of scale.) And in testing whether large public housing developments have a differential effect, Lee, Culhane, and Wachter (1999) also find no evidence that scale matters.

Much of the past work has examined the impact of a particular program. A few studies, however, examine the differential effect of various types of housing interventions. Lyons and Loveridge (1993), for instance, examine the differential effects of a variety of federal programs and find some interesting patterns (for instance, public housing appears to be associated with higher property values while Section 8 new construction projects appear to be linked to lower property values). Goetz, Lam, and Heitlinger (1996) compare the effects of public

housing; privately owned, publicly subsidized housing; and housing developed by not-for-profits and find that proximity to public housing and privately owned, publicly subsidized housing is associated with lower property values, while proximity to not-for-profit housing is associated with higher property values.

But the emphasis in all these studies has consistently been on rental housing. We found just one study that compares the effects of homeownership and rental projects. Examining a set of programs in Philadelphia, Lee, Culhane, and Wachter (1999) find that owner-occupied housing is associated with increases in property values, while most of the rental programs are associated with reductions.

Methodology

In assessing the extent to which the Ten-Year Plan was successful in revitalizing neighborhoods, we address the following three key questions: (1) Do Ten-Year Plan units have an impact on the prices of properties in their neighborhoods? (2) In what way does the impact depend on the number of units built in the vicinity of the sale? (3) Can we discern differences in the impact of homeownership versus rental developments?

When measuring these neighborhood effects, we exclude the privately owned, *occupied* rental and homeownership units that received rehabilitation subsidies through the Ten-Year Plan. As noted above, the scope of work was far smaller for these units, much of the work was internal, and we would not necessarily expect such investments to have much of an effect on surrounding neighborhoods.[8]

At the heart of our empirical work is a hedonic regression model that explains the sale price of a property as a function of its structural characteristics (such as the lot size and the age of the building) and its neighborhood surroundings. To test for the impact of Ten-Year Plan housing investments, we include a set of variables indicating the number and type of housing units that were built or rehabilitated in the vicinity of the property (specifically within 500 feet). The key challenge in identifying the independent effect of proximity to Ten-Year Plan units is to control for enough neighborhood attributes that our impact estimates do not suffer from omitted variable bias. If we leave out relevant variables, either because data (such as the condition of the sidewalk) are unavailable or because the attributes (such as social capital)

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[8] We include occupied *in rem* units because HPD staff indicated that the scope of work was far greater for these units. (Buildings that the city took over for back taxes were typically in worse shape than those that remained in private hands.)

are difficult to measure, the coefficients on the included variables, such as proximity to housing investment, may be biased.

Our approach is to compare the prices of properties in the micro-neighborhood (or ring) surrounding Ten-Year Plan sites with prices of comparable properties outside the ring, but still located in the same neighborhood (census tract). Then we examine whether the magnitude of this difference has changed over time, and if so, whether the change is associated with the completion of a unit. This approach weeds out any systematic differences between the neighborhoods chosen for these housing investments and other locations and allows us to disentangle the specific effects of the city housing investments from the myriad other changes occurring across neighborhoods and properties.

The regression model. More formally, we estimate a regression model of the sale price of a property that can be expressed as follows:

$$\ln P_{ict} = \alpha + \beta \mathbf{X_{it}} + \gamma \mathbf{Z_{it}} + \Sigma \rho_{ct} I_{ct} + \varepsilon_{it} \tag{1}$$

where $\ln P_{ict}$ is the log of the sale price of property i in census tract c in quarter t, $\mathbf{X_{it}}$ is a vector of property-related characteristics, including age and structural characteristics, $\mathbf{Z_{it}}$ is a vector of locational attributes (specifically, local housing investment within 500 feet of the property), and I_{ct} is a series of dummy variables indicating the quarter and census tract of the sale. The coefficients to be estimated are α, β, γ, and ρ, and ε is an error term. Notice that the ρ_{ct} will vary across census tracts *and* across time, which allows us to control for neighborhood conditions and local public services common to all properties within a census tract in a particular quarter.

