

## **Are the Outcomes of Low-Income Housing Programs Consistent with their Rationales?**

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### **Abstract**

Traditional rationales for low-income housing assistance imply that a housing program is not successful unless it induces recipients to occupy better housing than they would choose if given an equally costly cash grant. The general assumptions of economic theory do not imply that current housing programs would lead to that outcome. The few existing studies of this matter are dated and ignore the cost-ineffectiveness of project-based housing assistance. The purpose of this paper is to determine the extent to which different housing programs are consistent with traditional rationales. Based on data from the 2013 American Housing Survey and evidence on the cost-effectiveness of different types of housing assistance, the results indicate that public housing tenants had lower aggregate housing consumption than they would have chosen with equally costly cash grants and most public housing tenants and a substantial minority of recipients of each other type of housing assistance occupied worse housing than they would have chosen with this alternative policy. Indeed, about half of public housing tenants, a third of occupants of HUD-subsidized privately owned projects, and more than a fifth of recipients of other programs of project-based housing assistance occupied worse housing and consumed less of other goods and services than they would have chosen with equally costly cash grants. Of the programs considered, tenant-based housing vouchers induced a larger fraction of recipients to occupy better housing relative to an equally costly cash transfer and provided the greatest increase in the market value of total consumption relative to taxpayer costs than any of the forms of project-based housing assistance.

**Keywords:** Low-income housing programs, housing vouchers, public housing, project-based housing assistance, tenant-based housing assistance, housing subsidies

**JEL Codes:** H53, I38, R28

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## **1. Introduction**

Low-income housing assistance is a major part of the U.S. welfare system. The programs involved served more than 16 million people and cost more than \$63 billion in FY 2020. The U.S. Department of Housing and Urban Development (HUD) spent about \$54 billion, federal tax expenditures on the low-income housing tax credit, mortgage revenue bonds, and multi-family housing bonds added more than \$8 billion, the U.S. Department of Agriculture (USDA)'s low-income housing programs cost more than \$1 billion, and many state and local governments also provide such assistance.

Because recipients of assistance prefer an unrestricted cash grant to any in-kind subsidy with the same cost to donors, the justification for subsidizing housing consumption hinges on the preferences of others. The reasons for their preference for housing assistance might be altruistic or more narrowly self-interested. Unless nonrecipients prefer the outcomes of housing subsidies to the outcomes of cash grants, housing assistance cannot be justified.

One coherent argument for low-income housing assistance has been that people with higher incomes want to help low-income families and believe that the decision makers in some of these families undervalue housing for themselves or their children. This external effect argues for providing assistance that induces its recipients to occupy better housing than they would choose if they were given equally costly cash grants. Another coherent argument is that people with higher incomes care about the children in these households and think that the parents devote too little of the family's resources to their children. Providing housing assistance rather than cash grants might direct more of the assistance to the children because the housing assistance might induce recipients to live in better housing and neighborhoods than they would choose with cash grants and the children inevitably share in the consumption of these goods.

Other arguments for funding low-income housing programs in general or specific types of programs have been offered. For many years, the most popular argument has been that low-income households spend excessive fractions of their incomes on housing rather than that they live in inadequate housing. Lobbyist for low-income housing programs began using this argument when standard measures of the fraction of the housing stock with major deficiencies declined to low levels (Weicher 1980, Table 1). This is not a coherent argument for housing assistance. It presumes that these households are forced to spend high fractions of their income on housing. This is implicit in the verbiage rent burden. The argument fails to recognize that

almost all these households could reduce their housing expenditure by moving to a worse dwelling unit, a less attractive neighborhood, or a less convenient location. The argument fails to consider the possibility that these people would rather spend less on other goods than to live in worse housing. Since the only negative consequence of spending a high fraction of income on housing is low consumption of other goods, some people who make this argument might believe that these low-income households undervalue other goods relative to housing. This argues for subsidizing all goods except housing.

Some arguments for funding certain types of housing programs are based partly on tangible external benefits. For example, subsidizing the construction of low-income housing projects in the least attractive neighborhoods increases the desirability of these neighborhoods in part because more attractive buildings provide a visual amenity to people who do not live in them (Schwartz et al. 2006; Ellen et al. 2007; Diamond and McQuade 2019).

Other arguments that have attracted a lot of attention from public economics theorists are rarely mentioned in housing policy debates. For example, some have argued for in-kind transfers on the grounds that they can be designed to target assistance to the poorest households when household income cannot be observed. In the context of housing policy, a housing program might offer each applicant a low-quality unit at a below-market rent. This would be attractive to households with the lowest incomes and unattractive to the richest households. Because in-kind transfer programs in the U.S. devote considerable resources to determining the economic circumstances of applicants and can do it with reasonable accuracy, targeting is not an important justification for in-kind programs in the U.S. (Currie and Gahvari 2008). The only part of the system of low-income housing assistance that fits the targeting assumptions at all well are rudimentary homeless shelters that provide beds and showers to anyone who requests them without attempting to document their economic circumstances.

In their broad analysis of the rationales for welfare programs, Currie and Gahvari (2008, p. 333) conclude that "...paternalism and interdependent preferences are leading overall explanations for the existence of in-kind transfer programs...." Our analysis focuses on the consistency of housing program effects with these explanations. These rationales for low-income housing assistance imply that a housing program is not successful unless it induces recipients to occupy better housing than they would choose if given an equally costly cash grant. If a cash grant equal to the taxpayer cost of the housing program leads to better housing for recipients than

the housing program, taxpayers as well as recipients would prefer the cash grants.

Due to the way in which housing programs change the budget spaces of assisted families, the general assumptions of economic theory do not imply that current housing programs lead to greater consumption of housing services than equally costly cash grants (Olsen 2003, pp. 399-404). For example, each household living in public housing received an all-or-nothing offer of a particular unit at a below-market rent. That unit might have been worse than the unit that it would have chosen if given an equally costly cash grant. Indeed, it may be worse than their unit in the absence of any assistance. The net benefit to the tenant may stem entirely from its lower rent. This enables the household to increase its consumption of other goods and services.

The few existing studies of this matter are based on data that is at least 35 years old (Olsen 2003, Table 6.10). Since then, many housing projects have been built, many existing projects substantially renovated, many others demolished, and yet others have deteriorated greatly. The current housing voucher program has a different structure than the one studied previously. Furthermore, these studies provide no evidence about the newer programs such as the Low-Income Housing Tax Credit and HOME that have subsidized the development of most low-income housing projects for many years.

Finally, all previous studies of this matter for programs that subsidize the development and operation of housing projects ignore an important aspect of reality, namely, their cost-ineffectiveness. These studies have compared housing consumption under the program with predicted housing consumption if the program were replaced with a cash grant equal to the market rent of the subsidized unit minus the tenant's rent. Even ignoring administrative cost, the taxpayer cost of project-based assistance is much greater. Therefore, these studies have underestimated the desirability of the housing that recipients would have occupied if they had been given cash grants equal to the taxpayer cost of the housing program.

Recent surveys of the evidence on the performance of low-income housing programs in the U.S. have emphasized the importance and dearth of evidence on the difference between the effects of housing programs and cash grants (Olsen and Zabel 2015; Collinson, Ellen, and Ludwig 2016). This paper helps to fill that gap. It estimates (1) the fraction of recipients of each broad type of housing assistance who have occupied better housing than they would have chosen if given a cash grant with the same taxpayer cost as the housing program and (2) the difference between aggregate recipient housing consumption in these two scenarios for each type of

housing assistance.

Our results suggest that none of the housing programs produce changes in consumption patterns fully consistent with the standard rationales for their existence. Compared to equally costly cash transfers, HUD's voucher program was most effective in increasing aggregate housing consumption with an estimated 10 percent increase relative to an unrestricted cash transfer. However, more than a third of voucher recipients would have lived in better housing had they been given a cash grant. HUD's public housing was the least effective. In fact, our estimates suggest providing equally costly cash grants to public housing tenants would have increased their aggregate consumption of housing by nearly 8 percent and their consumption of other goods by over 34 percent. Our results further suggest that only about a third of public housing recipients consume better housing in the program than they would with an unrestricted cash grant.

The next section provides an overview of current housing assistance in the US, section 3 describes the theory underlying our methods, and sections 4 and 5 discuss the data and methods used to estimate consumption patterns across the policy options considered. Section 6 presents the results, and the paper concludes with a discussion of how well current US housing programs fit their rationales and policy implications.

## **2. Current System of Low-Income Housing Assistance in United States**

Most low-income housing assistance in the U.S. is for renting a unit, and the most important distinction between rental housing programs is whether the subsidy is attached to a housing project (project-based assistance) or the assisted household (tenant-based assistance). If the subsidy is attached to a housing project, each family must accept the specific unit offered in order to receive assistance and loses its subsidy if it moves to a unit outside the project unless it is able to obtain alternative housing assistance before moving. Each family offered tenant-based assistance is free to occupy any unit that meets the program's minimum housing standards, rents for less than the program's ceiling applicable to the family, is affordable with the help of the subsidy, and whose owner is willing to participate in the program. The family retains its subsidy if it moves to another unit meeting these conditions.

