

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

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The 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 twenty-one percent when compared to the entitlement portion of the package alone.

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

## **Abstract**

Many studies in the 1970s and 1980s have examined the effects of the welfare system on individual behavior. All of these studies fail to appropriately consider low income housing assistance. Most studies have either ignored housing assistance or have implicitly assumed that there is no rationing in this program. This paper 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.

The 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 twenty-one percent when compared to the entitlement portion of the package alone.

## **I. Introduction**

Various models of welfare reform are currently being enacted in all levels of government. While politicians debate the particulars of each welfare reform package, only recently have some begun to consider the impact of housing assistance on the decision making of households (GAO, 1999). Those studies are primarily concerned with the impact of welfare reform on utilization 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 housing subsidy is sometimes larger than the benefit from Aid to Families with Dependent Children (AFDC).<sup>1</sup> 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 over half as large as the sum of AFDC, Food Stamps, and Medicaid. The housing benefit in Los Angeles is \$567 per month, which comprises a third of the total benefit package. On the other hand, a housing benefit of \$338 per month in Birmingham comprises about forty percent of the total welfare package.

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<sup>1</sup> AFDC is now Temporary Assistance for Needy Families (TANF). Because the data in this analysis precedes this change, this program will be referred to as AFDC.

The welfare package for non-elderly 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 the past decades, real advances have been 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, and results from this literature have yielded a better understanding of the incentives of individuals both to participate in these programs and to supply labor. The implications of this literature suggest that labor supply is negatively affected by increases in benefits in these welfare programs, but that this effect is quite small. One might expect that as individuals are made better off in a non-working state, more would choose not to work or reduce hours substantially. 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 a strong impact of Medicaid on household decisions.<sup>2</sup>

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<sup>2</sup> Blank (1989) proxies for the value of Medicaid with the average expenditure per recipient in each state

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and finds insignificant effects on welfare participation. Winkler (1991) finds a small impact of Medicaid on labor force participation, but an insignificant 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 based on evidence from Medicaid eligibility expansions. He finds that increasing eligibility of 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.

This study uses augmented data from the Survey of Income and Program Participation (SIPP) to study the impact of low-income housing assistance on household decisions. At present, the vast majority of studies that analyze the impact of the 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 not only an in-kind benefit, but it is also distinct from the previously mentioned programs because it is not an entitlement in which an eligible household applicant automatically receives the benefit upon application 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 while other data only identify whether or not a household is receiving a subsidy. In addition, very little information exists on the length of the waiting times which households face. Housing is also different from the other welfare programs 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 this final hurdle, this study obtained confidential location identifiers from the Census Bureau.

This paper tests the impact of both the size of 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 entire welfare package. The 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 those who are not (49% vs. 72%). Further, if the effect of housing benefits on behavior is

correlated with the effect of other benefits in the welfare package 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 study housing in isolation. Many households tend to participate in many public assistance programs at a time (Table 2). Therefore studying one program at a time is likely to lead to spurious results.

There is one study (Keane and Moffitt, 1998) which has included housing in a structural model of multi-program participation. The authors utilize 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.<sup>3</sup> They find no significant effects of housing assistance, which they attribute 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 describe accurately the choices of households by correctly matching households to the housing authority in which they reside. Therefore they do not use the actual housing subsidy which households would receive. This study is able to overcome both of these deficiencies in past work.

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 is not found to have a statistically

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<sup>3</sup> 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.

significant effect on labor force participation, the rationing in the program has an impact on both labor force and housing program participation. 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 the housing benefit has a similar marginal impact on labor force participation probabilities as do the entitlement benefits, 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 twenty-one percent.

The remainder of the paper is presented as follows. Section II describes the unique features of the housing programs in comparison to the entitlement programs such as AFDC, Food Stamps, Medicaid. Section III describes the data sources employed in the analysis. The empirical strategy is outlined in section IV. A reduced form analysis is designed to assess the impact of the components of the welfare package (entitlements, housing assistance, and waiting list information) on labor force and housing program participation probabilities after controlling for the various socioeconomic characteristics of female-headed households. Section V presents the results of the estimation, and section VI provides concluding remarks.

