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Subsidized Housing and the Concentration of Poverty, 1977- 2008: A Comparison between Eight US Cities

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Abstract

This paper examines the link between subsidized housing and the concentration of poverty. I use newly available data from the Department of Housing and Urban Development that extends from the earliest years of subsidized housing reform to the present day. I find that neighborhoods with major public housing redevelopment experienced a decrease in their poor population. However, neighborhoods where the proportion of voucher units increased consistently experienced an increase in their poor population. These neighborhood level changes translated into implied increases in the citywide levels of segregation between the poor and non-poor. The segregative effect of subsidized housing at the metropolitan level was more pronounced for the 1980-2000 period than the 2000-2008 period.

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Introduction

Since the 1970s, federal housing policy has had two primary objectives: to help depressed neighborhoods through the construction of new affordable housing, and to deconcentrate poor subsidized-housing dwellers to areas outside of established areas of subsidized units (Vernarelli, 1986). With this end, the regulations for siting of new public housing have changed to prohibit building new units in segregated neighborhoods (Tegeler, 2005). Moreover, the federal government has started providing money for mixed-income subsidized housing in hopes that higher-income individuals would return to inner-city communities and providing low-income renters with vouchers in hopes that they would be able to move to areas with lower levels of poverty (Goetz, 2005).

The main concern with the geographic concentration of poverty in and around subsidized housing stemmed from evidence suggesting that the problems associated with living in concentrated poverty are different both in kind and in magnitude from those associated with living in other geographic settings (Schill and Wachter, 1995; Galster and Zobel, 1998). For example, the extreme spatial separation between the poor and non-poor could prevent low-income individuals from coming into contact with middle-class role models leading to the development of cultural norms that may be at odds with mainstream social conventions (Wilson, 1987). The assumption of norms that are different from mainstream values may in turn lead to early sexual initiation, non-marital childbirth and engagement in illicit activities. Moreover, the separation between the poor

and non-poor cuts off poor individuals from job referral networks and inner-city neighborhoods from the tax-paying base that could support their social and economic needs, such as decent schools and vibrant local businesses (Jargowsky, 2003).

The change in housing policy came at a time of unprecedented concentration of poverty in inner cities, especially in the Northeast and the Midwest (Jargowsky, 2003). The geographic separation between the poor and non-poor, as measured by the index of dissimilarity, rose by almost 50 percent between 1970 and 1980 (Massey et al. 2003). The concentration of poverty at the neighborhood level was even more astounding as family-level poverty changed little over the same period, suggesting a “fundamental change in the spatial organization of poverty” (Jargowky, 2003). The economic boom of the 1990s has helped in the reversal of trends for some poor neighborhoods (Ellen and O’Regan 2008). Nevertheless, some inner-ring suburbs experienced an actual increase in poverty while the index of segregation between poor and non-poor fell only slightly from its 1990 level and ended up 30% higher than its 1970 level (Jargowsky, 2003; Massey et al., 2003). The economic recessions of the 2000s do not bode well for continuing the trend in income desegregation that some communities experienced in the 1990s.

Against this background, revitalizing deteriorating neighborhoods while at the same time promoting the spatial deconcentration of poverty may be a futile endeavor if building subsidized housing within a neighborhood or allowing poorer people to move into pricier parts of town either prompts more affluent residents to leave, deters them from moving in or depresses the life chances of individuals living around subsidized

housing. The end result might be a re-segregation of areas where subsidized housing units grow in number (Popkin et al., 2000).

My paper provides an empirical test of how levels of neighborhood poverty change with shifts in the number of subsidized housing units, both building-based and voucher-based, from the earliest years of subsidized housing reform to the present day. It contributes to our knowledge of the subsidized housing program by, first, incorporating within a single model the two-pronged approach to deconcentrating poverty through the construction of scattered-site housing and the provision of vouchers. Second, it separates the effects that subsidized housing has on the poverty rate by virtue of being a program for low-income households from the effects it has on the population outside of subsidized housing. Third, it shows what the changes in subsidized units within neighborhoods imply for the trends in the income segregation at the metropolitan level. To preview my results I find that neighborhoods with redeveloped building-based housing lost poor population, while neighborhoods where the proportion of voucher units increased gained poor population. I also demonstrate that the drop in the poverty level of neighborhoods with the greatest changes of subsidized units was largely due to the movement of subsidized housing residents as opposed to the movement of poor individuals outside of subsidized housing. Finally, I show that the neighborhood level changes in subsidized units translated into predicted increases in the concentration of poverty at the metropolitan level, especially prior to 2000.

As units of analysis, I use the census tracts in eight American cities: Atlanta, Chicago, Cleveland, Dallas, Detroit, Los Angeles, New York, and Seattle. These cities

are representative of different regions of the U.S. that have different levels of poverty as well as distinct subsidized housing histories. They allow me to explore variations in the effects of subsidized housing on the concentration of poverty in areas with the largest redevelopment programs (Atlanta and Chicago), areas with some of the best public housing (New York), and areas where the number of voucher units have surpassed the number of building-based subsidized units (Los Angeles, Chicago, Dallas and Seattle).

My paper is organized in five sections. The first section provides a brief history of U.S. housing policy linking it to research on the concentration of poverty. The second section describes my analytic strategy. The third section discusses the datasets I use, while the fourth section presents my most important findings. The paper concludes with a discussion of the significance of my findings with respect to sociological debates about the concentration of poverty.

Subsidized Housing: From the “Projects” to Mixed-Income Communities

The plight of inner-city public housing in the 1970s has long been the single most egregious example of how the spatial concentration of poverty could lead to high rates of crime, welfare dependency, and out-of-wedlock childbirth (MacDonald, 1997).

Therefore, using the Civil Rights Act of 1964 and the Fair Housing Act of 1968, local housing advocates brought numerous challenges to the siting of public housing in segregated minority neighborhoods. The most famous case, *Gautreaux v. Public Housing Authority* (1976), resulted in the award of housing vouchers to Chicago public housing tenants and a court-mandated order to the local housing authority to deconcentrate its existing housing stock (Popkin et al., 2000). The *Gautreaux* case heralded the current

two-prong implementation of subsidized housing policy through vouchers that subsidized tenants can use in the private housing market and through new construction of less dense units in mixed-income communities (Popkin et al., 2000).

According to advocates of scattered-site and voucher subsidized housing, there are many benefits to income mixing. Poor households who move into non-poor areas may have access to better jobs and schools, to safer streets and to better quality housing (Crump, 2002). In fact, place-based redevelopment has led to the reduction of criminal activity around the new mixed-income developments and to significant upgrades in the physical environment of neighborhoods (Goetz, 2005). Between 1995 and 2008 the percent of public housing units located in extreme poverty neighborhoods has declined from 43% to 26% (Sard and Fisher, 2008). Outside of New York, only 48,000 units are in projects that have more than 500 units (Sard and Fisher, 2008).¹ Due largely to the demolition of public housing units, by 2008 the percent of public housing located in tracts with minority population rates greater than 80% has decreased by 14 percentage points, while the percentage in tracts with poverty rates greater than 40% has decreased by 10 percentage points (Schwartz, 2010). The demolition of public housing has removed from the urban landscape the highly stigmatized structures of the “projects” and opened up valuable land for redevelopment (Crump, 2002).

