

Low-Income Housing Assistance: Its Impact on Labor Force and Housing Program Participation

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Abstract

Many studies in past decades have examined the effects of the welfare system on individual behavior. All these studies failed to appropriately consider low-income housing assistance. Most have either ignored housing assistance or implicitly assumed there is no rationing in this program. This article presents a simple model that measures the impact of rationing one public assistance program in the context of the entire benefit package offered to female-headed households.

Results suggest that the neglect of controls for the rationing in the housing programs accounts for a large part of the insensitivity of housing assistance found in past research. Also, simulations suggest that the housing programs raise the disincentives of the welfare package an additional 21 percent when compared with the entitlement portion of the package alone.

Keywords: Housing; Labor supply; Welfare

Introduction

Various models of welfare reform are currently being studied in all levels of government. Although politicians debate the particulars of each welfare reform package, only recently have some begun to consider the impact of housing assistance on households' decision making (U.S. General Accounting Office 1999). These studies are concerned primarily with the impact of welfare reform on use of housing assistance, while little is known about the impact of housing assistance on labor force participation. The failure to study housing is alarming, as the size of the maximum housing subsidy is sometimes larger than the maximum benefit available from Aid to Families with Dependent Children (AFDC).¹ A sample of one city from each of the nine census regions is presented in table 1 for illustrative purposes. The housing benefit is larger than the AFDC benefit in four of the nine cities, and in four of the cities it is more than half as large as AFDC, food stamps, and Medicaid combined. The housing benefit in Los Angeles is \$567 per month, which makes up a third of the total benefit package. A

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¹ The maximum housing benefit is proxied by the fair market rent in an area. This assumption will be discussed more fully later. AFDC is now Temporary Assistance for Needy Families. Because the data in this analysis preceded that change, this program will be referred to as AFDC.

Table 1. Variation in Benefits across the Nine Census Divisions

	AFDC	Food Stamps	Medicaid	Sum of Entitlements	Housing
Boston	\$463	\$256	\$209	\$928	\$533
Pittsburgh	401	256	195	852	390
New Orleans	232	256	92	580	362
Birmingham, AL	147	256	130	533	338
Miami Beach, FL	273	256	132	661	515
Minneapolis	611	256	293	1,160	451
Cincinnati	343	256	283	882	331
L.A. County, CA	660	256	198	1,141	567
Denver	420	256	200	876	487

Source: The poverty level and benefit levels for the entitlements are taken from the Green Book (U.S. House of Representatives 1984). Fair market rents used for the housing benefit are taken from the *Federal Register* (1984).

Note: This example is taken from 1984, and the values are monthly. Benefit levels were calculated for a female-headed household with two children. Medicaid is valued as the average expenditure per AFDC family (mother and two children) in the state. The monthly poverty level in 1984 was \$690.

housing benefit of \$338 per month in Birmingham makes up about 40 percent of the total welfare package.

This study uses augmented data from the Survey of Income and Program Participation (SIPP) to study the impact of low-income housing assistance (specifically, public housing assistance and Section 8 vouchers and certificates) on a household's decisions to work and to participate in the housing programs. At present, the vast majority of studies that analyze the impact of public assistance programs on labor supply and program participation exclude housing. A careful study of the housing programs is difficult for many reasons. Housing assistance is distinct from other welfare programs because it is not an entitlement in which an eligible household applicant automatically receives the benefit after applying for assistance. Therefore, knowledge of an applicant's status on or off the waiting list for subsidies is important in an analysis of housing. Only select pieces of the SIPP identify a household's status on a waiting list; all other data identify only whether or not a household is receiving a subsidy. Housing is different from the other welfare programs also, because it is administered at the local level, and most data sets fail to identify the exact locale in which a household resides, for confidentiality reasons. To overcome that final hurdle, this study obtained confidential location identifiers from the U.S. Bureau of the Census.

This article tests the impact of both the size of the housing subsidy and the rationing in the assisted housing programs on a household's decision to participate in the labor force and to participate in the housing programs. This is done in the context of the entire welfare package. Inclusion of the housing assistance programs in the choice problem is necessary to understand the total impact of the welfare package on labor supply and program participation. For example, labor force participation rates are much lower for housing participants than for those who are not (49 percent vs. 72 percent). Further, if the effect housing benefits have on behavior is correlated with the effect other benefits in the welfare package have on behavior, then past results that exclude housing have been biased. A similar argument can be made of the importance of including the other welfare programs in an analysis of the impact of housing assistance, rather than studying housing in isolation. Many households tend to participate in multiple public assistance programs at a time (table 2). Therefore, studying one program at a time is likely to lead to spurious results.

Table 2. Multiple Program Participation of Female-Headed Households between the Ages of 16 and 50, Full Sample (N = 692)

Program Participation	Current Housing Recipient	Waiting List	Housing Participant
AFDC only	0	0	0
Food stamps only	2	2	4
Medicaid only	1	2	3
AFDC and food stamps	0	0	0
AFDC and Medicaid	3	6	9
Food stamps and Medicaid	13	7	20
AFDC, food stamps, and Medicaid	13	5	18
Number of households participating in housing and at least one entitlement	32	22	54

Source: Tabulations of the 1984 SIPP 4th wave.

Note: This table is compiled from the sample of the 1984 SIPP cross-section used in the estimation. Housing participants include both current recipients of subsidies and those who are on the waiting list. In addition to the number of people who participate in housing represented in the table, there are 57 (5 on a waiting list) who do not participate in AFDC, food stamps, or Medicaid. A total of 227 participate in at least one of the four programs.

The results of this analysis indicate that the ability to control for rationing of housing subsidies is critical in analyzing the impact of housing assistance on the decisions of households. Although the size of the housing subsidy has only a marginally statistically significant effect on labor force participation, the rationing in the program has an impact on participation in both the labor force and the housing programs. The results also suggest that past studies of the effect of entitlements may have been biased downward, and that not including housing in the total package of benefits offered to households underestimates the impact of the total welfare package. Simulations demonstrate that housing dollars have a marginal impact on labor force participation probabilities similar to the entitlement dollars, and that exclusion of the housing programs in a study of the welfare programs underestimates the total effect of the package on labor force participation by as much as 21 percent.

The remainder of this article is organized as follows. The next section reviews the literature on the impact that welfare programs such as AFDC, food stamps, and Medicaid have on labor supply, and discusses the few articles that address the issue of the impact housing assistance has on labor force participation. The third section outlines the empirical strategy, which takes into account the uniqueness of the housing programs. The data sources are described in the fourth section. In the fifth section a reduced form analysis is designed to assess the impact that components of the welfare package (entitlements, housing assistance, and waiting list information) have on labor force and housing program participation probabilities after controlling for the various socioeconomic characteristics of female-headed households. Next, the empirical results of the main model are presented together with the sensitivity analysis, and the final section provides concluding remarks.