## **II. The Uniqueness of the Housing Assistance Programs**

While there are numerous housing programs administered by the Department of Housing and Urban Development (HUD), the program which 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 it was not possible to categorize the benefit to households for other programs such as Section 202, Section 236, or project based



Section 8 in this data set. 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. The government pays the landlord a rent that will give the landlord, combined with the tenant payment, a “fair market rent” for the unit.<sup>4</sup> The fair market rent level for each locale is established by the federal government.<sup>5</sup> In public housing, the government acts as the landlord and simply collects the tenant portion of the fair market rent for the unit. Therefore the housing subsidy is the difference between the fair market rent and the tenant rental payment.

Housing subsidies are administered by a local public housing authority (PHA), which typically has jurisdiction over a county or city. The PHA is given a budget from the federal government based upon the number of low income households in the covered area, but this budget is insufficient to provide subsidies to all eligible applicants. It keeps a waiting list of those households which have applied for housing assistance, and give subsidies based on a queue. Households are only eligible if they are considered “low-income” or “very low-income”, which is eighty percent or fifty 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-

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<sup>4</sup> The differences between the certificate and voucher programs are small. The key difference is that in the voucher program, if the tenant wants to pay more or less than the fair market rent for a unit, he or she may pay keep the difference. The certificate program requires the household to pay its calculated portion of the fair market rent, and any deviation over the fair market rent must be approved by the housing authority.

<sup>5</sup> The fair market rent is calculated as the rent on a safe and sanitary unit which is in the forty-fifth percentile of rents on a comparable unit. The fair market rent varies by bedroom size, and is set at the metropolitan statistical area or county levels.

low income measure since the subsidies are in such short supply.<sup>6</sup>

Priority on the waiting list is given to households who obtain a designation of federal preference and local preference.<sup>7</sup> If a household is displaced or homeless, living in substandard housing, or paying more than fifty 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. A common example of a local preference is given when the applicant lives within the jurisdiction of a particular housing authority. This gives additional preference to residents at the expense of those applying remotely.

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. Newman and Schnare (1993) demonstrate using American Housing Survey data that residents in the large public housing structures display a lower opinion of the neighborhood quality than do housing-assisted households with vouchers. Since the data on waiting lists that are utilized in this paper do not distinguish between the two programs, one is not able to separate a household's decision to apply for

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<sup>6</sup> Eligibility must be maintained while a household is on the waiting list. Typically, a housing authority checks every six months from the time the applications is first submitted until the subsidy is granted.

<sup>7</sup> Federal preference was written into law in 1983, and became fully effective in 1987. Before that time, different housing authorities had implemented several provisions of preference prior to the law being passed.

public housing from the decision to apply for a Section 8 voucher. This may cause bias in 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 shorter waiting lists are present in areas with a relatively larger number of public housing units, then the estimated impact of housing assistance on housing program participation would be underestimated.

While a literature exists on the impact of welfare payments on various household decisions, there does not exist 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 that the rationing of housing assistance may have an impact on the labor force and housing participation probabilities. The first is that the queue may have a direct cost to the utility of households that may result from the time spent applying and continually proving one's eligibility at the intervals determined by the housing authority. The second possibility is that the waiting time captures the uncertainty of when benefits will be received. In considering this possibility, 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).

Two final issues are important to address in a study of the impact of housing assistance. The first is the treatment of housing assistance as an in-kind benefit. Although Food Stamps is also an in-kind benefit, food purchases have been found to be infra-marginal (Moffitt, 1989); i.e., no more food is purchased due to the receipt of Food Stamps. This allows the researcher to include food stamps as a cash benefit in the analysis. While there is no direct evidence that housing purchases are infra-marginal, this analysis makes this assumption in order to simplify

the model which is used to estimate the impact of housing assistance on household behavior.

