Who Benefits from Neighborhood Revitalization?

Giordano Palloni*   Matthew Staiger†   John Voorheis‡

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Abstract

We investigate how a large place-based policy, the HOPE VI Revitalization program, affected people and places. The program sought to benefit *people* living in high-poverty neighborhoods by transforming these *places* into mixed-income communities through the demolition of public housing projects and the construction of new housing. We find that the program led to a large decline in neighborhood poverty rates, driven by changes in who moved into the neighborhood after a Revitalization award. Within five years of an award most original residents had moved away and were not exposed to the changed neighborhoods. The program reduced the number of subsidized renters in targeted neighborhoods, but those able to find a unit after an award lived in lower poverty neighborhoods. We find no evidence to suggest that the program had large spillover effects on the poverty rates of other neighborhoods.

1 Introduction

Low-income households in subsidized housing often live in high-poverty neighborhoods, which a large body of evidence suggests can adversely affect health, behavior, and labor market outcomes (Chyn and Katz, 2021).[1] To address the harmful effects of exposure to high-poverty neighborhoods, the Department of Housing and Urban Development (HUD) has pursued two strategies to improve neighborhood conditions for subsidized renters. The first approach targets *people* by seeking to help disadvantaged families relocate to better neighborhoods. Evidence from the Moving to Opportunity experiment (Katz et al., 2001) and more recent research from Bergman et al. (2019) illustrate the promise of this approach. However, the scalability of MTO-type interventions may be limited by the fact that not all households will be able to move and by the availability of affordable rental housing in low-poverty neighborhoods. The second approach targets *places* by seeking to alter and improve existing neighborhoods. A common concern with place-based policies is that the benefits might not accrue to the original residents of targeted places.

This paper investigates how a large place-based policy, the HOPE VI Revitalization program, affected people and places. The program was administered by HUD and awarded 261 grants totaling $6.3 billion between 1993 and 2010. Each grant represented a large investment at a very local level: the average grant size was $24 million and the average grantee public housing project contained only 360 occupied units. The primary goal of the program was to improve living conditions for families in subsidized housing by transforming high-poverty neighborhoods into mixed-income communities through the demolition of severely distressed public housing projects and the construction of new housing units. Our analysis asks whether the program was successful at: (1) creating new, mixed-income communities, and (2) reduc-

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[1]There is an emerging consensus that neighborhood environment during childhood has a meaningful effect on social and economic outcomes measured in adulthood (Chetty et al., 2014). Neighborhoods also affect the health and subjective well-being of adults (Ludwig et al., 2012). While some research finds that neighborhoods affect the labor market outcomes of adults through the spacial proximity of jobs (Pollakowski et al., 2022; Haltiwanger et al., 2020) and local labor market networks (Hellerstein et al., 2011), these contemporaneous effects are thought to be less important than exposure effects for children.

ing exposure to neighborhood poverty for families in subsidized housing. In this way, we assess whether the program achieved its immediate goal of reducing the spatial concentration of poverty and shed light on who might have benefited from these neighborhood-level changes.

We estimate the effect of the Revitalization program on *places* by comparing neighborhoods that received an award to those that applied for but never received funding. While the program targeted some of the most distressed public housing projects in the country, our empirical strategy makes use of the fact that, due to funding constraints, there were many similar projects that applied for but never received an award. Indeed, in an average grant year only 29 percent of applicants received funding. We adjust for any remaining, observable pre-award differences between awardees and applicants using inverse propensity score weighting.

We estimate the effect of the Revitalization program on *people* using the same empirical strategy together with individual-level administrative data on income, residential location, and participation in subsidized housing. These data allow us to follow all of the original residents as they moved across neighborhoods and observe everyone who moved into the Revitalization neighborhoods after the award. Observing these distinct flows lets us better understand whether changes in neighborhood characteristics were driven by differences in the composition of new residents or differences in which original residents departed affected neighborhoods. The ability to decompose neighborhood change into a part attributable to out-migration and a part attributable to in-migration is a major improvement over existing work and critical for answering our main research questions.

We begin by showing that the Revitalization program reduced neighborhood poverty rates by affecting who moved into the neighborhood after the award. The program led to an 8 percentage point reduction in the share of residents with an adjusted gross income (AGI) below $15,000 15 years after an award.[2] The reductions in neighborhood poverty rates could

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[2] As discussed in Section 3, we classify a household as poor if their AGI is less than $15,000.

be attributable to income gains of the original residents who stay in the neighborhood, the displacement of low-income households who originally lived in the neighborhood, or a change in who moves into the neighborhoods after an award. We find that the decline in neighborhood poverty is primarily attributable to the fact that fewer low-income households with subsidized housing and more high-income households without subsidized housing moved into the neighborhood after the award. In this way, the program did achieve its goal of reducing neighborhood poverty and creating mixed-income communities in targeted neighborhoods.

Next, we find that original residents were displaced by the demolition of public housing and an increase in housing prices. Original residents of Revitalization public housing projects were 18 percentage points more likely to have moved to a new neighborhood five years after an award. These displacements are primarily, and mechanically, attributable to the demolition of public housing units. However, we also find that the program led to a 5 log point increase in rental prices in Revitalization neighborhoods. This increase in the cost of rental housing could have affected nearby residents, particularly those without subsidized housing. Indeed, we find that non-subsidized households living in Revitalization neighborhoods were 5 percentage points more likely to have moved within five years of an award. We find no evidence of displacement effects for households that had access to other housing subsidies (largely Section 8 Vouchers). This is consistent with the rules dictating assisted housing benefit amounts, which typically would not require beneficiaries to pay the full rent increase.

High rates of residential mobility, which is a common feature of low-income renters in high-poverty neighborhoods, limits the exposure of the original residents to any neighborhood changes. Within 5 years of the award, 74 percent of the original Revitalization public housing project residents had moved to a new neighborhood. The program increased the probability of moving by 18 percentage points, implying that three fourths of the moves still would have occurred absent the Revitalization program $(0.76 = \frac{74-18}{74})$. Because of these high rates of residential mobility, the reduction in poverty rates in neighborhoods (*places*) is over twice as large as the reduction in exposure to neighborhood poverty for the original residents (*people*).

Thus, most of the original neighborhood residents were not likely to benefit from reductions in poverty in the Revitalization neighborhoods.

The program reduced the number of subsidized households in the targeted neighborhoods, but those able to find a unit after the award lived in lower poverty neighborhoods. The reduction in poverty rates in the revitalized neighborhoods does not necessarily translate into a reduction in exposure to neighborhood poverty for new residents. In particular, the program could have attracted residents who, absent the intervention, would have chosen to live in a different, lower poverty neighborhood. However, we find similar poverty rates of origin neighborhoods for subsidized households that move into the Revitalization and failed applicant neighborhoods after the award. This suggests that the new residents of the Revitalization sites experienced a reduction in neighborhood poverty equal in magnitude to the reduction in poverty rates in the revitalized neighborhoods. The Revitalization program therefore appears to have successfully achieved its goal of allowing subsidized households to live in lower poverty neighborhoods. However, the program also led to a 3 log point reduction in the population with subsidized housing 15 years after the award. Thus, there exists a trade-off between reducing exposure to neighborhood poverty and providing access to these neighborhoods.

We find little evidence to suggest that HOPE VI led to large changes in poverty in other neighborhoods. One possible concern was that the program could have increased poverty rates in other neighborhoods by reallocating low-income, public housing residents to new neighborhoods. We track the migration patterns of original residents who move out of the Revitalization neighborhoods and find that the program dispersed residents throughout the surrounding metro areas as opposed to into a select few neighborhoods. Because of this, the program did not generate a distinguishable increase in poverty rates in neighborhoods that received households displaced by the program. Another possibility is that the program could have affected poverty rates in neighborhoods adjacent to those containing the Revitalization projects. We find that the program decreased poverty rates in surrounding neighborhoods

by just 1 percentage point, suggesting the Revitalization program had highly localized effects on poverty rather than influencing poverty rates in the broader community.

Our results point to three important lessons for the design of place-based policies. First, low-income households in distressed neighborhoods move frequently, so neighborhood-level interventions may be an ineffective way to target specific *people*. This need not imply that place-based policies are poorly targeted, but the primary beneficiaries are people who reside in the targeted place after the intervention and may or may not be the original residents. Second, decreasing neighborhood poverty rates in distressed neighborhoods can be achieved both by reducing the number of poor residents and by increasing the number of non-poor households. Because of the high rates of mobility seen in low-income households, careful policies could target changes in the composition of new residents while minimizing the displacement of original residents. Third, provision of subsidized housing can help mitigate the displacement effects generated by rising housing prices as targeted neighborhoods become more attractive places to live.

The main contribution of our paper is to estimate the effect of a large place-based policy on both people and places. Previous research on HOPE VI finds that the program reduced neighborhood poverty rates (Tach and Emory, 2017) and led the original residents of the public housing projects to move to lower poverty neighborhoods (Thomas Kingsley et al., 2003; Chyn, 2018). However, because most of the original residents moved, research focusing on the original residents offers an incomplete picture of who benefited from changes in HOPE VI neighborhoods. We document how the program reduced neighborhood poverty rates and shed light on who benefited from these changes. More broadly, we contribute to a literature that seeks to understand who benefits from neighborhood-level interventions (Busso et al., 2013; Diamond and McQuade, 2019; Pennington, 2021). Chyn and Katz (2021) note that "a final frontier research area involves the estimation of the impact of place-based policies to improve low-income neighborhoods on the intended beneficiaries—the incumbent (preexisting) adult residents and their children." Our paper suggests that the "intended beneficiaries"

should not be limited to the original residents but ought to include low-income families who move in after the intervention.

The rest of the paper is structured as follows. Section 2 provides background on the HOPE VI Revitalization program. Section 3 describes the data. Section 4 describes our empirical strategy. Section 5 present our empirical results. Section 6 concludes.

2   The HOPE VI Revitalization Program

The HOPE VI program was created in response to a report by the National Commission on Severely Distressed Public Housing that raised concerns about living conditions in public housing projects (Green and Lane, 1992). While there were several distinct programs included under the broader HOPE VI umbrella, 94 percent of HOPE VI funding was allocated to the Revitalization program.[3] The FY1999 HUD appropriations bill (Public Law 105-276) that authorized HOPE VI identifies four main goals of the program:

> (1) improving the living environment for public housing residents of severely distressed public housing projects through the demolition, rehabilitation, reconfiguration, or replacement of obsolete public housing projects (or portions thereof); (2) revitalizing sites (including remaining public housing dwelling units) on which such public housing projects are located and contributing to the improvement of the surrounding neighborhood; (3) providing housing that will avoid or decrease the concentration of very low-income families; and (4) building sustainable communities. (42 United States Code §1437v(a))

In short, the program sought to transform distressed public housing projects into economically integrated neighborhoods in which families receiving subsidized housing assistance would live alongside higher-income neighbors who paid market prices for housing.[4]

Prior residents of Revitalization public housing projects moved into one of four housing

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[3]The Demolition program was the other major arm of the HOPE VI program, which had the less ambitious goal of simply demolishing distressed public housing projects. HUD awarded 285 Demolition and 261 Revitalization grants but the average Revitalization award was 20 times as large. One challenge with interpreting the existing research on the HOPE VI program is that papers often lump the Demolition and Revitalization programs into one category and study the composite effect of these two distinct interventions.

[4]Appendix B describes the nature of the intervention using an illustrative example for a single HOPE VI Revitalization grant: The Dixie Homes project in Memphis, Tennessee.

arrangements after the award: (1) a different public housing project, (2) private market housing with the assistance of a Section 8 Voucher, (3) a limited number of public housing units in the new mixed-income development, or (4) out of subsidized housing entirely. Gress et al. (2016) analyze data from the HUD program reports and find that the Revitalization program reduced the total public housing stock by 43,274 units. However, the reduction in public housing could have been offset by an increase in other forms of subsidized housing. Indeed, their study also finds that 85 percent of the 98,592 public housing units that were demolished were replaced by housing intended for low- and moderate-income residents in the target neighborhoods. In principle, the original residents were supposed to be offered a chance to return to the revitalized neighborhood, but just 21 percent of re-developed units were ever occupied by original residents (Gress et al., 2016).

The Revitalization program represented a large investment in neighborhoods. In total, the program awarded 261 grants totaling $6.3 billion between 1993 and 2010 with an average award size of $24 million. On average, each grant leveraged an additional $42 million from non-HOPE VI funding sources and thus the true size of the neighborhood-level intervention often exceeds the grant amount (Gress et al., 2016). To put these numbers in perspective, Revitalization projects had 360 occupied units in 1993 on average and were located in block groups with an average population of 1,900 in 1990. The average grant therefore amounted to an outlay of $183,333 per occupied unit or $34,737 per block group resident.

Previous research studies the impact of HOPE VI on either neighborhoods or on the original residents. Research studying the neighborhoods finds that the program reduced neighborhood poverty rates (Tach and Emory, 2017) and crime (Sandler, 2017) and increased housing prices (Zielenbach and Voith, 2010). Research on the original public housing residents documents that the program led families to move to lower poverty neighborhoods and improved the long-run labor market outcomes of children (Thomas Kingsley et al., 2003; Chyn, 2018; Haltiwanger et al., 2020). An open question that our paper seeks to answer is: Who ends up living in and benefiting from the revitalized neighborhood. We are able to

tackle this question, in part, because our data allow us to track the near universe of residents as the move in and out of our neighborhoods of interest.

3 Data

We combine survey and administrative data to track the characteristics of neighborhoods and the outcomes of individuals over time. The two key strengths of our data are that they (1) contain the near universe of Revitalization grants, and (2) longitudinally track the outcomes of all individuals in the United States.

Applicants and Awardees. We use publicly available data to identify HOPE VI projects and the neighborhoods in which they were located. All applicants to and awardees of the HOPE VI grant program are publicly listed and are identified by the Public Housing Authority (PHA) and the name of the project. We link these records to project-level summary files from HUD and assign each public housing project to one of three categories:

1. *Revitalization*: projects that received a HOPE VI Revitalization grant,

2. *Failed Applicant*: projects that applied for but did not receive HOPE VI funding, and

3. *Non-HOPE VI*: projects that did not apply for or receive a HOPE VI grant.[5]

We limit our sample to large, non-senior public housing projects for which can identify the geographic location. Table A.1 presents the impact of each sample restriction and illustrates that we retain 88 percent of all Revitalization awards. We impose the same sample restrictions on the other projects but also require that they are located least one mile away from a

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[5]The HUD data identify projects with an alpha-numeric project ID and we assign a project ID to 99 percent of Revitalization grants, and 98 percent of HOPE VI applicants. All of the Revitalization grants and most of the applicants that were not assigned a project ID were scattered sites, which we omit from the analysis anyways. We use data from HUD User's a Picture of Subsidized Households to identify all projects that existed in 1993, map the project names to the project IDs, and measure project-level characteristics such as the geographic location. We also identify all projects that were awarded a HOPE VI Demolition grant and we drop these projects from our sample.

Revitalization site, since the Revitalization program might directly affect nearby neighborhoods.[6] Our sample contains 251 Revitalization, 166 failed applicant, and 5,783 non-HOPE VI projects.[7]

Neighborhoods. We use data from HUD User's a Picture of Subsidized Households to identify the Census block group in which each project is located.[8] Block groups are defined by the U.S. Census Bureau and typically contain around 1,500 residents. To account for the fact that multiple projects might be located in a single block group and some projects span multiple block groups, we group together clusters of nearby public housing projects into neighborhoods defined by the connected set formed between projects and census tracts. 90 percent of neighborhoods contain one or two block groups, and the two largest neighborhoods contain five block groups. For much of our analysis we collapse the data to these neighborhoods, of which there are 125 failed applicant and 204 Revitalization neighborhoods.[9]

We accurately identify the location of public housing projects. Using data from the 1990 Decennial Census we show that neighborhoods that contain a Revitalization or failed applicant project are significantly more disadvantaged relative to nearby neighborhoods. For example, in Revitalization neighborhoods the poverty rate is 55 percent and 38 percent of residents receive public assistance income. In comparison, for neighborhoods located within a half mile of the Revitalization neighborhoods the poverty rate is 21 percentage points lower and the percent of people receiving public assistance income is 14 percentage points lower (see Figure A.1).

Individuals. We use linked survey and administrative data to measure the outcomes

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[6]Our sample excludes the 39 demonstration grants awarded between 1993 and 1995. The demonstration grants differed in their objectives (creating mixed-income neighborhoods became an explicit goal only by 1996) and their approach (later awards placed a larger emphasis on leveraging additional sources of funding). Project-level data on applicants is missing for 2009 and 2010 but there were only 80 applicants in these two years compared to 778 applicants across all other years. Furthermore, many of these applicants likely applied in previous years and therefore still appear in our data.