There are two broad types of project-based rental assistance, namely, public housing and privately owned subsidized projects. Both types have usually involved the construction of new

projects. In almost all other cases, they have required substantial rehabilitation of existing buildings. Many of these programs no longer subsidize the construction of projects, but most projects built under them still house low-income households with the help of subsidies for their operation and renovation. Overall, project-based assistance accounts for two thirds of all households that receive low-income rental assistance.

Governments provide most project-based assistance to private parties that develop and operate housing projects. Most of these private parties are for-profit firms, but not-for-profits have a significant presence. The largest programs of this type are the IRS's Low-Income Housing Tax Credit (LIHTC), HUD's project-based Section 8 program, and USDA's Section 515/521 program. Under these programs, in exchange for certain subsidies, private parties agree to provide rental housing meeting certain standards at restricted rents to eligible households for a specified number of years. Most privately-owned subsidized projects receive subsidies from multiple sources. About 4 million households live in projects of this type.

Subsidized housing projects are also developed and operated by local public housing authorities established by local governments, albeit with substantial federal subsidies and regulations that restrict their choices. This is the oldest major low-income housing program in the U.S. In the public housing program, government employees make most of the decisions made by firms in the private market – what to build, how to maintain it, and when to tear it down. Decisions about where to build projects has been heavily influenced by local political bodies. The public housing stock has declined by about 400,000 units since its peak in 1991. About 1 million households live in public housing projects.

HUD's Housing Choice Voucher Program (often called Section 8) is the only significant program of tenant-based assistance. In terms of expenditure, it is the largest low-income program with an annual taxpayer cost of about \$24 billion. It serves about 2.5 million households and accounts for about a third of all households that receive low-income rental assistance.

Because the number of units in HUD's largest programs that have subsidized the construction of housing projects has been declining for several decades, it is often assumed that there has been little construction of subsidized projects over this period and little interest in doing it among legislators. This ignores the role of LIHTC in the current system. Since its inception in 1987, LIHTC has subsidized the construction of projects with more than 1.45 million units. This exceeds the increase in the number of households served by tenant-based

Housing Choice Vouchers over this period.<sup>1</sup> Without any change in legislation, LIHTC will lead to a large increase in the number of units in subsidized projects each year. Recent [proposed legislation](#) that has substantial support in Congress would massively expand it, and the Build Back Better Act passed by the U.S. House of Representatives in 2021 contained provisions that would allow the building of more than 200,000 new public housing units.

### 3. Theoretical Underpinnings

Figure 1 depicts a household's consumption of housing and neighborhood services (hereafter housing services) and other goods and services (hereafter other goods) under the housing program and with cash grants of various amounts. For simplicity, assume no administrative cost for either type of program. In the absence of any assistance, the household's income is  $Y$ , the market price of housing services is  $P_H$ , the market price of other goods is  $P_X$ , the household's budget frontier is  $EF$ , and  $ICC$  is the recipient's income-consumption curve based on these market prices. In the absence of any assistance, the household would choose the bundle  $M$ . Under the housing program, the household consumes the bundle  $G$ , where  $MR$  is the market rent of the unit and  $TR$  is the rent paid by the tenant.

Previous studies have compared bundle  $G$  with the bundle that the recipient would have chosen if offered a cash grant equal to  $MR-TR$  rather than the housing program. The budget line with this cash grant would be  $JK$ , and the chosen bundle would be  $A$ . As drawn, the housing program induces the recipient to consume more housing services and less other goods than would be chosen with the cash grant. Nothing in the structure of low-income housing programs ensures that outcome. The bundle under the program could be to the northwest of the bundle  $A$  on the line  $JK$ . That would involve a unit with a lower market and tenant rent. Previous studies based on data prior to 1985 indicate that  $G$  is to the southeast of  $A$  for most recipients for the programs and times studied (Olsen 2003, Table 6.10).

This is not the end of the story even for the programs and times involved. Excellent evidence indicates that programs that provide project-based housing assistance have total costs that exceed the market rent of their units even ignoring the cost of program administration. For

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<sup>1</sup> LIHTC has also subsidized the substantial rehabilitation of many projects built under older programs that subsidized the construction of privately owned projects, and increasingly it has been used to rehab public housing projects under the Rental Assistance Demonstration.

these programs, the taxpayer cost exceeds MR-TR and the budget frontier with the equally costly cash grant is beyond JK. If the cost-ineffectiveness is sufficiently modest, the recipient might choose the bundle B with cash assistance. Since the housing program induces the recipient to consume more housing services and less other goods than the cash grant, a taxpayer might prefer the housing program to the cash grant. However, if the cost-ineffectiveness of the housing program were sufficiently large, the recipient would choose a bundle on the ICC beyond C leading to the cash grant increasing their consumption of housing and other goods. In this case, the taxpayer as well as the recipient would prefer the cash grant. Although many taxpayers may believe that low-income households undervalue housing, they surely do not regard most other commodities as bads for recipients. They consume these items themselves, and it is safe to say that many who support low-income housing assistance also support programs such as SNAP and Medicaid that are intended to subsidize the consumption of other goods.

This simple description of the effect of replacing housing programs with cash grants reveals some general assumptions that underlie our analysis. First, we assume that the replacement has no effect on market prices. The same market prices  $P_H$  and  $P_X$  are assumed to prevail in the absence of any assistance, with the housing program, and with an equally costly cash grant instead of the housing program. The price indices used in the empirical analysis are market prices in the presence of housing programs. The evidence indicates that low-income housing programs have modest effects on market prices (Olsen and Zabel 2015), but there is no evidence about the effect on market prices of replacing housing programs with cash grants.

A second general assumption underlying the analysis is that replacing low-income housing assistance with equally costly cash grants would have no effect on a household's cash income from other sources. The same cash income from sources other than the cash grant that replaces housing assistance  $Y$  is assumed to prevail in the absence of any assistance, with the housing program, and with an equally costly cash grant instead of the housing program. The evidence indicates that housing assistance induces recipients to earn less (Olsen and Zabel 2015). The best study finds that non-elderly non-disabled adult voucher recipients reduce their earnings by about 10% (Jacob and Ludwig 2012). Other studies indicate work disincentive effects of similar magnitudes for HUD's largest programs of project-based assistance. The effect of housing assistance on the total cash income of these families is muted by larger payments from cash assistance programs in which they would participate in the absence of housing assistance

and their increased participation rates in these programs (Mills et al. 2006; Jacob and Ludwig 2012). The effects are much smaller for elderly and disabled (Jacob and Ludwig 2012), and 60% of HUD-assisted households have an elderly or disabled cohead (U.S. Department of Housing and Urban Development 2021). As in the case of market prices, there is no evidence about the effect of replacing housing programs with cash grants on cash income from other sources.

A third general assumption underlying the analysis is that households spend their entire income each period. Current expenditure on other goods is assumed to be current income minus current housing expenditure. There is no saving or dissaving. This is surely close to the truth for recipients of low-income housing assistance.

Fourth, our analysis ignores other in-kind transfer programs that serve recipients of low-income housing assistance. We ignore Medicaid, SNAP, National School Lunch Program, WIC, Pell Grants, Head Start, and many other smaller in-kind transfers. With the exception of massively underreported SNAP participation, our data does not contain information about participation in these programs. Due to the failure to account for them, recipients of housing assistance consume more other goods than indicated by our results, and they would have larger and more complicated budget spaces in the absence of housing assistance. Failure to account for these programs undoubtedly biases our estimates of the effects of low-income housing programs to some extent.

#### **4. Data**

The primary data used in this study is from the 2013 American Housing Survey (AHS) national sample. The AHS collects voluminous data for a large random sample of U.S. households (about 60,000 in 2013). The information includes (1) many characteristics of the household's dwelling unit and its neighborhood, (2) the general location of the unit (the specific metro area for households living in 144 large ones and metro/nonmetro/region categories for others), (3) whether the unit is rented or owner-occupied, (4) the household's expenditure on housing, (5) many of its demographic characteristics including its income, and (6) whether the household receives housing assistance.

#### *4.1 Identifying Type of Housing Assistance.*

The 2013 AHS is especially suitable for the purposes of this research because it identifies the type of housing assistance received by each household served by HUD's largest programs based on HUD's administrative records. The variable HUDADMIN identifies which households had a HUD housing voucher, which lived in public housing, and which lived in a privately owned project subsidized by one of HUD's largest programs. Prior to 2011, information about receipt of housing assistance in the AHS was based entirely on self-reporting, and many recipients of these HUD programs failed to report it (about 18% in 2013). We use data for 2013 because later AHS public use files fail to distinguish between public housing and HUD-subsidized privately owned projects. Based on the AHS variable HUDADMIN and sample weights, about 5 million households received housing assistance from HUD's largest programs in 2013.

HUD administrative records underlying HUDADMIN do not capture all households that receive low-income rental assistance. We use self-reported receipt variables (PROJ, VCHER, SUBRT, RENEW) to identify recipients of project-based rental assistance not identified by HUDADMIN. Respondents representing an additional 2.4 million households fall into this category. The AHS does not contain information about the type of rental assistance received by these households, but it seems likely that at least two thirds live in housing projects whose construction or renovation was funded in part by low-income housing tax credits (LIHTC).<sup>2</sup> [Online Appendix A](#) contains the analysis that leads to this conclusion. Hereafter, we refer to them as LIHTC and other housing programs. The non-LIHTC households in this category are served by a variety of programs. Some live in USDA Section 515/521 projects that were neither built nor renovated with the help of LIHTC. Others received housing assistance from HUD's homeless programs or state and local programs funded by HUD's block grants (HOME, IHBG, CDBG). HUDADMIN does not cover households served by these programs. Still others live in projects subsidized by small USDA, state, or local housing programs. A few are surely households that received assistance from HUD's largest programs but were not identified by the Census Bureau because HUD's records of assisted households was incomplete, or address matching could not be done perfectly.