On the other hand, critics of the way HUD is implementing its subsidized housing deconcentration program have compared these efforts to urban renewal in the 1950s, as current efforts to deconcentrate poverty have led to a dramatic reduction in the number of building-based subsidized units and sometimes have bolstered the gentrification of poorer

but affordable neighborhoods (Goetz, 2005). With funding under the HOPE VI program, nearly 270,000 units of public housing have been demolished since 1994, which represents a 19% decrease in the public housing stock (Sard and Fisher, 2008). Of the almost 100,000 planned replacement units, only a third are completed, and only half of the planned units will be subsidized for very low-income families (Popkin et al., 2004; Buron et al., 2007; Kleit and Manzo, 2006). The dispersion of residents through various voucher programs has led to only modest improvements in the mental and physical health of subsidized residents who moved and no improvements in economic self-sufficiency (Clampet-Lundquist, 2004; Kling et al., 2007; Sampson 2008). Moreover, over subsequent moves voucher holders do not tend to move to significantly better neighborhoods (Feins and Patterson, 2005). Perhaps most troubling are the allegations that voucher users are bringing the social pathologies of public housing along with them, raising the crime rates in destination neighborhoods (Rosin, 2008).

Empirical studies of the relationship between subsidized housing and the concentration of poverty before the reforms of the 1990s seem to indicate that the presence of subsidized housing in some of the bigger U.S. cities led to an increase in neighborhood-level poverty. This relationship holds for cities such as Chicago (Massey and Kanaiaupuni, 1993), Philadelphia, Boston, Cleveland, Detroit (Schill and Wachter, 1995; Carter, Schill, and Wachter, 1998) and Columbus, OH (Holloway et al., 1998). National-level results, however, indicate that the presence of newly built subsidized housing is not associated with the out-migration of non-poor individuals from neighborhoods with such housing, suggesting that neighborhoods with subsidized

housing have higher poverty rates because subsidized units house poor individuals and not because more affluent people outside of subsidized housing leave the area (Freeman, 2003; Freeman and Botein, 2002).

More recent cross-sectional evidence challenges the conventional wisdom that project-based subsidies are necessarily bad because they concentrate poverty around them while vouchers are necessarily good because they allow households to disperse to different neighborhoods (DeFilippis and Wyly, 2008). For example, in New York there is considerable diversity in the clustering of project-based and voucher-based units across neighborhood with different poverty levels (Wyly and DeFilippis, 2010). Moreover, landlords were opting out of accepting vouchers as their neighborhoods improved in quality (DeFilippis and Wyly, 2008). At the national level the distribution of vouchers follows the distribution of affordable apartments, suggesting that vouchers may have limited potential to move households to low-poverty areas if those are not already affordable (Wang, Varady and Wang, 2008; Schwartz, 2010). On the other hand, local housing authorities have been changing their eviction rules for existing tenants and screening policies for new ones, rendering the most vulnerable households ineligible for a subsidy even for minor violations (Popkin et al., 2000). The emerging trends in the spatial distribution of voucher units coupled with the net destruction of project-based units and stricter rules for qualifying for a subsidy warrant further investigation, as housing policies may be pushing voucher holders to circumscribed affordable areas and re-concentrating the most vulnerable families outside of subsidized housing in private market units (Popkin et al., 2000).

While the analyses in my paper do not provide a direct test of all dynamics at play in the subsidized housing program, they do fill several gaps in our knowledge of the link between subsidized housing and the concentration of poverty. The first set of studies described above employ a longitudinal analysis of the effects of subsidized housing only for building-based subsidies and only prior to 1990 (Massey and Kanaiaupuni, 1993; Schill and Wachter, 1995; Carter, Schill, and Wachter, 1998; Holloway et al., 1998). The more recent studies, which did incorporate vouchers (DeFilippis and Wyly, 2008; Wyly and DeFilippis, 2010), have stopped at cross-sectional estimates of the association between subsidized housing and poverty. Therefore, in this paper I incorporate within the same framework the effects of building-based and voucher units, providing a longitudinal account of both through the present day.

Second, the longitudinal studies of subsidized housing, with the exception of Freeman (2003), have been criticized for their inability to separate out the effect that subsidized housing has on the poverty level of a neighborhood by virtue of it being a program for low-income households from the effect it has on the population outside of subsidized housing (Freeman and Botein 2002). Therefore, using data on the income distribution of the subsidized housing population, I show whether the link between subsidized housing and the poverty level of a neighborhood is due to changes in the poverty status of the subsidized housing population or changes in the poverty status of the population outside of subsidized housing.

Third, I calculate what the changes in subsidized units within neighborhoods imply for the trends in the income segregation at the metropolitan level. While the

regression models in previous studies show what happens to the poverty levels of individual neighborhoods, they cannot demonstrate how the concentration of poverty at the metropolitan level would change in response to subsidized housing changes. Given that the U.S. government is not only trying to target the levels of poverty within specific neighborhoods but also the concentration of the poor in metropolitan areas as a whole, it is important to know whether the provision of vouchers and mixed-income housing is having the intended effect of reducing the geographic separation between the poor and non-poor.

Study Framework

The first part of my analysis estimates the change in percent poor within a neighborhood from the change in subsidized housing units within that neighborhood between 1980 and 2000 and between 2000 and 2008 separately for eight American cities (Atlanta, Chicago, Cleveland, Dallas, Detroit, Los Angeles, New York, and Seattle). The dependent variable represents the change in percent poor individuals within a census tract using the federal poverty threshold, adjusted for household size. I measure the main explanatory variable as the change in percent subsidized units relative to the total housing stock of a neighborhood. Results not shown here indicate that the change in percent subsidized units, expressed as a continuous variable, does not have a linear relationship with the change in percent poor. Therefore, I categorize my variable into the following categories: more than 5% drop in subsidized units; between 5% and 0.1% drop in subsidized units; 0% change; between 0.1% and 5% increase; and more than 5% increase.

In all of the above categorizations, I separate out the effects of building-based (“fixed”) units versus person-based (“voucher”) units.

In order to capture any spillover effects of the building or destruction of large public housing complexes as well as the utilization of voucher units across census tract boundaries, I also control for the change in the distance from the centroid of a census tract to, respectively, the nearest project of at least 100 units and the nearest census tract with at least 100 vouchers units. Finally, I also control for the number of subsidized units present in the tract in 1977 or 2000. This base-level control for subsidized units is a proxy for the initial attractiveness of census tracts to more affluent residents. It also controls for the fact that census tracts with the greatest number of subsidized units are also the ones who could experience the largest decreases in percent subsidized housing, and vice versa.

Subsidized housing can affect a neighborhood’s poverty rate both in a mechanical and a behavioral fashion (Freeman and Botein, 2002). On one hand, since the prerequisite to entering subsidized housing is low income, adding subsidized units to a neighborhood mechanically increases the number of poor residents within that neighborhood. For example, if the number of poor people within a neighborhood but outside subsidized housing stays the same but subsidized housing starts admitting more poor households, then the poverty rate within a neighborhood would rise even though subsidized housing itself would not have produced any behavioral response in the non-subsidized residents of a neighborhood (Freeman and Botein, 2002).

On the other hand, the negative stereotypes associated with subsidized housing, and especially project-based subsidized housing, may indirectly impact the poverty rate

of a neighborhood, as more affluent residents either decide to leave the vicinity or not move there (Freeman and Botein, 2002). In addition, subsidized housing might also change the neighborhood poverty rate by affecting the behaviors of individuals who live in the same neighborhood. Even if subsidized residents do not serve as bad role models or engage in illicit activities that may further depress a neighborhood, subsidized individuals may not be able to provide access to networks that could open up economic opportunities for their neighbors (Freeman and Botein, 2002).