In this model, the coefficients on continuous variables can be interpreted as the percent change in price resulting from a one-unit increase in that attribute. Controlling for the other attributes included in the regression, the coefficients on dummy variables, such as "property sold is within the 500-foot ring of a site where Ten-Year Plan units are or will be built," can be interpreted as the difference in log price between properties inside the ring and those outside but in the same census tract and sold in the same quarter and year. When the difference is small enough, the difference in log price closely approximates the percent difference in price. For the differences discussed in this article, which are generally less than 10 percent, the approximation is close enough that we use this more intuitive interpretation throughout.[9]

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[9] The exact effect of a difference of logs, b, is given by $100(e^b - 1)$, when b is fixed. When b is stochastic, as when it is a dummy variable coefficient, this formula is itself an approximation; see Halvorsen and Palmquist (1980).

If two conditions hold, our approach should yield an unbiased measure of impact. First, we must have enough data to control for the structural characteristics of properties that sell. Second, there must be no other changes in neighborhood characteristics simultaneous with the completion of the Ten-Year Plan units (across all neighborhoods) that have differential impacts on the value of properties in the 500-foot-ring units compared with those outside the ring but still in the same census tract.[10] The variables can be specified as follows:

1. *Structural characteristics of the property.* We include a rich set of variables describing structural characteristics, including building age, square footage, the number of buildings on the lot, and dummy variables distinguishing 18 different building classifications such as "single family detached" or "two-family home," among others. These are described in greater detail later.

2. *Controls for neighborhoods and trends in property values.* As noted, our regressions include a different dummy variable for every census tract for every calendar quarter in our study period (for example, first quarter 1980, second quarter 1980, and so on for each census tract). These dummy variables, which we refer to as "census tract–quarter effects," enable us to control for tract-specific trends in prices. Using quarters rather than years controls for seasonal patterns in sale prices.

   Finally, our regressions include a set of controls for proximity to other types of housing investment that were not part of the Ten-Year Plan. These include pre-1987 city-sponsored projects and housing units sponsored by the federal government (such as Section 202 and Section 8 units). We also control for proximity to the Ten-Year Plan units that we do not include in our central variables—that is, privately owned, occupied units that receive rehabilitation subsidies.

3. *Measuring the impact of the Ten-Year Plan units.* We include several different variables in our regression model to capture the impact of proximity and the number of Ten-Year Plan units. We begin by controlling for systematic differences between those properties that are near sites (whether completed or not) and those that are not. As discussed, units may have been located in particularly distressed neighborhoods, and so we want to control for this baseline effect as fully as possible.

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[10] Put differently, identifying the impact of housing investment requires that there be at least some properties in which housing investment takes place in the absence of other changes.

More specifically, we include a set of variables indicating whether the property sold was within 500 feet of an HPD site of a particular size (whether the units were completed or not). These three variables (In Ring, 1–50 units; In Ring, 51–100 units; and In Ring, 101+ units) capture the baseline differences in the sale prices of properties located in the rings where HPD units (either a small or a large number) are developed, as compared with the sale prices of properties that are more than 500 feet from any HPD sites but in the same census tract.

Several variables capture the impact of the actual completion of units on property values in the 500-foot ring. Our Post Ring dummy variables indicate whether the sale is within 500 feet of some number of *completed* units.[11] Specifically, we have different dummy variables indicating whether the sale is within 500 feet of 1 to 50 units, 51 to 100 units, or over 100 units. The coefficients on these variables are critical. They indicate the extent to which sales prices are higher in the vicinity of a completed HPD unit relative to prices outside the 500-foot ring but within the census tract.