Literature Review

The welfare package for nonelderly households with children consists of two types of benefits: cash assistance through AFDC and in-kind subsidies through food stamps, Medicaid, and housing assistance. In past decades real advances were made in understanding the effect of

public assistance programs on labor supply and other individual decisions. Most research has focused on entitlement programs such as AFDC and food stamps; results from this literature have yielded a better understanding of people's incentives both to participate in these programs and to supply labor (Fraker and Moffitt 1988; Levy 1979; Moffitt 1992). The implications of this literature are that labor supply is negatively affected by increases in benefit levels in these welfare programs, but that this effect is quite small. It might be expected that as people are made better off in a nonworking state, more would choose to reduce hours substantially or not work. This may be partially offset by unobservables in tastes for work and welfare stigma, but it is not likely that these account for the observed insensitivity of labor supply to changes in program rules. Part of the answer to this puzzle may lie in the fact that much of the research in this area has not included Medicaid or the housing programs. Recently, researchers have begun to analyze Medicaid and its effect on labor supply and welfare participation, and some studies have found that Medicaid has a strong impact on households' decisions.²

Only limited research exists on the impact of housing assistance on the labor supply. Two studies (Ong 1998; Reingold 1997) look at the impact that the receipt of housing assistance for AFDC recipients has on the propensity of households to work. Reingold (1997) tests whether living in public housing causes households to work less than households who live in comparable private sector housing. He finds that living in public housing does not have a detrimental effect on work effort. Ong (1998) uses a sample of AFDC recipients and compares the labor supply of households that receive no housing assistance with households living in public housing and with households receiving Section 8 vouchers and certificates. He finds that households with Section 8 vouchers have a significantly higher labor supply than those households without housing assistance. Both of these studies are restricted to populations that have already decided to participate in one or more welfare programs, and therefore may not be easily generalized to the population at large. For example, in Ong's (1998) work it may be the case that among welfare recipients, those who are receiving vouchers and have already waited to receive the vouchers are the most likely to work and end their welfare receipt. Further, neither study includes households that may be on the waiting list for housing assistance, which is necessary to determine the *ex ante* impact of the housing programs on labor force attachment.

The one study most similar in spirit to this research is the one by Keane and Moffitt (1998). They include housing in a model of multiprogram participation. This approach is critical if an attempt is being made to determine the impact of welfare programs on labor force and program participation for the population as a whole. The authors use a simulation estimator to overcome the difficulties of estimating a structural model with a labor supply equation and participation equations for AFDC, food stamps, and subsidized housing.³ They find that hous-

² Blank (1989) proxies for the value of Medicaid with the average expenditure per recipient in each state and finds insignificant effects on welfare participation. Winkler (1991) finds that Medicaid has a small impact on labor force participation, but an insignificant one on the continuous choice of hours. On the other hand, Moffitt and Wolfe (1992) develop an insurance value for Medicaid, and find large labor supply disincentives, particularly in families with poor health. Yelowitz (1995) takes a different approach. He estimates the impact of Medicaid on AFDC participation and labor force participation on the basis of evidence from Medicaid eligibility expansions. He finds that increasing eligibility for Medicaid by 25 percent of the federal poverty level will reduce AFDC participation by 4.61 percent and increase the probability of working by 3.32 percent.

³ Deriving an analytic solution in this four-equation system is computationally infeasible because of the interactions of the four error terms from the equations. It is not possible to identify the regions of the error space within which different program combinations are optimal.

ing has an insignificant effect; they attribute that finding to their inability to control for the rationing of public housing assistance in their model. There is another limitation of their study; they are unable to accurately describe the households' choices because they couldn't correctly match households to the housing authority in which they reside. Therefore they used the fair market rent value for the largest housing authority in the state, which can introduce substantial measurement error into the estimates. This study is able to overcome both of those deficiencies.⁴

Empirical Strategy

There are several empirical challenges in using cross-sectional data to test the impact of housing assistance on the choices to participate in the labor force and to participate in the housing programs.⁵ The first relates to the treatment of housing assistance as an in-kind benefit. Although food stamps are also an in-kind benefit, food purchases are close to being inframarginal (Moffitt 1989); that is, no more food is purchased because of the receipt of food stamps.⁶ This allows the researcher to include food stamps as a cash benefit in the analysis. Murray (1980) argues that housing subsidies lead to overconsumption of housing and therefore should not be valued in the same way as cash. The model found in Leonesio (1988) suggests that even if housing subsidies are not inframarginal, if housing assistance is a complement of leisure, the subsidies would have a larger negative impact on labor force participation than would cash assistance.

This study focuses on the impact that public housing and Section 8 vouchers and certificates have on households' decisions to work and participate in these programs, because the data identify participation only in these programs and not the many other programs the U.S. Department of Housing and Urban Development (HUD) administers. As appendix A notes, the three programs differ in the actual size of the subsidy given, although the tenant rental payment is the same. To simplify the analysis, the assumption is made that the maximum housing subsidy available to households can be proxied by the fair market rent level for the area established by the federal government. This is reasonable in that this value is likely to be closely related to the contract rent and payment standard for the Section 8 vouchers and certificates. Further, it is assumed that housing subsidies are inframarginal. To the extent that this assumption does not hold, the estimated marginal effect of housing dollars will be biased downward.⁷

⁴ A recent study by Yelowitz (2000) uses metropolitan-level fixed effects to control for both the rationing in the program and local labor markets. He finds that a one standard deviation increase in the housing subsidy lowers labor force participation by 4 percentage points; that finding is very similar to those of this study. The advantages of the present study are explicit control for rationing and explicit identification of the location of households.

⁵ Households' decision making concerning housing assistance is best studied in a dynamic setting. As outlined previously, the data used in this analysis are the only data that identify status on or off the waiting list and therefore can potentially enable the researcher to determine the impact of housing assistance on labor force participation and housing participation.

⁶ Fraker, Martini, and Ohls (1995) found a small reduction in food purchases after allowing recipients to cash out their food stamps, so the assumption above will result in a slight downward bias in the estimated effect on entitlements.

⁷ In addition, for many areas the fair market rent may overstate the payment standard. This would also cause an underestimate of the impact of the housing benefit.

Even though tenants in public housing and recipients of vouchers may pay the same rent, these two types of low-income housing assistance may be different goods and should potentially be treated differently in any analysis. Using American Housing Survey data, Newman and Schnare (1993) demonstrate that residents of large public housing structures display a lower opinion of neighborhood quality than do housing-assisted households with vouchers (see also Olsen and Barton 1983 for a similar discussion). Because the data on waiting lists used in this article do not distinguish between the two programs, it is not possible to separate a household's decision to apply for public housing from its decision to apply for a Section 8 voucher. This may affect the coefficient estimates if the waiting lists of housing authorities are affected in a systematic way by the amount of public housing units in the area. For example, if waiting lists are shorter in areas with a relatively larger number of public housing units, the impact of housing assistance on housing program participation would be underestimated.

The next empirical challenge concerns how to incorporate the data on the waiting list characteristics with the SIPP data in a manner that both highlights the importance of rationing in the choice problem that households face and isolates the effect of changes in the housing benefit. Households receiving benefits have no waiting time, and those on the waiting list have different waiting times than those that have not applied for benefits. The difficulty lies in what waiting time to include in this choice model for each of the different groups, as the data do not specify the expected wait of households on the waiting list. For example, if those households currently receiving benefits are given a waiting time of zero, the results will be biased. The bias occurs in much the same way it would if a categorical variable for the recipient of housing assistance were included in the model. In this regression a zero waiting time implies that households are housing participants, and the coefficient on rationing will be overstated. Instead, the average waiting time for all households is used whether or not they are currently receiving or have applied for housing assistance. The reason is that this is an exogenous measure that all households faced in their decision to apply and, therefore, this specification captures their decision process.

Although the literature describes the impact of welfare payments on various household decisions, there is no similar research on the impact of a rationed public assistance program. The literature on the rationing of consumption goods provides some guidance (e.g., Polterovich 1993; Stahl and Alexeev 1985). There are two ways the rationing of housing assistance may have an impact on labor force and housing program participation. The first is that the amount of time spent applying and waiting for a subsidy might discourage households from participating in housing assistance programs, and therefore potential applicants would be more likely to work. The second possibility is that the uncertainty of not knowing when a subsidy will be received might have a similar effect. Because of these possibilities, a standard discount rate model will be used to adjust the value of the housing subsidy for the length of the waiting period (Lawrance 1991).

In this second framework the two primary sources of welfare income will be entered into the estimated model differently. Although entitlement program income enters in the same manner as does labor income, housing program income (B_H) will be adjusted by a discount rate (δ). A discounted benefit ($\delta^T B_H$) will enter the model, where T is the average waiting time. Again, this will underestimate the true impact of housing assistance, because current recipients will not have to wait for benefits.