[7]A single Revitalization grant could affect multiple projects. In most cases projects affected by a single grant are clustered within the same neighborhood.

[8]We use the definition of a block group based on the 2010 Census geography.

[9]Our data include 308, 178, and 5,391 block groups that contain a Revitalization, failed applicant, and non-HOPE VI public housing project, respectively.

of individuals. We rely on four main data sources. First, we use administrative data from HUD, which allow us to identify which individuals receive subsidized housing and where these individuals live. Second, we use administrative data from tax records, which provide annual measures of income and precise residential location for all filers. Third, we use administrative data from the U.S. Census Bureau's Master Address File (MAF), which provide additional address data for those who do not appear in the tax records. Fourth, we use survey data from the Decennial Census Survey and the American Community Survey (ACS), which provide information on other variables including income, rent, and home ownership status. By linking these data we construct an individual-level panel that includes one observation per person per year between 1995 and 2018 for the near universe of people living in the United States.[10]

We use AGI to identify poor households. Specifically, an individual is defined as poor if their average AGI in the current and subsequent four years is less than $15,000.[11] The $15,000 threshold is approximately equal to the poverty line for a three-person family in 2007, which is the middle of our sample period. While there is considerable mobility in and out of poverty from year to year, our measure captures a persistent form of income deprivation (Larrimore et al., 2020).[12] We have found similar results using AGI in a single year or calculating poverty based on the official poverty line. However, we prefer our measure to the official poverty line since the latter depends on family size, which we cannot measure with perfect accuracy in the administrative data.

We combine the data on neighborhoods and individuals to create two datasets used throughout our analysis. First, we construct a repeated cross section by summarizing the population that lives in the neighborhood in a given year. We use these data to measure how neighborhoods change over time as well as study the new residents that move into

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[10]While the coverage is quite comprehensive, address data are not available for every individual in every year and we assume that an individual lives in the same address until we observe a new address. For children, we use the address data from the parent who most recently claimed them as a dependent.

[11]For children, we use the AGI from the parent who most recently claimed them as a dependent.

[12]Using a five-year average of AGI has the added advantage of providing a simple way to account for the fact that we do not have tax records for 1996 and 1997.

the neighborhoods after the award. Second, we construct a panel of original residents that follows the individuals who lived in the neighborhood in the year before the award. We use these data in order to measure the outcomes of the original residents. The two dataset provide an annual panel tracking the neighborhoods and original residents between 1995, (one year before the first award) and 2018 (eight years after the last award). In some cases we supplement these data with additional neighborhood-level information from the publicly available summary files from the 1990 and 2000 Decennial Census Surveys and the annual data from the 2009-2017 waves of the ACS, all of which are obtained through IPUMS (Manson et al., 2021).[13]

4   Empirical Strategy

Estimating the causal effect of the HOPE VI Revitalization program is made difficult by the fact that the program explicitly targeted distressed public housing projects. Table 1 presents baseline characteristics for non-HOPE VI, failed applicant, and Revitalization neighborhoods. Relative to the other groups, Revitalization projects tended to be larger and to house residents who have lower income and are more likely to be minorities. We find similar differences at the neighborhood level. In 1990, the average poverty rate for neighborhoods (defined at the block group) that contained a Revitalization project was 0.55 compared to 0.31 for non-HOPE VI projects.

We estimate the effect of the Revitalization program by comparing projects that received a grant to those that applied for but were never awarded funding. Grants were awarded through a competitive process in which PHAs could submit one application per year. Each year HUD evaluated applications based a number of factors including "capacity to undertake development, need, the amount of outside resources brought in (leveraging), resident and community involvement, community and supportive services, commitment to early edu-

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[13]Statistics from the publicly available ACS summary files are calculated by pooling five years of survey responses and the year is the midpoint of this window. For example, we use summary statistics from the 2007-2011 ACS surveys as our estimate of neighborhoods characteristics in 2009.

cation, and the relocation plan," and grants were allocated based on these evaluations subject to funding constraints (Congressional Research Service, 2012). Figure 1 presents a map that marks the location of each Revitalization and failed applicant project and illustrates that both sets of projects are dispersed across the United States.

There are three reasons why the failed applicants are a useful comparison group. First, demand for the program far exceeded supply, which means that there are many projects that applied for but never received funding even though they were similar to the awardees. Figure 2 displays the number of applicants and awardees by grant year. On average, only 29 percent of applicants in a given year were awarded a grant. While applicants that were rejected in one year could apply again in a subsequent year, 34 percent of applicants in any given year never received funding. Second, the average award size exceeds $20 million, making it difficult to pursue other projects absent HOPE VI funding. Third, failed applicants share the characteristics that led them to apply for the program, characteristics that might be difficult to measure or observe. Table 1 illustrates that failed applicants are more similar to HOPE VI projects than the non-HOPE VI sample. However, there are still observable differences between the failed applicants and Revitalization projects. We adjust for these observable, pre-award differences using inverse propensity score weights.

While there are observable differences between the failed applicant and Revitalization neighborhoods on average, there exist failed applicant neighborhoods that are very similar to Revitalization neighborhoods. Figure A.2(A) presents the distribution of poverty rates in 1990 for the failed applicants and Revitalization neighborhoods. While average poverty rates differ between the two groups, even for the highest-poverty Revitalization projects, there exist failed applicants neighborhoods that are located in similarly poor neighborhoods.[14] Given the overlap of the two distributions, we view inverse propensity score weighting as a promising way to adjust for observable differences.

We estimate the propensity score using neighborhood characteristics measured in the

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[14]Panels B-D of Figure A.2 show a similar degree of overlap for other relevant pre-award variables.

year before the award. As discussed below, we compare Revitalization awards from a given grant year to all failed applicants. To facilitate this comparison we create a stacked dataset that contains one observation for each Revitalization neighborhood and 15 observations for each failed applicant neighborhood for each of the 15 possible grant years between 1996 and 2010 (in this way, failed applicant neighborhoods are assigned a grant year). Within each grant year, we estimate a propensity score by estimating a logistic regression of receipt of a Revitalization award on a vector of baseline covariates measured in the year before the award. The variables in the propensity score model include population of the neighborhood, share Black, share poor, median home values, and size of the public housing project. Our approach allows for changes in the selection process over time and aims to balance the observable characteristics of the failed applicant and Revitalization neighborhoods within each grant year. We interact the estimated propensity score with baseline population so that we also weight by population. The weights for the failed applicant group are normalized such that within each grant year the sum of the weights across failed applicant neighborhoods is equal to the sum of the weights across the Revitalization neighborhoods.

Weighting the data by the inverse estimated propensity score eliminates observable differences between the Revitalization and failed applicant neighborhoods. Figure 3 presents balance tests in which we regress a neighborhood characteristic measured prior to the award on an indicator for receipt of a Revitalization grant. Panel A weights by population and illustrates that there are significant differences between the Revitalization and failed applicant neighborhoods. Panel B uses inverse propensity score weights and illustrates that these weights eliminate observable differences between the two groups.

The key identifying assumption is that, conditional on the estimated propensity score, assignment of treatment is orthogonal to potential outcomes. An intuitive concern with our strategy is: Why were some of the applicants with high estimated propensity scores rejected? If, for example, the failed applicant neighborhoods had lower potential for reductions in poverty then this would lead us to overstate the effect of the program on reducing

poverty rates. Figure 4 plots the average change in neighborhood poverty between 1990 and 2017 against the average estimated propensity score for groups defined by treatment (non-HOPE VI, failed applicant, and Revitalization neighborhoods) and the decile of the estimated propensity score. The series for the non-HOPE VI projects and failed applicants show that these two groups exhibited similar changes in poverty rates conditional on their estimated propensity score. In other words, poverty rates in failed applicant neighborhoods evolved similarly to poverty rates in observably similar neighborhoods that never applied for HOPE VI funding. The series for the Revitalization neighborhoods previews an important finding and shows that poverty rates in these neighborhoods declined much more than observably similar neighborhoods. This is particularly true for neighborhoods with high values of the estimated propensity score (which tend to be neighborhoods with high poverty rates and large public housing projects).

In most cases we have data on pre-treatment outcomes and we operationalize the comparison between Revitalization neighborhoods and failed applicant neighborhoods using a stacked difference-in-differences estimator. To address concerns related to the staggered timing of treatment, we follow Cengiz et al. (2019) and stack the data for each grant year. For each grant year we create a panel dataset that includes all failed applicants and the awardees from that year and outcomes 5 years before and 15 years after the award year.[15] We then stack the datasets from each award year and estimate the following specification,

$$y_{nt} = \sum_{j \neq -1} \beta^j D_{nt}^j + \lambda_{gt} + \delta_{ng} + \epsilon_{nt} \tag{1}$$

where δ_{ng} is neighborhood by grant year fixed effect, λ_{gt} is fixed effect for grant year by year relative to award, and D_{nt}^j treatment indicator equal to one if neighborhood n received a Revitalization grant and t is j years after the award.[16] We estimate this specification via

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[15]This specification effectively compares the Revitalization awardees in a given year to all failed applicants. The propensity score is estimated within grant year to adjust for observable differences between these two groups. Standard errors are clustered at the level of the neighborhood to account for the fact that we reuse the failed applicants as controls across grants years.

[16]We use the neighborhood by grant year fixed effect because we stack the data and a panel of the failed

weighted least squares using the inverse propensity score as weights and cluster standard errors at the level of the neighborhood. The main coefficient of interest is β^j, which traces out treatment effects over time relative to the year before the award.

In some cases we also use a simple cross-sectional estimator. Specifically, we estimate the following specification,

$$y_n = \alpha + \beta D_n + \lambda_g + \epsilon_n \tag{2}$$

where y is the outcome variable (typically measured as an average between the 10 to 15 years after the award) for neighborhood n, λ_g is a fixed effect for the grant year, and D is an indicator equal to one if the neighborhood received a Revitalization grant. We estimate this specification via weighted least squares using the inverse propensity score as weights and cluster standard errors at the level of the neighborhood. In some cases we control for pre-treatment covariates to increase precision.

5   Effect of the Revitalization Program

The following subsections present our empirical analysis of the Revitalization program. Section 5.1 discusses the effect of the program on the targeted neighborhoods. Sections 5.2 and 5.3 investigate who benefited from the neighborhood-level changes by first focusing on the original residents and then the new residents. Section 5.4 explores whether the program affected the poverty rates of other neighborhoods.

5.1   Neighborhoods

We begin by showing that the Revitalization program had a large impact on population churn. Figure 5 presents the results from equation 1 where the outcome variable is the log of total population. The Revitalization program led to a 26 log point reduction in population five years after the award. But population quickly recovered in the following five years.

applicant neighborhoods appears in the data for each grant year.

The results suggest the following timeline: (*short-run*) in the five years following the award people moved out and housing units were demolished; (*medium-run*) in the next five years people moved back in to the neighborhood as housing units were reconstructed; and (*long-run*) around ten years after the award construction was largely complete, the population had mostly recovered, and population growth began to stabilized.[17]

The Revitalization program led to a long-run reduction in neighborhood poverty rates, not by increasing the income of the original residents, but by reducing the number of poor households and increasing the number of non-poor households. The red series in Figure 6(A) illustrates that the Revitalization program led to an 8 percentage point reduction in the share of residents with an AGI below $15,000 15 years after the award.[18] While not directly comparable, these estimates are qualitatively similar to those found in Tach and Emory (2017).[19] The blue series presents results based on the panel of original residents and shows that the program had no effect on the income of individuals that originally lived in the neighborhood. Thus, the reduction in neighborhood poverty rates is driven by a change in who lives in the neighborhood as opposed to income gains for the original residents. Neighborhood poverty rates could decline through a reduction in the number of poor households or an increase in the number of non-poor households. Figure 6(B) shows that both forces are at play. In the long-run the Revitalization program led to a 10 log point reduction in the number of residents with an AGI below $15,000 and a 20 log point increase in the number of residents with an AGI above $15,000. Thus, while the Revitalization program displaced some poor households, it reduced neighborhood poverty rates by also attracting higher income households.

The Revitalization program led to a persistent reduction in the population with sub-

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[17]Figure A.3 presents the effect on the physical housing stock. These results suggest a similar timeline, with a reduction in total housing units in the first five years and the construction of new housing units taking place over the subsequent five years. These estimates are somewhat imprecise since the housing stock variables are measured from public data in 1990, 2000, and an annual series only starting in 2007.

[18]As discussed in Section 3, we classify households with an AGI below $15,000 as poor.

[19]Tach and Emory (2017) pool together Demolition and Revitalization grants and estimate the combined effect of these two HOPE VI programs on the change in poverty rates between 1990 and 2010. They find that the program led to a 11 percentage point reduction in poverty in the long-run.

sidized housing in the neighborhood. Figure 7 illustrates how the Revitalization program affected the proportion and number of people in public, any subsidized, and non-subsidized housing. Not surprisingly, the program dramatically reduced the number of individuals with public housing in the years immediately following the award. But even 15 years after the award, we find that the program led to a 14 log point reduction in the number of people in public housing. However, there was only a 3 log point reduction in the number of people with any subsidized housing; suggesting that the program shifted people into other types of subsidized housing (primarily voucher housing) without dramatically reducing the total number of subsidized households in the long-run. Furthermore, as we will see below, some of the original tenants of the public housing project were awarded vouchers and moved to different neighborhoods. Thus, a reduction in the number of subsidized households in these particular neighborhoods need not imply a reduction in subsidized units in the broader housing market. The program increase the non-subsidized population by 11 log points 15 years after the award.

Poverty rates fell in Revitalization neighborhoods primarily because fewer poor households with subsidized housing and more higher income households without subsidized moved in after the award. Table 2 presents estimates from equation 2 where the outcome variable is the average number of people who live in the neighborhood 10 to 15 years after the award. The specification controls for the number of poor and non-poor individuals who lived there in the year before the award to increase precision. Columns 1 and 2 indicate that the Revitalization program decreased the number of poor residents by 269 and increased the population with a higher income by 156 individuals. Columns 3 through 6 illustrate that both the reduction in poor residents and the increase in higher income residents is driven by a change in the number of new residents, as opposed to a change in migration patterns of original residents. Specifically, the program reduced the number poor residents who were there at the time of the award and who moved in after the award by 74 and 195 individuals, respectively. Columns 7 through 14 further break these results out by subsidized housing

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status and illustrate that the decline in the population of low-income households is driven by new residents with subsidized housing and the growth in the population of higher income households is driven by new residents without subsidized housing.

The reduction in poverty was not driven by an influx of higher income adults without children. The program was largely motivated by a desire to improve living conditions for children and it would thus potentially be problematic if the changes in poverty rates were driven by childless adults. To assess this concern, we calculate the proportion of children whose parents have an AGI of less than $15,000. Compared to the results based on the full population in the neighborhood, Figure 8 illustrates that we find a slightly larger reduction in the proportion of poor families with children.

Figure 9 presents a more detailed view of the effect of the program on the income distribution within the neighborhood. For each neighborhood, we calculate the proportion of individuals whose AGI falls within a narrow range in the 10 to 15 years after the award and estimate the effect of the program using equation 2. Figure 9 presents the estimates from this specification and shows that the program led to a reduction in proportion of families in all income categories below $15,000. The program led to an increase in relatively higher-income households, but primarily for households that had an AGI of greater than $20,000 and less than $100,000. Thus, the program reduced the proportion of low-income families primarily by increasing the proportion of moderate-income families.

Figure 10 presents results for the racial composition of the neighborhood. Many of the HOPE VI projects were predominately Black, which explains why the Black population share in the neighborhood declined when the projects were demolished. However, in the long-run we do not find significant changes in the racial composition of the neighborhood.

The Revitalization program led to a substantial increase in housing costs, but had no impact on home ownership rates. We measure housing-related variables using responses to the ACS in the 10 to 15 years after the award.[20] Since we do not have ACS data in the

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[20]Importantly, we are able to link the ACS data to the HUD administrative data and exclude households that receive subsidized housing. Respondents to the ACS often record the rent they pay as opposed to their

pre-award period, we use equation 2 to estimate the effect of the program the outcomes from the ACS. Column 1 of Table 3 shows that the program increased average rent by 5 log points. In column 2 we find even larger effects on our measure of home values, with a 12 log point increase in average monthly mortgage payments. Columns 3 and 4 suggest that the program had no impact on home ownership rates. Consistent with Figure 7, columns 5 and 6 illustrate that the program led a reduction in the proportion of the population that was a subsidized renter and an increase in the proportion of the population that was a non-subsidized renter.

