The Effect on Program Participation of Replacing Current Low-Income Housing Programs with an Entitlement Housing Voucher Program

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Abstract

This paper estimates the effect on participation rates of families of various types of replacing HUD's largest low-income housing programs with alternative tenure-neutral entitlement housing voucher programs that differ in their taxpayer cost and the relative generosity of the subsidy to households of different types. The estimates of participation in the entitlement programs are based primarily on the five-percent household sample from the 2000 Decennial Census and participation experience in the only entitlement housing assistance programs that have been operated in the United States. HUD's administrative records provide data on current recipients of low-income housing assistance. The paper explores the sensitivity of the results to the equations used to predict participation. The results indicate that even the entitlement housing voucher program that costs 10 percent less than the current system would serve 50 percent more households in total and many more of each type – white, black, and Hispanic; elderly and nonelderly; families living in metropolitan and nonmetropolitan areas; small, medium, and large families; and households in the first two real income deciles.

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1. Introduction

Low-income housing assistance is a major part of the U.S. welfare system. Unlike other major means-tested transfer programs, no low-income housing program is an entitlement for any type of household. Nevertheless, federal, state, and local governments spend substantially more on housing subsidies to the poor than on other better-known parts of the welfare system such as TANF. The U.S. Department of Housing and Urban Development spent more than $36 billion in FY 2009, federal tax expenditures on the Low Income Housing Tax Credit, mortgage revenue bonds, and multi-family revenue bonds added more than $5 billion, the USDA's low-income housing programs cost almost $1 billion, and state and local governments spend some money from their own resources to provide such assistance. For example, local governments provide substantial property tax abatements to all public housing projects and many privately owned projects.

Plausible assumptions about taxpayer preferences argue strongly for replacing the current patchwork of non-entitlement low-income housing programs with an entitlement housing assistance program for the poorest households [Olsen, 2003, pp. 428-430]. The non-entitlement nature of housing assistance is a historical accident with no coherent rationale.[1] Offering some households large subsidies while denying assistance to other identical households cannot be defended. Evidence on the excessive costs of all forms of unit-based housing assistance argues for exclusive reliance on tenant-based assistance [Olsen, 2003, pp. 394-399; Olsen, 2008, pp. 9-15; Olsen, 2009]. It costs much more to provide equally good housing with unit-based housing assistance, and unit-based assistance has no offsetting advantages. Therefore, it would be possible to serve current recipients equally well (that is, provide them with equally good housing for the same rent) and serve many additional families without spending more money by shifting resources from unit-based to tenant-based assistance. The results of the best study of HUD's

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[1] Government involvement began during the Great Depression with a program that subsidized the construction of public housing projects. In part, this program was intended to increase employment. The number of households made eligible for public housing enormously exceeded the ability to build apartments for them.

largest program that subsidized the construction of privately-owned projects imply that tenant-based vouchers could have provided all of the families who participated in the Section 8 New Construction Program with equally good housing for the same rent and served at least 72 percent more families with similar characteristics equally well without any additional public expenditure [Wallace et al., 1981]. Finally, few argue that the government should actively discourage homeownership by low-income households. Low-income housing assistance should be at worst neutral in this regard. Recent events say more about how, rather than whether, to deliver homeownership assistance to low-income households.

The current situation differs greatly from the ideal of an entitlement program of tenant-based housing assistance that does not discourage homeownership. Less than 30 percent of eligible renters receive low-income housing assistance, and this percentage is much lower for eligible homeowners [Olsen, 2003, pp. 390-393]. This is not because they do not want it on the terms offered. There are long waiting lists to get into subsidized housing in all localities, and the length of the waiting list understates excess demand in many localities because housing authorities often close their waiting lists when they get sufficiently long. Furthermore, more than two thirds of low-income housing assistance is unit-based. Finally, the current system of low-income housing assistance is heavily biased against homeownership. After accounting for geographical price differences and adding an imputed return on home equity to the income of homeowners in calculating real income, nearly 25 percent of renters but less than 5 percent of homeowners in the lowest real income decile receive housing assistance. The gap is smaller in the second real income decile, but still substantial [Olsen, 2007, Table 1]. The federal government does provide large subsidies through the federal income tax system that induce more households to be homeowners and homeowners to occupy better housing. However, the bulk of these subsidies go to middle- and upper-income families.

Replacing the current system of low-income housing programs with an entitlement program of tenant-based assistance has been espoused by housing policy analysts for many years [Khadduri and Struyk (1982), Olsen (1982), Weicher (1997), and Olsen (2004)]. The Clinton Administration proposed comprehensive legislation for phasing out unit-based assistance [HUD, 1995], and in his campaign against President Clinton, Robert Dole also proposed vouchering out public housing. Although the Clinton proposals were not adopted, the 1998 Housing Act

mandated the demolition of public housing projects and the provision of tenant-based assistance to their residents under certain circumstances and allowed it under other circumstances.

This paper studies the effect on participation rates of families of various types of replacing HUD's current low-income housing programs with alternative tenure-neutral entitlement housing voucher programs. Some have the same taxpayer cost as the current system, others cost 10 percent more, and still others 10 percent less. Several alternative adjustments of the subsidy for family size and composition are considered as well as higher subsidies for households with an elderly or disabled head. Finally, the paper explores the sensitivity of the results to the equations used to predict participation.

The entitlement voucher programs analyzed would offer a cash grant to each eligible family on the condition that it occupy housing meeting certain standards. This type of housing voucher was used in HUD's entitlement Housing Assistance Supply Experiment (HASE) operated in two metropolitan areas in the 1970s and in a non-entitlement national voucher program administered by HUD from 1983 through 1999. The minimum housing standards are similar to those in HUD's current voucher program. Like most current HUD programs, the entitlement voucher programs considered reduce the subsidy by 30 cents for each additional dollar of adjusted income. They also mimic the income adjustments in current programs. Unlike the current voucher program, the proposed programs are neutral with respect to homeownership (that is, a household receives the same subsidy with the same restrictions whether it owns or rents its dwelling unit). They also involve different subsidy levels than the current voucher program in order to achieve specified taxpayer costs.

Due to the absence of relevant data on the characteristics of households served by the majority of occupants of Low Income Housing Tax Credit projects, USDA's housing programs, HUD's HOME and CDBG block grants, and HUD's programs for the homeless, the analysis will be limited to replacing HUD's other programs with an entitlement voucher program. That is, this paper analyzes effects of replacing public housing, the tenant-based and project-based Section 8 programs, and HUD's older programs that subsidize privately owned projects. Since HUD provides project-based or tenant-based Section 8 subsidies on behalf of a substantial minority of the tenants of tax credit projects and HUD routinely collects data on these households, they are included in the analysis. The overwhelming majority of other households in tax credit projects have incomes too high to be eligible for the entitlement programs analyzed.

We assume that these households and households served by other programs excluded from the analysis will continue to be served by their current programs. Since the proposed reforms would not reduce the development subsidies associated with tax credit projects, these projects would continue to serve the same number of households. As in HASE, voucher recipients would not be allowed to live in subsidized housing projects. Therefore, the poorest households in tax credit projects would be replaced gradually by households with higher incomes.

The estimates of participation in the entitlement housing voucher programs are based on the five-percent household sample from the 2000 Decennial Census and previously estimated regression equations explaining participation in the entitlement housing assistance programs operated during the 1970s in two metropolitan areas as a part of the Experimental Housing Allowance Program's Housing Assistance Supply Experiment. These two experimental programs are the only entitlement low-income housing programs that have been operated in the United States. The two sites were chosen to differ greatly with respect to their vacancy rate and racial composition. The Supply Experiment entitlement housing assistance programs were neutral with respect to homeownership, and they provided a subsidy equal to a payment standard minus 25 percent of adjusted income on the condition that the household occupy a dwelling meeting certain minimum housing standards. To predict participation rates based on HASE experience, we adjust 1999 nominal magnitudes for differences in prices across space and time. HUD administrative data are used to determine participation rates of different types of households under its current programs.