A final empirical consideration is whether households choose to live in locales with higher benefits. If households move to jurisdictions with higher benefits, estimating a model of labor force participation in the cross-section will lead to an overestimate of the impact of the welfare benefits. There is some evidence that benefit differentials between states have small and sometimes statistically significant effects on mobility rates (Moffitt 1992). Walker (1994, 1996) finds that states with higher benefits are more likely to attract recipients of welfare from neighboring states with lower benefits, but his research does not find that these states have higher rates of retention. Therefore, he concludes that the “welfare magnet” hypothesis is not yet validated. There may be more mobility associated with the housing programs than with AFDC because a move across state lines will usually involve higher moving costs.⁸ Participants in the housing programs can achieve higher lifetime benefits by moving to locales within a metropolitan area with shorter waiting lists. Recent research (Painter 1997, 1999) suggests that the amount of intraurban mobility induced by benefit differentials is small and, therefore, is unlikely to influence the results in this study.

Data and Variable Construction

This analysis uses data from the SIPP, which contains a nationally representative sample and provides good information on labor supply and income sources. Each panel of the SIPP follows households for about two and a half years, interviewing the households in quarterly intervals. Each interview (wave) contains a set of core questions and a topical module that differs across waves. This study primarily uses wave 4 of the 1984 SIPP, totaling 692 observations, because only in this wave does the topical module ask whether households are on a waiting list. As mentioned previously, the SIPP is the only data set with information that allows for the proper identification of a household’s choice to participate in the housing programs.⁹ That question was dropped until 1991. To test for the sensitivity of estimates across time, the second wave in 1991 and the first wave in 1992 are also used, although as noted below, the waiting list data used here are more appropriate for the 1984 sample.

A sample of households headed by women ages 16 to 50 with children under the age of 18 present is selected because these households are potentially eligible for all the benefits discussed in the analysis. Households with nonlabor incomes greater than the AFDC asset limits are excluded because their behavior may be structurally different from those with assets below that level.¹⁰ Implicit in the selection of a sample of only female-headed households is

⁸ These costs include the transportation and search costs, but also may include the changing job market opportunities for welfare participants who want to work.

⁹ Unfortunately, the waiting list information is not asked of every respondent. The question covers all respondents who receive any sort of government assistance, including AFDC, food stamps, Medicaid, supplemental security income (SSI), and Social Security, but is not asked of the general population. Typically, households in this group supplement their meager labor income with government transfers of some kind, which implies that the misspecification bias may be negligible. As shown in table 2, 49 percent of housing participants also receive AFDC, food stamps, or Medicaid. In addition, the Green Book (U.S. House of Representatives 1992) demonstrates that an additional 43 percent of housing participants receive SSI, Social Security, unemployment insurance, or Medicare. With up to 89 percent coverage, this question may not leave out many of the households on waiting lists.

¹⁰ There is no explicit information on households’ assets. Therefore, households with nonlabor incomes of this level will likely not meet the eligibility requirements. Eligibility for AFDC benefits has traditionally been the most restrictive. The choice of restricting the sample to these households was made because this group of households is eligible for all the welfare programs. Results are robust in a sample that would include housing-eligible households who would not be eligible for AFDC.

that benefit levels do not influence the decision to become a single female head of household. If higher benefit levels increased the probability of female headship, then the estimated effect in this sample of AFDC benefits on work would be biased upward. Evidence from Hoynes (1997), however, suggests that once individual and state fixed effects are included in the estimation, AFDC benefit levels have no impact on the female headship decision.

Sample statistics for variables used in the analysis are presented in table 3. Housing participation is defined as whether participation took place in the month of the interview. Both current recipients and households on a waiting list are included. Labor force participation is equal to one if the female head of household worked that month. The waiting time is based on the average wait of households in a particular housing authority. Benefit levels are divided by 100 in the estimated equations and are adjusted for the Consumer Price Index whenever samples are pooled across the three time periods.

Table 3. Sample Statistics (N = 692)

Variable	Mean	Standard Deviation
Labor force participation	0.681	0.467
Housing participation (including waiting list households)	0.160	0.367
Housing participation (without waiting list households)	0.121	0.327
Age of youngest child	7.603	5.183
Number of children < 18	1.715	0.914
Age	33.619	7.122
Estimated wage	5.660	1.423
Education in years	12.743	2.547
Education dummy—some high school	0.156	—
Education dummy—high school diploma	0.416	—
Education dummy—at least some college	0.360	—
Race dummy—African American	0.270	—
Race dummy—other nonwhite	0.027	—
Housing benefit	\$396.87	73.49
Housing benefit with AFDC taxed away	\$273.07	61.33
Waiting time in months	19.484	13.562
Discounted housing benefit	\$224.41	50.07
Entitlement sum	\$657.88	149.27

Source: Tabulations of the 1984 SIPP 4th wave.

Note: Sample year is 1984. Standard deviations are omitted for categorical variables. Sample statistics for the years 1991 and 1992 are available on request.

The two components of data that previous studies lacked are information on households' waiting time and their exact location. As mentioned previously, the length of a housing authority's waiting list provides a metric to adjust the value of the housing benefit to a household. The Council of Large Public Housing Authorities has gathered information from HUD on the average length of time it takes households to get off waiting lists to receive either Section 8 vouchers or public housing residence. This information is calculated by averaging the waiting time among current recipients in 1992.¹¹ Even though the data represent the waiting times

¹¹ The use of only current recipients will potentially lower the estimated effect of the average waiting time. Many households that have waited a long time may give up and never receive a subsidy, yet they will not be included in these data. In addition, there are many households that, because of special programs, may not have waited at all. These latter households are dropped from the data, and the results are robust to their exclusion.

of current recipients in 1992, they provide a valuable proxy for the waiting time that an applicant could have expected to face in previous periods. The data reveal that more than two-thirds of these households applied for housing assistance before 1988, whereas only 13 percent of the sample applied after 1991. Therefore, these data are more likely to be valid proxies for the waiting times that a potential applicant would be facing in 1984 than in the later period (1991–92) for which there are data from the SIPP.

As mentioned in the introduction, the public-use SIPP does not include accurate location identifiers below the state level. This is problematic, as housing benefits vary by the metropolitan area and county, and waiting list information is available by the local housing authority that typically has jurisdiction over a county or a city. The measurement error that exists from not knowing where a household resides will cause estimates to be inefficient and possibly misleading. This analysis is able to accurately describe the housing program characteristics available to households because of the use of private census files, which give exact place locations for each household.¹²

The actual benefits received by participants of the transfer programs are not included in the tests of the model. Because the decision to work affects the amount of income a person earns, and therefore affects the level of the benefits, actual benefits are endogenous. Thus, the state guarantee is used in the case of AFDC, federal guarantee in the case of food stamps, and the fair market rent for the housing authority in the case of housing programs.¹³ The benefit information is collected from various sources. AFDC, food stamps, and Medicaid benefit levels are taken from the Green Book in the appropriate years. Fair market rents by county and bedroom size are obtained from the *Federal Register*.

The mechanism by which both AFDC and housing benefit levels are determined is important to highlight because it will influence the interpretation of their estimated impact on participation decisions. Estimates are obtained using interstate variation in the case of entitlements and intrastate and interstate variations in the case of the housing benefit. One goal of the federal government in establishing the fair market rent is to provide a similar quality of housing to households across jurisdictions. Therefore, the value to a household of a two-bedroom apartment may be the same in two areas with vastly different benefit levels because of differences in cost of living. This is similar to the goal of state governments in setting the AFDC levels, but politicians also adjust the size of the benefit according to each state's objectives. With cash benefits, a cost of living (COL) index can adjust for the variation that is solely from cost of living differences. Without these indices, the average impact of an additional dollar of benefits can only be estimated; the average effect can be quite different across states. In the case of housing benefits, if differences in fair market rent levels were due solely to differences in cost of living, a perfect COL index would eliminate any variation in the benefit. The variation that would exist in practice would be due simply to an imperfect COL index and imperfect deriva-

¹² These data remain classified, but I am able to do estimation at the U.S. Bureau of the Census. The Census Bureau retains all rights to these data, and they cannot be used outside its jurisdiction.

