Geographic Mobility in the Housing Choice Voucher Program: A Study of Families Entering the Program, 1995–2002

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Abstract

This article presents the results from a study examining the geographic mobility of families with children that entered the Housing Choice Voucher Program between 1995 and 2002. Using a specially constructed longitudinal data set developed from U.S. Department of Housing and Urban Development administrative records, it analyzes the residential moves made by these families to see whether moves within the voucher program—particularly moves after the initial lease up—are associated with improvements in the neighborhoods where the families live and/or with increases in their economic self-sufficiency. We find that subsequent to program entry (that is, after the moves to lease up), a small but consistent tendency exists for families making later moves to choose slightly better neighborhoods. The data show reductions across a number of indicators of concentrated poverty and improvements across a number of neighborhood opportunity indicators for households that moved.

Introduction

Nationwide, the Housing Choice Voucher (HCV) Program assists 1.9 million households and is the largest of the federal housing assistance programs. The goals of the HCV Program, which provides tenant-based housing assistance, include better housing quality, more geographic mobility, and increased self-sufficiency for very low-income renters, in addition to alleviating their housing affordability problems. Among these goals, geographic mobility is the one on which the U.S. Department of Housing and Urban Development (HUD) has placed increased emphasis in recent years—by, for example, changing maximum rents in some metropolitan areas to make a larger portion of the rental stock accessible to program participants[1] and rewarding local program administrators for encouraging participants to locate in better quality neighborhoods.[2]

Moving to better neighborhoods is expected to benefit voucher program participants, providing access to more pleasant living environments, better services, and lower exposure to crime. For families with children, neighborhood quality is believed to be particularly important because it may help parents become more economically self-sufficient and may increase the life chances of children through such mechanisms as positive role models and better quality education.[3]

To what extent do HCV participants use their vouchers to move to better quality neighborhoods? Previous research has found that, among families first entering the HCV Program, those that use their voucher to move to a new location are not much more likely to locate in low-poverty neighborhoods than families that use their voucher to lease in place.[4] It may be, however, that families are able to get to lower poverty neighborhoods as a result of *subsequent* moves.

The question addressed in this study is whether greater HCV participant geographic mobility is associated with improved neighborhood quality and increased economic self-sufficiency. Because it appears that first-time movers do not usually improve their neighborhood quality, we examine whether improvements in neighborhood quality occur more often on second or subsequent moves and for which participants. We also examine which participants are most likely to move and whether longer distance moves are associated with larger improvements in neighborhood quality.

Background

In a report published early in 2003 (Devine et al.), HUD analysts examined the residential locations of HCV participants and the implications of those locations for participant and neighborhood welfare. Using microdata on the characteristics of HCV participants linked to 1990 census data, the report analyzed participant locations relative to the supply of affordable rental housing, the poverty rates in the neighborhoods where participants were living, the relationship between those poverty rates and participant welfare, and whether the presence of concentrations of program participants might adversely affect neighborhoods.

HUD's report provided a valuable snapshot of the HCV Program, showing that HCV-assisted families are residing in most neighborhoods with affordable rental housing, that more than half of the participants live in neighborhoods with poverty concentrations below 20 percent, and that few neighborhoods have high concentrations of HCV-assisted households (Devine et al., 2003). But the report also noted that

> . . .[F]or families who move to a new location upon first entering the program, the study shows that there is not much benefit in terms of avoiding poverty concentrations. Mover households are only slightly more likely than non-movers to avoid neighborhoods with moderate- and high poverty concentrations. It may be that families are able to get to lower-poverty neighborhoods as a result of subsequent moves, *but determining whether, or how often, this happens is beyond the scope of this study* [italics added for emphasis] (Devine et al., 2003: ix).

The limitation noted in HUD's report represents the starting point for the present research effort.

The present study has two important advantages over the earlier study, enabling us to address the core question. The first advantage stems from the enhanced HCV Program data we were able to use. HUD has constructed a data file with longitudinally linked records of HCV participants spanning 8 years, from 1995 to 2002. The longitudinal structure allows us to examine sequences of moves over time. Further, because the file contains records for the same households from the public housing and project-based

assisted housing programs (if a program change was made), it also allows analysis of patterns of HCV Program entry from public or assisted housing developments and how this might affect location.[5]

The second advantage this study enjoys is the availability of census tract-level data from the 2000 Census. During the 1990s, marked changes took place in the concentration of poverty in many U.S. cities (Jargowsky, 2003; Kingsley and Pettit, 2003). Between 1970 and 1990, there had been a trend of increasing poverty concentration in many large American cities, which had alarmed researchers and policymakers concerned about the effects of such environments on those living in neighborhoods with high poverty rates (Jargowsky, 1997; Wilson, 1987, 1996). Between 1990 and 2000, however, the proportion of low-income people living in high-poverty census tracts (those with poverty rates of 40 percent or more) declined. Although 17 percent of the metropolitan poor were living in concentrated poverty areas in 1990, this share fell to 12 percent in 2000. At the same time, the number of low-income families living in mid-range neighborhoods increased. Balancing the 5-percent population reduction in the concentrated poverty tracts were increases of 5 percent in the tracts with 10- to 30-percent poverty rates (Kingsley and Pettit, 2003). Use of the most recent census data enables this study to update the picture of HCV locations from the HUD report as they relate to the mobility of voucher families with children.

Data and Methods

Longitudinal Data on HCV Participants

The primary data source for this analysis was HUD's longitudinal Multifamily Tenant Characteristics System (MTCS)/Tenant Rental Assistance Certification System (TRACS) file, an 8-year file with household-level data for all recipients of federal housing assistance over the years 1995 through 2002.[6] We restricted our analysis to recipients of Section 8 certificates, Section 8 vouchers, and Housing Choice Vouchers.

This data set provided annual information on each HCV participant's household composition, employment, amount and sources of income, and unit location during the period of program participation. The data also contained geocode information for most unit addresses—about 87 percent of the more than 10 million certificate and voucher records from 1995 through 2002. Records from 1995 had the worst geocoding rate, about 60 percent. The more recent years had geocoding rates of 80 percent or more.

The longitudinal HCV data set provides a tremendously rich source of information about participants in the HCV Program; however, the data set also poses several unique challenges for analysts. We made the following choices when constructing the analytical file used in this paper.

- **Discontinuities in the longitudinal data.** Just under half the sample households (48 percent) had possible missing records over the period of observation. About 31 percent had one single-year discontinuity in the observed time series, while the remaining households had multiple single-year discontinuities (11 percent), longer (multiyear) discontinuities (8 percent), or both (2.5 percent.) Such discontinuities could represent missing data during a continuous period of HCV participation, or they could mean the household exited and reentered the program. Due to this ambiguity, all observations with data gaps of more than 1 year were dropped from the sample. This restriction reduced the number of analysis households from 650,658 program entrants to 628,124. We retained participants with multiple gaps in their sequence of records as long as none of the individual gaps were more than 1 year in length. A single-year gap in records (in which no program exit or entry was indicated in the data) was assumed to represent continuous program participation.

- **Discontinuities and geographic mobility.** Some households with discontinuities in the observed time series were at different addresses before and after the discontinuity. Lacking information on when the move actually occurred, we used simple interpolation between the effective dates of the two records to infer a move date.

- **Using all sources of information on preprogram location.** In most of the records for new program entrants in the longitudinal file, the only information provided about preprogram location was the household's ZIP Code before admission. A small percentage of households were participating in another housing assistance program immediately before entering the HCV Program, so that preprogram address data (geocoded to the census tract level) were available for them. In these cases (just less than 5 percent of the analysis sample), we used the data to obtain tract-level neighborhood characteristics data on households' prior neighborhoods.