In assessing the political feasibility of the type of fundamental reform considered in this paper, it is important to realize that this reform need not be implemented overnight. A politically feasible reform would involve a transition that does not harm, or even benefits, the overwhelming majority of current recipients of low-income housing assistance. For example, public housing tenants could be offered a choice between housing vouchers and staying in their current units on the same terms. This will benefit some without hurting others. Current recipients of Section 8 vouchers could be allowed to receive the generous subsidies that are now offered by the program while new recipients receive less generous subsidies so that more households can be served. Reform must also honor legal commitments. For example, payments on current terms will be provided to owners of private subsidized projects until the end of their use agreements. Occupants of these projects will not be offered vouchers until that time, and

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they might be provided with a moving allowance if they decide to move at the end of the use agreement.[2]

2. Entitlement Housing Voucher Programs

This section specifies the parameters common to the entitlement housing voucher programs analyzed. Because these programs have the same structure and some of the same parameters as the program operated in HASE and participation predictions are based on HASE experience, we begin with a few additional details about the Experiment.

Congress authorized the Experimental Housing Allowance Program in 1970, planning for the experiment occurred in the early 1970s, data were collected during the mid-1970s, and the final reports were completed in the late 1970s and early 1980s. The Rand Corporation conducted the Housing Assistance Supply Experiment.[3] This experiment involved operating entitlement housing allowance programs in the Green Bay and the South Bend metropolitan areas. At the time of the experiment, Green Bay had few minorities and a rental vacancy rate of about 5 percent. South Bend had a large minority population and a rental vacancy rate of about 10 percent. About 16.5 percent of the households in Green Bay and 21.4 percent in South Bend were eligible for the entitlement program [Lowry, 1983, p. 90]. In the entitlement voucher programs considered in this paper, the fraction eligible ranges from 14.5 to 16.3 percent. Unlike established housing programs, both renters and homeowners could participate. These households were offered a cash grant on the condition that they occupy housing meeting certain standards. These payments could continue for up to ten years provided that the household's income remained sufficiently low. Unlike the Section 8 Housing Choice Voucher Program, the payments were made directly to the households. Empirical evidence indicates that the cost-effectiveness of the voucher program does not depend to any significant extent on this feature [Mayo et al. (1980); Wallace et al., 1981; Weinberg, 1982; Leger and Kennedy, 1990; ORC/Macro, 2001, Chapter V].

Figure 1 depicts the budget space of a household offered this type of housing assistance under standard simplifying assumptions. The quantity of housing services Q_H is measured along

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[2] Olsen (2008, pp. 17-23) provides detailed proposals for the transition to an entitlement housing voucher program.
[3] Lowry (1983) describes the Supply Experiment and its main findings.

the horizontal axis, the quantity of other goods Q_X along the vertical axis. The quantity of housing services is an index of the overall desirability of the dwelling unit and its neighborhood. If the household were to decline the offer of housing assistance, it could consume any bundle of goods that costs no more than its income Y at market prices P_H and P_X. These are the points on or below the line segment AB. Under the voucher program in the Supply Experiment, the household receives a subsidy S on the condition it occupies a unit meeting the program's minimum housing standards (in the diagram, a unit that provides at least Q_H^{MIN} units of housing service). The shaded area in Figure 1 is the budget space of a household that is offered this type of voucher. The subsidy in the Supply Experiment was equal to a payment standard R minus 25 percent of the family's adjusted income. Larger families were entitled to subsidies based on larger payment standards to enable them to occupy units with more bedrooms.

Because participation in an entitlement housing program depends in part on the program's minimum housing standards and our participation predictions are based on participation in HASE, the proposed programs adopt the minimum housing standards that were used in the Supply Experiment. These minimum housing standards are very similar to the standards in the current Section 8 Housing Choice Voucher Program [Katagiri and Kingsley, 1980, Section 2.07; 24CFR982.401].

The subsidy to a household under each entitlement housing program analyzed is equal to a payment standard minus 30 percent of the household's adjusted income provided that this amount exceeds $30 a month.[4] Like other welfare programs, we set a lower bound on the subsidy to avoid the administrative cost of distributing a small amount of money. Like payment standards in the Section 8 Housing Choice Voucher Program, the payment standards within an area for each program analyzed are different for households of different sizes and compositions, and they are different across areas for households of a given size and composition. However, they are not the payment standards in the Section 8 Housing Choice Voucher Program. Payment standards in the each entitlement voucher program analyzed are designed to achieve a specified

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[4] This subsidy formula differs from that in the current voucher program in several respects. Under the proposed programs, the subsidy does not depend on the rent of the unit occupied. Under the current voucher program, occupying a unit renting for less than the program's payment standard reduces the subsidy dollar for dollar and (on new leases) occupying one renting for more than the payment standard plus 10 percent of adjusted income reduces the subsidy to zero [Olsen, 2003, pp. 401-404].

taxpayer cost and insure that households with the same characteristics are able to occupy equally good housing in all localities.

Like the Section 8 Housing Choice Voucher Program, we establish payment standards that are tied to an entitlement to a unit with a particular number of bedrooms. However, families are not required to live in a unit with the specified number of bedrooms. Like the current program, the bedroom entitlement is only used to determine the payment standard and hence the generosity of the subsidy. Although federal rules do not mandate a particular number of bedrooms for households of a given size and composition, the norm under the current system is two people to a bedroom with certain exceptions [HUD, 2001, Section 5.9; HUD, 2003, Chapter 5]. For example, virtually all housing authorities establish a relationship that depends on the mix of age and gender of the children. Our payment standards assume two persons to a bedroom except to avoid the sharing of a bedroom by children of the opposite sex who are over six years old and adults who are not married or partners. Boys and girls under seven of different sexes can share a bedroom. Two children of the same sex can share a bedroom no matter what their ages. Our data do not indicate the relationship between adults except their relationship to the household head who filled out the Census questionnaire. Therefore, we allocate a separate bedroom to each other adult who was neither the spouse nor unmarried partner of the respondent. Although some households surely contain more than one couple, this is rare. Less than 5 percent of all households have more than three adults, and some of these households surely have only one couple.

Unlike the current Section 8 Housing Choice Voucher Program, we establish a nationally uniform relationship between the payment standards for units with different numbers of bedrooms. In the current program, each local housing authority can choose a payment standard for units with a particular number of bedrooms within 10 percent of HUD's Fair Market Rent (FMR) that applies throughout its metropolitan area or non-metropolitan county. Furthermore, relative FMRs for units with different numbers of bedrooms are not the same across all areas. Current ratios in a locality are based on local differences in median rents of units with different numbers of bedrooms, with some fairly arbitrary upward adjustments for units with more than two bedrooms. The methods used to produce FMRs and housing authority discretion in setting payment standards based on them lead to deviations in the relative payment standards for units with different numbers of bedrooms across housing authorities.

We analyze two alternative nationally uniform relationships between the payment standards for units with different numbers of bedrooms. One is based on the percentage difference in 2006 national average FMR for units with each number of bedrooms up to 4, with a 15 percent increment for each additional bedroom beyond 4.[5] The other is based on the coefficients of a hedonic equation explaining the natural logarithm of the market rents of dwelling units as a function of many housing and neighborhood characteristics, dummy variables for the location of the unit in one of 331 metropolitan areas or the non-metropolitan part of a particular state, and dummy variables for the number of bedrooms [Carrillo, Early, and Olsen, 2010, Table A-1 (1)]. Table 1 reports the ratio of our payment standard for units with each number of bedrooms to our two-bedroom payment standard.

Under each alternative entitlement housing voucher program, payment standards across areas are adjusted fully for differences in housing prices. This enables households entitled to the same number of bedrooms and living in units renting for the local payment standard to occupy equally good housing in all localities. Olsen, Davis, and Carrillo (2005, pp. 9-11) describe the derivation of this price index.[6] Using these housing price indices and the nationally uniform bedroom adjustment factors, the payment standards for all numbers of bedrooms and all locations can be computed from the two-bedroom payment standard in any location.

