HOPE VI Revitalization: Neighborhood Change, Housing Prices, and Intra-City Migration

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Abstract

We study how a large place-based policy, the HOPE VI Revitalization program, affected both people and places. The program sought to benefit *people* living in and around distressed public housing projects by transforming these *places* into mixed-income communities through the demolition of public housing projects and the construction of mixed-income housing. We estimate the effect of the Revitalization program using administrative data to compare neighborhoods that received an award to those that applied for but never received funding. We find that the program had a large impact on neighborhoods, leading to a 6 percentage point reduction in poverty rates and a 9 percentage point increase in rent. Within five years of the award most of the original residents had moved away and were therefore not exposed to the changes in neighborhood conditions. Some households moved as a result of the program but most would have moved absent the intervention, which suggests that neighborhood-level polices are likely an ineffective way to target specific individuals. In the next steps of our analysis we study the residents who lived in the neighborhoods after the award in an effort to better understand who was exposed to and potentially benefited from the program.

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1 Introduction

Where people live has important implications for short- and long-term measures of health, anti-social behavior, and labor market outcomes.[1] Improving neighborhood conditions for low-income households is therefore a potential way to reduce inequality and promote opportunity. Policies that aim to improve neighborhood conditions for households typically fall into one of two different strategies. One strategy targets *people* and seeks 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 how the provision of information and financial support can lead families to move to lower-poverty neighborhoods. However, the scalability of this approach is limited by the availability of housing in lower-poverty neighborhoods. An alternative type of intervention targets *places*, and seeks to alter and improve existing neighborhoods. A general concern with place-based policies is that benefits might not accrue to the intended populations. Accurately targeting populations with place-based policies requires an understanding of how people and markets will respond to the intervention.

This paper investigates how a large place-based policy, the HOPE VI Revitalization program, affected both people and places. The Revitalization program was administered by the Department of Housing and Urban Development (HUD) and awarded 261 grants totaling $6.3 billion between 1993 and 2010. The goal of the program was to demolish severely distressed public housing projects and replace them with mixed-income communities in which public housing residents would live alongside higher-income neighbors. The program represented a large investment at a very local level as the average grant size was $24 million and the average grantee public housing project contained 400 occupied units. In our analysis

[1] Research indicates that neighborhood environment during childhood has a large effect on social and economic outcomes measured in adulthood (Chetty et al., 2014). While less granular definitions of geography, such as commuting zones or states, have important implications for labor market outcomes, the contemporaneous effects of neighborhoods are generally thought to be less important than the exposure effects on long-term outcomes. However, there is some evidence that the neighborhood of residence has a contemporaneous effect on labor market outcomes through spatial proximity to jobs (Andersson et al., 2016; Haltiwanger et al., 2020) and labor market networks (Hellerstein et al., 2011).

of neighborhoods, we study the effect of the program on neighborhood poverty rates since the primary goal of the program was to reduce the spatial concentration of poverty. A main criticism of the Revitalization program is that rising housing prices driven by increased demand and a reduction in the number of available subsidized and unsubsidized housing units may have forced low-income households to move to different neighborhoods. Thus, the original residents may not have benefited from any improvements in neighborhood conditions. In our analysis of individuals, we investigate the extent to which families were displaced; the mechanisms through which this occurred; and how these effects differed across populations defined by income, race/ethnicity, and receipt of subsidized housing.

We estimate the effect of the Revitalization program using administrative data to compare neighborhoods that received an award to those that applied for but never received funding. We link administrative data on income, residential location, and receipt of subsidized housing in order to measure changes in neighborhoods and track residents as they move in and out of our neighborhoods of interest. While the program targeted some of the most distressed public housing projects in the country, our empirical strategy leverages the fact that, due to funding constraints, there were many qualified projects that applied for but never received an award. Indeed, in an average grant year only 29 percent of applicants received funding. Our empirical strategy compares neighborhoods containing projects that received a Revitalization grant to those that applied for, but that never received funding.

In our analysis of places, we find that the Revitalization program had a large impact on neighborhoods. In the five years following the award housing units were demolished and neighborhood population declined by 26 log points. Construction of new units and re-population occurred in the subsequent five years and neighborhood population fully recovered and even increased slightly fifteen years after the program. These dynamics led to a substantial change in the composition of residents. Notably, the program reduced neighborhood poverty rates by 6 percentage points within ten years of the grant award. We also find that the program reduced the stock of public housing in these neighborhoods by 290

individuals fifteen years after the award. However, the decline in total subsidized housing in the neighborhood was partially offset by an increase in the number of people with some other form of housing subsidy (primarily vouchers) by 160 individuals. These neighborhood-level changes translated into rising housing costs and average rent increased by 8 percent.

In our analysis of people, we find that the program forced some of the original residents to move, but that these displacement effects were muted by the fact that many households would have moved absent the HOPE VI intervention. Not surprisingly, we find the largest displacement effects for the original residents of the public housing projects and the program led to a 15 percentage point increase in the probability of moving to a new neighborhood within five years of the grant award. However, the the prior residents of the public housing projects were not altogether displaced from subsidized housing since most shifted into voucher housing or moved into a different public housing project. Among the households living in the neighborhood at the time of the award that were not in public housing, those without subsidized housing were 5 percentage points more likely to move within five years whereas those with access to other forms of subsidized housing were no more likely to move after the award. These results suggest that housing subsidies shield low-income households from rising housing costs. To put the magnitudes of the displacement effects in perspective, over 70 percent of the original residents of the Revitalization neighborhoods had moved away within five years of the award. Thus, the primary reason the original residents were not exposed to the neighborhoods after the awards is because many would have moved away even absent the intervention.

In the next step of our analysis we will focus on two goals. First, we will investigate how the effect of the program interacted with the local context. An important contribution of our paper is that our sample includes the near universe of Revitalization awards. Most research on the HOPE VI program in particular and subsidized housing more generally takes place in the context of a limited set of large metropolitan areas. Revitalization grants were awarded to public housing projects in diverse environments across the United States, which

provides us with a unique opportunity to gain a more representative understanding of the impact of these types of place-based policies. Second, we will investigate how the program affected other populations of interest including (i) residents of nearby neighborhoods, (ii) residents of neighborhoods that received large inflows of individuals displaced by the HOPE VI program, (iii) individuals that moved into the neighborhoods after the award, and (iv) individuals who would have moved into the HOPE VI neighborhood absent the award.

The main contribution of our paper is to estimate the effect of a large place-based policy on both people and places. Existing research on HOPE VI has either documented changes at the neighborhood-level or studied the outcomes of the original residents of the public housing projects. Research studying outcomes at the neighborhood-level finds reductions in neighborhood poverty (Tach and Emory, 2017) and crime (Sandler, 2017) as well as increases in housing prices (Zielenbach and Voith, 2010). Research on individuals finds that many of original residents of the public housing projects ended up living in different neighborhoods that had slightly lower poverty rates (Thomas Kingsley et al., 2003) and that children who lived in these projects experienced long-run gains in earnings (Chyn, 2018; Haltiwanger et al., 2020). A contribution of our paper is to investigate the interplay between neighborhood-level transformation and individual outcomes. For example: Were low-income families in the area displaced by rising housing costs that resulted from the Revitalization program? 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.

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 estimates of the effect of the program on neighborhoods and original residents. Section 6 outlines our goals in the next phase of our analysis. Section 7 concludes.