The second consideration is whether households choose to live in locales with higher benefits. If households move to jurisdictions with higher benefits then 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 (1996) finds that states with higher benefits are more likely to attract members of the welfare population from neighboring states with lower benefits, but his research does not find these states have higher retentive rates over members of the welfare. 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.<sup>8</sup> 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, 1997a and 1997b) suggests that the amount of intra-urban mobility induced by benefit differentials is small, and therefore is unlikely to bias the results in this study.

### **III. Data and Variable Construction**

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

This analysis uses data from the Survey of Income and Program Participation (SIPP). The SIPP contains a nationally representative sample and provides good information on labor supply and income sources. Each panel of the SIPP contains 7 to 8 waves that are taken quarterly. Every wave contains a set of core questions and a topical module which differs across waves. A sample of female-headed households aged 16-50 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 non-labor incomes greater than the AFDC asset limits are excluded because their behavior may be structurally different from those with assets below this level.<sup>9</sup> Implicit in the selection of a sample of only female-headed households is that benefit levels do not influence the decision to become a female household. If higher benefit levels increased the probability of female headship, then the estimate of the effect of AFDC benefits on work in this sample would be biased upward. Recent evidence in Hoynes (1997), however, suggests that once individual and state fixed effects are included in the estimation, then AFDC benefit levels have no impact on the female headship decision.

Sample statistics for variables used in the analysis are presented in Table 3. This study primarily uses Wave 4 of the 1984 SIPP, totaling 692 observations, because the topical module in this wave asks households if they are on a waiting list. This question was dropped until 1991. To test for the sensitivity of estimates across time, the second wave in 1991 and the first

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<sup>9</sup> 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.

wave of 1992 are also used, although the waiting list characteristics that are used are more appropriate for the 1984 sample. 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 worked that month. The waiting time is based on the average wait of households in a particular housing authority. Benefit levels are divided by one hundred in the estimated equations, and are adjusted for the CPI whenever samples are pooled across the three time periods.

The SIPP is particularly attractive because it asks households if they are on public housing waiting lists. This allows proper identification of the choice of a household to participate in the housing programs. 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, and Social Security, but is not asked of the general population. Therefore, even this data set will identify those households which only wish to participate in the housing programs, but have not yet received their subsidy, as non-applicants. On the other hand, this population is small because most households who are waiting will choose to have federal preference to move to the top of the waiting list. 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.<sup>10</sup>

The two components of data that previous studies lacked were information on the waiting time of households and information on the exact location of households. 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 prepared information on the average length of time it takes households to get off of waiting lists to get either Section 8 vouchers or public housing residence. This information is calculated by averaging the waiting time among current recipients in 1992. The rationing data is more likely applicable to those households who were deciding whether or not to receive assistance in 1984. An inspection of these data reveals that the number of households who entered waiting lists in the two periods (1984 and 1991-1992) is quite different. Only thirteen percent of this sample applied for housing assistance in the period 1991-1992, and two-thirds of the sample applied in the period from 1984-1991. Therefore, to the extent people are forward looking in making their decisions, the rationing information may be more appropriate to include in the choices of households in 1984.

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<sup>10</sup> Table 2 shows that forty-six percent of housing participants also receive AFDC, Food Stamps or Medicaid. In addition, the Green Book (1992) demonstrates that an additional forty-three percent of housing participants receive SSI, Social Security, Unemployment Insurance, or Medicare. With up to eighty-nine percent coverage, this question may not leave out many of the households on waiting lists.

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 local housing authority which typically have jurisdiction over a county or a city. (There are over twenty-eight hundred housing authorities nationwide.) The measurement error that exists from not knowing where a household resides will cause estimates to be inefficient and possibly biased. 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.<sup>11</sup>

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<sup>11</sup> These data remain classified, but I am able to do estimation at the Census. The Census retains all rights to these data, and it cannot be used outside of their jurisdiction.