To capture any postcompletion trend, we include Tpost, a continuous variable that indicates, for properties inside the 500-foot ring, the number of years between the sale date and the project completion date. For instance, the variable equals 1/365 if a sale is located within 500 feet of an HPD unit and occurs the day after its completion; it equals 1 if the sale occurs one year after the unit is completed; 2 if the sale occurs two years after the unit is completed, and so on. The Tpost coefficient will be positive if after completion prices in the rings continue to rise relative to prices in the census tract.

In sum, this specification provides estimates of the impact of the housing investments, allowing for differences in the scale of investment (1 to 50, 51 to 100, 101+), and allowing for dissipation or expansion of the initial impact over time.

Extension of the model. In addition to this regression model, we also estimate two alternative models. First, we estimate a model that distinguishes the impacts of homeownership and rental properties by including separate ring variables for homeownership and rental developments. This allows for heterogeneity in impacts across these types of developments.[12] Second, we estimate a version that supplements the variables

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[11] In cases where a sale was within 500 feet of more than one unit, we use the first completion date.

[12] Note that homeownership units are defined in this article as units within an owner-occupied building. Some of these units are in fact rental apartments in owner-occupied properties.

described above with variables describing other characteristics of the Ten-Year Plan units in the ring at the time of sale. Among these are the share of the completed units in the ring that are newly constructed as opposed to rehabilitated. We also include the share of the units that are single-family homes and the share of the units in two- to four-family homes. The omitted category is primarily multifamily homes. Since many of these variables capture differences between ownership and rental housing, they serve an important purpose. They allow us to disentangle the effect of housing characteristics from the effect of tenure type. For instance, after controlling for the share of units that are in single-family or two- to four-family homes, we can test whether homeownership units have a larger effect on surrounding property values than rental units.

Summary of data

To undertake this analysis, we have supplemented our data on HPD housing investments with data from two other city sources. First, through an arrangement with the City Department of Finance, we obtained a confidential database that contains sales transaction prices for all apartment buildings, condominium apartments, and single-family homes over the 1980–99 period.[13] We limited the analysis to properties that are located within the 48 community districts where there were more than 100 Ten-Year Plan units developed that were (1) rehabilitation of occupied *in rem* buildings, (2) rehabilitation of vacant buildings, or (3) new construction. Our final sample includes 293,756 property sales, spread across 1,612 census tracts.[14] Because of the long time span of the data and New York City's size, this is a large sample size compared with what is found in much of the literature.

Second, data on building characteristics were obtained from an administrative data set gathered for the purpose of assessing property taxes (the Real Property Assessment Database [RPAD] file). Unfortunately,

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[13] Because sales of cooperative apartments are not considered to be sales of real property, they are not recorded and are thus not included in this analysis. In constructing the dependent variable in the hedonic regressions, we adjust sale prices by the Consumer Price Index to account for inflation and normalize the price of multifamily buildings by the total number of units, thus arriving at a price per unit. We should also note that most of the apartment buildings in our sample are rent stabilized. Given that legally allowable rents were typically *above* market rents outside of affluent neighborhoods in Manhattan and Brooklyn during most of the period covered by our study, we do not think that their inclusion biases our results (see Pollakowski 1997).

[14] This includes 12 community districts in Manhattan, 12 in the Bronx, 15 in Brooklyn, 7 in Queens, and 2 in Staten Island.

RPAD data contain little information about the characteristics of individual units in apartment buildings (except in the case of condominiums).[15] Nonetheless, these building characteristics explain variations in prices surprisingly well, suggesting that the data are rich enough for estimating hedonic price equations.[16]

Table 5 shows summary statistics from the RPAD data. The first column shows the characteristics of our full sample; the second shows the characteristics of sales that are located within 500 feet of a unit, whether completed or not.[17] As shown, most sales were located in Brooklyn and Queens, largely because those boroughs include a relatively large share of smaller properties, which sell more frequently than apartment buildings. Nearly two-thirds of all buildings sold were either one- or two-family homes, and 81 percent were single-family homes, two-family homes, or small apartments. Almost a third of the transacting properties had garages, and more than three-quarters were built before World War II. Only a handful of buildings were vandalized or otherwise abandoned. Finally, 17 percent of the properties were located within 500 feet of a Ten-Year Plan site (whether completed or not).