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<sup>2</sup> Almost all tax credit projects receive subsidies from multiple sources. NCSHA (National Council of State Housing Agencies 2018) lists more than 18 federal sources that are used in combination with tax credits, and many tax credit projects receive subsidies from state or local sources.

Some households not classified as voucher recipients by HUDADMIN reported voucher receipt through the AHS variable VCHER (about 8% of all voucher recipients). We combine these households with those identified as voucher recipients by HUDADMIN. Past research indicates that most recipients of low-income housing assistance are clear about the distinction between having a tenant-based housing voucher and living in a subsidized housing project. This together with the similarity between the mean values of household characteristics and our outcome measures for the two groups of voucher recipients leads us to believe most households that report voucher receipt have a HUD Housing Choice Voucher or a voucher very similar to it.

Table 1 presents our estimate of the number of households and people who received assistance from each type of housing program based on AHS data. Without a doubt, this is a lower bound. Some households not captured by HUDADMIN did not report their receipt of housing assistance.

#### *4.2 Taxpayer Cost*

The AHS does not report the taxpayer cost of any subsidized unit. We estimate it based on the predicted market rent of the unit, evidence on the ratio of total cost to market rent for each type of program and reported tenant rent. This section describes the evidence on the ratio of total cost to market rent for each type of program.

Research indicates that the rents paid to landlords of tenant-based voucher units are very close to the rents of unsubsidized units with identical characteristics (Olsen 2019). Therefore, we assume that the total cost of these units exceeds market rent by the program's administrative cost. Administrative cost adds about 6% of market rent to the total cost of the voucher program.<sup>3</sup>

The best study of the cost-effectiveness of public housing indicates a ratio of total cost to market rent of 1.79 and 2.20 in its two sites (Mayo et al. 1980). These numbers include administrative cost. This is very old data, but more recent evidence greatly understates the cost of public housing. GAO (U.S. Government Accountability Office 2001) estimated that public

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<sup>3</sup> According to Turnham et al. (Turnham et al. 2015), the administrative cost of the voucher program between 7/1/13 and 6/30/14 was \$1.461 billion. According to McCarty et al. (McCarty, Perl, and Jones 2019), total government payments to landlords were \$17.964 billion in FY 2013 and \$19.177 in FY2014. This leads to an estimate of \$18.874 billion for the period from 7/1/13 to 6/30/14 and an estimated ratio of administrative cost to government payments to landlords of .084. HUD's Picture of Subsidized Households indicates that the government paid about 67% of the total rent of voucher units in this period. This leads to the conclusion that administrative cost adds about 6% of market rent to the total cost of the voucher program.

housing redevelopment under the HOPE VI program cost about 27% more than housing vouchers for units with the same number of bedrooms in the same metro area. This estimate ignored the opportunity cost of the land and the large difference between full property taxes and the small payments in lieu of taxes made by public housing authorities to local governments. HUD (U.S. Department of Housing and Urban Development 1973, p. 123) indicates that the property tax abatement accounts for about 22% of the total cost of providing housing under the public housing program.

The best study of the cost-effectiveness of HUD's privately owned subsidized projects indicates a ratio of total cost to market rent ranging from 1.44 to 1.61 (Wallace et al. 1981). This is a study of the Section 8 New Construction and Substantial Rehabilitation Program, HUD's largest program of this type. It made predictions of the market rents of subsidized units based on two different data sets containing information on the rent and many characteristics of unsubsidized units. The study did not collect information on the indirect costs of the Section 8 New Construction Program. Based on previous studies, the authors argue that these indirect costs would add 20 to 30 percent to the total cost of the Section 8 New Construction Program (Wallace et al., 1981, pp. 221, 226). Our range of estimates is based on the four combinations of the two predictions of market rent and the lower and upper limits on the indirect costs.

Dealing with LIHTC and other subsidized households is more problematic because they are served by a wide variety of programs. Since at least two thirds live in housing projects funded in part with LIHTC, our estimates of the lower bound on the ratio of total cost to market rent of their units is based primarily on GAO (U.S. Government Accountability Office 2002) results on differences in the cost per unit for housing vouchers versus tax credit projects for units with the same number of bedrooms and in the same type of area (metro v. nonmetro). [Online Appendix B](#) describes how we used the GAO results to approximate the ratio of total cost to market rent for the units occupied by LIHTC and other subsidized households and the rationale for our procedures.

The GAO results clearly understate the non-administrative cost of LIHTC projects. For example, the GAO calculations assume that tax credit projects pay full property taxes. In fact, many receive abatements or exemptions. The GAO calculations also assume that tax credit projects receive no subsidies for renovations during their initial 30-year use agreement. Based on experience with similar programs, GAO argues that many projects are likely to receive additional

tax credits to remedy the effects of under-maintenance during this period. GAO (2002, p. 24) argued that accounting for these two subsidies would increase their estimates of total cost by no more than 15%. We base our upper bound estimate of the taxpayer cost of the housing assistance to households in this category on this result. Other omitted costs such as land sold or leased to developers by local government agencies or public housing authorities for a nominal amount and residual loans from these sources that are not expected to be repaid in their entirety or at all are probably substantial. However, since their magnitude has never been documented, we ignore them.

Table 2 summarizes our estimates of the lower and upper bounds of the ratio of total cost to market rent across the different types of assistance. Multiplying the predicted market rent of the unit occupied by an assisted household by the relevant ratio of total cost to market rent yields the estimated total cost of providing its housing. Subtracting the tenant rent yields the taxpayer cost.

To determine the magnitude of the cash grant to each household that has the same cost to taxpayers as the housing program, we must subtract from the taxpayer cost of housing program the administrative cost of the program of cash assistance. We assume that this administrative cost is half of the administrative cost of the housing voucher program, namely, 3% of the market rent of the unit. Like the voucher program, the program of cash assistance must determine each household's economic circumstances to determine its subsidy. Unlike the housing voucher program, it will not have to determine whether the rent proposed by the landlord exceeds the rent of similar unsubsidized units (the rent reasonableness test) or inspect the housing unit periodically to determine whether it meets the voucher program's minimum housing standards.<sup>4</sup>

#### *4.3 Voucher Recipient Rents*

The taxpayer cost of housing assistance depends on not only the total cost of providing the housing but also the tenant's rent. For households living in subsidized projects, there is no ambiguity concerning what rent to report to the AHS. It is the rent that they pay. This is not true for voucher recipients. They sign an agreement with their landlord and housing authority specifying the rent that will be received by the landlord and the rent that will be paid by the

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<sup>4</sup> Increasing the predicted administrative costs of the cash transfer program to the cost of administering the voucher program had no important effects on our results.

tenant. To ensure that reported contract rent in the AHS is the tenant's rent, the survey asks respondents who reported receipt of a housing voucher a more detailed question about the rent they pay (PRENT). When these households reported a lower rent in response to this question than their answer to the initial question about their rent, the AHS assumes that the rent initially reported is the rent received by the landlord and uses PRENT to calculate the household's housing expenditure. The problem is that about a quarter of the households identified as voucher recipients by administrative records were not asked this question because they did not self-report receiving housing assistance. Therefore, it is unclear whether those voucher recipients reported tenant or landlord rent to the AHS.

We use a simple algorithm to (1) predict which voucher recipients who were not asked the detailed rent question underlying the variable PRENT reported landlord rent to the AHS and (2) estimate tenant rent for those households. The general approach is to identify a range of plausible values for tenant rent and range of plausible values for landlord rent for each household. If the reported rent is closer to the midpoint of the tenant range than the landlord range, we accept the reported rent as the tenant's rent. Otherwise, we assume that it is the rent received by the landlord.

Our range of plausible values for tenant rent in the voucher program is 27% to 36% of household income. According to voucher program rules, tenants pay between 30% and 40% of their adjusted income in rent. In the voucher program, adjusted income is about 90% of total income. Our range of plausible values of landlord rent is between 90% of the lowest Fair Market Rent in the household's general area (the AHS variable FMRA) and 110% of the highest Fair Market Rent in the area (the variable FMRB) plus 9% of the household's income. This range accounts for the discretion of public housing authorities to establish payment standards 10% below or above HUD's Fair Market Rents and the discretion of tenants to occupy units renting for more than the local payment standard.

This process suggests that roughly 12% of voucher holders who were not asked the detailed rent question underlying the variable PRENT reported landlord rent instead of tenant rent during the AHS survey. In those cases, we assume that the tenant's rent is 31.2% of the tenant's income. This is the ratio of mean tenant rent to mean tenant income in HUD's 2013 Picture of Subsidized Households.

