The Effects of Housing Assistance on Income, Earnings, and Employment

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Abstract

Policymakers have started examining the long-term impacts of housing assistance on families. In particular, policymakers want to determine whether assisted housing can act as a barrier or a bridge to economic self-sufficiency. In this article we use a longitudinal data set of households receiving housing assistance and compare their trajectories on three outcomes—income, earnings, and employment—across types of housing programs and household characteristics. Using descriptive and multivariate analyses, we find notable differences in these three outcomes across different housing programs and populations. These findings imply that, while housing assistance need not be an impediment to increasing household income, earnings, and employment rates, program- and household-specific policies and interventions would likely have the most success in helping assisted households achieve economic self-sufficiency.

Background

Housing assistance is a very valuable type of subsidy. Most households must wait for years and go through extensive application and certification procedures to obtain and retain such assistance. After they are accepted into assisted housing programs, many households remain for years. Policymakers have started examining the long-term impacts of housing assistance on families. In particular, policymakers want to determine whether assisted housing can act as a barrier or a bridge to economic self-sufficiency. They want to know whether assisted housing leads to long-term, full-time employment and independence from economic assistance programs such as welfare. While some would point out that housing assistance provides an important level of support and stability for families attempting to raise themselves out of poverty, others would argue that a prolonged presence in assisted housing may create a long-term dependency that saps households of their motivation to find employment. Furthermore, certain housing programs may contribute to the concentration of low-income households, which can create an environment that severely limits opportunities for families.

This study explores some of these issues by measuring the relationship between housing assistance and income, earnings, and employment over time.[1] In particular, we attempted to answer the following questions:

1. What happens to households' earnings and incomes while they are in subsidized housing?
2. Do certain types of households experience greater earning and income increases than other types of households, such as Temporary Assistance for Needy Families (TANF) recipients and employed people?
3. How does income trajectory vary by type of assistance?

These questions suggest a number of plausible theories, namely that income and employment are affected by baseline characteristics (for example, race or ethnicity, age of children, disability status); receipt of housing and cash assistance; location (neighborhood effects, spatial mismatch); and external conditions that change over time (changes in law and policy, economic conditions). To explore these questions further, we conducted descriptive (univariate) and multivariate analyses of publicly assisted households' income, earnings, and employment using a linked, time-series administrative data set provided by the U.S. Department of Housing and Urban Development (HUD). Other data sources were used to provide contextual and explanatory data.

In preparing for this analysis we benefited from a very recent literature review that examined the effects of housing assistance on labor supply, human capital accumulation, family formation, and neighborhood choice (Shroder, 2002). Although our study focuses on labor supply and earnings, the other outcomes are related.

Shroder concludes that the current research indicates mixed and inconclusive impacts of assisted housing on short-term employment effects and insufficient and possibly conflicting impacts on long-term human capital but positive and significant impacts on family formation and neighborhood choice. Shroder also identifies a number of methodological weaknesses in many of the studies, including self-reporting bias, simultaneity bias, and several sources of selection bias. Although simultaneity bias is not an issue when using longitudinal administrative data, our analysis is subject to self-reporting bias (in the survey control group) and several sources of selection bias. We will discuss each of these in turn.

In addition, Shroder points out that any national data set is likely to be vulnerable to omitted variable bias due to differences in local economic conditions and assistance policies and changes in both of these variables over time. We believe we have good sources of data to address economic conditions and cash assistance policies. We are not aware of comparable data on local housing assistance policies that would be compatible with our analysis.[2]

Overall, we observed an increase in income and earnings for households receiving housing assistance over the period of observation. From 1995 to 2002, income rose an average of 34.1 percent and earnings rose 93.1 percent. The rates of increase varied across the housing programs. Households that experienced the most rapid income and earnings growth participated in the Moderate Rehabilitation Program (Mod Rehab) and received tenant-based assistance (formerly known as vouchers and certificates and now known as the Housing Choice Voucher program). Nevertheless, we attributed much of this variation to differences in the populations served by the programs.

The initial employment rates were highest for households that were in the Below Market Interest Rate (BMIR) program, Rental Assistance Program (RAP), and voucher and certificate programs.[3] We observed that households that remained in housing assistance for

longer periods had lower initial employment rates and slower rates of employment increase than households that remained in housing assistance programs for shorter periods of time.

The remainder of this article provides additional details on our results and findings.

Data and Methods

MTCS/TRACS

Our primary research data set is a linked Multifamily Tenant Characteristics System (MTCS)/Tenant Rental Assistance Certification System (TRACS) file from HUD that provides detailed data on individual and household characteristics, income by source, and assisted households' program participation over time. This data set includes observations of assisted households by year, from 1995 to 2002.[4] The MTCS/TRACS file contains about 29 million records on more than 8 million households that received housing assistance between 1995 and 2002. The forms of housing assistance include public housing, vouchers and certificates, and a variety of project-based programs, including Section 8, Mod Rehab, Rent Supplement, RAP, Section 236, Section 202 Project Rental Assistance Contract (PRAC), Section 811 PRAC, and Section 202/162 PRAC. Using a unique household identifier, HUD has linked data records to make it possible to follow a household through the housing assistance system over time. The data record contains a variety of characteristics, including the type of housing program; the date when the household moved into the current unit; household members' income (and income sources); and household members' race, ethnicity, age, and disability status.

Housing authorities and subsidized housing owners collected household income information—the first outcome of interest to HUD—to certify program eligibility. Household income is reported to HUD annually. Since income in the MTCS/TRACS data was reported for individual household members by income source, we were able to derive the second outcome of interest—total household earnings—by adding up all household members' income from wages and business income.[5]

The third outcome of interest to HUD was the employment rate for households receiving housing assistance. Unfortunately, the MTCS/TRACS data do not contain a simple indicator for household members' employment status nor data on hours worked. Therefore, we devised an employment status indicator based on 50 percent of the annual, full-time minimum wage applicable in the year in question. If the total household earnings were greater than or equal to this amount, we categorized the household as "employed"; otherwise, the household was designated "unemployed."

In principle, household income should be verified and entered into the administrative tracking systems annually. Nonetheless, we found very few instances in which households had observations in every year during the period covered by the data file. In fact, only about 339,000 households (3.8 percent) had a complete set of observations for all years between 1995 and 2002. This lack of data was partly due to households entering and leaving the housing assistance system at different times but was also due to missing data. Unfortunately, it is very difficult or impossible to consistently distinguish between these two conditions in the data. Although a "move-out code" indicates when a household leaves housing assistance, in practice this information is entered very rarely. Therefore, we did not attempt to distinguish between missing data and exits from the system.

To add usable series for the descriptive analysis, we imputed income and earnings to households that had missing data for year t by taking the average of years $t-1$ and $t+1$. Records with more than one consecutive year of missing data were not imputed. About 1.6 million households (18 percent) had a single year of imputed data; an additional

364,000 households (4 percent) had 2 to 4 years of imputed data. We also made some other simple imputations, such as filling in missing HUD household types based on the elderly or disabled flags the files contained.

Supplemental Controls

Additional control variables for the descriptive and multivariate analysis were created from characteristics provided in the MTCS/TRACS data. We also merged three sets of longitudinal control variables from other sources: state-level welfare policy variables, metropolitan statistical area (MSA) or county-level unemployment rates, and location measures. These data sources, which are described in the next three sections, were used to supplement the household and housing program characteristics available from the MTCS/TRACS data.

Welfare Policy Variables

Because of the significant population overlap between households that receive housing assistance and those that participate in cash welfare programs (Aid to Families with Dependent Children [AFDC], TANF, and Supplemental Security Income [SSI]) and the significant expected effect of welfare policy on labor force participation and income, it is important to control for differences in welfare policy across states and over time whenever earnings or employment is examined.

Welfare policies in most states experienced a great deal of change during the study period. At first, a few individual states received waivers of federal AFDC rules. Later, all states implemented heterogeneous policies using the significant flexibility offered by the TANF block grants that replaced AFDC. As a result, welfare policies that affect benefit levels, the benefit reduction rate, job search and employment requirements, and time limits on welfare spells and lifetime assistance vary by state.

Our approach was to describe differences in welfare policy across states and over time using variables derived from the Welfare Rules Database (Rowe and Roberts, 2004), an Urban Institute project. This database contains welfare policies in effect in each state and the District of Columbia for each year from 1996 through 2000. In discussion with Lynne Fender, author of *Linking State TANF and Related Policies to Outcomes: Preliminary Typologies and Analysis* (2002), we decided to include in the variables the initial earned income disregard, the maximum sanction amount, and whether job search is required for welfare program enrollment (diversion).[6]

Another welfare-derived variable we included was a measure of state caseload decline. Our intent in using this variable was to capture unobserved differences in welfare policy, and perhaps state economic conditions, over time. In essence, the state caseload is a summary variable and is likely to be correlated with welfare policy variables such as time limits, sanctions, and diversion and with local economic variables such local employment rates. In states with rapidly falling caseloads, employment levels among low-income populations are almost certain to be rising[7] although income may actually decline.

Economic Variables

The primary explanatory economic variable we used was the local unemployment rate, derived from the Bureau of Labor Statistics (BLS) Local Area Unemployment Statistics (Bureau of Labor Statistics, n.d.) series. We expected that the local unemployment rate would be quite important although possibly correlated with welfare caseload decline. We downloaded this data from the BLS and matched it on the MSA/primary metropolitan statistical area level if the housing unit was located in an MSA and at the county level if the housing unit was not.

Location Variables

One research question asked whether income trajectory differed by location. We included location-related variables in both the descriptive analysis and the multivariate analysis, including the census tract poverty rate and whether the unit was located in a center city, in a suburb, or outside an MSA. These variables were derived by matching the 2000 Census tract identifier included in the MTCS/TRACS data to the Urban Institute's Neighborhood Change Database file (Tatian, 2003), which is derived from decennial census data.