2 The HOPE VI Revitalization Program

The objective of the HOPE VI Revitalization program was to improve the housing and neighborhood environment for residents of the most disadvantaged public housing projects. In 1992 the National Commission on Severely Distressed Public Housing released a report that raised concerns about the living conditions in many public housing projects. The HOPE VI program was created in response and aimed to benefit these public housing residents by transforming the high-poverty neighborhoods in which the public housing projects were originally located into mixed-income communities.[2] HOPE VI consisted of several distinct programs, but 94 percent of all HOPE VI funding was allocated to the Revitalization program.[3] The funding was used primarily for the demolition and rehabilitation of existing public housing, acquisition of new property, construction of new units, relocation of displaced residents, and community and supportive services for residents. The goal was to create economically integrated neighborhoods in which families receiving subsidized housing assistance would live alongside higher-income neighbors who paid market prices for housing.

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 400 occupied units in 1993 on average. Given the size of the

[2]The FY1999 HUD appropriations bill authorized the HOPE VI program and identifies four main goals: "(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."

[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 grants but the average Revitalization award was about 20 times as large. A challenge with interpreting the existing research on the HOPE VI program is that papers often lump the Demolitions and Revitalizations into one category and study the composite effect of these two distinct interventions.

program, it ought to have a transformative impact on neighborhoods; although, what these effects are and who benefits from them is not obvious.

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 (i) contain the near universe of Revitalization grants, and (ii) 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 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. *Revitalizations*: projects that received a HOPE VI Revitalization grant,

2. *Failed Applicants*: 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.[4]

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 Revitalization site, since the Revitalization program might directly affect nearby

[4]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 projects 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.

neighborhoods.[5] Our sample contains 251 Revitalizations, 166 failed applicants, and 5,783 non-HOPE VI projects.[6]

Individuals. We use linked survey and administrative data to measure the outcomes 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 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 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 1990 and 2018 for the near universe of people living in the United States.

Neighborhoods. We use data from HUD User's a Picture of Subsidized Households to identify the block group in which each project is located.[7] 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, where as 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 applicants and 204 Revitalizations.

[5]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.

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

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

We measure the characteristics of these neighborhoods by using the individual-level panel and summarizing outcomes of the individuals who live there. We also use publicly available summary files from the 1990 and 2000 Decennial Census Surveys and the annual data from the 2009-2017 waves of the American Community Surveys, both of which are obtained from IPUMS (Manson et al., 2021).[8]

Our data accurately identify the location of the public housing projects. Using data from the 1990 Decennial Census we show that neighborhoods that contain a Revitalization of 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).

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, HOPE VI projects tended to be larger and house residents who have lower income and are more likely to be minorities. Relatedly, the neighborhoods in which the HOPE VI projects are located tend to have higher poverty rates and larger minority populations.

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

[8]Statistics at the block group level based on ACS data 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.

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 education, and the relocation plan," and grants were allocated based on these evaluations subject to funding constraints. Figure 1 presents a map that marks the location of each Revitalization and failed applicant project and illustrates that both sets of projects are located in diverse environments 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 similarly qualified compared 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 applications that fail in a given year could choose to 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 of receiving 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 significant observable differences between the failed applicants and Revitalization projects and we adjust for these differences using inverse propensity score weighting.

Reweighting the data by the inverse estimated propensity score eliminates observable differences between the Revitalization and failed applicant neighborhoods. While Table 1 shows that average failed applicant differs from the average Revitalization neighborhood, Figure A.2 presents the distribution of the baseline characteristics and shows that there exist failed applicants that are observably very similar to the awardees. We thus choose to reweight the data using the inverse of the estimated propensity score. We estimate the

propensity score by estimating a logistic regression of receipt of a Revitalization award on a vector of baseline covariates. We estimate this specification separately for each grant year to account for changes in the selection process over time. Figure 3 presents balance tests in which we regress a neighborhood characteristics measured prior to the award again an indicator for receipt of a HOPE VI grants. Panel A weights by population and illustrates that there are significant differences between the HOPE VI and failed applicant. Panel B uses inverse propensity score weights and illustrates that these weights eliminate observable differences between the two groups.[9]

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 applicants had low 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 change in neighborhood poverty between 1990 and 2017 against the estimated propensity score for non-HOPE VI, failed applicant, and Revitalization neighborhoods. 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 very high poverty rates before the intervention.

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

[9] We interact the estimated propensity score with baseline population so that we also weight by population.

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.[10] We then stack the datasets from each award year and estimate the following specification,

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

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^j_{nt} treatment indicator equal to one if n received a Revitalization grant and t is j years after the award.[11] We cluster standard errors at the level of the neighborhood. We estimate this specification via weighted least squared using the inverse propensity score as weights. The main coefficient of interest is, β^j, which traces out treatment effects over time relative to the year before the award.

5 Effect of the Revitalization Program

5.1 Effect on Neighborhoods

We begin by showing that the Revitalization program had a large impact on neighborhood churn in the ten years following the award. Figure 5(A) 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. 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 and

[10] 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.

[11] We use the neighborhood by grant year fixed effect because we stack the data and failed applicants appear in all grant years.

population growth stabilized.

Changes in population were accompanied by a dramatic shift in the composition of subsidized housing in the Revitalization neighborhoods. Figure 5(B) presents estimates of the effect on the number of residents in public housing, other subsidized housing, and non-subsidized housing. Consistent with the results in Panel A, we see that the program led to a dramatic reduction in the number of people in public housing within five years of the award. This corresponds to the period in which the public housing projects were demolished. There is a partial recovery of the public housing stock over the following decade but even 15 years after the program the number of public housing units remains substantially lower. The figure also shows that the recovery in population observed in Panel A is also driven by an increase in the number of households that either have some other form of subsidized housing assistance (primarily from the voucher program) or are non-subsidized. The sum of the effect on public and other subsidized housing 15 years after the award is -150, which suggests that the program led to an overall reduction in subsidized housing in the affected neighborhoods. Although, as we will see below, this could be because some previous tenants of the public housing project were awarded vouchers and moved to different neighborhoods. Thus, these reductions in subsidized units in these particular neighborhoods need not imply a reduction in subsidized units in the broader housing market.

Next we show that the Revitalization program led to a reduction in poverty rates and temporary shift in the racial composition of the neighborhood. Figure 5(C) presents estimates of the effect on the proportion of residents whose income is below the poverty line. There is a gradual reduction in poverty rates in the first few years after the award and a more dramatic decline in poverty rates starting five years after the program, when new residents begin to move in. In the long-run, the Revitalization program lead to a 6 percentage point reduction in poverty rates 15 years after the award. This finding is important given that during the early phases of the program, there was a commonly held concern that the intervention would be unable to produce persistent changes in neighborhoods. Figure 5(D)

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 large changes in the racial composition of the neighborhood.

Figure 6 shows that the Revitalization program lead to substantial increases in rents, particularly at the higher-end of rent distribution. We measure rent using responses to the ACS.[12] Since we do not have ACS data in the pre-award period, we estimate the effect on rent using cross sectional data and regress a neighborhood-level measure of log rent on a treatment dummy and a set of controls, weighting by the inverse propensity score. The first bar in Figure 6 shows that HOPE VI lead to a 9 percentage point increase in average rent. The remaining columns present estimates for cases in which the outcome variable is a percentile of the log rent within the neighborhood. These estimates illustrate that the increase in rent is driven by relatively expensive units in the neighborhood, with a 12 percentage point increase in the 90th percentile compares to a 7 percentage point increase in the 10th percentile.