The second column of table 5 reveals some systematic differences between properties that are located close to sites and those that are not. Properties located within the 500-foot ring are far more likely to be in Brooklyn and far less likely to be in Staten Island and Queens. Properties within the 500-foot ring are also much older, much less likely to be single-family homes, more likely to be walk-up apartments, and, consistent with these differences, much less likely to have garages.

As mentioned earlier, identifying properties in the vicinity of the Ten-Year Plan investments was critical to our analyses. We used GIS (geographic information system) techniques to measure the distance from each sale in our database to all sites and, from these distance measures,

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[15] Among other things, we lack information on the number of vacant units in apartment buildings. Under the city rent regulation system, vacant units yield higher potential rents than occupied ones, and thus including the proportion/number of vacant units among the house price determinants for rental housing would be warranted. However, the omission of such a variable is probably less important in this article since, as noted earlier, market rents in the city's lowest-income neighborhoods are generally lower than the maximum allowable rents.

[16] See Ellen et al. (2001) for more detail on the data and parameter estimates on the building characteristics in a similar model.

[17] Again, we omit privately owned units receiving rehabilitation subsidies.

Table 5. **Characteristics of Properties Sold**

	Percentage of All Property Sales	Percentage of Sales within 500 Feet of a Ten-Year Plan Site
Borough		
Manhattan	14.6	16.9
Bronx	13.0	15.2
Brooklyn	29.5	53.3
Queens	31.0	12.5
Staten Island	11.8	2.1
Building class		
Single-family detached	25.0	9.8
Single-family attached	11.1	5.3
Two-family	27.6	29.7
Walk-up apartments	17.6	38.0
Elevator apartments	1.2	2.5
Loft buildings	0.1	0.1
Condominiums	14.4	8.6
Mixed use, multifamily (includes store or office plus residential units)	3.1	6.1
Built pre–World War II	77.0	95.3
Vandalized	0.0	0.2
Other abandoned	0.1	0.4
Garage	31.1	12.1
Corner location	7.1	7.7
Major alteration before the sale	3.3	7.2
In the 500-foot ring	17.1	100.0
N	293,756	50,260

Source: RPAD file.
Note: The universe consists of all sales in community districts with at least 100 Ten-Year Plan units in the rehabilitation occupied (*in rem*), rehabilitation vacant, and new construction categories combined. Sales within 500 feet of Ten-Year Plan projects involving rehabilitation of private occupied units are excluded. Percentages may not total 100 because of rounding.

created a variable that identified properties within 500 feet.[18] To ensure that we successfully distinguish the sale of buildings neighboring Ten-Year Plan developments and not the sale of the developments themselves, we attempted to exclude any sales that could potentially be part of a development. Unfortunately, RPAD and homes sales data do not identify whether a particular property received city subsidies, so we exclude sales that occurred on the same block as a Ten-Year Plan development if the building sold was constructed after the Ten-Year Plan units had been completed.[19]

Results

As discussed earlier, our central empirical strategy is to test whether and how sale prices in the rings surrounding Ten-Year Plan units change relative to prices in their census tracts after those projects are completed. Table 6 shows the key coefficients and their standard errors for the ring variables for the basic model in column 1. Column 2 shows the coefficients when we allow the impacts of homeownership and rental investments to differ. The coefficients on the structural variables are not shown here, but as in Ellen et al. (2001), they have the expected signs, which, combined with relatively high R^2 values (of roughly 0.88), suggest that they provide adequate controls for the characteristics of the houses sold.[20]

Property values near Ten-Year Plan investments. To start, we note that the In Ring coefficients are negative and statistically significant and that the magnitude of these coefficients is larger for large-scale

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[18] Since all buildings in New York City have been geocoded by the Department of City Planning, we used a "cross-walk" (the "Geosupport File"), which associates each tax lot with an x,y coordinate (latitude, longitude using the U.S. State Plane 1927 projection), police precinct, community district, and census tract. A tax lot is usually a building and is an identifier available to the homes sales and RPAD data. We can assign x,y coordinates and other geographic variables to over 98 percent of the sales using this method. For most of the HPD units, we had both the tax block and the tax lot. If the tax lot was unavailable, we then collapsed the Geosupport file to the tax block level (i.e., calculating the center of each block) to assign x,y coordinates. We were unable to assign a coordinate to 6 percent of the HPD units, largely because of missing block information.

