How does rental assistance influence spending behavior?

Rental assistance results in more of a housing effect than a welfare effect; that is, those receiving assistance seek higher valued housing and keep the share of income spent on rent constant, rather than reduce their rent burdens and allocate money to other expenditures

Robert Cage

With the passage of the 1937 Housing Act and subsequent amendments, the Federal Government of the United States established as a goal that all citizens have "safe, sanitary, and affordable housing."[1] Recent increases in rental prices and renter cost burdens for shelter, a leveling of homeownership rates, and an increased awareness of the plight of the homeless have challenged the reality of this Federal housing policy. For example, the cost of shelter as a percent of income increased from 23 percent in 1970 to about 30 percent in 1991 for renters.

Early government intervention in housing markets came in the form of public housing projects. Then, the 1980's saw increased interest and experimentation with various other forms of market intervention, such as housing vouchers and rental certificates. To measure the ramifications of rental assistance as a market intervention strategy, this article analyzes the spending behavior of households receiving such assistance. On the basis of data collected from the 1988–90 Consumer Expenditure Surveys, households that received rental assistance from Federal, State, or local government agencies were identified and compared with those households that were eligible to receive assistance, but did not, and with households that were ineligible for assistance.

The article is divided into three parts. First, a brief background and review of government intervention in housing markets is presented, and the Department of Housing and Urban Development's housing certificate and voucher programs are outlined. Sociodemographic characteristics of the aforementioned three groups are then compared and contrasted, and differences among them in renter cost burdens and distribution of total expenditures are identified. Finally, ordinary least square and TOBIT regression models that were run to calculate income elasticities and "subsidy" elasticities for various expenditure categories are presented.

Market intervention and assistance

Historically, it has been the general housing policy of the Federal Government to let the laissez-faire, free-market system meet the demand for housing across all levels of income. Even after the passage of the 1937 Housing Act, the extent of involvement by the Federal Government in low-income housing markets was limited to the provision of public housing and the replacement of substandard and blighted housing structures. During the Carter administration, most development of new public housing projects began to be phased out and various other experimental assistance programs phased in. Among the latter forms of assistance were housing certificates and vouchers, low-income housing tax credits, community development block grants, and below-market interest rate programs.

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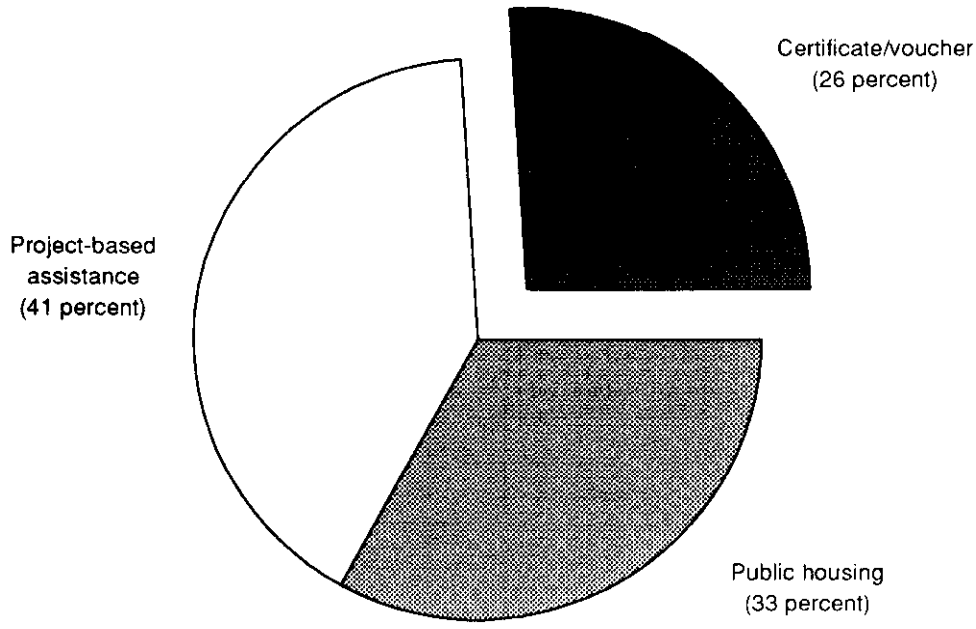
Today, various Federal, State, and local government agencies administer housing programs for low-income families. Most of these programs are funded by the Department of Housing and Urban Development (HUD). Some programs for rural families are funded by the Department of Agriculture. Federal budget outlays in fiscal year 1990 for public housing and rental assistance programs administered by HUD for low-income families and individuals were approximately $15 billion.[2] Generally speaking, housing programs administered by HUD can be classified into three major categories: privately owned subsidized housing projects, conventional public housing, and certificates and vouchers issued under Section 8 of the Housing Act. Programs that are grouped under the first umbrella include rent supplements; below-market interest rates; programs for the elderly; new construction, substantial rehabilitation, and moderate rehabilitation programs; and some other, smaller programs. The essential feature of this category is that assistance is given to the administrators of the privately owned projects, who, in turn, offer households subsidized rents. This approach contrasts with that of conventional public housing, in which projects are owned directly by public housing authorities or Indian housing authorities. Finally, in the Section 8 certificate and voucher programs, assistance is given directly to the low-income households, which are then free to choose their own housing units.

According to the 1989 American Housing Survey, there were roughly 34 million renter households in the United States.[3] In conjunction with the Census Bureau, HUD undertook several efforts to identify which units in the 1989 survey sample received assistance.[4] Population counts of renter households by eligibility and assistance status are presented in table 1. More than 40 percent of all renter households had incomes low enough to be considered eligible for housing assistance under various HUD subsidy programs. Of this group, 4 million (30 percent) actually received some form of rental assistance in 1989. Chart 1 illustrates the percent distribution of households that received assistance, by type of subsidy.

This article focuses on the group of renter households that receive assistance in the form of certificates or vouchers. The Section 8 housing program was established by the 1974 Housing and Community Development Act. It is the Federal Government's major operating program

Chart 1. **Distribution of subsidized renters, by category of assistance, 1989**



SOURCE: U.S. Department of Housing and Urban Development.

for assisting very low income families in renting "decent, safe, and sanitary private-market housing units."[5] While there is a subtle difference between a housing certificate and a housing voucher, both programs place the choice of housing directly in the hands of the consumer. Hence, the amount of the subsidy can be treated as a change in income, and the resulting alteration in spending on the part of the household receiving the assistance can be modeled.