5.2 Effect on Original Residents

The previous section shows that the program led to substantial reductions in neighborhood poverty and we now turn to investigating how the program affected the original residents of these neighborhoods. Figure 7 provides useful context and plots the proportion of original residents–i.e., residents of the neighborhood in the year before the award–who moved away by a given year after the award. Within Revitalization neighborhoods, residents of both public and non-public housing exhibited extremely high rates of rates of residential mobility. Within five years 80 of the original residents of the public housing projects and 70 percent of the other residents in the area had moved away. Thus, because these population are so

[12]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 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.

mobile, this type of program is likely to be an ineffective way to target a specific group of individuals. This does not necessarily imply that the program is poorly targeted, as low-income households who move in after the award may benefit.

Figure 8(A) shows that the program induced original residents living in public housing and in unsubsidized housing to move away, while having no impact on the mobility patterns of households that had access to other forms of subsidized housing. Five years after the program original residents of the Revitalization public housing projects were 15 percentage points more likely to have moved to a different neighborhood. Over the following decade this difference relative to the failed applicant group declined 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 rising rental prices found in Figure 6.

Figure 8(B) presents results for original residents of public housing and shows that, while HOPE VI did affect where these households lived and the type of subsidized housing they had access to, the program did not displace household altogether from subsidized housing in the long-run. Five years after the award original residents of the HOPE VI projects were 13 percentage points less likely to be living in public housing. However, this decline is largely offset by a 9 percentage point increase in the probability of receiving some other for of housing assistance, primarily in the form of voucher housing. While the program did lead to a slight reduction in the receipt of subsidized housing in the short-run, these losses decline with time and, in fact, HOPE VI led to a 4 percentage point increase in the probability of receiving subsidized housing 15 years after the program. 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.

What types of households were induced to move by the program, and what are the implications of these patterns for neighborhood poverty rates. To investigate this question we estimate the following specification using individual data,

$$m_i = \beta y_i \times D_n + \phi y_i \times (1 - D_n) + \lambda_{ng} + u_i \tag{2}$$

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, y is household poverty, 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 poverty 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 original in public housing, other subsidized housing, or non-subsidized housing in the year before the award.

Figure 9 presents the estimates of β and ϕ obtained from equation 2. The results for public housing show that, in failed applicant project, poor households are about 7 percentage points less likely to move than non-poor households. Intuitively, in distressed public housing projects only low-income residents with limited outside options will tend to stay. In contrast, in Revitalization projects, poor households are only 2 percentage points less likely to move. The fact that there is less sorting within the HOPE VI 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, poor households are significantly more likely to move. These patterns hold in both the failed applicant and Revitalization neighborhoods.

At first glance, this might seems to conflict with the find that the program leads to a 9 percentage point increase in average rent. However, we also find that the increases in rent are larger for relatively more expensive units. Thus, to the extent that a rise in rental costs is responsible for the displacement effects, these pressures may have been felt more or less equally across the household income distribution. Taken together the results for the population not in public housing suggest that the program did not lead to a reduction in neighborhood poverty rates in part by by pricing out low-income households.

6 Next Steps

In the next step of our analysis we will investigate how (i) the effect of the program interacted with the local context, and (ii) the program affected other populations.

Figure 4 presents preliminary evidence to suggest that the effect of the program differed across sites. Specifically, the reductions in neighborhood poverty are largest for Revitalization projects with high values of the estimated propensity score, which tend to be large projects located in very poor neighborhoods. In the next steps of our analysis we aim to more fully document heterogeneity in the impact of the program. A key question of interest is whether there is a necessary tradeoff between reducing neighborhood poverty rates and displacing low-income households. Furthermore, we hope to identify strategies that would better enable these types of policies to balance these tradeoffs. For example, perhaps larger investments in neighborhoods produce greater upward pressure on housing prices, but the displacement effects for low-income households could be mitigated through the provision of subsidized housing.

Our analysis of individuals focused on the original residents, but as we have previously shown, most of the original residents would have moved to a new neighborhood even absent the intervention. Thus, a more complete understanding of the incidence of the program requires us to look beyond the original residents. There are four other populations that

might be affected by the program, (i) residents of nearby neighborhoods, (ii) individuals that moved into the neighborhoods after the award, (iii) residents of neighborhoods that received large inflows of individuals displaced by the HOPE VI program, and (iv) individuals who would have moved into the HOPE VI neighborhood absent the award. Estimating the effect of the program on nearby neighborhoods is straightforward and can be done using the same empirical method as the one presented in equation 1. Estimating the effect on the other three populations is more difficult.

The central challenge in estimating the effect on other populations is that HOPE VI likely altered migration patterns and thus it is not obvious how to identify individuals to serve as controls even if the failed applicant projects are a valid comparison group. For example, we can identify neighborhoods that receive large inflows of individuals but if we want to estimate a treatment effect, which neighborhood ought we compare them to? One fact that we can leverage in this type of analysis is that households tend to move between neighborhoods in a way that is both predictable in stable. Specifically, our preliminary analyses show that we can predict which neighborhoods will receive large inflows of prior HOPE VI residents using only pre-award migration flows. The implication of this is that we can use pre-award migration flows to flag both treatment and control neighborhoods to estimate treatment effects on these neighborhoods. This type of migration pattern will also allow us to learn something about the individuals who would have moved into a HOPE VI neighborhood absent the award but do not do so because of the award.

7 Conclusion

This 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 reduced neighborhood poverty rates by 6 percentage points and increased average rent by 9 percentage points. Our analysis of people finds that the program displaced original residents in public

and non-subsidized into different neighborhoods. We find that the original residents of these neighborhoods exhibit very high rates of migration even absent any displacement effect from the program. Thus, the potential beneficiaries are more likely to be households that move into these neighborhoods after the award as opposed to the original residents. In the next steps of our analysis we aim to better understand the impacts for these populations. 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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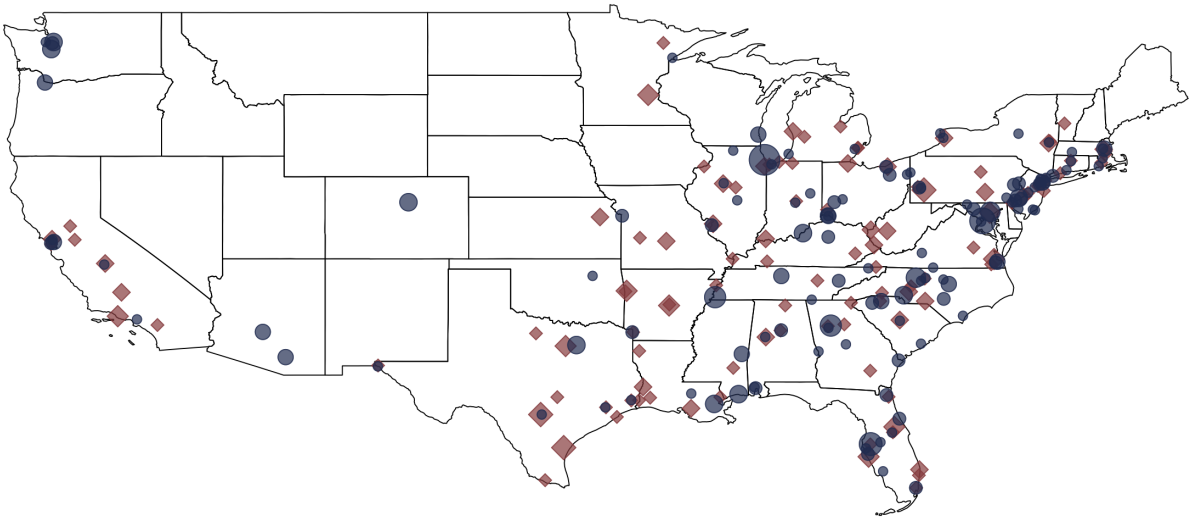
8 Tables and Figures