5.2   Original Residents

Many of the original residents of the Revitalization neighborhood moved away and were thus not exposed to the changed neighborhood conditions found in the previous section. Figure 11(A) provides useful context and plots the proportion of original residents of the Revitalization neighborhoods–i.e., residents of the neighborhood in the year before the award–who moved away by a given year after the award. Residents of both public and non-public housing exhibited extremely high rates of rates of residential mobility. Within five years of the award, over 70 percent of the original residents of the public housing projects and over 60 percent of the other residents in the area had moved away. While we show below that the program does increase the propensity of original residents to move, Figure 11(B) presents similarly high rates of mobility for the failed applicant population. Within five years of the award, about 60 percent of the original residents of the public housing projects have moved away. These descriptive findings foreshadow a main finding in this section: Residents of high-poverty neighborhoods containing public housing projects are highly mobile, which limits their exposure to any changes in neighborhood conditions.

The program induced original residents living in public housing and in non-subsidized housing to move away, while having no impact on the mobility patterns of households that had access to other forms of subsidized housing. Figure 12 presents estimates from equation

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contract rent. Because HOPE VI reduces the share of units that are subsidized, using all responses to the ACS would lead us to overestimate the effect on market rent.

1 where the sample includes individuals who originally lived in the neighborhood in the year before the award and the outcome is the proportion of individuals who have moved by a given year after the award. Five years after the program the original residents of the Revitalization public housing projects were 18 percentage points more likely to have moved to a different neighborhood. Over the following decade, this difference relative to the failed applicant group declines as some households in the failed applicants projects also move away. We find that original residents of the neighborhoods that did not have access to subsidized housing were about 5 percentage points more likely to have moved within five years after the award. Interestingly, we find no effect on the residential mobility patterns of original residents that had access to other forms of subsidized housing. This could be because these households were shielded from the increase in housing costs found in Table 3.

The original residents of the public housing projects were pushed out of public housing, but these displacement effects from subsidized housing were partially offset by receipt of other types of housing subsidized (primarily vouchers) and faded with time. Figure 13 presents the effect of the program on housing subsidy type for original residents of public housing. Five years after the award original residents of the Revitalization projects were 15 percentage points less likely to be living in public housing. However, this decline is partially offset by a 9 percentage point increase in the probability of receiving some other form of housing assistance, primarily in the form of voucher housing. Thus, the program led to a 6 percentage point reduction in the receipt of any subsidized housing five years after the award. However, these displacement effects decline over time and the Revitalization program actually led to a 4 percentage point increase in the probability of receiving subsidized housing 15 years after the award. These dynamics could be explained by a story in which some households were displaced in the short-run, but the ones that received other forms of subsidized housing preferred this to their original public housing project and were thus less likely to exit in the future.

Of the original residents, were lower income households more likely to be displaced? To

investigate this question we estimate the following specification using individual data,

$$m_i = \beta x_i \times D_n + \phi x_i \times (1 - D_n) + \lambda_{ng} + u_i \tag{3}$$

where i is the individual, n is the neighborhood, m is an indicator equal to one if i moved to a new neighborhood within five years, x is an indicator equal to one if AGi is less than \$15,000, λ_{ng} is a neighborhood by grant year fixed effect, D_n is equal to one if the neighborhood received a Revitalization grant, and standard errors are clustered at the level of the neighborhood. The coefficients β and ϕ describe how household income is correlated with residential mobility in Revitalization and failed applicant neighborhoods, respectively. We estimate this specification for three different samples defined by whether the household was originally in public housing, other subsidized housing, or non-subsidized housing in the year before the award.

Figure 14 presents the estimates of β and ϕ obtained from equation 3. The results for public housing show that, in failed applicant projects, low-income households are about 7 percentage points less likely to move than high-income households. Intuitively, in distressed public housing projects, only low-income residents with limited outside options will tend to stay. In contrast, in Revitalization projects, low-income households are only 2 percentage points less likely to move. The fact that there is less sorting within the Revitalization projects is attributable to the fact that most of the units were demolished and all residents were forced to move. Interestingly, for both the other subsidized and non-subsidized populations we do not see differential patterns of sorting in the failed applicant and Revitalization neighborhoods. For households with other subsidized housing, household income is largely unrelated to the propensity to move. For households without subsidized housing, low-income households are significantly more likely to move. These patterns hold in both the failed applicant and Revitalization neighborhoods. These results suggest that the program did not lead to a reduction in neighborhood poverty rates by disproportionately pricing out low-income

households who originally resided in the neighborhoods.

Relative to impact on neighborhoods, the Revitalization program had a much smaller impact on exposure to poverty for original residents. The red series in Figure 15(A) presents the effect of the program on the poverty rate of the Census block group in which the original resident current lives. Within five years of the award, the program reduced the poverty rate of the current neighborhood by about 5 percentage points. This outcome variable is measured using data from the most recently available Census or ACS and is not perfectly aligned with the early measure of the proportion of the population with AGI less than $15,000. For comparability, the blue series plots the effect of the program on the poverty rate of neighborhood that received the Revitalization grant, also measured using the survey data. The results indicate that the Revitalization program reduced the poverty rates in the targeted neighborhoods by over 10 percentage points but reduced the poverty rates in the neighborhoods in which the original residents lived by less than 5 percentage points.

The program could have reduced exposure to neighborhood poverty by either benefiting original residents who stayed, or displacing some original residents to lower poverty neighborhoods. To investigate this we construct counterfactual estimates of the poverty rates in the Revitalization neighborhoods absent the program. Specifically, for each year after 1990 we regress current poverty rate on the poverty rate in 1990 and include a county fixed effect. We estimate this specification on a sample that excludes the Revitalization neighborhoods, and then use the model to estimate the counterfactual poverty rates in each year for the Revitalization neighborhoods. This counterfactual measure tells us how poverty rates likely would have evolved based on changes in other similarly poor neighborhoods in the same county. We then estimate a specification where we replace the true neighborhood poverty rate with this counterfactual poverty rate for individuals who remained in the Revitalization neighborhood. The results are presented in the green series of Figure 15(A). The estimates suggest that if the program had no impact on the poverty rate of Revitalization projects the reduction in exposure to neighborhood poverty would be about 40 percent lower. In other words,

over half of the reduction in exposure to neighborhood poverty appears to be attributable to increased residential mobility to lower-poverty neighborhoods. This makes sense given that the Revitalization neighborhoods tended to be located in the poorest neighborhoods in the city, thus any moves were likely to be to substantially lower poverty neighborhoods.

Figure 15(B) illustrates how reductions in neighborhood poverty differ for groups of original residents defined by the housing subsidy in the year before the award. Residents of both public and non-subsidized housing experience similar reductions in exposure to neighborhood poverty. The estimates for voucher holders are slightly smaller but are also imprecise.

5.3   New Residents

While the Revitalization program reduced the number of subsidized renters in the neighborhood, those that were able to find a unit after the award benefited by living in a lower-poverty neighborhood. The reduction in poverty rates in the revitalized neighborhoods does not necessarily translate into a reduction in exposure to neighborhood poverty for new residents. In particular, the program could have attracted residents who, absent the intervention, would have chosen to live in a different low-poverty neighborhood. To investigate this possibility, we construct a sample of all individuals that move into a failed applicant or Revitalization neighborhood 10 to 15 years after the award. We then regress the poverty rate of the prior neighborhood on an indicator for receipt of a Revitalization grant. The regression is estimated via weighted least squared using the inverse propensity scores as weighted and clustering standard errors at the level of the neighborhood.

Panel A and column 1 of Table 4 illustrate that we find similar poverty rates of origin neighborhoods for subsidized households that move into the Revitalization and failed applicant neighborhoods after the award. The average poverty rate of the origin neighborhood for the failed applicants group is 0.28. Column 2 includes a vector of additional controls and shows that the finding is robust to conditioning on individual characteristics. Column 3 and 4 present estimates for the change in neighborhood poverty rate between the Revi-

talization and origin neighborhood. Households with subsidized housing who move into a Revitalization neighborhood after the award experience a 13 percentage point reduction in neighborhood poverty rates compared to households who move into a failed applicant neighborhood after the award. In other words, the program did not appear to have a dramatic affect on the migration patters of subsidized households and thus those that moved into the neighborhoods after the award experience substantial reductions in exposure to poverty.

Panel B of Table 4 presents analogous results for residents without subsidized housing. Columns 3 and 4 suggest that these households also experience reductions in poverty relative to the failed applicant neighborhoods, but the magnitudes are about a fourth as large as the estimates for the subsidized households. The estimates in columns 1 and 2 suggest that this not because non-subsidized household who move in Revitalization neighborhoods are coming from lower poverty neighborhoods. Rather the differences between panels A and B are likely attributable to differential weighting across projects that arises from the number of people who move into each neighborhood. The projects that experienced the largest reductions in poverty have the greatest number of subsidized households moving in after the award while the neighborhoods the experienced the smallest reductions in poverty have the greatest number of non-subsidized households moving in after the award.

Residents with subsidized housing are less likely to move out of a Revitalization neighborhood after an award. Columns 5 and 6 of Table 4 present estimates from a regression of an indicator for moving to a new neighborhood in the subsequent year on the Revitalization indicator. The sample includes all individuals who live in the neighborhoods 10 to 15 years after the award. Panel A suggest that individuals with subsidized housing are about 2 percentage points less likely to move out of a Revitalization neighborhood (this is about a 10 percent reduction relative to the mean mobility rate in failed applicant neighborhoods). Lower rates of out-migration suggest that residents of revitalized neighborhoods are more satisfied with their neighborhood. In Column 6 of Panel B we do not find similar reductions in residential mobility for the non-subsidized households.

5.4 Spillovers

The Revitalization program had a small impact on the poverty rates of surrounding neighborhoods. To estimate the effect of the program on surrounding neighborhoods we estimate equation 1 where the outcome variable is the proportion of individuals with AGI below $15,000 in the contiguous Census block groups surrounding the Revitalization and failed applicant neighborhoods. Figure 16 plots the estimates and illustrates that the program led to a 1 percentage point reduction in the neighborhood poverty rate 15 years after the award. For comparison, the figure also presents the effect on the neighborhoods that contain the Revitalization projects. The results suggest that the program had a very localized affect on the targeted neighborhoods and did not have a large impact on the poverty rates of the surrounding neighborhoods.

Original residents displaced by the program were not displaced into a select few neighborhoods. As shown in Figure 12, the magnitude of the displacement effects peak about five years after the award. Thus, for each neighborhood we identify all individuals who lived in the neighborhood before the award but moved away by five years after the award. Within each origin neighborhood, we then rank destination neighborhoods based on the number of individuals who moved there. In panel A of Table 5, columns 1 through 11 present the mean number of people who moved to a destination neighborhood of a given rank. On average, 111 individuals from from the Revitalization neighborhoods moved to the most common destination neighborhoods (column 11) and 1220 individuals from the Revitalization neighborhoods moved to the least common destination neighborhoods, i.e. they were ranked 11th or lower (column 1). We then estimate the effect of the program on the size of these out-migration flows using equation 2. Columns 2 through 11 suggest the Revitalization program did not meaningfully increase the number of people who moved to the most common neighborhoods. Column 1 illustrates that the program caused an additional 250 people to move to the least common destination neighborhoods. Intuitively, the Revitalization program displaced some of the original residents but dispersed them to different neighborhoods across the city.

Because the Revitalization program dispersed the original residents across many different neighborhoods, the program did not lead to a detectable increase in neighborhood poverty rates in any of the destination neighborhoods. The outcome variable in panel B of Table 5 is the change in neighborhood poverty rate between the year before the award and five years after. From the least to the most common destination, we find no evidence that the program led to reductions in neighborhood poverty rates. This makes sense given that the program did not produce concentrated migration flows of displaced residents.

One potential concern with the previous analysis is that the neighborhood rankings are based on post-award migration flows, which could themselves be affected by the intervention. The fact that there are only a few neighborhoods that receive a meaningful number of residents suggests that this is unlikely to affect our conclusions.[21] We assess this concern by re-ranking neighborhoods based on pre-award migration flows–specifically, people who moved away prior to the year before the award. The results are presented in Table A.2. The means in Panel A suggest that migration patterns are fairly stable over time, as neighborhoods that are more highly ranked using pre-award migration flows tend to receive more migrants after the award. Using this alternative methodology delivers a qualitatively similar result: There is no evidence that the Revitalization program substantially increased poverty rates in other neighborhoods by displacing low-income residents. Our finding that the program did not have large spillover effects on the poverty rates of other neighborhoods is not inconsistent with other work that finds spillover effects on crime (Bruhn, 2018) and housing prices (Blanco, 2021; Blanco and Neri, 2021).

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[21]Census tracts have a population between 1,200 and 8,000. Even the largest average flow for the Revitalization neighborhoods was 111. As a strict upper bound, if all of this flow was attributable to displacement effects of the program and all the residents were poor, this would only increase the poverty rates by 1 (100*111/8,000) to 9 (100*111/1,200) percent.

6 Conclusion

Our paper estimates the effect of a large place-based policy, the HOPE VI Revitalization program, on both places and people. Our analysis of places finds that the program led to a large reduction in poverty rates of targeted neighborhoods. These effects are driven by a change in who moved into the neighborhood after the award, as opposed a change in the outcomes of the original residents. Low-income renters are highly mobile and most of the original residents moved away and were not exposed to the changes in neighborhood conditions. While the program reduced the number of subsidized renters in the neighborhood, those that were able to find a unit after the award benefited by living in a lower-poverty neighborhood. A main contribution of our paper is to investigate the interplay between neighborhood-level transformation and individual outcomes. In this way, our analysis informs a central critique of many place-based policies, which is that the benefits might not accrue to the intended populations.

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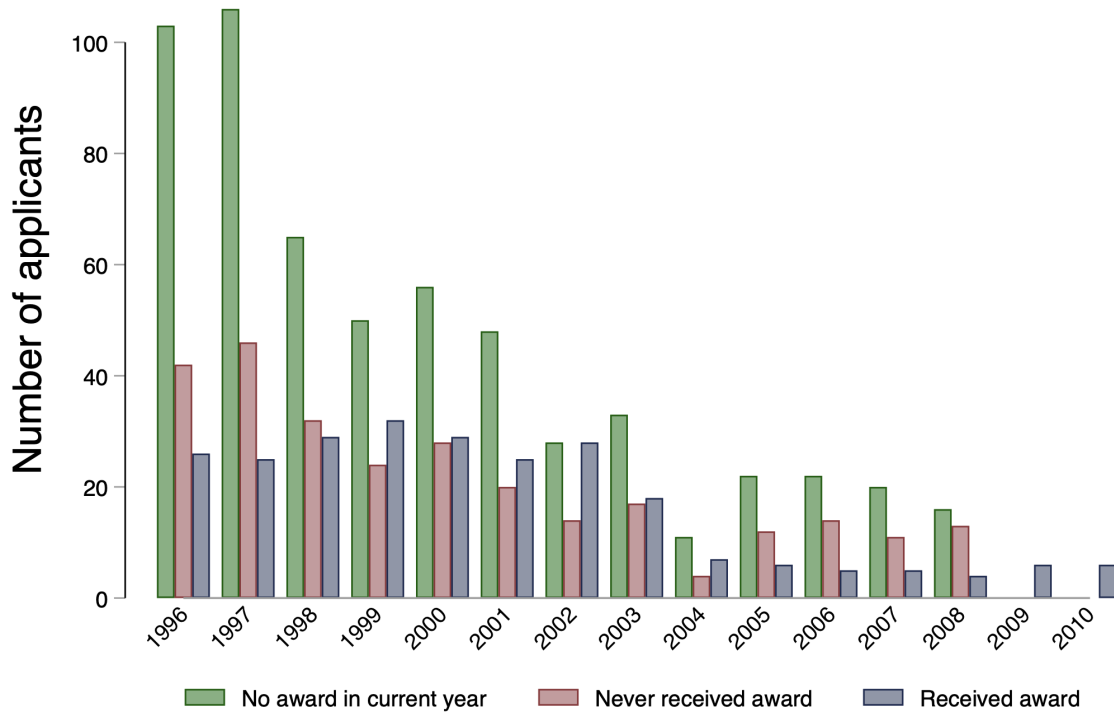
7 Figures

Figure 1: Geographic Distribution of Applicants and Awardees
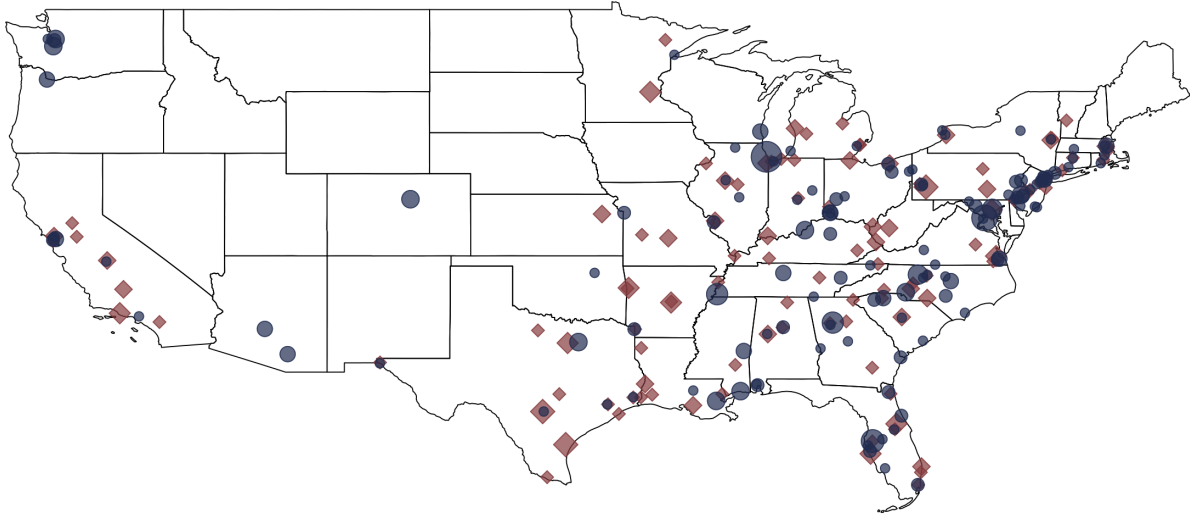
Notes: The blue circles and red diamonds represent the location of HOPE VI Revitalization and failed applicant sites, respectively. The size of the markers is proportional to the number of units in the project. Source: Authors' calculations based on project-level summary files from HUD.