The adjusted income used to determine a household's subsidy is the household's cash income from all sources plus an estimated return on home equity for homeowners minus allowed deductions from income, unless this yields a negative number. In this case, adjusted income is zero. Because homeowners are richer than renters with the same ordinary income, we add an estimated return on their home equity to their ordinary income to determine their gross incomes, as was done in HASE [Katagiri and Kingsley, 1980, 2.03(3)]. Appendix A describes how we calculated the estimated return for each homeowner. Our allowed deductions from gross income mimic those in the HUD programs replaced at the time of our data to the extent possible with the Decennial Census's PUMS data, namely, $480 a year per child, $400 a year if the head or co-head of the household was elderly or disabled, and the mean of other deductions ($628 a year) based on HUD's administrative data. Unlike many welfare programs, the allowed deductions

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[5] See http://www.huduser.org/portal/datasets/fmr.html for the underlying data. Because less than one percent of all households would be entitled to more than 4 bedrooms based on our algorithm, any reasonable treatment of units with more bedrooms would yield about the same results.
[6] It is a highly correlated (correlation coefficient=.983) with the more refined housing price index in Carrillo, Early, and Olsen (2010).

from gross income in low-income housing programs are modest. Their nominal amounts have not been changed for many years.

3. Methodology for Predicting Participation in Entitlement Programs

The purposes of this paper are to estimate participation rates under alternative entitlement housing voucher programs and compare them with participation patterns in HUD's current programs that they are intended to replace. In order to estimate the number of households that would participate in a particular entitlement housing voucher program and its cost, it is necessary to predict the participation rate of households with each combination of observed characteristics. This section discusses the alternative methods that could have been used to make these predictions and describes the method chosen in more detail.

There are two possible approaches to the prediction of participation rates under an entitlement housing voucher program. One possibility is to use information on outcomes under the current non-entitlement system of housing assistance to estimate a model that could be used to simulate the effects of replacing this system with an entitlement housing voucher program. The other approach is to base predictions of participation rates under the proposed program on outcomes under a previous entitlement housing voucher program.

Implementing the first approach would be very difficult. It would involve specifying and estimating a model that explains the choices of a random sample of households under the current non-entitlement system of housing assistance. This requires data on which households were offered housing assistance, how this offer affected the consumption bundles available to the household, and which households accepted the offer. No survey of a random sample of the population collects information about which unassisted families were offered housing assistance. Without information on which families were offered housing assistance and what they were offered, it is not possible to describe accurately their budget spaces when they made their decisions. Since the overwhelming majority of unassisted households are not offered housing assistance during a year, the best approximation of reality is to assume that no unassisted household was offered it. This will lead to biased estimators of the parameters of the model.

To avoid the preceding difficulties, we opted for the second approach. We estimate the participation rates of households of various types in the five-percent household sample from the

2000 Decennial Census using a previously estimated logit equation explaining participation in the Housing Assistance Supply Experiment. This equation reported in Table 2 was estimated using data for 1977 because the participation rate seemed to have reached its steady state by then. Because few single non-elderly households were eligible for housing assistance at the time, such households were excluded from the sample used to estimate the logit equation. We exclude them from our analysis because we did not have a good basis for predicting their participation rates in the proposed entitlement programs. Since HASE data were inadvertently discarded by an organization entrusted by HUD with its safekeeping, estimating alternative specifications of the prediction equations are not possible at this stage.

How the logit equation is used to predict participation in an entitlement housing voucher in 1999 in other locations based on information in the PUMS requires some discussion. We first created prediction equations based on the experience in each site by substituting the appropriate values for the dummy variable *St. Joseph County* (South Bend) into the equation.[7] Most of our predictions are based on the mean predicted participation rates across the two sites. However, to test the sensitivity of the results to the prediction equation used, we also produce results based on the equations for the individual sites. At the sample mean values of the variables, the predicted probability of participation is 10 percentage points lower in South Bend than Green Bay. Therefore, these prediction equations provide a substantial difference in predicted participation rates.

Obviously, the generosity of the subsidy (the variable *Allowance*) is an important determinant of participation. However, a subsidy of $3000 a year in South Bend in 1977 is considerably more generous than a subsidy of the same nominal magnitude in New York City in 1999. For each entitlement voucher program considered, we use Olsen, Davis, and Carrillo's cross-sectional consumer price index to express each household's subsidy in 1999 in terms of the prices that prevailed in each of HASE sites in 1999 and then use the national CPI to deflate these amounts to 1977, specifically, the CPI-U price index for all items.

The logit equation contains two variables *Duration of Eligibility* and *Fraction Previous Year Eligible* that are not available in the PUMS. We substituted HASE sample mean values of these variables into the prediction equation. The logit equation also contained a dummy variable

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[7] Because the estimated effects of the determinants of participation were very similar in the two sites in preliminary work, the authors settled on a final specification of the logit model in which only the constant term differed across sites [Carter and Wendt, 1982, p. 88].

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Previous Interview whose value we set equal to zero for the reason mentioned below. Each year during HASE, the occupants of a random sample of dwelling units chosen at the outset of the experiment were surveyed.[8] The logit equation was estimated with data from this survey and administrative records from the fourth year of the experiment. Due to household mobility and the addition of newly built units to the sample, some households surveyed in the fourth year were interviewed for the first time and many others had been interviewed earlier. Each year's survey asked a number of questions concerning the respondent's knowledge about HASE, thereby increasing their awareness of the program. The variable *Previous Interview* takes a value of 1 if the respondent had been interviewed previously and 0 otherwise. Unsurprisingly, it was found that respondents who had been interviewed previously were more likely to be receiving a housing allowance. Because no similar survey will accompany our reforms, we set the value of this variable equal to zero.

In estimating the logit equation, the variable *Minority* was defined to be 0 if the household head was a non-Hispanic white and 1 otherwise. It is tempting to apply this definition to households in the PUMS and use the logit equation in a straightforward manner to predict the participation rates of otherwise similar households in different racial and ethnic groups.[9] However, a careful consideration of the racial and ethnic mixes of the populations in HASE sites in 1977 and the participation rates of these groups in low-income housing programs in 1999 argues strongly for a more nuanced approach.

Table 3 reports the percentage of the U.S. population in broad racial and ethnic groups in 2000 and the percentages in HASE sites in 1980. It documents the substantial difference in the racial composition of the two HASE sites that reflected a conscious choice in site selection. More importantly for present purposes, it reveals the very small Hispanic population in the two sites compared with their percentage of the U.S. population in 2000. The households classified as minority in the sample underlying the logit equation were overwhelmingly black. Very few were Hispanic.

Clearly, HASE logit equations are most informative about the participation rates of non-Hispanic whites and blacks, and we use them without modification for these groups. Non-Hispanic whites and blacks accounted for about 82 percent of HUD-assisted households in the

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[8] New units were added to the sample each year to account for new construction.
[9] In the previous draft of the paper, we succumbed to this temptation. This led to extremely large predicted increases in Hispanic participation in low-income housing programs.

lowest two real income deciles in 1999.[10] Since almost all households eligible for the entitlement housing programs are in these income deciles, the logit equation provides a good basis for predicting participation for the bulk of likely participants.

Our decisions about how to predict participation rates of households with other combinations of race and ethnicity are based on evidence on participation in HUD's non-entitlement housing voucher program in 1999 by households in the first real income decile. About two thirds of participants in the proposed programs are in this decile. Because the existing program was a non-entitlement program that allocated funds to different localities in proportions that surely differed from the expenditure proportions under our entitlement programs, and the current program did not affect the consumption possibilities of households offered assistance in exactly the same way as any entitlement housing voucher program analyzed, the relative participation rates of different groups will not be exactly the same under the existing and proposed programs. Nevertheless, we believe that the relative participation rates of different groups in the current voucher program provide useful guidance for predicting the participation rates of groups other than non-Hispanic whites and blacks. In our view, this is undeniable for other-race Hispanics.