In the case of a housing certificate, the rental subsidy is the difference between the approved rent due the owner of the dwelling unit and the occupant family's required contribution toward the rent, which is usually set at 30 percent of the family's monthly adjusted income.[6] In the case of a housing voucher, the amount of the subsidy is based on a "payment standard" that varies among communities. The payment standard is developed by local public housing administrations and establishes rent standards for different-sized units, based on the average rent, including utilities, in each community. The amount of the subsidy a participating family receives equals the difference between the payment standard and 30 percent of the family's monthly income, adjusted for family size. Families receiving housing vouchers may choose from a wide variety of housing, including single-family homes, town houses, and apartments (either in apartment buildings or in private homes). They may choose to rent a unit for more or less than the payment standard.[7] Under both the housing certificate and voucher programs, subsidy payments are made directly to landlords, and the recipient household pays the remainder of the rent to the landlord. Housing must meet an acceptable level of quality before the local public housing authority will approve payments.

The budget constraint of recipient households shifts outward, affording them the opportunity to reach higher levels of utility. Even though the rental subsidy is actually given to the landlord, the reduced rent charged to the recipient household frees up money that can then be spent on other items. In the case of a housing voucher, recipients must spend a minimum of 10 percent of their adjusted monthly income on rent and utilities. The rental subsidy allows recipients to rent higher valued housing units that they would otherwise not be able to afford. It also allows them to decide how much of their own income they want to allocate to shelter and how much to all other goods.

During the 1980's, the Brookings Institute sponsored an "experimental housing allowance" program to research the effectiveness of various types of housing allowances in reducing the costs of shelter for eligible households.[8] As part of this study, Eric A. Hanushek and John M. Quigley concluded that unrestricted housing allowances (such as cash transfers) result in low income elasticities.[9] This implies that the welfare effects of such a program (that is, a reduction in the rent burden) are relatively stronger than the housing effects (that is, increases in the housing component of expenditures). Conversely, the more restrictive a housing allowance program (such as housing vouchers) is, the greater are the housing effects relative to welfare effects. To measure the ramifications of rental assistance on a family's total spending behavior, the entire budget outlays of renters, classified by whether they are eligible for assistance and whether they in fact receive assistance, are examined in the remainder of the article.

Table 1. **Renter households, by category of assistance, 1989**

[Numbers in thousands]

Category	Households	Percent
All renters	33,767	100
Income eligible	13,808	41
Receiving assistance	4,070	12
In public housing	1,360	4
Through certificate or voucher	1,060	3
In privately owned housing project	1,650	5
Not receiving assistance	9,378	29
Ineligible	19,959	59

Descriptive statistics on renters

Data from the 1989 American Housing Survey include socioeconomic and demographic information on renter households, by type of assistance received. However, the survey does not provide any data on household consumption, with the exception of expenditures for rent. Accordingly, to analyze the expenditure behavior of households receiving rental assistance, data from the 1988–90 Consumer Expenditure (CE) Interview Surveys were used. This survey is a quarterly rotating panel survey designed to collect data on major items of expense, household characteristics, and income. The technical reference group of the survey is a *consumer unit*, defined as (1) all members of a particular household who are related by blood, marriage, adoption, or some other legal arrangement; (2) a person living alone or sharing a household with others, or a person living as a roomer in a private home or lodging house, but who is financially dependent; or (3) two persons or more living together who pool their income to make joint decisions regarding the disposition of their expenditures. The terms *consumer unit*, *household*, and *family* are used

Table 2. **Selected weighted sample statistics for renters, by category of assistance, Consumer Expenditure Survey, 1988–90[1]**

Variable	Eligible for assistance		Ineligible for assistance
	Receiving assistance	Not receiving assistance	
Sample size	487	8,290	13,274
Geographic location:			
Central city	49.0	49.8	37.7
Other places inside metropolitan statistical area	27.6	33.7	44.2
Rural	23.4	16.6	18.1
Region:			
Northeast	26.6	21.1	20.5
South	26.5	29.6	31.9
Midwest	18.0	27.1	20.6
West	29.0	22.2	27.0
Type of building:			
Single-family, detached	15.3	25.7	31.9
Row or town house	21.7	17.1	18.2
Multiunit, garden	18.9	20.0	21.9
Multiunit, high rise	16.4	6.0	5.3
Basement, attic, or garage	25.0	24.1	18.3
Mobile home or other	2.6	7.2	4.4
Average number of rooms	4.1	4.2	4.6
Average number of bedrooms	1.9	1.9	2.1
Average number of bathrooms	1.1	1.1	1.2
Family size:			
One	31.5	47.3	35.9
Two	23.5	18.4	29.8
Three	21.4	12.7	15.1
Four	11.0	10.6	11.5
Five or more	12.7	11.0	7.7
Mean	2.6	2.3	2.3
Number of children:			
None	37.4	61.3	62.5
One	24.1	15.0	18.1
Two	19.7	12.8	12.7
Three	11.5	6.7	4.9
Four	5.6	2.7	1.2
Five or more	1.6	1.6	.6
Mean	1.3	.8	.7
Family composition:			
Single	31.5	47.3	35.9
Husband and wife only	3.9	7.3	16.7
Husband and wife with children	8.5	15.6	23.5
Single parent	39.6	12.9	6.2
Other type of arrangement[2]	16.6	17.0	17.7
Age of reference person:			
Under 25 years	10.4	19.0	14.1
25 to 34 years	37.0	29.8	42.0
35 to 44 years	13.7	14.4	18.8
45 to 54 years	8.0	9.9	11.4
55 to 64 years	12.2	8.1	5.9
65 years and older	18.8	18.8	7.8
Mean	44.4	42.4	37.8
Race of reference person:			
White	66.1	73.0	87.0
Black	32.1	22.7	9.6
Other[3]	1.8	4.3	3.4

See footnotes at end of table.

interchangeably throughout this article. The CE Survey sample is designed to represent the noninstitutional civilian population, and approximately 5,000 consumer units are interviewed each quarter.[10]

Three sample groups were selected from the set of all renter consumer units described in the CE Survey, based on their eligibility for, and whether they received, housing assistance: (1) income-eligible renters who received assistance; (2) income-eligible renters who did not receive assistance; and (3) ineligible renters. Income eligibility was determined by using the 1992 rental assistance very low income limits, as established by HUD for the 104 primary sampling units comprising the CE Survey sample.[11] To determine a consumer unit's eligibility, the income limits were matched against consumer unit records by family size and place of residence.

To identify eligible households, total expenditures, rather than reported income, were used to approximate a consumer unit's current income, for several reasons. First, underreporting and nonresponse are a larger problem in the CE Survey for income than for total expenditures. Second, using reported income would have resulted in households that suffered a significant self-employment or business loss being eligible for rental assistance. Typically, however, these types of households have very large expenditures and are generally not categorized as low-income households. Third, it is common practice to substitute total expenditures as a proxy for income with data from the CE Survey.[12] Usually, this proxy is made for permanent income, rather than current income. However, in this case, the assumption that households which receive rental assistance generally remain eligible for long periods of time implies that current income may not differ significantly from permanent income.