¹³ The food stamp benefit is valued as cash and therefore can be combined with the AFDC benefit. Medicaid is added according to the formula mentioned by Smeeding (1982), and is valued as the average expenditure per AFDC family (mother with two children) in the state, but the results are invariant to the inclusion of the Medicaid data. The combined welfare guarantee (G_B) will be $0.7 * G_A + G_F + 0.368 * G_M$ (where G_A , G_F , and G_M are the respective guarantee levels of the three entitlement programs) because the food stamp benefit formula taxes AFDC income. Because the AFDC benefit also enters into the housing assistance formula, AFDC income is taxed by an additional 30 percent in specifications that include both the entitlement benefit and the housing benefit.

tion of the fair market rent by the federal government. Although it is not clear, differences in the cost of housing across areas may be due to better job opportunities and other social amenities that are capitalized into housing prices. If that is true, then higher housing benefit levels would imply a better benefit, and the use of COL indices to eliminate that variation may not be warranted.

The use of COL indices is important for another reason. To the extent that higher housing prices correlate with tighter housing markets, the waiting list in those areas may be longer. If in addition tight housing markets correspond to tight labor markets, the estimate on the waiting time variable will be biased upward because some of the effect of local economic conditions would be attributed to longer waiting times.¹⁴ Using a separate COL index for housing costs and another for general cost of living will partially control for those factors. There are two sources of the COL indices used when the model is tested for sensitivity to cost of living differences. McMahon (1991) provides a state-level COL index for the total package of goods, and the American Chamber of Commerce Researchers Association (ACCRA) provides both housing and total goods measures for 314 selected metropolitan statistical areas (MSAs).

Econometric Specification

Previous research has used both reduced form and structural models to estimate labor force and welfare participation equations with cross-sectional data (Moffitt 1992 provides a review). The more complicated structural models such as the one employed by Keane and Moffitt (1998) use a simulation estimator to solve the various equations in the model simultaneously. It is not possible to include the housing programs in this setting because their model requires the data to correctly classify the choices of those people who are on waiting lists. For example, the choices faced by a household that has just entered the waiting list will be much different from a household that may have waited for two years. In addition, households on a waiting list may refuse certain units in public housing that are deemed of inferior quality and then return to the waiting list in hope of a better draw. These hindrances in the data necessitate some sort of reduced form approach.

This analysis employs a single-equation reduced form analysis to assess the impact of the housing programs on each of the labor force and program participation decisions. Estimation of a bivariate model, which jointly examines the decision to participate in the labor force and the decision to participate in housing, is left for sensitivity analysis. The key comparison in this reduced form setting will be the relative impact of the housing programs on participation probabilities in relation to the entitlement programs. Because there are no a priori reasons to believe that any bias that may exist from using the reduced form will affect the coefficient on the entitlement programs differently from the estimated coefficient on the housing programs, the comparison between the two programs provides insight into the effect of the housing programs on household behavior. An important caveat is that the different programs may have different participation stigmas, as evidenced by the varied participation rates of eligible households (Moffitt 1983). Thus the coefficient on housing assistance may be understated if participation in housing carries more stigma than participation in AFDC.

¹⁴ It should be noted that the overall economic conditions in 1984 were somewhat neutral. The economy had recovered from the recession of 1981–82, but had not yet experienced the huge run-up in housing prices observed in the late 1980s.

A household is assumed to choose work if its utility from working is greater than its utility from receiving benefits and not working. The following labor force participation (*LFP*) equation is estimated using the discussion above as the framework for the analysis:

$$\begin{aligned} LFP^* &= X'\beta + Z'\gamma + \varepsilon \\ LFP &= 1, \text{ if } LFP^* \geq 0; LFP = 0, \text{ if } LFP^* < 0, \end{aligned} \quad (1)$$

where X captures heterogeneity of preferences with respect to work and is a function of an individual's socioeconomic characteristics (such as education level and size of the family) and other labor market characteristics.¹⁵ Z represents the benefit characteristics of the welfare programs that differ across specifications. The error term is assumed to be normally distributed.

Although modeling labor force participation in this manner is straightforward to interpret, alternative specifications are used in sensitivity analysis. Following Fraker and Moffitt (1988), labor force participation was also modeled as the decision to work part time, work full time, or not work at all. Further, hours worked was used as the dependent variable to ascertain whether the welfare programs affected the quantity of hours in a way different from the decision to work or not. Because there were no additional insights gained when these alternative specifications were employed, tables 4 through 7 show the results from equation 1 only.

Next, a housing participation (P) equation is estimated to observe the effect these same variables have on the program participation probabilities. Let

$$\begin{aligned} P^* &= X'\phi + Z'\chi + \mu \\ P &= 1, \text{ if } P^* \geq 0; P = 0, \text{ if } P^* < 0, \end{aligned} \quad (2)$$

where X includes the individual's socioeconomic characteristics, which capture both the stigma and transaction costs of participation in the housing programs. Z represents the benefit characteristics, and μ is a normally distributed error term.

Results

Labor Force Participation Equation

Table 4 shows estimates of the various specifications of the labor force participation equation that differ in the inclusion of the various program variables. Because COL indices have not been used in previous studies of the effect of welfare components on labor force participation, the initial empirical tests are conducted without COL adjustments. The predicted wage is included to capture the potential income available from choosing to work. Wages are estimated using the Heckman two-step estimator.¹⁶ Other covariates are included to control for socioeconomic characteristics that may affect labor force participation in ways that are unre-

¹⁵ Although the linear specification of the labor force participation equation implies a certain utility function, the coefficients here are not meant to be interpreted as estimates of the structural parameters.

¹⁶ Predicted wages are used for both those who work and those who do not work. Results of the wage estimation are included in appendix B. Gross wages are used because net wages are endogenous.

Table 4. Labor Force Participation Equation Probit Estimates (N = 692)

	Specification				
	1	2	3	4	5
Constant	-0.365 (0.447)	-0.181 (0.424)	-0.228 (0.482)	-0.011 (0.493)	0.430 (0.547)
Age of youngest child	0.048 ** (0.014)	0.049 ** (0.014)	0.049 ** (0.014)	0.049 ** (0.014)	0.049 ** (0.014)
Number of children	-0.072 (0.058)	-0.074 (0.059)	-0.074 (0.059)	-0.069 (0.059)	-0.071 (0.059)
Age	-0.020 * (0.011)	-0.023 ** (0.011)	-0.023 ** (0.011)	-0.024 ** (0.011)	-0.023 ** (0.011)
Estimated wage	0.167 ** (0.058)	0.187 ** (0.060)	0.187 ** (0.060)	0.190 ** (0.060)	0.184 ** (0.060)
Education dummy—some high school	0.110 (0.237)	0.090 (0.237)	0.092 (0.237)	0.124 (0.239)	0.095 (0.237)
Education dummy—high school diploma	0.633 ** (0.224)	0.615 ** (0.224)	0.618 ** (0.225)	0.635 ** (0.226)	0.612 ** (0.224)
Education dummy—at least some college	0.487 * (0.275)	0.440 * (0.277)	0.441 (0.277)	0.466 * (0.278)	0.454 * (0.277)
Race dummy—African American	0.200 (0.123)	0.180 (0.122)	0.176 (0.124)	0.143 (0.125)	0.178 (0.123)
Race dummy—other nonwhite	0.775 * (0.377)	0.793 * (0.378)	0.788 * (0.379)	0.841 ** (0.382)	0.842 ** (0.379)
Housing benefit	-0.047 (0.068)	—	0.017 (0.082)	-0.051 (0.087)	—
Entitlement sum	—	-0.058 * (0.035)	-0.058 * (0.035)	-0.085 ** (0.036)	-0.089 ** (0.039)
Waiting time in months	—	—	—	0.010 ** (0.004)	—
Discounted housing benefit	—	—	—	—	-0.177 * (0.100)
Log likelihood	-395.91	-394.51	-394.48	-391.50	-393.37

Notes: Standard errors are in parentheses. Standard errors are corrected for the presence of heteroskedasticity. Sample year is 1984.