Table 4 presents the total number of households of each type (excluding single non-elderly households) in the first real income decile and their participation rates in HUD's housing voucher program in 1999. The participation rate of other-race non-Hispanics is similar to that of white non-Hispanics and very different from black non-Hispanics. Therefore, we classify this group as non-minority for predicting their participation. The participation rate of black Hispanics is very similar to that of black non-Hispanics. We classify this group as minority for prediction purposes. How to predict participation for white Hispanics is less clear. Their participation rate in the current program is between the participation rates of non-Hispanic whites and blacks, albeit somewhat closer to the black rate. Our predicted participation rate for members of this group is a weighted average of the participation rates of non-Hispanic whites and blacks with the same other characteristics, where the black participation rate has a weight of 70 percent [.162=.3(.088)+.7(.194)].

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[10] Our method for calculating real income is described later. Briefly, it accounts for geographic differences in consumer prices and differences in family size and composition

The most striking result in Table 4 is the extraordinarily low participation rate of other-race Hispanics. For example, it is only 2 percent of the participation rate of black Hispanics. This low participation rate is not limited to the voucher program. Only 1 percent of all other-race Hispanic households in the lowest real income decile received assistance from any of the HUD programs replaced compared to 19 percent for the group with the next lowest participation rate. Without a doubt, other-race Hispanics are overwhelming American Indians whose immigration status precludes or strongly discourages applying for housing assistance.[11] Categorizing other-race Hispanics as minorities in the logit equation for predicting their participation in an entitlement housing voucher program with current citizenship rules for eligibility would grossly overstate their participation. Based on the numbers in Table 4, we assume that the participation rate of other-race Hispanics in an entitlement housing voucher program would be only 2.5 percent of the participation rate of otherwise similar white Hispanics [.025=.004/.162].

Unlike the proposed entitlement programs, HASE did not replace the low-income housing programs that existed at the time. Instead it offered an alternative form of housing assistance to all households with sufficiently low income, roughly the poorest 15 to 20 percent of households. Most families served by existing programs were eligible for HASE, but few switched to the allowance program [Lowry, 1983, p. 89].[12] The logit equation was estimated with data on HASE-eligible households who were not served by other programs. Therefore, it surely understates what the participation rates would have been in the absence of the existing programs. Many households that continued to participate in the existing programs would have participated in the entitlement housing assistance program if the existing programs had been terminated. We assume that all households that were poor enough to be eligible for HASE but continued to participate in an existing program would have participated in HASE in the absence of the existing programs. Lowry (1983, pp. 96-99) provides results that allow us to predict participation in an entitlement housing voucher program in the absence of the existing programs under this assumption. Specifically, he reports the fraction of eligible households (excluding those served by other housing programs) who received housing allowances and the fraction of all eligible households who received housing allowances or were served by other programs,

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[11] See HUD (2001, Chapter 5) for the citizenship rules that apply to all HUD housing assistance.
[12] Since housing allowance payments were limited to at most the ten years of the experiment, this is not surprising.

separately for renters and owners in each site. Consistent with these results, we increase the predicted participation rates based on the logit regression by 17.8 percent for renters and 32.1 percent for homeowners in Green Bay and 44.7 percent for renters and 14.8 percent for homeowners in South Bend.[13]

4. Estimating Participation Rates in Existing Housing Programs

The number of households of various types who received assistance from the HUD programs that would be gradually replaced by the entitlement housing voucher program is based primarily on HUD's Longitudinal Occupancy, Demography, and Income (LODI) file that contains data from HUD's Multifamily Tenant Characteristics System (MTCS) and Tenant Rental Assistance Certification System (TRACS) for 1995 through 2002. This database provides information that is reported by local housing authorities and owners of privately-owned HUD-subsidized housing projects on the characteristics of assisted families collected when they are admitted to a housing program or recertified for continued participation. It also identifies the primary program providing the housing assistance.[14] Due to incomplete reporting by housing agencies and owners of private projects, the LODI data file does not contain information on all households that received HUD assistance under the set of programs considered. Furthermore, in making calculations, we deleted observations for households that did not report values of the variables used in the analysis or reported clearly erroneous values.[15] So using unadjusted counts of the households in the LODI data file with reasonable values of the variables of interest would understate the number of HUD-assisted households.

We used data on the total number of households that received assistance under the specified programs in 1998 and 2000 reported in HUD's Picture of Subsidized Households (PSH) to adjust upward the total number of households of each type in the LODI data file in 1999 with reasonable values of the variables used in the analysis.[16] Specifically, with two exceptions explained below, we calculated the number of HUD-assisted households in each state

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[13] These are percentages rather than percentage points. The same percentage is applied to the predicted participation rate for all renters in Green Bay no matter what their other characteristics and similarly for the other three groups.
[14] Selected researchers were granted access to this file under confidentiality agreements to protect the privacy of the households involved. An issue of Cityscape (Volume 8, Number 2, 2005) contains many articles based on it.
[15] With billions of entries, some errors are inevitable.
[16] The source is http://www.huduser.org/portal/datasets/assthsg.html. HUD did not produce a PSH for 1999.

in 1999 by first multiplying the number of HUD units (or vouchers) in each state by the occupancy rate (or voucher utilization rate) and then calculating the mean of these numbers for the two years. The ratio of this estimated total number of HUD-assisted households in the state to the number of households in the LODI file was used to adjust the participation totals for all household types in the state.

One problem with the PSH numbers is that they understate the number of units and households served in 2000 due to the exclusion of households served by Indian Housing Agencies (IHA). After 1998, IHA were no longer required to submit to HUD the information used to construct the PSH.[17] Since the money spent to serve these households is included in the taxpayer cost of the existing system and residents of these areas would be eligible for the entitlement housing voucher program, households served by IHA should be included among current recipients. The 1998 PSH reports the number of units and occupancy rates for IHA in each state, and we use this information to calculate the number of households served in that year. To estimate the number of households served by these housing authorities in 2000 in each state, we multiply the 1998 number of units by the mean of the 1998 and 2000 public housing occupancy rates in the state.

Although the total number of households served by IHA is a very small fraction of the national HUD total, their exclusion would greatly affect the results in the states with the largest Native American populations. In Alaska, IHA accounted for almost half of total HUD units; in South Dakota about a third. Since the proposed reforms would require congressional approval and members represent states or parts of states, producing credible results at the state level is important.

With this adjustment to the PSH numbers, our estimate of the HUD total in each state in 1999 was the mean of the 1998 and 2000 totals with one exception. Even if the 1998 and 2000 totals were correct, this estimate will be too high in some states and too low in others due to linear interpolation. Furthermore, there are always some inaccuracies in any data file. We can deal with these measurement errors to some extent. Under the assumption that housing authorities do not submit forms for fictional households, the number of households served in each state in 1999 must be at least as large as the number in the 1999 LODI file. In seven states, the estimated HUD total was less than the number of households in the 1999 LODI. In these

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[17] See http://www.hud.gov/offices/pih/ih/codetalk/nahasda/1998/1998-09.pdf.

cases, we increased our estimate of the HUD total to the LODI total. This added only about 20,000 households to the total.

Independent evidence indicates that our methods led to estimates of the total number of HUD-assisted households at the national level in 1999 very close to the truth. Our estimate is about 4.15 million. HUD's Recent Research Results (October 2000) reported 4.19 million households at the end of 1999, excluding Indian housing but including HUD-assisted housing in U.S. possessions.[18] Since there were about 70,000 households served by IHA and 110,000 HUD-assisted households in U.S. possessions, the comparable HUD number is also about 4.15 million. This does not preclude errors in a particular direction for some types of households, but it implies errors of equal magnitude in the opposite direction for other types.

Overall, the preceding analysis led us to conclude that the LODI file contained about 87 percent of HUD-assisted households, and we adjusted total participation in current programs upward by that magnitude. However, we did not adjust participation rates upwards by the same percentage for families of all types. We used the same percentage adjustment for all families in the same state, but families of a given type accounted for different fractions of the population in different states.