Because total expenditures are collected on a quarterly basis in the CE Survey, the HUD income limits were divided by 4, and if a consumer unit's total quarterly expenditures were less than or equal to this critical value, that unit was identified as income eligible. The 1992 very low income limits were deflated using the Consumer Price Index for All Urban Consumers (CPI-U) to match the limits that existed during the quarter in which each consumer unit was interviewed.

Of the income-eligible consumer units, those receiving rental assistance were identified as the ones that responded "yes" to the question, "Are your housing costs lower because the Federal, State, or local government is paying for the cost?" *and* reported a value to the question, "How much rent is paid by someone outside of your consumer unit, including local, State, or Federal government agencies?" Income-eligible consumer units

that did not receive rental assistance were those which responded negatively to the two questions. The third group of renters, ineligible renters, was selected for comparison with the two eligible renter groups.

Twelve quarters of data (the first quarter of 1988 through the fourth quarter of 1990) were used to obtain sample sizes large enough to compute reliable sample statistics. The total sample size of all renters in the CE Survey during this time was 24,855. Those in public housing (n = 868), those not reporting any amount of assistance received (n = 553), and those reporting assistance other than governmental (n = 1,383) were removed. The resulting sample sizes for the three groups were as follows: eligible for and receiving assistance (n = 487); eligible for, but not receiving assistance (n = 8,290); and ineligible (n = 13,274).

While the CE Survey does not explicitly ask respondents whether or not they participate in a Section 8 housing certificate or voucher program, the group of income-eligible renters who receive housing assistance is functionally the same in that regard; that is, a portion of the rental charge to these households is paid for by some government housing program. For consistency, demographic comparisons of income-eligible renters as identified in the 1989 American Housing Survey were made with income-eligible renters as identified in the 1988–90 CE Survey. The results indicated that both samples were very similar with respect to race, age, educational attainment, household composition and size, and income level.

Selected weighted geographic, housing, and demographic characteristics for the three renter groups are listed in table 2. In many respects, the demographic and geographic characteristics of renters who receive housing assistance and those who are eligible for, but do not receive, assistance are similar. Almost 50 percent of both groups live in the central city of a metropolitan statistical area. A slightly greater percentage of the first group (23 percent) live in rural areas, compared with the second group (17 percent). The average household size of renters receiving assistance (2.6) is greater than that of renters who are eligible for, but do not receive, assistance (2.3). This is accounted for by the greater probability that a household that receives assistance has children, compared with a household that is eligible for, but does not receive, assistance. The distribution of the age of the reference person is similar in both groups, with the average age (approximately 43 years) being higher than that of the reference person in ineligible households. The proportion of eligible renters that are 65 years and older (19 percent) is much larger than that of ineligible renters (8 percent).

One of the most obvious differences among the three groups is family composition. Roughly 40 percent of all renters receiving assistance are single parents, compared with only 13 percent of eligible renters who do not receive assistance and only 6 percent of ineligible renters. Furthermore, a greater percentage of households receiving assistance are headed by a black reference person (32 percent), compared with the other two groups.

Another major demographic difference among the groups is the occupation of the reference person. Of all renters who receive housing assistance, 45 percent did not work due to unemployment or other reasons, compared with only 20 percent of those who were eligible for, but did not receive, assistance and 5 percent of ineligible renters. This factor helps explain the major differences in sources of income among the three groups. Almost half of all the income of renters receiving assistance comes from transfer payments (unemployment compensation, workers' compensation, veterans' payments, public assistance and welfare, supplemental security income, food stamps, and other financial assistance). Social Security and retirement income make up an additional 22 percent. (See chart 2.) Renters who were eligible for, but did not receive, assistance are almost twice as likely to have income

Table 2. **Continued — Selected weighted sample statistics for renters, by category of assistance, Consumer Expenditure Survey, 1988–90[1]**

Variable	Eligible for assistance		Ineligible for assistance
	Receiving assistance	Not receiving assistance	
Education of reference person:			
Less than high school graduate	49.0	38.4	15.9
High school graduate	49.9	51.9	57.4
College graduate or more	1.1	9.7	26.7
Occupation of reference person:			
Wage or salary earner	36.8	62.1	84.5
Self-employed	.3	3.1	5.1
Retired	18.0	14.9	5.5
Unemployed	2.8	1.9	4.7
Not working, other reasons[4]	42.1	18.1	.2
Below poverty threshold:			
Yes	59.4	34.4	7.5
No	32.7	47.8	82.6
Income not reported	7.9	17.8	9.9