- **Identifying participants who leased in place at program entry.** The HCV longitudinal data set contains a variable for each year indicating whether the family moved into the housing unit that year (the "family-moving-into-unit" indicator). Theoretically, for the initial year of HCV participation, this indicator would tell us whether the household leased in place or moved to use the housing voucher. This variable, however, is known to be frequently missing or unreliable. Therefore, we took advantage of additional information to build a more accurate indicator of entry moves. We compared preprogram address (where present) or ZIP Code to initial program address or ZIP Code to supplement information from the family-moving-into-unit indicator.[7]

- **Identifying moves during HCV participation.** The availability of address data in the HCV file, combined with warnings about the family-moving-into-unit indicator, led us to develop an independent way to identify moves for analysis of mobility during HCV participation. Our approach used geocode data (the latitude and longitude of the unit address) to calculate the distance between pairs of consecutive locations.[8] After examination of the data, we adopted a decision rule that distances of a quarter mile or more (at least 1,320 feet) would be treated as moves, with a new "mover flag" set to 1 for the records with these distances. For cases with positive distances smaller than a quarter mile, the "mover flag" was set to 0 so that they were treated as nonmovers in the mobility analysis.

U.S. Census Data

We used census tract-level data from 1990 and 2000 and census ZIP Code-level data from 2000 to measure neighborhood characteristics for each dwelling occupied by a household in the HCV sample. After defining a set of variables to characterize the locations of the study sample, tract-level or ZIP Code-level census variables were linked to HCV locations. These measures were used to characterize the areas where sample members lived when they entered the HCV Program and where they were living each year during the period covered by the HUD longitudinal data file. Interpolations were used to estimate the value of each neighborhood characteristic measure between the years covered by the HCV longitudinal file—1995 and 2002.[9]

We were able to construct neighborhood indicators for preprogram locations for 57 percent of the analysis sample. Where tables in this report use preprogram location information, the sample for the comparison with program addresses is therefore restricted to the 57 percent of cases for which we have both preprogram and program addresses.[10]

The Study Sample

This study focuses on families with children that entered the HCV Program between 1995 and 2002. We restricted the sample to families with children and with heads that

were neither elderly nor disabled, because this is the population using vouchers for whom mobility might offer benefits that are particularly associated with neighborhood quality.

We further restricted the data to those households that were observed entering the HCV Program during the time span covered in the HUD data. We defined program entrants as households with a certificate or voucher record from the MTCS recording a transaction type of "new admission." We had to augment this definition, however. This period of time included the conversion of households participating in the predecessor Section 8 certificate and Section 8 voucher programs to the HCV Program. Some housing authorities coded records as "new admission" when participants' subsidies were converted from certificates to vouchers. To ensure that we did not inadvertently code program conversions as program entries, we applied the following criteria:

- First, for each household head with any certificate or voucher records during this time span, we examined all records that existed before the effective date in the "new admission" record. If there was another HCV record (either voucher or certificate) for that participant in the 2 program years prior to the "new admission" record, we did not consider the "new admission" transaction flag to be a valid indicator of program entry (because it is unlikely that the household would have exited and reentered the program within such a short time) and we treated the household as an ongoing participant, excluding it from the "new entrants" sample.

- If there was a prior HCV record for that participant, but the record date was more than 2 program years prior to the "new admission" record, we examined the transaction type of the prior HCV record. If the transaction type was "end of participation," then we considered the "new admission" record to be a valid indicator of program entry. Otherwise, we did not consider the "new admission" record to be valid and we did not retain the household in the sample.

- Third, a household was considered as a valid program entrant only if the listed date of admission to the program was equal to the effective date of the program entry record. Applying this rule was another way of ensuring that we were identifying true program entrants rather than ongoing participants who had a miscoded transaction type.

After applying these decision rules for defining program entry, we found that, of the 2.2 million families with children with any HCV records in the original file, some 628,000 were identified as HCV Program entrants over the period of observation. Exhibit 1 summarizes the number of households retained in the study sample out of the total data file provided by HUD.[11, 12]

Exhibit 1

Summary of Sample Selection

Included in Sample	Number	Percentage of All Households	Percentage of Families With Children
All households in MTCS/TRACS file, 1995–2002	8,856,409	100	—
Nonelderly, nondisabled households with children, with any certificate or voucher participation	2,220,994	25.1	100
Nonelderly, nondisabled households with children, with reliable records indicating HCV entry between 1995 and 2002	628,124	7.1	28.3

Source: HCV Longitudinal Data File

Entry to the HCV Program in the Analysis Sample

The sample of families with children entering the voucher program between 1995 and 2002 contains a substantial number of cases entering the program each year, as shown by the "new admission" markers in the data. Between 9 and 13 percent of the sample entered the program in each of the first 5 years. This number increased to 15 percent in 2000. Households entering in the final 2 years (2001 and 2002) account for almost 30 percent of the sample (14 percent each). This increase in the last 3 study years could be a result of increased resource use in the HCV Program (more program entrants as Public Housing Authorities attempted to increase the total number of vouchers under lease), better reporting by the agencies administering HCVs, or both.

Exits From the HCV Program vs. Exits From the Sample

Because of the longitudinal nature of the data set, we also expected to be able to make use of sample data on exits from the voucher program. The correct way to do this would be to use the "end of participation" markers that are in the data (one of the transaction types filled in by the housing authority or property manager). A fairly small proportion of the families (22.7 percent), however, have a program exit code in their last records.[13] Most families have codes in the last records indicating continued participation.

In the years from 1995 to 1999, between 2 and 6 percent of the sample exited the sample—that is, these households had no subsequent records. In 2000, about 8 percent of the sample exited. Cumulatively, 31 percent of the households in the sample had left the program by 2000 and 48 percent had exited by 2001. The remaining 52 percent were in the HCV Program at the end of the observation period. In this study, we treat the sample exits as equivalent to program exits, although they could also result from missing reports.

Sample Households' Duration in the HCV Program

Based on the families' first and last records in the longitudinal file, about 25 percent of the households in this sample of voucher program entrants are present in the longitudinal data set for only 1 year. The remaining 75 percent of the households were in the HCV Program 2 years or more during this observation period. Overall, nearly half the sample households (46 percent) used vouchers for at least 3 years from 1995 through 2002, but less than 30 percent used them for 4 years.

Durations for Those Who Moved or Leased in Place at Program Entry

Three-fourths of all the households in this sample moved at the time they entered the HCV Program. Only 25.2 percent of those families with children leased in place. In general, those leasing in place remained in the program longer during this observation period than those; that moved to lease up; 74 percent of in-place leasers were present in the sample for at least 2 years, compared to 67 percent of those that moved to lease up.

Geographic Mobility Among HCV Participants

According to the HUD longitudinal data, most families with children entering the voucher program during the period 1995 through 2002 did not move again after lease up. Just 18.7 percent of the sample households moved more than a quarter mile (the definition of a move for this analysis) after leasing up in the program. Only 4 percent of the whole sample moved twice or more.[14]

These low observed mobility rates, however, may be due, in part, to the cutoff of the longitudinal data as of 2002, which limited the observation period for most families to 3 years or less. As discussed above, only a small portion of the sample families have last

reports that are clearly program exits. As a result, it is quite possible that if this time series were continued into 2003 and beyond we would see the families that entered the voucher program in 2000 through 2003 making further moves. Thus, our analysis of mobility rates may somewhat underestimate mobility rates because of the data set's structure.

Only a small portion of the full study sample participated in the voucher program for the entire 8-year period from 1995 through 2002. The average length of time in the program for this sample was 2 years and 11 months, with a median of 3 years. At the same time, the proportion of the sample making a move from the initial program unit to another dwelling increased with length of time in the program.