There is a third possibility, however, as changes in the percent poor in a neighborhood may not be driven either by mechanical changes in the subsidized housing units or by a behavioral response of non-subsidized individuals. For example, if the number of non-poor people stays the same, but new non-subsidized housing is built which mostly houses a poor population, the percent poor in a neighborhood would also mechanically increase even if no one is prompted to move out. If non-subsidized housing is destroyed in a neighborhood and this housing is disproportionately occupied by a poor population, the changes in percent poor within a neighborhood will not be a response to introducing subsidized units but rather to changes in non-subsidized housing. If any of these are true the associations in my models would capture compositional changes in the relative proportion of subsidized to non-subsidized housing rather than actual changes in the subsidized housing stock.

I try to address these concerns, first, by changing the dependent variable in the model to reflect the non-subsidized poor and, second, by introducing the change in non-subsidized housing as an independent variable. To that effect, I first re-estimate the

models from the first part of my analysis with a dependent variable that represents the change in percent non-subsidized poor in a census tract. Second, I compute the number of non-subsidized units by subtracting the number of subsidized units from the total housing stock, categorizing the non-subsidized units variable in the same way as my subsidized units one and adding it as a control variable to my original models.

All models, I discussed above, are first-difference fixed effects models, as they predict changes in the outcome variable from changes in the predictor variables between two time periods. Fixed-effects models purge from the prediction equation those factors, both measured and unmeasured, that are constant over time. Nevertheless, I cannot rule out the effects of omitted variables that change over time or rule out the possibility of reverse causality between the changes of the poverty rate within a neighborhood and changes in the percent subsidized units there. While my regression results are not causal in nature, they still allow me to draw conclusions about the general trends in poverty within neighborhoods given changes in subsidized units as well as examine to what extent behavioral responses to subsidized housing may account for changes in the poverty rate of a neighborhood. More importantly, I am able to take the results of my regression and simulate what metropolitan-level segregation would be if neighborhoods only experienced changes in subsidized units.

My simulation proceeds as follows. First, I compute the predicted changes in the poor population for each tract using the city-specific regression coefficients from the first part of my analysis. Second, I add these changes to the actual 1980 or 2000 poor population in each tract to obtain predicted values for 2000 and 2008, respectively. Third,

I use these predicted values to compute the indexes of dissimilarity² and isolation³ for 2000 and 2008 for each city. Finally, I compare the predicted changes to the actual changes in these indexes of segregation in order to discern whether the redistribution of subsidized housing units across neighborhoods had a “segregative” or “integrative” effect on the spatial distribution of the poor with respect to the non-poor.

Data

I use the Geolytics Neighborhood Change Database (NCDB) to access U.S. Census poverty data for 1980 and 2000 in constant 2000 census tract boundaries. I use the 2005-2009 American Community Survey (ACS) census tract estimates for the poverty data after 2000. The ACS poverty rates are averages over a five-year period derived through a different sampling frame compared to the single-year estimates of the 1980 and 2000 Censuses. However, this is currently the only dataset that provides census-tract level poverty data at the national level post-2000. I exclude from my analysis census tracts that either had no housing or no population in 1980, 2000 or the 2005-2009 period. As mentioned above, my analysis covers eight cities, which allows me to explore variations in the effects of subsidized housing across geographic areas having different subsidized housing histories and different levels of poverty. My analysis includes all census tracts for the county (or counties) in which all 8 cities are found. Therefore, I use all census tracts within the political municipal boundaries of the eight cities along with the ones in the immediately contiguous suburbs but not within the municipal boundaries.

Census tracts are small and relatively permanent statistical subdivisions of a county. They usually have between 2,500 and 8,000 persons and, when first delineated,

are designed to be homogeneous with respect to population characteristics, economic status, and living conditions (U.S. Bureau of the Census, 2000). However, census tracts are not always designed to approximate actual city neighborhoods and may indeed be too large of a geographic unit for the detection of localized behavioral responses to the construction of subsidized units or the influx of voucher users. Despite these drawbacks, they are the smallest consistent geographic unit that I can incorporate in my analysis.

I use data on the location and type of subsidized housing from the Department of Housing and Urban Development (HUD). HUD's dataset Picture of Subsidized Households disaggregates building-based "fixed" subsidies (Public and Indian Housing, Section 236, Section 8 New Construction and Substantial Rehabilitation, FHA, LIHTC) from person-based "voucher" subsidies (Section 8 voucher and certificate users). I utilize only the 1977, 2000 and 2008 available datasets.⁴ Using these data has some limitations. First, the 1977 HUD file does not include any information on the specific census tracts of subsidized units. Therefore, I had to geocode all units using a reference database, which shows all housing in existence in 1995. I was successful in geocoding 94% of all subsidized units from the 1977 HUD file. The corresponding numbers for 2000 and 2008 are 96% and 98%.

Second, HUD does not provide any public information on its subsidized properties between 1977 and 1994 and cautions against using the 1994-1997 files in tracking changes over time, as any trend in the number of subsidized units may only represent better data collection and not actual changes. Therefore, for the first period under consideration in my analysis (1980-2000) I link the 1977 HUD data to the 1980

Census data and the 2000 HUD data to the 2000 Census data. For the second period under consideration (2000-2008), I link the 2000 HUD data to the 2000 Census data and the 2008 HUD data to the 2005-2009 ACS data.

Results

Descriptive Statistics

[Tables 1 and 2 about here]

Before proceeding with my regression analysis it is useful to put the eight cities within a historical perspective. Table 1 shows the percent poor within each city in the analysis. Most notable in the table is the substantial increase in the poverty levels of Detroit, Cleveland and Dallas as well as the consistent place of New York as one of the cities with the highest poverty rates and Seattle as the city with the lowest poverty rates. Table 2, on the other hand, shows changes in the total number of fixed and voucher units by city between 1977 and 2008. In general, in 2000 and 2008 there were more building-based units in each city than in 1977. However, cities with considerable redevelopment programs such as Atlanta and Chicago lost more than 3,000 fixed units each between 2000 and 2008. Detroit, Dallas and Seattle also experienced sizable losses in building-based units during the same period. The gradual replacement of subsidizing new housing construction with subsidizing tenants with vouchers is apparent in all eight cities with the number of vouchers growing rapidly everywhere and catching up or surpassing the number of fixed units in Los Angeles, Atlanta, Dallas and Seattle. New York is the only exception to this nationwide trend as the number of vouchers there in 2008 was only about half of the number of fixed units.

[Table 3 about here]

Between 1980 and 2000, the average poverty rate in neighborhoods with fixed subsidized units dropped in all eight cities and continued to fall or stay about the same through 2008, with the exception of Detroit and Dallas (Table 3). As far as voucher units are concerned, Detroit and Dallas are also the two cities with the largest increases in the average poverty levels of census tracts with voucher units. Neighborhoods with no subsidized units were significantly less poor than neighborhoods with subsidized units and remained so over time. Moreover, neighborhoods that contain fixed subsidized units are still on average poorer than neighborhoods where voucher recipients live, although this gap seems to have diminished by 2008. These descriptive statistics show that the voucher program is working as intended in giving recipients the opportunity to live in less poor areas than their counterparts in public housing projects. They also suggest that changes in the way that public housing authorities build new projects or redevelop old ones may be alleviating some of the worst problems associated with the public housing of the 1950s and the 1960s.