#### *4.4 Implausible Incomes*

Recent research has revealed substantial underreporting of resources by the poorest families in major household surveys (Corinth et al. 2021; Meyer et al. 2019; Meyer, Mok, and Sullivan 2015; Meyer and Mittag 2019). Although this problem has not been studied for the AHS, there is no reason to believe that it is less severe in it. This leads to implausible reported cash incomes for many households. In the 2013 AHS, negative incomes (always small in absolute value) are reported for about 4% of renters.<sup>5</sup> Their mean reported housing expenditure is about \$700 a month. Among renters with a positive reported income, about 12% report a rent exceeding their income, with mean reported rent of about \$1,020 a month and reported income of less than \$500 a month. Most of these households report rents more than twice as great as their incomes. Based on the work of Meyer and his coauthors, these implausible cash incomes almost surely result from underreporting the magnitude of labor earnings and the receipt of cash assistance such as Supplemental Security Income (SSI). Furthermore, the AHS does not ask about receipt of income from the earned income tax credit (EITC) or child tax credits, important sources of cash income for low-income households.

The AHS also does not provide any information on receipt of in-kind assistance except for low-income housing assistance and SNAP, and SNAP participation is massively underreported. According to self-reported receipt of SNAP assistance in the 2013 AHS, the program served less than 9 million households in that year. Administrative records indicate that it served 23 million.

The first-best solution to the underreporting of labor earnings and cash and in-kind assistance in the AHS would be to append to the record for each person in the public use data set information on these magnitudes from administrative records as the Comprehensive Income Dataset Project has done and continues to do for other public use datasets.<sup>6</sup> This is a major undertaking beyond the scope of this paper. In a study of the effects of different low-income housing programs on consumption patterns and recipient wellbeing, (Early and Olsen 2022)

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<sup>5</sup> Since less than 1% of renters with negative reported income report income from sources that could be negative, this is the result of low reported values of income components combined with AHS bottom coding rules.

<sup>6</sup> Even that would understate the income of the poorest people because they have labor earnings from sources such as housekeeping, babysitting, and yard work that are not reported to any government agency (Edin and Lein 1997, Table 2-6).

attempted to improve upon reported household resources in the AHS, but found that simply deleting households with reported incomes less than reported rent yielded estimated program effects quite similar to estimates based on the improved resource measures. Therefore, except for the estimation the hedonic equation explaining market rent, households that report an income less than their housing expenditure are excluded from the analysis.

#### *4.5 Price Indices*

Our analysis requires interarea price indices. Carrillo, Early, and Olsen (2014) produced price indices for housing services, other goods, and all goods and services for each metropolitan area in the United States and the nonmetro part of each state from 1982 through 2012 and recently updated them through 2016.<sup>7</sup> We used their 2013 indices to create price indices at the lowest levels of geography identified in the AHS. Specifically, we used their price indices for households living in one of the 144 metro areas identified by the AHS variable SMSA. For other households in the 2013 AHS, we constructed population-weighted means based on the household's general area (DIVISION), whether it lived in an unidentified metro area, and if so, the type of metro area (METRO3). All three price indices were rescaled to have a national mean of 1. As a result, our quantity indices can be interpreted as market values at national average prices. The housing price index is used to convert market rents into indices of the quantity of housing services and similarly for other goods. These price indices are also used in estimating a regression model explaining the housing expenditure of renters without housing assistance.

## **5. Methods**

### *5.1 Consumption Pattern under Housing Program*

The first step in predicting the quantity of housing services consumed by a household under a housing program and the taxpayer cost of the program is to estimate the market rent of each subsidized unit in the sample. Dividing the predicted market rent by the housing price index yields an index of the quantity of housing services provided by the subsidized unit. Multiplying

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<sup>7</sup> These price indices can be found at <https://eolsen.weebly.com/price-indices.html>

the predicted market rent by the ratio of total cost to market rent for the program involved and subtracting the tenant's rent yields the taxpayer cost.

[Online Appendix](#) Table I reports the results of the estimation of a hedonic regression model that explains the rent of unsubsidized rental units as a function of their general location and the characteristics of the unit and its neighborhood.<sup>8</sup> Unsubsidized units are defined as units with positive rents that were occupied by households that did not receive HUD housing assistance according to HUD's administrative records, and reported that they did not receive housing assistance, did not live in a rent-controlled unit, and did not have their rent adjusted because someone in the household worked for or was related to the owner.

The 2013 AHS contains an unusually large number of variables capturing the condition of the unit, characteristics of the neighborhood, and contract conditions. The hedonic regression used to predict market rents contains 278 regressors representing 113 underlying variables that capture housing and neighborhood characteristics and contract conditions. [Online Appendix](#) Table I lists all of the regressors and their summary statistics.

Roughly half of the variables capture conditions of the housing unit, such as the number of bedrooms, bathrooms, whether a detached or multifamily structure, inclusion of various appliances in rent, and the household's satisfaction with the landlord's response to repair requests. To capture aspects of the condition of the unit not covered by these characteristics such as worn carpets and old appliances, we included the number of years that the current resident has lived in the unit. Landlords usually wait until tenants move to refresh their units.

The hedonic also includes 43 neighborhood variables, including 28 from two modules new to the AHS in 2013. One captures the respondent's opinion of his or her neighbors and the other the availability of public transportation and the walkability/bikeability of the neighborhood.<sup>9</sup> The neighbor module asked, among other things, whether the people in the neighborhood are close knit and get along. The transportation module focused on options available to households in the neighborhood such as the distance to the closest public

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<sup>8</sup> We also estimate a regression model explaining the logarithm of market rent rather than its level. The results of the log-linear specification differ from results based on the linear specification so trivially that we do not report results from the log-linear specification. For example, the mean of the predicted market rents across all subsidized units was \$1,054 a month based on the linear specification and \$1,067 month based on the log-linear specification.

<sup>9</sup> To reduce respondent burden, half of the AHS sample were asked the questions in the neighbor module and half the questions in the public transportation and walkability module. Our specification accounts for this feature by including dummy variables identifying observations that were not asked each set of questions.

transportation stop, what locations are accessible by public transportation, whether the neighborhood has bike lanes, and whether it is safe to walk in the neighborhood.

To capture omitted neighborhood variables, we also included dummy variables for Black and Hispanic head of the household. In our hedonic results, both are estimated to pay about 4% less for housing that is the same with respect to the included housing and neighborhood characteristics. We believe that these results reflect omitted neighborhood characteristics that are correlated with race and ethnicity.

The hedonic equation also includes 163 dummy variables (whose coefficients and summary statistics are not reported in [Online Appendix Table I](#)) to capture the general location of the unit. These include dummies that identify the specific metro area for households living in the 144 large areas identified in the AHS and combinations of census divisions and whether the unit is in a central city, suburban area, or rural area for other households.

Coefficients of important characteristics of the housing unit and location generally have expected signs and are statistically significant. For example, units with more bedrooms and bathrooms, with a working fireplace and with central air conditioning are estimated to have higher rents. Predicted rents fall with years in the unit and increase with additional persons per room. Units in the metropolitan areas of San Francisco, San Jose, New York City, and Honolulu were found to have the highest rents and the lowest were in small metropolitan areas of the south and southwest.

Despite its many regressors, the estimated hedonic equation had a relatively low  $R^2$  – 0.49. This suggests the omission of important explanatory variables. We believe that the main culprit is the failure to fully account for the differences in the desirability of the neighborhood and its proximity to places where people want to travel regularly. The AHS asks the respondent's opinion of the desirability of the neighborhood in a variety of respects, for example, their overall rating of the neighborhood as a place to live. However, a person's rating may say more about the neighborhood's desirability relative to the neighborhoods where the respondent grew up than its desirability relative to all other neighborhoods. The coefficients on opinions about aspects of the neighborhood are generally small and rarely significant. Beyond an indicator of whether the unit is part of the central city, or in an urban or rural area, no variables capture the unit's proximity to jobs or other locations of interest.

For our purposes, the key question is how well the hedonic regression based on unsubsidized units can predict the market rent of subsidized units. The panel nature of the AHS allows us to explore this question for units occupied by voucher recipients. The AHS uses administrative data to identify these recipients in the 2011 and 2013 surveys and 142 units occupied by voucher recipients in 2013 were occupied by unsubsidized households in 2011. The household might have been the same or different, but the unit is essentially the same. The reported 2011 gross rent (updated by the change in the BLS shelter price index) is a good estimate of its 2013 market rent. The mean of the updated 2011 gross market rents for the 142 units involved was \$960 per month. The mean of the predicted 2013 gross market rents of the same units based on the hedonic equation is \$928 per month. This suggests that our hedonic does an excellent job of predicting the market rent of units occupied by voucher recipients using the observed factors listed in [Online Appendix Table I](#).

We cannot use the same approach to assess the performance of the hedonic in predicting the market rent of units in subsidized housing projects (public or private). Units that were in a subsidized project in 2013 were in the same subsidized project in 2011. Other evidence suggests that these units are likely to be worse than unsubsidized rental units with respect to unobserved neighborhood characteristics. Newman and Schnare (Newman and Schnare 1997) report that 53.6% of public housing tenants and 21.9% of occupants of privately owned subsidized projects live in census tracts with poverty rates exceeding 30% compared with 14.8% of voucher recipients and 12.5% of all renters. These results suggest that our estimates of market rent will be reasonably accurate for voucher units, somewhat overstated for units in privately owned subsidized projects, and even more overstated for public housing units. If so, our results overstate the extent to which housing consumption under programs that have subsidized the construction and operation of housing projects, especially public housing, exceeds housing consumption with equally costly cash grants.<sup>10</sup> That is, they overstate the extent to which these programs are consistent with their rationales.