[19] We did not exclude properties on blocks where privately owned units received renovation subsidies through the Ten-Year Plan. To provide a margin of error with respect to the construction dates in RPAD, we also excluded sales of buildings that were on the same block as a Ten-Year Plan unit and were built up to five years before the Ten-Year Plan units.

[20] The coefficients on control variables included in the models but not shown in table 6 are available from the authors.

Table 6. **Selected Coefficients from Regression Results**

	Model 1		Model 2	
Ring Variable	Coefficient	Standard Error	Coefficient	Standard Error
In Ring, 1–50 units	−0.0591 ***	(0.0040)		
In Ring, 51–100 units	−0.0905 ***	(0.0073)		
In Ring, 101+ units	−0.1127 ***	(0.0096)		
Post Ring, 1–50 units	0.0181 **	(0.0086)		
Post Ring, 51–100 units	0.0331 **	(0.0136)		
Post Ring, 101+ units	0.0736 ***	(0.0184)		
Tpost	−0.0013	(0.0015)		
In Ring, Owner, 1–50 units			−0.0460 ***	(0.0044)
In Ring, Owner, 51–100 units			−0.0632 ***	(0.0104)
In Ring, Owner, 101+ units			−0.0566 ***	(0.0162)
Post Ring, Owner, 1–50 units			0.0227 **	(0.0104)
Post Ring, Owner, 51–100 units			0.0510 **	(0.0203)
Post Ring, Owner, 101+ units			0.0700 **	(0.0304)
Tpost, Owner			−0.0026	(0.0019)
In Ring, Renter, 1–50 units			−0.0654 ***	(0.0051)
In Ring, Renter, 51–100 units			−0.0907 ***	(0.0084)
In Ring, Renter, 101+ units			−0.1230 ***	(0.0111)
Post Ring, Renter, 1–50 units			0.0140	(0.0107)
Post Ring, Renter, 51–100 units			0.0377 **	(0.0163)
Post Ring, Renter, 101+ units			0.0672 ***	(0.0222)
Tpost, Renter			0.0009	(0.0019)
Adjusted R^2	0.8709		0.8710	
N	293,756		293,756	

Note: The dependent variable is the log of the price per unit. All regressions include the following variables capturing characteristics of the property sold: building age and its square, log square feet per unit, the number of buildings on a lot, dummies for the presence of commercial units, extension, major alteration before the sale, location on a block corner, vandalized buildings, other abandoned buildings, an odd shape, and a set of 18 building classification dummies ("single-family detached," "two-family home," "three-family home," "four-family home," "five-/six-family home," "more than six families, no elevator," "walkup, units not specified," "elevator apartment building, cooperatives," "elevator apartment building, not cooperatives," "loft building," "condominium, single-family attached," "condominium, walk-up apartments," "condominium, elevator building," "condominium, miscellaneous," "multiuse, single family with store," "multiuse, two family with store," "multiuse, three family with store," and "multiuse, four or more families with store"). All regressions include a set of variables controlling for the proximity of the sale to Ten-Year Plan projects involving the rehabilitation of private occupied units, pre-1987 city-sponsored projects, and projects sponsored by the federal government; for whether the sale occurred after such projects; and for the size of such projects completed before the sale. All regressions include census tract–quarter fixed effects. Standard errors are in parentheses. Coefficients of the full models are available from the authors. *$p = 0.1$. **$p = 0.05$. ***$p = 0.01$.