5. Taxpayer Cost of Existing Housing Programs

The purpose of this paper is to estimate certain effects of replacing the bulk of HUD's low-income housing programs for most potential recipients in the United States with alternative entitlement housing voucher programs with the same taxpayer cost as the current system and with taxpayer costs 10 percent more and less than this amount. This section describes how we estimated the cost of serving all households except single non-elderly under the HUD programs replaced.[19] For the reasons mentioned below, ours is a conservative estimate of taxpayer cost. As a result, our estimate of the increase in the number of households served that would result from the reform is understated on this account.

The HUD programs that would be replaced with the entitlement voucher program served about 4.0 million households in 1999. The full taxpayer cost of serving these households is not

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[18] See http://www.huduser.org/periodicals/rrr/rrr_10_2000/1000_6.html.
[19] Recall that we exclude single non-elderly individuals from our analysis because we did not have a good basis for predicting their participation rates in the proposed entitlement programs.

available. To get a lower bound estimate of this cost, we begin with the reported outlays of the HUD programs that served them. According to the U.S. House of Representatives (2000, Table 15-32), this amount was about $25 billion. However, a part of it was used to serve non-elderly one-person households that are excluded from the analysis. In adjusting the total taxpayer cost for the exclusion of these households, we account for their share of total assisted households (about 20 percent) and the ratio of their cost per household to the cost per household of other household types. In the Section 8 Housing Choice Voucher Program, the latter ratio is about .77.[20] Since we have not found data for other programs, we assume that this ratio applies to all current HUD programs. This leads to the conclusions that the excluded households account for 16.7 percent of the aforementioned budget and hence about $20.8 billion is spent on the households included in the analysis. This figure includes almost $500 million spent to assist households in U.S. possessions, mainly Puerto Rico.[21] Assuming that 16.7 percent is devoted to single non-elderly, about $400 million is devoted to other households. This suggests that the total taxpayer cost of the programs replaced in the United States for serving all households except the single non-elderly was about $20.4 billion.

The taxpayer cost of providing housing assistance to the specified households is clearly much greater than this amount. For example, about 40 percent of the households that live in tax credit projects receive tenant-based or project-based Section 8 assistance [GAO, 1997, p. 40]. HUD assistance under these programs is included in our total. However, the tax credit subsidy that pays 70 percent of the development cost is not included. Furthermore, tax credit projects usually receive additional subsidies from several other sources that are not included in the outlays of the specified HUD programs. For example, many receive subsidies funded by the HOME Program that provides housing block grants to state and local governments [Cummings and DiPasquale, 1999, p. 299]. Public housing provides another example. Housing authorities receive substantial property tax abatements on their projects. This is a cost to local taxpayers. A less obvious example is the opportunity cost of continuing to use public housing projects to serve assisted households. These projects could be sold to the highest bidders and the proceeds put into a trust fund whose interest is used to fund housing vouchers. Since some of these funds

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[20] The source of these numbers is the LODI file.
[21] This is based on data from the 1998 and 2000 PSH.

would be difficult to tap to support an entitlement housing voucher program, we ignore these costs and limit our budget for most proposed entitlement programs to $20.4 billion.

Because the entitlement voucher programs would have administrative costs, the entire $20.4 billion would not be available to distribute to recipients. We assume that the administrative cost of the entitlement programs would account for the same fraction of the total cost as in the Section 8 Housing Choice Voucher Program, namely, 8.2 percent.[22] This leaves $18.8 billion to distribute to recipients. All of our simulations involving equal taxpayer cost distribute slightly less than this amount. HASE administered their entitlement program in a simpler manner than the current voucher program. If these procedures were used, it would be possible to distribute more to recipients with no increase in the budget.

6. Results

This section presents estimates of the effect on participation rates of families of various types of replacing HUD's largest current low-income housing with alternative tenure-neutral entitlement housing voucher programs. Most simulations are designed to have the same taxpayer cost as the current system, but one is designed to spend 10 percent more and another 10 percent less. Most simulations adjust the payment standards for differences in the number of bedrooms to which the family is entitled in a manner consistent with the national average in HUD's Section 8 Housing Choice Voucher Program, but one uses adjustments based on a hedonic regression. Most predict participation in the entitlement program as the mean of the predicted probabilities from the two HASE sites for families of each type. However, to test the sensitivity of the results to the prediction equation used, we calculate separate results based on the prediction equations for each site. We report results for families whose members are in the first and second decile of the distribution of real income. This requires a measure of the real income of the members of a household. In all simulations, we add an imputed return on home equity to the income of homeowners and account for geographical price differences in calculating real household income. To measure the level of material well-being attained by the individuals in the household in most simulations, we divide real household income by an equivalence scale for family size

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[22] In fiscal year 2005, HUD spent $13.5 billion on housing assistance payments and $1.2 billion on program administration (http://www.cbpp.org/cms/index.cfm?fa=view&id=2115).

and composition recommended by a committee of the National Research Council, namely, the number of adults plus .7 times the number of children all raised to the .7 power, [Citro and Michael, 1995, p. 162]. In one simulation, we use the simpler real household per capita income.

Table 5 reports results based on the current budget for the programs replaced, payment standard adjustments for the number of bedrooms in the Section 8 Housing Choice Voucher Program, the mean of the predicted probabilities from the two HASE sites, and the NRC equivalence scale for family size and composition. It indicates that the entitlement housing voucher program would serve more than 2 million additional households with a slightly smaller budget, namely, $20.0 rather than $20.4 billion. All major groups would experience large increases in participation from the reform ranging from 16 percent for black households to 155 percent for households with 5 or more members.

In interpreting the results in this table, it is important to distinguish between the amount of money spent on behalf of a recipient and how much the recipient is helped. Because the same total amount is spent on a larger number of households, the amount spent per household is less under the entitlement housing voucher program than with the continuation of the current system. Current recipients will not be hurt by the reforms because they will be grandfathered. However, many future recipients will receive smaller subsidies than they would have received with the continuation of the current system. This does not mean that they will be served less well. The best previous studies show that housing vouchers could be used to provide occupants of subsidized housing projects with equally good housing for the same rent at a much lower taxpayer cost [Mayo et al. (1980); Wallace et al., 1981]. More recent studies yield the same conclusion, albeit based on data of lower quality. The amount spent on behalf of recipients under different types of low-income housing assistance is a poor measure of how much they are helped by it. The 61 percent increase in the number of households served due to the reform analyzed in Table 5 results to a considerable extent from replacing programs of project-based assistance with much more cost-effective housing vouchers. However, it is the case that households that would have received Section 8 vouchers with a continuation of the current system would not only receive smaller subsidies but also be less well served by the entitlement housing voucher program. The entitlement program's payment standards were less than HUD's FMRs in almost all cases. The median and mean payment standards for two-bedroom units across all metropolitan areas were about 16 percent less than the median and mean FMRs. In our

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view, this reduction in subsidies to future recipients serves the interest of equity. Instead of providing larger subsidies to two identical households and none to a third, the proposed reform provides smaller subsidies to all three.

Table 6 shows that the wide range of percentage increases for different groups is due to the overrepresentation of some groups and underrepresentation of others in the current system. It reports participation rates in the current system and under the entitlement voucher program separately for households in the first and second real income deciles. About 93 percent of current recipients and 98 percent of participants in the entitlement voucher are in these real income deciles. Under the current system, the participation rate of blacks in the first income decile is more than twice the participation rate of whites or Hispanics. Under the entitlement voucher program, the black participation rate is only slightly greater than the white rate.[23] Because blacks in the lowest real income decile participate at such a high rate in the current system, they would experience a smaller increase in participation than other groups due to the reform (about 13 percent). The pattern is similar in the second real income decile. The data in Table 6 support the conventional wisdom that current low-income housing programs serve large families at a much lower rate than smaller families. Large families would be served at a much higher rate under the entitlement voucher program and hence experience the greatest percentage increase in participation from the reform.