Exhibit 2 shows that only 14.5 percent of the sample families moved again in their second year of participation. Of those in the program at least 3 years, however, 25 percent made a move from their initial program address. The proportion of movers increased to more than half the households within 6 years and more than 60 percent within 8 years. Of course, these percentages apply to a smaller and smaller number of families because relatively few sample households participated throughout this entire period. The mobility of these families in the first 2 to 3 years may be underestimated because the time series data end in 2002. Recall, also, that the sample cannot include any of the long-term voucher participants who entered the program before the beginning of the longitudinal data set.

Exhibit 2

Moving Behavior of HCV Participants: Timing of Moves, 1995–2002

Characteristic	Moves After Lease Up for All Households (%)	Moves After Lease Up for Those Leasing in Place (%)	Moves After Lease Up for Those Moving at Program Entry (%)
BASE	**Full Analysis Sample**		
HCV Participation Characteristic			
Timing of moves relative to HCV participation:			
Moved within first 2 years	14.5	12.1	15.4
Moved within 3 years	25.2	22.5	26.3
Moved within 4 years	36.8	34.4	37.9
Moved within 5 years	45.3	43.2	46.3
Moved within 6 years	51.5	49.2	52.7
Moved within 7 years	56.6	53.8	58.5
Moved within 8 years	60.8	58.1	63.4

Sample: Families with children entering the HCV Program, 1995 through 2002. Full sample consists of 628,124 families.
Source: HCV Longitudinal Data File

Exhibit 2 also shows that there were some differences in the proportion of movers between families that leased in place and those that moved at HCV Program entry (about three-fourths of the sample households). At each additional year of participation, movers at program entry were more likely to move again than those that leased in place. The differences, however, were only 3 to 5 percentage points.

Geographic Mobility and Neighborhood Characteristics: Preprogram and Initial Program Neighborhoods

Now we turn to the question of neighborhood environments: the characteristics of the neighborhoods where families with children participating in the voucher program were living. HUD's prior research (Devine et al., 2003) used the poverty rate as the key indicator

of quality. The poverty rate—the proportion of people with incomes below the poverty line living in a particular area—has been widely used to identify adverse living environments in the United States and to examine the clustering of negative conditions in concentrated-poverty areas.[15] The poverty rate has also been used as a benchmark for identifying better quality neighborhoods to which voucher holders can be encouraged to move. For example, the Moving to Opportunity (MTO) program—a HUD-sponsored mobility demonstration for families living in public housing in concentrated-poverty areas—required families with special MTO vouchers to seek housing in neighborhoods with poverty rates below 10 percent (Orr et al., 2003). Throughout the remainder of this article, we use not only the poverty rate but also a larger set of neighborhood quality indicators to describe the areas surrounding HCV unit addresses. These measures were calculated from census data for the census tracts where sample households lived during their HCV participation between 1995 and 2002.[16]

The neighborhood quality indicators are listed in exhibit 3. The exhibit's first (upper) panel presents a number of concentrated-poverty indicators: the percentage of people in poverty, the percent of households receiving public assistance income, the rate of high school dropouts, measures of unemployment and labor force participation, and so on. The next (middle) panel presents several opportunity indicators—the types of neighborhood characteristics thought to benefit low-income families able to move to lower poverty areas. This group includes a measure of higher incomes relative to the poverty line, measures of post-secondary education among adults and current school of youths, and an indicator of how many dwellings are owned by their occupants. The last (bottom) panel of the exhibit shows measures of the neighborhoods' racial and ethnic composition.

Exhibit 3 provides a snapshot of the preprogram neighborhoods and initial locations of the families in the study sample. In the first two (unshaded) columns, it compares the neighborhood characteristics for the portion of the sample with both locations known, which is just under 60 percent of all the families in the study. Then, in the shaded column, it shows the characteristics of the initial HCV location for the entire sample. They are virtually identical to the locations for the portion of the sample with preprogram addresses.

The overall pattern is for families with children entering the HCV Program in this period to move to neighborhoods with about a fifth of the population living in poverty. Three-fourths of the households in these neighborhoods have earnings from employment, and about 40 percent of the adults have some education beyond high school. Just more than half the households own their own homes. Consistent with the findings reported by Devine et al. (2003), these neighborhoods are not better off on average than the neighborhoods from which participants moved.

Geographic Mobility and Neighborhood Characteristics: Characteristics of Subsequent Neighborhoods

As noted earlier, fewer than one in five of the sample families moved again during the period between 1995 and 2002. There is considerable interest, however, in these movers and whether they choose better neighborhoods in the next units they rent with HCVs.

Exhibit 4 focuses on the movers in the sample and compares neighborhood indicators for their first and second voucher locations. It shows small changes in characteristics—reductions in the factors associated with concentrated poverty and increases in the opportunity indicators. These changes are in the desired direction but are very small and probably do not indicate any material difference in local conditions.

Exhibit 3

Neighborhood Characteristics of HCV Participants' Preprogram and Initial Program Locations

Neighborhood Characteristic	Preprogram Location[a]	Initial HCV Location[b]	Initial HCV Location
	Sample with Pre- and Post-Lease-Up Addresses		Full Analysis Sample
Concentrated Poverty Indicators for the Sample's Residential Locations (%)			
People in poverty	18.4	20.1	20.0
Households receiving public assistance income	6.4	7.3	7.3
Female-headed families with own children	28.9	32.4	32.3
High school dropouts	15.7	16.6	16.6
Unemployment rate	8.2	8.8	8.7
Labor force participation			
Males	67.7	67.9	68.1
Females	55.5	55.7	55.8
Families with no workers	14.6	14.8	14.7
Opportunity Indicators for the Sample's Residential Locations (%)			
People with incomes twice the poverty level	60.4	57.2	57.3
Households with wage or salary income	75.4	75.5	75.6
People with education beyond high school			
Some college	20.2	20.3	20.3
College graduate	23.4	21.4	21.3
16- to 19-year-olds in school	76.3	74.3	74.2
Owner-occupied housing	59.0	54.1	54.2
Racial and Ethnic Composition of Population (%)			
African American	22.1	24.7	24.4
Hispanic	13.6	14.2	14.2
Minority	40.7	43.8	43.6

Sample: Families with children entering the HCV Program, 1995 through 2002. Full sample consists of 628,124 families; families with known preprogram and initial HCV location addresses N = 359,978 (57.3 percent of the full sample). A family is defined as a household with a head who is neither elderly nor disabled and with at least one child under 18.

[a] Preprogram address characteristics are based on the ZIP Code of the preprogram location.

[b] Program address characteristics are based on the census tract of the initial program location.

Notes: Neighborhood characteristics are shown as of the year of the initial location (the first year of HCV participation) or the preprogram year. They were estimated using a simple linear interpolation over the decade between the 1990 Census and the 2000 Census. For example, if the 1990 poverty rate in the destination census tract was 8 percent but in the 2000 Census it was 12 percent, over the decade the rate was assumed to change by .4 percent a year. For a lease up in 1995 in this tract, the estimated poverty rate at that time would be about 10 percent. (The formula used the actual date of the program move and estimated the poverty rate based on days elapsed from April 1, 1990.)

Sources: U.S. Census, HCV Longitudinal Data File

Just 4 percent of the study sample moved a second time. Extending our look at the subsequent neighborhoods of HCV movers shows that all of the concentrated-poverty indicators are reduced at each move, although the changes are very small. All of the opportunity indicators rise, again in very small steps. Because the percentage of participants that move multiple times is quite small, it is difficult to say whether these changes represent material improvements ***on average*** for all participants, but the pattern of movement in the direction of better neighborhood conditions is clear.