investment than for small-scale investment. Specifically, the coefficient on the In Ring, 1–50 units variable indicates that properties located within 500 feet of a site where at least 1 and no more than 50 HPD units would be built sold for roughly 5.9 percent less than comparable properties located in the same census tract, but more than 500 feet

from an investment site. The coefficients on the other In Ring variables show that properties in the ring of sites on which 51 to 100 units were ultimately built sold for roughly 9.1 percent less than comparable properties in the same census tract, while properties in the ring of sites on which more than 100 units were ultimately built sold for roughly 11.3 percent less. The implication is that micro-neighborhoods receiving larger-scale housing investment were initially more distressed (that is, had lower property values) than those receiving housing investment on a smaller scale. In sum, our estimates imply that HPD investments tended to be made in the most distressed locations within already distressed census tracts. And this was especially true for the larger projects.

In Model 2, when we separate homeownership and rental investments, a similar pattern emerges. The coefficients on In Ring, Renter and In Ring, Owner variables show that both homeownership and rental developments were located in distressed pockets of their census tracts. Other things being equal, the prices of properties in the ring of rental sites were lower than the prices of properties in the ring of homeownership sites, suggesting that rental units were located in worse neighborhoods than homeownership units. As an example, properties in the ring of a 1–50 ownership unit site sold for 4.6 percent less than properties outside, while properties in the ring of a 1–50 rental unit site sold for 6.5 percent less than comparable properties.

Impacts. Turning to the impact of housing investment on property values, our estimates are, on the whole, positive. The magnitude of the impact increases with the scale of the investment, and there is no evidence that the impact changes over time, either in a positive or negative direction. Specifically, the coefficients on the In Ring variables in Model 1 indicate that before completion, properties in the 500-foot ring of small-scale investment sold for 5.9 percent less on average than comparable properties outside the ring but in the same census tract. The coefficient on Post Ring, 1–50 units indicates that immediately after completion, this gap shrinks by roughly 1.8 percentage points. For 51–100 unit investments, the initial 9.1 percent gap between prices inside and outside the ring falls by 3.3 percentage points after the units are completed, while for more than 100 units, the initial 11.3 percent gap falls by 7.4 percentage points. Although the coefficient on the trend variable is negative, which might indicate erosion in these gains over time, it is statistically insignificant.

This pattern of increasing impact with scale would be predicted by any of the mechanisms that would generate positive externalities that were discussed earlier. For example, if the city investments raise property

values because they remove dilapidated buildings and clean up vacant lots, then larger projects should result in larger improvements. By contrast, this pattern would not be expected if the results were driven by sample selection bias—that is, the city's ability to "pick winners" by choosing sites likely to appreciate in value. If anything, this type of bias should be most important for the smallest projects, since smaller tracts are much more readily available, giving HPD greater flexibility over site selection.

When considering the impacts of proximity to ownership and rental units separately, we see that the coefficients on the Post Ring variables for the homeownership projects are somewhat larger in magnitude than for rental units. For instance, our estimates indicate that in the case of small-scale homeownership investment, the gap between prices in the ring and the census tract shrinks by 2.3 percentage points immediately after completion. For small-scale rental projects, the gap is estimated to fall by 1.4 percentage points. These differences are highlighted in figures 5 and 6, which summarize our homeownership and rental results, respectively. In particular, they show the percent difference between prices for projects of different sizes inside the 500-foot ring and in the surrounding census tracts, before and after completion. The impact of the rental units appears somewhat less robust for all three size classes, but the differences between the impacts of the ownership and rental housing are not statistically significant.

