Neighborhood Revitalization in New York City in the 1990s

March 27, 2003

Jason Bram, Jesse Edgerton, Yigal Gelb, Andrew Haughwout, David Lagakos, Margaret McConnell, and James Orr

PRELIMINARY AND INCOMPLETE – PLEASE DO NOT QUOTE WITHOUT
PERMISSION FROM THE AUTHORS

Neighborhood Revitalization in New York City in the 1990s

I.   Introduction. New York City is widely perceived to have become a nicer place to live and work over the past decade. After reversing the losses from the 1989 – 1992 downturn, economic activity in the city experienced its sharpest expansion in four decades. The boom was most pronounced during the latter part of the decade when over one-half million net new jobs were created and the city's annual employment growth matched or exceeded that of the nation.   Aggregate earnings growth of city residents rose 12 percent in real, or inflation-adjusted, terms.[1] While the city's financial sector played a significant role in raising economic activity in the city, other key sectors such as consumer services, new media, healthcare, and education also contributed importantly to the growth in activity.

Though the recession that began in New York City in early 2001 and the attack on the World Trade Center in September of that year curtailed economic growth, the experience of the city throughout the 1990s gives us an opportunity to analyze what a strengthening city economy can offer its low-income residents. At the start of the decade a number of neighborhoods were far below the citywide average on several dimensions, particularly housing adequacy and public safety. The inequality across neighborhoods was readily apparent in the condition of a number of low- and moderate-income neighborhoods in parts of the Bronx and Brooklyn. The difficult conditions led to an intensification of both private and public sector actions on several fronts to improve the quality of life in these neighborhoods. Much of this targeting action can be included

---

[1] Growth in real annual earnings from 1989 to 1999 is taken from the 1990 and 2000 Census of Population.

under the umbrella of New York City's "Ten Year Plan" for housing, probably the largest

public effort of its kind. The strong economic environment of the city in the 1990s was

thus overlaid on concerted private and public sector efforts. The combination of

economic expansion and targeted private and public sector programs would appear to

provide the most favorable circumstances for an improvement in the quality of life for

residents of the city's poorest neighborhoods.[2]

This article characterizes the pattern of neighborhood revitalization over the

1990s in New York City, with a particular emphasis on low- and moderate-income

neighborhoods. We then explore the relative roles of a strong economy and targeted

programs in driving these outcomes. Our operational definition of a neighborhood is a

sub-borough, of which there are 55 in New York City. We exploit a variety of data

sources available at this level of disaggregation, including the New York City Housing

and Vacancy Survey (HVS) and the Census of Population. The particular targeted public

policy program of interest is the housing assistance provided through the New York City

Capital Programs, and data on this program are taken from the Department of Housing

Preservation and Development (HPD).

We focus our analysis of neighborhood revitalization on measures of the quality

of the housing stock, utilizing both neighborhood level and individual housing unit data.

We also provide a discussion of the associated reduction in crime outcomes throughout

the city. It is important to note that our measures of revitalization are computed

independently of the economic and social characteristics of the residents themselves, and

thus reflect the changes to the safety and physical structure of neighborhoods, per se.

---

[2] For an overview of recent trends in New York City's neighborhoods, see Schill and Daniels (2002).

In the next section of this article we characterize the overall revitalization of New York City in the 1990s and highlight the substantial improvements in low- and moderate-income neighborhoods. As an illustration of the process of neighborhood revitalization, we provide short descriptions of the individual experiences of several of the city's poorest neighborhoods. The third section of the paper presents a model of neighborhood revitalization in which both public and private investments are the key sources of neighborhood improvement. The fourth section presents the model estimates.

To preview our results, the growth of the city's economy over the 1990s appears to have had a large positive effect on neighborhood revitalization: deficient housing units and the quality of neighborhood structures were likely to improve regardless of location. We also find, however, that the city housing program had a positive effect on neighborhood improvement, and further, we provide evidence of spillover effects of city housing assistance in low-income neighborhoods.[3] Ellen, Schill, Schwartz and Voicu (forthcoming) explain that production subsidies provided by the government can in theory generate positive spillovers and contribute to neighborhood revitalization, but note that the importance of these effects is an empirical matter. One aspect of their argument is that production subsidies are targeted to specific areas and therefore might be an important catalyst to neighborhood revitalization in a way that housing vouchers, for example, might not be. We view our results as providing support for the hypothesis that government subsidies to housing supply, as least as captured by New York City's "Ten Year Plan", do indeed lead to neighborhood revitalization and positive spillover effects.

---

[3] In a series of studies, each with a slightly different focus, Ellen, Schill, Susin and Schwartz (2001); Schill, Ellen, Schwarz and Voicu (2001); Ellen, Schill, Schwarz and Voicu (2001) have concluded that investments in place-based housing programs have the effect of increasing the value of homes in surrounding neighborhoods.

While our paper does not speak directly to the question of the relative merits of demand-oriented versus supply-oriented subsidies, our results lend support for the arguments in favor of supply-oriented programs.[4]

Finally, we also find that these improvements in housing quality and neighborhood structures were associated with increases in rents, a result that is consistent with our theoretical model's predictions of neighborhood improvement ultimately reflecting a return on public and private sector investment activity.[5] The last section of our paper summarizes our results and outlines our future work on identifying the effects on neighborhood improvement of the activities of Community Development Corporations (CDCs) and lending activities under the Community Reinvestment Act, beyond their role in the implementation of the city's housing program.[6]

II. How Did New York City's Neighborhoods fare over the 1990s?

(a) Measuring neighborhood revitalization

In this paper we employ a variety of data sources in order to examine the process of "neighborhood revitalization." Here we outline some of the key data and definitions we use throughout the analysis.

---

[4] See Ellen, Schill, Schwatz and Voicu (forthcoming) for a brief discussion of the debate over supply- and demand-oriented subsidies. Newman and Schnare (1997) and McClure (1998) also speak to this debate.
[5] Using a slightly different sample (1987 to 1996), Van Ryzin ad Genn (1999) reach similar qualitative conclusions, though they note an increase in maintenance deficiencies over their sample, as well as increases in the share of poor single-parent and welfare dependent households.
[6] As Schwartz (1999) and Van Ryzin and Genn (1999) note, there are multitudes of non-profit and for-profit institutions involved in the implementation of a plan as large as the one undertaken in NYC. At this

4

Neighborhood

Our definition of a neighborhood is a "sub-borough." New York City has a total of 55 sub-boroughs, each comprised of about 40 census tracts and containing roughly 150,000 people. Examples include Central Harlem, the Upper East Side, and Bedford-Stuyvesant. Map 1 displays the sub-boroughs used in our analysis.

We choose the sub-borough as our definition of a neighborhood to exploit the wealth of data that is produced at this level of disaggregation. In addition, using sub-boroughs allows us to make use of any data reported at the tract-level, such as US Census data, since tract data can easily be aggregated to the sub-borough level.

Although we are interested in neighborhood revitalization in all areas of the city, much of our analysis focuses on revitalization in low-income neighborhoods. Numerous times in the paper we refer to 'the 10 lowest-income sub-boroughs,' 'the middle 35,' and 'the top 10.' Our rankings are based on real median household income for sub-boroughs at the beginning of the decade based on the 1990 U.S. Census of Population.[7] Chart 1a lists (and shows the location of) the individual sub-boroughs that fall into each of these three categories.

Revitalization

The term "revitalization," when used to describe neighborhood-level phenomena could mean many things. Definitions might include improvements in the residents' perception of neighborhood safety, quality of the housing units, access to health services,

---

point, we know of no study that provides a comprehensive exploration of the role of CDCs, per se, in NYC neighborhood revitalization.

[7] DeGiovanni and Minnite (1991) identify a set of high need sub-boroughs, and Van Ryzin and Genn (1999) use these in their analysis. The sub-boroughs we highlight in our analysis differ from theirs in that we use income to identify the "high need" sub-boroughs, whereas they use the prevalence of dilapidation, maintenance deficiencies, overcrowding, and rent burden to identify high need sub-boroughs.

schools or jobs, or even access to supermarkets and other retail stores that are conspicuously absent from some low-income areas. Since revitalization generally means a desirable change, any definition of the word implicitly includes a normative statement on what changes in a neighborhood people find desirable. For the purposes of this analysis, we focus on two aspects of revitalization—a reduction in crime, and an improvement in the quality of housing in a neighborhood.[8] We thus define neighborhood revitalization independent of the social or economic characteristics of the residents.

Crime data come from two distinct sources. The first is the New York Police Department, which has made available annual data on homicides, felonies and other crimes for the period from 1990 through 2000. These data are available at the sub-borough level. The second source for crime data is the Department of Vital Statistics of the New York City Department of Health (DOH). These data come by way of death certificates collected by DOH, which contain cause of death and place of residence of the deceased. From this data set we can obtain a yearly count of the number of homicides and drug-related deaths by sub-borough of residence, among other variables. The DOH was kind enough to aggregate the data to the sub-borough level for us, for the years 1991, 1993, 1996 and 1999.

Information to compute measures of housing quality are taken from the New York City Housing and Vacancy Survey (HVS), which is conducted every 2 or 3 years on a sample of roughly 18,000 vacant and occupied housing units throughout the 5 boroughs

---

[8] See Basolo and Strong (2002), Greenberg (1999), Kutty (1999) and Kain and Quigley (1970) for discussions of issues surrounding the measurement of housing quality. See Oreopoulos (2001) for a discussion on the importance of housing quality.

each year. Our analysis makes use of data from the years 1991, 1993, 1996 and 1999[9].

Two quality measures are computed. One is a count of the number of deficiencies in the

housing unit.[10] The other is the resident's perception of the quality of the structures in

their neighborhood. Other characteristics of the housing unit that we use in our analysis

include the rent, rent controlled or stabilized status, ownership status, age, and location.

Neighborhood Characteristics

Our analysis includes not only the characteristics of the housing units but also the

characteristics of the sub-borough in which the unit is located. We use the demographic

and economic data available from the U.S. Population Census for 1990 and 2000. We

also use employment data aggregated by sub-borough that were obtained from the New

York Department of City Planning. The employment data contain, among other things,

the total number of employees by major industry in each sub-borough, for several years

throughout the 1990s.[11]

Targeted assistance programs:

---

[9] While we use the HVS starting in 1991, much of the City's activity took place before this year. In fact, Schwartz (1999) points out that nearly 55 percent of all city-funded gut starts occurred before 1991 (for the Bronx this number is nearly 75 percent). For publicly funded new construction about 43 percent took place before 1991. Thus in a sense our results may tend to understate the impact of these programs.

[10] The seven possible deficiencies are: 1. No toilets working for at least six consecutive hours at any time in the last three months. 2. Heating not working for at least six consecutive hours. 3. Use of additional sources of heat because regular heating system did not provide enough heat. 4. Mice or rats in building in last 90 days. 5. Open cracks or holes in interior walls, ceiling, or floors. 6. Areas of broken plaster or peeling paint larger than 8.5 by 11 inches. 7. Water leaking into the apartment in the last 12 months.
[11] Schwartz (1999) explores the economic effects of the housing programs. He looks at direct effects, which are defined as the employment of neighborhood residents to construct and maintain city-financed housing, and indirect effects, which are the effects on commercial activity in the community. He concludes that there is evidence that the direct effects mattered, but that the indirect effects on commercial activity were moderate.

The City's Capital Programs

The New York City Department of Housing Preservation and Development (HPD) oversees over 100 programs that subsidize the rehabilitation and construction of affordable housing for low and moderate-income households.[12] Some of the notable programs include the Article 8-A loan program, which assists in the rehabilitation of occupied, privately owned units. Others focus on new construction, such as the Nehemiah Plan and the New York City Housing Partnership New Homes Program. These programs are financed by city, federal, state, and private funds and involve other entities, such as private developers or nonprofit organizations. Together, these programs are referred to as the City's "Capital Programs" (also known as "the Ten Year Plan"). These programs are estimated to have assisted about 180,000 housing units since 1987, which is close to 6% of the City's existing housing stock in 2000[13].