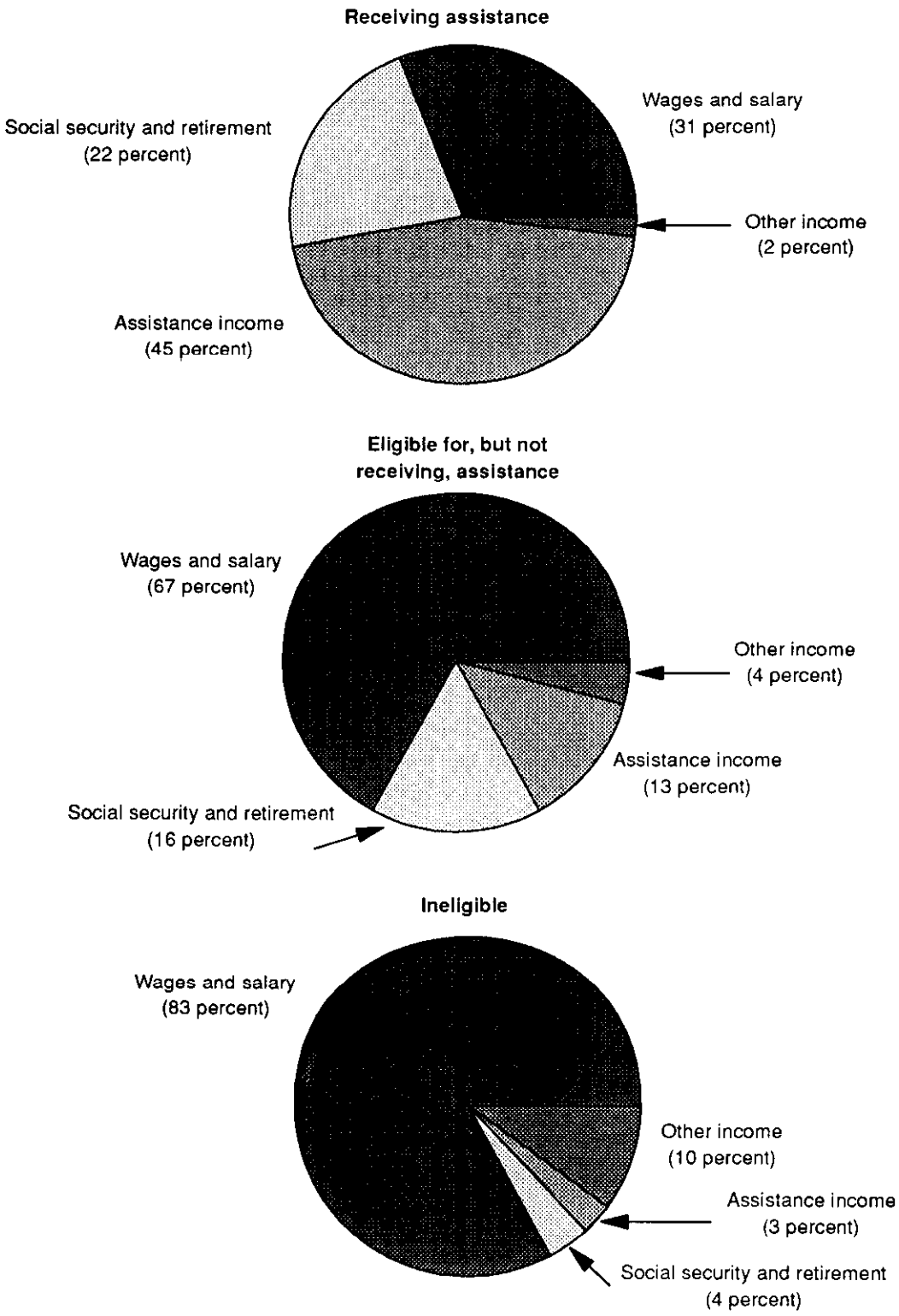
[1] Sample size of all renters was 24,855. Those in public housing (n = 868), those not reporting amount of assistance (n = 553), and those reporting assistance other than governmental (n = 1,363) were removed from sample.

[2] Other types of consumer unit arrangements include husband and wife with others, and unrelated individuals living together.

[3] Other races include American Indian, Aleut, Eskimo, and Asian or Pacific Islander.

[4] Other reasons for not working include being disabled, taking care of home or family, going to school, and doing something else.

Chart 2. **Sources of income, by category of rental assistance, 1989**



from wages and salary, compared with renters who received housing assistance.

Average annual income and average total quarterly expenditures are listed in table 3 for all three renter groups. On average, both eligible groups spend less than one-half of the amount spent by ineligible renters. By far, the largest portion—42 percent—of the total budget of renters who were eligible for, but did not receive, assistance is allocated to rent and utilities. Food is the second largest budget item of this group, accounting for roughly 25 percent of total expenditures. The distribution of expenditures is manifestly different for renters receiving assistance, whose average subsidy is $918 per quarter (or $306 per month). The portion of total expenditures allocated to rent and utilities by this group (30 percent) is significantly less than that of renters who were eligible for, but did not receive, assistance and approaches the share of ineligible renters (28 percent). With the exception of transportation (and, of course, rent and utilities), the budget share of all of the expenditure categories is slightly higher for renters receving housing assistance, compared with renters who were eligible for, but did not receive, assistance.

In the 1989 American Housing Survey, the median monthly rent of renters participating in certificate and voucher programs was $185, compared with $334 for renters who were eligible for, but did not receive, assistance. In the Consumer Expenditure Survey described above, the monthly averages of these two groups were $221 and $337, respectively. Thus, the findings of the two surveys are quite similar.

Regression models and results

To control for demographic differences between those receiving rental assistance and those who were eligible for, but did not receive, assistance, ordinary least squares and TOBIT regression models were used to measure the influence of the rental subsidy on various expenditures. The first set of regressions was run for the sample of all eligible renters, to isolate any differences in spending behavior due to potentially varying income elasticites between those households which did, and those which did not, receive assistance. Seven separate regressions were run, in turn, on the following dependent variables: food, rent and utilities, household furnishings and operations, transportation, apparel, entertainment, and health and personal care.[13] All expenditure categories were defined as the total quarterly out-of-pocket expenses of each consumer unit for each item.

To control for variations in income, an income variable had to be included as an independent variable in the models. As mentioned earlier,

Table 3. **Weighted income and expenditure statistics for renters, by category of assistance, Consumer Expenditure Survey, 1988–90[1]**

Variable	Eligible for assistance		Ineligible for assistance
	Receiving assistance	Not receiving assistance	
Mean quarterly rental assistance	$918.49	$0.00	$0.00
Mean annual income before taxes	7,723.82	9,646.48	25,387.15
Wages and salary:			
Mean	2,418	6,506	21,118
Percent reporting	39.0	56.7	82.7
Percent of total income	31.3	67.4	83.2
Self-employment and farm income:[2]			
Mean	74.11	214.67	1,325.81
Percent reporting	1.6	3.5	9.1
Percent of total income	1.0	2.2	5.2
Social Security and retirement income:[3]			
Mean	1,689.98	1,503.02	1,111.32
Percent reporting	29.6	22.7	12.0
Percent of total income	21.9	15.6	4.4
Assistance income:[4]			
Mean	3,485.18	1,242.24	683.28
Percent reporting	71.3	33.3	18.6
Percent of total income	45.1	12.9	2.7
Dividend and interest income:			
Mean	12.66	144.73	418.22
Percent reporting	7.6	13.3	29.7
Percent of total income	.2	1.5	1.6
Other types of income:[5]			
Mean	43.73	39.68	730.52
Percent reporting	4.1	1.7	2.9
Percent of total income	.6	.4	.3
Total quarterly expenditures[6]	2,246.07	2,401.06	5,827.43
Food:			
Mean	658.35	604.56	1,023.78
Percent reporting	99.2	99.4	99.9
Budget share	29.3	25.2	17.6
Alcohol and tobacco:			
Mean	80.84	88.64	173.16
Percent reporting	56.1	56.6	76.7
Budget share	3.6	3.7	3.0
Rent and utilities:			
Mean	663.54	1,012.19	1,630.49
Percent reporting	99.6	99.3	99.9
Budget share	29.5	42.2	28.0
Household operations and furnishings:			
Mean	112.74	60.54	323.88
Percent reporting	68.0	54.8	80.6
Budget share	5.0	2.5	5.6
Apparel and services:			
Mean	152.44	113.86	359.54
Percent reporting	90.8	83.5	95.2
Budget share	6.8	4.7	6.2
Transportation:			
Mean	232.03	272.16	1,180.29
Percent reporting	77.8	83.8	98.3
Budget share	10.3	11.3	20.3