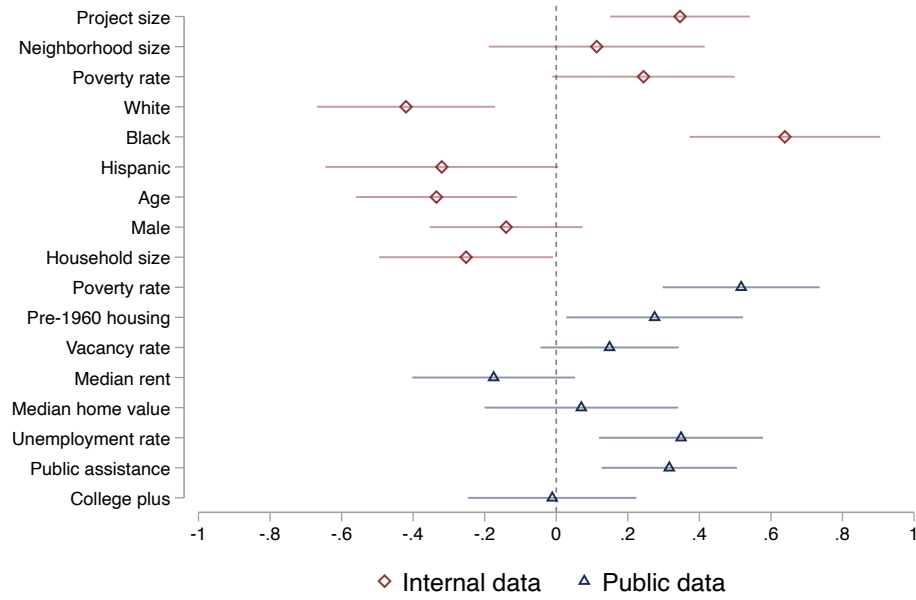Figure 2: Number of Awardees and Failed Applicants by Year

Notes: The figure presents the number of public housing projects per grant year for projects that applied for and: (1) did not receive funding in that year, (2) did not receive funding in any year, and (3) received a HOPE VI Revitalization grant in that year. If a project received more than one HOPE VI grant, then we report the earliest year. Projects not awarded a grant in one year could apply in a subsequent year. We do not observe application data for 2009 and 2010.

Source: Authors' calculations based on the publicly available list of awardees of and applicants to HOPE VI funding.

Figure 3: Balance of Baseline Characteristics

(A) Population weights

◇ Internal data   △ Public data

(B) Inverse propensity score weights

◇ Internal data   △ Public data
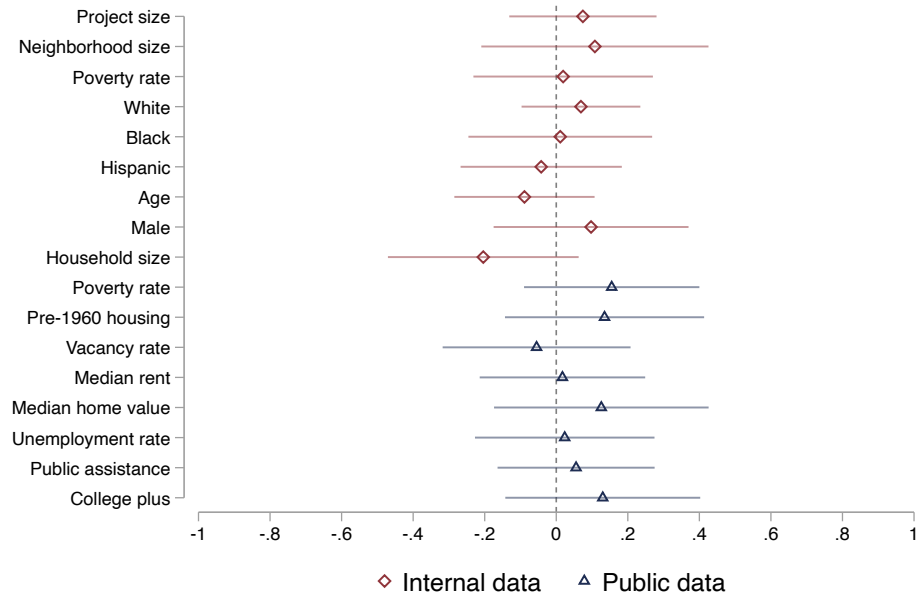
Notes: Each point represents an estimate from a separate regression in which we regress a characteristic of the neighborhood measured prior to the award (standardized by mean and s.d.) against a treatment dummy. In panels A and B we weight by population and the inverse propensity score, respectively. The red diamonds denote variables constructed using our internal data and the blue triangles denote variables based on publicly available data. Standard errors are clustered at the level of the neighborhood and the horizontal bars denote the 95 percent confidence interval.

Source: Authors' calculations based on linked administrative data.

Figure 4: Change in Poverty Rate by Estimated Propensity Score
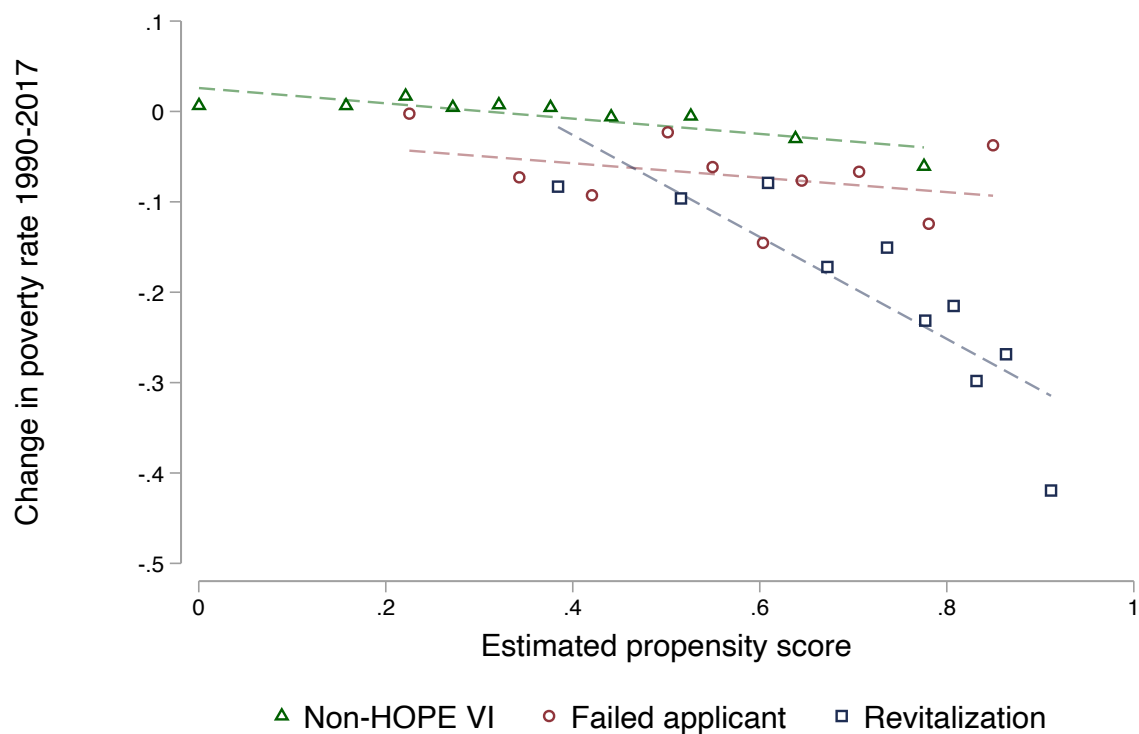
Notes: This figure plots the change in neighborhood-level poverty rates between 1990 and 2017 against the estimated propensity score. Within the non-HOPE VI, failed applicant, and Revitalization samples, observations are grouped into deciles based on the estimated propensity score.

Source: Authors' calculations based on summary files of Decennial Census survey and the ACS.
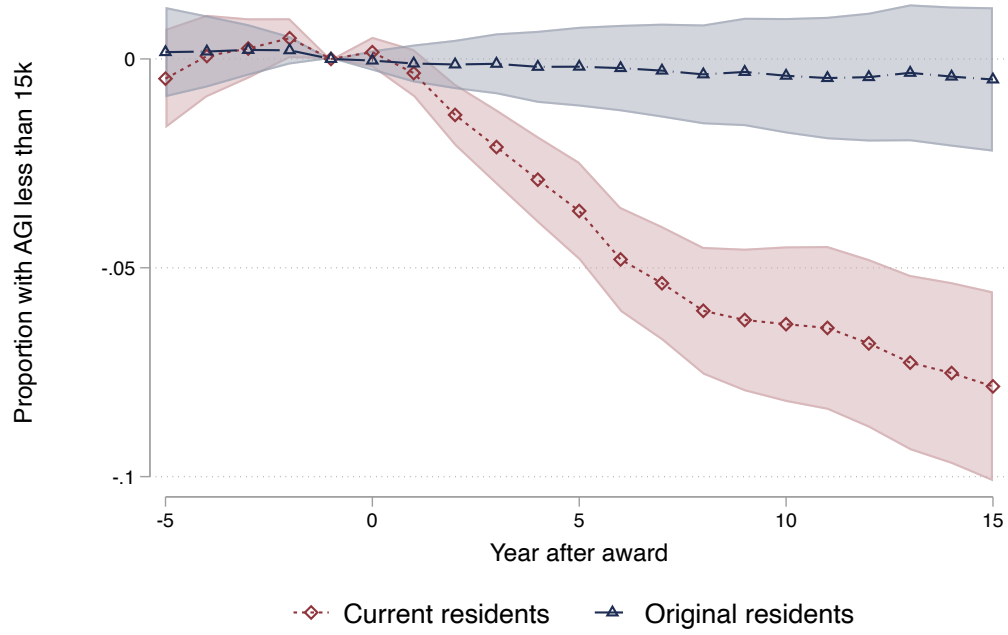
Figure 5: Effect on Population of Neighborhood
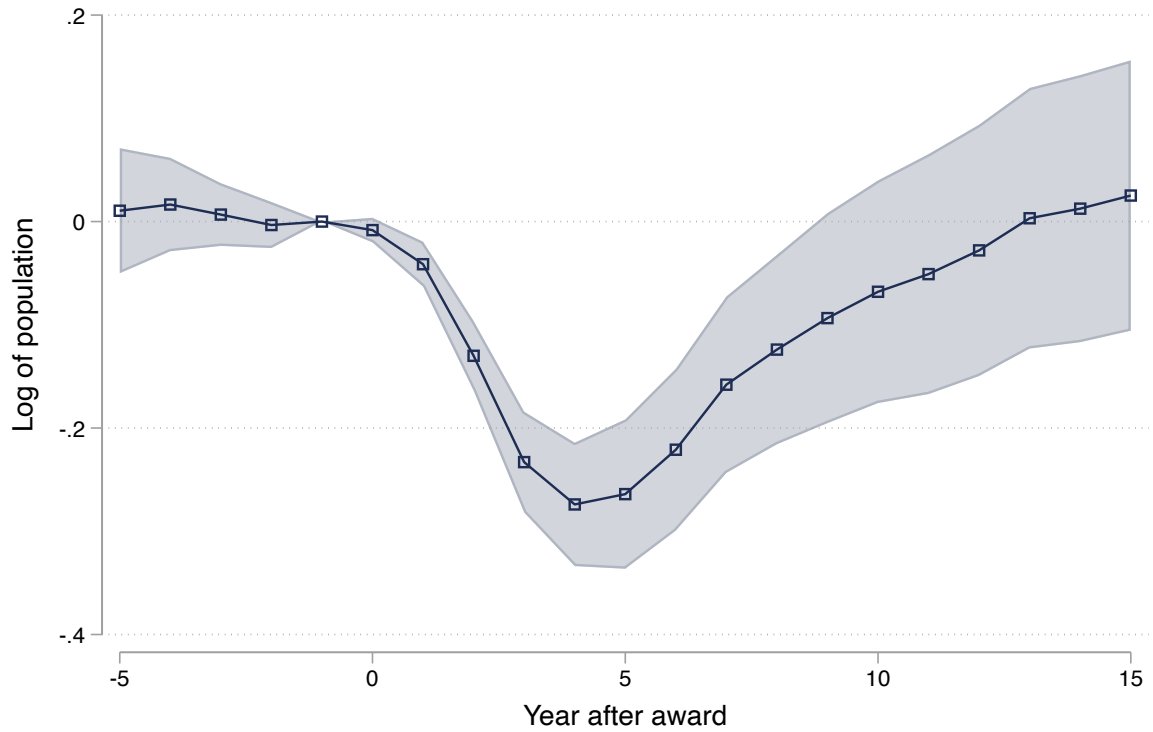
Notes: This figures plots estimates from the stacked difference-in-differences specification described in equation 1. The outcome variable is the log of the total number of people living in the neighborhood. The shaded regions denote the 95 percent confidence intervals.
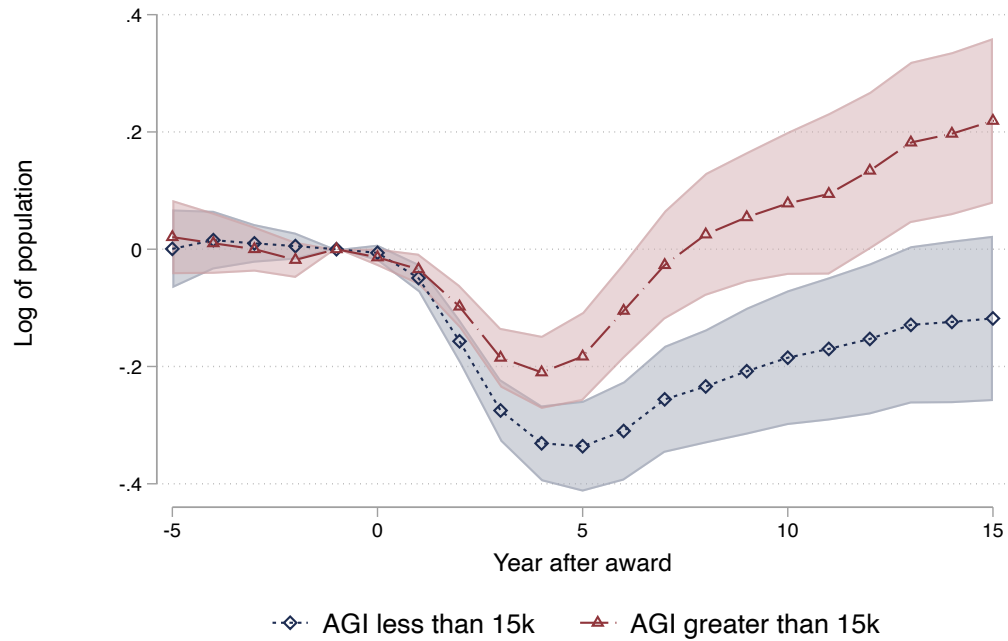
Source: Authors' calculations based on linked administrative data.