With these caveats in mind, our prediction of the market rent of each subsidized unit is the estimated mean market rent based on the hedonic equation and the unit's observed

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<sup>10</sup> Overstating the market rents of subsidized units also leads to an overstatement of their taxpayer cost and hence an overestimate of housing consumption with the cash grants. However, due to the small estimated marginal propensity to spend on housing, this is a small fraction of the overstatement of the market rent of the subsidized unit.

characteristics. The predicted market rent is used to predict housing consumption and taxpayer cost for each subsidized household.

Our index of consumption of other goods under the program is the household's income minus its housing expenditure divided by our price index for other goods.

### *5.2 Consumption Pattern with Equally Costly Cash Grant*

The next step is to predict how much each subsidized household would spend on housing if its housing assistance were replaced with a cash grant equal to the taxpayer cost of its housing assistance. For this purpose, we estimate a regression model explaining the housing expenditure of unsubsidized renters as a function of their income, market prices, and demographic characteristics. We exclude from this estimation the households in the top quintile of real income per-capita on the argument that the equation specified is at best a good approximation of reality for subsidized households and it will be a better approximation if its estimation is limited to similar households.

The equation specified assumes that each household has a displaced Cobb-Douglas utility function, where utility is derived from its consumption of two composite goods – housing services and other goods. Specifically,

$$U = (Q_H - \beta_H)^{\alpha_H} (Q_X - \beta_X)^{1-\alpha_H}$$

The displacement parameters  $\beta_H$  and  $\beta_X$  are assumed to be linear functions of household size and unobserved error terms and the marginal propensity to spend on housing  $\alpha_H$  is assumed to depend on demographic characteristics and an unobserved error term. For a given household, the error terms can be viewed as constants reflecting differences in taste, but since households are selected at random into the sample, they are random variables for our purposes. They could also reflect failure to maximize and measurement error in housing expenditure, but that would not affect our analysis. The maximization of this utility function subject to a linear budget frontier for a household with income  $Y$  and facing market prices  $P_H$  and  $P_X$  yields the housing expenditure function:

$$P_H Q_H = \alpha_H Y + (1 - \alpha_H) \beta_H P_H - \alpha_H \beta_X P_X$$

Substituting the expressions  $\alpha_H$ ,  $\beta_H$ , and  $\beta_X$  into the preceding yields a housing expenditure function that is not linear in its parameters and has an error term that is heteroskedastic. We estimate it with Stata's nonlinear regression command with the robust standard error option to account for heteroscedasticity.

Table 3 lists the demographic variables used in the estimation of the housing expenditure function, their summary statistics, and the results of the nonlinear regression. The fit of the equation is excellent. The estimated housing expenditure equation is used to predict the housing expenditure of participants in a housing program if the program were replaced with an equally costly cash grant. Housing expenditure is divided by our housing price index to get an index of housing consumption. Our results depend importantly on the marginal propensity to spend on housing. The mean predicted marginal propensity across all subsidized households based on this estimated equation is 0.074, and there is little difference in the marginal propensity across households with different characteristics.

A standard objection to the preceding approach is that subsidized households might have different tastes on average than unsubsidized households with the same observed characteristics and hence spend more or less on housing when facing the same budget constraint. Due to the way that housing programs change the budget spaces of families that are offered assistance, the direction of self-selection bias in our method for estimating conditional mean preference parameters is theoretically ambiguous. Administrative selection further complicates the matter. Low-income housing programs are not entitlement programs. Only one in four eligible renters receive low-income housing assistance in the United States (Collinson, Ellen, and Ludwig 2016), and waiting lists are long and closed to new applicants for extended periods. The system that determines which households are offered assistance varies enormously across thousands of public housing authorities and tens of thousands of privately owned subsidized projects. However, since subsidized households are not a random sample of eligible families, the existence of selection bias is undeniable. Only its importance and direction are in doubt.

Crews (1994) provides the best evidence on this matter. She accounts for both self and administrative selection in the estimation of the preferences of households with housing assistance and finds that ignoring selection bias leads to underestimating the mean tenant benefit of low-income housing programs by only 2% (Crews 1994, Tables 6.4 and 6.9). Given the small magnitude of the bias and the great complexity of dealing with it, our calculations ignore it.

## 6. Results

Table 4 reports key characteristics of the subsidized households in our analysis for all programs combined and programs of each type. The households served by HUD's largest programs are substantially poorer than those served by LIHTC and other housing programs, and they are much more likely to have a female or black head. Elderly and disabled people are overrepresented in HUD subsidized privately owned projects. The mean values of the price indices indicate that recipients of low-income housing assistance tend to live in places with somewhat higher than average prices, especially housing prices. The price indices were scaled to have a mean value of 1 across all households in the country.

Table 5 reports indices of mean consumption of housing services and other goods with and without housing assistance. The most striking result is that the HUD programs result in a much greater percentage increase in consumption of non-housing goods than in consumption of housing services and that the public housing program leads to a trivial increase in aggregate housing consumption of less than 1%. Recipients of assistance through LIHTC and other housing programs realized small increases (roughly 5%) in their consumption of housing and of other goods and have a much smaller taxpayer cost per household than the largest HUD programs.<sup>11</sup>

Table 5 contains other interesting results. On average, the housing voucher program and the conglomerate of other programs provide housing of similar quality and noticeably better than public housing and privately owned HUD-subsidized projects. The largest HUD programs increase the market value of goods consumed by recipients by similar amounts, but the largest HUD programs that provide project-based assistance have a much greater taxpayer cost than the tenant-based housing voucher program. Based on the lower bound estimate of taxpayer cost, the effect on the market value of goods consumed by recipients of a dollar spent on project-based housing assistance is about half of the effect of a dollar spent on tenant-based assistance. Based on the upper-bound estimates of taxpayer cost, subsidized projects are only about a third as effective as housing vouchers in increasing overall consumption relative to taxpayer costs. These results are a consequence of the cost-ineffectiveness of project-based assistance.

Table 6 compares mean consumption of housing services and other goods under the housing program with these mean consumption levels if the housing program were replaced with

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<sup>11</sup> But recall that our estimated taxpayer cost per unit for these programs is understated for reasons explained earlier.

a cash grant equal to our lower bound on the taxpayer cost of the housing program minus our estimate of the cost of administering cash assistance (hereafter net taxpayer cost). The most striking result is that public housing tenants had less aggregate consumption of housing services (roughly 8%) and much less consumption of other goods (roughly 34%) than they would have chosen with a cash grant equal to our lower bound on the net taxpayer cost of public housing. Only vouchers led to a noticeable increase in housing consumption (slightly more than 10%) compared to cash transfers equal to the net taxpayer cost of their housing assistance. The other types of housing assistance increase aggregate housing consumption modestly (less than 2%) compared with cash grants. All types of housing assistance led to less consumption of other goods than cash grants of these magnitudes. These differences are especially large for public housing and privately owned HUD-subsidized projects. The results based on the upper bound on the taxpayer cost of each type of housing assistance are not fundamentally different ([Online Appendix](#) Table II). This is due to the small estimated marginal propensity to spend on housing.

The fact that a housing program leads to greater aggregate consumption of housing services than an equally costly cash grant does not imply that this is the case for each household. We use two methods for estimating the fraction of households that would consume more housing services and less other goods, less housing services and more other goods, and less housing services and less other goods with housing programs than with cash grants. Under our assumptions and indeed any reasonable assumptions, no household can consume more of both goods with its housing program than with an equally costly cash grant.

The first method assumes that each subsidized household in the sample lived in a unit with a market rent equal to the predicted mean market rent of units with its observed characteristics based on our hedonic regression and would have lived in a unit with a market rent equal to the predicted mean housing expenditure of unsubsidized households with its observed characteristics and enhanced income if its housing program had been replaced with a cash grant equal to its net taxpayer cost. The results for method 1 assume that, for each sample observation, the population contains  $W$  households with the same consumption bundle under the housing program and the same bundle with the cash grant, where  $W$  is the reported AHS weight for the observation.

Table 7 reports results based on our lowest estimates of taxpayer cost. Except for public housing, most recipients of each type of housing assistance consume more housing services and

less other goods under their housing program than with cash grants. However, a substantial minority live in worse housing ranging from 34% of voucher recipients to 64% of public housing tenants. Indeed, many consume less of both goods under their housing program than with cash grants. About 60% of public housing tenants, a third of occupants of HUD-subsidized privately owned projects, and more than a quarter of recipients of the LIHTC and other housing programs consume less of both goods with their housing assistance than with equally costly cash grants. The qualitative results are similar for our highest estimates of the taxpayer cost of the housing programs ([Online Appendix](#) Table III).

The second method for estimating the qualitative differences in consumption patterns with housing programs versus cash grants recognizes that households with the same observed characteristics in the hedonic and housing expenditure equations do not have the same consumption of housing services and other goods under the housing program and would not with cash grants. The differences correspond to different values of the error terms in these equations. For simplicity, the second method assumes these error terms are independent normally distributed random variables. With these assumptions, we can estimate the fraction of households with the observed characteristics of each household in the sample that consume more housing services and less other goods under their housing program than with equally costly cash grants, consume less housing and more other goods, and consume less of both goods. [Online Appendix](#) C describes the underlying theory in detail. Multiplying these fractions by the sample weight for an observation yields the number of households in each category associated with that observation. Summing these numbers over all observations yields estimates of population totals.