For the purposes of this paper, HPD has provided us, through NYU School of Law's Center of Real Estate and Urban Policy, with a data set that provides information on housing rehabilitation and new construction from 1987 to 2001. This data set gives an annual break down of HPD's housing efforts, by sub-borough, by type of city initiative. Included are rehabilitation of occupied and vacant housing units (including both in rem and private housing), and construction of new owner-occupied and rental housing units. The category affecting the largest number of units was the rehabilitation of occupied, private units, about 40 percent of all units. Two other categories – rehabilitation of vacant, in rem units and rehabilitation of occupied, in rem units – each affect about 20

---

[12] The data on the city's housing program were provided for this project by HPD.
[13] Some examples of articles containing detailed discussions of New York City's "Ten-Year Plan", see Ellen, Schill, Schwartz and Voicu (forthcoming), Ellen, Schill, Susin and Schwartz (forthcoming) and Ryzin and Glenn (1999), Schwartz (1999) and Blackburn (1995).

percent of units. About 30% of all assisted units were located in the 10 poorest sub-

boroughs.

Other public and private sector programs

Community Development Corporations (CDC's) undoubtedly played a large role

in the implementation of the city's housing efforts.[14] Therefore, the efforts of CDC's are

reflected to a large extent in the City Capital Programs. While data on CDC expenditures

in sub-boroughs are reported, we are not comfortable at this time that our expenditure

measures adequately capture the full range of CDC activities and impacts and thus do not

explicitly incorporate these measures into the empirical analysis in this paper. Targeted

home mortgage lending is another type of public sector effort that can influence

revitalization. While data on new home loans originated over the 1990s from Home

Mortgage Disclosure Act (HMDA) data is available from the Federal Reserve Board of

Governors, we are not certain at this time that we can correctly measure the number and

types of loans that are relevant for our neighborhood analysis. Future work on this

project will focus on incorporating both CDC and HMDA lending data into our analysis.

(b) Dimensions of neighborhood improvement in the 1990s

A variety of indicators support the notion that New York City neighborhoods

became more livable over the 1990s. The improvement is most readily apparent in two

key dimensions of neighborhood revitalization—crime and housing quality. Moreover,

the biggest improvements occurred for residents of the city's poorest sub-boroughs.

---

[14] See Nye and Glickman (2001) and Carman (2001) for discussions of the role CDCs and Community
Development Partnerships (CDPs).

The overall crime rate in New York City declined dramatically over the 1990s, and the decline far outpaced the decline in crime nationwide.[15] We use the number of murders per 100,000 residents as a measure of crime in the city. The murder rate is considered to be particularly well measured. We report this rate for our three groupings of sub-boroughs arranged by median household income--the 10 lowest, the 35 middle-income, and the 10 highest (Chart 2). The homicide rate in the city's 10 lowest-income sub-boroughs fell dramatically over the decade, from an average of 80 (per 100,000 residents) in 1990 to 18 in 2000; the homicide rate in the 35 middle-income sub-boroughs was more than halved from 25 to less than 10, and the rate in the highest-income sub-boroughs declined from 10 to 3. Although the poorest sub-boroughs still recorded the highest average homicide rate of these three income groupings in both 1990 and 2000, the disparity between this group and the rest of the city was sharply reduced. All of the 10 lowest-income sub-boroughs experienced steep reductions in the homicide rate (Chart 2a).[16]

Measures of housing quality also improved dramatically in New York City neighborhoods in the 1990s, and the broad pattern of improvement across neighborhoods was comparable to that of the reduction in crime rates. Two measures reported in HVS highlight this improvement. One measure is the share of housing units in a neighborhood with 4 or more deficiencies. This measure showed strong improvements in the quality of

---

[15] See Bram, Haughwout, Orr (2002)

[16] The decline in the murder rate was mirrored in the decline in the felony rate. There were 81 felonies per 100,000 people in New York City in 1990. By 2000 this figure had declined to 22.9, with felonies down in every neighborhood. In fact, no sub-borough had even half as many felonies in 2000 as in 1990. The pattern was similar for property felonies. Schwartz (1999) provides a discussion of the links between the City's Plan and changes in factors such as crime and welfare dependency. While acknowledging the speculative nature of his results, he concludes that both of these factors were positively affected by the City's Plan.

housing (fewer deficient units) across all neighborhoods in the 1990s (Chart 3). The

largest gains in housing quality occurred in the lowest-income sub-boroughs, leading to

greater uniformity in the quality of the housing stock citywide. All of the 10 lowest-

income sub-boroughs saw an improvement in their housing quality with particularly large

gains in the Highbridge/South Concourse neighborhood in the Bronx borough and in the

Central Harlem neighborhood in the borough of Manhattan (Chart 3a). A second more

subjective measure of housing quality--the share of residents who perceive the quality of

the structures in their neighborhood as poor--showed a similarly broad-based

improvement across the city (Chart 4). Residents of the lowest-income neighborhoods as

a group reported the largest improvement in the quality of the structures, and the

improvement in quality was observed separately in all but one (University

Heights/Fordham) of these low-income neighborhoods (Chart 4a). Despite these gains,

housing quality in these relatively low-income areas remains below that of the other

groups. Nevertheless, the findings based on this self-reported indicator of housing

quality are broadly consistent with the compilations of the surveyors and the measures.

Together, these measures support the contention that the quality of housing rose sharply

across city neighborhoods over the past decade.

(c) Economic growth and housing quality

The correlation of the widespread improvement in the quality of housing in New

York City neighborhoods and the relatively strong economic performance of the city's

economy over the 1990s suggests a simple story of cause and effect. Between 1990 and

2000, aggregate New York City employment expanded by roughly 4 percent while real aggregate earnings rose by roughly 12 percent. In the second half of the decade, in particular, the city's economy was creating jobs at a rate that matched or exceeded the national rate. Sustained economic growth at such a strong pace carries with it the potential to improve conditions in a local economy: more jobs and higher income can lead individual households to improve their housing quality and landlords to redevelop and upgrade rental structures in neighborhoods in high demand by relatively higher-income residents.

Yet, data on the growth in household income across city neighborhoods suggests that the improvement in neighborhood quality is not a simple story of a stronger economy. The change in real median household income in the 10 lowest-income sub-boroughs, the 35 middle-income sub-boroughs, and the 10 highest income sub-boroughs in New York City does not show the same general pattern of broad-based improvement across the city as did the improvements in housing quality (Chart 5). Median household income grew modestly in the lowest-income sub-boroughs and in the wealthiest sub-boroughs, and declined slightly in the middle-income sub-boroughs. Moreover, within the lowest-income sub-boroughs, income growth was unevenly distributed (Chart 5a).

The variation in the strength of income growth across neighborhoods reflects, in part, the dynamics of population change in the city over the 1990s. The city's population grew by roughly 700,000 (9%) between 1990 and 2000; this growth was the result of a net increase of 800,000 foreign-born residents and a decline of 100,000 native-born residents. While the Census data can not be used to calculate a median household income for native- or foreign-born residents, the Current Population Survey data show the native-

born median income is about 4 percent above the city median and the foreign-born median about 8 percent below the city median.

With the exception of Asians, high-income groups lost population while low-income groups gained in numbers. The biggest population decline among demographic groups was the net loss of 300,000 white, Non-Hispanic residents.[17] These demographic shifts suggest that a significant portion of the residents of New York City neighborhoods in 1990 were not residing in the same neighborhood in 2000. Nevertheless, the modest shifts in the levels of median household income within the groups of neighborhoods and the lack of a clear correlation of residents' income growth with neighborhood improvement suggest that the process of neighborhood revitalization in the city is the result of the confluence of several forces.

A further look at the process of income growth across neighborhoods suggests only a limited role in neighborhood revitalization for gentrification; i.e., the rise in income and educational attainment in a neighborhood that results from the displacement of lower-income households by higher-income households. We address this issue by looking at the correlation of changes in income and in the college-educated share of residents in neighborhoods. Chart 6 groups neighborhoods by their median household incomes in 1990 (the rows) and their median household real (inflation-adjusted) income growth rates between 1990 and 2000. The five sub-boroughs in the upper right hand panel became increasingly affluent—they began the decade with high-income levels and saw their incomes grow over the decade. The eight sub-boroughs in the lower right-hand

---

[17] The 2000 Census data for New York City show White, Non-Hispanic residents had the highest median annual household income in the city ($53,625). Direct comparison of race data between 1990 and 2000 are precluded because respondents in the 2000 Census could be multiracial, while in the 1990 Census only

panel, which include a number of the poorest sub-boroughs in 1990, also saw an upward shift in income. To get at the issue of gentrification, we highlight in boldface type the sub-boroughs with substantial increases in college-educated residents over the 1990s.[18] While the sub-boroughs in the upper right hand panel all had relatively strong increases in college-educated residents, none of the poor sub-boroughs in the lower right hand panel saw a sizable increase in their college-educated residents. Based on the relatively weak growth in the share of the population with college degrees, gentrification does not appear to be a significant factor in the increasing income of most of the poorest sub-boroughs. Consequently, the observed improvement in neighborhood quality in poor sub-boroughs does not appear to be simply the result of the gentrification of these neighborhoods.

(d) Three Neighborhood Revitalization Experiences:

While the crime and housing quality measures capture the broad outlines of revitalization, the process has taken several interesting and diverse forms in different neighborhoods.[19] In this section we highlight the experiences of three New York City neighborhoods over the 1990s—Mott Haven/Hunts Point, Central Harlem, and Coney Island.

Mott Haven / Hunts Point

Although it remained the lowest-income sub-borough, this area saw substantial improvement in quality-of-life indicators, such as crime and the housing stock,

---

one race could be indicated. The above estimate represents the average of an upper and lower bound estimate.
[18] The boldface sub-boroughs had increases in college-educated residents more than two standard deviations above the citywide average.
[19] See Grogan and Proscio (2000) for numerous anecdotes as well as a comprehensive discussion of the important factors in neighborhood revitalization.

during the 1990s. Unlike most low-income neighborhoods, it has a fairly large

business sector, led by distribution and manufacturing.

Income & Labor Force - This sub-borough of the Bronx saw a steep decline in median

income during the 1980s and had the city's lowest median household income in 1989. In

the 1990s, however, median income surged by 22%—the strongest gain of any area

outside Manhattan—but, at $17,250 in 2000, it was still lower than in any other sub-

borough. In 1992, more than 35% of residents were on public assistance, by far the

highest in the city, and an equal proportion were employed, the lowest in the city. By

2000, the percent on public assistance had fallen to 21% (no longer the highest), but the

percent employed remained the lowest, at 33%.

Quality-of-Life Measures - This area made substantial progress during the 1990s. The

murder rate, which had been among the highest in the city, tumbled from 98 (per 100,000

residents) to 14. Similarly, the drug dependency death rate fell from 40% to 23%, the

sharpest improvement of any sub-borough.

This neighborhood's housing stock improved noticeably but was still relatively

poor at the end of the decade. The incidence of deficient units fell from 25% to 16%, still

fairly high, and the proportion of residents complaining about poor neighborhood quality

fell from 75% to 42%. The median rent was unchanged at $404—the lowest in the city—

and the share of owner-occupied homes rose from 4% to 7%, still close to the lowest of

any sub-borough.

Changing Population Profile - The composition of the neighborhood's population did not

change much. Educational attainment was the lowest in the city both in 1990 and 2000,

with the proportion of adults holding college degrees edging up from 3% to 5%. In 1990, nearly 70% of the population was Hispanic and 35% was black, and the racial mix remained about the same – a slightly higher proportion of Hispanics and a slightly smaller share of blacks. There was, however, a sizable 10% increase in the overall population and most of the net increase appears to be accounted for by immigrants.