Descriptive Analysis

The primary analysis, which describes differences in earnings and labor force participation among groups of assisted households, is relatively straightforward. Exhibit 1 presents the outcomes of interest: average and cumulative percent change in household income, average and cumulative percent change in household earnings,[8] and average employment rate from 1995 to 2002. This table was created for the cohort of assisted households that started receiving housing assistance in 1995 and had complete data for the following 7 years. There were 679,190 such households, after imputing the missing data described in the MTCS/TRACS section. By focusing our analyses on the cohort that had complete data over time, we control for the possibility of changes in the composition of households in these programs. Exhibits 2 through 6 summarize trends in the three outcome variables by major housing program and by year.

Exhibit 1

Change in Average Income, Earnings, and Employment Rate for Households in HUD-assisted Housing, 1995–2002

		Average Income			Average Earnings			Employment Rate (%)	
	No. of House-holds	1995	2002	Pct. Chg. (%)	1995	2002	Pct. Chg. (%)	1995	2002
TOTAL	679,190	8,191	10,986	34.1	1,778	3,434	93.1	14.8	20.4
Program									
Section 8	300,904	8,209	10,601	29.1	1,274	2,336	83.3	11.3	14.8
Public housing	162,653	7,951	10,961	37.8	2,001	3,869	93.4	15.7	21.7
Certificates	134,182	7,835	11,144	42.2	1,965	4,403	124.0	17.5	27.1
Vouchers	42,845	8,145	11,739	44.1	2,130	5,108	139.8	19.1	31.0
Sec. 236	12,094	12,843	14,263	11.1	4,931	4,580	–7.1	32.9	24.5
Mod Rehab	9,279	6,743	10,230	51.7	1,729	4,074	135.6	16.4	26.3
Sec. 202 PRAC[a]	4,415	8,506	10,186	19.7	271	208	–23.0	2.8	1.5
Rental Assistance Program	4,269	10,252	13,075	27.5	3,593	4,953	37.8	24.0	25.7
Rent Supplement	3,437	9,295	11,704	25.9	2,250	3,188	41.7	15.3	17.3
Below Market Interest Rate	2,647	18,864	22,364	18.6	13,685	14,815	8.3	67.9	54.2
Sec. 202/162 PRAC[a]	1,332	7,753	9,501	22.5	429	486	13.1	3.6	3.4
Sec. 811 PRAC[a]	1,127	7,235	9,045	25.0	910	1,220	34.1	7.4	8.0
(Missing = 6)									
Race/Ethnicity									
Non-Hisp. White	331,220	8,378	10,566	26.1	1,007	1,748	73.7	8.9	11.0
Non-Hisp. African Am	238,788	7,788	11,272	44.7	2,521	5,053	100.4	20.8	29.9
Non-Hisp. Am. Indian/AK Native	2,934	8,213	11,319	37.8	1,888	4,178	121.2	16.4	24.2
Non-Hisp. Asian/Pac. Islander	21,468	9,773	12,694	29.9	1,929	4,192	117.3	15.3	22.9
Hispanic	83,667	8,201	11,374	38.7	2,555	4,963	94.3	19.3	27.5
(Missing = 1,113)									

Exhibit 1

Change in Average Income, Earnings, and Employment Rate for Households in HUD-assisted Housing, 1995–2002 (continued)

		Average Income			Average Earnings			Employment Rate (%)	
	No. of Households	1995	2002	Pct. Chg. (%)	1995	2002	Pct. Chg. (%)	1995	2002
Age of Household Head									
18–21 years	16,234	4,796	10,458	118.0	1,438	6,447	348.4	15.3	40.9
22–25 years	33,427	6,221	12,047	93.7	2,227	7,580	240.4	21.2	45.8
26–35 years	112,553	7,821	12,670	62.0	2,985	7,523	152.1	25.6	44.0
36–51 years	157,198	8,435	11,391	35.0	3,008	5,264	75.0	23.7	30.2
52–61 years	76,886	8,083	10,018	23.9	2,208	1,817	–17.7	16.4	10.3
62+ years	276,619	8,668	10,227	18.0	344	208	–39.6	3.0	1.4
(Missing = 6,273)									
Working-age Adults Present									
Nonelderly household	265,322	8,504	10,084	18.6	248	173	–30.2	2.3	1.2
1	324,169	7,261	10,958	50.9	2,082	4,880	134.4	18.4	29.8
2	72,762	10,207	13,373	31.0	4,591	6,978	52.0	34.6	38.1
3	12,083	12,006	14,757	22.9	6,075	7,968	31.2	40.7	39.6
4	2,864	14,216	17,358	22.1	8,155	10,294	26.2	46.7	43.8
5	537	14,845	17,765	19.7	8,690	11,226	29.2	47.2	44.6
6 or more	529	18,404	24,217	31.6	12,230	18,308	49.7	54.4	53.4
(Missing = 924)									
Household Type									
Elderly, no children	273,516	8,648	10,217	18.1	331	194	–41.3	2.8	1.3
Disabled, no children	113,772	7,424	9,392	26.5	1,058	1,551	46.6	7.3	7.7
Other, no children	56,037	8,158	11,161	36.8	4,286	5,102	19.0	33.5	29.6
Elderly, with children	6,279	10,316	11,386	10.4	1,580	1,600	1.3	12.5	10.1
Disabled, with children	24,383	10,147	11,267	11.0	606	1,948	221.6	5.7	12.6
Other, with children	204,279	7,720	12,808	65.9	3,354	8,123	142.2	28.3	47.8
(Missing = 924)									
Disabled Household									
Nondisabled	519,524	8,113	11,224	38.4	2,009	4,003	99.3	17.0	24.0
Disabled	138,192	7,905	9,724	23.0	978	1,623	65.9	7.0	8.6
(Missing = 21,474)									
Elderly Household									
Nonelderly	392,556	7,818	11,517	47.3	2,740	5,596	104.2	22.5	32.8
Elderly	279,795	8,686	10,243	17.9	359	226	–37.0	3.1	1.5
(Missing = 6,839)									
Age of Youngest Child									
0–3 years	87,927	7,260	12,481	71.9	2,542	7,494	194.8	22.2	45.0
4–5 years	36,455	8,041	13,116	63.1	3,169	7,874	148.5	27.1	46.5
6–12 years	78,764	8,618	12,920	49.9	3,438	7,491	117.9	28.8	44.0
13–17 years	31,795	8,770	11,621	32.5	3,328	6,077	82.6	27.4	35.4
(Missing/not applicable = 444,249)									
Spouse/Co-head Present									
No	620,516	7,843	10,633	35.6	1,574	3,226	105.0	13.6	19.6
Yes	58,674	11,880	14,720	23.9	3,963	5,654	42.7	27.9	29.1
Spouse/Co-head With Earnings									
No	675,186	8,155	10,952	34.3	1,720	3,388	97.0	14.4	20.2
Yes	4,004	14,253	16,716	17.3	11,253	10,910	–3.0	78.4	54.5

Exhibit 1

Change in Average Income, Earnings, and Employment Rate for Households in HUD-assisted Housing, 1995–2002 (continued)

		Average Income			Average Earnings			Employment Rate (%)	
	No. of Households	1995	2002	Pct. Chg. (%)	1995	2002	Pct. Chg. (%)	1995	2002
Household Income									
Lowest decile	52,953	2,317	8,066	248.1	235	4,028	1,612	0.3	28.1
2nd decile	57,155	4,268	9,778	129.1	522	4,848	827.8	5.7	32.2
3rd decile	96,548	5,544	7,936	43.1	233	1,399	501.2	3.8	9.2
4th decile	65,297	6,012	8,713	44.9	377	1,934	413.3	5.4	12.5
5th decile	81,526	6,825	9,541	39.8	566	2,274	302.0	7.6	14.4
6th decile	79,439	7,769	10,209	31.4	763	1,999	162.1	9.4	12.9
7th decile	71,749	9,009	11,479	27.4	1,487	2,889	94.3	16.8	18.5
8th decile	67,980	10,700	12,855	20.1	2,368	3,451	45.7	24.5	21.4
9th decile	60,707	13,222	14,971	13.2	4,036	4,781	18.5	35.4	27.2
Highest decile	45,836	20,050	20,625	2.9	11,365	10,724	–5.6	63.0	44.3
Welfare Income Present									
No	526,309	8,772	10,895	24.2	2,156	2,726	26.4	17.8	15.7
Yes	152,881	6,191	11,301	82.5	541	5,753	963.7	5.0	35.7
SSI Present									
No	610,806	8,180	11,118	35.9	1,924	3,647	89.6	15.9	21.6
Yes	68,384	8,291	9,810	18.3	451	1,491	230.4	4.0	9.6
SS/Pension Income Present									
No	304,645	7,853	12,055	53.5	3,463	6,722	94.1	27.9	38.8
Yes	374,545	8,467	10,116	19.5	298	545	82.8	2.7	3.6
Homeless at Admission									
No	670,773	8,205	10,987	33.9	1,781	3,422	92.1	14.8	20.4
Yes	8,417	7,075	10,880	53.8	1,547	4,340	180.5	14.2	26.6
Tract Poverty Rate									
0–10%	114,598	9,151	11,693	27.8	1,500	2,666	77.7	12.2	15.1
11–20%	164,136	8,236	10,833	31.5	1,554	2,882	85.5	13.4	17.5
21–30%	118,122	7,972	10,795	35.4	1,793	3,510	95.7	15.0	21.0
31–40%	78,376	7,916	10,828	36.8	2,007	3,862	92.5	16.4	23.0
41–50%	46,221	8,110	11,000	35.6	2,201	4,094	86.0	17.0	24.0
51% or more	34,010	7,929	11,268	42.1	2,397	4,782	99.5	18.4	27.3
(Missing = 123,727)									
Tract Location									
Central city	301,999	8,329	11,246	35.0	1,993	3,812	91.2	15.8	21.9
Suburbs	159,163	8,774	11,545	31.6	1,679	3,177	89.2	14.0	18.8
Nonmetro	218,028	7,575	10,218	34.9	1,554	3,099	99.4	14.0	19.7

Notes: Income and earnings are in nominal dollars and are not adjusted for inflation. Earnings are the sum of all household member wages and business income. Employment status is based on 50 percent of the annual, full-time minimum wage applicable in the year in question. If total household earnings were greater than or equal to this amount, the household was designated as "employed"; otherwise, the household was "unemployed." For more information on missing cases, please contact the authors.