[Table 4 about here]

A different way of looking at the relationship between percent poor and subsidized units is to calculate the percent poor within each city who live in census tracts with fixed and voucher units. As Table 4 shows, by 2008 about two-thirds of the poor lived in census tracts with fixed units and a minimum of 94% lived in census tracts with voucher units. These figures, however, do not necessarily imply a further concentration of the poor around subsidized housing. They are rather a reflection of the fact that both

new construction and voucher use occurred in census tracts away from current concentrations, and this dispersal further encompassed new neighborhoods where the poor live. For example, in 1977 building-based units were present in only 25% of census tracts across all eight cities, while in 2008 they were on average in half of all neighborhoods. Vouchers in 2008 were present in more than 90% of all census tracts.

Regression Analysis

[Tables 5 and 6 about here]

Tables 5 and 6 present the regression results of my model predicting the change in percent poor residents of a census tract broken down for each city for the two time periods under consideration. Some notable patterns emerge. First, between 1980 and 2000 neighborhoods that saw a drop of fixed units by more than 5 percentage points either lost significant percent of poor population or experienced almost no change in it. The results in this case are strongest for Atlanta, Chicago, Detroit and Dallas. On the other hand, neighborhoods where fixed units decreased by less than 5 percentage points uniformly added poor population. Second, between 1980 and 2000 neighborhoods, where voucher units increased as a percent of the housing stock added poor population, with Atlanta and New York being notable exceptions. Taken together these results indicate that only neighborhoods with large building-based housing redevelopment experienced an appreciable reduction in their poverty rates. Moreover, census tracts where voucher residents concentrated were on a downward trajectory in terms of their poverty levels.

The reduction in the poverty rate of census tracts with a decrease of more than 5% of fixed units carries through in the analysis of changes between 2000 and 2008 (Table

6). For this time period, any census tract where fixed units decreased by more than 5% either experienced a decrease in percent poor or very small change in it. Moreover, neighborhoods where fixed units increased as percent of the housing stock also experienced a decrease in their poor population, with the results being stronger for census tracts that added more than 5% fixed units. On the other hand, neighborhoods with increases of voucher units, with the exception of Los Angeles, Chicago and New York, continued to become poorer over the 2000-2008 period, while neighborhoods where voucher units decreased on average lost poor population or saw no change. The drop in the poverty rates of census tracts with substantial redevelopment and the increase in the poverty rates of census tracts with increases in vouchers are consistent with the continuing efforts of housing authorities to voucher-out larger developments and build smaller mixed-income ones in their place.

Discussion of mechanisms

As mentioned above, the results in Tables 5 and 6 are estimates of the “total” effect of subsidized housing on the composition of the neighborhood, i.e. they do not distinguish between changes in the percent poor within and outside subsidized housing as well as changes in the relative composition of subsidized versus non-subsidized units within a census tract. Therefore, I change the dependent variable in the model to reflect the non-subsidized poor and introduce the change in non-subsidized housing as a control variable.

There are two limitations to my estimate of the number of non-subsidized poor. First, I do not have complete information on the percent poor within subsidized units, as

the managers of privately owned subsidized housing are not required to report on the socioeconomic composition of their properties to HUD. In addition, the HUD database does not show the income breakdown of subsidized tenants in neighborhoods with less than 11 units in order to preserve individual confidentiality. Second, the HUD database does not contain information on whether individuals fall below the official federal poverty line that the U.S. Census uses. Therefore, I have to estimate the number of subsidized individuals who fall below the poverty line using the distribution of household income in the HUD database. As the criteria for entering subsidized housing are tied to cutoffs based on the local median income, it is not correct to assume that all individuals living in subsidized housing also fall below the poverty line.

[Tables 7 and 8 about here]

Bearing in mind these limitations, the results in Tables 7 and 8 are similar to my original ones in Tables 5 and 6, with some notable exceptions especially for the 1980-2000 period. First, between 1980 and 2000 the reduction in the poverty rate of census tracts where fixed units dropped by more than 5% disappears for Atlanta, Chicago and Detroit. Moreover, across all cities census tracts that saw an increase of more than 5% in the number of fixed units saw a drop in their non-subsidized poor population, while in Atlanta this change also occurred for census tracts with greater than 5% voucher increase. Second, between 2000 and 2008 census tracts with more than 5% fixed unit increase saw a substantial decrease in their non-subsidized poor population. These differences in the results for census tracts with the most extensive public housing redevelopment seem to indicate that it was the destruction of project-based units or addition of new ones in

sizable numbers, rather than the movement of households outside of public housing, that mattered most for the changes in the poverty rates of census tracts.

The regression models that include as a control the effect of adding or subtracting non-subsidized units (results available upon request) are very similar to Tables 5 and 6 indicating that changes in the non-subsidized housing stock do not explain away the effect of changes in subsidized housing on changes in poverty.

Residential Segregation

In this section, I examine the residential segregation by poverty status for each city and ask the question of whether the changes in the poor population predicted by my models in Tables 5 and 6 have “segregative” or “integrative” effects at the metropolitan level. Table 9 shows the actual 1980, 2000 and 2008 levels of the index of dissimilarity and the isolation index along with the predicted levels of these indexes for 2000 and 2008. For easier comparison, I also present the actual and predicted changes of both segregation indexes for the two periods under consideration.

[Table 9 about here]

The actual segregation between the poor and non-poor, as measured by the index of dissimilarity, decreased in Atlanta, Chicago, Detroit, New York, Cleveland and Dallas, stayed the same in Los Angeles and increased in Seattle. The isolation index, or the extent to which the poor are exposed to one another, increased in Los Angeles, Detroit, Cleveland, Dallas and Seattle. Against this backdrop, my models over-predict the increase in poor-non-poor segregation between 1980 and 2000, as measured by both the index of dissimilarity and the isolation index. The differences between the predicted

increase and the actual increase are largest in Atlanta, Chicago, Dallas, and Cleveland. These estimates indicate that the changes in subsidized units between 1980 and 2000 had segregative effects and there were other citywide “integrative” factors at work counterbalancing the implied increase in the segregation levels predicted by my models. To take this a step further, my analysis shows that the change in U.S. policy towards the provision of mixed-income and voucher housing had a positive association with increased segregation between the poor and non-poor in the 1980-2000 period. Therefore, if no other segregative mechanisms were at work between 1980 and 2000 and cities experienced only changes in subsidized units, they would have ended up more segregated by 2000.

The predicted changes of the index of dissimilarity and the isolation index between 2000 and 2008 are much more in line with the actual changes of the two indexes during the same period. The only notable exceptions are Atlanta, Chicago and Cleveland where the changes in subsidized housing units had a segregative effect as measured by the index of dissimilarity, albeit much smaller than the corresponding ones for the 1980-2000 period. Therefore, these results indicate that after 2000 the changes in subsidized units in individual neighborhoods were much less associated with increased citywide levels of segregation than during the 1980-2000 period.

Conclusions

In this paper, I examined the association between changes in the relative number of subsidized housing units and changes in the poverty level of individual neighborhoods. I found that both large increases and decreases in the proportion of fixed units led to a

drop in the poverty rate of neighborhoods. On the other hand, neighborhoods where the proportion of voucher units increased consistently saw an increase in their poor population. These neighborhood level changes in the percent poor translated into implied increases in the citywide levels of segregation between the poor and non-poor. The segregative effect of subsidized housing at the metropolitan level was more pronounced for the 1980-2000 period than the 2000-2008 period.