Business Sector - In terms of businesses, this neighborhood is expected to undergo extensive change. Hunts Point is a major wholesale distribution hub for food products, and its role will become increasingly important as the Fulton Fish Market relocates there from lower Manhattan. Wholesale trade accounts for 23% of jobs, up from 20% in 1991; manufacturing accounts for 14% of jobs—down from 23% in 1991 but the highest, by far, in the Bronx. More generally, employment grew by 11% in the 1990s (slightly below the citywide rate), and Mott Haven continues to have the greatest concentration of jobs of any sub-borough in the Bronx.

Central Harlem

This sub-borough has also seen substantial improvement in quality-of-life measures during the 1990s, with modest signs of gentrification, as reflected in above-average income growth, a moderate increase in the population's educational attainment, and above-average rent increases. This appears to have been driven by this neighborhood's central location.

Income - This neighborhood saw median income rise 17% during the 1980s. Still, in 1990 it had the third lowest median income of any sub-borough. In the 1990s, however, median household income jumped another 12%, among the strongest gains in the city.

Quality-of-Life Measures - Like Mott Haven/Hunts Point, this sub-borough showed dramatic improvement in the 1990s. At the start of the decade, it had the second highest murder rate in the city and the highest rate of drug-dependency deaths. But during the 1990s, the murder rate tumbled by more than 80% while the drug-dependency death rate fell by a third, though both measures remained among the highest in the city. The proportion of deficient homes also declined sharply, falling from 41% to 20%, though this figure remained the highest in the city. Similarly, the proportion of residents complaining of poor neighborhood quality fell from 81% to 59%, which, though still high, was no longer the highest in the city. The real median rent, which at $430 in 1990 was near rock bottom, jumped 13%—well above the average for low-income neighborhoods and even the city as a whole, but in line with other Manhattan neighborhoods. The incidence of owner-occupied homes rose from 5% to 7%, in line with other lower-income sub-boroughs.

Changing Population Profile - This neighborhood's population grew by 8% in the 1990s, close to the city average, while the composition of the neighborhood's population appears to have changed noticeably but not dramatically. The proportion of residents with college degrees rose from 10% to 15%—comparable to other neighborhoods in or near Manhattan.   The percentage with high-school degrees rose from 56% to 64%, one of the largest increases of any sub-borough. These figures suggest some gentrification, but not mainly from people at the upper end of the income and education spectrum. This neighborhood's population is overwhelmingly black, though less so than in 1990—84%, down from 92%. Conversely, Hispanics' share of the population rose from 10% to 17%

(these categories are not mutually exclusive). There was also a large increase in the foreign-born population, evidently contributing much to net population growth.

Business Sector - Perhaps surprisingly, Central Harlem has a lower concentration of employment than almost any other sub-borough. Health and social services is the dominant industry in terms of both level and growth, accounting for 37% of jobs in 1991 and 45% in 2000; retail trade is somewhat important representing 20% of employment in both years. There was also good growth in entertainment services, which accounted for just 5% of jobs in 1991 but 10% in 2000. There is virtually no manufacturing.

Coney Island

This Brooklyn neighborhood differs noticeably from other low-income sub-boroughs, particularly in terms of demographics, crime and housing. Although median income declined, quality-of-life indicators improved in line with other low-income neighborhoods.

Income and Labor Force - This was one of only three NYC sub-boroughs to see a decline in real median household income in the 1980s (down 3%). At $28,565 in 1990, median income was well below the city-wide average, though nine sub-boroughs had lower incomes. During the 1990s it fell by another 9%, again one of the weakest performances of any sub-borough, though its income rank did not change. In 1992, a relatively modest 13% of residents were on public assistance, but only 42% were employed.

Quality-of-Life Measures - This area improved substantially during the 1990s, from already favorable levels. The murder rate fell from 19 to 7 (per 100,000 residents), and the property felony rate registered a comparable drop. Both remained below the

18

respective city-wide averages. Interestingly, however, the drug-dependency death rate *more than doubled*, from 7% to 15%, while the city-wide rate held steady at just over 10%.

At the beginning of the 1990s, the quality of the neighborhood's housing stock was close to the city-wide average and exceptionally good for a low-income sub-borough; during the 1990s it improved even further. The proportion of residents complaining about poor neighborhood quality fell from 42% to 28%, matching the city average, while the incidence of deficient units fell to 5%, well below the citywide figure of 7.8%. Real median rent rose 6.7%, comparable to the city as a whole, to $565, leaving it about 25 percent below average. The incidence of owner-occupied homes rose from 19% to 23%, only moderately below par.

Changing Population Profile - Population growth over the 1990s was below average at 4.7%. However, the composition of the neighborhood's population, as well as the change over the 1990s, was unusual for a low-income sub-borough. Educational attainment improved dramatically, with the share of college graduates surging from 13% to 23%, close to the NYC average. The proportion of blacks fell further below the NYC average, declining from 21% to 17%, and the share of Hispanics rose only modestly, from 14% to 16%. However, Asians' share rose from 6% to 11%. White, non-Hispanics continued to represent a majority of the area's population, though it edged down from 59% to 57%. The share of foreign-born jumped to 48%, from 32% in 1990; again, this is much higher than in any other low-income neighborhood. This sub-borough is a leading destination for Russian immigrants, and appears to be increasingly so for Asian immigrants.

Business Sector - In terms of businesses, this neighborhood registered brisk employment growth of 23%, among the highest in the city. Health and social services is the dominant sector, representing about 35% of jobs in both 1991 and 2000. The strongest growth contribution came from the transportation/utilities/ communication sector, whose share of jobs surged from 6.6% to 12.8%. Retail trade accounted for 20% of jobs.

III. A Model of Neighborhood Revitalization

We now present a theoretical framework for analyzing the key elements of the process of neighborhood revitalization. Although the model we present is relatively abstract, it provides a basis for implementing our empirical analysis. We begin with the assumption that households are freely mobile and simultaneously choose a neighborhood and a quantity of housing. As a result, each neighborhood represents only one of the many potential residential locations available to households. Each housing unit comes with a set of neighborhood conditions which households take as given: each is too small individually to affect the character of the neighborhood overall.

There are several ways that neighborhood conditions can improve during a particular time period. Our focus is on improvements in private housing quality as an index of neighborhood change. By this definition, investment decisions by individual property owners are key to the process of neighborhood improvement. Property owners choose investments to solve the problem described in the following equation:

(1) $\max_{i} E(\pi) = PDV\{E[R(h_{u,n,t}, Y_{n,t}, Z_{n,t})] - r_{n,t}\}$

where PDV refers to present discounted value, $E[R(\cdot)]$ is expected annual rents, $Y_{n,t}$ is annual income in neighborhood n in year t, $\mathbf{Z_{n,t}}$ is a set of exogenous determinants of neighborhood conditions, and $r_{n,t}$ is the (annualized) cost of new investments, potentially varying by neighborhood because of cost subsidy programs such as enforcement of CRA provisions or investment subsidy programs. $h_{u,n,t}$ is the value of housing stock in place in the uth unit in neighborhood n in year t and is given by

$$h_{u,n,t} = (1-\delta)\, h_{u,n,t-1} + i_{u,n,t},$$

where δ is the annual rate of housing stock depreciation.[20]

Profit-maximizing property owners choose $i_{u,n,t}$, new private housing investment, by equating the marginal (annualized) cost of improvements to the value of the same improvements' marginal impact on rent. $i_{,n,t}$ may consist of improvements to existing units and/or new construction. That is, investments must pay for themselves in order to be worthwhile from the landlord's perspective.[21] Thus,

(2) $i_{u,n,t} - \delta h_{u,n,t-1} = i\{E[R(h_{u,n,t-1}, Y_{n,t}, \mathbf{Z_{n,t}})], r_{n,t}\}.$

Net new investment in each unit ($i_{u,n,t} - \delta h_{u,n,t-1}$) depends (positively) on changes in expected future rental return on new investments, and negatively on the cost of new investment.

Note also that changes in rents will depend on the same set of variables, including the value of the housing stock currently in place. Thus,

(3) $R_{u,n,t} = R(h_{u,n,t}, r_{n,t,}, Y_{n,t}, \mathbf{Z_{n,t}},)$; i.e. $R = r(h(r), Y, Z).$

---

[20] While the model is written for rental units, a specification that begins with utility maximization by owner- occupants yields a similar expression for new investments in their homes.

[21] Alternatively, one could view property owners as adjusting stocks of housing so as to reach an optimal level of stock, again conditional on (expected) neighborhood conditions $Y_{n,t}$, $\mathbf{Z_{n,t}}$ and $r_{n,t}$. Such a specification would result in an investment expression similar to (and empirically indistinguishable from) (1).

Our focus is on identifying the effects of exogenous determinants of neighborhood conditions ($\mathbf{Z_{n,t}}$) on rental appreciation and new net investment in neighborhood housing units. Among these exogenous determinants are

- Public sector housing investment

- Exogenous private housing investment, primarily by non-profit groups.

- Exogenous variations in the cost of new investments, potentially through CRA lending (which potentially affect r)

- Public goods provision (net of neighborhood tax cost)

- Changes in job location and amenity patterns across neighborhoods

The presence of neighborhood income ($Y_{n,t}$) on the right-hand side of (2) and (3) raises several issues. A neighborhood-level income increase is the weighted average of two parts: (1) increases in incomes earned by beginning-of-period residents who remain in the neighborhood (stayers) and (2) differences between incomes of beginning-of-period residents who leave the neighborhood (emigrants) and new residents (immigrants).

Of course, higher-income households can afford to move to nicer neighborhoods and are likely to spend more on housing. In addition, the presence of wealthier neighbors may influence neighborhood attractiveness by many routes, including the fact that residents are likely to value new investments in their neighbors' housing stocks.[22]

This means that rent, income and housing investment all depend on each other across neighborhoods and over time within a given neighborhood. The endogeneity of neighborhood- (and unit-) level income complicates identification of the structural effects

of neighborhood-level policy interventions of the sort measured in $\mathbf{Z_{n,t}}$. We will address this issue in our empirical specification by excluding current neighborhood income from our regression analysis.

IV.   Empirical Strategy and Model Estimates

Our empirical analysis has two parts. In the first part, we present regression results that help to explain the process of improvement in a key dimension of neighborhood revitalization—the quality of the housing stock. The variables used to measure improvement are a significant reduction in the number of deficiencies in housing units and a reduction in the share of residents of these units who give a rating of "fair" or "poor" to the overall quality of the housing stock in their neighborhood. Both of these measures are taken from the HVS. Our focus in this analysis is on occupied units, though in future work we plan to expand the scope of our investigation to include the rehabilitation of vacant units and the construction of new units. The second part of the analysis focuses on the impact of neighborhood revitalization on rents. Higher expected rents play an important role in the model as a driver of housing investment. The model predicts that neighborhoods that experience relatively strong physical improvement will be the same ones that see a rise in their relative rents.

The regression analysis model is designed to estimate separately the impact of the economy and public policy in improving neighborhoods. The specific policy that we focus on in the analysis in this paper is the housing assistance provided through the city Capital Programs (discussed earlier). We use a linear probability model specification

---

[22] Other routes that have been studied in the literature include, but are not limited to, potentially reduced crime, improvements in local public school peer groups, and the attraction of new retail consumption

23

which means the dependent variable in the regression takes on only two values—0 if no improvement occurred and 1 if there was improvement.[23] The primary explanatory variable that captures the impact of public policy is the number of units assisted by the city's housing program. We are as yet unsatisfied that our data on CRA lending and CDC activity are measuring what we intend them to measure, as mentioned earlier, and we omit them from these results. When we include the measures we have in the regression, we find them to be statistically insignificant; their exclusion has no effect on these results.

Housing Unit Improvement

The Housing and Vacancy Survey (HVS) asks residents seven yes or no questions about the presence of specific deficiencies in their homes. We exploit the longitudinal features of the HVS to model the probability that a unit with a high number of deficiencies in the 1991 survey had a low number of deficiencies in the 1999 survey. In the results presented here, we define a high number of deficiencies as three or more and a low number of deficiencies as two or fewer. Results using different cutoffs are similar.