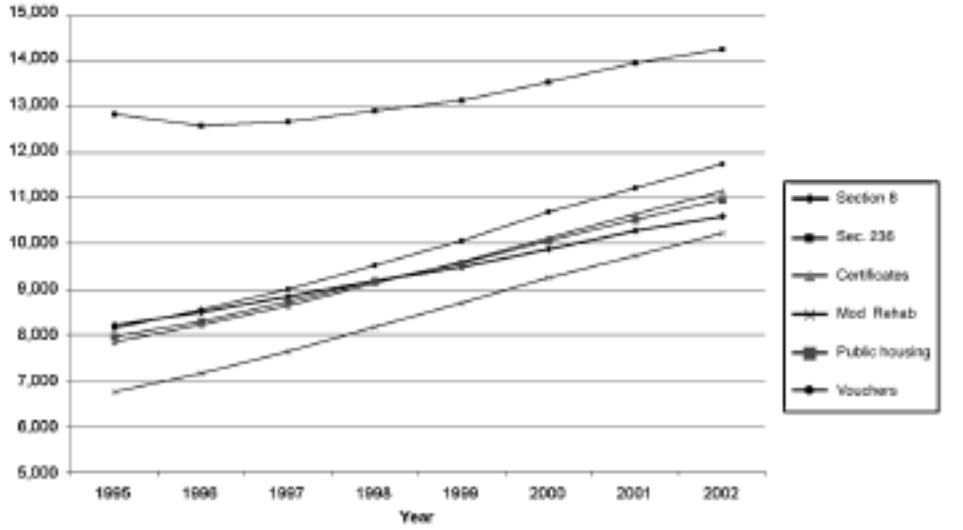
[a] PRAC = Project Rental Assistance Contract.

Source: U.S. Department of Urban Development Multifamily Tenant Characteristics System/Tenant Rental Assistance Certification System longitudinal data compiled by the Urban Institute

Note that the construction of the cohort for the descriptive analysis was based not on the start of housing assistance but on the presence of data in each of the included years. We chose this time specification to avoid dropping households with pre-1995 admission or move-in dates (about 36 percent) and a substantial portion of households with missing admission or move-in dates (about 25 percent). Clearly, this approach limits our ability to isolate the effect of time spent in assisted housing. In any case, since the descriptive analysis cannot isolate the independent effects of various influences, we thought this was a worthwhile tradeoff. The multivariate analysis, described in the Multivariate Analysis section, uses the most recent admission date for MTCS households and the most recent move-in date for TRACS households as the initial period (t_0). Since households get new dates when they change programs (for example, switch from public housing to vouchers) or units, these dates are not a perfect measure of assisted time. The multivariate analysis does have the advantage of using the most current program. As a result, the earnings of a household with a voucher are not misassociated with the household's prior public housing because it would be in the descriptive series, which are based on baseline characteristics.

Exhibit 2

Average Nominal Household Income by Housing Program for Households in HUD-assisted Housing, 1995–2002

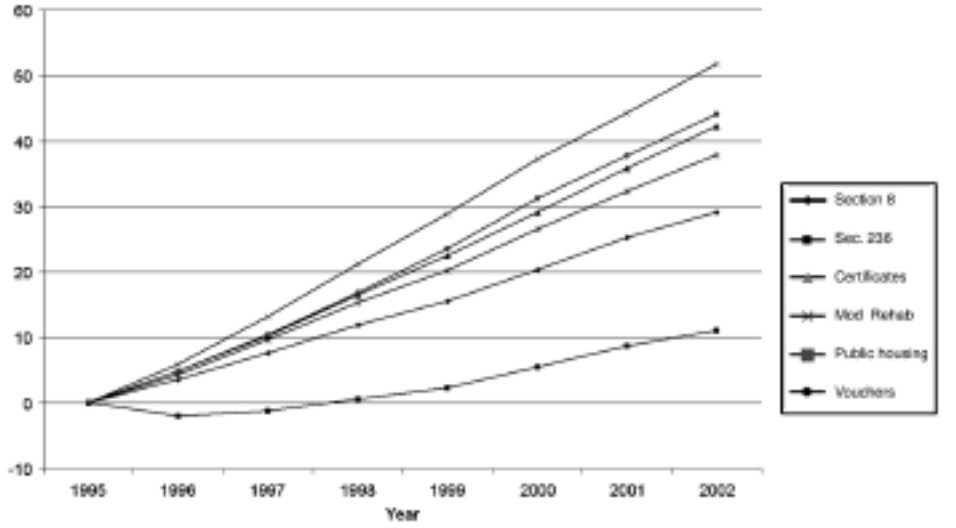


Note: N = 679,184.

Source: U.S. Department of Urban Development Multifamily Tenant Characteristics System/Tenant Rental Assistance Certification System longtitudinal data compiled by the Urban Institute

Exhibit 3

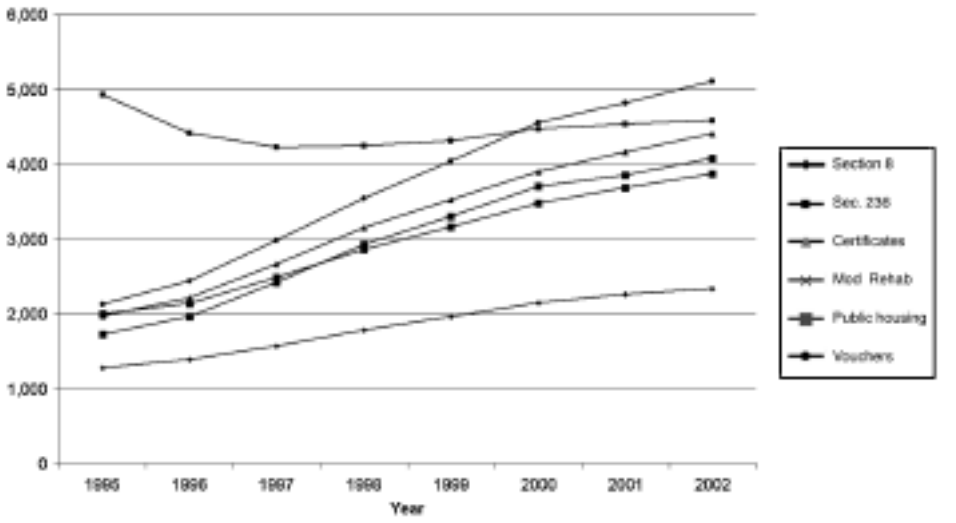
Cumulative Percent Change in Nominal Household Income by Housing Program for Households in HUD-assisted Housing, 1995–2002



Note: N = 679,184.
Source: U.S. Department of Urban Development Multifamily Tenant Characteristics System/Tenant Rental Assistance Certification System longtitudinal data compiled by the Urban Institute

Exhibit 4

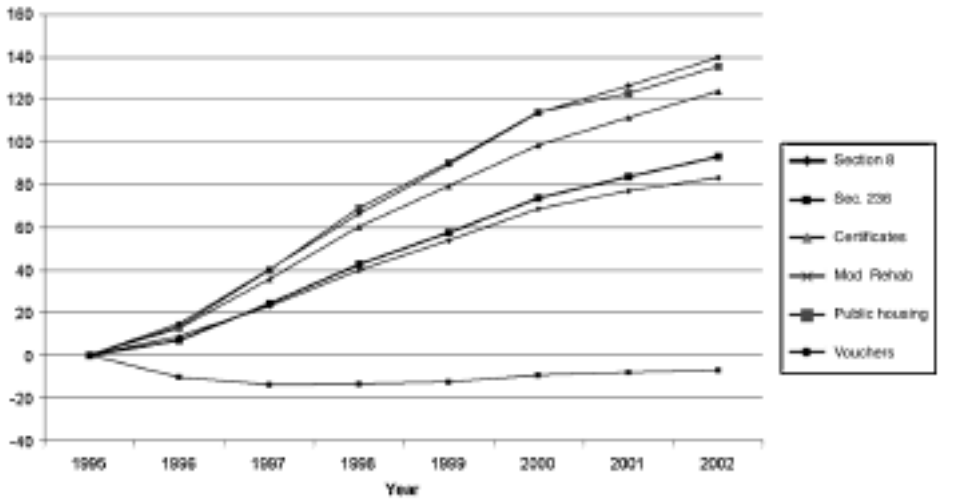
Average Nominal Household Earnings by Housing Program for Households in HUD-assisted Housing, 1995–2002



Notes: N = 679,184. Earnings are the sum of all household members' wages and business income.
Source: U.S. Department of Urban Development Multifamily Tenant Characteristics System/Tenant Rental Assistance Certification System longtitudinal data compiled by the Urban Institute