One reason for the observed relationships may be the redevelopment efforts of local housing authorities. During the period under study the primary programs that provided funds for new subsidized construction were the HOPE VI program and the Low Income Housing Tax Credit Program (LIHTC). Both HOPE VI and LIHTC projects are known for being smaller in size, for being more attractive than the rest of the housing stock in a neighborhood and for housing higher-income populations through the development of both below-market and market-rate units. While my dataset does not indicate if subsidized units are part of a mixed-income housing development, it is conceivable that neighborhoods that experienced a sizeable change in percent fixed units were also the ones where HOPE VI and LIHTC funds were used.

My results also point to some troubling trends in the neighborhoods where voucher users live as tracts that saw an increase in percent vouchers ended up on average poorer. If voucher recipients are faced with discrimination in the private rental market, they may be confined to disadvantaged areas where the exodus of the middle class is not so much prompted by the renting of units to subsidized tenants, but rather the general undesirability of the area. In order to open up more opportunities for voucher users, New

Jersey, New York City, Washington, D.C., Seattle and Chicago have all passed bills prohibiting landlords from discriminating against tenants using vouchers (Fernandez, 2008). Nevertheless, nationwide 30% of vouchers remain unused as voucher users fail to find suitable housing that falls under HUD acceptability guidelines in terms of rent and quality. The number jumps to 50% in some large metropolitan areas (Grigsby and Bourassa, 2004). Therefore, the discrimination in the housing market against voucher recipients coupled with the distribution of affordable housing across neighborhoods may be working against efforts to disperse subsidized tenants to less poor areas of these cities.

Despite the results for voucher users, the fact that changes in subsidized housing units no longer translated into increases of the segregation by poverty status for the 2000-2008 period shows that subsidized housing programs do not necessarily concentrate poverty. While my analysis paints a broad picture of the connection between subsidized housing and poverty, it also warrants further investigation of how the general housing market, economic conditions and racial segregation within each city interact with the separation of the poor from the non-poor. The current slack housing markets may imply very different trends in income segregation from the tight housing markets of the late 1990s and early 2000s. Moreover, even though all housing policies are on paper race-blind, by targeting poverty they may have unintended consequences for the residential separation between racial and ethnic groups. These further points of research will not only better elucidate the mechanisms that translate changes in individual neighborhoods to changes at the metropolitan level. They will also show what the barriers are for different approaches to the deconcentration of poverty.

References

- Bickford, A., and Massey, D.S. 1991. "Segregation in the Second Ghetto: Racial and Ethnic Segregation in American Public Housing, 1977," *Social Forces* 69(4), 1011-1036.
- Buron, L.F., Levy, D.K. and Gallagher, M. 2007. *Housing Choice Vouchers: How HOPE VI Families Fared in the Private Market*. Washington, DC: The Urban Institute.
- Carter, W.H., Schill, M.H., and Wachter, S.M. 1998. "Polarization, Public Housing and Racial Minorities in US cities," *Urban Studies* 35(10), 1889-1911.
- Clampet-Lundquist, S. 2004. "HOPE VI Relocation: Moving to New Neighborhoods and Building New Ties," *Housing Policy Debate* 15(2), 415-447.
- Crump, J. 2002. "Deconcentration by Demolition: Public Housing, Poverty, and Urban Policy," *Environment and Planning D - Society and Space* 20(5), 581-596.
- DeFilippis, J., and Wyly, E. 2008. "Running to Stand Still: Through the Looking Glass with Federally Subsidized Housing in New York City," *Urban Affairs Review* 43(6), 777-816.
- Feins, J.D., and Patterson, R. 2005. "Geographic Mobility in the Housing Choice Voucher Program: A Study of Families Entering the Program, 1995–2002," *Cityscape: A Journal of Policy Development and Research* 8(2), 21-47.
- Fernandez, M. 2008. "Mayor Vetoes Bill Protecting Section 8 Tenants From Landlord Bias," *The New York Times*. (Retrieved on June 5, 2011, at <http://www.nytimes.com/2008/03/01/nyregion/01housing.html>).
- Freeman, L. 2004. *Siting Affordable Housing: Location and Neighborhood Trends of Low Income Housing Tax Credit Developments in the 1990s*. Washington, DC: The Brookings Institution.

- Freeman, L. 2003. "The Impact of Assisted Housing Developments on Concentrated Poverty," *Housing Policy Debate* 14(1-2), 103-141.
- Freeman, L., and Botein, H. 2002. "Subsidized Housing and Neighborhood Impacts: A Theoretical Discussion and Review of the Evidence," *Journal of Planning Literature* 16(3), 359 -378.
- Galster, G., and Zobel, A. 1998. "Will Dispersed Housing Programs Reduce Social Problems in the US?" *Housing Studies* 13(5), 605-622.
- Geolytics, Inc. 2001. *Census CD Neighborhood Change Database (NCDB): 1970-2000 Tract Data Selected Variables for US Census Tracts for 1970,1980, 1990, 2000 and Mapping Tool*. E. Brunswick, NJ: Geolytics, Inc.
- Goering, J., Kamely, A., and Richardson, T. 1997. "Recent Research on Racial Segregation and Poverty Concentration in Public Housing in the United States," *Urban Affairs Review* 32(5), 723-745.
- Goetz, E.G. 2005. "Comment: Public Housing Demolition and the Benefits to Low-Income Families," *Journal of the American Planning Association* 71(4), 407-410.
- Goetz, E.G. 2003. *Clearing the Way: Deconcentrating the Poor in Urban America*. Washington, DC: The Urban Institute Press.
- Gould Ellen, I., and O'Regan, K. 2008. "Reversal of Fortunes? Lower-income Urban Neighborhoods in the US in the 1990s," *Urban Studies* 45(4), 845 -869.
- Grigsby, W.G., and Bourassa, S.C. 2004. *Section 8: The Time for Fundamental Program Change?* Washington, DC: The Fannie Mae Foundation.

- Holloway, S.R., Bryan, D., Chabot, R., and Rogers, D. 1998. "Exploring the Effect of Public Housing on the Concentration of Poverty in Columbus, Ohio," *Urban Affairs Review* 33(6), 767-789.
- Jargowsky, P.A. 2003. *Stunning Progress, Hidden Problems: The Dramatic Decline of Concentrated Poverty in the 1990s*. Washington, DC: The Brookings Institution.
- Jargowsky, P.A., and Bane, M.J. 1991. "Ghetto Poverty in the United States, 1970-1980," in C. Jencks and P.E. Peterson (eds.), *The Urban Underclass*, pp. 235-273. Washington, DC: Brookings Institution.
- Kleit, R.G., and Manzo, L.C. 2006. "To Move or Not to Move: Relationships to Place and Relocation Choices in HOPE VI," *Housing Policy Debate* 17(2), 271-308.
- Kling, J.R., Liebman, J.B., and Katz, L.F. 2007. "Experimental Analysis of Neighborhood Effects," *Econometrica* 75(1), 83-119.
- Mac Donald, H. 1997. "Comment on Sandra J. Newman and Ann B. Schnare's 'And a Suitable Living Environment': The Failure of Housing Programs to Deliver on Neighborhood Quality,'" *Housing Policy Debate* 8(4), 755-762.
- Massey, D.S., and Denton, N. 1988. "The Dimensions of Residential Segregation," *Social Forces* 67 (2), 281-315.
- Massey, D.S., and Kanaiaupuni, S. 1993. "Public-Housing and the Concentration of Poverty," *Social Science Quarterly* 74(1), 109-122.
- Massey, D.S., Fisher, M.J., Dickens, W.T., and Frank, L. 2003. "The Geography of Inequality in the United States, 1950-2000." *Brookings-Wharton Papers on Urban Affairs*, 1-40.