Our sample consists of 1,411 occupied units that had more than three deficiencies in 1991 and appeared in the sample again in 1999. The dependent variable is equal to one for the 966 units (68%) that registered fewer than three deficiencies in 1999 and zero for the 445 units that did not. Our key explanatory variables relate to city assistance to three kinds of housing units: occupied units, vacant units, and newly constructed units. Note that our data on city assistance is available at the sub-borough level. Thus we will

---

opportunities. Each of which is likely to affect both rents and investments.
[23] The results reported here are nearly identical to those obtained from a probit model.

model the probability of improvement in an individual unit as a function of the number of units publicly assisted in the unit's sub-borough.

Since our sample consists of occupied units, we expect city assistance to occupied units to have an important effect on the probability of improvement. The magnitude of this effect is of particular interest. In our specification, we use as an explanatory variable the number of occupied units assisted in the sub-borough as a percentage of the number of deficient occupied units in the sub-borough at the beginning of the period. If we assume that city assistance is targeted towards these deficient units, then our specification relates the probability that a deficient unit improved to the probability that a deficient unit was assisted. If the estimated coefficient on the variable indicating the probability that a deficient unit was assisted is greater than one, it suggests that city assistance had a positive effect on the neighborhood as a whole through spillovers to improvements in nearby units. If the estimated coefficient is exactly one, then city assistance improved the units assisted but with no significant spillover effects. If the estimated coefficient is less than one, it suggests that city assistance did not significantly improve deficient units. This could reflect, among other things, the fact that city assistance was not targeted to deficient units, was targeted to units that would have improved anyway, or was not substantial enough to have a significant impact.

We also wish to allow this key coefficient to vary across sub-boroughs. The city assistance was concentrated in sub-boroughs with a relatively large share of deficiencies and the assistance may be more effective in sub-boroughs where there are many assisted units that are physically close together. To achieve this flexibility, we include an

interaction between the percent of deficient units that were assisted and the percent of units that were deficient, a term that reduces to the percent of units that were assisted.[24]

The model we estimate is:

$$\mathbf{P}[\text{Improvement}] = \alpha_1 \text{pctAssistDef} + \alpha_2 \text{pctAssistAll} + x\beta + \varepsilon$$

Where $\mathbf{P}$[improvement] is the probability of improvement
PctAssistDef is the percent of deficient units assisted
PctAssistAll is the product of PctAssistDef and the percent of units deficient
x is a vector of a constant, neighborhood characteristics, and unit characteristics

The effect of the percentage of units in a neighborhood assisted by the city is
$[\alpha_1 + \alpha_2 \text{(percent of units deficient)}]$

We can also imagine scenarios where other targets of city housing assistance—vacant units or the construction of new units--might affect investments in occupied units. If the rehabilitation of vacant units or construction of new units makes a neighborhood a more desirable place to live, demand for existing, occupied units may rise, increasing the return to investing in improvements. However, if the supply of available units rises without attracting new residents, demand for existing, occupied units may fall. We include measures of these two forms of assistance in the regression. We suggest, however, that our data on assistance to vacant units be interpreted cautiously. Ideally, we would construct an explanatory variable as the number of vacant units assisted as a percent of vacant units, but we suspect that the definitions of vacant units used by the HVS and the city are not the same.[25] Instead, our explanatory variable will be the

---

[24] This interaction term is computed as: (number of units assisted/number of units deficient) x (number of units deficient/number of units) = (number of units assisted/number of units)
[25] For example, in 1991, the HVS reports 1,600 vacant in rem units, while the city claims to have provided assistance to over 5,000 such units.

number of vacant units assisted as a percent of all units. This variable may be measuring the presence of vacant units more than the extent to which they were assisted.

Several other sub-borough and unit characteristics are included in our specification. We use three sub-borough characteristics: median household income from the 1990 census, percent of units with three or more deficiencies in 1991, and the distance from the center of the sub-borough to Union Square, an intersection in the middle of lower Manhattan which proxies for the "center" of the city. The first two control for the affluence and desirability of a neighborhood at the beginning of the period; the third tests whether the benefits of Manhattan's booming economy spilled over into nearby neighborhoods. At the unit level, we control for the year each unit was built and each unit's rent regulation status at the end of the period. We expect older buildings to be more likely to deteriorate and rent regulation to depress expected future rents, discouraging investment in improvements.

The regression model estimates are presented in Table 1. The estimated coefficients on city assistance to occupied units suggest that the concentration of assisted units in highly deficient sub-boroughs was a key factor in the success of the city's assistance. The coefficient on the percent of deficient units that were assisted is small and statistically insignificant, while the coefficient on its interaction with the percent of all units that were deficient is positive and statistically significant. This latter variable takes its maximum in Central Harlem, where 55 percent of units were deficient in 1991, and the number of assisted units (7,456) represented 41 percent of the number of deficient units. The estimated coefficients suggest that a one percent increase in the

probability that a deficient unit was assisted was associated with a 1.45 percent

(0.002+2.641×0.55) increase in the probability that a deficient unit improved.[26]

In the Stuyvesant Town/Turtle Bay sub-borough in lower Manhattan, only 11

percent of units had 3 or more deficiencies in 1991, and only 18 units (representing 0.2

percent of the deficient units) received assistance. Here, the estimated coefficients

suggest that a one percent increase in the probability that a deficient unit was assisted was

associated with a 0.29 percent (0.002+2.64×0.11) increase in the probability that a

deficient unit improved; with a standard error of 0.28, however, we cannot distinguish

this estimate from zero. Thus our estimates suggest that city assistance was most

effective in neighborhoods with a lot of deficient housing units and may have encouraged

improvements beyond those units directly assisted. In neighborhoods where deficient

units were fewer and farther between, city assistance had less impact on the probability

that any deficient unit would improve.

The estimated coefficients on the housing unit-level control variables tend to be

consistent with our model. Units in older buildings were less likely to improve. Owner

occupancy made a unit 14 percent more likely to improve, while being under rent control

or in rem made a unit 21 percent and 23 percent less likely to improve.[27] The coefficients

---

[26] This estimate suggests that city assistance to occupied units spilled over into other units, though the standard error on this estimate, 0.42, does not permit us to conclude that the estimate is statistically different from one.

[27] There is some question whether owner-occupied and in rem units belong in the sample and whether their status can be considered exogenous. We exclude public housing units from the sample on the argument that improvement decisions are made by a public entity rather than the private property owner that we have in mind in our model. A similar argument might be made for the in rem units. However, much of the city's assistance to occupied units went to in rem units with the intention of transferring them back to private ownership. We think that improvements in these units reflect the market mechanism that we have in mind. However, if a unit is still in rem at the end of the period, its status as such can not be considered exogenous. Either excluding the in rem units from the sample or removing the in rem control from the equation has little effect on the results. Owner occupancy status is not completely exogenous, but it changes little enough over our period that it can nearly be considered so.

on the sub-borough level control variables are also in line with expectations. Each additional mile in distance from Union Square made a unit one percent less likely to improve, suggesting that spillover gains from Manhattan's economic growth were concentrated nearby. A higher initial level of income in a sub-borough made its units more likely to improve, while a higher concentration of deficient units made improvement less likely. This is consistent with our model's prediction of higher expected rents in affluent, desirable neighborhoods.

Variables that capture other city assistance programs were also included in the regression. The coefficient on assistance to new construction is positive, suggesting that assistance to new construction may encourage investment in existing units, though it is not statistically significant at the ten percent level. The coefficient on assistance to vacant units is negative and statistically significant. This variable takes its maximum, 0.14, for the units in the Central Harlem sub-borough. The estimated coefficient suggests that assistance to vacant units made each unit in Central Harlem 46 percent less likely to improve. This estimate must be interpreted cautiously because, as discussed above, it is not clear that it actually reflects assistance to vacant units rather than the existence of vacant units at the beginning of the period.

Neighborhood Quality Improvement

The HVS also asks residents to rate the quality of the residential structures in their neighborhood as excellent, good, fair, or poor. We exploit the longitudinal features of the HVS to model the probability that a unit whose residents rated the neighborhood fair or poor in 1991 rated it good or excellent in 1999. Our sample consists of 2,620 units whose residents rated their neighborhood fair or poor in 1991 and that appeared in the

sample again in 1999. The dependent variable is equal to one for the 1,497 units (57%)

whose residents rated the neighborhood good or excellent in 1999 and zero for the 1,123

units whose residents did not.

Our explanatory variables will be the same as in the previous regression. Here,

though, we do not test for a specific relationship between assistance and improvements.

Rather, we are interested in whether the programs that we showed to have an impact on a

relatively objective measure of housing quality also had an impact on residents'

perceptions of housing quality.

Table 2 presents the regression results for this specification. The estimated

coefficients on the percent of deficient units assisted and its interaction with the percent

of units that were deficient together suggest that city assistance had the largest marginal

effect on perceptions of neighborhood quality in sub-boroughs that had a lower rate of

deficiencies in 1991. The coefficient on the first variable is positive and statistically

significant, while the coefficient on the second is negative, though statistically

insignificant. For instance, assisting one percent of deficient units in Stuyvesant

Town/Turtle Bay was associated with a 0.66 percent (0.743-0.787×0.11) increase in the

probability that residents reported an increase in neighborhood quality. In Central

Harlem, assisting one percent of deficient units was associated with a 0.31 percent (0.74-

0.79×0.11) increase in the probability that residents reported an increase in neighborhood

quality. Note that this does not imply that city assistance had a larger overall impact on

the probability of improvement in Stuyvesant Town than in Central Harlem. Because a

much higher percent of deficient units were assisted in Central Harlem than in Stuyvesant

Town, the estimated effect of the assistance was much larger in Central Harlem. This

result suggests that it was more difficult to affect residents' perceptions of neighborhood quality in sub-boroughs that began the decade in poor shape. The city largely succeeded, though, by concentrating their efforts in these same sub-boroughs.

We might expect the unit-specific characteristics to affect changes in neighborhood quality only because they proxy for the characteristics of other units in the neighborhood. It is not surprising that they are smaller in magnitude or less statistically significant than in the previous regression. The coefficients on assistance to vacant units and the construction of new units are negative and statistically insignificant, providing no strong evidence that these types of assistance had an impact on residents' perceptions of neighborhood quality.

Rent-Quality Regression

Our model of neighborhood revitalization implies that quality improvements in the housing stock will be associated with higher rents. We again utilize the HVS's longitudinal sample of housing units to test this hypothesis. Our sample consists of the housing units that were renter occupied during both the 1991 survey and the 1999 survey.

The regression model uses the percentage change in the real, or inflation-adjusted, rent of the unit between 1991 and 1999 as the dependent variable. The independent variables in this regression include two measures of quality included in the previous regressions – the number of unit deficiencies as reported by the interviewer and the resident rating of residential structures in the neighborhood. Both the initial levels of these measures and the changes in these levels over the 1990s are included. Several characteristics of the individual unit are included in the regression, including the unit's

rent regulation status in 1991, the year the unit was built, and whether the unit was in rem in 1991. Also included are the unit's 1991 real rent level and the distance of the sub-borough in which the unit is located from Union Square in Manhattan.

The regression estimates suggest that both the reduction in deficiencies and the residents' perceptions of improved quality of residential structures in the neighborhood have a positive and significant impact on the percentage change in the unit's real (contract) rent from 1991-99 (Table 2). This finding supports the model's assumption that improvements in housing quality reflect increases in expected rents. Among the other variables, a unit's distance from Union Square has a negative and significant impact on rents, suggesting that closeness to Manhattan played a role in raising the rent level. Less clear is why regulated units experienced larger increases in rent compared to non-regulated units. The estimated coefficient on the 1991 quality of residential structures in the neighborhood has a positive and significant impact on rents, indicating that units in neighborhoods with better residential structures saw larger rent increases. The estimated coefficient on the 1991 number of deficiencies has a negative and significant impact on rents, indicating that units with fewer deficiencies expected larger rent increases. The estimated coefficient on the year the unit was built has a positive and significant impact on rents, indicating that older units experienced larger rent increases. This could reflect the fact that many older units are located in higher-income areas. The estimated coefficient on the 1991 real rent level is negative and significant, indicating that initially low rents were more likely to increase than initially high rents.