Since the proposed reforms would require congressional approval and members represent states or parts of states, we report the overall results for each state. Table 7 indicates very large increases in the overwhelming majority of states. In five states, more than twice as many households would be served. Only five states would experience decreases in the number of assisted households. These range from 0.2 percent in Connecticut to 11 percent in North Dakota. These are small states that had unusually high participation rates under the current system ranging from 23.9 percent in the bottom two real income deciles in South Dakota to 44.9 percent in D.C. Throughout the country, only 17.8 percent of all households in these deciles participated in the current programs.

Although passage of legislation to implement reforms does not require unanimous consent, it would surely be facilitated by insuring that no state experiences a reduction in the

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[23] The Hispanic participation rate is much lower than the rates for blacks and whites due to the very low predicted participation rates of other-race Hispanics due to their immigration status.

number of households that receive housing assistance. Because the states involved have such small populations, this can be done at a minute cost by providing higher subsidies to the households in these states than would result from the strict application of the formulas underlying the proposed entitlement housing voucher program. This is a common legislative practice. One particularly relevant example is the legislation that allows selected housing authorities to base their payment standards in HUD's Section 8 Housing Choice Voucher Program on Fair Market Rents that are 25 percent greater than the norm. This enables them to provide more generous subsidies to the residents of their areas at the expense of taxpayers elsewhere. Allowing housing authorities in the five states that would experience declines in the number of assisted households under the standard formulas of the proposed reform to offer sufficiently generous subsidies so that the number of assisted households in each state would increase by 5 percent would cost less than $76 million each year. This would increase the cost of the proposed reform to $20.1 billion which is still less than the cost of the current system.

Table 8 reports results for alternative policy parameters, participation prediction equations, taxpayer cost, and measures of real income. Column 1 repeats the results for the simulation reported in Table 5. The results of each alternative simulation are compared with them.

The results in column 2 are based on the same assumptions as those in column 1 except for the measure of real income. In column 2, the real income enjoyed by members of a household is simply real household income accounting for geographic price differences and the return on home equity for homeowners divided by the number of members of the household. This alternative definition of real income only affects the estimated percentage increase for households in different real income deciles. Although alternative definitions of real income lead to different quantitative conclusions about the increases in the two lowest deciles, the qualitative effects are the same. Households in both deciles would experience large increases in participation due to the reforms.

The results of an entitlement housing voucher program depend on its parameters. For example, the participation rate of larger households relative to smaller households can be increased without spending more money by increasing the payment standards associated with units with many bedrooms and reducing it for units with few bedrooms. Column 3 reports the results of an alternative variation in program parameters, namely, 10 percent higher payment

standards for households with an elderly or disabled household head. Some argue an increment is desirable to pay for additional features that are important for these households. This modification of program parameters has some effect on the participation rates of all groups, but its largest effects are to increase the participation rates of the elderly, small households, and households in the second real income decile.

Column 4 reports results for an alternative set of payment standards. Specifically, payment standards for units with different numbers of bedrooms are based on a hedonic regression rather than HUD's Fair Market Rents (see table 1). These lead to differences in the payment standards and hence subsidies for households of different sizes and compositions. For most groups, the effect is modest. Although the smallest households gain the most from these alternative payment standards, their percentage gain in participation from replacing current programs with an entitlement voucher program is still much smaller than for larger households.

Some favor greater spending on low-income housing assistance; others favor less spending for this purpose. Columns 5 and 6 report the results of spending about 10 percent more and 10 percent less than the current system, respectively. The most important result is that the proposed reform would serve 50 percent more households in total and substantially more households of every type while spending 10 percent less money.

The preceding estimates of the effects of proposed reforms are based on the average participation experience in the two HASE sites. The actual effects will surely be at least somewhat different because the actual participation rates of households with a particular set of characteristics and offered a particular subsidy will differ from the average HASE experience. The remaining columns in Table 8 indicate the sensitivity of our results to the equation used to predict participation. As mentioned earlier, the two HASE sites differed greatly in their vacancy rates and racial composition and experienced very different participation rates in the entitlement program for households with the same characteristics. At the sample mean values of the variables, the predicted probability of participation based on the logit equation is 10 percentage points lower in South Bend than Green Bay. Therefore, these prediction equations provide a substantial difference in predicted participation rates.

Column 7 presents results based on the South Bend experience and column 8 on the Green Bay experience, adjusting the program's payment standards in each case to spend the current budget. The lower predicted participation rates based on the South Bend experience lead

to smaller predicted increases in participation than in column 1, but the overall increase exceeds 50 percent and all groups experience substantial increases. The predicted increase in participation from the reform is much larger for all groups based on the Green Bay prediction equation. However, the qualitative conclusions are the same for the alternative prediction equations.

The preceding analysis indicates how the effect of replacing the current system with an entitlement housing voucher depends on the participation propensities, when the program's payment standards are adjusted to spend the current budget. The final simulations consider how the outcomes of an entitlement voucher program with fixed parameters would vary with differences in participation propensities. Column 9 reports the outcomes for an entitlement program with the payment standards underlying the results in column 1 if the actual participation experience was that in South Bend. The result would be smaller, but still substantial, increases for all groups and spending $1.5 billion less. Column 10 reports the outcomes for the same voucher program based on the Green Bay participation experience. In this case, the increases would be larger for all groups and the cost would be $1.6 billion more.

It is rarely, if ever, possible to predict exactly the cost of changes in government policy, and the inability to do it in this case is a very weak argument against the proposed reform because it will be phased in over about a decade. If participation experience deviates from the expected in the early years, the payment standards can be adjusted to account for these deviations. Some adjustments in payment standards will occur every year to account for inflation. In the early years of the reform, this could be done each year rather than by formula. If participation rates and hence taxpayer cost are higher than expected, these adjustments could be more modest. If they are lower than expected, the adjustments could be more generous.

7. Conclusion

The calculations in this paper strongly suggest that it will be possible to devise an entitlement housing voucher program that costs no more than the current system and that serves many more households of each type. Indeed, an entitlement voucher program that costs much less than the current system would have this effect. With due attention to the transition to the new system, this can be done without hurting current recipients. Indeed, a transition can be designed to

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benefit many of these households. Our conclusion is that replacing the current system with an entitlement housing allowance program serves the interests of low-income households and the taxpayers who want to help them with their housing. Sometimes it is possible to get more for less.

Appendix A

This appendix describes how we calculated the return on home equity of each homeowner in the 2000 Decennial Census PUMS. Home equity is equal to the market value of the house minus the outstanding balance on all home loans. The PUMS reports the owner's estimate of market value but does not report the outstanding balance on home loans. We combine information from the PUMS, the American Housing Survey, Freddie Mac's Primary Mortgage Market Survey, and research on the relationship between the owner's estimate of market value and actual sales price to approximate each household's home equity and the return on it.

PUMS reports the owner's estimate of market value (VALUE) in 24 categories. We use the midpoint of the category reported by a household as its estimate of the market value of its house. Based on research on the relationship between the owner's estimate of market value and actual sales price [Kiel and Zabel, 1999], we multiply the owner's estimate by .95 to get a better estimate of market value.

PUMS does not report outstanding balances on mortgage and home equity loans. However, it does report monthly payments on first and second mortgages (MRT1AMT and MRT2AMT) and the year that the household occupied the unit (YRMOVED). To approximate the outstanding balance, we assumed that (1) the owner's only loans are first and second mortgages taken out at the time that the household moved into its house, (2) the loans have not been refinanced, (3) both loans are for some standard duration, and (4) the interest rate on these loans is the national average interest rate for loans of similar durations at the time that the mortgage was originated. Under these assumptions, the appropriate formula to calculate outstanding balance on each mortgage is:

$$OB = MP \cdot \left(\frac{1 - (1/(1+r))^T}{r} \right).$$

In this formula, OB is the outstanding balance on the loan, MP is the monthly payment (MRT1AMT or MRT2AMT), T is the number of remaining monthly payments, and r is the monthly interest rate. Adding the estimated outstanding balances on the first and second mortgages yields the overall outstanding balance.