The actual benefits received by participants of the transfer programs are not included in the tests of the model. Since the decision to work affects the amount of income one earns, and therefore affects the level of the benefits, actual benefits are endogenous. Thus, the state guarantee is used in the case of AFDC, and federal guarantee in the case of Food Stamps, and the fair market rent for the housing authority in the case of the housing programs.<sup>12</sup> The fair market rent is used as proxy for the maximum benefit available for both subsidized rental housing and public housing. With the diversity which exists in both quality and proximity to jobs and other services in both types of housing, using the fair market rent for public housing is preferred to attempting a mediocre, at best, hedonic regression using the SIPP. 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 inter-state variation in the case of the entitlements, and using intra- and inter-state variations in the case of the housing benefit. One

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<sup>12</sup> 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. The combined benefit will be  $.7*G_A + G_F + .368*G_M$  (where  $G_i$  are the respective guarantee levels of the three entitlement programs) because the Food Stamp benefit formula taxes AFDC income. Since the AFDC benefit also enters into the housing assistance formula, AFDC income is taxed by an additional thirty percent in specifications which include both the entitlement and housing benefits.

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 a similar goal of the 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 index (COL) can adjust for the variation that is solely from cost of living differences. Without these indices, one is only able to estimate the average impact of an additional dollar of benefits, which can be quite different across states. In the case of housing benefits, if differences in fair market rent levels were solely due to differences in cost of living, then a perfect cost of living index would eliminate any variation in the benefit. The variation that would exist in practice would be simply due to an imperfect cost of living index and imperfect derivation of the fair market rent by the federal government. It is not clear, however, that differences in the cost of housing across areas may not be due to better job opportunities and other social amenities that are capitalized into housing prices. If this is true, then higher housing benefit levels would imply a better benefit, and use of cost of living indices to eliminate this variation may not be warranted. There are two sources of the COLs that are used when testing the model for sensitivity to cost of living differences. McMahon (1991) provides a state level COL 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 MSAs.

#### **IV. Empirical Strategy**

There are several empirical challenges in testing the impact of housing assistance on the

choices to participate in the labor force and to participate in the housing programs using cross-sectional data.<sup>13</sup> The first challenge concerns how to incorporate the data on the waiting list characteristics together 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 which are receiving benefits have no waiting time, and those who are on the waiting list have different waiting times than those who have not applied for benefits. The difficulty lies in what waiting time to include in this choice model for each of the different groups since 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 as if a categorical variable for the recipient of housing assistance is 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 whether or not they are currently receiving or have applied for housing assistance is used. 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.<sup>14</sup> The bias that may exist from this

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<sup>13</sup> The decision making of households concerning housing assistance is best studied in a dynamic setting. As outlined previously, the data used in this analysis are the only which 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.

<sup>14</sup> This assumption also requires that waiting lists have not changed much over time. Since Susin (1997) found average waiting times to be only two months longer in 1996 than is found in this study, the assumption will

assumption would reduce the estimated impact of rationing in the simple choice model.

In the empirical model, this rationing information is used in two ways. This variable is included directly to capture any direct cost of waiting in the queue, and is included in a standard discount rate model which adjusts the value of the housing subsidy for the waiting time. In this latter framework, the two primary sources of welfare income will be entered into the estimated model differently. While entitlement program income enters in the same manner as does labor income, the housing program income ( $B_H$ ) will be adjusted by a discount rate ( $\delta$ ).

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 issue must be addressed in order to implement a test of the model. The designation of federal preference is a choice of the households. Households with income above the level designated by federal preference may choose to lower its labor income to receive this designation. The participation decision is complicated further because of the interaction of the rules of the entitlements and rationed assistance programs. As noted in Appendix 1, the various rules of the programs allow labor income to be included in calculation of federal preference, but excludes the value of Food Stamps and Medicaid. Without AFDC, Food Stamps, and Medicaid, it would be less likely that an individual would participate in the housing programs. More individuals would be observed working during their wait, yielding the possibility of not receiving federal and local preferences. This interaction has an

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probably not affect the results.

ambiguous effect on the estimated impact of program variable unless the sample is homogenous in its designation of federal preference.

### *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 in order 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 classify correctly the choices of those individuals who are on waiting lists. For example, the choices faced by a household that has just entered the waiting list will be much different than one that may have waited for two years. In addition, those households on a waiting list may refuse certain units in public housing which are deemed of inferior quality and then return to the waiting list in hope of a better draw. Since this hindrance in the data necessitates some sort of reduced form approach, it is not clear that imposing structure on the relationship between the decisions to participate in the labor force and the decision to participate in the housing programs would yield better information about the impact of housing assistance.