V. Summary and directions for future research

Neighborhood revitalization in New York City was measured in this paper by the changes in the safety and the quality of the housing stocks in 55 sub-boroughs. Based on these measures, New York City neighborhoods clearly improved over the course of the 1990s. Furthermore, these gains were largest in neighborhoods that had the lowest-income at the start of the 1990s. Though the city's economy expanded sharply over the decade, this revitalization was not simply the result of a stronger economy. Rather, it reflected a combination of the gains in economic activity in the city and targeted city efforts to improve the housing stocks, particularly in lower-income neighborhoods.

Our empirical analysis focused on two specific measures of neighborhood quality—deficiencies in the housing stock and residents' perceptions of the quality of the structures in their neighborhood. Information on these measures as well as a variety of household characteristics is available for individual housing units from the New York City Housing and Vacancy Survey. We aggregate these measures to quantify the amount of improvement in housing quality across sub-boroughs and then exploit the longitudinal nature of the survey to estimate the underlying sources of improvement. Our findings show that the stronger economy in the city over the decade appears to have played a role in neighborhood revitalization and, notably, confirm an important role of the city's housing programs in the process of revitalization. Moreover, there was evidence that the effects of this housing assistance spilled over to other units in lower-income neighborhoods.

While this analysis focused on the city housing assistance, there have been a number of other public and private sector programs to improve the quality of New York

City neighborhoods. Two key examples of these efforts are the activities of a variety of Community Development Corporations (CDCs) and lending to both lower-income individuals and in lower-income neighborhoods under the Community Reinvestment Act. The former efforts often worked in concert with the city housing assistance programs and at least some of the impact of these organizations is likely to be subsumed in the estimate of the effects of the city program. The data on the specific location and types of CDC expenditures in the city, however, was not detailed enough to be incorporated separately into our empirical analysis. While data on lending activities is available for individual neighborhoods, we did not believe the available measures were adequate to capture the impact of this lending on neighborhood improvement. Future work will attempt to fine tune both the CDC expenditure data and the lending data by neighborhood in order to derive an estimate of their impacts on neighborhood revitalization apart from any role they might play in the implementation of city housing programs.

Chart 1: The 55 Sub-boroughs
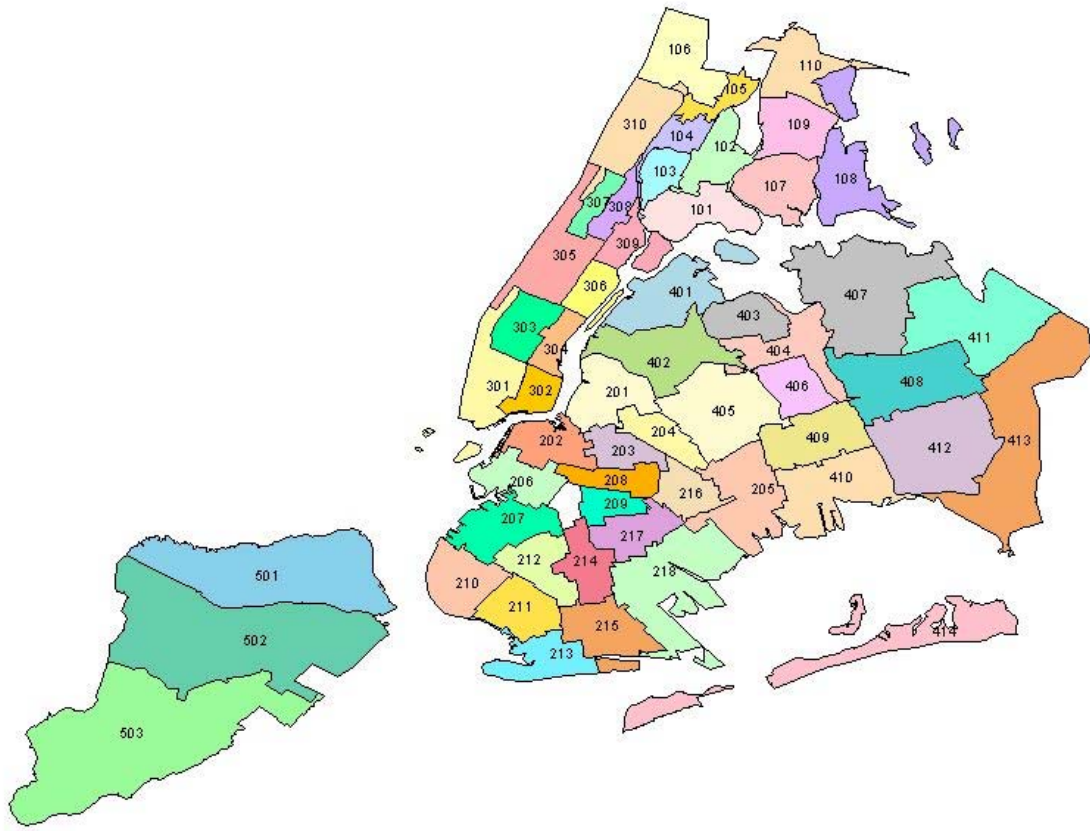
The Bronx
101 Mott Haven/Hunts Point
102 Morrisania/East Tremont
103 Highbridge/South Concourse
104 University Heights/Fordham
105 Kingsbridge Heights/Mosholu
106 Riverdale/Kingsbridge
107 Soundview/ Parkchester
108 Throgs Neck/Co-op City
109 Pelham Parkway
110 Williamsbridge/Baychester

Brooklyn
201 Williamsburg/Greenpoint
202 Brooklyn Heights/Fort Greene
203 Bedford Stuyvesant
204 Bushwick
205 East New York/Starrett City
206 Park Slope/Carroll Gardens
207 Sunset Park
208 North Crown Heights/Prospect Hei
209 South Crown Heights
210 Bay Ridge
211 Bensonhurst
212 Borough Park
213 Coney Island
214 Flatbush
215 Sheepshead Bay/Gravesend
216 Brownsville/Ocean Hill
217 East Flatbush
218 Flatlands/Canarsie

Manhattan
301 Greenwich Village/Financial Dist
302 Lower East Side/Chinatown
303 Chelsea/Clinton/Midtown
304 Stuyvesant Town/Turtle Bay
305 Upper West Side
306 Upper East Side
307 Morningside Heights/Hamilton Hei
308 Central Harlem
309 East Harlem
310 Washington Heights/Inwood

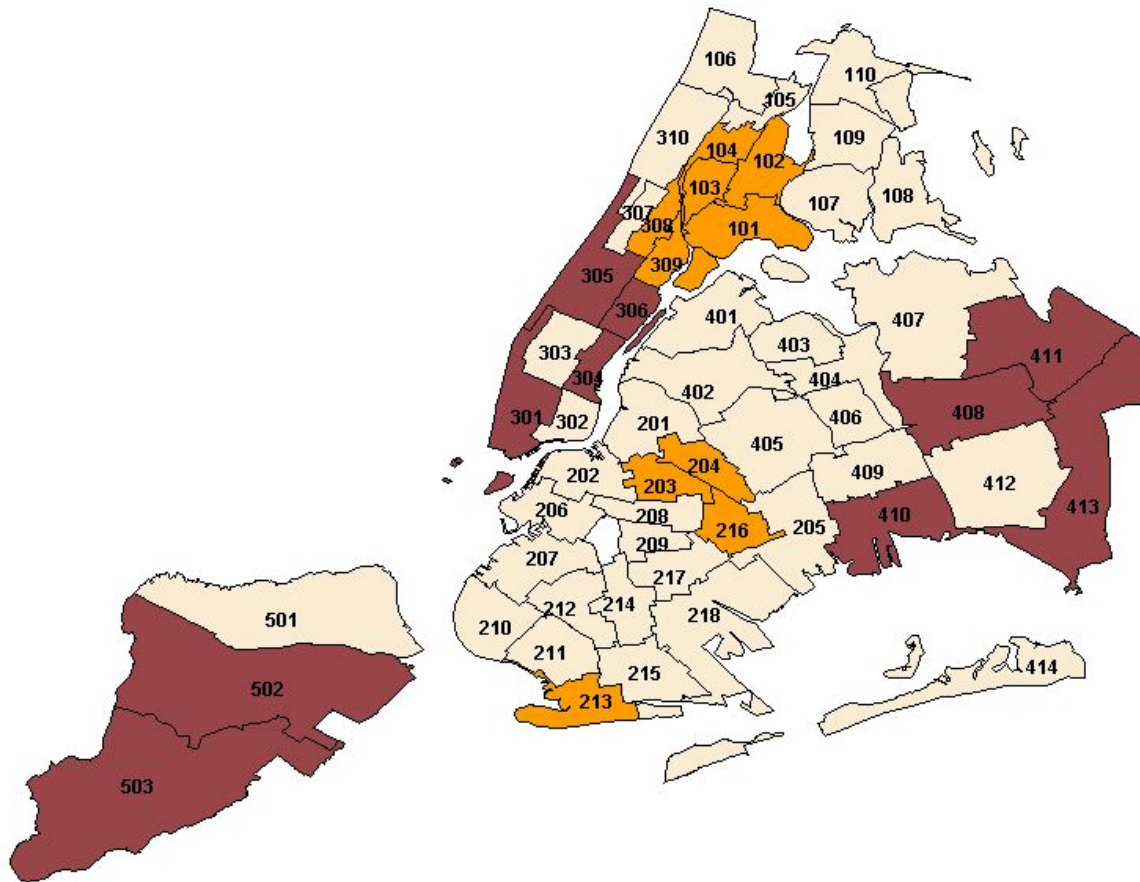**Queens**
401 Astoria
402 Sunnyside/Woodside
403 Jackson Heights
404 Elmhurst/Corona
405 Middle Village/Ridgewood
406 Forest Hills/Rego Park
407 Flushing/Whitestone
408 Hillcrest/Fresh Meadows
409 Kew Gardens/Woodhaven
410 Howard Beach/South Ozone Park
411 Bayside/Little Neck
412 Jamaica
413 Bellerose/Rosedale
414 Rockaways