To approximate the outstanding balance on a mortgage based on the preceding formula requires estimates of its interest rate *r* and number of remaining mortgage payments *T*. The PUMS reports neither. To estimate the interest rate on first and second mortgages, we combine data on the average durations of mortgages of each type with data on mortgage interest rates for mortgages of similar durations. Specifically, the 1999 National American Housing Survey reports that the mean term of first mortgages was 25 years (300 months) and the mean term of second mortgages was 17 years (204 months). We assume that all first and second mortgages were of these durations. To approximate the interest rates on them, we use the interest rates at the time that the household moved into its house from Freddie Mac's Primary Mortgage Market Survey for 30-Year Fixed Rate Mortgages and Conventional Conforming 15-Year Fixed Rate Mortgages.[24] The PUMS does not report the exact date that the household moved into its house. Instead, it reports the date in one of six categories: 1999-2000, 1995-1998, 1990-1994, 1980-1989, 1970-1978, and 1969 or earlier. We assume that the move occurred in the middle of each period except for the last. We assume that households in the last category moved into their house in January 1969. Very few people in this category had a mortgage. The first period was assumed to end on April 1, 2000, the approximate time of the census survey. Our calculations use the interest rates on 30-year and 15-year mortgages at these times for first and second mortgages, respectively. The PUMS data together with the preceding assumptions about when mortgages were originated leads to an estimate of the number of mortgage payments that had already been made. This combined with our assumption about the duration of first and second mortgages leads to an estimate of number of remaining mortgage payments.

Due to the various approximations involved in our calculations, the predicted number of remaining mortgage payments was negative in some cases. In these cases, we assumed that the outstanding balance on the mortgage was zero. In part for the same reason, the estimated outstanding balance on all mortgages exceeded the estimate market value of the house in some cases. In these cases, we assumed that home equity was zero.

Finally, we must apply a rate of return to home equity to get a dollar return that is added to the homeowner's income. Such returns differ from property to property and time to time. For our calculations, we assume a rate of return of 7.2 percent. This was the average mortgage

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[24] The sources are http://www.freddiemac.com/pmms/pmms30.htm and
http://www.freddiemac.com/pmms/docs/15yr_pmmsmnth.xls

interest rate on 30-year fixed rate mortgages between 1998 and 2002. The assumed rate of return overstates the average return on home equity for at least one important reason and understates it for another. Since the return on home equity is untaxed, the relevant rate of return is the expected *after-tax* return on a taxed investment of the same risk. Recipients of mortgage interest payments must pay taxes on this income. Therefore, the after-tax return on mortgages was less than 7.2 percent during this period. An offsetting bias is that mortgagors assume more risk than mortgagees. Mortgagees do not incur losses unless the market value of the house falls below the outstanding balance of the loan. Index funds based on the S&P 500 and the Wilshire 4500 arguably are more risky than mortgages but less risky than equity in a house. The returns on both indices vary greatly from year to year. Between 1996 and 2005, the return on the S&P index fund varied from a high of 33.17 percent in 1997 to a low of negative 22.05 percent in 2002. In 2000, the rates of return on these index funds were –9.14 and –9.74 percent, respectively. The *before-tax* rate of return on the stocks in the S&P 500 averaged about 9.01 percent over this period and the rate of return on the stocks in the Wilshire 4500 averaged about 9.75 percent. *After-tax* returns would be around 6 percent. The risk associated with the equity in a single asset is surely greater than the risk associated with an index fund of stocks.

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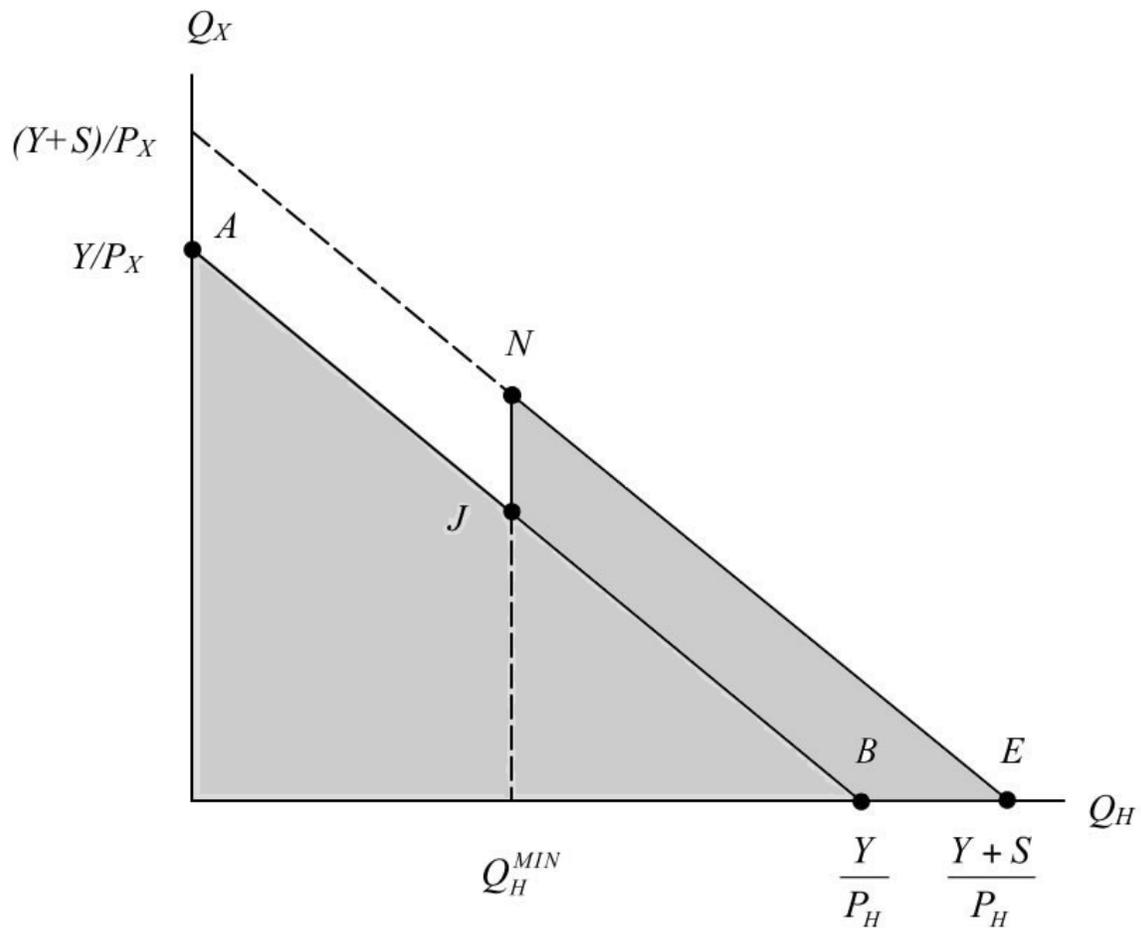
Figure 1 – Budget space with proposed voucher program

Table 1

**Ratios of Payment Standard for Units with Each Number of Bedrooms
to Two-Bedroom Payment Standard**

Number of Bedrooms	FMR Based	Hedonic Based
0	0.736	0.706
1	0.826	0.857
2	1.000	1.000
3	1.296	1.204
4	1.467	1.334
5	1.687	1.477
6	1.940	1.637
7	2.231	1.814
8	2.566	2.009

Table 2

Logit Equation for the Probability of Participation in Proposed Program

Variable	Coefficient	t-statistic	Sample Mean
Constant	-3.281	3.70	1.00
Allowance[*]	0.396	3.31	6.64
Duration of eligibility (yrs)	0.036	5.18	10.56
Fraction previous year eligible[+]	1.143	3.01	-0.26
Household size	-0.206	3.27	2.71
Household type			
Children in household	1.359	3.68	0.56
Single parent	-0.388	1.70	0.34
Elderly	0.089	0.24	0.36
Elderly couple	-0.196	0.70	0.10
Owner	0.067	0.35	0.19
Minority	0.164	0.65	0.11
St. Joseph County	-0.456	2.88	0.47

Source: Carter & Wendt, 1982, p. 57.