- Newman, S.J., and Schnare, A.B. 1997. “ ‘... And a suitable living environment’: The Failure of Housing Programs to Deliver on Neighborhood Quality,” *Housing Policy Debate* 8(4), 703-741.
- Popkin, S.J., Buron, L., Levy, D.K., and Cunningham, M.K. 2000. “The Gautreaux Legacy: What Might Mixed-Income and Dispersal Strategies Mean for the Poorest Public Housing Tenants?” *Housing Policy Debate* 11(4), 911-942.
- Popkin, S.J., Katz, B., Cunningham, M.K., Brown, K., Gustafson, J. and Turner, M.A. 2004. *A Decade of HOPE VI: Research Findings and Policy Challenges*. Washington, DC: The Urban Institute.
- Rosin, H. 2008. “American Murder Mystery,” *The Atlantic*. (Retrieved on June 5, 2011, at <http://www.theatlantic.com/magazine/archive/2008/07/american-murder-mystery/6872/>)
- Sampson, R.J. 2008. Moving to Inequality: Neighborhood Effects and Experiments Meet Social Structure,” *American Journal of Sociology* 114(1), 189-231.
- Sard, B., and Fischer, W. 2008. *Preserving Safe, High Quality Public Housing Should be a Priority of Federal Housing Policy*. Washington, DC: Center on Budget and Policy Priorities.
- Schill, M.H., and Wachter, S.M. 1995. “The Spatial Bias of Federal Housing Law and Policy: Concentrated Poverty in Urban America,” *University of Pennsylvania Law Review* 143(5), 1285-1342.
- Schwartz, A.F. 2010. *Housing Policy in the United States*. New York: Taylor & Francis.

- Tegeler, Philip. 2005. "The Persistence of Segregation in Government Housing Programs" in *The Geography of Opportunity*, X.d.S. Briggs (ed.), pp.197-219. Washington, DC: Brookings Institution Press.
- U.S. Bureau of the Census. 2000. *Census of the Population and Housing: Characteristics for Census Tracts and Block Numbering Areas*. Washington, DC: Government Printing Office.
- Vernarelli, M.J. 1986. "Where Should HUD Locate Assisted Housing?" in *Housing Desegregation and Federal Policy*, J. Goering (ed.), pp. 214-34. Chapel Hill, NC: University of North Carolina Press.
- Wang, X., Varady, D., and Wang, Y. 2008. "Measuring the Deconcentration of Housing Choice Voucher Program Recipients in Eight U.S. Metropolitan Areas Using Hot Spot Analysis," *Cityscape: A journal of Policy Development and Research* 10(1),s 65-88.
- White, M.J. 1983. "The Measurement of Spatial Segregation," *American Journal of Sociology* 88 (5), 1008-1018.
- Wilson, W.J. 1987. *The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy*. Chicago, IL: University of Chicago Press.
- Wyly, E., and DeFilippis, J. 2010. "Mapping Public Housing: The Case of New York City," *City & Community* 9(1), 61-86.

Footnotes

¹ New York City contains 13% of the national public housing stock. Its Housing Authority is considered one of the best and has not been extensively involved in the types of comprehensive redevelopment programs, characteristic of cities such as Atlanta and Chicago (Schwartz 2010).

² The index of dissimilarity is defined by the following formula:

$$D = \frac{1}{2} \sum |N_{1i}/N_1 - N_{2i}/N_2|,$$

where N_{1i} = population of group 1 in i th tract, N_{2i} = population of group 2 in i th tract, N_1 = total population of group 1 in city, and N_2 = total population of group 2 in city. The index value can be interpreted as the proportion of the poor (or non-poor) population, which would have to be redistributed so that each census tract would have the same composition as the city as a whole (White 1983).

³ The isolation index is computed as the weighted average of each census tract's population in poverty:

$$I = \sum (N_i/N) (N_i/T_i),$$

where N_i = population of group in i th tract, N = total population of group within the city, and T_i = total population in i th tract. It can be interpreted as the probability that a randomly drawn poor person shares a census tract with another poor person (Massey and Denton 1988).

⁴ Please note that the 1977 HUD data file has information only on fixed housing units. The Section 8 voucher program was passed by Congress in 1974 and does not figure in the 1977 HUD file.

Subsidized Housing and the Concentration of Poverty

Table 1. Percent poor by city

	Los Angeles	Atlanta	Chicago	Detroit	New York	Cleveland	Dallas	Seattle
1980	13	16	14	14	20	11	11	8
2000	18	14	13	16	21	13	13	8
2008	15	15	15	21	19	16	17	10

Subsidized Housing and the Concentration of Poverty

Table 2. Total number of subsidized housing units by city

		Los Angeles	Atlanta	Chicago	Detroit	New York	Cleveland	Dallas	Seattle
Fixed units	1977	16,042	14,714	41,924	12,124	94,455	11,819	7,149	10,589
	2000	47,436	20,741	53,465	24,928	209,575	19,852	11,020	15,327
	2008	51,829	16,009	50,289	22,643	250,843	21,381	9,102	12,855
Voucher units	2000	62,484	12,042	35,938	9,738	87,197	10,319	14,811	8,700
	2008	83,025	17,866	46,621	14,812	123,759	14,873	24,492	14,500

Subsidized Housing and the Concentration of Poverty

Table 3. Average Poverty Rate in Census Tracts with Subsidized Units and without Subsidized Units

		Los Angeles	Atlanta	Chicago	Detroit	New York	Cleveland	Dallas	Seattle
1980	No subsidized units	14	14	15	14	19	13	9	7
	Fixed housing units	36	44	39	26	36	39	39	15
2000	No subsidized units	8	7	10	8	13	7	8	4
	Fixed Housing units	26	25	26	23	32	29	20	12
	Voucher units	19	21	18	21	21	19	15	9
2008	No subsidized units	7	7	11	9	11	5	9	4
	Fixed housing units	19	23	23	29	24	29	24	12
	Voucher units	17	21	19	25	19	21	19	11

Subsidized Housing and the Concentration of Poverty

Table 4. Percent of the poor who live in census tracts with subsidized units by city

		Los Angeles	Atlanta	Chicago	Detroit	New York	Cleveland	Dallas	Seattle
Fixed units	1977	62	55	40	30	55	48	47	80
	2000	36	47	40	30	55	45	26	54
	2008	62	63	64	62	69	67	34	61
Voucher units	2000	97	87	93	93	93	89	94	95
	2008	97	96	96	97	94	94	96	98

Subsidized Housing and the Concentration of Poverty

Table 5. Model predicting change in percent poor residents of a census tract, 1980-2000