Table 1: Baseline Characteristics

	Non-HOPE VI		Failed Applicants		Revitalization	
	mean	s.d.	mean	s.d.	mean	s.d.
A. Project						
Occupied units	123	391	224	198	360	301
Percent minority	56.3	38.4	71.8	35.5	78.4	33.6
Percent majority income from wages	23.5	16.8	20.4	11.7	15.5	10.3
Average household size	2.5	1.1	2.7	1.0	2.5	1.1
Percent 62 or older	23.4	20.5	16.4	12.2	13.3	11.7
Percent with disability	12.5	10.4	10.8	7.4	10.0	8.0
Percent single parent	38.0	24.1	45.8	22.3	42.4	26.3
Percent with female head	70.1	24.4	73.7	25.0	73.2	29.7
Percent crowded housing	7.4	8.9	6.8	6.4	8.3	7.7
Average rent	269	136	243	122	206	126
Average income (thousands)	12.8	6.1	11.5	5.2	9.8	5.7
B. 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	

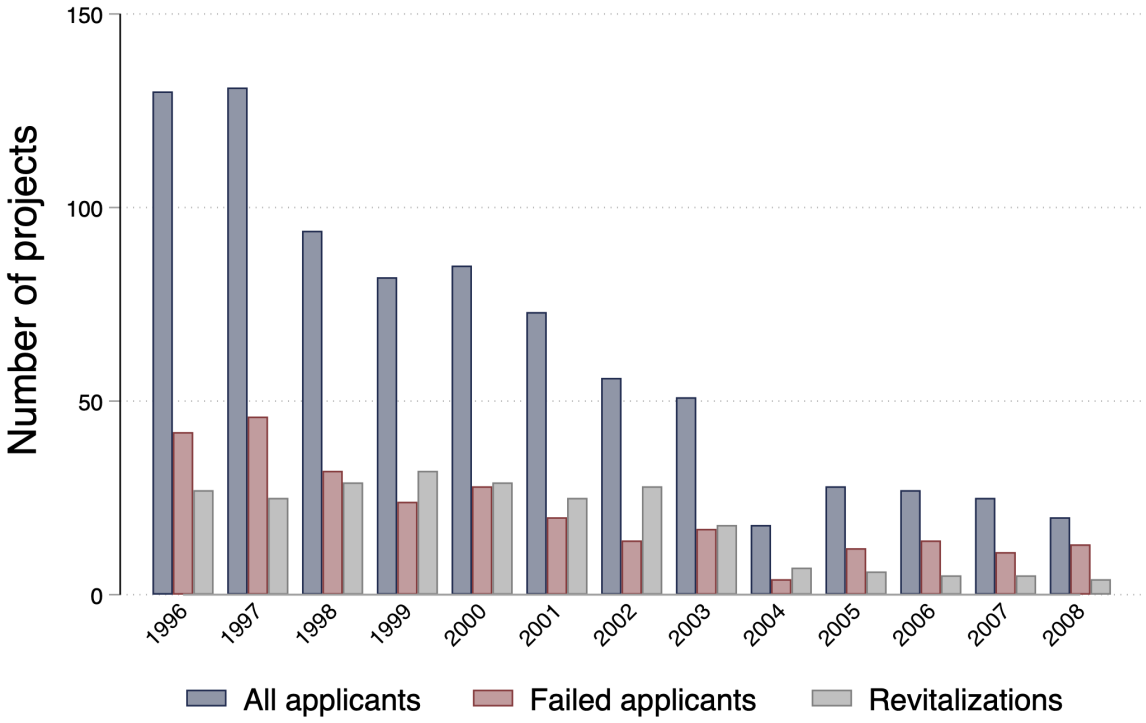
Notes: The columns define one of three mutually exclusive samples including non-HOPE VI, failed applicants, and Revitalizations. Each row presents statistics for a different variable. In panel A the variables are measured at the project level in 1993. In panel B the variables are measured at the block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

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.

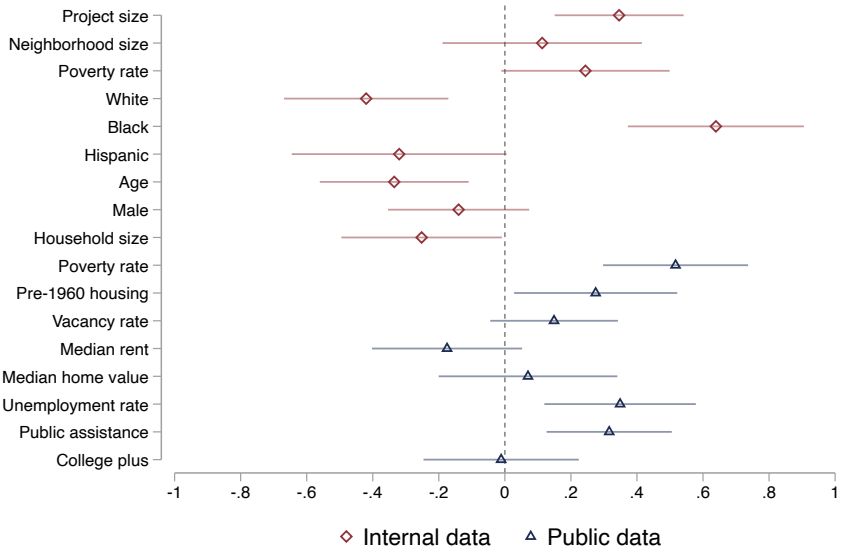
Figure 2: Number of Awardees and Failed Applicants by Year



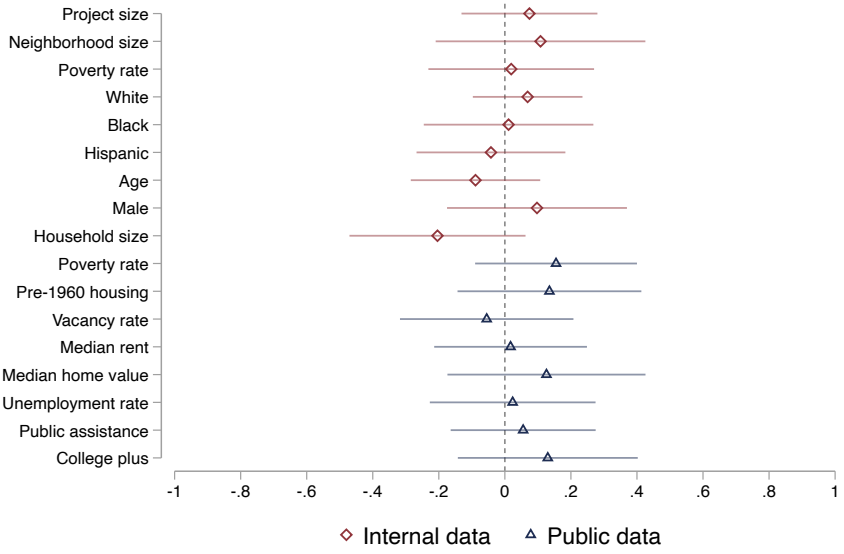
Notes: The figure presents the number of public housing projects per grant year that fit into the following groups: (1) projects that applied for but did not receive funding in that year, (2) projects that applied for funding but did not receive funding in the current or any subsequent year, and (3) projects that applied for and 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. Applicants could apply in multiple years. We do not observe application data for 2009 and 2010.