Exhibit 4

HCV Movers: Neighborhood Characteristics of First and Next Program Locations[a]

Tract Characteristic	Initial HCV Location	Second HCV Location
	All Movers in Full Analysis Sample	
Concentrated-Poverty Indicators for the Sample's Residential Locations (%)		
People in poverty	20.6	19.5
Households receiving public assistance income	7.7	6.7
Female-headed families with own children	33.8	33.0
High school dropouts	17.0	16.4
Unemployment rate	8.9	8.6
Labor force participation		
Males	68.5	68.5
Females	56.2	56.7
Families with no workers	14.7	14.1
Opportunity Indicators for the Sample's Residential Locations (%)		
People with incomes twice the poverty level	56.4	57.9
Households with wage or salary income	75.9	76.7
People with education beyond high school		
Some college	20.3	21.0
College graduate	21.0	21.8
16- to 19-year-olds in school	73.3	74.1
Owner-occupied housing	53.0	55.1
Racial and Ethnic Composition of Population (%)		
African American	27.1	26.8
Hispanic	13.8	14.4
Minority	45.7	46.5

Sample: Families with children entering the HCV Program, 1995 through 2002, that moved at least once during that period. N = 117,671 (18.7 percent of family entrants in this period). A family is defined as a household with a head who is neither elderly nor disabled and with at least one child under 18.

Note: All neighborhood data are measured at the census tract level.

[a] Neighborhood characteristics are shown as of the year of the initial location (the first year of HCV participation) or the year of the next move. They were estimated using a simple linear interpolation over the decade between the 1990 Census and the 2000 Census. For example, if the 1990 poverty rate in the destination census tract was 8 percent but in the 2000 Census it was 12 percent, over the decade the rate was assumed to change by .4 percent a year. For a lease up in 1995 in this tract, the estimated poverty rate at that time would be about 10 percent. (The formula used the actual date of the program move and estimated the poverty rate based on days elapsed from April 1, 1990.)

Sources: U.S. Census, HCV Longitudinal Data File

Who Moves in the Voucher Program?

Up to this point, we have examined the characteristics of the neighborhoods where HCV entrants lived between 1995 and 2002 with reference only to the households' mobility behavior. Now we turn to the question of whether household characteristics or preprogram neighborhood characteristics made a difference in mobility behavior among participants. Because mobility appears to be associated with at least small neighborhood improvements, there may be subgroups among the HCV entrants that moved more and realized greater changes in neighborhood conditions.

The families with children entering the voucher program in this period varied in size, in the age composition of their members, in the age of the household heads, in their income sources and levels, and in their race or ethnicity. Exhibit 5 shows how the families' moving behavior was related to these characteristics.[17] Smaller households of one or two members (about a third of the sample) were more likely to move to lease up. But after lease up, the largest households (with five or more members, making up 15 percent of the sample) were somewhat more likely to move, both at least once and more than once.

Exhibit 5

Moving Behavior of HCV Participants: Probability of Moving, 1995–2002

Characteristic	Proportion Moving on Lease Up	Probability of Moving At Least Once	Probability of Moving More Than Once	Probability of Moving At Least Once	Probability of Moving More Than Once
	Full Sample	Leased in Place		Moved at Lease Up	
Base		Full Analysis Sample			
Household Characteristics (%)					
Number of HH members:					
1 or 2	76.1	18.8	4.3	17.6	3.6
3 or 4	74.6	20.4	5.0	18.6	3.8
5 or more	72.7	21.5	5.2	18.7	3.9
Children present:					
Age 3 or younger	76.5	21.9	5.5	19.6	4.2
Ages 4–5	75.0	22.9	5.8	20.4	4.5
Ages 6–12	73.6	21.0	5.1	18.5	3.8
Ages 13–17	72.1	17.3	3.7	15.3	2.7
Number of adults in HH:					
1	75.7	21.5	5.3	19.1	4.0
2	72.1	14.9	2.9	14.5	2.5
3 or more	67.9	12.1	2.3	12.1	1.8
Age of HH head:					
24 or younger	78.3	23.2	6.5	20.7	4.7
25–44	73.6	19.6	4.5	17.6	3.4
45 or older	71.0	13.7	2.6	13.4	2.3
Total HH income:					
< $5,000	76.6	23.8	6.7	21.4	5.1
$5,000–$9,999	74.0	21.9	5.4	20.0	4.2
$10,000–$14,999	73.5	17.7	3.6	16.3	2.8
$15,000–$19,999	74.6	14.6	2.5	13.0	1.8
$20,000 or more	76.2	10.5	1.4	8.9	1.0
Total HH wages:					
< $5,000	74.2	23.1	6.0	21.1	4.8
$5,000–$9,999	75.1	17.7	3.9	16.6	2.9
$10,000–$14,999	75.2	15.3	2.7	14.3	2.2
$15,000 or more	77.1	11.6	1.7	10.7	1.2
Total income from TANF:					
< $2,500	75.5	18.0	4.0	16.2	3.0
Total income from TANF:					
$2,500–$4,999	75.5	24.6	6.8	23.6	5.7
Total income from TANF:					
$5,000 or more	70.7	23.9	5.9	21.9	4.9
Race of HH head:					
White	73.5	16.1	3.4	15.8	2.9
African American	76.8	26.1	6.9	21.5	4.8
Asian/Pacific Islander	69.4	17.2	3.4	14.0	2.3
American Indian/ Alaskan Native	73.4	15.8	4.0	13.8	2.3
HH head is Hispanic	74.2	19.9	5.1	16.0	3.1
All Households	**74.8**	**20.1**	**4.8**	**18.3**	**3.7**

Sample: Families with children entering the HCV Program, 1995 through 2002. Full sample consists of 628,124 families.

Source: HCV Longitudinal Data File

Moving behavior also varied with the ages of children in the families: households with teenagers (about 16 percent of these families) moved less than those with preschool age children (about a third of the sample). The number of adults in the household and the age of the head both were associated with differences in rates of moving while participating in the voucher program. Families with only one adult (81 percent of the sample) and families with young heads (26 percent of the sample) were more mobile than households with more adults or older heads.

Turning to financial characteristics, exhibit 5 shows mobility patterns in relation to total household income and to the amount of income from wages or Temporary Assistance for Needy Families (TANF). Within the program's income limits, households with more income overall—and those with more wage income—were more likely to move to lease up in the HCV Program. Those with higher amounts of TANF assistance were less likely to move to lease up. After program entry, however, those with higher total incomes and more wage income moved less, regardless of the way they entered.

There were also differences in moving behavior associated with the race of the household head. African Americans—who made up 43 percent of the sample—were the group with the largest proportion of moves to lease up (more than 75 percent) and the highest probability of moving after HCV Program entry. In fact, African Americans showed strikingly higher rates across all the mobility indicators than the other racial or ethnic groups. Families with Hispanic heads (14 percent of the sample) had about the same rate of moving to lease up, but they were less likely than African Americans to move after becoming voucher program participants.

Moving behavior in this sample also varied with the poverty rate of the household's pre-program address or that of the initial voucher unit (results not shown). Those living initially in low-poverty neighborhoods were the least likely to move after becoming voucher program participants, no matter whether they leased in place or moved to their first program unit. Households living in neighborhoods with poverty rates between 20 and 39 percent showed the highest move rates, while these rates were somewhat lower for the families in the poorest neighborhoods. It seems surprising that the families in the most adverse environments did not move more, but this may be due to other factors (for example, the households' characteristics).

The Timing and Direction of HCV Mobility Behavior

We now take a more direct look at the changes in neighborhoods made by HCV participants in this sample and ask what may have influenced their patterns of movement. One factor that may well have shaped the mobility experience of voucher program participants in this period was the general condition of the U.S. economy and its rental housing markets. The late 1990s saw the culmination of a long economic expansion, which reached virtually every part of the country and led to rising home prices and rents in many places. Anecdotal evidence from operators of the HCV Program pointed to the tightening rental market as a factor pushing participants out of low-poverty neighborhoods (as rents increased more rapidly there) and into areas with greater proportions of low-income residents. Under this scenario, deconcentration gains made during the early and mid-1990s did not last; instead, voucher holders had to seek units in poorer neighborhoods where the rents still fell within program requirements.