Exhibit 5

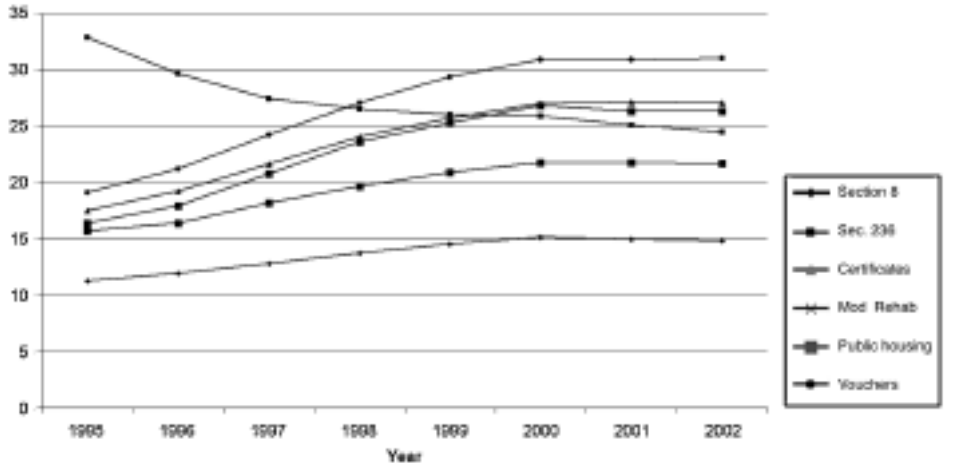
Cumulative Percent Change in Nominal Household Earnings by Housing Program for Households in HUD-assisted Housing, 1995–2002



Notes: N = 679,184. Earnings are the sum of all household members' wages and business income.
Source: U.S. Department of Urban Development Multifamily Tenant Characteristics System/Tenant Rental Assistance Certification System longtitudinal data compiled by the Urban Institute

Exhibit 6

Percent Employed by Housing Program for Households in HUD-assisted Housing, 1995–2002



Notes: N = 679,184. Employment status is based on 50 percent of the annual, full-time minimum wage applicable in the year in question. If total household earnings were greater than or equal to this amount, the household was designated as "employed"; otherwise, the household was "unemployed."
Source: U.S. Department of Urban Development Multifamily Tenant Characteristics System/Tenant Rental Assistance Certification System longtitudinal data compiled by the Urban Institute

Income and Earnings

The average income for households observed from 1995 to 2002 rose 34.1 percent (from $8,191 in 1995 to $10,986 in 2002).[9] The steepest income increases were for households that participated in Mod Rehab (51.7 percent income growth from 1995 to 2002), received vouchers (44.1 percent income growth), and received certificates (42.2 percent income growth). Households participating in Section 236 (which had the second highest incomes among the assisted housing population after the BMIR program) and project-based Section 8 programs experienced the lowest 1995-to-2002 income growth rates at 11.1 percent and 29.1 percent, respectively.

Average household earnings followed a similar pattern but with substantially higher growth rates. Average earnings of the 1995-to-2002 cohort rose 93.1 percent, from $1,778 in 1995 to $3,434 in 2002. As shown in exhibits 4 and 5, the highest 1995 average earnings for households participating in the largest housing programs were for Section 236 households, but the level of earnings for these households actually declined from $4,931 to $4,580 in 2002 (a loss of 7 percent). Households in other programs all experienced growth in earnings. The largest earnings growth was for voucher recipients (140 percent), Mod Rehab participants (136 percent), and certificate recipients (124 percent).

Examining income differences by baseline household characteristics, non-Hispanic Asian/Pacific Islander households had the highest average income in 1995 ($9,773).[10] Next highest were non-Hispanic White households ($8,378), followed by non-Hispanic American Indian/Alaskan Native households ($8,213), then Hispanic households ($8,201), and non-Hispanic African-American households ($7,788). African Americans had the largest cumulative income growth between 1995 and 2002 (44.7 percent). White households and Asian/Pacific Islanders had the lowest cumulative income growth at 26.1 and 29.9 percent, respectively.

Hispanic and non-Hispanic African-American households had the highest average earnings in 1995 at $2,555 and $2,521, respectively. Non-Hispanic White households had the lowest average earnings in 1995 at $1,007. Among all racial/ethnic groups, Non-Hispanic American Indian/Alaskan Native households had the fastest 1995-to-2002 earnings growth rate (121 percent). Hispanics and African Americans had the slowest growth in earnings, at 94 and 100 percent, respectively.

As might be expected, income and earnings trajectories were age dependent; 1995 income and 2002 income for remaining households rose as the ages of the household heads increased. The income trajectory slope flattens with the starting age of the household head, however, ranging from an 118-percent cumulative increase for household heads aged 18 to 21 to an 18-percent change for those aged 62 and over in 1995. The pattern for earnings is understandably different, with average earnings rising as the age of household heads reached 36 to 51 years ($3,008 average household earnings in 1995), and then dropped sharply for household heads aged 62 and over ($344 in 1995). Younger households had the fastest growth in earnings; 1995-to-2002 earnings growth was 348 percent for households with household heads 18 to 21 years old.

Although households with more than one working-age adult had higher income and earnings, the effect is not directly multiplicative. That is, a household with two working-age adults does not have twice as much income as one with only one adult. Nor is there a perfect pattern to the income trajectories; single-adult households had the highest 1995-to-2002 income growth at 50.9 percent. Income growth tended to decline with the number of adults in a household, but in a nonlinear way. There were varying drops in income growth from an additional adult and an increase in income growth between households with five and six adults (a small number of households). A similar pattern was generally observed

for earnings. The fastest growth in earnings (134 percent from 1995 to 2002) was for households with a single working-age adult. The earnings growth rate dropped to 26.2 percent for households with four working-age adults. It increased, however, to 29.2 percent for households with five working-age adults and 49.7 percent for households with six working-age adults.

HUD household types, which mix the presence of children with elderly and disability status, show a mixed pattern regarding the presence of children and income trajectory. Elderly and disabled households with children had somewhat higher income levels but lower income growth than those without children. Among nonelderly and nondisabled households (labeled "other" in the exhibits), those with children had lower initial incomes but much higher income growth. Among those 1995 families with children who were still assisted in 2002, income had risen by an average of 66 percent and earnings by 142 percent. This rate compares to 36.8 percent income growth and 19.0 percent earnings growth for those households without children (the fourth-highest earnings growth rate). Disabled households with children had the largest growth in earnings, at 222 percent. It is unclear whether the higher earnings pattern for families with children is an age effect, as household heads and their spouses mature and gain skills and experience, or whether it might be driven by welfare reform pushing recipients into work.

The age of a household's youngest child is a characteristic closely related to the presence of children and the age of the household head; we expected the youngest child's age to have a significant effect on income and employment. The older a family's youngest child is, the higher income and earnings were in 1995, but the lower the income and earnings growth rate was through 2002. The average 1995 income ranged from $7,260 for households with a youngest child less than 3 years old to $8,770 for households with a youngest child 13 to 17 years old. The range for earnings was $2,524 to $3,328, respectively.

The presence of a spouse or co-head of the household, especially one with earnings, raised average income and average earnings, although as with the presence of other working-age adults in a household, it does not double them. Moreover, single household heads in the 1995-to-2002 cohort had steeper income and earnings growth rates.

Households with welfare income in 1995 had a lower starting income but much higher income growth, 82.5 percent by 2002, compared to 24.2 percent income growth for nonwelfare households. Income growth was so great, in fact, that by 2002 households with welfare in the base year had surpassed those without welfare in average income. (The multivariate analysis will be able to measure this effect while controlling for the age of the household head and the age of youngest child; these variables are also strong predictors of a steep income and earnings trajectory.) At 964 percent, earnings growth was dramatically higher for welfare families, compared to 26.4 percent for nonwelfare families. Welfare families started out with much lower earnings ($542), however, compared to nonwelfare families' initial earnings ($2,156).

Households with SSI or Social Security/pension income had slightly higher average incomes in 1995, but their income growth rates were much slower. As a result, households with these income sources had lower average incomes by 2002 than those without such sources. In contrast, earnings for households with SSI or Social Security/pension income were much lower than those without such income sources, but the growth in earnings was much higher for households with SSI or Social Security/pension income.

The household income level generally declined as the household's census tract poverty rate rose. Income declined from $9,151 (in 1995) for households living in tracts with less than 10 percent poverty to $7,929 for households in tracts with 50 percent poverty or higher.[11] The opposite pattern was observed for earnings, however. Housing-assisted

households living in high-poverty tracts had higher earnings than did those in low-poverty tracts. Average earnings increased from $1,500 for households living in tracts with less than 10 percent poverty to $2,397 for households in tracts with 50 percent poverty or higher.

Somewhat surprisingly, a household's location in a central city, suburb, or nonmetro area did not seem to have a large effect on income or earnings, average levels or growth rates. The average income in 1995 varied from $8,774 in suburban tracts to $8,329 in central city tracts and $7,575 in nonmetro tracts. Income growth rates for central cities and nonmetro areas were virtually identical, 35.0 and 34.9 percent, respectively. The slowest income growth was in the suburbs (31.6 percent). The highest earnings levels were in central cities ($1,993) followed by the suburban ($1,679) and nonmetro tracts ($1,554). Earnings growth was fastest in nonmetro areas (99.4 percent from 1995 to 2002), followed by central cities (91.2 percent) and suburban areas (89.2 percent).

Employment Rates

Households that entered assisted housing in 1995 and were still observed in assisted housing in 2002 had average employment rates that increased from 14.8 to 20.4 percent during this period. Employment rates varied across housing programs. The highest average employment rates among the larger housing programs were for households in the Section 236 program. Average employment levels for Section 236 households declined from 32.9 percent to 24.5 percent between 1995 and 2002.

Employment rates in 1995 ranged from 10 to 20 percent among households participating in the five remaining large housing programs. Certificate and voucher households had the highest employment rates of this group at 17.5 and 19.1 percent, respectively. Households living in Section 8 project-based units had the lowest average employment rate (11.3 percent).

Except for Section 236 participants, average employment rates for households participating in other housing programs rose from 1995 to 2000 and then leveled off. The steepest employment rate rise was for households in the voucher and Mod Rehab programs, which increased by 11.9 and 9.9 percentage points, respectively. The rise was flattest for the Section 8 project-based households; the employment rate increased by only 3.5 percentage points from 1995 to 2002.