* $p < 0.1$. ** $p < 0.05$.

lated to the wage. The variables in these specifications have the expected signs. Having higher potential wages, fewer children, and a higher age for the youngest child raise the probability of labor force participation. It is interesting to note that the educational dummies that seem to have an effect beyond education's effect on wage are the high school diploma and college dummies. That effect may imply a lower distaste for work in that population.

In the first and second specifications, the housing benefit and the entitlement benefit, respectively, are included as the key program variables. The coefficient on the entitlement sum is statistically significant, but the coefficient on the housing benefit is not. (Although the probit coefficients should not be interpreted as marginal effects, the discussion remains unchanged whether probit coefficients or marginal effects are compared.) That fact is unchanged when the two programs are included together in specification three. This result is similar to the Keane and Moffitt (1998) study, which uses a sample from the 1984 SIPP. The difference between these results and their results becomes evident after the waiting list characteristics are added. In the fourth and fifth specifications the addition of the rationing information has a large effect. When included as another variable (specification 4), the coefficient on the

length of the waiting time is positive and statistically significant, indicating that the longer a person would have to wait to receive housing, the greater the likelihood of labor force participation. The coefficient on the entitlement sum increases as well, which may imply that fewer people participate in AFDC when waits for housing are longer.¹⁷ When the rationing information is used to adjust the housing benefit (specification 5), the coefficient on the housing benefit becomes significant at the 10 percent level. These results would validate Keane and Moffitt's (1998) assertion that the ability to control for rationing is necessary to obtain accurate estimates of the impact of housing.

In table 5, COL indices are used to adjust the wage and benefit levels. The first four columns replicate tests of the model using a state-level index, and the final column presents a test using the ACCRA index to adjust benefit levels. The impact of the indices on the estimates is not large. The standard error of the estimates is greater, as would be expected. The parameter estimates are a bit smaller, but not enough to claim that including this index has changed the estimates. The ACCRA index may be preferable because the housing benefit can be adjusted by a housing index, and the entitlements can be adjusted by a general index. These adjustments would be necessary if households distinguish their housing purchases from their overall purchases, and if tight housing markets are correlated with tight labor markets. Although the estimates are again very similar to estimates without COL indices, they do not prove to be statistically significant.¹⁸

Housing Participation Equation

Table 6 presents the estimates for the housing participation equation. In these models, the dependent variable is equal to one if the households either are currently receiving benefits or are on a waiting list. The same variables that are included in the labor force participation equations are included in these models. Again, all the statistically significant socioeconomic variables have the expected sign. One noted difference in the housing equation estimates in comparison with the labor force equation estimates is that the race categorical variable capturing African Americans has a large impact on participation probabilities. In the labor force participation equations, once wage was added as an explanatory variable, the categorical variable for African Americans was not significant, and has a much smaller coefficient. A possible explanation is that for African Americans, in particular, there may be less stigma associated with living in subsidized housing, or there may be fewer housing options because of residential segregation and/or racial discrimination.

The surprising result in table 6 is that the size of the housing subsidy does not affect housing program participation. The coefficient is insignificant and of the wrong sign. The coefficient on the entitlement sum, however, is consistently significant in all specifications. Inclusion of rationing information has the expected effect of lowering the probability of housing participation, but including the waiting time in a discount rate has little effect.

¹⁷ An AFDC participation equation was estimated to explore the impact of the housing programs on AFDC participation probabilities. Although the coefficient on the entitlement sum is 0.13, the coefficient on the housing programs is insignificant. The rationing of housing does seem to affect AFDC participation. Including the waiting list information increases the coefficient on the entitlement sum.

¹⁸ The impact of the COL indices was also explored in the housing participation equations. The same patterns emerge. Tables of these estimates are available from the author.

Table 5. Labor Force Participation Equation Probit Estimates, with State COL in Specifications 1–4 (N = 692), with ACCRA COL in Specification 5 (N = 379)

	Specification				
	1	2	3	4	5
Constant	−0.501 (0.490)	−0.244 (0.457)	−0.270 (0.523)	0.253 (0.520)	0.886 (0.761)
Age of youngest child	0.046 ** (0.014)	0.047 ** (0.014)	0.047 ** (0.014)	0.048 ** (0.014)	0.023 (0.020)
Number of children	−0.077 (0.058)	−0.078 (0.059)	−0.078 (0.059)	−0.074 (0.059)	−0.204 (0.082)
Age	−0.020 * (0.011)	−0.021 ** (0.011)	−0.021 * (0.011)	−0.022 * (0.011)	−0.024 (0.015)
Estimated wage	0.185 ** (0.061)	0.191 ** (0.061)	0.192 ** (0.061)	0.192 ** (0.061)	0.208 ** (0.079)
Education dummy—some high school	0.101 (0.237)	0.094 (0.237)	0.094 (0.237)	0.103 (0.237)	−0.149 (0.301)
Education dummy—high school diploma	0.620 ** (0.223)	0.620 ** (0.224)	0.620 ** (0.224)	0.618 ** (0.224)	0.254 (0.284)
Education dummy—at least some college	0.469 * (0.272)	0.462 * (0.272)	0.462 * (0.272)	0.472 * (0.272)	0.128 (0.343)
Race dummy—African American	0.148 (0.120)	0.124 (0.121)	0.123 (0.122)	0.114 (0.122)	0.210 (0.163)
Race dummy—other nonwhite	0.767 * (0.376)	0.784 * (0.377)	0.782 * (0.378)	0.843 * (0.378)	1.300 ** (0.653)
Housing benefit	−0.026 (0.082)	—	0.009 (0.087)	—	—
Entitlement sum	—	−0.055 (0.041)	−0.056 (0.043)	−0.048 (0.041)	−0.067 (0.063)
Discounted housing benefit	—	—	—	−0.164 * (0.082)	−0.163 (0.145)
Log likelihood	−395.69	−394.86	−394.85	−392.84	−221.60

Notes: Standard errors are in parentheses. Standard errors are corrected for the presence of heteroskedasticity. Sample year is 1984.

* $p < 0.1$. ** $p < 0.05$.

It is curious that the entitlement programs have a larger estimated impact on housing participation than do the housing programs. One reason may be that the entitlement programs are almost essential for the time that the housing participants are on the waiting list. Receipt of the entitlements allows the household to receive some income while maintaining federal preference. Households may not be able to obtain this designation with the same level of labor income as with some welfare income, and therefore may have an incentive to take up welfare. (See appendix A for a detailed discussion of the program rules.) A second reason for the estimated insensitivity to the size of the housing benefit is that households respond more to access to housing than to the size of the subsidy.

Because most data sets do not include any information on whether or not people are on waiting lists, housing participation equations are estimated that mistakenly identify those on a waiting list as nonparticipants. This should produce a downward bias on participation probabilities. In results not shown, exclusion of the waiting list population drops the estimated impact of both the housing program and the entitlement program by about 30 percent.