Figure 3: Balance of Baseline Characteristics

(A) Population weights

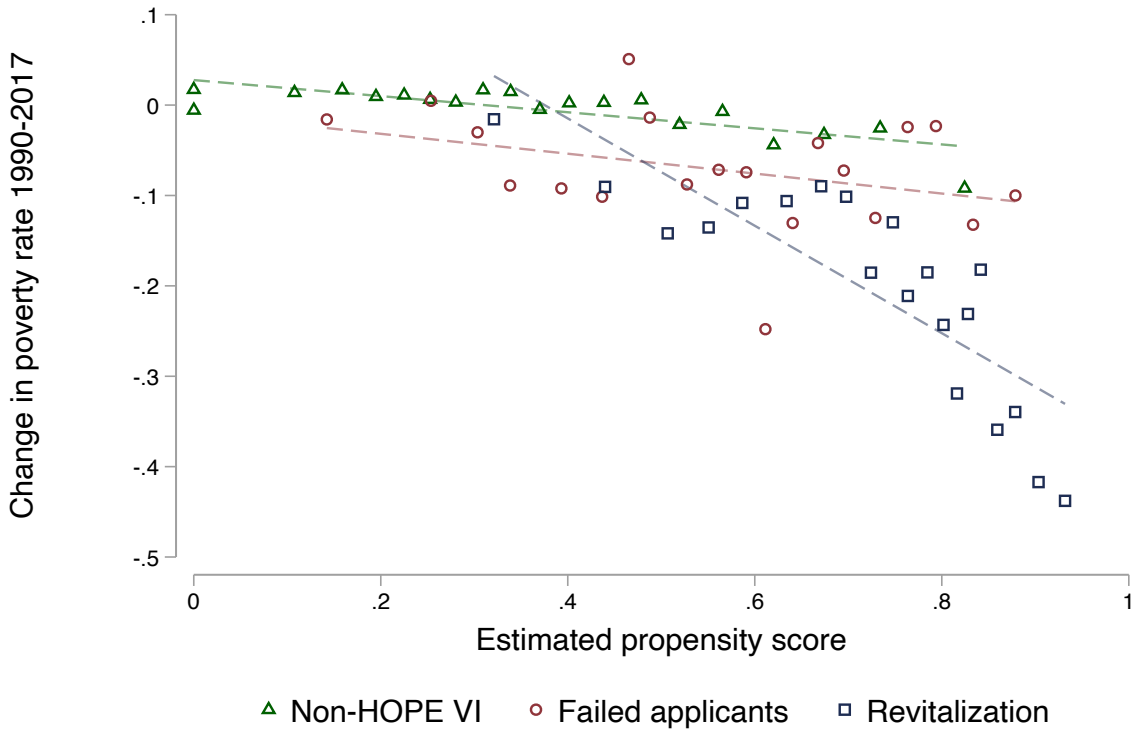


(B) Inverse propensity score weights



Notes: Each point represents an estimate from a separate regression in which we regress a characteristic of the neighborhood measure 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.

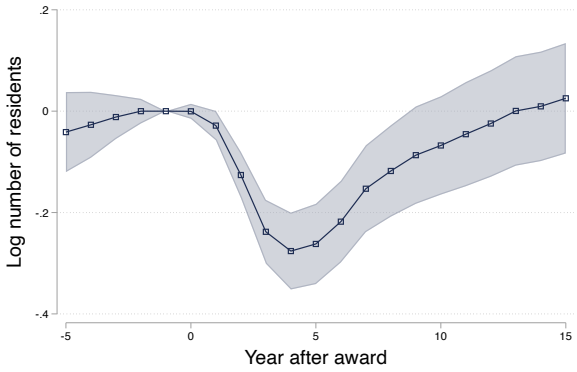
Figure 4: Change in Poverty Rates by Estimated Propensity Score



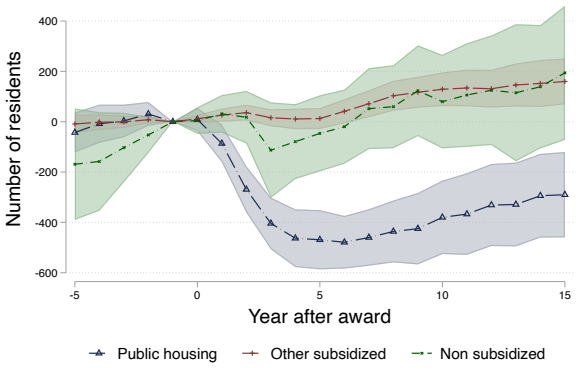
Notes: This figure plots the change in neighborhood-level poverty rates between 1990 and 2017 against the estimated propensity score. Within the non-HOPE VI, failed applicant and Revitalization samples, observations are grouped into ventiles based on the estimated propensity score.