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 together with 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. Since there are no *a priori* reasons to believe that bias which may exist from using the reduced form will affect the coefficient on the entitlement programs differently than the estimated coefficient on the housing programs; therefore 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), and may have different relationships with leisure. The model found in Leonesio (1988) suggests that if housing assistance is a complement of leisure, then it would have a larger negative impact on labor force participation than would cash assistance. In addition, the coefficient on housing assistance may be understated if participation in housing carries more stigma than participation in AFDC.

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

$$LFP^* = X'\beta + Z'\gamma + \varepsilon,$$

$$LFP = 1, \text{ if } LFP^* \geq 0; \text{ } LFP = 0, \text{ if } LFP^* < 0,^{15}$$

where  $X$  captures heterogeneity of preferences with respect to work, and is a function of an individual's socioeconomic characteristics (such as the education level and size of the family) and other labor market characteristics.  $Z$  represents the benefit characteristics of the welfare

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<sup>15</sup> While 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.

programs that differ across specifications. The error term  $\varepsilon$  is assumed to be normally distributed.

A housing participation equation is estimated to observe the effect of these same variables on the participation probabilities. Let

$$P^* = X'\phi + Z'\chi + \mu,$$
$$P = 1, \text{ if } P^* \geq 0; P = 0, \text{ if } P^* < 0,$$

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  $\mu$  is a normally distributed error term.

## **V. Results**

### *i. Labor Force Participation Equation*

Estimates of the various specifications of the labor force participation equation are presented in Table 4 which differ in the inclusion of the various program variables. Because cost of living (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.<sup>16</sup> Other covariates are included to control for socioeconomic characteristics which may impact labor force participation in ways that are unrelated to the wage. The variables in these specifications have the expected signs. Higher potential wages, having fewer children, and having a higher

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<sup>16</sup> Predicted wages are used for both those who work and those who do not work. Results of the wage estimation are included in Appendix II. Gross wages are used because net wages are endogenous.

age for the youngest child raise the probability of labor force participation. It is interesting to note that the educational dummies which seem to have an effect beyond education's effect on wage are the high school diploma and college dummies. This may imply a lower distaste for work in this 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. (While the probit coefficients should not be interpreted as marginal effects, the discussion remains unchanged whether probit coefficients or marginal effects are compared.) This 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 adding the waiting list characteristics. 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 suggest that fewer people participate in AFDC when waits for housing are longer.<sup>17</sup> When the rationing information is used to adjust the housing benefit (specification 5), the coefficient on the

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<sup>17</sup> An AFDC participation equation was also estimated to explore the impact of the housing programs on AFDC participation probabilities. While the coefficient on the entitlement sum is .13, the coefficient on the housing programs is insignificant. The rationing of housing does seem to effect AFDC participation. Including the waiting list information directly increases the coefficient on the entitlement sum.



housing benefit becomes significant at the 10 percent level. These results would validate the Keane and Moffitt (1998) assertion that the ability to control for rationing is necessary to obtain accurate estimates of the impact of housing.

In the Table 5, cost of living 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 one would expect. The parameter estimates are a bit smaller as well, but not enough to claim that including this index has changed the estimates. In the first four specifications, housing purchases have been assumed to be infra-marginal, and therefore a total goods index has been used to adjust the dollar amount of the benefit. The ACCRA index may be preferable because the housing benefit can be adjusted by a housing index, and the entitlements can be adjusted by an general index. This would be necessary if households distinguish their housing purchases from their overall purchases. These estimates do not prove statistically significant. This result may be derived from the fact that the sample is smaller or that these indices may be poor, as McMahon (1991) notes in his derivation of the state level indices.<sup>18</sup>

#### *ii. Housing Participation Equation*

Table 6 presents the estimates for the housing participation equations. In these models, the dependent variable is equal to one if the households are either currently receiving benefits or are on a waiting list. The same variables are included in these models that are included in

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<sup>18</sup> The impact of the cost of living indices was also explored in the housing participation equations. The same patterns emerge. Tables of these estimates are available from the author.

the labor force participation equations. Again, all of the statistically significant socioeconomic variables have the expected sign. One noted difference in the housing equation estimates in comparison to 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 African-Americans, in particular, may have less stigma associated with living in subsidized housing.