Notes: -- * Natural logarithm of annual dollars, + Natural logarithm
Household types listed are not mutually exclusive. For example, the coefficient for
a non-elderly married couple with children is 1.359, but the coefficient for a single
non-elderly parent with children is .987 (=1.359-.388).

Table 3

Racial and Ethnic Percentages

Group	United States (2000)	St. Joseph (1980)	Brown (1980)
White	75.1	89.4	97.7
Black	12.3	8.9	0.3
Other	12.6	1.7	2.0
Non-Hispanic	87.5	98.5	99.5
Hispanic	12.5	1.5	0.5

Sources: For the U.S. in 2000, http://factfinder.census.gov/home/saff/main.html.
For the HASE sites in 1980, www.socialexplorer.com.

Table 4

Participation Rates in First Real Income Decile in Existing Housing Voucher Program (1999)
Excluding Single Non-Elderly

Group	Total Households	Voucher Participation Rate
Non-Hispanic		
White	3,852,013	0.088
Black	2,111,053	0.194
Other	513,820	0.074
Hispanic		
White	877,012	0.162
Black	60,868	0.206
Other	844,677	0.004

Table 5

Summary of Effects of Proposed PS1 Reform on Number of Households Served

Number of Households

Group	Current System	Proposed Program	Absolute Increase	Percentage Increase
All	3,339,409	5,366,820	2,027,411	61%
White	1,846,794	3,447,158	1,600,364	87%
Black	1,360,794	1,582,365	221,571	16%
Hispanic	461,222	702,132	240,910	52%
Elderly	1,202,217	1,440,998	238,781	20%
Non-Elderly	2,137,192	3,925,822	1,788,630	84%
Metro	2,728,184	4,304,864	1,576,680	58%
Non-Metro	611,225	1,061,956	450,731	74%
First Real Income Decile	2,239,993	3,628,556	1,388,563	62%
Second Real Income Decile	852,240	1,622,123	769,883	90%
1-2 person	1888015	2419067	531,052	28%
3-4 person	1102278	2058900	956,622	87%
5+ person	349116	888853	539,737	155%

Table 6

Subgroup Participation Rates in Lowest Two Real Income Deciles for Current System and PS1 Reform

Group	Current System	Proposed Program
First Decile of Real Income		
White	23.1%	46.6%
Black	48.1%	54.2%
Hispanic	20.5%	28.5%
Elderly	29.7%	37.7%
Non-Elderly	26.3%	45.8%
Metro	28.2%	43.8%
Non-Metro	23.0%	44.4%
1-2 person	30.3%	40.4%
3-4 person	29.0%	50.3%
5+ person	17.7%	39.9%
Second Decile of Real Income		
White	8.9%	18.0%
Black	16.5%	25.0%
Hispanic	4.7%	11.0%
Elderly	16.3%	22.1%
Non-Elderly	6.1%	15.7%
Metro	9.9%	19.2%
Non-Metro	7.5%	13.1%
1-2 person	15.0%	21.9%
3-4 person	6.2%	16.7%
5+ person	1.9%	10.2%

Table 7

Effects of Proposed PS1 Reform on Number of Households Served by State

State Name	Current Programs	Proposed Program	Absolute Increase	Percentage Increase
AL	66,681	99,594	32,913	49.4%
AK	8,521	11,589	3,068	36.0%
AZ	38,019	87,469	49,450	130.1%
AR	38,777	51,305	12,528	32.3%
CA	330,172	675,662	345,490	104.6%
CO	36,499	59,255	22,756	62.3%
CT	59,401	59,254	(148)	-0.2%
DE	8,442	12,789	4,347	51.5%
DC	22,467	20,856	(1,611)	-7.2%
FL	134,595	360,719	226,124	168.0%
GA	97,760	171,912	74,152	75.9%
HI	15,982	24,053	8,071	50.5%
ID	8,948	30,294	21,345	238.5%
IL	138,683	211,836	73,153	52.7%
IN	66,508	87,764	21,256	32.0%
IA	28,051	34,674	6,623	23.6%
KS	22,904	32,216	9,312	40.7%
KY	61,064	90,095	29,031	47.5%
LA	61,424	113,579	52,156	84.9%
ME	17,597	26,968	9,371	53.3%
MD	67,795	88,959	21,163	31.2%
MA	112,294	140,179	27,885	24.8%
MI	100,341	159,772	59,431	59.2%
MN	59,219	63,484	4,266	7.2%
MS	39,887	70,450	30,563	76.6%
MO	65,553	81,024	15,471	23.6%
MT	12,927	17,359	4,431	34.3%
NE	19,618	21,527	1,910	9.7%
NV	14,480	33,612	19,132	132.1%
NH	14,289	18,972	4,683	32.8%
NJ	120,955	166,206	45,251	37.4%
NM	19,802	32,604	12,802	64.6%
NY	392,438	541,349	148,911	37.9%
NC	85,823	144,541	58,718	68.4%
ND	10,343	9,201	(1,143)	-11.0%
OH	143,893	187,284	43,391	30.2%
OK	44,128	66,539	22,410	50.8%
OR	30,374	57,826	27,452	90.4%
PA	148,884	230,115	81,231	54.6%
RI	25,764	24,006	(1,757)	-6.8%
SC	44,136	84,144	40,008	90.6%
SD	12,448	12,246	(203)	-1.6%
TN	74,119	109,693	35,575	48.0%
TX	193,108	382,605	189,497	98.1%
UT	11,036	25,623	14,587	132.2%
VT	7,541	12,737	5,195	68.9%
VA	74,473	110,899	36,426	48.9%
WA	48,054	95,465	47,411	98.7%
WV	23,935	44,119	20,184	84.3%
WI	54,878	66,413	11,536	21.0%
WY	4,378	5,983	1,605	36.7%
US	3,339,409	5,366,820	2,027,411	60.7%

Table 8

Percentage Increases in Households Served under Alternative Policy and Prediction Scenarios

Policy and Prediction Scenarios

Group	1	2	3	4	5	6	7	8	9	10
All	61%	61%	63%	63%	72%	50%	53%	69%	45%	76%
White	87%	87%	90%	91%	101%	73%	77%	97%	66%	107%
Black	16%	16%	17%	17%	22%	10%	12%	21%	8%	25%
Hispanic	52%	52%	52%	51%	62%	43%	48%	57%	41%	64%
Elderly	20%	20%	32%	23%	29%	11%	10%	29%	4%	36%
Non-Elderly	84%	84%	80%	86%	96%	73%	78%	91%	68%	99%
Metro	58%	58%	59%	60%	68%	48%	51%	65%	43%	72%
Non-Metro	74%	74%	77%	78%	86%	62%	62%	85%	53%	95%
First Decile	62%	65%	62%	63%	65%	59%	51%	73%	48%	76%
Second Decile	90%	41%	92%	97%	117%	64%	87%	94%	67%	114%
1-2 person	28%	28%	34%	35%	37%	20%	20%	36%	14%	42%
3-4 person	87%	87%	84%	89%	99%	75%	81%	93%	72%	102%
5+ person	155%	155%	151%	135%	172%	138%	142%	168%	129%	180%
Cost (in billions)	$20.0	$20.0	$20.3	$20.1	$22.2	$18.2	$20.1	$20.2	$18.5	$21.6

The cost of the current system for the programs and households involved is at least $20.4 billion.

Policy and Prediction Scenarios (see text for details)

1. FMR bedroom adjustments, current budget, mean prediction equations, ES real income measure
2. Same as 1 except for use of per capita real income measure
3. Same as 1 except payment standards are 10 percent higher for elderly or disabled household
4. Same as 1 except for hedonic bedroom adjustments
5. Same as 1 except 10 percent larger taxpayer cost
6. Same as 1 except 10 percent smaller taxpayer cost
7. Same as 1 except South Bend equation used to predict participation
8. Same as 1 except Green Bay equation used to predict participation
9. Same program parameters as 1 but taxpayer cost based on South Bend participation equation
10. Same program parameters as 1 but taxpayer cost based on Green Bay participation equation