Staten Island
501 North Shore
502 Mid-Island
503 South Shore

Chart 1a: The 55 Sub-boroughs grouped by median household income in 1990

<table>
<tr><td colspan="2">Bottom Ten Sub-boroughs</td><td colspan="2">Middle 35 Sub-boroughs (cont'd)</td></tr>
<tr><td>101 Mott Haven/Hunts Point</td><td>$14,100</td><td>404 Elmhurst/Corona</td><td>$43,188</td></tr>
<tr><td>102 Morrisania/Belmont</td><td>$16,671</td><td>110 Williamsbridge/Baychester</td><td>$44,322</td></tr>
<tr><td>103 Highbridge/South Concourse</td><td>$22,214</td><td>217 East Flatbush</td><td>$44,533</td></tr>
<tr><td>308 Central Harlem</td><td>$19,014</td><td>403 Jackson Heights</td><td>$44,536</td></tr>
<tr><td>104 University Heights/Fordham</td><td>$20,949</td><td>405 Middle Village/Ridgewood</td><td>$44,907</td></tr>
<tr><td>309 East Harlem</td><td>$21,322</td><td>215 Sheepshead Bay/Gravesend</td><td>$45,405</td></tr>
<tr><td>204 Bushwick</td><td>$21,874</td><td>412 Jamaica</td><td>$46,166</td></tr>
<tr><td>216 Brownsville/Ocean Hill</td><td>$22,242</td><td>210 Bay Ridge</td><td>$46,183</td></tr>
<tr><td>203 Bedford Stuyvesant</td><td>$23,725</td><td>303 Chelsea/Clinton/Midtown</td><td>$46,318</td></tr>
<tr><td>213 Coney Island</td><td>$26,843</td><td>108 Throgs Neck/Co-op City</td><td>$47,399</td></tr>
<tr><td></td><td></td><td>106 Riverdale/Kingsbridge</td><td>$48,694</td></tr>
<tr><td></td><td></td><td>206 Park Slope/Carroll Gardens</td><td>$49,547</td></tr>
<tr><td>Middle 35 Sub-boroughs</td><td></td><td>409 Ozone Park/Woodhaven</td><td>$50,813</td></tr>
<tr><td>302 Lower East Side/Chinatown</td><td>$28,640</td><td>406 Rego Park/Forest Hills</td><td>$51,465</td></tr>
<tr><td>201 Williamsburg/Greenpoint</td><td>$28,923</td><td>407 Flushing/Whitestone</td><td>$51,529</td></tr>
<tr><td>208 North Crown Heights/Prospect Heights</td><td>$30,111</td><td>501 North Shore</td><td>$52,388</td></tr>
<tr><td>205 East New York/Starrett City</td><td>$30,350</td><td>218 Flatlands/Canarsie</td><td>$54,388</td></tr>
<tr><td>307 Morningside Heights/Hamilton Heights</td><td>$31,155</td><td></td><td></td></tr>
<tr><td>310 Washington Heights/Inwood</td><td>$31,173</td><td></td><td></td></tr>
<tr><td>105 Kingsbridge Heights/Mosholu</td><td>$32,222</td><td></td><td></td></tr>
<tr><td>107 Soundview/Parkchester</td><td>$34,999</td><td colspan="2">Top Ten Sub-boroughs</td></tr>
<tr><td>207 Sunset Park</td><td>$36,291</td><td>408 Hillcrest/Fresh Meadows</td><td>$55,587</td></tr>
<tr><td>212 Borough Park</td><td>$37,390</td><td>410 South Ozone Park/Howard Beach</td><td>$55,786</td></tr>
<tr><td>414 Rockaways</td><td>$37,744</td><td>301 Greenwich Village/Financial District</td><td>$59,045</td></tr>
<tr><td>209 South Crown Heights</td><td>$38,182</td><td>305 Upper West Side</td><td>$59,978</td></tr>
<tr><td>211 Bensonhurst</td><td>$38,807</td><td>502 Mid-Island</td><td>$64,171</td></tr>
<tr><td>401 Astoria</td><td>$38,888</td><td>304 Stuyvesant Town/Turtle-Bay</td><td>$65,717</td></tr>
<tr><td>109 Pelham Parkway</td><td>$39,544</td><td>413 Queens Village</td><td>$66,131</td></tr>
<tr><td>214 Flatbush</td><td>$39,761</td><td>411 Bayside/Little Neck</td><td>$66,168</td></tr>
<tr><td>402 Sunnyside/Woodside</td><td>$42,268</td><td>503 South Shore</td><td>$73,551</td></tr>
<tr><td>202 Brooklyn Heights/Fort Greene</td><td>$42,422</td><td>306 Upper East Side</td><td>$75,931</td></tr>
</table>

Chart 2: Murders per 100,000 people, 1990 to 2000 (Source: NYPD)

- 1990
- 2000

bottom 10 sub-boroughs　　middle 35　　top 10

Sub-boroughs ranked by median income in 1990
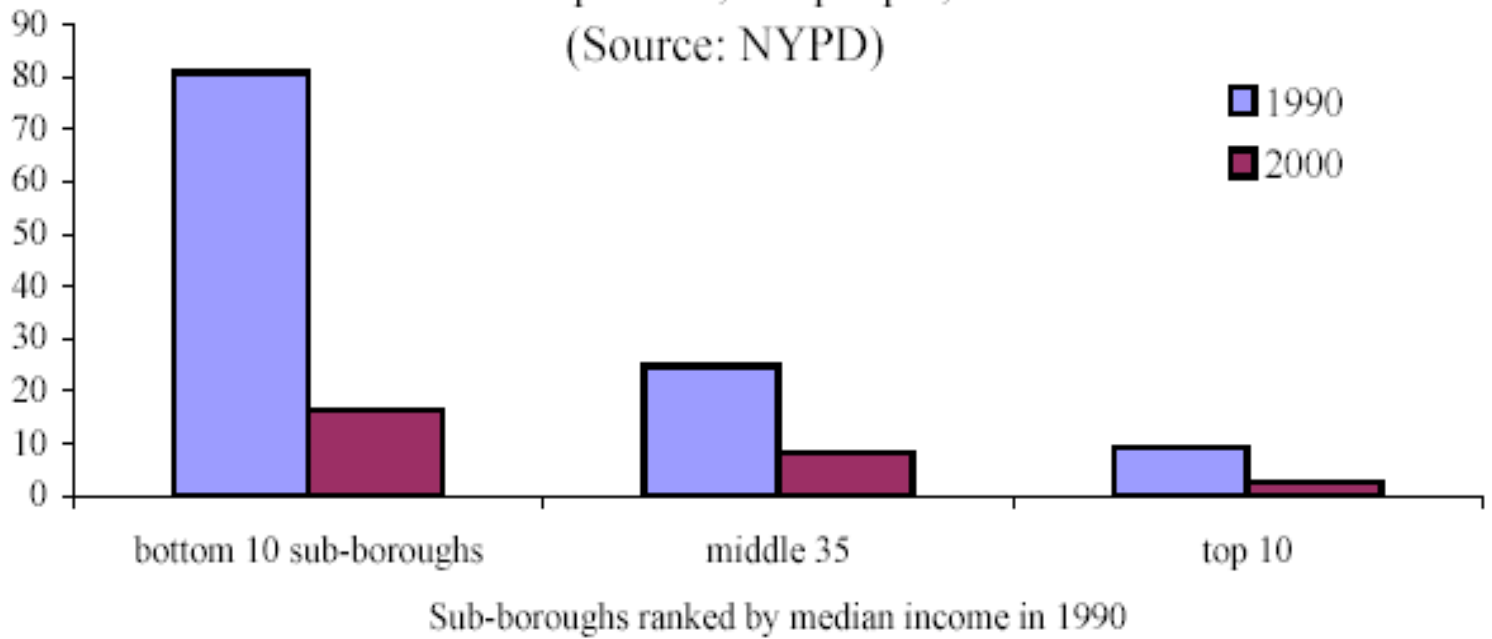
Chart 2a: Change in Murders per 100,000 people, 1990 to 2000 Bottom 10 Sub-boroughs (Source: NYPD)

Mott Haven/ Hunts Point

Morrisania/Belmont

Highbridge/South Concourse

Central Harlem

University Heights/ Fordham

East Harlem

Bushwick

Brownsville/ Ocean Hill

Bedford Stuyvesant

Coney Island

sub-boroughs ranked by median income in 1990
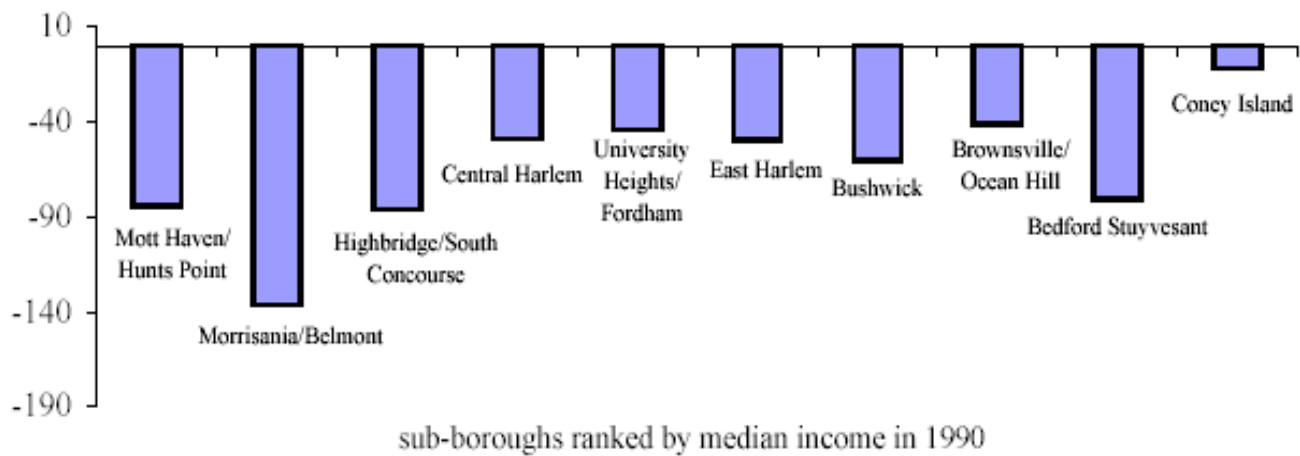
Chart 3: Percent of housing units that have 4 or more deficiencies (Source: HVS)

Legend:
- 1991
- 1999

sub-boroughs ranked by median income in 1990

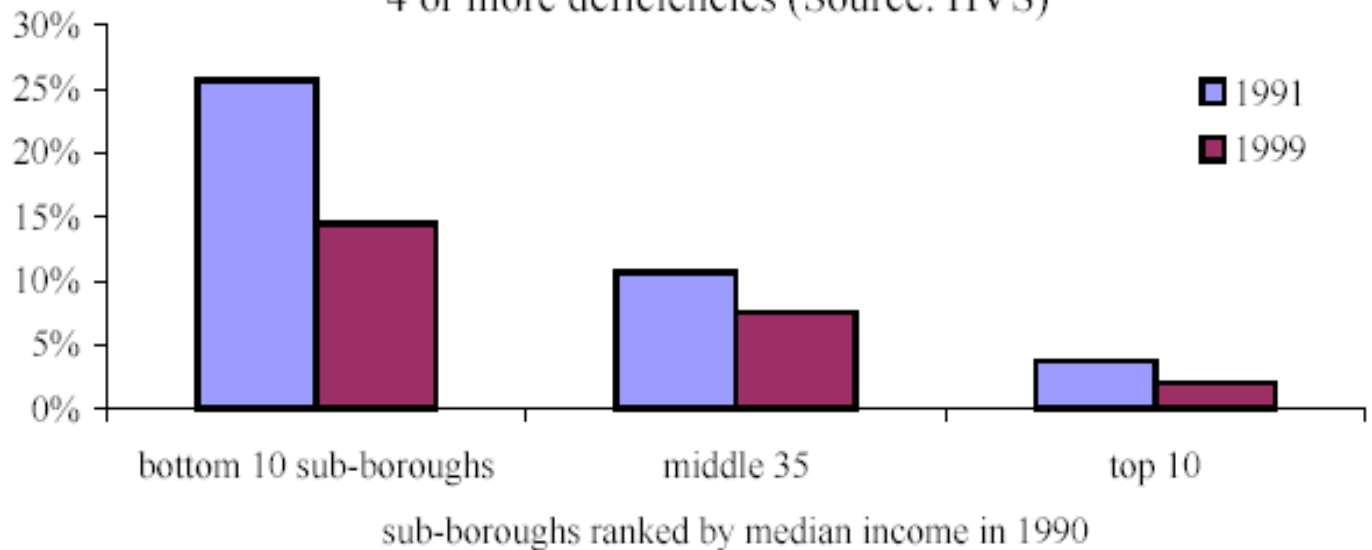# Chart 3a: Percentage point change in percent of units with 4 or more deficiencies, 1990 to 2000 -- Bottom 10 Sub-boroughs (Source: HVS)