Figure 5. **Percent Difference between Prices in the 500-Foot Ring and the Surrounding Tracts, by the Number of Ten-Year Plan Units (Owner-Oriented Programs)**
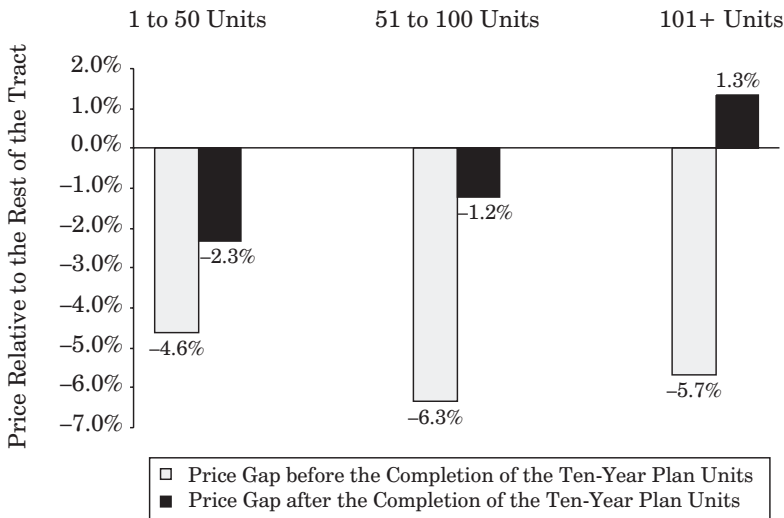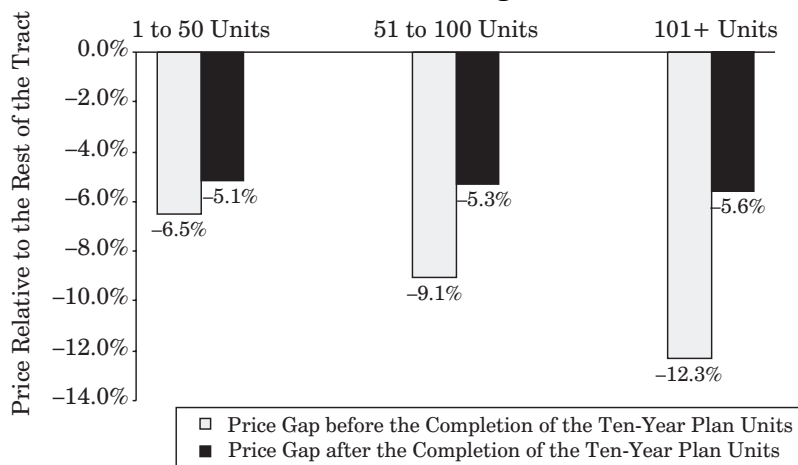
Figure 6. **Percent Difference between Prices in the 500-Foot Ring and the Surrounding Tracts, by the Number of Ten-Year Plan Units (Renter-Oriented Programs)**

Note: The reduction in the price gap is not statistically significant after the completion of 1 to 50 units.

Taken together, our results provide encouraging news about the effects of the housing production programs undertaken as part of New York City's Ten-Year Plan. Both rental and homeownership units were located in areas with low property values relative to their census tracts, but there is considerable evidence that much of this investment served to increase the prices of properties in close proximity. Further, with coefficients on the postcompletion trends consistently insignificant, there is no evidence to suggest that these impacts declined over time.

It remains possible that ownership and rental units did have differential effects but that these differences are clouded by differences in the structural characteristics of the housing investment. Rental units, for instance, are more frequently found in multifamily, as opposed to single- or two- to four-family homes. Thus, we also estimated a specification that includes a set of variables describing the mix of structural characteristics in the housing units that are built or rehabilitated. These include the share of new construction units, the share of units that were occupied before rehabilitation, the share in single-family homes, and the share of units in two- to four-family homes. Adding these variables leaves our results essentially unchanged, and their coefficients are all insignificant.[21]

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[21] Results are available from the authors.