	Los Angeles	Atlanta	Chicago	Detroit	New York	Cleveland	Dallas	Seattle
<u>Fixed units</u>								
Less than -5%	1.29 (2.88)	-7.92* (3.47)	-5.75* (2.55)	-9.03 (7.37)	0.25 (1.98)	-2.50 (3.97)	-11.84** (3.30)	4.20 (2.23)
-5 to -0.1%	13.95** (4.96)	10.21** (3.60)	1.49 (2.26)	2.87 (3.13)	0.90 (1.91)	11.44** (4.36)	0.04 (6.60)	2.34* (1.07)
0% (omitted)								
0.1 to 5%	1.05* (0.43)	0.70 (1.51)	-1.34 (0.87)	0.61 (1.23)	-2.81** (0.82)	1.19 (1.15)	1.66 (1.14)	1.01 (0.60)
More than 5%	2.65** (0.55)	-0.18 (1.47)	0.24 (0.89)	-0.89 (0.94)	-1.66** (0.62)	3.86** (1.09)	0.84 (1.14)	0.89 (0.99)
<u>Voucher units</u>								
0% (omitted)								
0.1 to 5%	3.44** (0.48)	-1.02 (1.40)	4.12** (0.71)	4.00** (0.83)	-0.65 (0.62)	1.47 (0.91)	4.54** (0.81)	1.56* (0.78)
More than 5%	5.60** (0.69)	0.69 (1.85)	5.28** (1.05)	10.98** (0.83)	-1.22 (0.79)	4.83** (1.42)	9.82** (1.34)	4.38** (1.42)
Diff. in distance to closest tract with 100+ fixed units (miles)	0.02 (0.03)	-0.73** (0.27)	-0.50** (0.19)	-0.25** (0.07)	-2.08** (0.31)	0.25 (0.23)	-0.07 (0.11)	0.05 (0.11)
Diff. in distance to closest tract with 100+ voucher units (miles)	0.09* (0.04)	-0.55* (0.22)	-0.14 (0.11)	-0.13 (0.12)	0.32 (0.17)	0.06 (0.15)	-0.19 (0.17)	-0.07 (0.06)
Number of fixed units, 1977	-0.002 (0.004)	-0.01 (0.004)	-0.002 (0.003)	-0.0004 (0.002)	0.002 (0.001)	-0.004 (0.005)	0.005* (0.002)	-0.01** (0.003)
Constant	0.30 (0.48)	1.27 (1.56)	-2.67** (0.72)	-0.98 (0.97)	0.70 (0.65)	0.98 (1.15)	0.07 (1.03)	-0.69 (0.85)
R-squared	0.06	0.20	0.05	0.11	0.04	0.09	0.19	0.07
N	2028	280	1319	612	2139	491	481	373

Notes: * < 0.05; ** <0.01 (two-tailed tests). Standard errors are in parentheses.

Subsidized Housing and the Concentration of Poverty

Table 6. Model predicting change in percent poor residents of a census tract, 2000-2008

	Los Angeles	Atlanta	Chicago	Detroit	New York	Cleveland	Dallas	Seattle
<u>Fixed units</u>								
Less than -5%	-1.51 (1.39)	-2.01 (2.73)	-11.15** (1.95)	-0.20 (2.33)	-2.25* (1.14)	0.88 (2.87)	-0.63 (2.17)	-5.13* (2.56)
-5 to -0.1%	-0.57 (0.52)	-2.84 (1.79)	-1.32 (1.11)	0.75 (1.56)	-1.12 (0.83)	0.91 (1.68)	0.60 (1.15)	0.27 (0.83)
0% (omitted)								
0.1 to 5%	-0.18 (0.34)	-0.88 (1.41)	-0.48 (0.72)	0.43 (0.90)	-0.46 (0.50)	1.86 (1.11)	-0.42 (0.98)	-0.94 (0.79)
More than 5%	-0.84 (1.02)	-1.62 (3.15)	-3.63** (1.40)	-0.52 (2.32)	-1.69* (0.83)	-1.44 (2.30)	-2.84 (2.57)	-4.96 (2.97)
<u>Voucher units</u>								
Less than -5%	1.74 (3.37)	-3.00 (5.29)	-7.97* (3.61)	-16.20 (10.50)	-14.51** (2.78)	2.11 (5.93)	-8.14* (3.67)	--
-5 to -0.1%	-1.93** (0.58)	1.76 (2.16)	-2.05 (1.20)	4.37** (1.62)	-2.19** (0.83)	-0.64 (1.87)	2.34 (1.19)	1.21 (1.60)
0% (omitted)								
0.1 to 5%	-1.72** (0.58)	2.37 (1.95)	-0.14 (1.09)	3.98** (1.43)	-1.53 (0.79)	3.55* (1.46)	4.26** (1.07)	2.20 (1.53)
More than 5%	-3.76** (1.13)	4.20 (3.05)	-6.37** (1.80)	2.68 (3.77)	-2.66* (1.13)	3.55 (3.15)	5.77** (1.70)	2.49 (2.59)
Diff. in distance to closest tract with 100+ fixed units (miles)	-0.01 (0.10)	-0.18 (0.58)	0.13 (0.33)	0.83 (0.57)	0.72 (0.45)	-0.54 (0.41)	0.01 (0.20)	-0.02 (0.20)
Diff. in distance to closest tract with 100+ voucher units (miles)	-0.17** (0.03)	0.16 (0.54)	0.03 (0.16)	-0.20 (0.12)	-0.24 (0.16)	-2.59** (0.73)	0.56 (0.29)	0.14 (0.14)
Number of fixed units, 2000	0.0003 (0.002)	-0.01 (0.005)	0.002 (0.003)	0.001 (0.01)	-0.0003 (0.001)	0.01 (0.01)	-0.01 (0.01)	-0.003 (0.004)
Number of voucher units, 2000	-0.01** (0.003)	0.003 (0.01)	0.02** (0.01)	0.04* (0.02)	-0.003 (0.003)	0.04* (0.02)	0.03** (0.01)	0.02 (0.01)
Constant	-0.34 (0.53)	1.81 (1.83)	2.71** (1.02)	0.35 (1.36)	-0.42 (0.75)	-0.32 (1.36)	0.11 (1.01)	-0.06 (1.48)
R-squared	0.04	0.04	0.06	0.04	0.03	0.10	0.11	0.06
N	2028	280	1319	612	2139	491	481	373

Notes: * < 0.05; ** <0.01 (two-tailed tests). Standard errors are in parentheses.