Figure 5: Effect on Neighborhoods

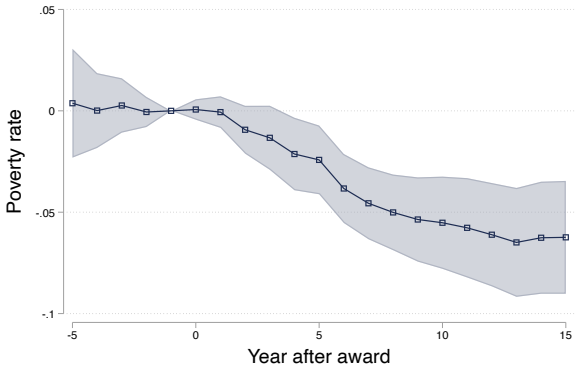
(A) Population



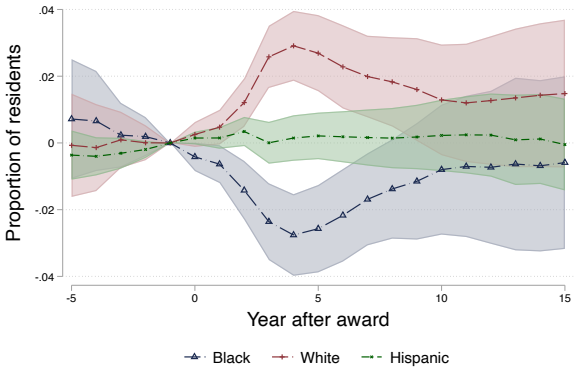
(B) Subsidized housing



(C) Poverty

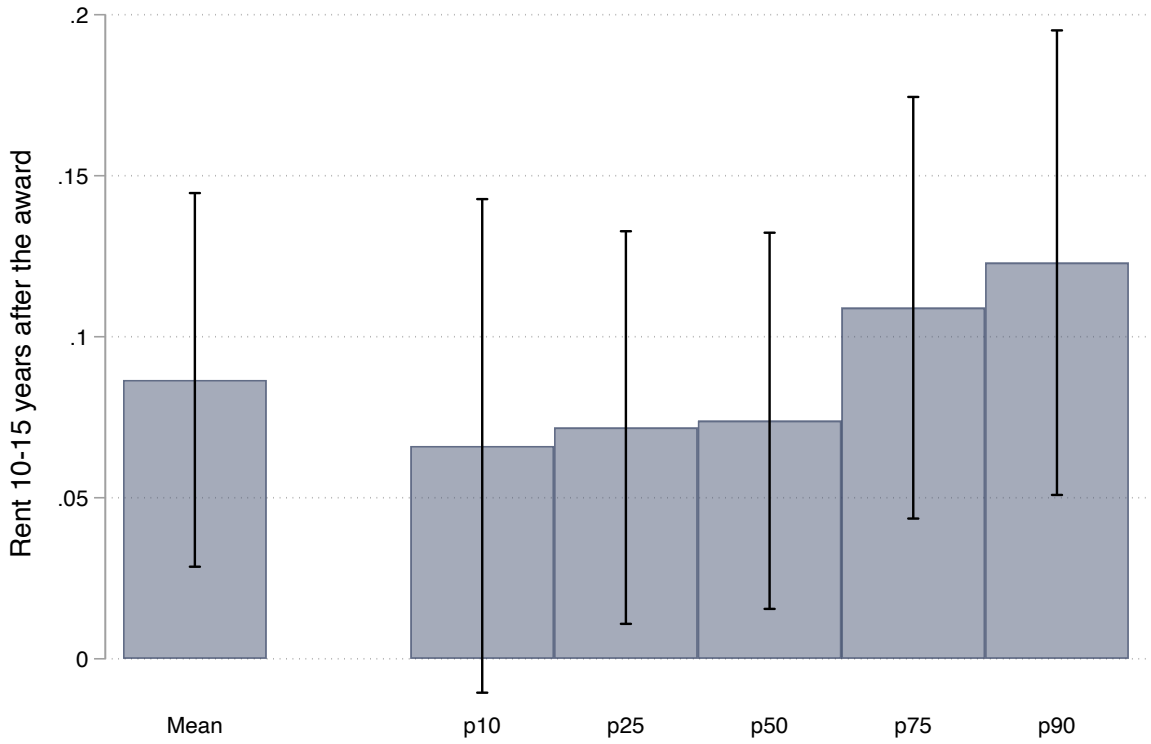


(D) Race



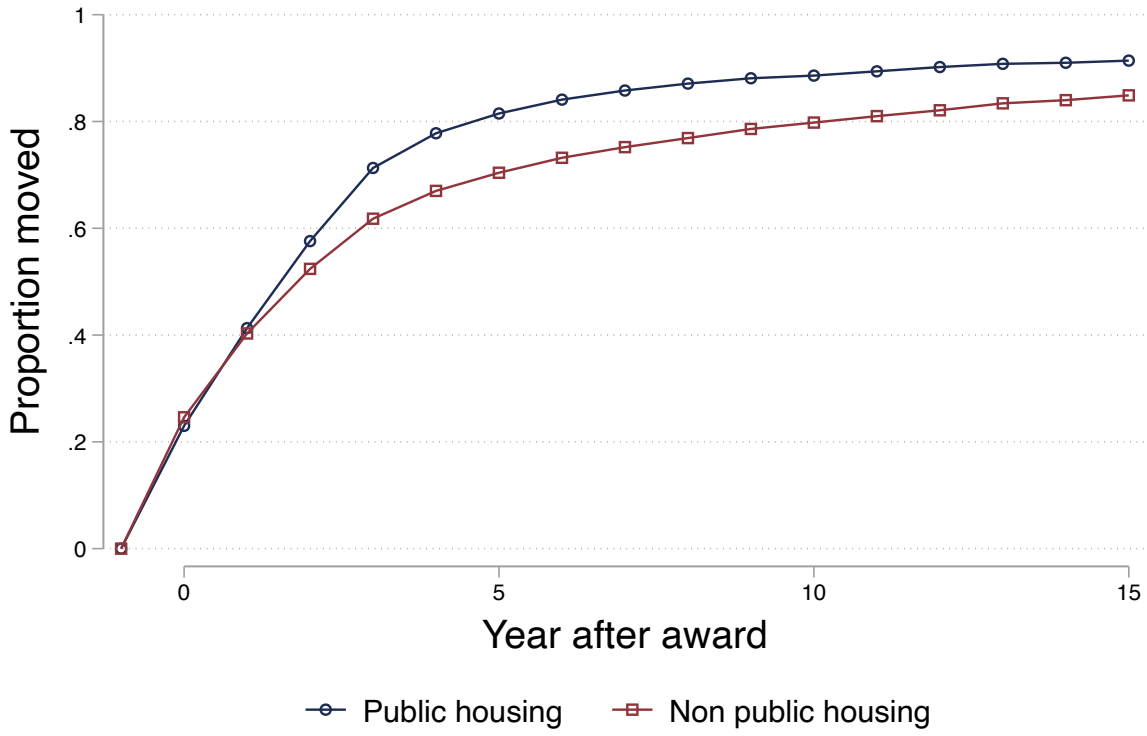
Notes: This figures plots estimates from the stacked difference-in-differences specification described in equation 1. The shaded regions denote the 95 percent confidence intervals.

Figure 6: Effect on rent



Notes: The figure presents results from a set of regressions in which we regress a measure of rent on an indicator for HOPE VI and a set of covariates. Each bar presents a estimates of the coefficient on the HOPE VI indicator. The vertical bars denote the 95 percent confidence intervals.

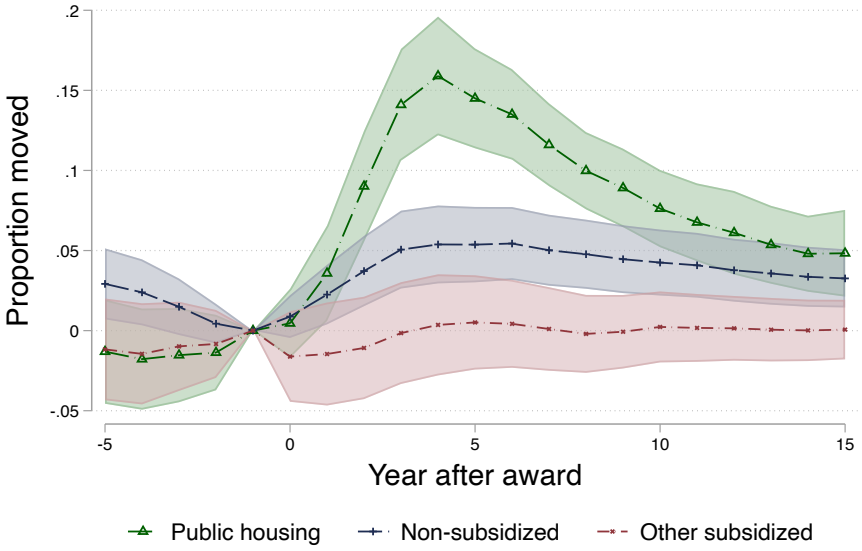
Figure 7: Residential mobility of original residents of HOPE VI neighborhoods



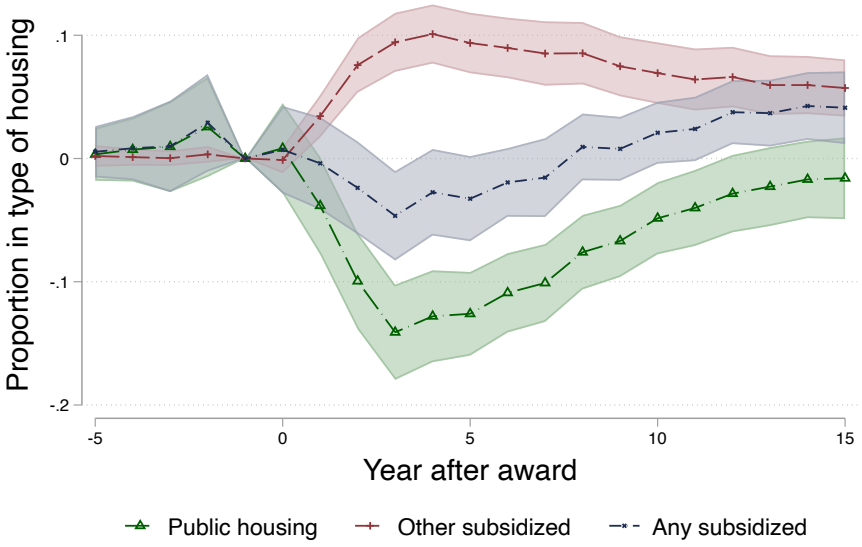
Notes: This figure plots the proportion of individuals who have moved to a different neighborhood by a given year after the award. The sample includes individuals who lived in a HOPE VI Revitalization neighborhood in the year before the award.