Sub-boroughs ranked by median income in 1990

40
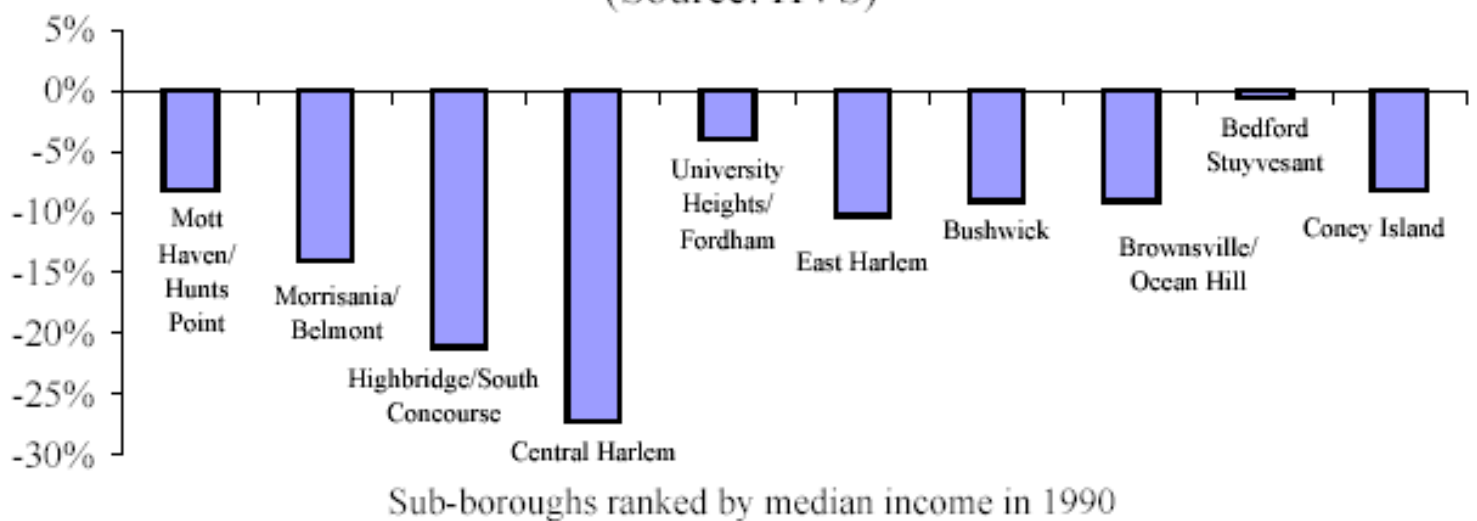
Chart 4: Percent of housing units describing neighborhood structures as 'poor.' (Source: HVS)

Legend:
- 1991
- 1999

Categories (Sub-boroughs ranked by median income in 1990): bottom 10 sub-boroughs, middle 35, top 10

Chart 4a: Percentage point change in percent of units describing neighborhood structures as 'poor' -- Bottom 10 Sub-boroughs 1991 to 1999 (Source: HVS)

Sub-boroughs: Mott Haven/Hunts Point, Morrisania/Belmont, Highbridge/South Concourse, Central Harlem, University Heights/Fordham, East Harlem, Bushwick, Brownsville/Ocean Hill, Bedford Stuyvesant, Coney Island

Sub-boroughs ranked by median income in 1990
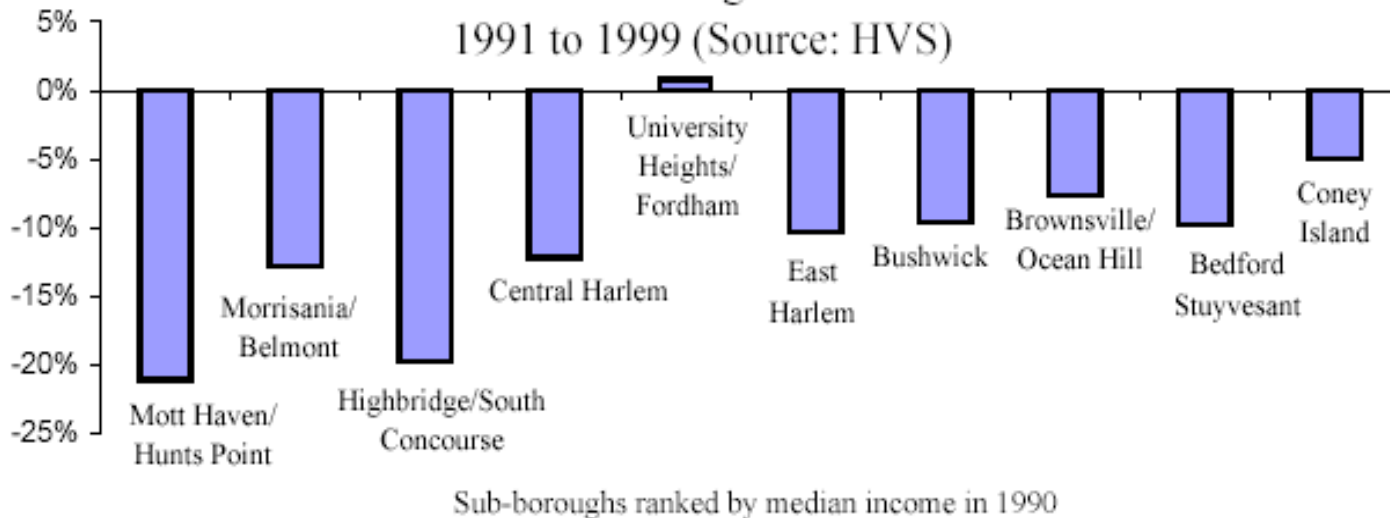
Chart 5: Median Household Income in 1990 and 2000, in 2001 dollars (Source: US Census)

- 1990
- 2000

$70,000
$60,000
$50,000
$40,000
$30,000
$20,000
$10,000
$0

bottom 10 sub-boroughs   middle 35   top 10

Sub-boroughs ranked by mediian household income in 1990

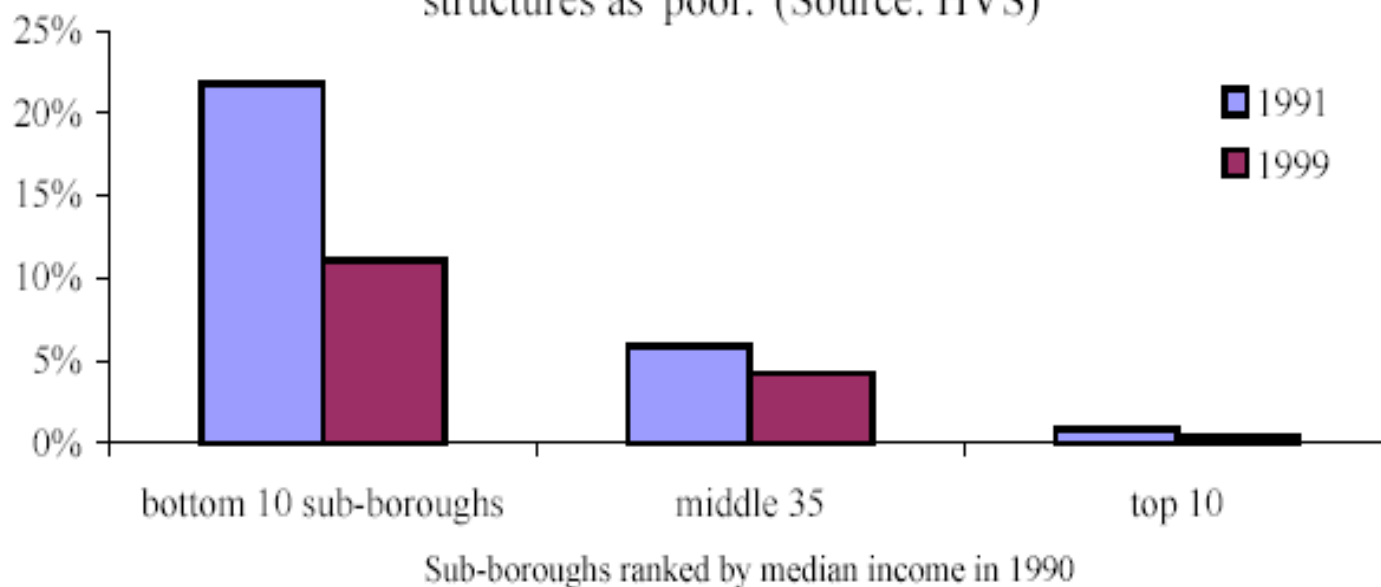## Chart 5a: Percent Change in Real Median Household Income, 1990 to 2000 -- Bottom 10 Sub-boroughs (Source: US Census)