The qualitative results in Table 7 based on method 2 and our lowest estimates of the taxpayer cost of the housing programs indicate that less than half of public housing tenants and slim majorities of recipients of other types of housing assistance consume more housing services under the program than they would with equally costly cash grants. Substantial minorities of recipients of project-based assistance would consume more of both goods with equally costly cash grants. [Online Appendix](#) Table III reports similar results based on our highest estimates of taxpayer cost.

## **7. Conclusion**

Good public policy provides the members of society with a mix of goods and services consistent with their preferences and the preferences of others who care about them. Low-income housing programs have a substantial effect on this mix for their participants. In determining the best mix, the preferences of both recipients and taxpayers are relevant. Taxpayers foot the bill for housing subsidies, and some taxpayers care about the consumption patterns of recipients. To be consistent with the usual assumptions about taxpayer preferences, housing programs must improve the housing conditions of recipients relative to equally costly cash grants.

The results in this paper indicate that none of the housing programs produce changes in consumption patterns fully consistent with the standard rationales for their existence. Although all the programs considered increase the aggregate consumption of housing beyond the level of consumption in the absence of any assistance, substantial numbers of recipients occupy worse housing under the program than they would with cash grants equal to the taxpayer cost of their housing program. Since money can be shifted between the broad types of housing programs, it is important for public policy to determine the extent to which different types of programs change consumption patterns in a direction consistent with their justifications and to target resources toward programs that best meet program rationales.

The results suggest that tenant-based housing vouchers are superior to project-based assistance in moving consumption patterns in a direction consistent with the rationales of housing programs. Tenant-based vouchers have led to the greatest increase in aggregate housing consumption relative to the absence of any assistance and relative to the consumption under an equally costly cash grant, and it has provided the largest increase in the market value of total consumption relative to taxpayer cost. Estimates further suggest that a smaller percentage of households in subsidized projects have increased their housing consumption relative to equally costly cash grants than the households that received tenant-based vouchers. Indeed, significant numbers of recipients of all types of project-based housing assistance would have occupied better housing and consumed more other goods had they been given equally costly cash grants rather than their housing assistance. This is due to the substantial cost-ineffectiveness of project-based assistance programs.

The dominance of tenant-based assistance across the metrics used in this study makes a strong case for phasing out subsidized housing projects in favor of tenant-based housing

vouchers. This is counter to the direction of current policy. Recent increases in housing assistance have relied on project-based assistance, mostly through the low-income housing tax credit program. Our results also raise questions about the desirability of providing housing assistance in any form rather than cash grants. Does the housing voucher program's modest improvement in housing conditions compared with cash grants justify its extra administrative cost?

For many years, arguments for low-income housing assistance in the U.S. focused on structural housing defects such as the absence of indoor plumbing. In recent years, the desirability of living in better neighborhoods has received much more attention (Newman and Schnare 1997; Orr et al. 2003; Kling, Liebman, and Katz 2007; Sanbonmatsu et al. 2011; Ludwig et al. 2013; Chetty, Hendren, and Katz 2016; Chyn 2018; Bergman et al. 2019). Our study deals with the effect of replacing housing programs with cash grants on a measure of housing consumption that includes both structure and neighborhood. The effect of this replacement on these separate components of the housing bundle remains an important gap in knowledge.

## References

- Bergman, Peter, Raj Chetty, Stefanie DeLuca, Nathaniel Hendren, Lawrence Katz, and Christopher Palmer. 2019. "Creating Moves to Opportunity: Experimental Evidence on Barriers to Neighborhood Choice." w26164. Cambridge, MA: National Bureau of Economic Research. <https://doi.org/10.3386/w26164>.
- Carrillo, Paul E., Dirk W. Early, and Edgar O. Olsen. 2014. "A Panel of Interarea Price Indices for All Areas in the United States 1982–2012." *Journal of Housing Economics* 26 (December): 81–93. <https://doi.org/10.1016/j.jhe.2014.09.002>.
- Chetty, Raj, Nathaniel Hendren, and Lawrence F. Katz. 2016. "The Effects of Exposure to Better Neighborhoods on Children: New Evidence from the Moving to Opportunity Experiment." *American Economic Review* 106 (4): 855–902. <https://doi.org/10.1257/aer.20150572>.
- Chyn, Eric. 2018. "Moved to Opportunity: The Long-Run Effects of Public Housing Demolition on Children." *American Economic Review* 108 (10): 3028–56. <https://doi.org/10.1257/aer.20161352>.
- Collinson, Rob, Ingrid Gould Ellen, and Jens Ludwig. 2016. "Low-Income Housing Policy." In *Economics of Means-Tested Transfer Programs in the United States*, edited by Robert Moffitt. University of Chicago Press.
- Corinth, Kevin, Bruce D. Meyer, Matthew Stadnicki, and Derek Wu. 2021. "The Anti-Poverty, Targeting, and Labor Supply Effects of the Proposed Child Tax Credit Expansion." Working Paper 29366. Working Paper Series. National Bureau of Economic Research. <https://doi.org/10.3386/w29366>.
- Crews, Cutts. 1994. "Self-Selection, Administrative Selection, and Aggregation Bias in the Estimation of the Effects of In-Kind Transfers." Doctoral dissertation, University of Virginia.
- Currie, Janet, and Firouz Gahvari. 2008. "Transfers in Cash and In-Kind: Theory Meets the Data." *Journal of Economic Literature* 46 (2): 333–83. <https://doi.org/10.1257/jel.46.2.333>.
- Diamond, Rebecca, and Tim McQuade. 2019. "Who Wants Affordable Housing in Their Backyard? An Equilibrium Analysis of Low-Income Property Development." *Journal of Political Economy* 127 (3): 1063–1117. <https://doi.org/10.1086/701354>.
- Early, Dirk W., and Edgar O. Olsen. 2022. "The Effects of US Low-Income Housing Programs on Recipient Consumption and Wellbeing." Working Paper. <https://economics.virginia.edu/sites/economics.virginia.edu/files/EffectsLowIncHousingPolicy-MARCH2022.pdf>.
- Edin, Kathryn, and Laura Lein. 1997. *Making Ends Meet: How Single Mothers Survive Welfare and Low-Wage Work*. Russell Sage Foundation.
- Ellen, Ingrid Gould, Amy Ellen Schwartz, Ioan Voicu, and Michael H. Schill. 2007. "Does Federally Subsidized Rental Housing Depress Neighborhood Property Values?" *Journal of Policy Analysis and Management* 26 (2): 257–80. <https://doi.org/10.1002/pam.20247>.
- Jacob, Brian A., and Jens Ludwig. 2012. "The Effects of Housing Assistance on Labor Supply: Evidence from a Voucher Lottery." *American Economic Review* 102 (1): 272–304. <https://doi.org/10.1257/aer.102.1.272>.
- Kling, Jeffrey R, Jeffrey B Liebman, and Lawrence F Katz. 2007. "Experimental Analysis of Neighborhood Effects." *Econometrica* 75 (1): 83–119. <https://doi.org/10.1111/j.1468-0262.2007.00733.x>.