The surprising result in Table 6 is that the size of the housing subsidy does not impact housing program participation. The coefficient is insignificant and of the wrong sign. On the other hand, the coefficient on the entitlement sum is consistently significant in all specifications. The inclusion of the 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.

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 presence of the entitlement programs is 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 are not 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.

Since most data sets do not include any information on whether or not people are on

waiting lists, housing participation equations are estimated which mistakenly identify those on a waiting list as non-participants. This should produce a downward bias on participation probabilities. In results not shown, the exclusion of the waiting list population drops the estimated impact of the programs about thirty percent.

### *iii. Sensitivity Analysis*

Table 7 presents estimates of the labor force participation model that includes data from a 1991 and 1992 wave of the SIPP. The estimates on the socioeconomic characteristics are similar to the estimates when the 1984 data was 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. While the basic pattern of the results between Tables 4 and 6 are 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 this analysis.

In results not show, different specifications of the discount rate are tested because researchers have found that individuals with different socioeconomic characteristics may have different rates of time preferences (Lawrance, 1991). For example, the less educated may have much shorter time horizons than do the highly educated. To test the sensitivity of the parameter estimates to the discount rate specification, two tests are conducted. The first simply allows the discount rate ( $\delta$ ) to vary. The primary tests of the model are conducted using a yearly discount rate ( $\delta$ ) which 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 different  $\delta$  on the coefficients of the model.

When  $i$  is allowed to vary thirty-six percent to six 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% interest rate ( $i$ ), which is quite a bit smaller than the one assumed in the paper. 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 either through formal education or life experience. In sum, while discount rates do seem to vary systematically by individuals, there is little impact on the other coefficients of the model.

The final sensitivity test conducted is 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 this 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 (-.26) is significant, but the coefficient estimates are little changed after correcting for this correlation.

#### *iv. 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 cost of living 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 which 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 one hundred dollars in the housing programs decreases participation probabilities by 1.6 percentage points, while an increase of the same dollar amount in the entitlements decreases participation probabilities by 2.7 percentage points. While raising the benefit levels of the welfare programs by \$100 each has a small effect on labor force participation (-.042), it has about two thirds the effect of lowering the wage by a dollar (-.059). When housing is made an entitlement by eliminating the waiting times, there is large adverse effect on labor force participation (-.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. Elimination of the housing programs has little effect (-.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, elimination of the entitlement programs would increase labor force participation by 14 percentage points, and elimination of all four program 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 of the effect of elimination of the entitlements in a model which ignores housing is done (Table 4, specification 2), the result is a 11 percentage point increase in labor force participation rates. Based on this comparison, labor force participation probabilities are raised an additional twenty-one percent over the simulated impact of the elimination of 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 suggests housing participation would increase by 1.6 percentage points if there was no rationing in the program. On the other hand, elimination of the entitlement program would lower participation by over five percentage points. The simulations confirm the intuition that households would be less likely to participate in the housing programs if the entitlements did not exist to provide income during the waiting period.

## **VI. Concluding Remarks and Policy Implications**

As many researchers have suspected, housing programs do affect the labor force and housing program participation decisions of households. Proper assignment of benefits and accounting for rationing are both important in getting an accurate assessment of the impact of these rental assistance programs. This study demonstrates that inclusion of housing changes the independent impact of the entitlement programs because of the correlation of the entitlement benefits with the waiting time. Simulations suggest that in a model which includes housing the elimination of all of these transfer programs increases labor force participation by twenty-one percent more than when do a similar simulation in a model without housing. While this increases the overall disincentive of welfare, the impact on hours worked is likely small. Moffitt (1992) refers to previous research which states that elimination of the AFDC and Food Stamp programs would increase hours worked by approximately two to ten hours. Given the estimates of this study, elimination of the total package would increase work by three to twelve hours.