Table 6. Housing Participation Equation Probit Estimates, Full Sample (N = 692)

	Specification				
	1	2	3	4	5
Constant	0.721 (0.510)	0.093 (0.483)	0.577 (0.552)	0.485 (0.588)	0.237 (0.572)
Age of youngest child	-0.011 (0.016)	-0.011 (0.016)	-0.011 (0.016)	-0.012 (0.016)	-0.011 (0.016)
Number of children	0.050 (0.068)	0.051 (0.066)	0.057 (0.066)	0.054 (0.066)	0.052 (0.066)
Age	-0.005 (0.012)	-0.003 (0.012)	-0.001 (0.012)	-0.001 (0.012)	-0.003 (0.012)
Estimated wage	-0.242 ** (0.064)	-0.288 ** (0.068)	-0.300 ** (0.070)	-0.297 ** (0.070)	-0.291 ** (0.069)
Education dummy—some high school	-0.292 (0.258)	-0.249 (0.262)	-0.254 (0.262)	-0.281 (0.261)	-0.247 (0.261)
Education dummy—high school diploma	-0.472 * (0.249)	-0.419 * (0.253)	-0.428 * (0.254)	-0.447 * (0.252)	-0.419 * (0.253)
Education dummy—at least some college	-0.285 (0.299)	-0.168 (0.306)	-0.154 (0.309)	-0.172 (0.306)	-0.162 (0.307)
Race dummy—African American	0.773 ** (0.132)	0.804 ** (0.138)	0.854 ** (0.137)	0.869 ** (0.139)	0.810 ** (0.134)
Race dummy—other nonwhite	0.418 (0.349)	0.342 (0.352)	0.412 (0.352)	0.375 (0.352)	0.362 (0.351)
Housing benefit	-0.040 (0.079)	—	-0.009 (0.087)	-0.135 (0.127)	—
Entitlement sum	—	0.085 ** (0.041)	0.082 ** (0.042)	0.094 ** (0.041)	0.081 ** (0.061)
Waiting time in months	—	—	—	-0.010 * (0.005)	—
Discounted housing benefit	—	—	—	—	-0.056 (0.124)
Log likelihood	-269.11	-267.24	-265.79	-265.32	-267.15

Notes: Standard errors are in parentheses. Standard errors are corrected for the presence of heteroskedasticity. Sample year is 1984.
* $p < 0.1$. ** $p < 0.05$.

Sensitivity Analysis

Table 7 presents estimates of the labor force participation model that include data from 1991 and 1992 waves of the SIPP. The estimates on the socioeconomic characteristics are similar to the estimates obtained when the 1984 data were used alone. The estimate on the housing benefit is statistically significant when included alone, but once the entitlement sum is also included, the estimate loses its statistical significance. The key difference among the data sets is that the rationing information has little impact on the results. Although the basic pattern of the results presented in tables 4 and 6 is the same, better information on the waiting times facing those who were choosing to wait in 1991 would be needed to fully validate the primary findings of the analysis represented in these two tables.

Different specifications of the discount rate were also tested, because researchers have found that individuals with different socioeconomic characteristics may have different rates of time preferences (Lawrance 1991). For example, those who are less educated may have much shorter time horizons than do those who are highly educated. To check the sensitivity of the para-

Table 7. Labor Force Participation Equation Probit Estimates for 1984, 1991, and 1992 Waves (N = 2,538)

	Specification				
	1	2	3	4	5
Constant	-0.339 (0.217)	-0.298 (0.229)	-0.218 (0.236)	-0.207 (0.238)	-0.175 (0.244)
Age of youngest child	0.043 ** (0.008)	0.044 ** (0.007)	0.043 ** (0.008)	0.043 (0.008)	0.043 (0.008)
Number of children	-0.149 ** (0.031)	-0.148 ** (0.031)	-0.148 ** (0.031)	-0.147 (0.031)	-0.147 (0.031)
Age	-0.011 * (0.006)	-0.012 * (0.006)	-0.011 * (0.006)	-0.011 (0.006)	-0.012 (0.006)
Estimated wage	0.129 ** (0.028)	0.130 ** (0.028)	0.133 ** (0.028)	0.133 (0.028)	0.132 (0.028)
Education dummy—some high school	0.080 (0.134)	0.087 (0.134)	0.077 (0.134)	0.078 (0.134)	0.078 (0.134)
Education dummy—high school diploma	0.533 ** (0.123)	0.546 ** (0.123)	0.530 ** (0.123)	0.531 (0.123)	0.532 (0.123)
Education dummy—at least some college	0.399 ** (0.141)	0.406 ** (0.141)	0.390 ** (0.142)	0.393 (0.142)	0.394 (0.141)
Race dummy—African American	0.116 ** (0.065)	0.092 * (0.066)	0.105 * (0.067)	0.101 (0.067)	0.099 (0.066)
Race dummy—other nonwhite	-0.005 (0.154)	-0.001 (0.154)	0.005 (0.155)	0.005 (0.155)	0.006 (0.155)
Year is 1991	0.484 ** (0.076)	0.447 ** (0.076)	0.467 ** (0.078)	0.470 (0.078)	0.469 (0.078)
Year is 1992	0.400 ** (0.061)	0.347 ** (0.063)	0.374 ** (0.066)	0.378 (0.066)	0.377 (0.066)
Housing benefit	-0.064 ** (0.029)	—	-0.048 (0.034)	-0.054 (0.037)	—
Entitlement sum	—	-0.043 ** (0.021)	-0.039 * (0.021)	-0.040 * (0.021)	-0.041 ** (0.021)
Waiting time in months	—	—	—	0.001 (0.002)	—
Discounted housing benefit	—	—	—	—	-0.066 (0.044)
Log likelihood	-1,443.68	-1,443.94	-1,442.98	-1,442.88	-1,442.83

Notes: Standard errors are in parentheses. Standard errors are corrected for the presence of heteroskedasticity. * $p < 0.1$. ** $p < 0.05$.

meter estimates against the discount rate specification, two tests are conducted. The first simply allows the discount rate (δ) to vary. The primary tests of the model are conducted using a yearly discount rate (δ) that is equal to $1/(1+i)$, where $i = 0.12$. The second test estimates the discount rate directly as $\delta = \delta_0 + \delta_1 * V$, where V includes a number of socioeconomic characteristics by which individuals may have different rates of time preference. Here the discount rate is estimated directly to test the effect of a different δ on the coefficients of the model.

When i is allowed to vary 6 to 36 percent, the coefficient on the housing benefit varies very little. The second test is more illuminating. When the discount rate is directly estimated, its value translates into a yearly 4.3 percent interest rate (i), and the coefficient on the discounted housing benefit falls slightly. The estimates also show that individuals with higher levels of education and with higher ages are more willing to wait. In both of these cases, it seems

that willingness to wait is associated with learning through either formal education or life experience, or with having greater resources, which translates into a greater likelihood that the individuals are not credit constrained. In sum, although discount rates do seem to vary systematically by individuals, there is little impact on the other coefficients of the model.

Two final sensitivity tests are conducted. First, participation probabilities are estimated jointly in a bivariate test of the model. As has been noted by many researchers (Moffitt 1992 provides a review), the decision to participate in welfare programs and to supply labor may be simultaneous. If that is true, it would be important to capture the correlation between the error terms in the two participation equations in order to obtain unbiased estimates. In this test the error terms from the two participation equations are assumed to be drawn from a joint normal distribution. The correlation coefficient (-0.26) is significant, but the coefficient estimates are little changed after correcting for this correlation (see appendix C for results from this model).