- Ludwig, Jens, Greg J Duncan, Lisa A Gennetian, Lawrence F Katz, Ronald C Kessler, Jeffrey R Kling, and Lisa Sanbonmatsu. 2013. "Long-Term Neighborhood Effects on Low-Income Families: Evidence from Moving to Opportunity." *American Economic Review* 103 (3): 226–31. <https://doi.org/10.1257/aer.103.3.226>.
- Mayo, Stephen K., Shirley Mansfield, David Warner, and Richard Zwetchkenbaum. 1980. "Housing Allowance and Other Rental Housing Assistance Programs, Part 1: Participation, Housing Consumption, Location and Satisfaction." Washington, DC: U.S. Department of Housing and Urban Development, Office of Policy Development and Research.
- McCarty, Maggie, Libby Perl, and Hatie Jones. 2019. "Overview of Federal Housing Assistance Programs and Policy." RL34591. Congressional Research Service. <https://crsreports.congress.gov/product/pdf/RL/RL34591>.
- Meyer, Bruce D., and Nikolas Mittag. 2019. "Using Linked Survey and Administrative Data to Better Measure Income: Implications for Poverty, Program Effectiveness, and Holes in the Safety Net." *American Economic Journal: Applied Economics* 11 (2): 176–204. <https://doi.org/10.1257/app.20170478>.
- Meyer, Bruce D., Wallace K. C. Mok, and James X. Sullivan. 2015. "Household Surveys in Crisis." *Journal of Economic Perspectives* 29 (4): 199–226. <https://doi.org/10.1257/jep.29.4.199>.
- Meyer, Bruce D., Derek Wu, Victoria Mooers, and Carla Medalia. 2019. "The Use and Misuse of Income Data and Extreme Poverty in the United States." *Journal of Labor Economics* 39 (S1): S5–58. <https://doi.org/10.1086/711227>.
- Mills, Gregory, Daniel Gubits, Larry Orr, David Long, Judie Feins, Bulbul Kaul, and Michelle Wood. 2006. "Effects of Housing Vouchers on Welfare Families." Washington, DC: U.S. Department of Housing and Urban Development, Office of Policy Development and Research. [https://www.huduser.gov/portal/Publications/pdf/hsgvouchers\\_1\\_2011.pdf](https://www.huduser.gov/portal/Publications/pdf/hsgvouchers_1_2011.pdf).
- National Council of State Housing Agencies. 2018. "State HFA Factbook: 2016 NCSHA Annual Survey Results." Washington, DC: National Council of State Housing Agencies.
- Newman, Sandra J., and Ann B. Schnare. 1997. "'... And a Suitable Living Environment': The Failure of Housing Programs to Deliver on Neighborhood Quality." *Housing Policy Debate* 8 (4): 703–41. <https://doi.org/10.1080/10511482.1997.9521275>.
- Olsen, Edgar O. 2003. "Housing Programs for Low-Income Households." In *Means-Tested Transfer Programs in the United States*, 365–442. University of Chicago Press. <https://www.nber.org/books-and-chapters/means-tested-transfer-programs-united-states/housing-programs-low-income-households>.
- . 2019. "Does HUD Overpay for Voucher Units, and Will SAFMRs Reduce the Overpayment?" *Cityscape* 21 (3): 89–102.
- Olsen, Edgar O., and Jeffrey E. Zabel. 2015. "Chapter 14 - US Housing Policy." In *Handbook of Regional and Urban Economics*, edited by Gilles Duranton, J. Vernon Henderson, and William C. Strange, 5:887–986. Handbook of Regional and Urban Economics. Elsevier. <https://doi.org/10.1016/B978-0-444-59531-7.00014-4>.
- Orr, Larry, Judith Feins, Robin Jacob, Erik Beecroft, Lisa Sanbonmatsu, Lawrence F. Katz, Jeffrey Liebman, and Jeffrey Kling. 2003. "Moving to Opportunity Interim Impacts Evaluation." Washington, DC: U.S. Department of Housing and Urban Development, Office of Policy Development and Research. <https://www.huduser.gov/publications/pdf/mtofullreport.pdf>.

- Sanbonmatsu, Lisa, Lawrence F. Katz, Jens Ludwig, Lisa A. Gennetian, Greg J. Duncan, Ronald C. Kessler, Emma K. Adam, Thomas McDade, and Stacy T. Lindau. 2011. "Moving to Opportunity for Fair Housing Demonstration Program: Final Impacts Evaluation." Washington, DC: U.S. Department of Housing and Urban Development, Office of Policy Development and Research.
- Schwartz, Amy Ellen, Ingrid Gould Ellen, Ioan Voicu, and Michael H. Schill. 2006. "The External Effects of Place-Based Subsidized Housing." *Regional Science and Urban Economics* 36 (6): 679–707. <https://doi.org/10.1016/j.regsciurbeco.2006.04.002>.
- Turnham, Jennifer, Meryl Finkel, Larry Buron, Melisa Vandawalker, Bulbul Kaul, Kevin Hathaway, and Chris Kubacki. 2015. "Housing Choice Voucher Program Administrative Fee Study: Final Report Executive Summary." SSRN Scholarly Paper ID 3055223. Rochester, NY: Social Science Research Network. <https://papers.ssrn.com/abstract=3055223>.
- U.S. Department of Housing and Urban Development. 1973. "Housing in the Seventies." US Government Printing Office Washington, DC.
- . 2021. "Assisted Housing: National and Local | HUD USER." 2021. <https://www.huduser.gov/portal/datasets/assthsg.html>.
- U.S. Government Accountability Office. 2001. "Federal Housing Programs: What They Cost and What They Provide." GAO-01-901R. Washington, DC: Government Accountability Office. <https://www.gao.gov/products/gao-01-901r>.
- . 2002. "Federal Housing Assistance: Comparing the Characteristics and Costs of Housing Programs." GAO-02-76. Washington, DC: Government Accountability Office. <https://www.gao.gov/products/gao-02-76>.
- Wallace, James E., Susan Philipson Bloom, William L. Holshouser, Shirley Mansfield, and Daniel Weinberg. 1981. "Participation and Benefits in the Urban Section 8 Program: New Construction and Existing Housing. Vol. 1 & 2." Cambridge, MA: Abt Associates.
- Weicher, John. 1980. *Housing: Federal Policies and Programs*. Washington, DC: American Enterprise Institute. [https://www.aei.org/wp-content/uploads/2014/07/-housing\\_134308428970.pdf?x91208](https://www.aei.org/wp-content/uploads/2014/07/-housing_134308428970.pdf?x91208).

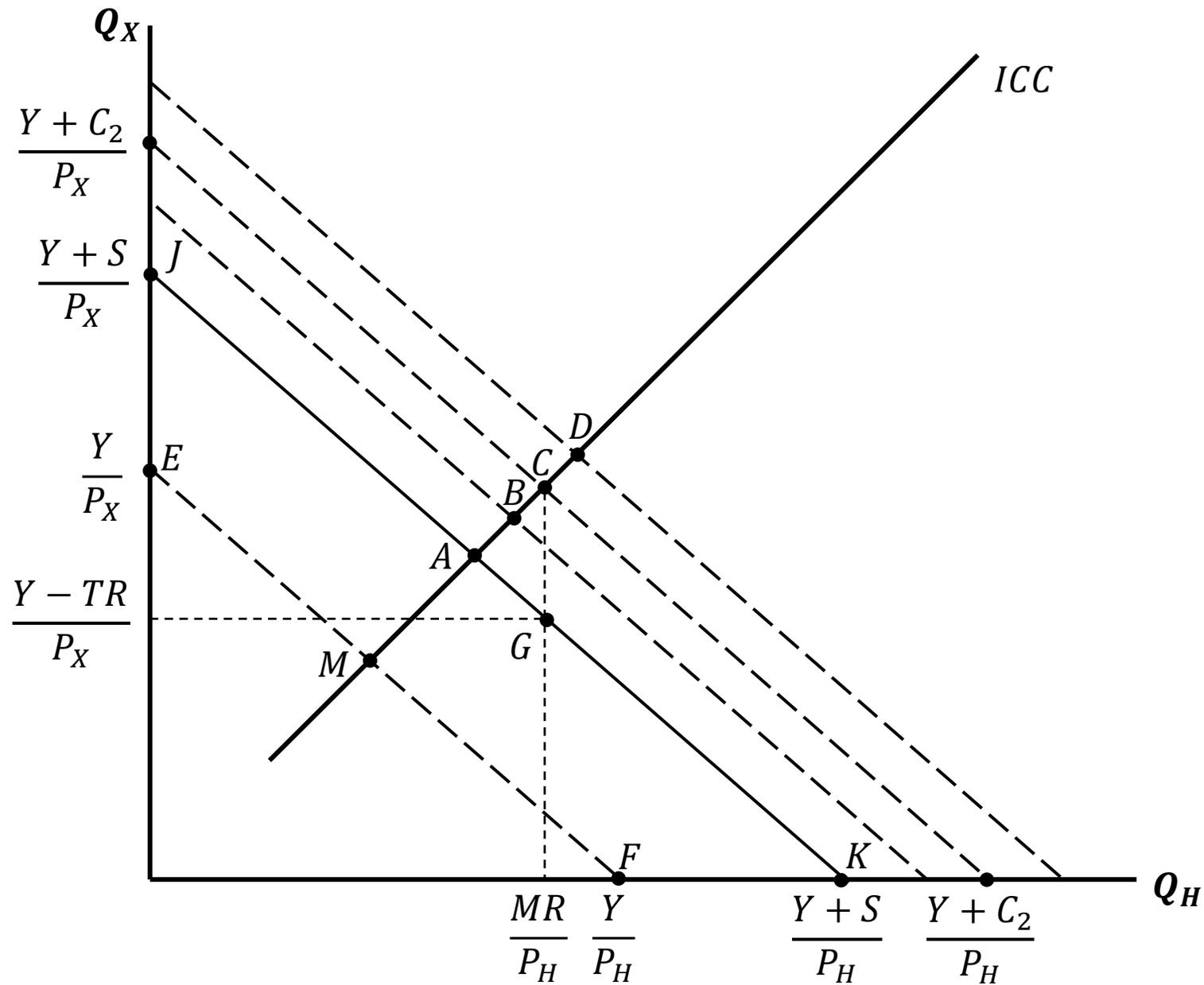


Figure 1. Effect on Consumption Pattern of Replacing Housing Program with Cash Grant

Table 1. Estimates of the number of households that received housing assistance

	All subsidized households	HUD voucher	HUD public housing	HUD subsidized privately owned projects	LIHTC and other housing programs
Number of households with housing assistance	7,359,566	2,527,738	1,062,683	1,357,782	2,411,362
Number of persons with housing assistance	16,700,130	6,208,522	2,440,810	2,564,609	5,486,190

*Notes* : Estimates based on 2013 AHS data using HUDADMIN and the self-reported variables that cover receipt of rental housing assistance.