Exhibit 6 shows the pattern of movement among our sample of families with children entering the voucher program between 1995 and 2002. By calendar year, it categorizes moves according to the poverty levels of the locations from which the participant households were moving and the poverty levels of their destination addresses. In this table, we use the following fairly large categories:

- Low-poverty areas are defined following the convention of MTO (less than 10 percent poverty).
- Mid-level poverty areas are defined as all those with poverty rates between 10 and 39 percent.
- High-poverty areas are defined according to the usual threshold for concentrated poverty areas (40 percent or more).

Exhibit 6

Moving Behavior of HCV Participants: Comparison of Premove and Postmove Neighborhoods, By Year of Move[a]

	1996 (%)	1997 (%)	1998 (%)	1999 (%)	2000 (%)	2001 (%)	2002 (%)
Moves from LP to:							
LP	10.2	9.4	8.5	8.7	9.6	9.6	10.6
MP	10.2	9.7	9.1	9.4	9.4	8.7	9.0
HP	0.3	0.3	0.3	0.2	0.5	0.4	0.3
Moves from MP to:							
LP	10.5	10.9	10.8	11.5	12.1	12.9	13.9
MP	59.0	60.2	60.1	59.5	57.9	57.1	55.0
HP	3.5	3.5	4.2	3.9	3.8	4.0	4.1
Moves from HP to:							
LP	0.4	0.4	0.4	0.5	0.6	0.6	0.6
MP	4.1	4.1	5.0	4.5	4.5	4.9	4.7
HP	1.9	1.5	1.7	1.7	1.8	1.9	1.8
All moves	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total number of moves	6,496	12,327	18,663	21,917	18,803	21,488	35,999

Sample: Families with children entering the HCV Program, 1995 through 2002, that moved during that period. Family entrants made 135,693 moves in this period.

[a] Includes moves after lease up only.

Notes: LP indicates neighborhoods with poverty rates below 10 percent.
MP indicates neighborhoods with poverty rates from 10 to 39.9 percent.
HP indicates neighborhoods with poverty rates of 40 percent or more.
Percentages may not add to 100 percent due to rounding.

Sources: HCV Longitudinal Data File, 2000 Census

Across the 7 years in the table, there does seem to be a smaller proportion of moves to low-poverty areas from 1997 through 1999 and a larger proportion leaving mid-level poverty areas in those years. In 1996 and 1997, about 21 percent of the HCV moves by recent program entrants were to low-poverty neighborhoods—10.2 percent from other low-poverty locations and 10.5 percent from areas of mid-level poverty. In 1998 and 1999, the shares were lower (19.3 percent and 20.2 percent, respectively), and a greater share of movers went to areas of mid-level poverty. Then, in 2000 through 2002, the share of all moves to low-poverty areas rose from 22 to 25 percent.

These changes, however, were relatively small, in part because of the low mobility rates among a sample relatively new to the program. Conducting this analysis on a similar sample for a longer period, or on the full set of program participants (including those entering the program before 1995 and those for whom information on entry date is missing) might show stronger patterns.

Multivariate Analysis

Now we turn to a multivariate examination of the relationship of mobility among voucher recipients to the quality of recipients' neighborhoods and to recipients' economic self-sufficiency. Neighborhood quality is measured by two outcomes: the poverty rate and the owner-occupancy rate in the last neighborhood in which the family is observed in the program. Economic self-sufficiency is measured by three outcomes: total household income, the percentage of income that is earned, and the percentage of income from welfare for the last year in which the family is observed. After examining these basic outcomes, we test whether the relationship between mobility and neighborhood quality varies by race and ethnicity for HCV participants. Finally, we present an analysis of whether *distance moved* is an important determinant of outcomes.

For each outcome, three models are estimated (all using ordinary least squares). The first model includes an indicator variable for "household moved at least once" and tests whether there is a significant relationship between whether a household has *ever* moved (has moved at least once) while in the HCV Program and the outcome variable. The second model includes an indicator variable for "household moved exactly once" and an indicator variable for "household moved more than once"; it addresses whether there is an observable difference in outcomes for households that moved once compared to those moving more than once in the HCV Program. The third model includes an indicator variable for "household moved at least once" and a continuous variable measuring the total number of moves the household made while receiving vouchers. This model tests whether there is a linear relationship between the number of moves and the outcome variable, conditional on a household having moved at least once.

In addition to the measures of mobility just described, a number of covariates are included in every regression, as follows:

- The **maximum distance moved**, as measured by the distance between the household's first HCV location and the farthest HCV location to which they ever subsequently moved, is included to test whether moving longer distances is associated with greater changes in household and neighborhood outcomes.

- The **number of years each household is observed** in the HCV Program is measured with a set of indicator variables, permitting a nonlinear relationship to be estimated between years in the program and each outcome variable.

- **Whether the initial lease up was a move** or was an in-place rental is also included in all model specifications.

- A broad set of **household demographic and socioeconomic characteristics** measured during each household's first year in the HCV Program is included, including controls for household size and the number of children, the race and ethnicity of the voucher recipient, the amount and sources of household income, and the household's income-to-poverty line ration.

- Finally, **characteristics of the neighborhood** in which the household lived during the first year of the HCV Program are also included.

We do not report the results for the covariates in the exhibits for this section, except where they are also used in interaction terms.[18]

Mobility and Neighborhood Characteristics

Exhibit 7 presents results from regressions of the neighborhood poverty rate on measures of mobility. Model 1 indicates that having moved at least once is significantly associated with living in a lower poverty neighborhood. The size of the coefficient on "ever moved" (household moved at least once) is quite small, however. Households that moved lived in neighborhoods that had poverty rates 1.2 percentage points lower than the neighborhoods of those that did not move. This difference is about 6 percent of the mean poverty rate (19.8 percent). Turning to model 2, we see that households that moved exactly once experienced slightly lower levels of neighborhood improvement (a 1.1 percentage point decline in the poverty rate) than households that moved more than once (a 1.5 percentage point decline in the poverty rate), and an F-test confirms that these differences are statistically significant. Model 3 shows evidence of a linear relationship between the number of moves a household makes and further declines in the neighborhood poverty rate. Each additional move after the initial move is associated with a 0.3 percentage point decline in the neighborhood poverty rate.

Exhibit 7

Mobility and Final Year Neighborhood Poverty Rates

Model	Model 1			Model 2			Model 3		
Outcome	Poverty Rate			Poverty Rate			Poverty Rate		
Mean of dependent variable	19.8			19.8			19.8		
R-squared	0.78			0.78			0.78		
Regression sample size	522,182			522,182			522,182		
	Est	SE	pr>t	Est	SE	pr>t	Est	SE	pr>t
Intercept	2.434	0.142	0.000	2.441	0.142	0.000	2.442	0.142	0.000
Moved exactly once				–1.117	0.023	0.000			
Moved more than once				–1.450	0.043	0.000			
Ever moved (moved At least once)	–1.171	0.022	0.000				–0.845	0.044	0.000
Number of Moves							–0.273	0.031	0.000
Farthest distance moved	–0.001	0.000	0.000	–0.001	0.000	0.000	–0.001	0.000	0.000
Moved at program entry	0.031	0.019	0.094	0.031	0.019	0.097	0.031	0.019	0.096

Sample: Families with children entering the HCV Program, 1995 through 2002. Full sample consists of 628,124 families; sample size for each equation is shown in table.

Note: Additional covariates not shown include household size and family structure, race/ethnicity of head, years in program, initial lease-up status, sources and amount of income, and characteristics of first HCV neighborhood. These are described in detail in the text.