Figure 8: Effect on original residents

(A) Residential mobility

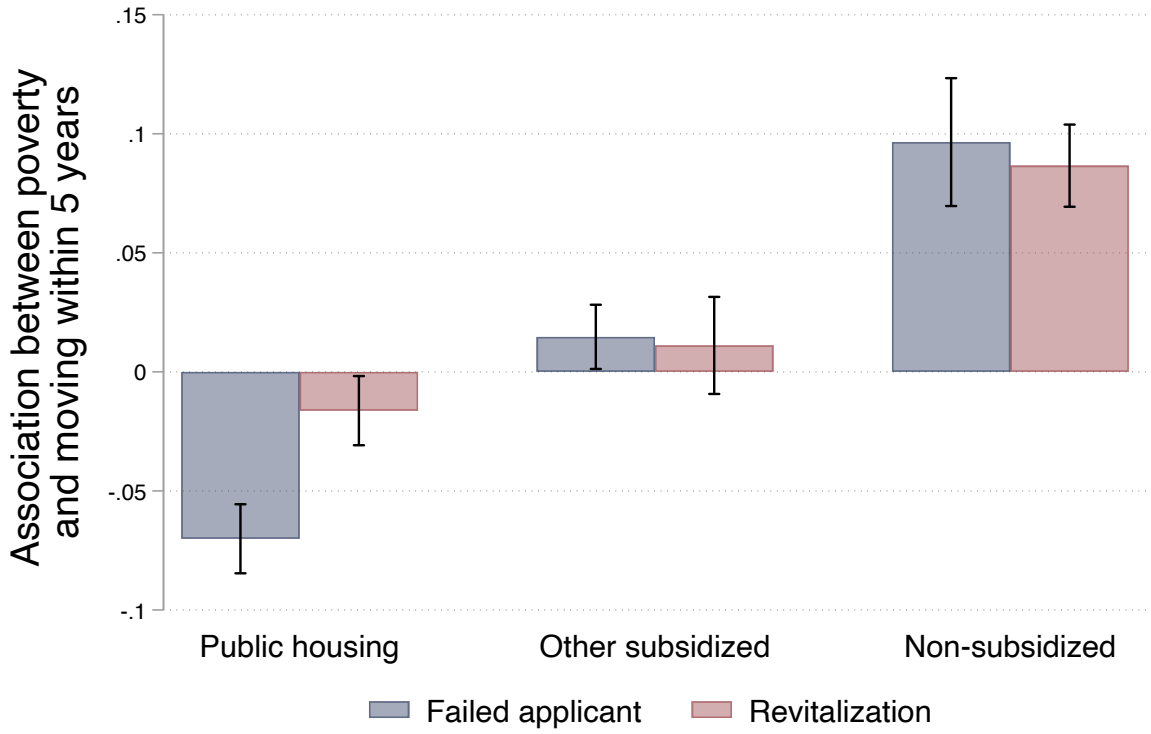


(B) Receipt of subsidized housing



Notes: This figures plots estimates from the stacked difference-in-differences specification described in equation 1. The shaded regions denote the 95 percent confidence intervals.

Figure 9: Association between mobility and income for original residents



Notes: This figures plots estimates from the specification described in equation 2. The vertical bars denote the 95 percent confidence intervals.

Appendix A Additional Results

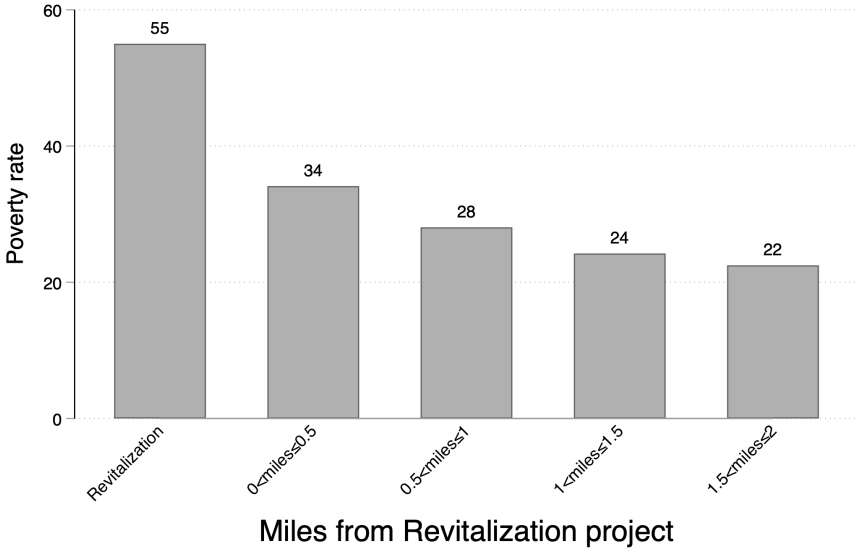
Table A.1: Sample Restrictions

	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%

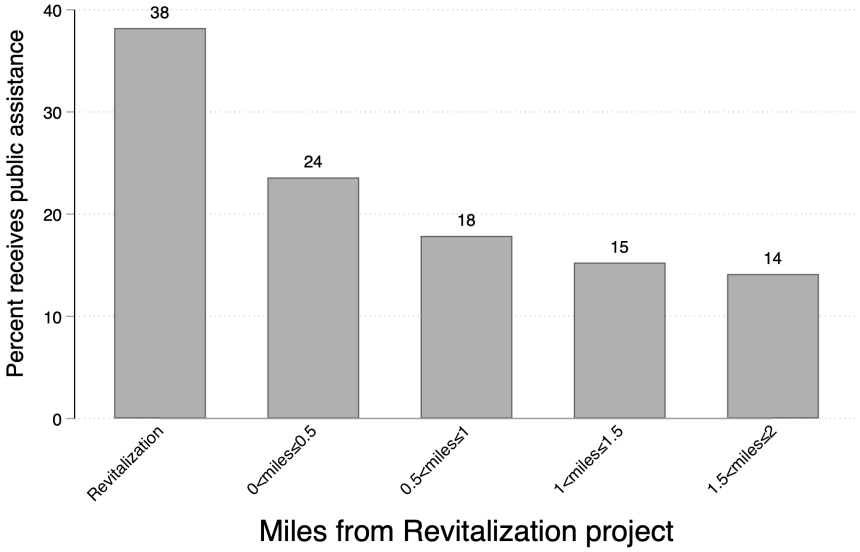
Notes: The column headers define the sample (the three samples are mutually exclusive). Each row presents the count of projects that remain after imposing the sample restriction as well as the percent of the full sample.