Of course, potential differences between the impacts of homeownership and rental developments may be attributable not to the characteristics of the units, but instead to the characteristics of the residents. As an example, in addition to replacing blighted properties with housing units, homeownership units could lead to an increase in property values if they cause an in-migration of relatively higher-income residents. The residents of rental units may not be similarly higher income. In our final specification, we controlled for the share of units in developments slated for formerly homeless families and individuals, and the results were largely unchanged. However, this may not be sufficient. In other developments (not slated for the formerly homeless), homeowner households are more likely to have higher incomes than renter households.

Thus, while there do appear to be significant differences in the location of rental and homeownership developments, we cannot conclude that homeownership units generate greater spillover effects than rental units. But clearly this is an area in which additional research is warranted, and we plan to investigate these questions more fully.

Conclusion

In 1987, New York City embarked on a set of policies born of both necessity and opportunity. In the face of an extremely tight housing market and with a large number of abandoned buildings on its hands, the city spent roughly $5.1 billion to build or rehabilitate over 182,000 apartments and houses. The city's investment in housing production was unprecedented; various studies reported that the amount New York City spent on housing over the course of the Ten-Year Plan was more than three times the total housing expenditures of several dozen of the next largest cities combined (Berenyi 1989; Schwartz 1999).[22] Innovation and adaptation were constants over the course of the Ten-Year Plan. Over 100 separate programs were implemented by dozens of government agencies, for-profit developers, financial institutions, and community-based organizations.

The city was motivated by the desire to produce additional housing and to revitalize inner-city neighborhoods. As our results indicate, the investments of the Ten-Year Plan were overwhelmingly concentrated in the city's poorest communities—the same neighborhoods that had experienced wave after wave of abandonment and arson during the

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[22] According to Berenyi (1989), New York City spent 3.7 times more for housing in FY 1989 than the next 50 largest cities combined. More recent data from Basolo (cited in Schwartz 1999) indicate that in 1995, New York City spent more than three times the amount spent by 32 other large U.S. cities.

1960s and 1970s. Could massive investments in housing construction and rehabilitation not only improve the housing conditions for hundreds of thousands of New Yorkers, but also help to turn around neighborhoods that had been devastated by decades of disinvestment? Casual observation suggests that the answer is yes. Once-barren landscapes have been filled with housing; stores that once had no customers are now scenes of bustling activity.

In this article, we have sought to go beyond impressionistic evidence and learn whether housing production programs can generate positive spillover effects sufficient to revitalize neighborhoods and thereby increase property values. Our results suggest that the Ten-Year Plan has indeed had a positive impact on neighborhoods and has contributed to what some have characterized as the rebirth of inner-city neighborhoods. Whether the experience of the Ten-Year Plan can be transplanted to other cities remains a subject for further research. During the 1980s and 1990s, New York City experienced a significant increase in population largely attributable to immigration and an economic boom. If its economic and demographic circumstances were more like those found in several other older cities in the Northeast and Midwest such as Baltimore, Detroit, or Philadelphia, it is possible that additional housing production would have increased vacancy rates and led to more disinvestment.

In addition, the distribution of the benefits of neighborhood revitalization can be a bit murky and may be a fruitful topic for further analysis. Clearly, property owners—vacant landowners, landlords, and homeowners—stand to benefit from the increased values apparently associated with the Ten-Year Plan. However, most people living in the neighborhoods where the Ten-Year Plan was most active were renters. Although rent regulation no doubt provided some protection against steep increases in housing costs, some tenants may have experienced difficulties if their landlords sought to increase rents to reflect improved neighborhood circumstances.

More work also needs to be done to understand which types of investments (e.g., homeownership versus rental, rehabilitation versus new construction) are most effective in different types of communities. In addition, in future work we hope to gain a better understanding of how housing interacts with other types of public investment to change neighborhoods.

Finally, while we have shown that production programs can lead to large positive spillover effects, we have not empirically demonstrated their superiority over housing vouchers in this respect. While both theory and intuition suggest that production programs should be more

successful in creating positive externalities, a direct comparison of the spillovers generated by the Ten-Year Plan versus those generated by housing vouchers will have to await future research.

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