Est = Parameter estimate.

SE = Standard error of the estimate.

pr>t = Probability of estimated value using 2-tailed t-test.

Source: HCV Longitudinal Data File

These results are consistent with the descriptive statistics presented above. For example, exhibit 4 shows that, on average, the poverty rate in the last observed neighborhood was about 1.1 percentage points lower than the poverty rate in the first HCV neighborhood for households that move. Finally, it should be noted that *distance moved* is significantly associated with the last year's poverty rate (as we discuss below.)

Exhibit 8 presents results from similar models in which the dependent variable is the percentage of owner-occupied units in the neighborhood. The results are quite comparable to those found for the poverty rate. Model 1 in exhibit 8 shows that households that moved at least once ended up in neighborhoods that had significantly higher rates of owner occupancy compared to households that did not move. The difference was not large, however; movers were located in neighborhoods that had owner-occupancy rates averaging just 2.1 percentage points higher than nonmovers. Against an overall mean owner-occupancy rate of 55 percent, this figure represents a 4-percent difference.

Exhibit 8

Mobility and Final Year Neighborhood Owner-occupancy Rates

Model	Model 1			Model 2			Model 3		
Outcome	Owner-occupancy Rate			Owner-occupancy Rate			Owner-occupancy Rate		
Mean of dependent variable	54.6			54.6			54.6		
R-squared	0.77			0.77			0.77		
Regression sample size	522,182			522,182			522,182		
	Est	SE	pr>t	Est	SE	pr>t	Est	SE	pr>t
Intercept	12.648	0.253	0.000	12.635	0.253	0.000	12.634	0.253	0.000
Moved once				2.028	0.041	0.000			
Moved more than once				2.601	0.076	0.000			
Ever moved	2.121	0.039	0.000				1.606	0.078	0.000
Number of moves							0.431	0.056	0.000
Farthest distance moved	0.001	0.000	0.000	0.001	0.000	0.000	0.001	0.000	0.000
Moved at program entry	–0.073	0.033	0.027	–0.073	0.033	0.028	–0.073	0.033	0.027

Sample: Families with children entering the HCV Program, 1995 through 2002. Full sample consists of 628,124 families; sample size for each equation is shown in table.

Note: Additional covariates not shown include household size and family structure, race/ethnicity of head, years in program, initial lease-up status, sources and amount of income, and characteristics of first HCV neighborhood. These are described in detail in the text.

Est = Parameter estimate.

SE = Standard error of the estimate.

pr>t = Probability of estimated value using 2-tailed t-test.

Source: HCV Longitudinal Data File

Model 2 in exhibit 8 indicates that households that moved more than once did appear to locate in slightly better neighborhoods, as measured using the owner-occupancy rate, compared to households moving only once. Households that moved exactly once lived in neighborhoods where the owner-occupancy rate was 2 percentage points higher than in neighborhoods where nonmovers lived, while the difference was 2.6 percentage points for households that moved more than once. An F-test indicates that this difference was statistically significant. Clearly, however, the effect of additional moves is quite small. Turning to model 3, there is evidence for a very modest linear relationship between the number of moves a household makes and the owner-occupancy rate of its last neighborhood; each additional move after the initial move is associated with about half a percentage point increase in the neighborhood owner-occupancy rate. These results, too, are highly comparable to the descriptive findings presented earlier. For example, exhibit 4 shows that, on average, households that move locate into neighborhoods where the average proportion of owner-occupied homes is 2.1 percentage points higher than in their initial neighborhoods.

Mobility and Family Self-sufficiency

In this section we discuss the estimated relationships between mobility measures and three key indicators of family self-sufficiency: total household income, the percent of household income obtained from earnings, and the percent of household income obtained from cash assistance. These indicators are measured at the last year each household is observed to be participating in the HCV Program.

Overall, the results indicate a weaker relationship between mobility and these outcomes than was observed between mobility and the neighborhood quality outcomes discussed above. There are small but statistically significant relationships between the mobility indicators and (1) total household income and (2) the percent of household income from earnings. The relationship between mobility and the percent of household income from cash assistance, however, is not statistically significant.

Model 1 in exhibit 9 shows that HCV households that moved at least once had slightly lower total incomes in their most recent record than households that never moved.[19] The difference is just $579, however, 5.2 percent lower than the overall mean of $11,111. It appears that moving more than once is associated with a larger reduction in income (model 2). Those that moved multiple times had, on average, $1,097 less in total household income than those that never moved. An F-test indicates that this value is significantly larger than the decrease in income associated with moving exactly once, which is $479. Finally, model 3 shows that there does appear to be a linear relationship between number of moves and total household income; each move is associated with a $488 reduction in household income.

Exhibit 9

Mobility and Final Year Total Household Income

Model	Model 1			Model 2			Model 3		
Outcome	Household Income			Household Income			Household Income		
Mean of dependent variable	$9,500			$9,500			$9,500		
R-squared	0.35			0.35			0.35		
Regression sample size	522,182			522,182			522,182		
	Est	SE	pr>t	Est	SE	pr>t	Est	SE	pr>t
Intercept	$12,068	161	0.000	$12,082	161	0.000	$12,084	161	0.000
Moved once				–479	26	0.000			
Moved more than once				–1,097	49	0.000			
Ever moved	–579	25	0.000				4	50	0.940
Number of moves							–488	36	0.000
Farthest distance moved	–1	0	0.000	–1	0	0.000	–1	0	0.000
Moved at program entry	–97	21	0.000	–97	21	0.000	–97	21	0.000

Sample: Families with children entering the HCV Program, 1995 through 2002. Full sample consists of 628,124 families; sample size for each equation is shown in table.

Note: Additional covariates not shown include household size and family structure, race/ethnicity of head, years in program, initial lease-up status, sources and amount of income, and characteristics of first HCV neighborhood. These are described in detail in the text.

Est = Parameter estimate.

SE = Standard error of the estimate.

pr>t = Probability of estimated value using 2-tailed t-test.

Source: HCV Longitudinal Data File

Exhibit 10 presents the relationship between mobility and the percentage of income from earnings. On average, households that moved at least once had a significantly *lower* percentage of income from earnings than households that never moved (model 1); however, the difference is fairly modest—4.5 percentage points, about 10 percent lower than the overall sample, which averaged 46 percent of income from earnings. Model 2 indicates that households that moved exactly once were 4 percentage points lower in the percent of income from earnings, while households that moved more than once experienced a larger decline—7.4 percentage points—in the percentage of income from earnings relative to households that did not move. An F-test indicates that this difference was statistically significant. Turning to model 3, we find evidence for a linear relationship between the number of moves a household makes and the percentage of income from earnings. Each additional move (after the initial move) is associated with about a 3 percentage point decline in the percentage of income from earnings.[20]

Exhibit 10

Mobility and Final Year Percentage of Income From Earnings

Model	Model 1			Model 2			Model 3		
Outcome	Percent Income From Earnings			Percent Income From Earnings			Percent Income From Earnings		
Mean of dependent variable	0.46			0.46			0.46		
R-squared	0.25			0.25			0.25		
Regression sample size	522,182			522,182			522,182		
	Est	SE	pr>t	Est	SE	pr>t	Est	SE	pr>t
Intercept	0.917	0.010	0.000	0.918	0.010	0.000	0.918	0.010	0.000
Moved once				–0.039	0.002	0.000			
Moved more than once				–0.074	0.003	0.000			
Ever moved	–0.045	0.002	0.000				–0.011	0.003	0.001
Number of moves							–0.029	0.002	0.000
Furthest distance moved	0.005	0.001	0.000	0.005	0.001	0.000	0.005	0.001	0.000
Moved at program entry	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Sample: Families with children entering the HCV Program, 1995 through 2002. Full sample consists of 628,124 families; sample size for each equation is shown in table.