Non-Hispanic White households had the lowest employment rates among all racial/ethnic groups. Employment rates for Non-Hispanic White households started at 8.9 percent in 1995 and rose to 11.0 percent by 2002. Non-Hispanic African-American households and Hispanic households almost doubled the 1995 employment rates of White households at 20.8 and 19.3 percent, respectively. Non-Hispanic American Indian/Alaska Native and Asian/Pacific Islander households had the lowest employment rates after White households, at 16.4 and 15.3 percent, respectively.

Employment rates rose as the age of the household head reached 26 to 35 years but fell after that point. In 1995, employment rates for households with household heads aged 18 to 21, 26 to 35, and 62 or older were 15.3 percent, 25.6 percent, and 3.0 percent, respectively. Employment rates for all age groups up to 51 years old increased throughout the observation period except for two older groups—52 to 61 years and 62 years and older—in which employment rates declined over time. Employment rates increased with the presence of more working-age adults in the household. This increase, however, is largely an artifact of our constructed employment measure, which is based on an earnings-level threshold. With more wage-earning adults present, it is more likely that a household will reach the threshold. Similarly, households with spouses or co-heads of the household present or households that have earnings had higher employment rates than those without spouses or co-heads of the household.

Disability status had a negative effect on employment rates. Disabled households had a 1995 employment rate of 7.0 percent, less than half of the employment rate for nondisabled households, which was17.0 percent. The difference in employment rate widened over time to 8.6 percent for disabled households and 24.0 percent for nondisabled households.

Families with children generally had lower employment rates than those without children (28.3 percent for the former versus 33.5 percent for the latter). Although average employment rates for households without children declined over time, employment rates for households with children rose. By 2002, the employment rate for households with children was 47.8 percent, higher than households without children, which was 29.6 percent.

As might be expected, households with higher income levels also had higher employment rates. Households in the lowest income decile in 1995 had an employment rate of only 0.3 percent, while those in the highest decile had an average employment rate of 63.0 percent. Employment rates for the lower income groups rose through 2002, however, while employment rates for households in the top three deciles declined over the same period.

Households with welfare, SSI or Social Security/pension income had lower employment rates than those without such income sources. Households with welfare income in 1995 had average employment rates less than one-third of those not receiving welfare. Over time, however, the employment rates for these households rose to more than double that of the nonwelfare group. Throughout the observation period, employment rates for households with SSI or Social Security/pension income remained lower than rates for other households.

Being homeless at the time of housing assistance admission seemed to make no difference in employment status. The initial employment rates for homeless and nonhomeless households were virtually identical, 14.2 percent and 14.8 percent, respectively. Over time, the formerly homeless households increased their employment rate to 26.6 percent, higher than the 20.4-percent rate for nonhomeless households. Households living in census tracts with higher poverty rates had higher employment rates than those living in lower poverty tracts. Households in the tracts with the most severe concentrations of poverty (50 percent or more) had an employment rate of 18.4 percent in 1995. Those in very low-poverty tracts (less than 10 percent) had an employment rate of only 12.2 percent.

Central city households had slightly higher employment rates in 1995 (15.8 percent) than households in the suburbs or nonmetro areas (14.0 percent for each). By the end of the observation period, the employment rate for suburban households (18.8 percent) fell behind the rate for nonmetro households (19.7 percent). The employment rate for central city households increased to 21.9 percent.

Multivariate Analysis

To identify the separate influences of observed variables, we used a series of linear regression models to model household income and earnings as a function of time since program entry (*t*) and household characteristics. Probability of employment was also modeled using logistic (logit) regressions.[12] For each outcome, we ran the following specifications:

1. All variables except transfer income (welfare, SSI, or Social Security/pension income) with no interaction terms.

2. Specification 1 plus interactions of *t* with all remaining explanatory variables.

3. Specification 2 plus presence of transfer income (welfare, SSI, or Social Security/pension income) and their interactions with *t*.

To simplify the specification and interpretation of the models, we organized HUD housing programs into four categories: public housing, Section 8 site-based assistance, other site-based programs, and vouchers and certificates. We omitted the public housing category in our model specifications; thus, all housing program effects are measured relative to this population.

Although we expected that presence of transfer income was an important predictor, we left it out until specification 3 because it is endogenous to income. As expected, most terms in most models were highly statistically significant, as were the F values. The high levels of significance are simply an effect of the very large size of the MTCS/TRACS data set, but it means that we will generally not need to discuss statistical significance and can focus on the coefficients. Because linear and logistic regressions cannot employ cases with missing data, approximately 11 million of the 29 million MTCS/TRACS observations were deleted, or just more than one-third. Note, however, that these deletions includes the 25 percent of households that did not have move-in dates in the file. Regression results are summarized in exhibits 7 through 9.

Exhibit 7

Results of Linear Regression of Household Characteristics on Household Income (Nominal $ per Year)

	Regression Coefficients		
	Model 1	**Model 2**	**Model 3**
R^2	0.1700	0.1746	0.2310
Adjusted R^2	0.1700	0.1746	0.2310
Independent Variable			
Intercept	6859.31 ***	6306.98 ***	6907.47 ***
Years in program	12.08 ***	129.73 ***	116.53 ***
Program: Section 8 site-based	–178.32 ***	–193.49 ***	–332.79
Program: Other site-based	3297.42 ***	3586.97 ***	3213.45 ***
Program: Certificates/vouchers	–69.65 ***	196.52 ***	232.31 ***
African-American household head	–49.21 ***	–44.37 ***	31.43 ***
American Indian household head	–517.70 ***	–647.45 ***	–361.99 ***
Asian household head	70.19 ***	81.93 ***	731.27 ***
Hispanic household head	82.28 ***	264.40 ***	360.39 ***
Disabled	–1587.20 ***	–1405.19 ***	–1279.31 ***
Household head aged 22–25	204.85 ***	400.84 ***	267.15 ***
Household head aged 26–35	1679.73 ***	1868.87 ***	1566.12 ***
Household head aged 36–51	1872.33 ***	2032.31 ***	1718.96 ***
Household head aged 52–61	1782.39 ***	1872.28 ***	1501.20 ***
Household head aged 62 plus	3388.25 ***	3683.99 ***	3049.20 ***
Youngest child aged 0–3	–136.57 ***	103.79 ***	1445.76 ***
Youngest child aged 4–5	784.65 ***	957.86 ***	2073.43 ***
Youngest child aged 6–12	1225.18 ***	1355.30 ***	2351.02 ***
Youngest child aged 13–17	968.67 ***	1046.39 ***	1893.08 ***
Spouse or co-head with earnings present	5784.99 ***	5725.18 ***	5125.64 ***
Spouse or co-head present	1796.33 ***	1768.13 ***	1439.58 ***
Working-age adults present	1956.60 ***	1867.89 ***	1948.05 ***
Social Security/pension income present			661.94 ***
SSI present			–728.33 ***
Welfare income present			–3946.93 ***
Tract poverty rate	–46.17 ***	–46.31 ***	–38.41 ***
Local unemployment rate	–13.73 ***	–14.23 ***	–5.01 ***
Suburbs	71.36 ***	94.94 ***	45.20 ***
Nonmetro	–1451.77 ***	–1400.78 ***	–1512.24 ***
TANF caseload change since 1993	2324.97 ***	2281.25 ***	1867.04 ***
TANF worst sanction = case closure	–683.79 ***	–620.26 ***	–679.43 ***
TANF sanction length	–4.65 ***	–2.28 ***	–4.25 ***
TANF initial earned income disregard ($)	–1.50 ***	–1.35 ***	–1.50 ***
TANF initial earned income disregard (%)	–2.59 ***	–2.17 ***	–3.04 ***
TANF job search required	–286.92 ***	–219.59 ***	–288.80 ***

Exhibit 7

Results of Linear Regression of Household Characteristics on Household Income (Nominal $ per Year) (continued)

	Regression Coefficients		
	Model 1	**Model 2**	**Model 3**
Interaction Terms			
Years in Program			
Program: Section 8 site-based		8.13 ***	3.47 ***
Program: Other site-based		–48.34 ***	–41.63 ***
Program: Certificates/vouchers		–54.16 ***	–47.06 ***
African-American household head		–5.16 ***	–2.72 ***
American Indian household head		53.55 ***	53.95 ***
Asian household head		–3.03 **	–10.67 ***
Hispanic household head		–35.75 ***	–30.10 ***
Disabled		–19.17 ***	–10.47 ***
Household head aged 22–25		–55.19 ***	–50.57 ***
Household head aged 26–35		–57.61 ***	–53.33 ***
Household head aged 36–51		–57.12 ***	–51.35 ***
Household head aged 52–61		–52.23 ***	–43.33 ***
Household head aged 62 plus		–76.69 ***	–59.53 ***
Youngest child aged 0–3		–23.14 ***	–23.09 ***
Youngest child aged 4–5		–16.11 ***	–15.94 ***
Youngest child aged 6–12		–11.39 ***	–12.53 ***
Youngest child aged 13–17		–6.66 ***	–7.83 ***
Spouse or co-head with earnings present		10.46 ***	6.20 ***
Spouse or co-head present		10.44 ***	13.15 ***
Working-age adults present		14.16 ***	14.32 ***
Social Security/pension income present			–9.56 ***
SSI present			–14.32 ***
Welfare income present			–1.84 ***
Tract poverty rate		–0.04 ***	–0.12 ***
Local unemployment rate		–0.93 ***	–0.78 ***
Suburbs		–3.74 ***	–4.58 ***
Nonmetro		0.42	2.65 ***
TANF caseload change since 1993		9.92 ***	21.57 ***
TANF worst sanction = case closure		–10.67 ***	–10.30 ***
TANF sanction length		–0.49 ***	–0.35 ***
TANF initial earned income disregard ($)		–0.03 ***	–0.03 ***
TANF initial earned income disregard (%)		–0.08 ***	–0.06 ***
TANF job search required		–13.03 ***	–14.05 ***

Notes: N = 17,948,607. Outcomes are in nominal dollars, not adjusted for inflation.