See footnotes at end of table.

underreporting and nonresponse are a larger problem in the CE Survey for income than for expenditures. Accordingly, it is common practice to substitute total expenditures as a proxy for income with CE Survey data.[14] In the regressions employed in this analysis, total quarterly expenditures were used as a proxy variable for income. To capture differences among eligible renters, also included were a dummy variable denoting whether a renter received assistance (value = 1) or not (value = 0) and an interaction term between the dummy variable and total expenditures. The remaining independent variables common to all regressions were family size; number of children; age of reference person; a dummy variable denoting race or ethnicity, with a value of 1 if the race of the reference person was Afro-American, Asian, Eskimo, Aleut, or another minority and a value of 0 if the race of the reference person was white; four dummy variables representing family composition, namely, single, husband and wife only, husband and wife with children, or other consumer units (single parents were excluded as the control category); three dummy variables representing the quarter during which the interview took place, namely, the first, second, or third quarter (the fourth quarter was excluded as the control quarter); and two dummy variables representing geographic location, namely, center city or suburb (rural was excluded as the control group).

The following additional variables were included in some models. Building-type dummy variables, the number of bedrooms, and a dummy variable representing the age of the housing unit (value = 1 if the unit was built within the last 10 years, value = 0 if the unit was older) were included for the rent and household furnishing models. A variable representing the number of automobiles owned or operated by the household was added to the transportation model, and dummy variables representing whether a household had one earner or two or more earners (the case of no earners was excluded as a control group) were included in the transportation and health and personal care models. Finally, the cash value of food stamps was added to the food model.[15]

The method of ordinary least squares was employed for the food and rent models, as 100 percent of the sample group reported that they incurred these expenditures. TOBIT analysis was used for the remainder of the dependent variables, because the percent of the sample group reporting each of these expenditures was about 80 percent or less. TOBIT is a more appropriate model when the dependent variable is truncated at a lower bound and there is a large frequency of that value—in this case, zero.[16]

Each of the seven regressions assumed the functional form

$$E_i = \alpha + \beta_1 Y_i + B_2 Y_i * S_i + \beta_3 S_i + \beta_n \mathbf{D}_i + e_i,$$

where E_i = quarterly expenditure amount of dependent variable for ith household;
α = intercept;
β_j = independent variable parameter estimates;
Y_i = total quarterly expenditures (income proxy) of ith household;
S_i = 1 if household received rental assistance, 0 otherwise;
$\mathbf{D}_i$ = vector of various demographic variables;
e_i = error term.

The results of the regressions are listed in table 4. With the exception of apparel and housewares, the parameter estimate for the interaction term $Y_i S_i$ was significantly different from zero in all

Table 3. **Continued — Weighted income and expenditure statistics for renters, by category of assistance, Consumer Expenditure Survey, 1988–90**[1]

Variable	Eligible for assistance		Ineligible for assistance
	Receiving Assistance	Not receiving assistance	
Health and personal care:			
Mean	134.87	118.84	323.31
Percent reporting	74.3	78.5	95.0
Budget share	6.0	4.9	5.5
Entertainment:			
Mean	100.07	70.92	321.12
Percent reporting	74.5	67.6	93.7
Budget share	4.5	3.0	5.5
Other expenditures:[7]			
Mean	91.39	57.26	370.89
Percent reporting	65.1	66.9	92.6
Budget share	4.1	2.4	6.4

[1] Sample size of all renters was 24,855. Those in public housing (n = 868), those not reporting amount of assistance (n = 553), and those reporting assistance other than governmental (n = 1,363) were removed.

[2] Self-employment and farm income includes all earnings from self-employment, both farm and nonfarm.

[3] Social Security and retirement income includes Social Security income and income from pensions or annuities from private companies, the Federal Government, or individual retirement accounts.

[4] Assistance income includes unemployment compensation, workers' compensation, veterans' payments, public assistance, supplemental security income, food stamps, and other financial assistance.

[5] Other types of income include money received from care of foster children, cash scholarships, and stipends not based on working.

[6] Total quarterly expenditures equal BLS published definition, minus personal insurance and pensions and vehicle monthly payment, instead of purchases and interest.

[7] Other expenditures include expenditures for reading and education, miscellaneous expenditures, cash contributions, and other housing expenditures.

Table 4. **Ordinary least square and TOBIT regression results, all eligible renters**