Note: Additional covariates not shown include household size and family structure, race/ethnicity of head, years in program, initial lease-up status, sources and amount of income, and characteristics of first HCV neighborhood. These are described in detail in the text.

Est = Parameter estimate.

SE = Standard error of the estimate.

pr>t = Probability of estimated value using 2-tailed t-test.

Source: HCV Longitudinal Data File

We found no evidence for a relationship between mobility and the percentage of household income from cash assistance (results not shown). In sum, moving appears to be associated with significant, but fairly small, *declines* in family self-sufficiency as measured by total household income and the percentage of household income from earnings. Despite these small declines, no correlation was found between moving and household reliance on welfare; therefore, self-sufficiency (or its lack) as measured by reliance on public aid should not be considered higher among movers.[21]

Race, Mobility, and Neighborhood Quality

We next examine whether the relationships between mobility and neighborhood quality differ for households from different racial and ethnic groups. Exhibit 11 presents regressions

of two neighborhood quality measures—the poverty rate and the owner-occupancy rate—on the interaction of household race and household mobility. Mobility is measured by whether the household moved at least once during the observation period.

Exhibit 11

Race-Mobility Interactions and Final Year Neighborhood Outcomes

Model	Model 1			Model 2		
Outcome	Poverty Rate			Owner-occupancy Rate		
Mean of dependent variable	19.8			54.6		
R-squared	0.78			0.77		
Regression sample size	522,182			522,182		
	Est	SE	pr>t	Est	SE	pr>t
Intercept	2.553	0.141	0.000	12.433	0.252	0.000
White x Household ever moved	–0.699	0.034	0.000	1.330	0.060	0.000
African American x Household ever moved	–1.460	0.029	0.000	2.608	0.052	0.000
Asian x Household ever moved	–1.554	0.146	0.000	2.784	0.261	0.000
Native American x Household ever moved	–0.830	0.180	0.000	1.176	0.322	0.000
Hispanic x Household ever moved	–0.565	0.062	0.000	0.978	0.110	0.000
Farthest distance moved	–0.001	0.000	0.000	0.001	0.000	0.000
HH head is White	–0.988	0.023	0.000	1.018	0.041	0.000
HH head is Asian	–0.666	0.065	0.000	–0.090	0.116	0.438
HH head is Native American	–0.754	0.075	0.000	0.302	0.133	0.023
HH head is Hispanic	0.686	0.031	0.000	–0.927	0.056	0.000

Sample: Families with children entering the HCV Program, 1995 through 2002. Full sample consists of 628,124 families; sample size for each equation is shown in table.

Note: Additional covariates not shown include household size and family structure, years in program, initial lease-up status, sources and amount of income, and characteristics of first HCV neighborhood. These are described in detail in the text.

Est = Parameter estimate.

SE = Standard error of the estimate.

pr>t = Probability of estimated value using 2-tailed t-test

Source: HCV Longitudinal Data File

The model 1 results show that the relationship between household mobility and the neighborhood poverty rate does, indeed, vary significantly by race. The effects of moving are largest for African Americans and Asians; members of these two groups that moved at least once lived in neighborhoods with poverty rates 1.5 to 1.6 percentage points lower compared to the neighborhoods of nonmovers. For Whites, Hispanics, and Native Americans, moving was associated with small (0.6 to 0.8 percentage point) reductions in the neighborhood poverty rate. F-tests indicate that the effects of moving for African Americans and Asians differ significantly from the effects of moving for Whites, but the effects of moving for Whites, Hispanics, and Native Americans do not differ significantly from one another.

Similar results were found when we examined the relationship between household mobility and the neighborhood owner-occupancy rate by race (model 2). Once again, the effects of moving were found to be largest for African Americans and Asians. For Asians, moving is associated with a 2.8 percentage point increase in the owner-occupancy rate in the neighborhood, while for African Americans, moving is associated with a 2.6 percentage point increase in the neighborhood owner-occupancy rate. For Whites, Hispanics, and Native Americans, moving is associated with a 1.0 to 1.3 percentage point increase in the neighborhood owner-occupancy rates. Again, F-tests indicate that the effects of moving for African Americans and Asians differ significantly from the effects of moving for Whites, while the effects of moving for the other groups (Whites, Hispanics, and Native Americans) do not differ significantly from one another.

The Relationship Between Distance Moved and Neighborhood Quality

In the final regression models, we present a slightly different conceptualization of mobility—the distance a household moves while participating in the HCV Program, measured by the distance between the household's first program location and the household's farthest location from its first home.

Exhibit 12 shows the relationship between household mobility and the farthest distance moved. Not surprisingly, the more times a household moved, the farther they moved from their initial home. The mean value for farthest distance moved in the analysis sample is 1.2 miles, which of course includes many zero values for households that never moved. Model 1, however, shows that households that moved at least once moved an average of 6 miles from their initial location. Model 2 shows that households that moved *exactly* once moved an average of 5 miles, while households that moved at least twice moved an average of 8 miles. An F-test indicates that these two coefficients are statistically different from each other. Finally, model 3 shows that there appears to be a linear relationship between the number of moves a household makes and the farthest distance moved—on average, households move approximately 2 additional miles with each additional move.

Exhibit 12

Mobility and Farthest Distance Moved

Model	Model 1			Model 2			Model 3		
Outcome	Farthest distance moved			Farthest distance moved			Farthest distance moved		
Mean of dependent variable	1.17			1.17			1.17		
R-squared	0.41			0.43			0.43		
Regression sample size	522,182			522,182			522,182		
	Est	SE	pr>t	Est	SE	pr>t	Est	SE	pr>t
Intercept	0.081	0.072	0.262	0.015	0.071	0.833	0.010	0.071	0.889
Moved once				5.304	0.011	0.000			
Moved more than once				8.101	0.021	0.000			
Ever moved	5.773	0.011	0.000				3.240	0.022	0.000
Number of moves							2.106	0.016	0.000
Moved at program entry	0.027	0.009	0.004	0.030	0.009	0.001	0.029	0.009	0.002

Sample: Families with children entering the HCV Program, 1995 through 2002. Full sample consists of 628,124 families; sample size for each equation is shown in table.
Note: Additional covariates not shown include household size and family structure, race/ethnicity of head, years in program, initial lease-up status, sources and amount of income, and characteristics of first HCV neighborhood. These are described in detail in the text.
Est = Parameter estimate.
SE = Standard error of the estimate.
pr>t = Probability of estimated value using 2-tailed t-test.
Source: HCV Longitudinal Data File

Exhibit 13 shows the relationship between the farthest distance that a household moves and the neighborhood poverty rate in the household's last (most recent) location. The results indicate the presence of a significant, although not extremely large, association. Compared to households that moved less than a mile, those that moved 1 to 5 miles experienced declines in the neighborhood poverty rate of about 1 percentage point. Those that moved more than 5 miles experienced declines in the neighborhood poverty rate of about 2 percentage points. Compared to an overall neighborhood poverty rate of about 20 percentage points, moving longer distances is associated with 10- to 20-percent improvements

in the neighborhood poverty rate. Households that use their HCVs to move longer distances do appear to locate into slightly better quality neighborhoods than households that lease in place or do not move very far from their first location on the HCV Program.