The last test of the model concerns the sensitivity of the results for the actual recipients of housing assistance. Although the model presented above was intended to capture the decision to participate in these programs, it might be the case that, as suggested by Reingold (1997) and Ong (1998), receipt of Section 8 and/or public housing may not dampen labor force participation. Ong (1998) found that receipt of Section 8 actually increases labor force participation among AFDC recipients, but among all households who could be eligible for welfare, the receipt of Section 8 and public housing is found to have a negative effect.¹⁹ At the same time, a positive coefficient is estimated for an interaction term between Section 8 receipt and housing dollars, implying that housing dollars are more important for Section 8 recipients. This latter result is merely suggestive because the effect was not statistically significant.

Simulations

Table 8 illustrates some of the policy implications of the results. The simulations are calculated by using the variables for each household in the sample, and then calculating the probability of participation based on the parameter estimates. The values are then averaged over the sample. The full sample with no COL adjustments is chosen for the comparison (table 4, specification 4, and table 6, specification 4, in the labor force and housing participation equations, respectively).

Simulations based on the labor force participation equation are presented first in table 8. The first two rows of the table provide simulations based on changes in some of the socioeconomic variables. They serve as a basis for comparison for the policy simulations. In this reduced form model, it is the relative comparisons that prove most interesting. The policy simulations include increasing the benefit levels of the two sets of programs, making housing an entitlement, and eliminating both programs.

The marginal effect of increases in the amount of dollars in each program is similar. An increase of \$100 in the housing programs decreases participation probabilities by 1.6 percentage points, whereas an increase of the same dollar amount in the entitlements decreases

¹⁹ Because of sample size, the analysis could not be restricted to only AFDC recipients.

Table 8. Simulation of Changes in Program Variables on Labor Force Participation and Housing Participation

	Percent	Change from Baseline
Baseline—labor force participation	68.06	—
<i>Simulations using specification 4 from table 4</i>		
Have two additional children	63.45	-4.62
Increase wage by \$1/hour	74.01	5.95
Housing + \$100	66.46	-1.61
Entitlement sum + \$100	65.37	-2.69
Housing as an entitlement (eliminate rationing)	61.62	-6.44
Eliminate the entitlement programs	82.58	14.16
Eliminate the housing programs	66.24	-1.82
Eliminate all programs	81.48	13.42
<i>Simulations using specification 2 from table 4</i>		
Entitlement sum + \$100	66.08	-1.99
Eliminate the entitlement programs	79.12	11.05
Baseline—housing program participation	16.04	—
<i>Simulations using specification 4 from table 6</i>		
Eliminate the entitlement programs	10.90	-5.14
Housing as an entitlement (eliminate rationing)	17.58	1.62

participation probabilities by 2.7 percentage points. Although raising the benefit levels of the welfare programs by \$100 each has a small effect on labor force participation (-0.042), it has about two-thirds the effect of lowering the wage by \$1 (-0.059). When housing is made an entitlement by eliminating waiting times, there is a large adverse effect on labor force participation (-0.064). This suggests that the rationing in the housing programs may be keeping some households in the labor force and keeping some from participating in the welfare system altogether.

The final simulations present an approximate measure of the overall impact of the welfare system on labor force participation. This exercise is similar to the one conducted by Fraker and Moffitt (1988) in their study of AFDC and food stamps, and is subject to the standard Lucas critique of policy simulations in reduced form settings. Eliminating the housing programs has little effect (-0.018) on labor force participation probabilities, as there are counteracting effects of the size of the subsidy and the rationing in the program. On the other hand, eliminating the entitlement programs would increase labor force participation by 14 percentage points, and eliminating all four programs raises labor force participation by 13.42 percentage points. At the same time, ignoring the housing programs leads to an underestimate of the impact of the welfare package on labor supply. When the simulation is done of the effect of eliminating the entitlements in a model that ignores housing (table 4, specification 2), the result is an 11 percentage point increase in labor force participation rates. On the basis of this comparison, labor force participation probabilities are raised an additional 21 percent over the simulated impact of eliminating the entitlements in a model without control for the housing programs.

The final rows in table 8 present a simulation taken from the housing participation equations. The only housing program variable with an impact is the waiting time. The simulation implies

that housing participation would increase by 1.6 percentage points if there were no rationing in the program. It also implies that eliminating the entitlement program would lower participation by more than 5 percentage points. The simulations confirm the theory that households would be less likely to participate in the housing programs if there were no entitlements to provide income during the waiting period.

Concluding Remarks and Policy Implications

As many researchers have suspected, housing programs do affect households' decisions regarding labor force and housing program participation. Assigning benefits properly and accounting for rationing are both important in accurately assessing the impact of these rental assistance programs. This study demonstrates that the inclusion of housing changes the independent impact of the entitlement programs because of the correlation of the entitlement benefits with the waiting time. Simulations imply that within a model that includes housing, eliminating all of these transfer programs increases labor force participation by 21 percent more than does a similar simulation in a model without housing. Although this increases the overall disincentive of welfare, the impact on hours worked is likely small. Moffitt (1992) refers to previous research that states that eliminating the AFDC and food stamp programs would increase hours worked by approximately 2 to 10 hours per week. Given the estimates of this study, eliminating the total package would increase work by 3 to 12 hours per week.

This study represents a first step in a comprehensive study of the four primary components of the welfare system. These results are static in nature and do not give any guide to the dynamics of welfare participation. As better data on housing become available, research on the dynamics of housing participation will give a better guide to the long-term impacts of the welfare package on both labor force and welfare participation. In particular, data would need to describe a household's exact position on a waiting list to create a full structural model of multiprogram participation. At present, no such data exist.

It would also be useful to study how local labor markets interact with the welfare and housing programs. Hoynes (2000) has found that employment options significantly affect the length of AFDC receipt. Local labor markets may also affect the receipt of housing assistance because the availability of jobs is critical in the decision process for potential welfare recipients. In the present analysis such data were not available at the local level. That could bias the results, on the one hand, if it is the case that good labor markets exist in areas with the longest waiting lists and tight housing markets. In this scenario, the estimated impact of the housing programs would be overestimated. On the other hand, if high unemployment accompanies long waiting lists because more individuals are without work and therefore are seeking housing assistance, the results here are an underestimate. Although the use of COL indices are meant to partially control for those factors, more precise measures would be useful in future study. In a recent study on public housing and labor supply, Yelowitz (2000) uses metropolitan fixed effects to control for unmeasured labor market characteristics, and he finds substantively similar results to those in this study.

This study shows that the assisted housing programs lower overall labor force participation, but it may be the case that receipt of housing assistance can help in the transition from welfare to work because the family will still have a place to live after it leaves welfare and, in the case of vouchers, may be able to locate closer to places of employment. Unfortunately,

there is now little direct evidence of this. Although Ong (1998) finds that in a sample of welfare recipients Section 8 receipt promotes work, little is known about the importance of housing assistance for former AFDC recipients. In the future, evidence from the Moving to Opportunity experiments (Ludwig, Duncan, and Pinkston 2000) should provide insights into that question. Regardless of how states and counties implement welfare reform, it is clear from this analysis that careful consideration of housing as a part of the welfare package is needed to allow policy makers to construct a complete reform package.

Appendix A

Description of the Programs

Transfer programs such as AFDC, food stamps, and housing assistance have many restrictions, and the eligibility requirements can be somewhat confusing to potential applicants. Indeed, this may be one of the reasons why some eligible populations do not participate. Keane and Moffitt (1998) provide a succinct description of the eligibility requirements and program characteristics from which part of this explanation follows.

For the most part, AFDC is restricted to very low income female-headed households with children. Eligible women receive a subsidy determined by household size, nonlabor income (N), labor income (WH), and other allowable deductions for child care (C) and work-related expenses (E) for workers. In 1984 the formula for the monthly AFDC benefit (B_A) for a given number of children was as follows:

$$\begin{aligned} B_A &= \text{Min} \{P, r [G_1 - \text{Max} (0, WH + N - C - E)]\} \\ &\text{if } WH + N < (1.85)G_2 \\ &= 0 \text{ if not,} \end{aligned} \tag{1}$$

where P is the maximum payment permitted in a state, r is the “ratable reduction” (a number between 0 and 1 by which the benefit may be reduced), G_1 is the maximum benefit paid, and G_2 is the needs standard.