Figure 6: Effect on Neighborhood Poverty

(A) Proportion
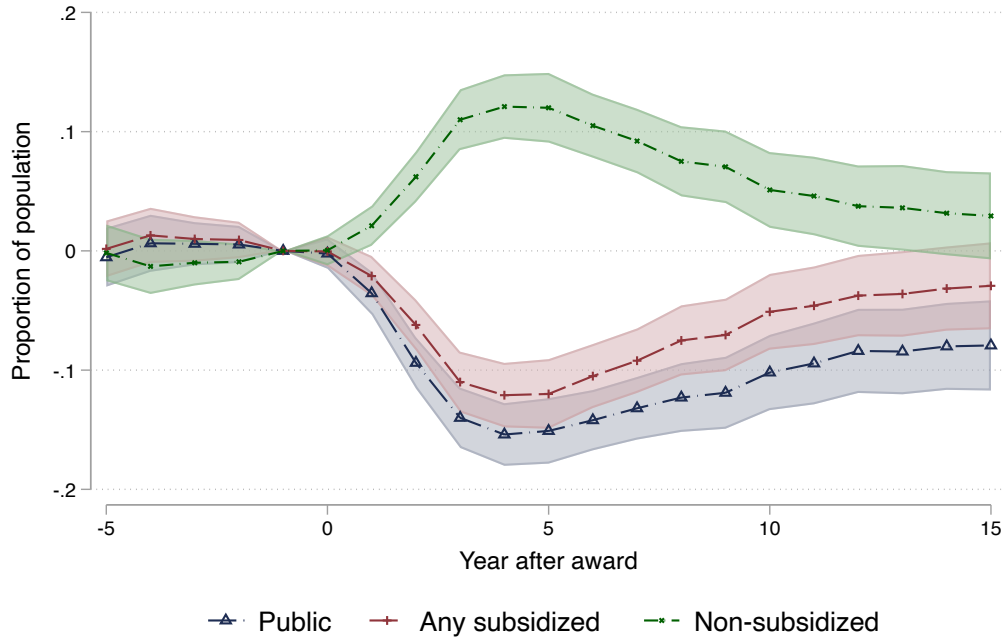

(B) Number of People

Notes: This figures plots estimates from the stacked difference-in-differences specification described in equation 1. In panel A the outcome is the proportion of current residents who are poor or the proportion of original residents who are poor. In panel B the outcome is the log number of poor and non-poor individuals in the neighborhood. The shaded regions denote the 95 percent confidence intervals.
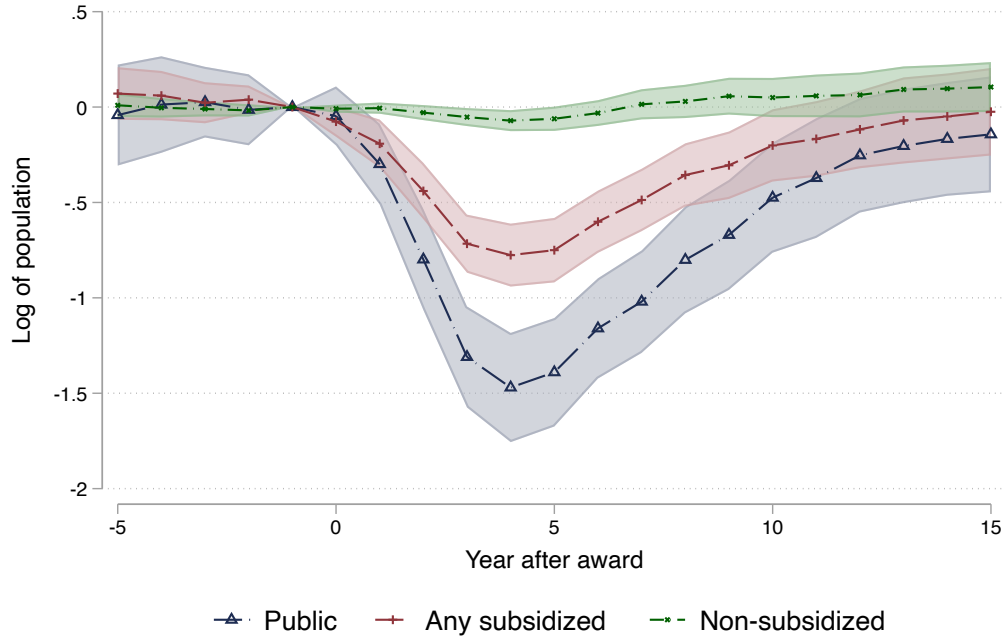Source: Authors' calculations based on linked administrative data.

Figure 7: Effect on Subsidized Housing in Neighborhood
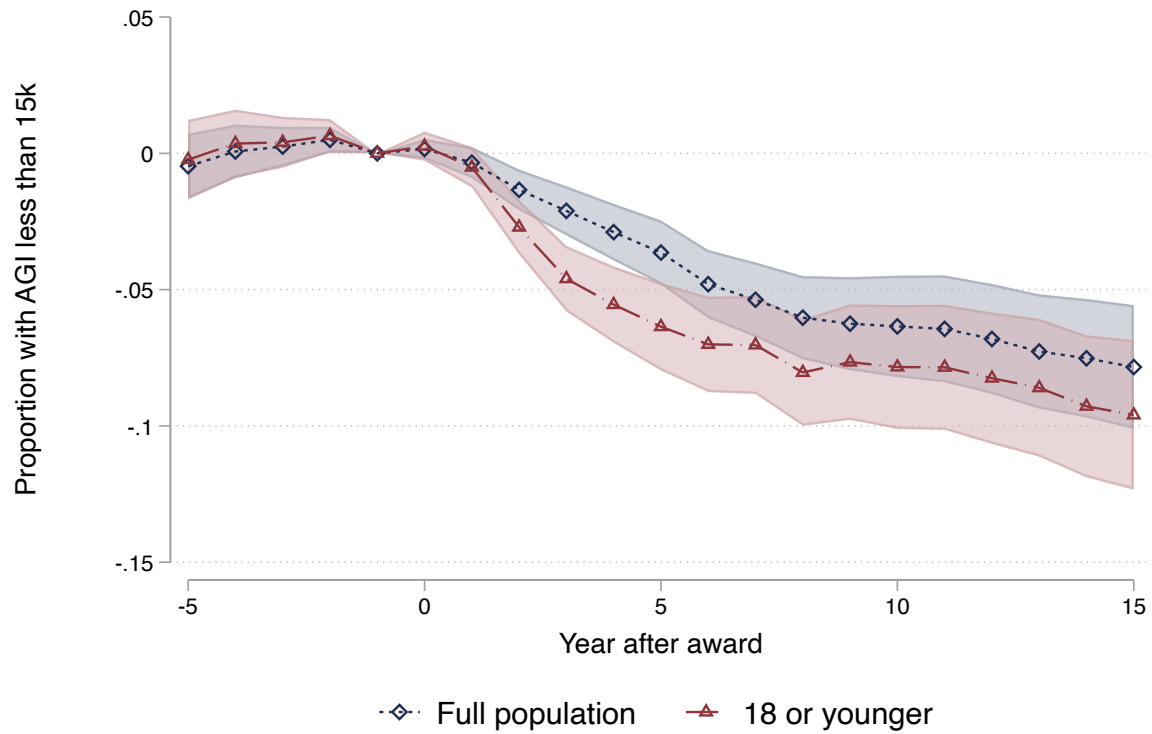
(A) Proportion

(B) Number of People

Notes: This figures plots estimates from the stacked difference-in-differences specification described in equation 1. In panel A the outcome is the proportion of the population in public, any subsidized, or non-subsidized housing. In panel B the outcome is the log number of people in each of the three groups. The shaded regions denote the 95 percent confidence intervals.

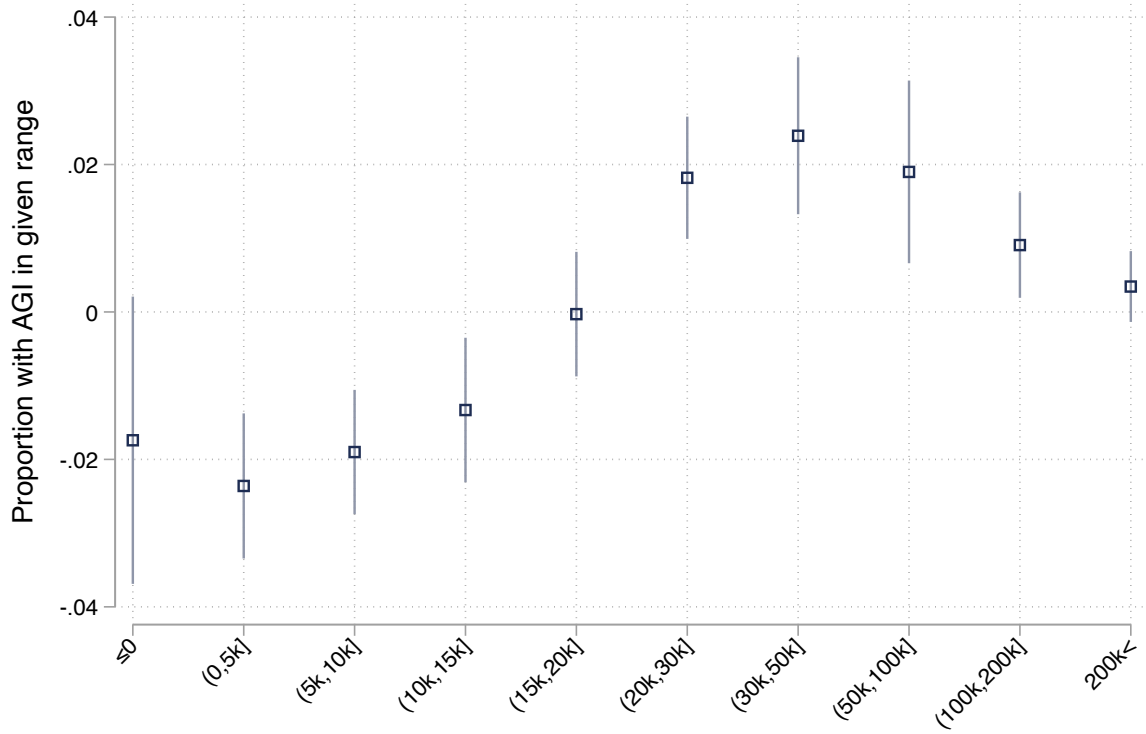Source: Authors' calculations based on linked administrative data.

Figure 8: Effect on Neighborhood Poverty, Families with Children

Notes: This figures plots estimates from the stacked difference-in-differences specification described in equation 1. The outcome is the poverty rate for all individuals in the neighborhood (diamond markers) or the poverty rate for those 18 and younger (triangle markers). The shaded regions denote the 95 percent confidence intervals.

Source: Authors' calculations based on linked administrative data.

Figure 9: Effect on Income Distribution in Neighborhood

Notes: This figures plots estimates from the equation 2. Each point represents an estimate from a separate regression in which the outcome variable is the proportion of individuals living in the neighborhood 10 to 15 years after the award whose AGI falls within the range defined by the horizontal axis. The vertical bars denote the 95 percent confidence intervals.
Source: Authors' calculations based on linked administrative data.

Figure 10: Effect on Racial and Ethnic Composition of Neighborhood

Notes: This figures plots estimates from the stacked difference-in-differences specification described in equation 1. The outcome is the proportion of the population that is White non-Hispanic, Black non-Hispanic, or Hispanic. The shaded regions denote the 95 percent confidence intervals.
Source: Authors' calculations based on linked administrative data.

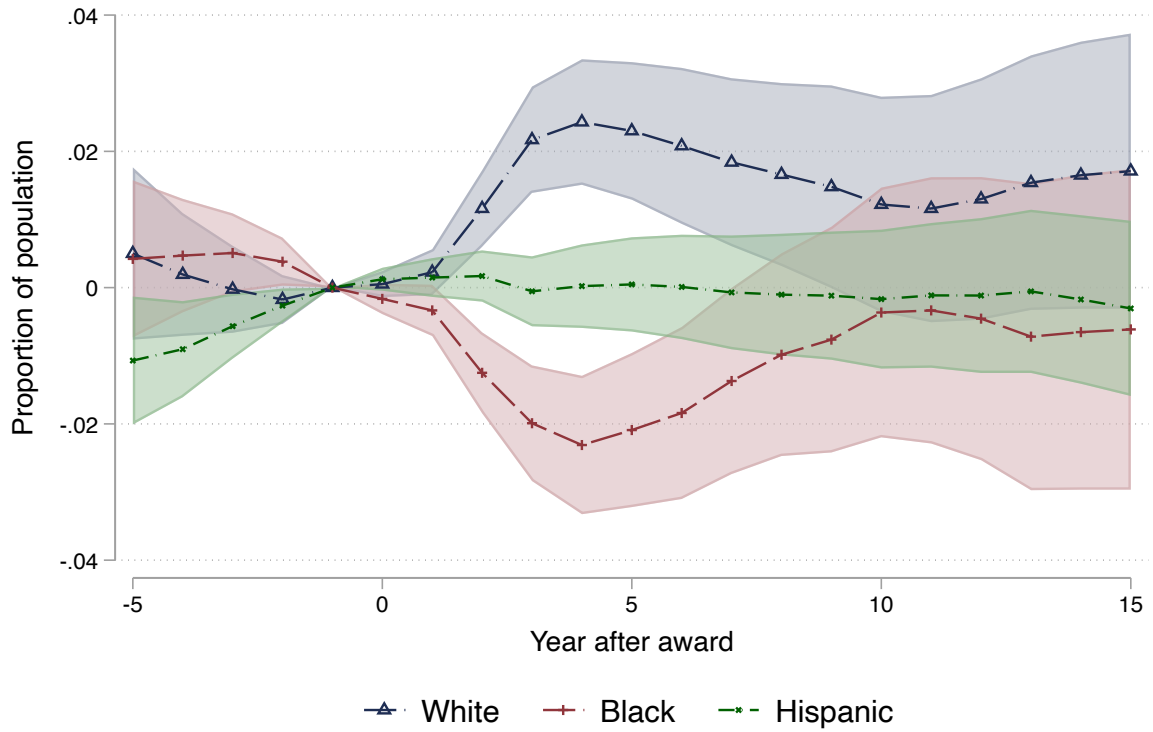Figure 11: Residential Mobility of the Original Residents

(A) Revitalization

(B) Failed applicant

Notes: This figures plots the proportion of the original residents who moved to a different Census block group by a given year after the award. Results are broken out by populations defined by treatment status and original housing status (i.e., non-subsidized, other subsidize-d, or public housing).
Source: Authors' calculations based on linked administrative data.