Statistically significant at: 0.05 * 0.01 ** 0.001 ***

Public housing households are comparison group for interaction models.

Source: U.S. Department of Urban Development Multifamily Tenant Characteristics System/Tenant Rental Assistance Certification System longitudinal data compiled by the Urban Institute

Exhibit 8

Results of Linear Regression of Household Characteristics on Household Earnings (Nominal $ per Year)

	Regression Coefficients		
	Model 1	**Model 2**	**Model 3**
R^2	0.3039	0.3056	0.4236
Adjusted R^2	0.3039	0.3056	0.4236
Independent Variable			
Intercept	2742.13 ***	2708.90 ***	5149.00 ***
Years in program	8.79 ***	19.94 ***	31.92 ***
Program: Section 8 site-based	–75.84 ***	–26.65 ***	–721.62 ***
Program: Other site-based	3325.35 ***	3513.47 ***	2364.74 ***
Program: Certificates/vouchers	–302.88 ***	–83.39 ***	67.45 ***
African-American household head	565.82 ***	500.11 ***	633.17 ***
American Indian household head	–306.87 ***	–475.55 ***	–85.84 ***
Asian household head	398.31 ***	351.62 ***	887.62 ***
Hispanic household head	761.31 ***	848.39 ***	917.79 ***
Disabled	–5776.66 ***	–5672.52 ***	–3864.07 ***
Household head aged 22–25	1493.69 ***	1439.44 ***	927.69 ***
Household head aged 26–35	2422.49 ***	2344.23 ***	1626.01 ***
Household head aged 36–51	2122.86 ***	1990.70 ***	1420.22 ***
Household head aged 52–61	1486.02 ***	1241.90 ***	806.64 ***
Household head aged 62 plus	–1937.99 ***	–2144.81 ***	–1269.37 ***
Youngest child aged 0–3	–631.57 ***	–586.21 ***	1312.39 ***
Youngest child aged 4–5	59.43 ***	103.57 ***	1690.04 ***
Youngest child aged 6–12	371.24 ***	396.83 ***	1866.23 ***
Youngest child aged 13–17	297.13 ***	303.14 ***	1620.27 ***
Spouse or co-head with earnings present	8810.46 ***	8706.06 ***	7394.66 ***
Spouse or co-head present	412.09 ***	508.98 ***	236.47 ***
Working-age adults present	2251.67 ***	2113.50 ***	2151.82 ***
Social Security/pension income present			–2321.69 ***
SSI present			–2393.31 ***
Welfare income present			–6627.65 ***
Tract poverty rate	–36.52 ***	–37.16 ***	–24.54 ***
Local unemployment rate	–72.20 ***	–71.47 ***	–60.75 ***
Suburbs	–64.74 ***	–39.87 ***	–95.22 ***
Nonmetro	–714.36 ***	–724.60 ***	–898.38 ***
TANF caseload change since 1993	1853.27 ***	1947.37 ***	–3.87
TANF worst sanction = case closure	–243.37 ***	–204.41 ***	–154.02 ***
TANF sanction length	–4.87 ***	–3.04 ***	–5.13 ***
TANF initial earned income disregard ($)	–1.28 ***	–1.21 ***	–1.39 ***
TANF initial earned income disregard (%)	–2.71 ***	–2.17 ***	–4.33 ***
TANF job search required	–169.35 ***	–132.66 ***	–224.97 ***
Interaction Terms:			
Years in Program			
Program: Section 8 site-based		–3.38 ***	–21.23 ***
Program: Other site-based		–31.01 ***	–30.21 ***
Program: Certificates/vouchers		–44.77 ***	–40.28 ***
African-American household head		7.85 ***	4.41 ***
American Indian household head		56.59 ***	58.04 ***
Asian household head		10.28 ***	–0.59
Hispanic household head		–17.13 ***	–13.92 ***
Disabled		–17.43 ***	–15.02 ***
Household head aged 22–25		23.65 ***	13.27 ***
Household head aged 26–35		27.89 ***	16.10 ***
Household head aged 36–51		35.46 ***	23.17 ***
Household head aged 52–61		45.27 ***	33.75 ***
Household head aged 62 plus		27.37 ***	22.22 ***
Youngest child aged 0–3		–8.68 ***	–9.19 ***
Youngest child aged 4–5		–8.30 ***	–8.48 ***
Youngest child aged 6–12		–4.34 ***	–5.50 ***
Youngest child aged 13–17		–1.32 **	–2.90 **
Spouse or co-head with earnings present		23.21 ***	17.50 ***
Spouse or co-head present		–5.93 ***	–1.83 ***

Exhibit 8

Results of Linear Regression of Household Characteristics on Household Earnings (Nominal $ per Year) (continued)

	Regression Coefficients		
	Model 1	Model 2	Model 3
Working-age adults present		10.83 ***	10.38 ***
Social Security/pension income present			–7.95 ***
SSI present			–4.86 ***
Welfare income present			–0.20
Tract poverty rate		0.01	–0.09 ***
Local unemployment rate		–0.71 ***	–1.26 ***
Suburbs		–4.16 ***	–2.67 ***
Nonmetro		7.72 ***	21.20 ***
TANF caseload change since 1993		–16.06 ***	–4.26 ***
TANF worst sanction = case closure		–7.49 ***	–6.53 ***
TANF sanction length		–0.37 ***	–0.19 ***
TANF initial earned income disregard ($)		–0.01 ***	–0.01 ***
TANF initial earned income disregard (%)		–0.09 ***	–0.06 ***
TANF job search required		–7.32 ***	–5.74 ***

Notes: N = 17,948,607. Outcomes are in nominal dollars, not adjusted for inflation.

Statistically significant at: 0.05 * 0.01 ** 0.001 ***

Earnings are the sum of all household member wages and business income.

Public housing households are comparison group for interaction models.

Source: U.S. Department of Urban Development Multifamily Tenant Characteristics System/Tenant Rental Assistance Certification System longitudinal data compiled by the Urban Institute

Exhibit 9

Results of Logistic Regression of Household Characteristics on Household Employment (Probability of Being Employed)

	Logistic Regression Odds Ratios		
	Model 1	Model 2	Model 3
Independent Variable			
Intercept			
Years in program	1.00 ***	0.93 ***	0.97 ***
Program: Section 8 site-based	0.98 ***	1.02 ***	0.84 ***
Program: Other site-based	2.65 ***	2.89 ***	2.10 ***
Program: Certificates/vouchers	0.99 ***	1.08 ***	1.20 ***
African-American household head	1.18 ***	1.12 ***	1.20 ***
American Indian household head	0.85 ***	0.78 ***	0.79 ***
Asian household head	1.21 ***	1.14 ***	1.48 ***
Hispanic household head	1.32 ***	1.32 ***	1.41 ***
Disabled	0.09 ***	0.09 ***	0.23 ***
Household head aged 22–25	1.57 ***	1.36 ***	1.31 ***
Household head aged 26–35	1.87 ***	1.59 ***	1.56 ***
Household head aged 36–51	1.64 ***	1.37 ***	1.46 ***
Household head aged 52–61	1.20 ***	0.90 ***	1.13 ***
Household head aged 62 plus	0.11 ***	0.08 ***	0.20 ***
Youngest child aged 0–3	1.06 ***	1.03 ***	1.78 ***
Youngest child aged 4–5	1.26 ***	1.24 ***	1.98 ***
Youngest child aged 6–12	1.37 ***	1.34 ***	2.08 ***
Youngest child aged 13–17	1.37 ***	1.34 ***	1.91 ***
Spouse or co-head with earnings present	17.41 ***	14.03 ***	16.45 ***
Spouse or co-head present	1.00	1.06 ***	0.89 ***
Working-age adults present	1.79 ***	1.64 ***	1.89 ***
Social Security/pension income present			0.22 ***
SSI present			0.22 ***
Welfare income present			0.07 ***
Tract poverty rate	0.99 ***	0.99 ***	0.99 ***

Exhibit 9

Results of Logistic Regression of Household Characteristics on Household Employment (Probability of Being Employed) (continued)

	Logistic Regression Odds Ratios		
	Model 1	**Model 2**	**Model 3**
Local unemployment rate	0.97 ***	0.97 ***	0.98 ***
Suburbs	1.04 ***	1.05 ***	1.04 ***
Nonmetro	0.91 ***	0.91 ***	0.80 ***
TANF caseload change since 1993	1.59 ***	1.63 ***	0.56 ***
TANF worst sanction = case closure	0.95 ***	0.97 ***	0.96 ***
TANF sanction length	1.00 ***	1.00 ***	1.00 ***
TANF initial earned income disregard ($)	1.00 ***	1.00 ***	1.00 ***
TANF initial earned income disregard (%)	1.00 ***	1.00 ***	1.00 ***
TANF job search required	0.96 ***	0.97 ***	0.94 ***
Interaction Terms			
Years in Program			
Program: Section 8 site-based		0.99 ***	0.98 ***
Program: Other site-based		0.98 ***	0.98 ***
Program: Certificates/vouchers		0.98 ***	0.98 ***
African-American household head		1.01 ***	1.01 ***
American Indian household head		1.03 ***	1.03 ***
Asian household head		1.02 ***	1.01 ***
Hispanic household head		1.00	1.00 ***
Disabled		0.99 ***	1.00 ***
Household head aged 22–25		1.08 ***	1.04 ***
Household head aged 26–35		1.09 ***	1.04 ***
Household head aged 36–51		1.09 ***	1.05 ***
Household head aged 52–61		1.10 ***	1.05 ***
Household head aged 62 plus		1.09 ***	1.06 ***
Youngest child aged 0–3		1.00 ***	1.00 ***
Youngest child aged 4–5		1.00 ***	1.00 ***
Youngest child aged 6–12		1.00 ***	1.00 ***
Youngest child aged 13–17		1.00 *	1.00 ***
Spouse or co-head with earnings present		1.06 ***	1.05 ***
Spouse or co-head present		1.00	1.01 ***
Working-age adults present		1.00 ***	1.01 ***
Social Security/pension income present			0.99 ***
SSI present			0.99 ***
Welfare income present			1.00 ***
Tract poverty rate		1.00 ***	1.00 ***
Local unemployment rate		1.00 ***	1.00 ***
Suburbs		1.00 ***	1.00 ***
Nonmetro		1.00 ***	1.01 ***
TANF caseload change since 1993		1.00 ***	1.00 ***
TANF worst sanction = case closure		1.00 ***	1.00 ***
TANF sanction length		1.00 ***	1.00 ***
TANF initial earned income disregard ($)		1.00 ***	1.00 ***
TANF initial earned income disregard (%)		1.00 ***	1.00
TANF job search required		1.00 ***	1.00 ***

Notes: N = 17,948,607. Outcomes are in nominal dollars, not adjusted for inflation.