Figure A.1: Characteristics of Surrounding Neighborhoods

(A) Poverty

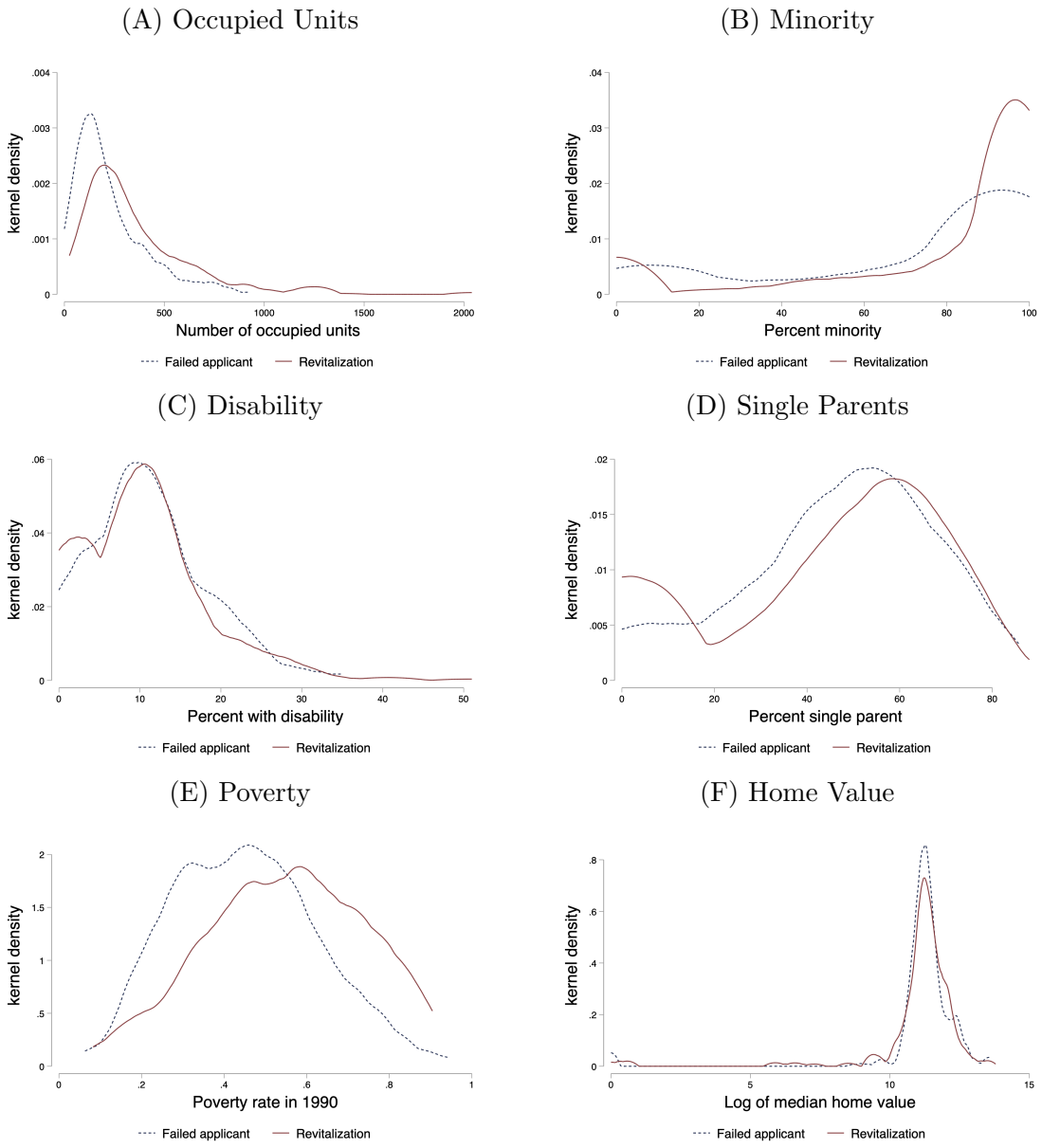


(B) Public Assistance



Notes: The figure presents the average characteristics of neighborhoods (based on responses from the 1990 Decennial Census) that contains a Revitalization project and the neighborhoods within a one mile radius.

Figure A.2: Distribution of Baseline Characteristics



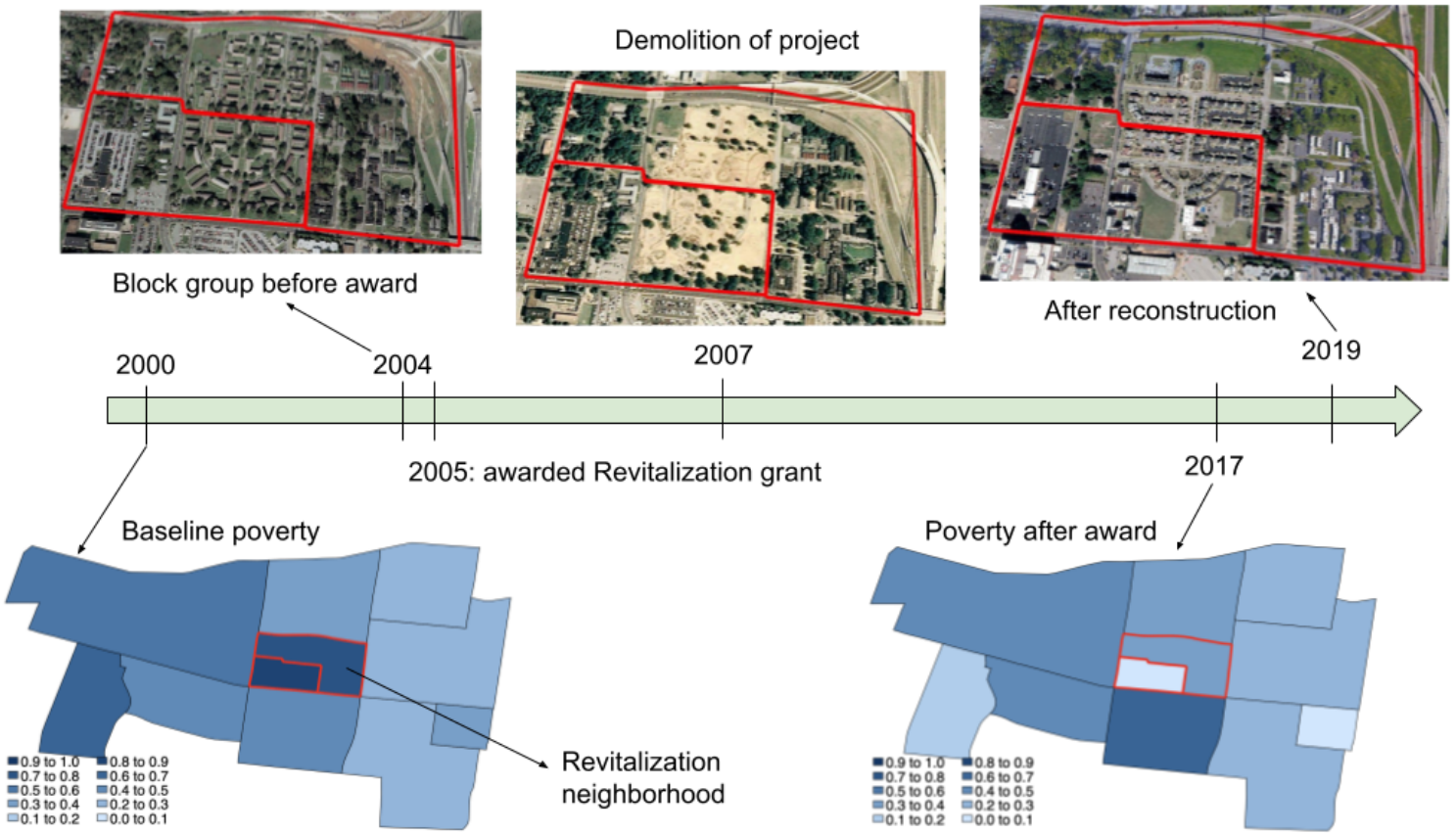
Notes: Each figure presents a kernel density plots of characteristics measured prior to the award. Panels A-D summarize characteristics of the projects as measured in the 1993 vintage of HUD User's Picture of Subsidized Households. Panels E-F summarize characteristics of the block group and are based on data from the 1990 Decennial Census. Distributions are presented separately by treatment status.

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 on average. 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. The objective of the next section is to move beyond these descriptive statistics and estimate the causal effect of the program (i.e., what would have happened to the neighborhoods and residents had they not been exposed to the Revitalization program).

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.