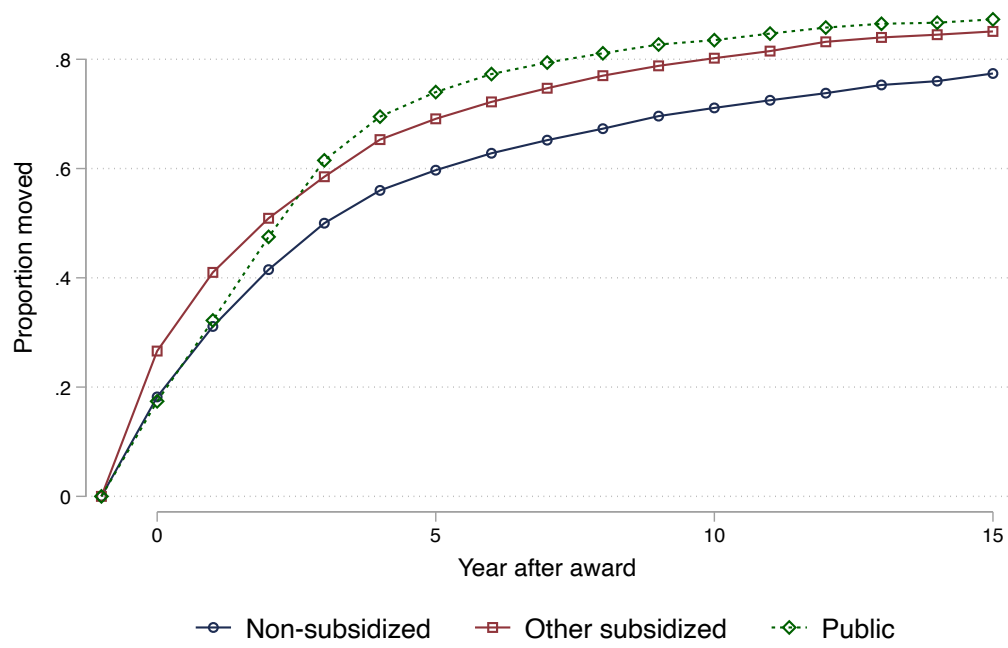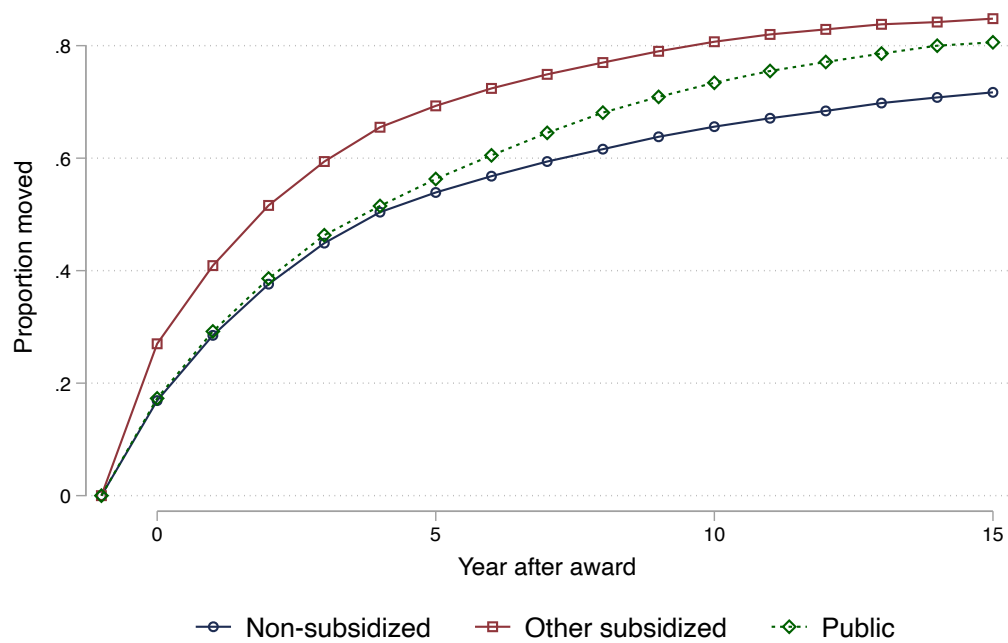Figure 12: Effect on Residential Mobility of Original Residents
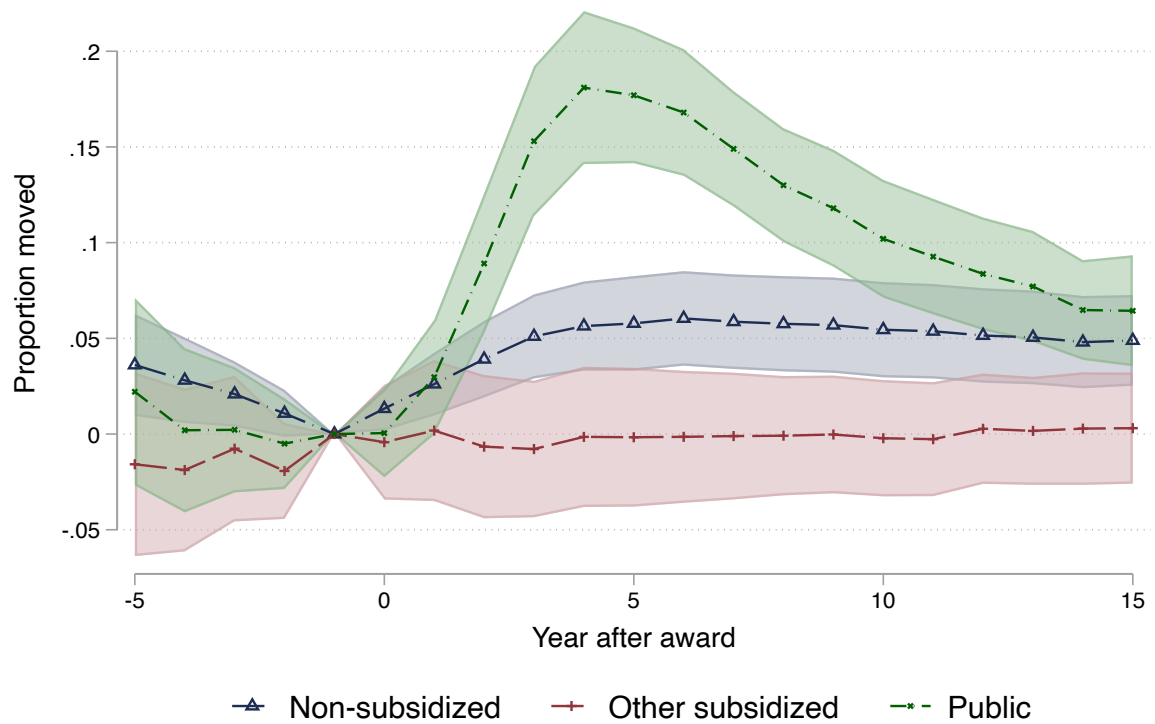
Notes: This figures plots estimates from the stacked difference-in-differences specification described in equation 1. The out is the proportion of the original residents who moved and results are presented separately by original housing status (i.e., non-subsidized, other subsidized, or public housing). The shaded regions denote the 95 percent confidence intervals.

Source: Authors' calculations based on linked administrative data.

Figure 13: Effect on Subsidy Status, Original Residents of Public Housing
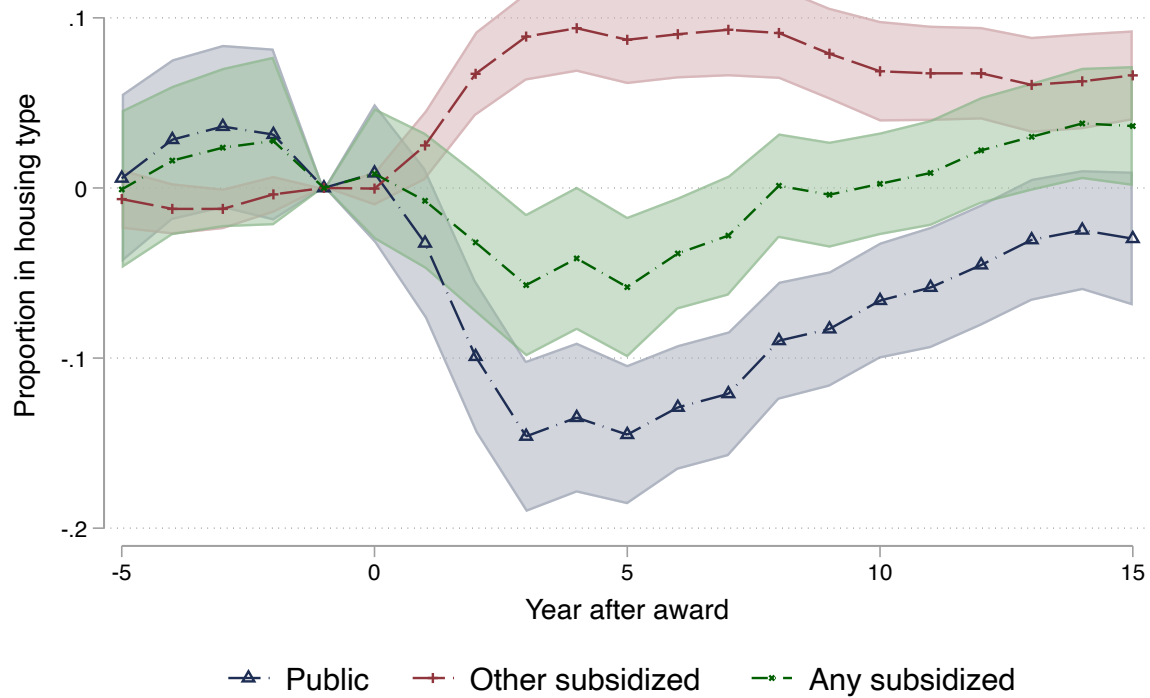
Notes: This figures plots estimates from the stacked difference-in-differences specification described in equation 1. The outcome is the proportion of the original residents of the public housing project that were living in public, other subsidized, or non-subsidized housing. The shaded regions denote the 95 percent confidence intervals.
Source: Authors' calculations based on linked administrative data.

Figure 14: Association between Residential Mobility and Poverty for Original Residents

Notes: This figures plots estimates from the specification described in equation 3. The outcome variable is an indicator for moved within five years after the award. The clusters of bars represent estimates from three separate regressions where the population is individuals living in public, other subsidized, and non-subsidized housing. The vertical bars denote the 95 percent confidence intervals.

Source: Authors' calculations based on linked administrative data.

Figure 15: Effect on Exposure to Neighborhood Poverty for Original Residents

(A) Full population
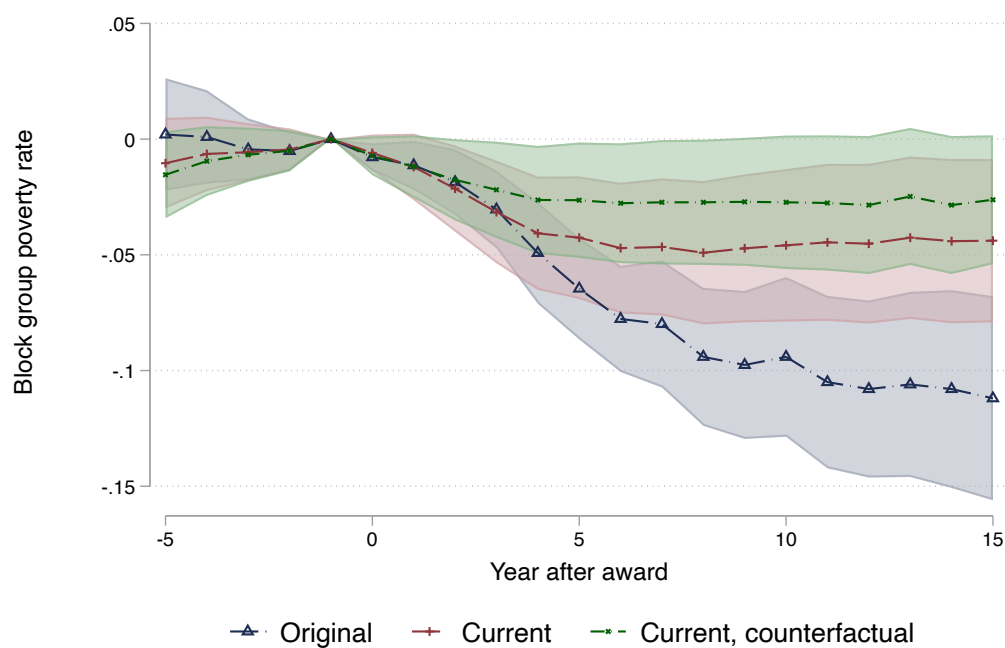
(B) By subsidized housing status
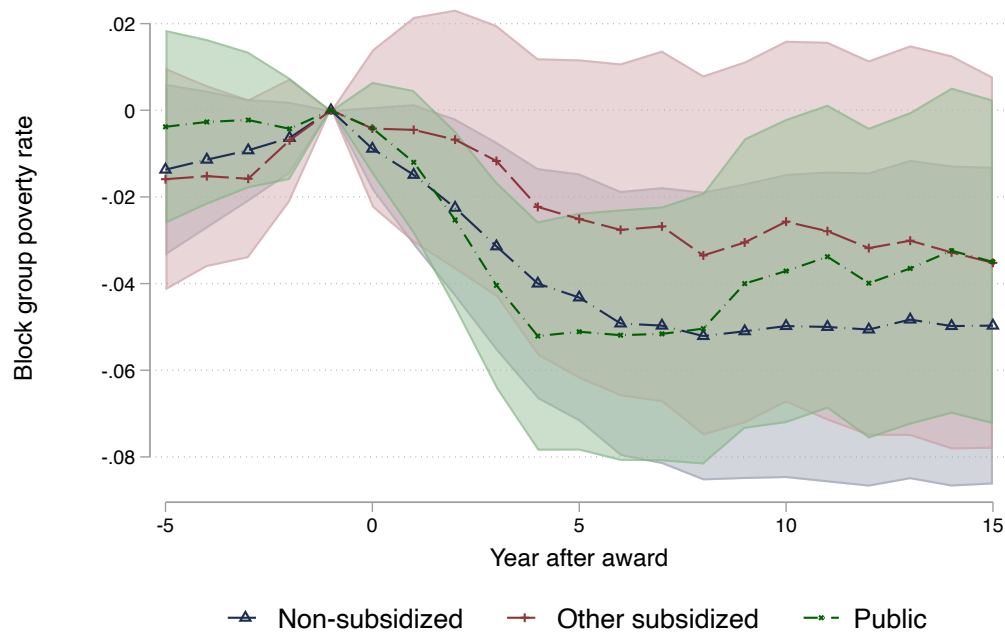
Notes: This figures plots estimates from the stacked difference-in-differences specification described in equation 1. The outcome in panel A is the poverty rate of the original or current neighborhood. The outcome in panel B is the poverty rate of the current neighborhood, and results are estimated separately by subsidized housing status. The shaded regions denote the 95 percent confidence intervals.
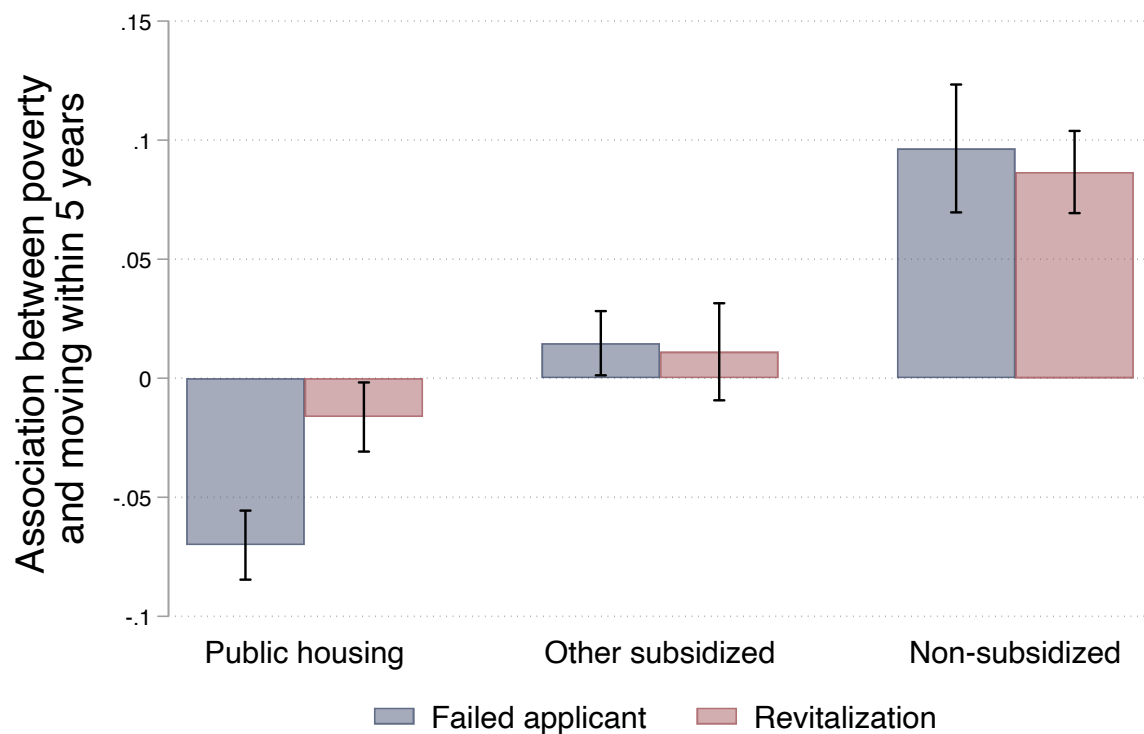Source: Authors' calculations based on linked administrative data.