Independent variables[1] (n = 8,777)	Dependent variables													
	Ordinary least square models				TOBIT models									
	Food		Rent[2]		Transportation		Apparel		Entertainment		Health care[3]		Housewares[4]	
	β	t	β	t	β	t	β	t	β	t	β	t	β	t
Intercept	32.32	1.68	-2.64	-0.09	-214.02	[5]-10.28	-35.51	[5]-3.57	1.01	0.10	-251.57	[5]-16.84	-119.72	[5]-6.15
Total expenditures	.20	[5]48.45	.38	[5]73.53	.15	[5]34.88	.07	[5]33.18	.06	[5]29.15	.08	[5]26.27	.08	[5]23.89
Total expenditure dummy	-.056	[5]-6.09	-.159	[5]-13.59	.05	[5]4.95	-.006	-1.25	-.011	[5]-2.24	.029	[5]4.32	-.005	-.63
Assistance dummy	161.66	[5]6.27	47.49	1.45	-33.57	-1.20	66.66	[5]4.65	73.36	[5]5.35	-40.76	[5]-2.11	115.24	[5]5.09
Size of consumer unit	52.55	[5]15.33	-6.09	-1.49	-24.73	[5]-7.50	9.46	[5]5.45	-7.68	[5]-4.61	-19.39	[5]-8.25	-8.17	[5]-2.86
Age of reference person	.23	1.36	3.95	[5]18.49	-2.39	[5]-11.39	-1.57	[5]-16.78	-1.89	[5]-20.81	3.80	[5]26.47	-.92	[5]-5.98
Minority dummy	-7.07	-.97	64.58	[5]6.97	3.17	.41	12.31	[5]3.08	-25.66	[5]-6.59	-15.27	[5]-2.84	-22.43	[5]-3.46
Composition of consumer unit (single parent):														
Single	-52.16	[5]-4.46	-89.25	[5]-6.07	60.98	[5]4.96	3.70	.58	13.03	[5]2.13	38.82	[5]4.48	-51.36	[5]-4.98
Husband and wife only	.39	.03	-118.88	[5]-6.22	53.58	[5]3.32	-45.76	[5]-5.43	-11.90	-1.48	64.61	[5]7.62	-51.37	[5]-3.82
Husband and wife with children	.87	.07	-88.80	[5]-5.94	10.17	.77	-48.77	[5]-7.50	-3.37	-.54	57.74	[5]6.30	-4.92	-.48
Other consumer units	-20.47	-1.78	-56.28	[5]-3.94	28.73	[5]2.21	-37.32	[5]-6.00	-3.40	-.57	29.03	[5]3.18	-50.12	[5]-5.00
Season (fourth quarter):														
First quarter	-26.91	[5]-3.12	....	....	16.92	1.86	12.19	[5]2.54	31.33	[5]6.85	....	....	....	....
Second quarter	-15.16	-1.78	....	....	23.17	[5]2.59	-19.38	[5]-4.08	-3.26	-.72	....	....	....	....
Third quarter	-5.35	-.60	....	....	-6.49	-.69	-12.12	[5]-2.45	-1.44	-.30	....	....	....	....
Region (west):														
Northeast	60.49	[5]6.63	-9.28	-.76	-20.74	[5]-2.13	22.56	[5]4.10	-27.09	[5]-5.26	-2.86	-.43	-21.16	[5]-2.45
Midwest	-43.79	[5]-5.11	-86.39	[5]-7.86	44.81	[5]5.03	9.03	1.57	-30.46	[5]-5.65	43.67	[5]7.01	30.50	[5]3.97
South	-17.60	[5]-2.00	-82.16	[5]-7.35	46.75	[5]5.08	9.82	1.70	-30.18	[5]-5.59	38.33	[5]5.95	28.74	[5]3.65
Urban location (rural):														
Center city	12.81	1.32	71.36	[5]5.53	....	....	....	....	....	....	-31.23	[5]-4.36	....	....
Suburb	-19.56	-1.92	80.54	[5]6.10	....	....	....	....	....	....	-17.27	[5]-2.31	....	....
Building type (high rise):														
Single family, detached	....	....	12.83	.69	....	....	....	....	....	....	....	....	-31.39	[5]-2.42
Town house	....	....	34.55	1.90	....	....	....	....	....	....	....	....	-9.09	-.72
Garden apartment	....	....	54.04	[5]3.03	....	....	....	....	....	....	....	....	4.79	.39
Garage, attic, or basement	....	....	22.40	[5]1.32	....	....	....	....	....	....	....	....	-8.86	-.74
Other	....	....	-15.31	-.67	....	....	....	....	....	....	....	....	-34.07	[5]-2.14
Age-of-housing-unit dummy	....	....	147.54	1.16	....	....	....	....	....	....	....	....	-9.30	[5]-2.82
Number of bedrooms	....	....	-12.87	[5]-2.82	....	....	....	....	....	....	....	....	-9.38	[5]-2.84
Number of vehicles	....	....	....	....	142.55	[5]34.96	....	....	....	....	....	....	....	....
Value of food stamps	.03	[5]6.82	....	....	....	....	....	....	....	....	....	....	....	....
Earner composition (none):														
One	....	....	....	....	75.46	[5]8.07	....	....	....	....	-4.58	-.56	....	....
Two or more	....	....	....	....	80.77	[5]6.81	....	....	....	....	-5.52	-.67	....	....
Adjusted R-square[6]	.47	....	.52	....	.23	....	.13	....	.10	....	.12	....	.08	....
F-statistic[7]	408	....	437	....	168	....	44	....	30	....	56	....	38	....

[1] Omitted (control) group for categorical variables in parentheses.

[2] Rent includes rent and utilities paid by consumer unit.

[3] Health care includes health insurance, medical services, drugs, medical supplies, and personal care products and services.

[4] Housewares include household operations, housekeeping supplies, and household furnishings and equipment.

[5] Parameter estimate is significantly different from zero at the 95-percent confidence interval.

[6] For TOBIT models, this statistic is the log likelihood ratio index and is equal to [1 – (log likelihood full model/log likelihood restricted model)].

[7] For TOBIT models, this statistic is a pseudo chi-square, equal to [2 x (log likelihood full model/log likelihood restricted model)].

models. This indicates that renters who received assistance and renters who were eligible for, but did not receive, assistance had significantly different income elasticities for food, rent, transportation, entertainment, and health care. Such a result is not surprising, because income elasticities usually vary along the income distribution, and the former group of renters is more likely to have less income than the latter group. Furthermore, the rental assistance dummy was significant in the food, apparel, entertainment, health care, and housewares models, indicating that the levels of expenditure for these items were also significantly different for the two groups of renters.

All items had a positive estimated income elasticity, indicating that they were "normal" (spending increases as income increases) goods for eligible renters. The income elasticities for food and for rent and utilities were less than 1.0, indicating that these items were necessities for eligible renters; those items with elasticities greater than 1.0 would be considered luxuries. For renters who did not receive assistance, the elasticities for food and rent were higher, indicating that these items were less of a necessity for this group than for the former. Hence, given an increase in income, renters who did not receive assistance would be more likely to allocate more money

Table 5. **Ordinary least square and TOBIT regression results, assisted renters only**