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 becomes available, research on the dynamics of housing participation will give a better guide as to the long term impacts of the welfare package on both labor force and welfare participation. In particular, data would need to describe the exact position of a household on a waiting list in order to create a full structural model of multi-program participation. At present, no such data exist.

There are a few implications of this study which may help policy makers in their welfare reform decisions. As the architects of the welfare system had intended, current

reformers are seeking to have AFDC be a program which lasts but a short time (e.g., two years). If the housing programs are not also reformed, it may be the case that the money spent on AFDC reform will not achieve the desired effect because of a household's concurrent participation in housing programs. One would expect this to be critical in those states with housing benefits which are relatively large and in locations for which households may have had to wait a good length of time (in some cases over 5 years) to receive the housing assistance. Thus, while households may no longer receive AFDC benefits, they may still rely on public assistance rather than work.

One possible reform in the housing program which could prove beneficial would be to eliminate the guarantee of housing implicit in obtaining housing assistance, and instead give smaller subsidies to a larger number of eligible households. Olsen and Crews (1996) suggest that the needs of many more households can be met by lowering the fair market rent which is used to calculate the subsidy. (This is related to what HUD has suggested in lowering the FMR to 40 percent of the median rent.) A smaller voucher would shorten waiting lists, and allow more households which are currently on a waiting list to receive assistance. It is not clear if there would be a large increase in housing caseload because households which are currently on the program would exit sooner due to the smaller size of the subsidy. The simulations in Table 8 suggest that this type of proposal may even increase labor force participation. The long term impact of reducing the length of waits could be greater. Currently, households may continue to receive housing assistance by choosing labor supply below what would push them off the housing programs because they would not want to wait for benefits again if there is a job loss. Shorter waiting lists would lessen this disincentive.



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 in order for policy makers to construct a complete reform package.

Table 1

## Variation in Benefits Across the 9 Census Divisions

	AFDC	Food Stamps	Medicaid	Sum of Entitlements	Housing
Boston, MA	463	256	209	928	533
Pittsburgh, PA	401	256	195	852	390
New Orleans, LA	232	256	92	580	362
Birmingham, AL	147	256	130	533	338
Miami Beach, FL	273	256	132	661	515
Minneapolis, MN	611	256	293	1160	451
Cincinnati, OH	343	256	283	882	331
L.A. County, CA	660	256	198	1141	567
Denver, CO	420	256	200	876	487

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. The poverty level and benefit levels for the entitlements are taken from the Green Book (1984). Fair market rents are taken from the Federal Register (1984), and the waiting times were obtained from the Council of Large Public Housing Authorities (1992).

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 Participan t
AFDC only	0	0	0
Food Stamps only	2	2	4
Medicaid only	1	2	3
AFDC & Food Stamps	0	0	0
AFDC & Medicaid	3	6	9
Food Stamps & Medicaid	13	7	20
AFDC, Food Stamps, & Medicaid	13	5	18
Number of Households Participating in Housing & at least one Entitlement	32	22	54

Note: This table is compiled from the sample of the 1984 SIPP cross-section used in the estimation. In addition to the number of people that participate in housing represented in the table, there is an additional 57 (5 on a waiting list) which do not participate in AFDC, Food Stamps, or Medicaid. There are a total of 227 which participate in at least one of these four programs.

Table 3  
Summary 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 non-white	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

Note: Standard Deviations are omitted for dummy variables.

Table 4

Labor Force Participation Equation  
Probit Estimates

(N = 692)

	Specification (1)	Specification (2)	Specification (3)	Specification (4)	Specification (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 - H.S. Diploma	0.633 ** (0.224)	0.615 ** (0.224)	0.618 ** (0.225)	0.635 ** (0.226)	0.612 ** (0.224)
Education Dummy- 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 Non-white	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)
<u>Log Likelihood</u>	-395.91	-394.51	-394.48	-391.50	-393.37

Notes: Standard errors are in parentheses. Standard errors are corrected for the presence of heteroskedaticity.  
\* indicates different from zero at the 10 percent level. \*\* indicates different from zero at the 5 percent level.