Figure 16: Effect on Poverty Rates in Surrounding Neighborhoods
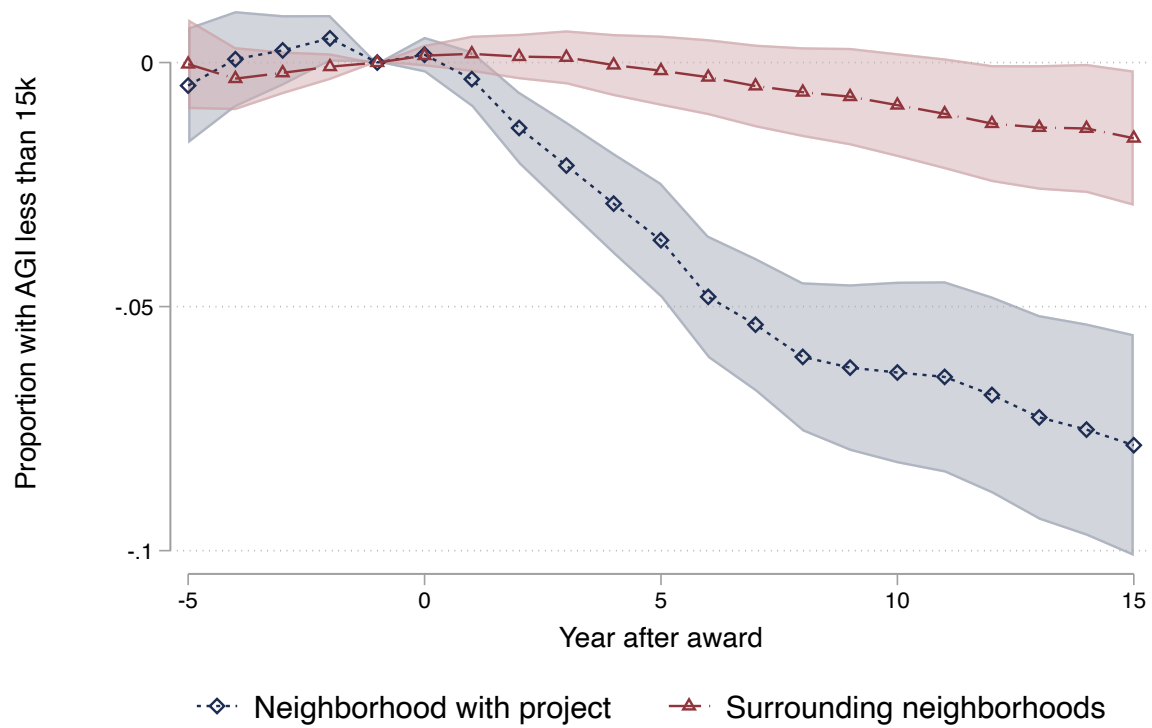
Notes: This figures plots estimates from the specification described in equation 1. The outcome variable is the poverty rate in the target neighborhoods or the poverty rate in the contiguous Census block groups. The shaded region denotes the 95 percent confidence intervals.
Source: Authors' calculations based on linked administrative data.

8 Tables

Table 1: Baseline Characteristics

	Non-HOPE VI		Failed Applicant		Revitalization	
	mean	s.d.	mean	s.d.	mean	s.d.
A. Project						
Occupied units	430	960	293	200	667	756
Percent minority	61.6	38.9	77.7	33.0	77.9	35.6
Percent majority income earned	21.1	15.2	19.9	11.2	14.1	10.5
Average household size	2.3	1.1	2.7	1.0	2.4	1.1
Percent 62 or older	26.4	21.4	15.0	11.8	13.1	11.7
Percent with disability	12.9	11.1	10.9	7.5	10.0	8.9
Percent single parent	35.5	25.0	47.4	23.4	40.3	27.2
Percent with female head	69.0	25.7	75.4	24.6	71.4	31.5
Percent crowded housing	6.8	8.5	7.4	6.8	8.0	7.1
Average rent	273	145	248	123	189	130
Average income (thousands)	13.1	6.9	11.6	5.3	8.9	5.9
Observations	5,783		166		251	
B. Census block group						
Percent Black	31.9	33.8	48.3	36.2	72.0	32.0
Median rent	606	260	501	207	451	222
Median home value	119	103	111	113	109	107
Percent with public assistance	19.2	13.0	31.3	16.8	38.2	17.2
Percent unemployed	12.1	8.2	19.4	12.1	24.0	14.1
Percent below poverty	30.8	17.2	45.0	19.0	55.0	20.6
Number of people (thousands)	1.5	0.6	1.6	0.6	1.9	0.8
Observations	5,391		178		308	

Notes: The columns define one of three mutually exclusive samples including non-HOPE VI, failed applicant, and Revitalization neighborhoods. Each row presents statistics for a different variable. In panel A the variables are measured at the project level in 1993. In panel B the variables are measured at the block group level in 1990. In panels A and B we weight by the population of the project and block group, respectively.

Source: Authors' calculations based on project-level summary files from HUD and summary files from the 1990 Decennial Census.

Table 2: Effect on Size of Sub-Populations

	By income		By income and tenure				By income, tenure, and subsidized housing							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Revitalization	-269	156	-74	-195	-42	199	-43	-31	-168	-27	-20	-23	-2	201
	(74)	(65)	(15)	(71)	(10)	(65)	(11)	(10)	(53)	(41)	(7)	(9)	(33)	(54)
	[0.000]	[0.017]	[0.000]	[0.006]	[0.000]	[0.002]	[0.000]	[0.001]	[0.002]	[0.520]	[0.008]	[0.012]	[0.958]	[0.000]
Mean	1580	1100	285	1290	224	879	108	177	696	595	52	172	335	544
AGI ≤ 15k	yes	no	yes	yes	no	no	yes	yes	yes	yes	no	no	no	no
Original resident			yes	no	yes	no	yes	yes	no	no	yes	yes	no	no
Subsidized housing							yes	no	yes	no	yes	no	yes	no
Observations	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000

Notes: Each column presents estimates from a separate regression in which an outcome variable is regressed on an indicator for the Revitalization award. The outcome variable differs across columns and is the size of the population defined by income, tenure, and subsidized housing status. Regressions are estimated via weighted-least squares using the inverse propensity score. All regressions control for the year of first award as well as the number of poor and non-poor households who lived in the neighborhood in the year before the award. Standard errors are clustered at the neighborhood and are presented in parentheses and p-values are presented in brackets.

Source: Authors' calculations based on linked administrative data.

Table 3: Effect on Housing Costs and Home Ownership

	Log housing cost		Proportion of population			
	Rent (1)	Mortgage (2)	Owner (3)	Renter (4)	Renter non-subsidized (5)	Renter subsidized (6)
Revitalization	0.054	0.122	-0.014	0.014	0.068	-0.054
	(0.026)	(0.040)	(0.023)	(0.023)	(0.017)	(0.031)
	[0.035]	[0.003]	[0.537]	[0.537]	[0.000]	[0.087]
Mean	6.900	6.800	0.348	0.652	0.225	0.427
Standard deviation	0.026	0.040	0.023	0.023	0.017	0.031
Observations	2,000	1,500	2,000	2,000	2,000	2,000

Notes: Each column presents estimates from a separate regression in which an outcome variable is regressed on an indicator for the Revitalization award. Regressions are estimated via weighted-least squares using the inverse propensity score. All regressions control for the year of first award and the calendar year as well as the vacancy rate and median home value in the year before the award. Standard errors are clustered at the neighborhood and are presented in parentheses and p-values are presented in brackets. We also report the mean and standard deviations for the failed applicant neighborhoods.

Source: Authors' calculations based on linked survey and administrative data.

Table 4: Migration Patterns for New Residents

	Poverty prior neighborhood		Change in poverty		Moved out	
	(1)	(2)	(3)	(4)	(5)	(6)
A. Subsidized						
Revitalization	-0.005	-0.004	-0.131	-0.130	-0.021	-0.017
	(0.008)	(0.007)	(0.033)	(0.033)	(0.012)	(0.010)
	[0.561]	[0.505]	[0.000]	[0.000]	[0.085]	[0.080]
Covariates		X		X		X
Mean	0.280	0.280	0.261	0.261	0.222	0.222
Observations (thousands)	827	827	827	827	3,012	3,012
B. Non-subsidized						
Revitalization	-0.013	-0.001	-0.047	-0.049	0.018	0.001
	(0.009)	(0.005)	(0.017)	(0.017)	(0.009)	(0.006)
	[0.127]	[0.887]	[0.007]	[0.004]	[0.041]	[0.853]
Covariates		X		X		X
Mean	0.215	0.215	0.162	0.162	0.182	0.182
Observations (thousands)	1,174	1,174	1,174	1,174	6,598	6,598

Notes: Each column presents estimates from a separate regression in which an outcome variable is regressed on an indicator for the Revitalization award. Regressions are estimated via weighted-least squares using the inverse propensity score. All regression control for calendar year and year of first award. The regressions in the even columns also include the following covariates: quadratic in age, indicator for child present in the household, race/ethnicity, source of address data, and AGI. Standard errors are clustered at the neighborhood and are presented in parentheses and p-values are presented in brackets. We also report the mean for the failed applicant neighborhoods.
Source: Authors' calculations based on linked administrative data.

Table 5: Dispersion of Original Residents, using Post-Award Migration Flows

	≤ Eleventh (1)	Tenth (2)	Nineth (3)	Eigth (4)	Seventh (5)	Sixth (6)	Fifth (7)	Fourth (8)	Third (9)	Second (10)	First (11)
A. Number of individuals											
Revitalization	250.0	3.7	3.8	2.8	2.8	1.8	1.2	0.7	0.8	0.7	-2.2
	(111.0)	(2.7)	(3.0)	(3.3)	(3.6)	(4.3)	(4.7)	(5.6)	(6.7)	(8.5)	(11.7)
	[0.025]	[0.173]	[0.196]	[0.393]	[0.431]	[0.678]	[0.793]	[0.904]	[0.900]	[0.934]	[0.847]
Failed applicant mean	966.0	28.5	31.1	34.7	37.9	43.1	48.8	56.3	65.4	80.6	114.0
Revitalization mean	1220.0	32.1	35.0	37.5	40.7	44.8	50.1	56.9	66.3	81.3	111.0
Observations (thousands)	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
B. Change in poverty rate											
Revitalization	-0.001	-0.001	-0.008	-0.006	0.010	0.008	0.009	-0.007	-0.006	0.004	-0.015
	(0.002)	(0.007)	(0.007)	(0.007)	(0.009)	(0.009)	(0.009)	(0.008)	(0.007)	(0.008)	(0.010)
	[0.657]	[0.922]	[0.267]	[0.409]	[0.295]	[0.351]	[0.329]	[0.362]	[0.420]	[0.592]	[0.153]
Failed applicant mean	0.010	0.005	0.016	0.007	0.001	0.003	-0.002	0.005	0.009	-0.003	0.001
Revitalization mean	0.009	0.005	0.009	0.001	0.011	0.011	0.007	-0.002	0.003	0.002	-0.014
Observations (thousands)	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000

Notes: Each column presents estimates from a separate regression in which an outcome variable is regressed on an indicator for the Revitalization award. In columns 1 through 11 the outcome corresponds to the destination neighborhood that received the least to the most individuals from the origin neighborhood. The outcome variable in panels A and B is the total number of individuals who moved to the destination neighborhood and the change in the poverty rates in the destination neighborhood, respectively. Regressions are estimated via weighted-least squares using the inverse propensity score and control for the year of first award. Standard errors are clustered at the neighborhood and are presented in parentheses and p-values are presented in brackets. We also report the mean for the failed applicant and Revitalization neighborhoods. Source: Authors' calculations based on linked administrative data.

Appendix A Additional Results

Table A.1: Sample Restrictions

	Non-HOPE VI		Failed Applicants		Revitalizations	
	count	percent	count	percent	count	percent
Full sample	16,300	100%	244	100%	286	100%
Located in state	15,932	98%	242	99%	286	100%
Not in indian housing	13,233	81%	242	99%	286	100%
In picture of subsized housing	13,233	81%	233	95%	272	95%
Not scattered site or vacant	12,618	77%	220	90%	271	95%
At least 25 units in 1993	8,913	55%	210	86%	266	93%
Not senior housing	6,946	43%	204	84%	262	92%
Non-missing location	6,084	37%	198	81%	251	88%
At least one mile from Revitalization	5,783	35%	166	68%	251	88%

Notes: The column headers define the sample (the three samples are mutually exclusive). Each row presents the count of projects that remain after imposing the sample restriction as well as the percent of the full sample.
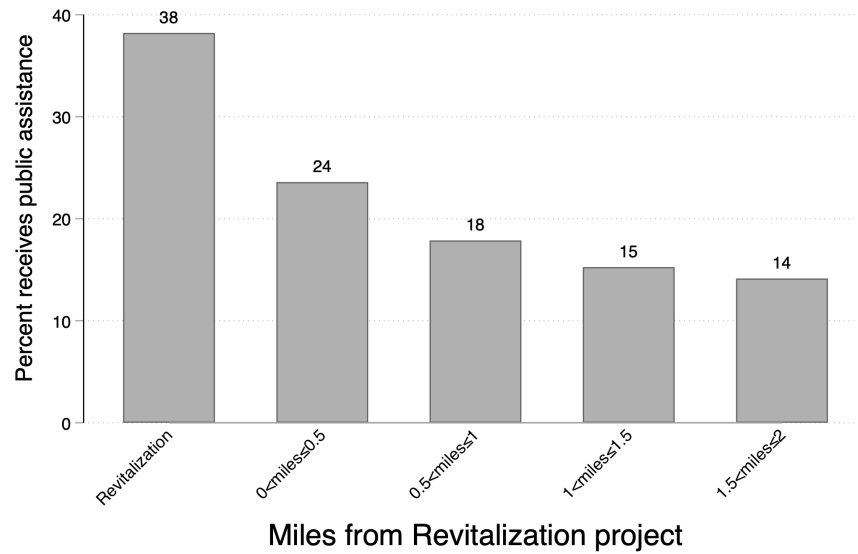
Source: Authors' calculations based on project-level summary files from HUD and the publicly available list of awardees of and applicants to HOPE VI funding.

Figure A.1: Characteristics of Surrounding Neighborhoods

(A) Poverty
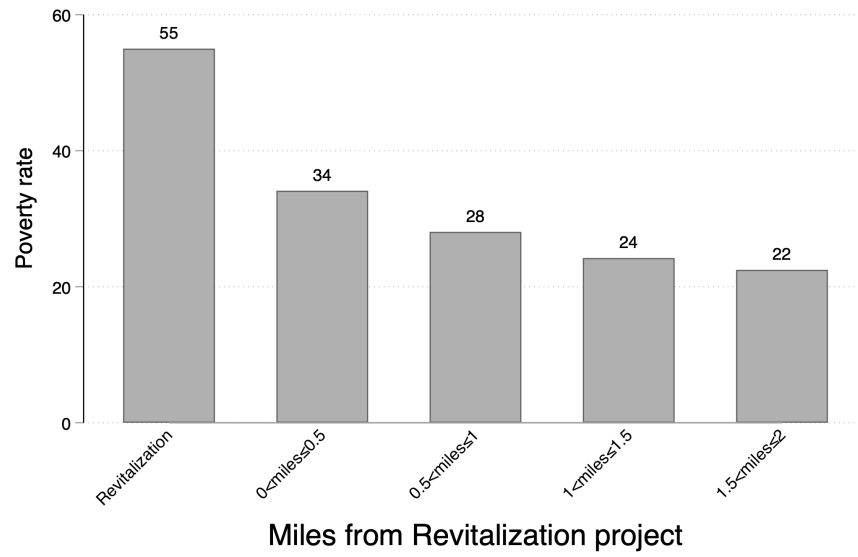
(B) Public Assistance

Notes: The figure presents the average characteristics of neighborhoods that contains a Revitalization project and the neighborhoods within a one mile radius.

Source: Authors' calculations based on summary files of 1990 Decennial Census survey.