Independent variables[1] (n = 8,487)	Dependent variables													
	Ordinary least square models				TOBIT models									
	Food		Rent[2]		Transportation		Apparel		Entertainment		Health care[3]		Housewares[4]	
	β	t	β	t	β	t	β	t	β	t	β	t	β	t
Intercept	177.16	1.95	-7.25	-.07	-126.15	-1.44	25.11	.60	-19.20	-.51	-455.31	[5]-16.29	-99.98	-0.98
Total expenditures	.13	[5]10.32	.19	[5]14.47	.16	[5]12.41	.07	[5]11.64	.05	[5]9.72	.13	[5]26.21	.08	[5]7.20
Rental assistance	.085	[5]2.34	-.006	-.16	-.03	-.72	-.012	-.69	.002	.13	-.018	[5]-2.33	.026	.75
Size of consumer unit	37.55	[5]2.07	-11.03	-.58	-38.06	[5]-2.40	14.17	1.88	3.13	.46	-27.63	[5]-8.17	-2.04	-.12
Age of reference person	2.70	[5]2.18	2.78	[5]2.20	-2.54	[5]-2.05	-.94	-1.59	-1.03	-1.89	6.43	[5]26.35	-1.97	-1.61
Minority dummy	-94.81	[5]-2.37	-5.71	-.14	52.86	1.45	64.83	[5]3.44	-4.06	-.24	-62.12	[5]-2.79	-22.90	-.65
Composition of consumer unit (single parent):														
Single	-203.97	[5]-3.20	-133.17	[5]-2.04	34.08	.54	-23.70	-.77	-30.04	-1.07	46.24	[5]4.53	21.19	.34
Husband and wife only	-180.82	-1.84	-31.37	-.32	95.65	.97	-78.47	-1.64	-34.55	-.80	-13.51	[5]-7.66	10.22	.11
Husband and wife with children	-33.85	-.52	39.45	.63	129.35	[5]2.11	-72.81	[5]-2.53	-38.46	-1.52	169.47	[5]6.33	41.29	.72
Other consumer units	-97.60	-1.79	40.66	.73	52.09	.96	-49.84	-1.89	-46.90	[5]-1.99	77.70	[5]3.26	-37.97	-.73
Season (fourth quarter):														
First quarter	-77.63	-1.71	....	....	....	....	-20.32	-.93	80.06	[5]4.06	....	....	....	....
Second quarter	-9.38	-.20	....	....	....	....	-49.89	[5]-2.20	38.52	1.87	....	....	....	....
Third quarter	-40.01	-.87	....	....	....	....	-29.24	-1.32	2.65	.13	....	....	....	....
Region (west):														
Northeast	56.61	1.24	-31.57	-.62	....	....	....	....	....	....	35.23	.33	-13.20	-.27
Midwest	-92.03	-1.89	-91.95	-1.86	....	....	....	....	....	....	151.36	[5]7.00	58.18	1.27
South	-104.24	[5]-2.20	-100.43	[5]-2.08	....	....	....	....	....	....	177.67	[5]5.91	70.74	1.57
Urban location (rural):														
Center city	....	....	252.55	[5]4.86	....	....	....	....	....	....	-114.96	[5]-4.22	....	....
Suburb	....	....	140.01	[5]2.76	....	....	....	....	....	....	-103.00	[5]-2.20	....	....
Building type (high rise):														
Single family, detached	....	....	99.81	1.33	....	....	....	....	....	....	....	....	-61.71	-.91
Town house	....	....	40.29	.62	....	....	....	....	....	....	....	....	54.02	.90
Garden apartment	....	....	81.24	1.26	....	....	....	....	....	....	....	....	21.73	.37
Garage, attic, or basement	....	....	90.56	1.46	....	....	....	....	....	....	....	....	46.02	.81
Other	....	....	-38.32	-.32	....	....	....	....	....	....	....	....	-17.80	-.16
Age-of-housing-unit dummy	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Number of bedrooms	....	....	19.79	.68	....	....	....	....	....	....	....	....	-15.84	-.57
Number of vehicles	....	....	....	....	294.77	[5]11.55	....	....	....	....	....	....	-9.38	[5]-2.84
Value of food stamps	.08	[5]4.39	....	....	....	....	....	....	....	....	....	....	....	....
Earner composition (none):														
One	....	....	....	....	....	....	....	....	....	....	-46.41	-.94	....	....
Two or more	....	....	....	....	....	....	....	....	....	....	-34.62	-.53	....	....
Adjusted R-square[6]	.45	....	.44	....	.40	....	.19	....	.17	....	.14	....	.10	....
F-statistic[7]	23	....	20	....	440	....	80	....	62	....	124	....	70	....

[1] Omitted (control) group for categorical variables in parentheses.

[2] Rent includes rent and utilities paid by consumer unit.

[3] Health care includes health insurance, medical services, drugs, medical supplies, and personal care products and services.

[4] Housewares include household operations, housekeeping supplies, and household furnishings and equipment.

[5] Parameter estimate is significantly different from zero at the 95-percent confidence interval.

[6] For TOBIT models, this statistic is the log likelihood ratio index and is equal to [1 – (log likelihood full model/log likelihood restricted model)].

[7] For TOBIT models, this statistic is a pseudo chi-square, equal to [2 x (log likelihood full model/log likelihood restricted model)].

toward food and rent, compared with the former group. The elasticities for apparel and housewares were not significantly different between the two groups. Renters who received assistance had higher elasticities than renters who did not only for transportation and health and personal care.

To isolate the influence of rental assistance on spending behavior, a second set of similar regressions was run, this time using only the sample of renters receiving housing assistance. Instead of regressing the interaction term $Y_i S_i$ and the rental assistance dummy, the models involved in these regressions used the income proxy variable and a variable representing the dollar value of rental assistance. That way, the significance of the rental assistance amount after controlling for variation in income could be measured. The results of these further regressions are listed in table 5. The parameter estimate for the rental assistance variable proved to be significantly different from zero in only the food and health care models. Results from both sets of regressions were used to estimate income elasticities and "subsidy" elasticities for the seven expenditure categories tested and are presented in table 6. The elasticities are point elasticities evaluated at the mean.

"Subsidy" elasticities were calculated using the parameter estimate of the rental assistance variable from the second set of regressions. These elasticities measure the marginal effect of a larger

subsidy on households receiving assistance, holding income (total expenditures) constant. This parameter estimate was statistically significant in only the food and health care models; the elasticities listed for the remaining expenditure categories were not significantly different from zero. The elasticity of approximately zero for rent and utilities indicates that, regardless of the rental assistance amount, households receiving assistance will contribute approximately the same amount to rent and utilities, roughly 30 percent of their total expenditures. This implies that these households would be more likely to seek better quality or higher valued apartments, given their rental subsidy, and less likely to reduce their contribution toward the rental payment so as to free up income for other goods. Whatever budgetary substitution they make would be to the purchase of more food.

Renters who received assistance allocated 29 percent of their budget to food, compared with only 25 percent of renters who did not receive assistance. Much of this difference could be explained by the fact that the former were more likely than the latter to receive food stamps. The negative coefficient on health care indicates that renters who received larger subsidy amounts spent less on health and personal care. This perhaps indicates, in turn, that a large proportion of the subsidized group may receive medicaid and have very little out-of-pocket health care expenditures. There may also be correlations among health care expenditures, age of household members, and rental assistance that are unaccounted for or misspecified in the models.

Table 6. **Estimated elasticities for selected expenditure categories, 1989**

Category	Income		Subsidy
	Receiving rental assistance	Not receiving rental assistance	
Food	[1].57	[1].79	[1].12
Rent and utilities	[1].51	[1].87	−.01
Transportation	[1]1.78	[1]1.33	−.12
Apparel	[1]1.32	[1]1.45	−.07
Entertainment	[1]1.58	[1]1.94	.02
Health and personal care	[1]2.15	[1]1.58	[1]−.12
Housewares	[1]2.72	[1]2.90	.21

[1] Elasticity significantly different from zero at 95-percent confidence interval.

NOTE: Elasticities are calculated at the mean income and mean expenditure values.

Conclusions

The analysis presented in this article supports the thesis that there are demographic differences between renters who receive housing assistance and renters who are eligible for, but do not receive, such assistance. These differences help to explain some of the variation in the distribution of total expenditures between the two groups. A large proportion (40 percent) of the first group is made up of single parents, and almost 30 percent of the group are over the age of 55. By contrast, those in the second group are more likely to be younger and single. The greatest difference between the two groups is that almost two-thirds of all renters who receive assistance are unemployed, retired, or not working for some other reason. This fraction is much lower for renters who are eligible for, but do not receive, assistance—about one-third.