Subsidized Housing and the Concentration of Poverty

Table 7. Model predicting change in percent non-subsidized poor, 1980-2000

	Los Angeles	Atlanta	Chicago	Detroit	New York	Cleveland	Dallas	Seattle
<u>Fixed units</u>								
Less than -5%	1.25 (3.04)	5.68 (4.46)	-0.52 (2.91)	7.58 (7.94)	6.92** (2.24)	8.64 (4.77)	-9.08* (3.65)	12.55** (2.49)
-5 to -0.1%	5.73 (5.24)	8.22 (4.63)	-1.68 (2.58)	-1.57 (3.38)	-8.96** (2.16)	13.26* (5.24)	3.10 (7.29)	2.57* (1.19)
0% (omitted)								
0.1 to 5%	-0.19 (0.46)	-1.65 (1.94)	-3.77** (0.99)	-1.57 (1.33)	-5.13** (0.93)	-1.25 (1.38)	-0.15 (1.26)	-0.67 (0.67)
More than 5%	-3.13** (0.58)	-10.78** (1.88)	-9.84** (1.02)	-11.35** (1.02)	-14.76** (0.70)	-10.45** (1.30)	-7.12** (1.26)	-7.31** (1.11)
<u>Voucher units</u>								
0% (omitted)								
0.1 to 5%	3.12** (0.51)	-3.73* (1.79)	4.04** (0.81)	3.90** (0.88)	-0.39 (0.70)	2.38* (1.09)	3.86** (0.90)	1.69 (0.87)
More than 5%	2.14** (0.73)	-6.62** (2.38)	0.41 (1.20)	6.85** (2.15)	-5.08** (0.89)	2.02 (1.70)	4.68** (1.48)	0.84 (1.59)
Diff. in distance to closest tract with 100+ fixed units (miles)	0.02 (0.04)	-0.96** (0.34)	-0.52* (0.21)	-0.12 (0.08)	-2.15** (0.35)	-0.28 (0.27)	-0.15 (0.12)	-0.07 (0.12)
Diff. in distance to closest tract with 100+ voucher units (miles)	0.11** (0.04)	-0.62* (0.28)	0.01 (0.12)	0.02 (0.13)	0.49* (0.19)	0.39* (0.19)	0.03 (0.18)	0.02 (0.07)
Number of fixed units, 1977	0.002 (0.004)	-0.03** (0.01)	-0.02** (0.003)	0.002 (0.005)	-0.006** (0.002)	-0.02** (0.01)	0.01* (0.002)	-0.03** (0.004)
Constant	-0.09 (0.50)	1.71 (2.01)	-3.57 (0.83)	-1.18 (1.04)	-0.45 (0.73)	-2.51 (1.38)	-1.15 (1.14)	-1.98* (0.95)
R-squared	0.04	0.26	0.15	0.20	0.27	0.17	0.19	0.20
N	2028	280	1319	612	2139	491	481	373

Notes: * < 0.05; ** <0.01 (two-tailed tests). Standard errors are in parentheses.

Subsidized Housing and the Concentration of Poverty

Table 8. Model predicting change in percent non-subsidized poor residents, 2000-2008

	Los Angeles	Atlanta	Chicago	Detroit	New York	Cleveland	Dallas	Seattle
<u>Fixed units</u>								
Less than -5%	2.11 (1.50)	-0.16 (3.59)	-0.41 (2.13)	3.47 (2.43)	2.06 (1.29)	4.62 (3.12)	-1.23 (2.46)	1.67 (2.68)
-5 to -0.1%	-1.18* (0.56)	-3.90 (2.35)	-1.10 (1.21)	3.53* (1.62)	-1.09 (0.94)	0.23 (1.83)	-0.88 (1.30)	0.64 (0.87)
0% (omitted)								
0.1 to 5%	-0.66 (0.36)	-1.62 (1.85)	-1.30 (0.78)	0.10 (0.94)	-1.21* (0.56)	-0.31 (1.20)	-0.73 (1.11)	-1.46 (0.82)
More than 5%	-10.22** (1.10)	-9.67* (4.15)	-9.94** (1.53)	-10.49** (2.42)	-18.07** (0.94)	-17.91** (2.49)	-17.18** (2.91)	-19.70** (3.10)
<u>Voucher units</u>								
Less than -5%	8.33* (3.64)	0.75 (6.97)	-0.53 (3.95)	-12.57 (10.95)	-10.03** (3.15)	9.24 (6.43)	-2.63 (4.16)	--
-5 to -0.1%	-1.22 (0.63)	1.75 (2.85)	-2.70* (1.31)	5.88** (1.69)	-0.50 (0.94)	1.12 (2.03)	2.49 (1.35)	1.59 (1.68)
0% (omitted)								
0.1 to 5%	-1.71** (0.62)	1.61 (2.57)	-1.72 (1.19)	4.36** (1.49)	-0.94 (0.90)	4.32** (1.59)	3.22** (1.22)	1.71 (1.60)
More than 5%	-6.49** (1.22)	2.45 (4.01)	-12.89** (1.97)	0.98 (3.93)	-6.43** (1.28)	-0.86 (3.42)	-0.70 (1.92)	0.94 (2.70)
Difference in distance to closest tract with 100+ fixed units (miles)	-0.04 (0.10)	0.87 (0.76)	0.30 (0.36)	0.72 (0.59)	0.90 (0.51)	-0.29 (0.44)	0.08 (0.23)	0.10 (0.21)
Difference in distance to closest tract with 100+ voucher units (miles)	-0.14** (0.03)	0.24 (0.71)	0.03 (0.17)	-0.18 (0.12)	-0.13 (0.18)	-2.06** (0.79)	0.41 (0.33)	0.19 (0.14)
Number of fixed units, 2000	0.01** (0.003)	0.01* (0.005)	0.01* (0.003)	-0.01 (0.01)	0.01** (0.001)	0.01* (0.01)	0.02** (0.01)	0.001 (0.004)
Number of voucher units, 2000	-0.01** (0.003)	0.01 (0.01)	0.02* (0.01)	0.04* (0.02)	-0.001 (0.003)	0.06** (0.01)	0.03** (0.01)	0.02* (0.01)
Constant	-0.58 (0.57)	1.61 (2.41)	3.55 (1.12)	-0.41 (1.42)	-1.47 (0.85)	-1.58 (1.48)	0.18 (1.14)	-0.12 (1.55)
R-squared	0.09	0.06	0.08	0.10	0.19	0.20	0.19	0.14
N	2028	280	1319	612	2139	491	481	373

Notes: * < 0.05; ** < 0.01 (two-tailed tests). Standard errors are in parentheses.

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Table 9. Actual and implied changes in the level of segregation from model predicting percent change in the poor population from change in fixed and voucher units

Index of Dissimilarity	Los Angeles	Atlanta	Chicago	Detroit	New York	Cleveland	Dallas	Seattle
1980	0.34	0.43	0.48	0.44	0.39	0.48	0.41	0.28
2000	0.34	0.39	0.41	0.42	0.34	0.47	0.34	0.31
2008	0.34	0.36	0.38	0.42	0.36	0.44	0.35	0.34
Simulated, 2000	0.34	0.54	0.52	0.50	0.38	0.53	0.48	0.32
Simulated, 2008	0.33	0.42	0.43	0.45	0.33	0.49	0.37	0.33
Actual change, 1980-2000	0.00	-0.04	-0.07	-0.02	-0.05	-0.01	-0.07	0.03
Simulated change, 1980-2000	0.00	0.11	0.04	0.06	-0.01	0.05	0.07	0.04
Actual change, 2000-2008	0.00	-0.03	-0.03	0.00	0.02	-0.03	0.01	0.03
Simulated change, 2000-2008	-0.01	0.03	0.02	0.03	-0.01	0.02	0.03	0.02

Isolation Index	Los Angeles	Atlanta	Chicago	Detroit	New York	Cleveland	Dallas	Seattle
1980	0.21	0.3	0.3	0.26	0.31	0.26	0.22	0.13
2000	0.26	0.25	0.25	0.27	0.3	0.28	0.21	0.14
2008	0.24	0.25	0.25	0.34	0.28	0.31	0.26	0.16
Simulated, 2000	0.19	0.32	0.34	0.35	0.29	0.32	0.25	0.11
Simulated, 2008	0.25	0.25	0.27	0.31	0.28	0.32	0.22	0.13
Actual change, 1980-2000	0.05	-0.05	-0.05	0.01	-0.01	0.02	-0.01	0.01
Simulated change, 1980-2000	-0.02	0.02	0.04	0.09	-0.02	0.06	0.03	-0.02
Actual change, 2000-2008	-0.02	0.00	0.00	0.07	-0.02	0.03	0.05	0.02
Simulated change, 2000-2008	-0.01	0.00	0.02	0.04	-0.02	0.04	0.01	-0.01