Figure A.2: Distribution of Baseline Characteristics

(A) Poverty

(B) Home Value

(C) Minority

(D) Disability


(E) Single Parents

(F) Occupied Units
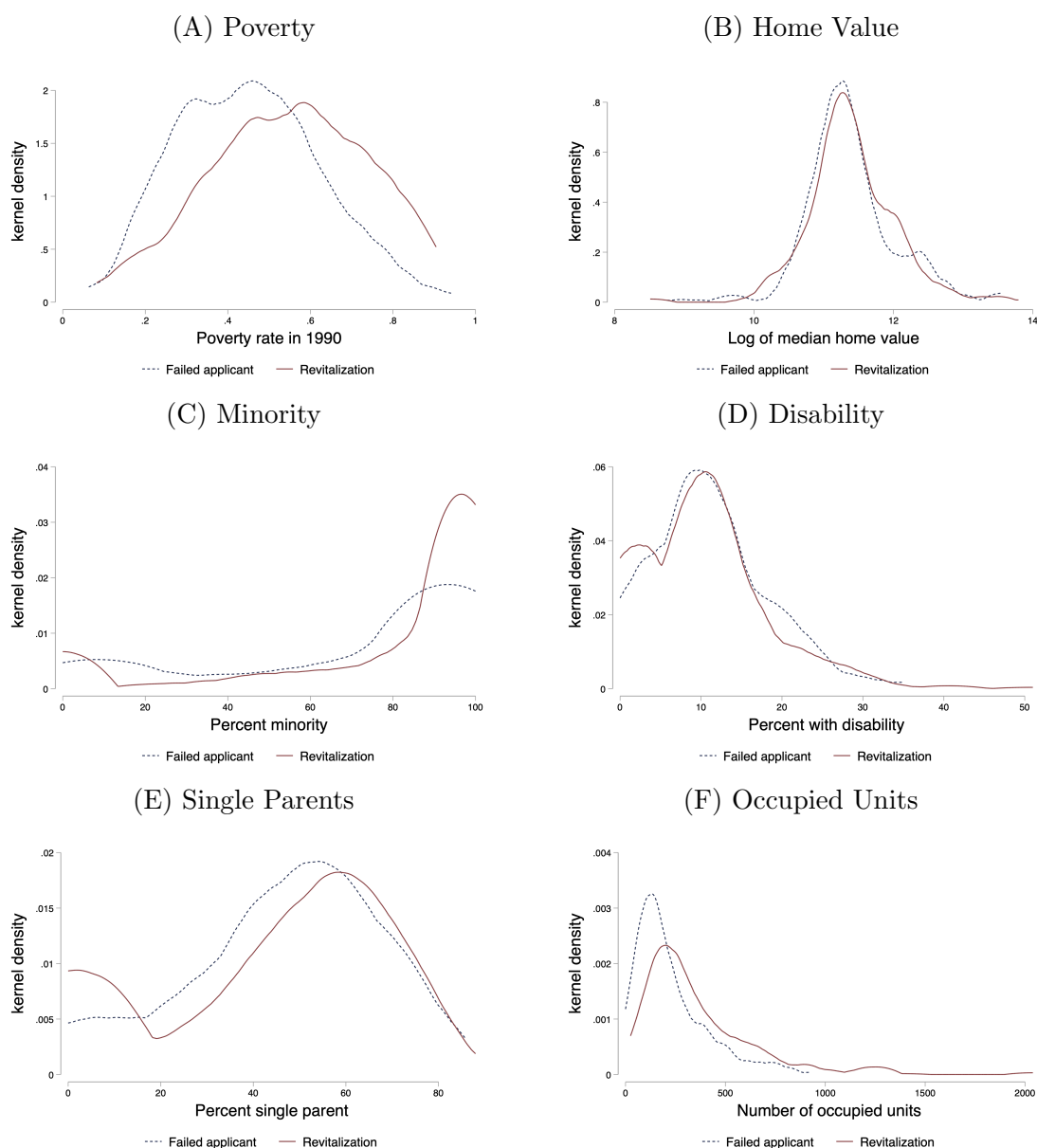
Notes: Each figure presents a kernel density plots of characteristics measured prior to the award. Panels A and B summarize characteristics of the block group and are based on data from the 1990 Decennial Census. Panels C-F summarize characteristics of the projects as measured in the 1993 vintage of HUD User's Picture of Subsidized Households. Distributions are presented separately by treatment status. Source: Authors' calculations based on summary files of 1990 Decennial Census survey and project-level summary files from HUD.

Figure A.3: Effect on Housing Stock

(A) Total housing
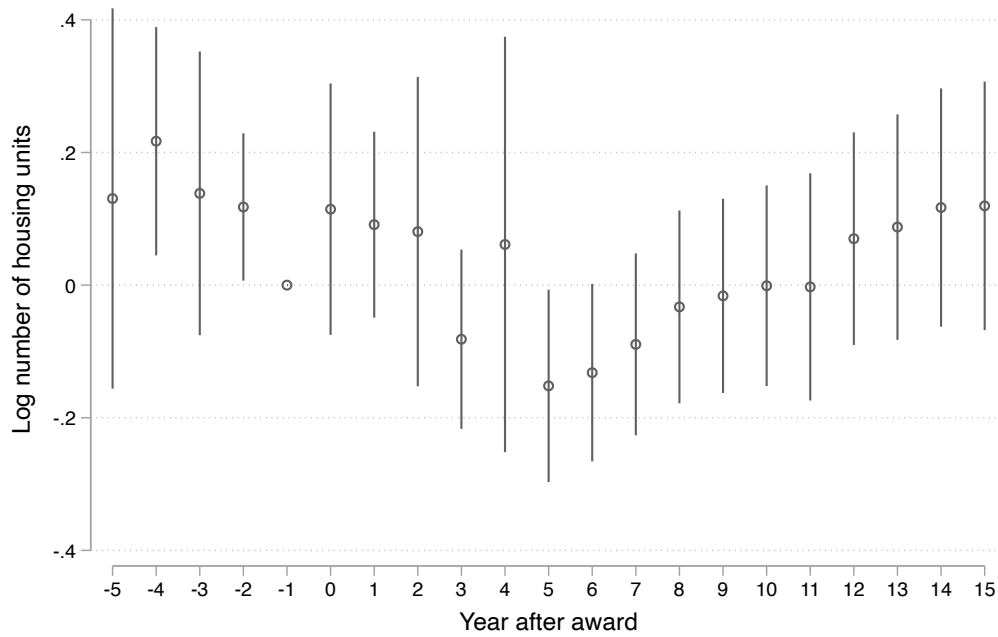
(B) New housing
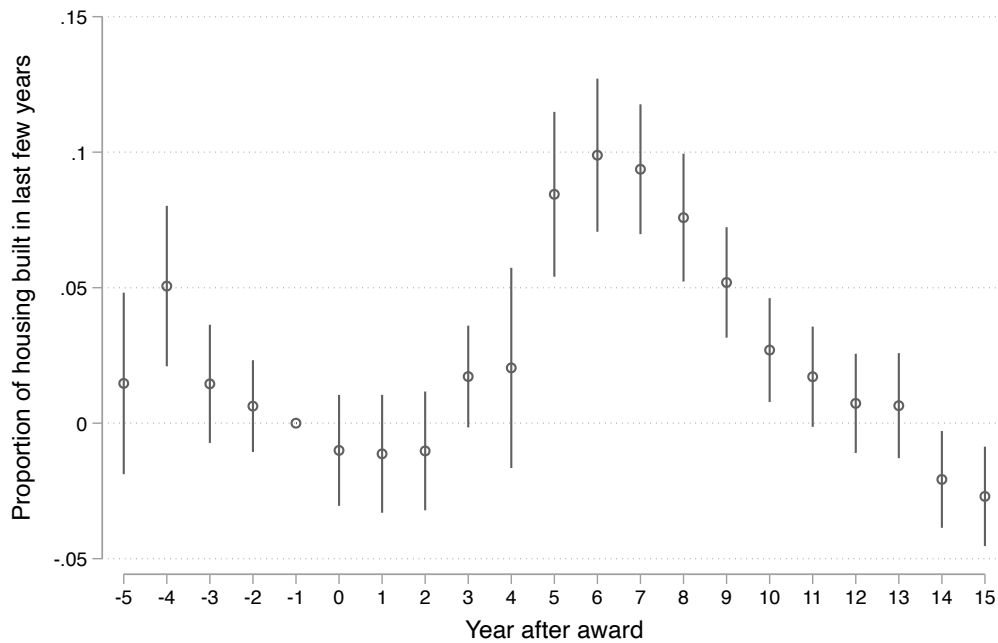
Notes: This figures plots estimates from the stacked difference-in-differences specification described in equation 1. The outcomes are the total housing stock and the proportion of housing built within the past few years. The vertical bars denote the 95 percent confidence intervals.
Source: Authors' calculations based on summary files of Decennial Census surveys and the ACS.

Table A.2: Dispersion of Original Residents, using Pre-Award Migration Flows

	≤ Eleventh (1)	Tenth (2)	Nineth (3)	Eigth (4)	Seventh (5)	Sixth (6)	Fifth (7)	Fourth (8)	Third (9)	Second (10)	First (11)
A. Number of individuals											
Revitalization	224.0	2.8	3.9	0.9	4.2	0.5	-0.1	-1.6	4.0	-4.6	-7.0
	(93.4)	(3.1)	(3.2)	(3.8)	(3.4)	(5.0)	(5.9)	(7.0)	(6.5)	(9.1)	(12.2)
	[0.017]	[0.361]	[0.230]	[0.813]	[0.224]	[0.919]	[0.982]	[0.819]	[0.546]	[0.617]	[0.566]
Failed applicant mean	665.0	27.1	28.7	34.3	33.7	41.1	48.2	55.2	59.0	72.6	101.0
Revitalization mean	889.0	29.8	32.8	35.2	37.8	41.6	48.0	53.5	63.2	68.1	93.9
Observations (thousands)	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
B. Change in poverty rate											
Revitalization	-0.002	0.007	0.001	-0.005	-0.003	-0.002	0.003	-0.013	-0.009	0.006	-0.018
	(0.002)	(0.008)	(0.008)	(0.009)	(0.008)	(0.007)	(0.010)	(0.009)	(0.010)	(0.007)	(0.010)
	[0.302]	[0.399]	[0.882]	[0.550]	[0.726]	[0.779]	[0.746]	[0.127]	[0.335]	[0.422]	[0.060]
Failed applicant mean	0.010	0.003	0.003	0.011	0.007	0.005	0.003	0.004	0.002	-0.000	0.007
Revitalization mean	0.008	0.010	0.005	0.005	0.005	0.003	0.006	-0.009	-0.007	0.006	-0.011
Observations (thousands)	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000

Notes: Each column presents estimates from a separate regression in which an outcome variable is regressed on an indicator for the Revitalization award. In columns 1 through 11 the outcome corresponds to the destination neighborhood that received the least to the most individuals from the origin neighborhood. The outcome variable in panels A and B is the total number of individuals who moved to the destination neighborhood and the change in the poverty rates in the destination neighborhood, respectively. Regressions are estimated via weighted-least squares using the inverse propensity score and control for the year of first award. Standard errors are clustered at the neighborhood and are presented in parentheses and p-values are presented in brackets. We also report the mean for the failed applicant and Revitalization neighborhoods.
Source: Authors' calculations based on linked administrative data.

Appendix B   Illustrative Example

Figure B.1 presents an illustrative example of how the Revitalization program affected neighborhoods by focusing on the Dixie Homes project in Memphis, Tennessee. This project had 439 occupied units in 1993 and was awarded a $20 million Revitalization grant in 2005. The top left image of Figure B.1 depicts satellite imagery from 2004 and shows that the project was intact in the year prior to the grant award. The solid line marks the boundaries of the two census block groups that contain the Dixie Homes project. The map in the bottom left depicts the poverty rate measured from the 2000 Decennial Census of all block groups within one mile of the Dixie Homes project. The poverty rate in the Dixie Homes neighborhoods was 77 percent compared to only 31 percent in the surrounding block groups. The subsequent satellite images on the top panel illustrate how the housing units were demolished in 2007 but then rebuilt by 2019. The map on the lower right shows the poverty rates in 2017. The neighborhoods containing the Dixie Homes projects experienced a 59 percentage point reduction in poverty. In comparison, the surrounding block groups only experienced a 2 percentage point reduction in poverty rates, on average.

The large neighborhood-level changes were not specific to the Dixie Homes project. On average, poverty rates declined by 17 percentage points between 1990 and 2017 among all neighborhoods that were impacted by a Revitalization grant. In comparison, neighborhoods that contained projects that applied for but did not receive HOPE VI funding only experienced a 7 percentage point decline in poverty during this same time.

Figure B.1: Illustrative Example
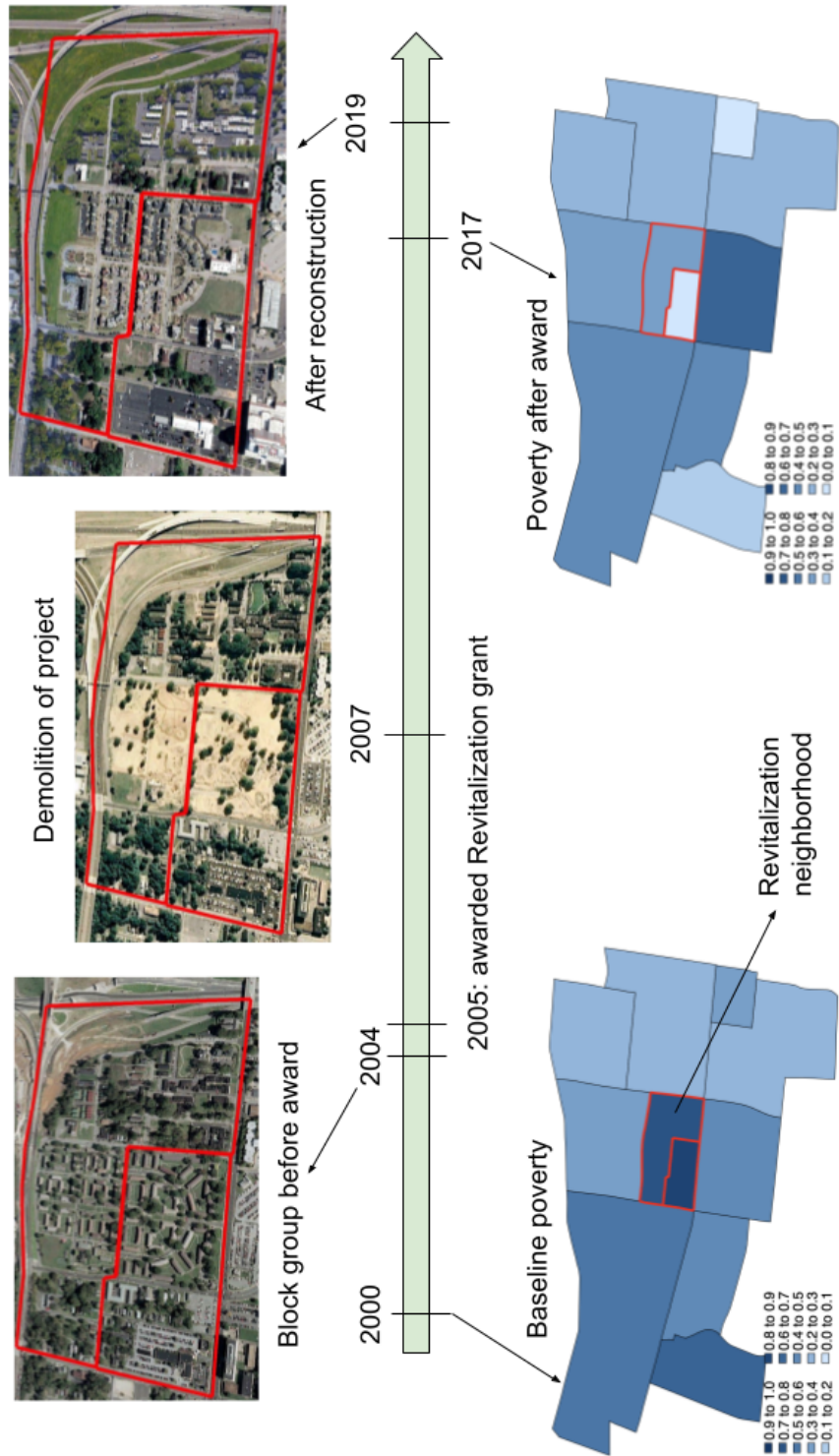
Notes: This figure presents a timeline of the Revitalization award for the Dixie Homes public housing project, which was located in Memphis Tennessee. The images above the timeline are from Google Earth Pro and the solid line marks the two block groups in which the project was located. The figure in the lower left depicts the baseline poverty rate of all block groups within a one-mile radius and the figure in the lower right depicts the change in poverty between 2000 and 2017.