The analysis further supports the idea that rental assistance programs are effective in reducing the cost burden of shelter for low-income households: while renters who were eligible for, but did not receive, assistance allocated more than 40 percent of their total expenditures to rent and utilities, those receiving assistance allocated only about 30 percent to this major category, a budget share just slightly greater than the 28 percent allocated to the category by renters who were ineligible to receive housing assistance. With the exception of transportation, renters receiving assistance allocated a greater percentage of their budget to all other expenditure categories, compared with renters who were eligible for, but did not receive, assistance. In fact, their spending pattern more closely mirrored that of the ineligible group.

Income elasticities for selected expenditure categories also proved to be slightly different between renters who did and renters who did not receive assistance. Elasticities for food, rent and utilities, and entertainment were lower for the former group, compared with the latter, while elasticities for apparel and housefurnishings were not significantly different between the two groups.

While there are differences in expenditures between the groups, the regression analysis suggests that rental assistance has more of a housing effect (increasing housing expenditures) than a welfare effect (reducing the rent burden). On average, renters who received assistance allocated 10 percent less of their total budget to rent and utilities than did renters who were eligible for, but did not receive, assistance. Further, the second set of regression tests indicated that those receiving assistance are more likely to seek higher valued housing and, regardless of the rental subsidy amount, spend roughly 30 percent

of their income on shelter. The "subsidy" elasticity for rent and utilities turned out not to be significantly different from zero, indicating that the value of the rental subsidy had little influence on rent expenditures among recipients. Rental assistance proved to have a significant influence only on food and health care expenditures, even after controlling for differences in income and demographics. Correlations among food stamp subsidies, medicaid coverage, and rental assistance that were unaccounted for in the regression models may have contributed to this result. In any event, the result does suggest that any budget substitutions that may be made because of the rental subsidy would most likely be in the direction of increased food spending.

Footnotes

[1] Dolores Hayden, *Redesigning the American Dream: The Future of Housing, Work, and Family Life* (New York, W. W. Norton and Company, 1986), p. 122.

[2] Department of Health and Human Services, *Social Security Bulletin*, Vol. 54, No. 9, 1991.

[3] *Characteristics of HUD-Assisted Renters and Their Units in 1989* (Department of Housing and Urban Development, March 1992), p. 4.

[4] To identify public housing and privately owned housing projects that received rental assistance, HUD asked all public housing authorities and all private sponsors of subsidized multifamily rental projects to list the mailing addresses of all units in the projects under their management that received such assistance. The Census Bureau matched these addresses with those of the approximately 17,000 renters responding to the American Housing Survey, who represent the 33,767,000 total renter households in the United States. Each respondent in the sample represents about 2,000 renters. Public housing units were matched separately, and all other subsidy programs were matched as a group. Of the 1.3 million public housing units reported to HUD, 221 cases were matched, so that each respondent identified as belonging to this category represents more than 6,000 units. Of the 1.5 million other permanently subsidized respondents reported to HUD, 298 were matched, representing 5,500 units each.

[5] "8 Facts About Section 8" (Department of Housing and Urban Development, 1992).

[6] Actually, the tenant must pay the highest of the following alternatives: (1) 30 percent of gross monthly income, adjusted for family size; (2) 10 percent of gross monthly income; (3) for families receiving welfare assistance, the portion of such assistance designated as the monthly housing cost for the family.

[7] The maximum housing voucher subsidy is set by the difference between the payment standard and 30 percent of the household's monthly adjusted income. For example, if the payment standard for a particular metropolitan statistical area is $525, and an eligible household's monthly adjusted income equals $800, the maximum housing voucher subsidy would be $285. The local public housing administration would pay this amount to the landlord on behalf of the family. If the total rent equals the payment standard of $525, the family would have to pay only $240 out of its own pocket. However, if the family can find acceptable housing that rents for less than $525, the public housing administration would still pay $285, and the family's share would be less than $240. The only restriction in the program is that recipients must pay at least 10% of their gross monthly income toward rent and utilities.

[8] See Katherine Bradbury and Anthony Downs, eds., *Do Housing Allowances Work?* (Washington, DC, The Brookings Institution, 1981).

[9] Eric A. Hanushek and John M. Quigley, "Market Effects," in Bradbury and Downs, *Do Housing Allowances Work?* p. 236.

[10] Data were selected from interviews collected in 1988–90 for the following reasons: (1) 3 years of data were necessary to obtain large enough sample sizes for statistical analysis; (2) data were required to center around calendar year 1989 so that data from the CE Survey could be compared with 1989 data from the American Housing Survey; and (3) the 1991 redesign of the CE Interview Survey questionnaire dropped the question that asked how much rent was paid by anyone who was not a member of the consumer unit. This means, of course, that the analysis presented is restricted to data collected prior to 1991.

[11] HUD classifies households in the lower end of the income distribution as (1) low-income households, that is, those households with income less than or equal to 80% of the median household income of the geographic area in which they are located, and (2) very low income households, that is, those households with income less than or equal to 50% of the median household income of the geographic area in which they are located.

[12] See H. S. Houthakker and Lester D. Taylor, *Consumer Demand in the United States* (Cambridge, MA, Harvard University Press, 1970), p. 59.

[13] Food includes both food at home and food away from home. Rent is defined as the consumer unit's contribution to the total rental charge, plus any utility expenses. Transportation expenditures include the monthly principal and interest paid for the purchase of an automobile if the automobile was purchased and financed; the net purchase amount for a vehicle purchased without financing; expenditures for gasoline and motor oil; and other vehicle expenses, such as maintenance and repair costs. Apparel expenses include expenses for clothing, footwear, jewelry, and other clothing products and services. Health care expenditures include (1) health insurance premiums and the consumer unit's contribution to expenses for total medical services, drugs, and medical supplies and (2) expenditures for personal care products and services. Expenditures for household furnishings and operations include those for personal services such as babysitting, other household services, housekeeping supplies, household textiles, furniture, appliances, floor coverings, and miscellaneous household equipment.

[14] See Houthakker and Taylor, *Consumer Demand*, p. 59. Total expenditures equal the BLS published definition, minus personal insurance and pensions and vehicle monthly payments, instead of net purchase price and interest.

[15] Because an intercept was calculated in the regression model, it was necessary to remove one variable from each group of dummy demographic variables modeled in the regression. These *control dummies* are listed in table 4.

[16] See Jean Kinsey, "Probit and Tobit Analysis," paper presented at American Council of Consumer Interest Conference, Atlanta, Apr. 11–14, 1984.