The food stamp program is unique in this group of transfer programs in that it does not vary by state in the continental United States. Households are eligible if they pass the income screens. The formula for the monthly food stamp benefit (B_F) in 1984 was as follows:

$$\begin{aligned} B_F &= \text{Max} \{M, G - 0.3 Y_{n1}\} \\ &\text{if } WH + N < M_1 \text{ and } Y_{n1} < M_2 \\ &= 0 \text{ if not,} \end{aligned} \tag{2}$$

where

$$\begin{aligned} Y_{n1} &= \text{Max} (0, 0.82WH + N + B_A - 95 - S) \\ S &= \text{Min} [134, \text{Max} (0, R - 0.5 Y_{n2})] \\ Y_{n2} &= \text{Max} (0, 0.82WH + N + B_A - 95), \end{aligned}$$

where G is the food stamp guarantee, M is a minimum benefit, Y_{n1} is a first type of net income, M_1 is the gross income screen, M_2 is the net income screen, S is a shelter deduction, R is rent paid, and Y_{n2} is a second type of net income.

Although there are numerous housing programs administered by HUD, the program that has the greatest impact on the poor is subsidized rental housing. This study focuses on public housing and subsidized private rental housing (Section 8 vouchers and certificates) because in this data set it was not possible to categorize the involvement of households in other programs such as Section 202, Section 236, or project-based Section 8. In both programs studied, a household is eligible if its income and assets are below mandated guidelines and the tenant is obligated to pay a rent set by a government formula. The Section 8 programs allow the tenant to find suitable private housing that meets government-defined safe and sanitary living standards. In the voucher program, a voucher is given to the recipient based on the difference between the payment standard for the public housing authority (PHA) and the required tenant contribution. The recipient is then allowed to find any suitable unit. In the certificate program the government pays the landlord the difference between a contract rent and the tenant contribution. Typically, both the payment standard and contract rent are related to the fair market rent for each locale as established by the federal government, but the PHA has the discretion to pay larger or smaller benefits.²⁰ In public housing the government acts as the landlord and simply collects the tenant contribution.

Housing assistance is administered by a PHA, which typically has jurisdiction over a county or city. The PHA is given a budget from the federal government based on the number of low-income households in the covered area, but this budget is insufficient to provide subsidies to all eligible applicants. The PHA keeps a waiting list of households that have applied for housing assistance and gives subsidies based on a queue. Households are eligible only if they are considered “low income” or “very low income,” which is 80 percent or 50 percent of the area’s median income, respectively. The housing authority has the discretion of which measure to use, but most stick to the very low income measure because the subsidies are in such short supply.²¹

Priority on the waiting list is given to households that obtain a designation of federal preference and local preference.²² If a household is displaced or homeless, living in substandard housing, or paying more than 50 percent of net income in rent, the household is given federal preference and is placed at the top of a housing authority’s waiting list. Designation of local preference varies by locale, but cannot supersede federal preference. Local preference is given, for example, when the applicant lives within the jurisdiction of a particular housing authority. That gives additional preference to residents at the expense of those applying remotely.

Housing assistance varies by housing authority, but is set at the federal level according to the set of rules below. For participants not on AFDC or for those on AFDC in one of 40

²⁰ The fair market rent is calculated as the rent on a safe and sanitary unit that is in the 45th percentile of rents on a comparable unit. The fair market rent varies by bedroom size and is set at the MSA or county level.

²¹ Eligibility must be maintained while a household is on the waiting list. Typically, a housing authority checks every six months from the time the application is first submitted until the subsidy is granted.

²² Federal preference was written into law in 1983 and became fully effective in 1987. Before the law was passed, different housing authorities had implemented several provisions of preference. Preference rules have since changed, but recent changes do not affect the time period covered in this analysis.

states, the monthly rental payment (S) in 1984 for the tenant was determined by the following formula:

$$S = \text{Max} (0.10Y_G, 0.30Y_N), \quad (3)$$

where

$$Y_G = WH + N + B_A$$

$$Y_N = Y_G - 40K - C,$$

where Y_G and Y_N are gross and net income, K is the number of children, and C is a child care expense. The rental formula for households on AFDC in the remaining 10 states was as follows:

$$S = \text{Max} (0.10Y_G, 0.30Y_N, rM), \quad (4)$$

where r is the ratable reduction in the state AFDC program, and M is the maximum shelter deduction permitted in the state AFDC rules. The housing subsidy (B_H) can then be calculated as the difference between the appropriate rental standard and the tenant rental payment.

Appendix B

Estimation of the Wage Equation

Table B.1. Labor Force Participation (N = 692)

	Coefficient	Standard Error
Intercept	-5.926 **	(1.001)
Age	0.250 **	(0.050)
Age squared	-0.344 **	(0.073)
Education	0.152 *	(0.076)
Education squared	-0.405	(0.315)
Unemployment rate	0.062 *	(0.028)
Average wage	-0.013	(0.045)
Race dummy—African American	0.003	(0.103)
Race dummy—other nonwhite	0.183	(0.263)
Number of children	-0.153 *	(0.047)
MSA—central city	0.711 **	(0.103)
MSA—suburbs	0.819 **	(0.104)

Notes: Standard errors are corrected for the presence of heteroskedasticity. Sample year is 1984.

* $p < 0.1$. ** $p < 0.05$.

*Table B.2. Wage Estimation-Dependent Variable Ln (Wage)
Sample if Wage > 0 (N = 471)*

	Coefficient	Standard Error
Intercept	-0.053	(1.314)
Age	0.080	(0.043)
Age squared	-0.102	(0.060)
Education	-0.067	(0.062)
Education squared	0.502 *	(0.222)
Unemployment rate	-0.042 *	(0.017)
Average wage	0.091 **	(0.022)
Race dummy—African American	0.060	(0.052)
Race dummy—other nonwhite	-0.047	(0.131)
MSA—central city	-0.091	(0.138)
MSA—suburbs	-0.040	(0.146)
Mills ratio	-0.299	(0.282)

Notes: Standard errors are corrected for the presence of heteroskedasticity. Sample year is 1984.
* $p < 0.1$. ** $p < 0.05$.

Appendix C

Table C.1. Bivariate Model of Labor Force and Housing Program Participation (N = 692)

	Labor Force Participation	Housing Program Participation
Constant	-0.086 (0.502)	0.473 (0.550)
Age of youngest child	0.049 ** (0.015)	-0.011 (0.016)
Number of children	-0.071 (0.056)	0.058 (0.066)
Age	-0.024 ** (0.011)	-0.002 (0.012)
Estimated wage	0.196 ** (0.063)	-0.273 ** (0.065)
Education dummy—some high school	0.127 (0.241)	-0.285 (0.264)
Education dummy—high school diploma	0.634 ** (0.226)	-0.453 ** (0.254)
Education dummy—at least some college	0.456 * (0.275)	-0.181 (0.307)
Race dummy—African American	0.077 (0.122)	0.868 ** (0.138)
Race dummy—other nonwhite	0.827 ** (0.409)	0.403 (0.352)
Housing benefit	-0.049 (0.088)	0.132 (0.103)
Entitlement sum	-0.082 ** (0.036)	0.089 ** (0.041)
Waiting time in months	0.010 ** (0.004)	-0.006 (0.005)
Rho		0.276 ** (0.082)
Log likelihood		-651.11

Notes: Standard errors are in parentheses. Standard errors are corrected for the presence of heteroskedasticity. Sample year is 1984.

* $p < 0.1$. ** $p < 0.05$.

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