Statistically significant at: 0.05 * 0.01 ** 0.001 ***

Employment status is based on 50 percent of the annual, full-time minimum wage applicable in the year in question. If total household earnings were greater than or equal to this amount, the household was designated as "employed"; otherwise, the household was "unemployed."

Public housing households are the comparison group for interaction models.

Source: U.S. Department of Urban Development Multifamily Tenant Characteristics System/Tenant Rental Assistance Certification System longitudinal data compiled by the Urban Institute

Income and Earnings Levels

Income

In the first model specification (exhibit 7, model 1), we measured the effects of current year characteristics on current year income without time interactions or transfer income, not income trajectory. The R^2 and Adjusted R^2 for this model were relatively low, explaining only 17 percent of the variance. All terms were highly statistically significant however.

The largest increase in income is associated with having an employed spouse or co-head of the household ($5,785 per year), which is in the same direction as in the descriptive analysis but is even more substantial. Having a spouse or co-head of the household, regardless of employment status, raised income by nearly $1,800 per year; this increase is probably driven by the presence of employed spouses.

Controlling for everything else, the second largest coefficient is associated with a household head aged 62 or older, resulting in $3,388 more income. The magnitude of the coefficient is not consistent with the descriptive analysis, in which elderly households had higher incomes only in 1995 and 1996 and had flatter income trajectories than nonelderly households. The regression results suggest that the average income of elderly households is held down by other variables that are controlled for by the regression.

The largest negative coefficient was associated with disability status. Disabled households have $1,587 less income per year than nondisabled households have. Characteristics with large positive effects on income included the presence of a household head older than 25 (at least $1,475), the presence of an additional working-age adult ($1,956, including income from spouses or co-heads of the household), and living in a state with a large welfare caseload decline since 1993 ($2,325).

Other welfare policy variables had much less effect. Living in a state that completely eliminates welfare payments as a consequence of program rule violation (as opposed to grant amount reductions)[13] was associated with a decline in average income of $684 but may, in part, reflect regional differences. States that required employment search before offering welfare (which generally has the effect of diverting families from receiving welfare) had slightly lower average incomes. Again, the different income effects across states could reflect regional differences. In any case, a minority of states required employment search. Other measured welfare policies (sanction length and initial earned income disregards) essentially had no effect.

Among HUD programs, households with Section 8 site-based or tenant-based assistance (vouchers or certificates) had statistically significant but not markedly different incomes than public housing residents had, when controlling for everything else. As a group, residents of other, smaller programs (Section 236, BMIR, Mod Rehab, etc.) had much higher average income ($3,297 more per year) than public housing households had.

The presence in a household of a child younger than 4 years was associated with a slightly lower income level ($137 less per year) than the base case household without children. Households with older children, however, had higher incomes than those without children (controlling for the household head's age and disability status).

Finally, the poverty level of the assisted household's census tract had very little effect on income, as did living in the suburbs instead of the central city. The only location measure that made a large difference in average income was living in a nonmetro county, which was associated with $1,452 lower average income per year.

Earnings

The multivariate results for earnings level (exhibit 8, model 1) showed similar but greater positive or negative effects than the income results, suggesting that the included characteristics acted on household income mainly by changing household earnings. An example is disability status, which was associated with only $1,587 less income but with $5,777 less earnings. Earnings effects of a household head's age showed higher earnings than income effects for younger household heads in prime wage-earning years (22–25, 26–35, and 36–51), but lower effects on earnings for older households (52–61). For those aged 62 or older, a positive income increment of $3,388 becomes a negative earnings increment of -$1,938. The age of the household's youngest child has a smaller effect on earnings than on income. Having a spouse or co-head of the household with earnings increases earnings more than income, but having a spouse without earnings increases earnings less than income ($412 more earnings compared to $1,796 more total income a year).

Income and Earnings Trajectories

Our second model (exhibits 7 and 8, model 2) interacted every independent variable with years since program entry to measure the changing effects of the independent variables on household income and earnings trajectories with increasing time spent in assisted housing. Basically, this specification controlled not only for elderly or disabled status and the like, but also for incomes and earnings trends for each particular characteristic of households in housing assistance.

In this case, all the assisted housing programs had a net positive trend. Only Section 8 site-based residents had a higher trend than public housing residents.[14] Controlling for all other measured characteristics and their income trend effects, the base case public housing resident gained an average of $130 per year throughout the observation period, while Section 8 site-based households gained $138 per year. Households receiving tenant-based assistance gained only about $76 per year.

Almost all the time and household characteristic interactions lowered the household income trend from the base case of $130 per year. Minority status, disabled status, being over 21 years old, or having children at home all lowered the income trend by a few dollars per year, although not enough to make it completely negative, in nominal terms, even in combination. Exceptions are generally what one might expect based on the descriptive analysis: the number of working-age adults, presence of a spouse or co-head of the household, and presence of a spouse or co-head of the household with earnings all had modest positive effects on household income and earnings. One exception to expectations is that households with American Indian or Alaskan Native ethnicity had one of the largest positive effects on the base income trend, adding $54 per year, more than households with White ethnicities.

Most of these characteristics had similar but smaller effects on earnings, as compared to total income. Exceptions include the household head's minority status, which had a small but positive effect (large in the case of American Indians, but this is consistent with the total income effect), and age of the head of the household, which has a negative effect on total income but a positive effect on earned income (peaking $52 to $61 in the prime earning years).

Effects of Transfer Income on Income and Earnings Levels and Trajectories

Our third income and earnings models (exhibits 7 and 8, Model 3) added three more characteristics and their interactions: presence of welfare, presence of SSI, and presence of Social Security/pension income. We expected these to be important characteristics,

and this appeared to be confirmed by the descriptive tables, but we omitted them from the previous regressions because they are endogenous to income and earnings.

The presence of transfer income—welfare, SSI, or Social Security/pension income—had a very large negative effect on earnings levels, even more so than on total incomes, as might be expected from programs limited to families with very low income and earnings. Households with SSI or Social Security income had approximately $2,300 less earnings per year. Households with welfare income had $3,947 less total income and $6,628 less earned income.

Adding the transfer income variables and their interactions changed the other parameter estimates, increasing some and decreasing others, but without significantly changing the sign or magnitude of most of the other parameters. Exceptions were the household head being non-Hispanic African American, which went from $44 to $31, and being non-Hispanic Asian, which increased from $82 to $731.

The most significant effects, however, were on the income levels of households with children, which were much higher when controlling for receipt of transfer income. This indicates that the average income level of assisted housing families with children was lower for those families with children receiving welfare, which is what one might expect. Although SSI was associated with a reduced income and earnings growth trend, however, the presence of welfare had essentially no effect. The income and earnings growth trends for welfare recipients were essentially equal to that of nonwelfare families with the same characteristics.

While it is encouraging to see that assisted-housing residents receiving welfare do not have lower income and earnings growth, note that the descriptive statistics showed much higher growth rates for welfare recipients than for nonrecipients—as much as 82.5 percent income growth and 964 percent earnings growth for still-assisted households by 2002, compared to just 24.2 percent income growth and 26.4 percent earnings growth for nonwelfare households. The multivariate results demonstrate that the very high average income and earnings growth of assisted-housing residents on welfare was in fact explained by other characteristics, such as their ages and the ages of their children. This explanation is also consistent with the fact that the state-level welfare policy variables generally had little effect. Controlling for transfer income also had the effect of removing the effect associated with strict TANF sanction policies, implying that the two are strongly associated and that the declines in income and increases in earnings associated with living in a state with strict sanction policies are real because they affect mainly welfare recipients.

Employment

As in the descriptive analysis, we coded employment as a “yes” or “no” variable based on the earnings level in the administrative data. The definition had to be binary, in fact, to calculate a traditional employment or unemployment rate. If total household earnings were greater than the product of the minimum wage times 1,000 hours (20 hours per week, 50 weeks per year), we considered the household to be “employed.” Clearly a household with two or more adults could reach this threshold more easily, but this fact does not seem to detract from the basic test.

Because employment was structured as a binary outcome variable, we modeled the effects of household characteristics on employment using logit regressions. As with the linear regressions on income and earnings, the very large size of the data set makes the results highly statistically significant. For the most part, we can discuss the results without discussing significance tests. To aid in interpretation, the logit model coefficients have been transformed into odds ratios. The odds ratio is the ratio of the odds of households with a

particular characteristic being employed, over the odds that the base case households are employed.[15] For example, based on the first logit regression specification, households with African-American household heads have 18 percent higher odds of being employed than the base case households with White household heads, all other things being equal.

The first logit regression for employment (exhibit 9, model 1) is equivalent to the first linear regression used for income and earnings. That is, it includes years since program entry, all the predictive variables except the presence of welfare, SSI, or Social Security/pension income, and no time interaction terms. Therefore, with this specification we are modeling the odds of being employed in any given year with no time trend. In general, the other odds ratios behave as expected and are consistent with the linear regressions on earnings and the descriptive results.