Table 2. Estimates of the lower and upper bounds of the cost inefficiencies across programs

	All subsidized households	HUD voucher	HUD public housing	HUD subsidized privately owned projects	LIHTC and other housing programs
Lower bound on ratio of total cost to market rent	1.30	1.06	1.79	1.44	1.25
Upper bound on ratio of total cost to market rent	1.45	1.06	2.20	1.61	1.43

*Notes:* See text for sources and derivations. Numbers exceed 1 due to administrative cost and cost-ineffectiveness in producing housing services.

Table 3. Descriptive statistics and results from the regression predicting housing expenditures

	Marginal propensity to spend on housing ( $\alpha_H$ )	
	mean/(SD)	b/(se)
Housing expenditures	967.63 (465.94)	----- -----
Constant	-----	0.084*** (0.004)
Age of head	41.45 (15.87)	0.000 (0.000)
Head is female	0.50 (0.50)	0.003* (0.001)
Number of kids	0.75 (1.13)	-0.004*** (0.001)
Number of adults	1.89 (0.87)	-0.005*** (0.001)
Householder is Black	0.19 (0.39)	-0.009*** (0.002)
Householder is Asian	0.05 (0.22)	-0.003 (0.003)
Householder is Native American	0.02 (0.12)	-0.004 (0.005)
Householder is mixed race	0.02 (0.13)	-0.006 (0.004)
Householder is Hispanic	0.22 (0.41)	-0.009*** (0.002)
Householder is married	0.36 (0.48)	0.002 (0.001)
	Displacement parameter on housing expenditures ( $\beta_H$ )	
	mean/(SD)	b/(se)
Constant	-----	463.097*** (31.577)
Number of persons	2.64 (1.54)	10.593 (10.842)
	Displacement parameter on nonhousing expenditures ( $\beta_X$ )	
	mean/(SD)	b/(se)
Constant	-----	-652.169 (351.540)
Number of persons	2.64 (1.54)	-1029.050*** (146.187)
	R <sup>2</sup>	0.88
	RMSE	380.63
	N	10,631

Notes: Based on unsubsidized renter households in the bottom 4 quintiles of real per capita household income. Observations reporting housing cost in excess of income are also omitted from the analysis.

\* significant at the 10% level, \*\* significant at the 5% level, \*\*\* significant at the 1% level

Table 4. Characteristics of assisted households

	All subsidized households	HUD housing voucher	HUD public housing	HUD subsidized privately owned projects	LIHTC and other housing programs
Monthly reported household income	2095.49 (2402.90)	1780.74 (2014.04)	1504.66 (1523.15)	1465.51 (1426.69)	3007.59 (3118.83)
Number of persons	2.30 (1.52)	2.49 (1.62)	2.34 (1.46)	1.85 (1.31)	2.33 (1.49)
Real reported per capita household income	1101.45 (1250.14)	870.77 (1029.38)	793.00 (759.71)	956.75 (908.22)	1546.31 (1610.38)
Housing price index	1.07 (0.33)	1.08 (0.31)	1.05 (0.36)	1.07 (0.33)	1.08 (0.33)
Consumer price index	1.03 (0.12)	1.03 (0.12)	1.02 (0.13)	1.03 (0.13)	1.03 (0.12)
Black head	0.36 (0.48)	0.43 (0.50)	0.45 (0.50)	0.34 (0.47)	0.27 (0.45)
Asian head	0.04 (0.20)	0.03 (0.17)	0.03 (0.16)	0.06 (0.24)	0.05 (0.22)
Native American head	0.03 (0.17)	0.02 (0.15)	0.02 (0.13)	0.02 (0.13)	0.05 (0.21)
Mixed race head	0.03 (0.17)	0.03 (0.17)	0.03 (0.17)	0.03 (0.18)	0.03 (0.17)
Hispanic head	0.20 (0.40)	0.19 (0.39)	0.20 (0.40)	0.15 (0.36)	0.22 (0.42)
Single female with children	0.23 (0.42)	0.33 (0.47)	0.30 (0.46)	0.19 (0.39)	0.14 (0.35)
Married	0.17 (0.38)	0.12 (0.32)	0.14 (0.35)	0.12 (0.33)	0.26 (0.44)
Elderly person in the household	0.24 (0.43)	0.20 (0.40)	0.21 (0.41)	0.46 (0.50)	0.18 (0.38)
Disabled person in the household	0.32 (0.47)	0.33 (0.47)	0.35 (0.48)	0.43 (0.50)	0.24 (0.43)
	N 6211	1067	1520	2569	1055

*Notes.* Means and standard deviations in parentheses. Characteristics of the household are coded 1 if condition exists, 0 otherwise. These statistics refer to households included in the analysis, mainly subsidized households with incomes no less than tenant rent.

Table 5. Mean consumption levels with and without housing programs

	All subsidized households	HUD housing voucher	HUD public housing	HUD subsidized privately owned projects	LIHTC and other housing programs
Quantity of housing services without program	809.55 (204.37)	795.84 (195.17)	783.57 (171.90)	743.68 (150.20)	869.99 (233.83)
Quantity of housing services with program	876.16 (259.92)	913.33 (272.98)	788.62 (209.10)	817.94 (200.88)	907.30 (279.26)
Percentage increase in housing consumption	8.23	14.76	0.64	9.99	4.29
Quantity of other goods without program	1236.29 (2163.40)	936.13 (1831.09)	700.31 (1375.19)	681.43 (1238.07)	2069.68 (2802.22)
Quantity of other goods with program	1512.45 (2134.28)	1278.68 (1819.00)	1093.34 (1406.87)	1054.67 (1188.20)	2175.98 (2818.16)
Percentage increase in other goods consumption	22.34	36.59	56.12	54.77	5.14
Increase in market value of goods per month	362.76 (424.54)	480.57 (378.05)	429.58 (381.19)	477.16 (394.20)	152.92 (423.95)
Taxpayer cost per month (lower bound)	619.64 (527.56)	538.84 (389.17)	1082.18 (593.07)	860.37 (494.98)	373.51 (451.05)
Ratio of increase in market value to taxpayer cost (lower bound)	0.59	0.89	0.40	0.55	0.41
Taxpayer cost per month (upper bound)	751.67 (597.91)	538.84 (389.17)	1420.88 (718.24)	1008.43 (539.79)	542.14 (465.20)
Ratio of increase in market value to taxpayer cost (upper bound)	0.48	0.89	0.30	0.47	0.28
	N 6211	1067	1520	2569	1055

Notes: Quantities can be interpreted as monthly market values at national average prices in 2013.

Table 6: Mean consumption with housing programs vs cash grants at lower bound on net taxpayer cost

	All subsidized households	HUD housing voucher	HUD public housing	HUD subsidized privately owned projects	LIHTC and other housing programs
Quantity of housing services with cash grant	850.83 (196.57)	829.93 (189.32)	855.18 (170.00)	803.10 (143.03)	895.78 (227.62)
Quantity of housing services with program	876.16 (259.92)	913.33 (272.98)	788.62 (209.10)	817.94 (200.88)	907.30 (279.26)
Percentage change in housing consumption beyond consumption with cash grants	2.98	10.05	-7.78	1.85	1.29
Quantity of other goods with cash grant	1773.49 (2043.63)	1399.75 (1731.21)	1658.76 (1394.62)	1434.88 (1193.65)	2384.31 (2690.30)
Quantity of other goods with program	1512.45 (2134.28)	1278.68 (1819.00)	1093.34 (1406.87)	1054.67 (1188.20)	2175.98 (2818.16)
Percentage change in other goods consumption beyond consumption with cash grants	-14.72	-8.65	-34.09	-26.50	-8.74
	N 6211	1067	1520	2569	1055

*Notes:* Quantities can be interpreted as monthly market values at national average prices in 2013. Cash grants are equal to the taxpayer cost of the housing program minus an administrative cost of 3% of the market value of the unit occupied under the program.

Table 7. Qualitative differences in consumption patterns with housing programs vs cash grants at lower bound on net taxpayer cost

	All subsidized households	HUD housing voucher	HUD public housing	HUD subsidized privately owned projects	LIHTC and other housing programs	
<b>Method 1</b>						
Fraction of households that consume more housing services and less other goods with the housing program than with cash grant	0.55	0.66	0.36	0.57	0.53	
Fraction of households that consume less housing services and more other goods with the housing program than with cash grant	0.20	0.30	0.05	0.09	0.21	
Fraction of households that consume less housing services and less other goods with the housing program than with cash grant	0.25	0.04	0.59	0.34	0.26	
<b>Method 2</b>						
Fraction of households that consume more housing services and less other goods with the housing program than with cash grant	0.53	0.57	0.46	0.52	0.52	
Fraction of households that consume less housing services and more other goods with the housing program than with cash grant	0.32	0.39	0.17	0.24	0.34	
Fraction of households that consume less housing services and less other goods with the housing program than with cash grant	0.16	0.04	0.36	0.23	0.15	
	N	6211	1067	1520	2569	1055

*Notes:* Method 1 is the sum of the households each observation represents (based on AHS weights) whose predicted market rent and predicted housing expenditures under a cash transfer fits each criteria. Method 2 allows for differences in consumption patterns and market rents of units with identical characteristics and assumes the error terms in the equations used to predict market rents and housing expenditures are independent normally distributed. Cash grants are equal to the taxpayer cost of the housing program minus an administrative cost of 3% of the market value of the unit occupied under the program.