25%
20%
15%
10%
5%
0%
-5%
-10%
-15%

Mott Haven/Hunts Point

Morrisania/ Belmont   Highbridge/ South Concourse

Central Harlem

University Heights/Fordham

East Harlem

Bushwick

Brownsville/ Ocean Hill

Bedford Stuyvesant

Coney Island

Sub-boroughs ranked by median income in 1990

Chart 6: Sub-boroughs Grouped by Income Levels/Changes

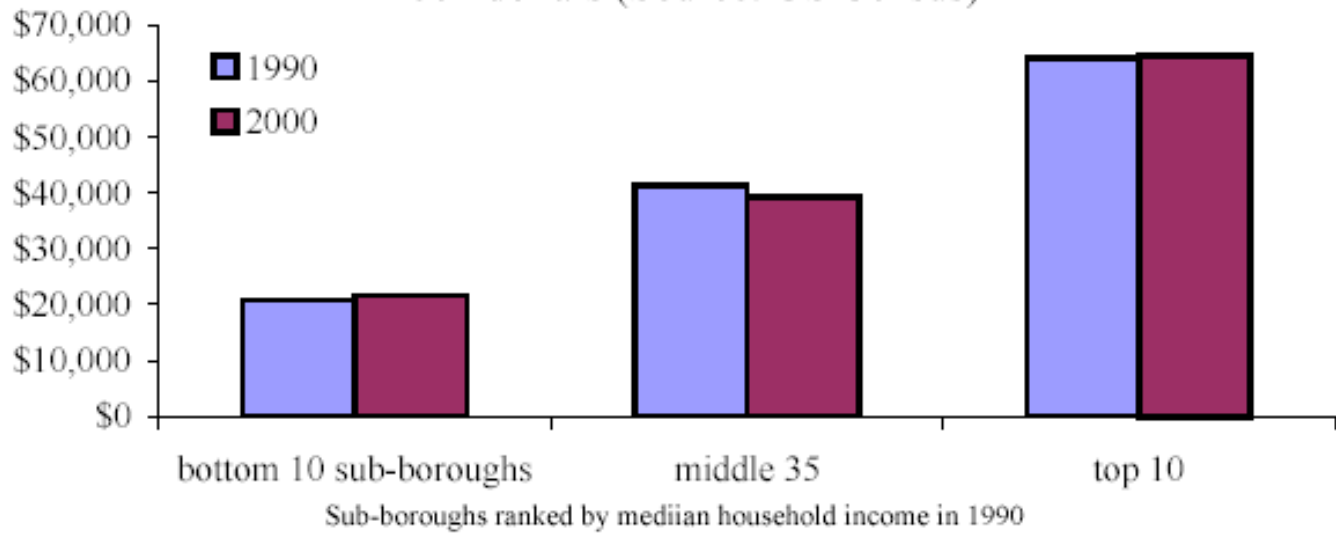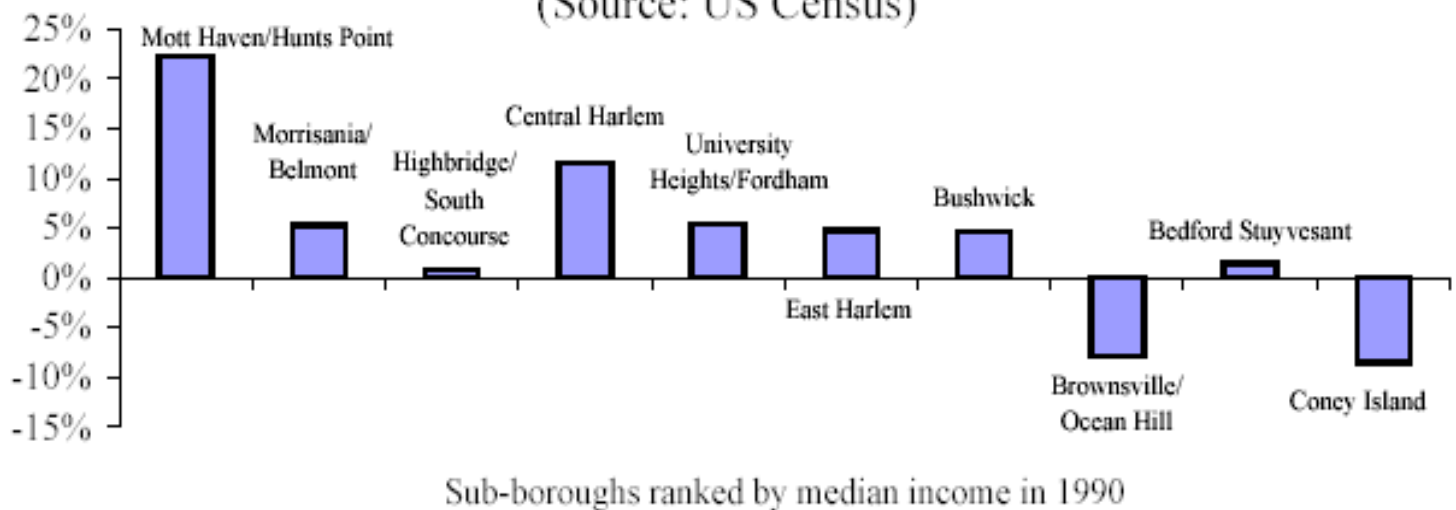|	Sub-boroughs that had losses in real income over the 1990s			Sub-boroughs that had basically no change in real income over the 1990s			Sub-boroughs that had rises in real income over the 1990s		
		1990 median income	1990-2000 Pct Growth in Real Income		1990 median income	1990-2000 Pct Growth in Real Income		1990 median income	1990-2000 Pct Growth in Real Income
Upper 18 Sub-boroughs by median income, 1990	108 Throgs Neck/Co-op City	$47,399	-4.1%				206 **Park Slope/Carroll Gardens**	$49,547	13.7%
	106 Riverdale/Kingsbridge	$48,694	-8.1%				305 **Upper West Side**	$59,978	17.3%
	503 South Shore	$73,551	-7.7%				304 **Stuyvesant Town/Turtle-Bay**	$65,717	10.8%
	409 Ozone Park/Woodhaven	$50,813	-11.2%				306 **Upper East Side**	$75,931	3.2%
	406 **Rego Park/Forest Hills**	$51,465	-2.5%				301 **Greenwich Village/Financial District**	$59,045	22.5%
	407 Flushing/Whitestone	$51,529	-10.8%						
	501 North Shore	$52,388	-6.1%						
	218 Flatlands/Canarsie	$54,388	-6.4%						
	408 Hillcrest/Fresh Meadows	$55,587	-7.7%						
	410 South Ozone Park/Howard Beach	$55,786	-10.5%						
	502 Mid-Island	$64,171	-7.2%						
	413 Queens Village	$66,131	-8.4%						
	411 Bayside/Little Neck	$66,168	-7.3%						
Middle 19 Sub-boroughs by median income, 1990	207 Sunset Park	$36,291	-6.5%	210 Bay Ridge	$46,183	-0.9%	202 Brooklyn Heights/Fort Greene	$42,422	5.1%
	212 Borough Park	$37,390	-14.7%				303 **Chelsea/Clinton/Midtown**	$46,318	24.2%
	414 Rockaways	$37,744	-5.3%						
	209 South Crown Heights	$38,182	-16.8%						
	211 **Bensonhurst**	$38,807	-7.5%						
	401 Astoria	$38,888	-3.6%						
	109 Pelham Parkway	$39,544	-5.8%						
	214 Flatbush	$39,761	-13.1%						
	402 Sunnyside/Woodside	$42,268	-2.8%						
	404 Elmhurst/Corona	$43,188	-10.1%						
	110 Williamsbridge/Baychester	$44,322	-11.6%						
	217 East Flatbush	$44,533	-17.3%						
	403 Jackson Heights	$44,536	-7.0%						
	405 Middle Village/Ridgewood	$44,907	-3.7%						
	215 Sheepshead Bay/Gravesend	$45,405	-11.6%						
	412 Jamaica	$46,166	-8.0%						
Bottom 18 Sub-boroughs by median income, 1990	216 Brownsville/Ocean Hill	$22,242	-7.8%	103 Highbridge/South Concourse	$22,214	0.8%	101 Mott Haven/Hunts Point	$14,100	22.3%
	213 **Coney Island**	$26,843	-8.6%	201 **Williamsburg/Greenpoint**	$28,923	-0.4%	102 Morrisania/Belmont	$16,671	5.3%
	205 East New York/Starrett City	$30,350	-8.2%	208 North Crown Heights/Prospect Heights	$30,111	-0.7%	308 Central Harlem	$19,014	11.6%
	310 Washington Heights/Inwood	$31,173	-2.5%	307 Morningside Heights/Hamilton Heights	$31,155	-0.3%	104 University Heights/Fordham	$20,949	5.4%
	105 Kingsbridge Heights/Mosholu	$32,222	-11.4%				309 East Harlem	$21,322	4.8%
	107 Soundview/Parkchester	$34,999	-13.8%				204 Bushwick	$21,874	4.6%
							203 Bedford Stuyvesant	$23,725	1.4%
							302 Lower East Side/Chinatown	$28,640	5.8%

bold indicates that the sub-borough had a much-larger-than-average increase in college graduates as a percent of the total population over the 1990s. (we define this to be more than two standard deviations above the average for all sub-boroughs)

43

Table 1: Model Estimates

Housing Unit Improvement, 1991-1999

Regressor	Coefficient	Std. Error
Subborough Level:		
Occupied Assisted Units as Percent of Occupied Deficient Units	0.002	0.373
Occupied Assisted Units as Percent of All Occupied Units	2.641 **	1.178
Vacant Assisted Units as Percent of All Units	-3.266 ***	0.973
New Assisted Units as Percent of All Units	1.491	1.305
Median Household Income (1000's), 1989	0.003 *	0.002
Percent of Units with 3 or More Deficiencies, 1991	-0.527 ***	0.178
Distance from Union Square (miles)	-0.011 **	0.005
Unit Level:		
Year Built (Decades Ago)	-0.022 **	0.009
Owner Occupied	0.141 ***	0.049
Rent Stabilized	-0.081 **	0.032
Rent Controlled	-0.208 ***	0.078
In Rem	-0.233 ***	0.064
Constant	0.955 ***	0.130
Observations:	1411	
Mean of Dependent Variable:	0.68	
F Statistic (12, 1398)	11.13	

Neighborhood Quality Improvement, 1991-1999

Regressor	Coefficient	Std. Error
Subborough Level:		
Occupied Assisted Units as Percent of Occupied Deficient Units	0.743 ***	0.286
Occupied Assisted Units as Percent of All Occupied Units	-0.787	0.929
Vacant Assisted Units as Percent of All Units	-0.373	0.777
New Assisted Units as Percent of All Units	-0.951	1.000
Median Household Income (1000's), 1989	0.007 ***	0.001
Percent of Units with 3 or More Deficiencies, 1991	-0.096	0.141
Distance from Union Square (miles)	-0.012 ***	0.004
Unit Level:		
Year Built (Decades Ago)	-0.010	0.006
Owner Occupied	0.128 ***	0.030
Rent Stabilized	-0.048 **	0.024
Rent Controlled	-0.009	0.063
In Rem	-0.188 ***	0.061
Constant	0.466 ***	0.098
Observations:	2620	
Mean of Dependent Variable:	0.57	
F Statistic (12, 2607)	17.59	

* indicates significance at the 10% level, ** at the 5% level, and *** at the 1% level.

Table 2: Model Estimates

Percent Change in Housing Unit's Real Contract Rent, 1991-1999

Regressor	Coefficient	Std. Error
Subborough Level:		
Distance from Union Square (miles)	-0.013 ***	0.003
Unit Level:		
Real contract rent (100's), 1991	-0.062 ***	0.003
Number of maintenance deficiencies, 1991	-0.020 **	0.008
Respondent rating of residential structures in neighborhood, 1991	0.066 ***	0.017
Rent Stabilized, 1991	0.105 ***	0.021
Rent Controlled, 1991	0.431 ***	0.044
In Rem, 1991	-0.114 *	0.066
Year Built (Decades Ago)	0.013 **	0.006
Change in maintenance deficiencies, 1991-99	-0.017 **	0.007
Change in respondent rating of residential structures, 1991-99	0.064 ***	0.014
Constant	0.430 ***	0.072
Observations:	4787	
Mean of Dependent Variable:	0.230	
F Statistic (10, 4776)	77.05	
R-squared:	0.13	

* indicates significance at the 10% level, ** at the 5% level, and *** at the 1% level.
56 observations with values for the dependent variable above 5 (change of 500%) were dropped.

Bibliography

Basolo, Victoria and Denise Strong (2002), "Understanding Neighborhood: From Residents' Perceptions and Need to Action", *Housing Policy Debate*, Vol 13, Issue 1.

Daniels, Glynis and Michael H. Schill (2001), "State of New York City's Housing and Neighborhoods".

Daniels, Glynis and Michael H. Schill (2002), "State of New York City's Housing and Neighborhoods: An Overview of Recent Trends". February 7.

Ellen, Ingrid Gould, Michael H. Schill, Amy Ellen Schwartz, and Ioan Voicu (2003), "Housing Production Subsidies and Neighborhood Revitalization: New York City's Ten-Year Capital Plan for Housing", *Forthcoming: Federal Reserve Bank of New York Economic Policy Review, 2003*

Ellen, Ingrid Gould, Michael H. Schill, Amy Ellen Schwartz, and Ioan Voicu (2001), "Building Homes, Reviving Neighborhoods: Spillovers from Subsidized Construction of Owner-Occupied Housing in New York City". *Journal of Housing Research*, Vol 12, no. 2.

Ellen, Ingrid Gould, Michael H. Schill, Amy Ellen Schwartz, and Ioan Voicu (2001), "The Role of Cities in Providing Housing Assistance: A New York Perspective." Paper presented at New York University, Wagner School of Public Service conference honoring Dick Netzer.

Greenberg, Michael R. (1999), "Improving Neighborhood Quality: A Hierarchy of Needs", *Housing Policy Debate*, Vol 10, Issue 3.

Grogan, Paul S. and Tony Proscio (2000), *Comeback Cities*, Westview Press.

Kain, John F. and John A. Quigley (1970), "Measuring the Value of Housing Quality", *Journal of the American Statistical Association*. 65 (440).

Kutty, Nandinee K (1999), "Determinants of Structural Adequacy of Dwelling", *Journal of Housing Research*, Vol 10, Issue 1.

McClure, Kirk (1998), "Housing Vouchers versus Housing Production: Assessing Long-Term Costs". *Housing Policy Debate*, Vol 9, Issue 2.

Newman, Sandra J. and Ann B. Schnare (1997), "…And a Suitable Living Environment": The Failure of Housing Programs to Deliver on Neighborhood Quality" *Housing Policy Debate*, Vol 8, Issue 4.

Nye, Nancy and Norman J. Glickman (2000), "Working Together: Building Capacity for Community Development", *Housing Policy Debate*, Vol 11, Issue 1.

Oreopoulos, Philip, "The Long-Run Consequence from Living in a Poor Neighborhood", University Of California, Berkeley, *The Center for Labor Economics Working Paper*, 39.

Schwarz, Alex (1999), "New York City and Subsidized Housing: Impacts and Lessons of the City's $5 Billion Capital Budget Housing Plan", *Housing Policy Debate*, Vol 10, Issue 4.

Seley, John E. and Julian Wolpert (2002), *New York City's Nonprofit Sector,* May 2002

Van Ryzin, Gregg G. and Andrew Genn (1999), "Neighborhood Change and the City of New York's Ten-Year Housing Plan". *Housing Policy Debate*, Vol 10, Issue 4.