The greatest effect on the odds of employment is associated with having an employed spouse or co-head of the household. Such households are 17.4 times more likely to be employed. The higher odds of employment for these households are in part because we did not change the earnings thresholds for such families, meaning if both adults worked even a few hours they would more easily reach the threshold for being coded "employed." The presence of each additional working-age adult also increased the odds of employment by 1.8 times. Merely having a spouse present, however, controlling for his or her employment, had no effect.

The odds of employment are essentially the same for residents of Section 8 site-based, tenant-based, and public housing programs. Examined as a whole, however, households participating in the smaller privately owned site-based programs (that is, excluding Section 8) have the highest odds of employment (2.65 times those of public housing residents), all else being equal.

Non-Hispanic White households are slightly more likely to be employed than are American Indian/Alaskan Native households, but slightly less likely than African-American, Asian/Pacific Islander, or Hispanic-headed households.

The odds of being employed are higher for households with household heads aged 22 to 61 (compared to the base case 18-to-21-year-old household head). A household is less likely to be employed if the head of the household is 62 years or older. The peak employment odds are for households with household heads aged 26 to 35; these households are 1.87 times more likely to be employed. The odds of employment also rise as the age of the youngest child increases; however, even those households with a youngest child up to 3 years old have 6 percent greater odds of being employed than those without children, probably because households without children include most of the elderly.

Local unemployment, tract poverty rate, metro/nonmetro location, and most state-level welfare policies have essentially no substantial effect on the odds of employment. The exception is state TANF caseload changes since 1993; greater percentage declines in TANF cases are associated with greater odds of employment (odds ratio of 1.59). The odds ratio for years in assisted housing program was 1.00, indicating that any differences in employment rates identified in the descriptive exhibits are associated with characteristics that were controlled for, such as the head of the household's age or the age of the household's youngest child, rather than with time in the program itself.

Our second logit model (exhibit 9, model 2), like our second models of income and earnings, retained all the variables from the first model and added interactions for each of them with years in a program to estimate a trend in the odds of employment over time. The odds of employment associated with the noninteracted characteristics changed very little,

as was the case with income and earnings. The odds ratios for the characteristics that were interacted with time in a program represent the increment to the odds of employment that are associated with a year in an assisted housing program. These odds ratios were also very nearly 1, indicating that the employment trends for groups defined by those characteristics were also explained by characteristics that were controlled for, rather than by time in a program itself.

Our third model (exhibit 9, model 3) added the presence of welfare, SSI, and Social Security/pension income and their interactions with the time-in-program trend. The odds ratios for the presence of transfer income were some of the lowest so far; households receiving SSI and Social Security/pension income were only 22 percent as likely to reach our employment threshold as other households were, all else being equal. Lower still were the odds of families receiving welfare to be employed at least half time; welfare families were only 7 percent as likely as nonwelfare families to be employed at least half time. Having transfer income in the model also significantly lowered the odds of employment associated with living in a state with large caseload declines. This last result may mean that remaining welfare recipients in states with large caseload drops are even less likely to be employed than those in other states, which would be consistent with the less disadvantaged recipients leaving the rolls as caseloads declined.

Conclusion

The purpose of this analysis was to attempt to answer a series of questions regarding the relationship between housing assistance programs and household income, earnings, and employment. To do this, we looked at the economic trends of households that spent at least 8 consecutive years in housing supported by one of HUD's assistance programs. The reader should bear in mind that our conclusions may not apply to households with shorter assisted housing tenures.

In summary, our key findings were as follows:

- Although we cannot easily compare these results with a comparable set of unassisted households, overall housing assistance did not seem to be an impediment to increasing incomes and earnings. Income and earnings for households receiving housing assistance rose by 34.1 and 93.1 percent, respectively, from 1995 to 2002.

- According to the descriptive analysis, the steepest increases in income were for households in the Mod Rehab (51.7 percent from 1995 to 2002), vouchers (44.1 percent), and certificates (42.2 percent) programs. The lowest rates of growth were for Section 236 households (11.1 percent growth from 1995 to 2002) and project-based Section 8 households (29.1 percent growth). Nonetheless, when controlling for other trends and household characteristics in the multivariate analysis, the steepest increase in income was for households in project-based Section 8 units and the flattest was for voucher/certificate programs and non-Section 8 site-based programs. These increases indicate that the income trends in the descriptive analysis were explained by differences in household characteristics among the programs.

- The income trajectories were highest for non-Hispanic African-American households and Hispanic households that had household heads aged 18 to 25, had a single working-age adult, had children, were neither disabled nor elderly, had a youngest child less than 3 years old, had no spouse or co-head of the household present, had an income level in the lowest deciles, received welfare, did not receive SSI or Social Security/pension income, were homeless at the time of admission to housing assistance, lived in high-poverty census tracts, and lived in the central city or outside a metro area.

- The initial employment rates were highest for households that were in the BMIR, Rental Assistance, and voucher and certificate programs; were non-Hispanic African American or Hispanic; had household heads aged 26 to 35; had no children; were neither disabled nor elderly; did not have welfare, SSI, or Social Security/pension income; and lived in central cities.

- The largest increase in income was associated with having an employed spouse or co-head of the household present in the household.

- State-level TANF policies seemed to have a significant relationship to incomes of households in housing assistance programs. Total state TANF caseload decline had a positive effect on incomes, but applying a "worst case" sanction (case closure) or requiring a job search had a negative effect on incomes.

- The presence of transfer income—welfare, SSI, or Social Security/pension income—had a very large negative effect on earnings levels of assisted housing households. Such income did not have a substantial effect on income or earnings trajectories, however.

- After controlling for household characteristics, the odds of being employed are essentially the same for residents of Section 8 site-based, tenant-based, and public housing programs. Households living in smaller, privately owned site-based programs (that is, excluding Section 8) have the highest odds of employment, however.

These findings imply that, while housing assistance need not be an impediment to increasing household income, earnings, and employment rates, program- and household-specific policies and interventions would likely have the most success in helping assisted households achieve economic self-sufficiency. Certain household types will understandably have a more difficult time finding and keeping employment than others. Specific assistance and counseling strategies need to be focused on specific subgroups of the assisted housing population.

For example, welfare-assisted and nonwelfare-assisted households in assisted housing had equal income and earnings growth rates, which suggest that welfare-to-work policies have not been particularly effective for the assisted housing population. Elderly and disabled households have lower income growth rates than other assisted housing households do, indicating that additional special efforts will be needed to improve the economic conditions of these subpopulations. In addition, when controlling for other household characteristics, living in a high-poverty tract had a negative effect on initial household income and earnings and on long-term income and earnings growth. This last finding has particular importance for housing mobility programs, such as Housing Choice Vouchers, suggesting that economic self-sufficiency efforts for these programs will be more likely to succeed if they are coupled with policies promoting poverty deconcentration.

Even after controlling for household characteristics, however, we found significant differences across programs in all three measures of economic success. While some of these differences may be attributed to unobservable differences in the populations served by these programs, specific program effects are also likely part of the explanation. HUD, local housing authorities, and others interested in promoting financial success among assisted housing households need to keep these differences in mind when developing and implementing interventions.

Future research efforts on this topic might examine more of these subpopulations and program differences in greater detail. In particular, as noted earlier, we were not able to control for local differences in housing assistance policies and practices. For example, after 1997 Public Housing Authorities (PHAs) were free to form their own waiting lists

for vouchers and public housing units, which enabled PHAs to target vouchers to special populations. An additional policy change was that PHAs must now balance their waiting list preferences so that at least 75 percent of households that receive vouchers and 40 percent of households that receive public housing have incomes less than 30 percent of the area median income.[16] How individual PHAs may choose to go about this balancing is another local policy variation that could affect income, earning, and employment outcomes. Additional research might better explore what effect these local policy choices have on economic outcomes for assisted housing households.

Finally, it should be noted that although our findings did show improvement in HUD-assisted households' overall economic status, they indicated only modest increases in income, earnings, and employment. For example, the average increase in incomes for assisted households during this period was only about $400 per year; earnings increased only $237 per year. Future research may be able to focus more on why these gains are so modest. An important component of such research would be to analyze differences between HUD-assisted households and comparable households that are not benefiting from housing assistance.

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Notes

1. This article is adapted from a report originally prepared for the U.S. Department of Housing and Urban Development as part of its Research Cadre program.

2. For more information on variations in local housing assistance policies, see Devine et al., 2000, and Devine, Rubin, and Gray, 1999.

3. The certificate program has been discontinued and these programs are now known as the Housing Choice Voucher program.

4. A much more limited set of observations (about 3 percent of all records) was also available for 1993 and 1994. Given the much lower rates of coverage, we did not rely on these earlier data in our analyses.

5. The file disaggregated income for the six largest sources for each household.

6. Creating measures of these policies requires combinations of several Welfare Rules Database variables.

7. Other hypothesized income replacements and coping mechanisms may also come into play, such as increased cohabitation with family or romantic partners.

8. Includes all households in the cohort, including those that had zero (0) earnings.

9. All dollar figures in this article are nominal and are not adjusted for inflation. We note that inflation during this period was historically very low.

10. Household race and ethnicity are based on the race and ethnicity of the household head.

11. The poverty rate was obtained from the 2000 Census and so is only a single-point-in-time measure.

12. We estimated the regression and logistic models using PROC REG and PROC LOGISTIC, respectively, in SAS, release 8.2.

13. Grant reduction sanctions varied widely. One state (Massachusetts) applied no sanctions at all.

14. Net trend for each program is the sum of the coefficients for the "years in program" term and the time interaction term for the particular program.

15. Odds are related to, but not the same as, probability. Mathematically, if the probability of an outcome is given by p, then the odds of that same outcome are equal to $p / (1 - p)$.

16. We are grateful to Barbara Haley of HUD for making us aware of these potential local policy differences.

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Additional Readings

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