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)	Specification (2)	Specification (3)	Specification (4)	Specification (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 - H.S. Diploma	0.620 ** (0.223)	0.620 ** (0.224)	0.620 ** (0.224)	0.618 ** (0.224)	0.254 (0.284)
Education Dummy- 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 Non-white	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)
<u>Log Likelihood</u>	-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.  
\* indicates different from zero at the 10 percent level. \*\* indicates different from zero at the 5 percent level.

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

	Specification (1)	Specification (2)	Specification (3)	Specification (4)	Specification (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 - H.S. Diploma	-0.472 * (0.249)	-0.419 * (0.253)	-0.428 * (0.254)	-0.447 * (0.252)	-0.419 * (0.253)
Education Dummy- 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 Non-white	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)
<u>Log Likelihood</u>	-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.  
\* indicates different from zero at the 10 percent level. \*\* indicates different from zero at the 5 percent level.

Table 7  
 Labor Force Participation Equation  
 Probit Estimates  
 Sample includes 1984, 1991, and 1992 waves  
 (N = 2538)

	Specification (1)	Specification (2)	Specification (3)	Specification (4)	Specification (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 - H.S. Diploma	0.533 ** (0.123)	0.546 ** (0.123)	0.530 ** (0.123)	0.531 (0.123)	0.532 (0.123)
Education Dummy- 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 Non-white	-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)
<hr/> <u>Log Likelihood</u>	-1443.68	-1443.94	-1442.98	-1442.88	-1442.83

Notes: Standard errors are in parentheses. Standard errors are corrected for the presence of heteroskedasticity.  
 \* indicates different from zero at the 10 percent level. \*\* indicates different from zero at the 5 percent level.



Table 8  
Simulation of Changes in Program Variables  
upon 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 a dollar / 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
<hr/>		
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

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## Appendix 1: 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 the potential applicants. Indeed, this may be one of the reasons for non-participation of eligible populations. Keane and Moffitt (1995) provide a succinct description of the eligibility requirements and program characteristics from which the explanation follows.

For the most part, AFDC is restricted to very low income female-headed households with children. Eligible women receive a subsidy that is determined by household size, non-labor 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 for a given number of children was:

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

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 in 1984 was:

$$B_F = \text{Max} \{ M, G - .3 Y_{n1} \} \quad \text{if } WH + N < M_1 \text{ and } Y_{n1} < M_2$$
$$= 0 \quad \text{if not}$$

where

$$Y_{n1} = \text{Max} (0, .82WH + N + B_A - 95 - S)$$

$$S = \text{Min} [134, \text{Max} (0, R - .5 Y_{n2})]$$

$$Y_{n2} = \text{Max} (0, .82WH + N + B_A - 95)$$

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.

Public 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 on AFDC in all but 10 states, the monthly rental payment (S) in 1984 for the tenant was determined by the following formula:

$$S = \text{Max} (.10Y_G, .30Y_N)$$

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

$$S = \text{Max} (.10Y_G, .30Y_N, rM)$$

where r is the ratable reduction in the state AFDC program and M is the maximum shelter deduction permitted in the state AFDC rules. Values for M can be taken from the U.S. Department of Health and Human Services (1985). The  $B_H$  can then be calculated as the difference between the fair market rent and the tenant rental payment.

## Appendix 2: Estimation of the wage equation

### Labor Force Participation (N = 692)

	Coef.	Std 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 non-white	0.183	(0.263)
Number of Children	-0.153	(0.047)
MSA - Central City	0.711	(0.103)
MSA - Suburbs	0.819	(0.104)

### Wage Estimation - Dependent Variable Ln (Wage) Sample if Wage > 0 (N = 471)

	Coef.	Std 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 non-white	-0.047	(0.131)
MSA - Central City	-0.091	(0.138)
MSA - Suburbs	-0.040	(0.146)
Mills Ratio	-0.299	(0.282)