Exhibit 13

Distance Moved and Neighborhood Poverty Rate

Outcome	Tract Poverty Rate		
Mean of dependent variable	19.8		
R-squared	0.78		
Regression sample size	522,182		
	Est	SE	pr>T
Intercept	2.403	0.142	0.000
Household ever moved	–0.035	0.043	0.415
Farthest distance moved: 1–5 miles	–1.027	0.048	0.000
Farthest distance moved: 5–10 miles	–1.837	0.059	0.000
Farthest distance moved: 10–15 miles	–2.063	0.083	0.000
Farthest distance moved: More than 15 miles	–2.131	0.061	0.000
Moved at program entry	0.033	0.019	0.078

Sample: Families with children entering the HCV Program, 1995 through 2002. Full sample consists of 628,124 families; sample size for each equation is shown in table.
Note: Additional covariates not shown include household size and family structure, race/ethnicity of head, years in program, initial lease-up status, sources and amount of income, and characteristics of first HCV neighborhood. These are described in detail in the text.
Est = Parameter estimate.
SE = Standard error of the estimate.
pr>t = Probability of estimated value using 2-tailed t-test.
Source: HCV Longitudinal Data File

Conclusions

This study examined the geographic mobility of families with children that entered the HCV Program between 1995 and 2002. Using a specially constructed longitudinal data set developed from HUD administrative records, we analyzed the residential moves (of at least a quarter mile's distance) made by these families over the observation period. Our purpose was to see whether moves within the voucher program—particularly moves after the initial lease up—were associated with improvements in the neighborhoods where the families lived and with increases in their economic self-sufficiency.

Overall, about 75 percent of the families in the study sample moved at program entry, rather than leasing up where they had been living before. Families with children entering the HCV Program in this period moved to neighborhoods with poverty rates of around 20 percent and where, on average, three-quarters of all households had income from earnings and half owned their own homes. The preprogram neighborhoods and the areas where families leased their initial units through the voucher program were very similar in terms of neighborhood characteristics, as measured by census data.

Subsequent to program entry (that is, after the moves to lease up), the overall mobility rate of the sample was 19 percent, and just 4 percent of the sample moved more than once. There was a small but consistent tendency for families making later moves to choose slightly better neighborhoods. We observed reductions across a number of indicators of concentrated poverty and improvements across a number of neighborhood opportunity indicators for households that moved. Multivariate analysis confirmed that moving at least once was associated with small improvements in neighborhood quality. Further moves appeared to produce additional movement in the direction of better neighborhood conditions, but the changes remained very small.

This analysis revealed some interesting differences across racial/ethnic groups in the importance of the mobility provided by the HCV Program. African-American households were more likely than others to move after program entry and generally experienced the largest improvements in neighborhood characteristics when they moved. Asian households also experienced larger-than-average gains in neighborhood quality when they moved.

While mobility is clearly associated with positive (albeit small) improvements in neighborhood quality, the relationship between geographic mobility and improvements in economic self-sufficiency was less clear. The number of times a household moved appeared to be associated with very slight *decreases* in total household income and in the percentage of income from earnings. Moving, however, was not significantly associated with changes in the percentage of income from cash assistance.

Finally, consistent with our finding that the number of moves is associated with improvements in neighborhood quality, we also found that the *distance* a household moved was associated with improvements in neighborhood quality. Households moving 1 to 5 miles chose neighborhoods that were about 1 percentage point less poor than the neighborhoods of nonmovers, while households moving more than 5 miles located in neighborhoods that were about 2 percentage points less poor.

In conclusion, the continuing mobility offered by the HCV Program appears to benefit participating families with children, enabling those that move to relocate into somewhat lower poverty neighborhoods. While these benefits of mobility were not observed to translate into improved household-level outcomes, the most immediate goal of moving for most households—attaining a better living environment—seems to be facilitated by the program.

Appendix

Distribution of Household Characteristics in the Analysis Sample

Household Characteristics	Total N	Percent of Sample	Total on Characteristic	Missing on Characteristic
Number of HH members:				
1 or 2	199,626	31.79		
3 or 4	334,705	53.31		
5 or more	93,558	14.90	627,889	235
Children present (any):				Categories are not mutually exclusive, as HH may have children of different ages.
Age 3 or younger	322,382	33.29		
Ages 4–5	172,579	17.82		
Ages 6–12	320,743	33.12		
Ages 13–17	152,652	15.76	968,356	
Number of adults in HH:				
1	504,517	80.99		
2	109,831	17.63		
3 or more	8,580	1.38	622,928	5,196
Age of HH head:				
24 or younger	154,644	26.01		
25–44	398,988	67.12		
45 or older	40,850	6.87	594,482	33,642
Total HH income:				
< $5,000	177,404	28.24		
$5,000–$9,999	215,214	34.26		
$10,000–$14,999	135,110	21.51		
$15,000–$19,999	67,117	10.69		
$20,000 or more	33,279	5.30	628,124	0
Total HH wages:				
< $5,000	375,560	59.79		
$5,000–$9,999	93,742	14.92		
$10,000–$14,999	91,004	14.49		
$15,000 or more	67,818	10.80	628,124	0
Total income from TANF:				
< $2,500	427,508	68.06		
$2,500–$4,999	103,233	16.44		
$5,000 or more	97,383	15.50	628,124	0
Race of HH head:				
White	333,915	53.22		
African American	270,569	43.12		
Asian/Pacific Islander	13,750	2.19		
Native American	9,201	1.47	627,435	689
HH head is Hispanic	89,347	14.22		
HH head is Female	567,108	90.29		
Total	**628,124**			

Sample: Families with children entering the HCV Program, 1995 through 2002. Full sample consists of 628,124 families.

Source: HCV Longitudinal Data File

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Notes

1. Fair market rents (FMRs) have been increased in many major metropolitan areas to allow voucher recipients to rent housing units in more expensive areas. The FMRs control the maximum subsidy level available to participants, depending on where they live and the size housing unit they need.

2. The Section 8 Management Assessment Program (SEMAP) is the performance measurement system for evaluating Housing Choice Voucher (HCV) housing program administrators. SEMAP includes an indicator for "expanding housing opportunities" and a "deconcentration bonus" for increasing the share of participants living in low-poverty areas. See 24 CFR 985.3, indicators (g) and (h).

3. See Gould Ellen and Turner (1997).

4. See Devine et al. (2003).

5. The file draws on both the Multifamily Tenant Characteristics System (MTCS) and Tenant Rental Assistance Certification System (TRACS), with public housing records coming from MTCS and records for privately owned, assisted housing developments coming from TRACS.

6. The completeness of this data file, relative to the actual number of households receiving federal housing assistance, depends on monthly reporting to the U.S. Department of Housing and Urban Development (HUD) by the public housing authorities that operate the HCV and public housing programs and by private owners operating other assisted developments. Reporting rates to the HUD systems fluctuated somewhat during the period 1995 through 2002 as the reporting requirements underwent changes and expansions. But in general the reporting rates increased toward the end of the period.

7. We considered a new entrant to the voucher program as having moved to lease up if one of the following four conditions were met: (1) If the preprogram address (when present) was different from the address in the initial ("new admission") voucher record; (2) when there was no preprogram address, if the ZIP Code before admission was different from the ZIP Code of the address in the initial ("new admission") voucher record; (3) when there was no preprogram address and the ZIP Code before admission was the same as the ZIP Code of the address in the initial voucher record, if the family-moving-into-unit indicator showed there was a move; or (4) when there was neither a preprogram address nor a ZIP Code before admission, if the family-moving-into-unit indicator showed there was a move. Thus, we accepted and used the

indicator in the original data when we did not have address information with which to correct it. The result of combining address information with the indicator was to treat 75 percent of the study sample as moving on program entry. The most recent study of lease-up patterns in the voucher program reported that 79 percent of the households that entered the voucher program in 2000 moved, while the figure in 1993 was 63 percent (Finkel and Buron, 2001, citing Kennedy and Finkel, 1994). Because our sample of HCV Program entrants spans the years 1995 through 2002, we think the 75 percent figure is reasonable.

8. All the records were geocoded with the same system and the same underlying geography, so there should not be problems with identical addresses carrying different latitude or longitude values.

9. The estimates were made using a simple linear interpolation over the decade between the 1990 Census and 2000 Census. For example, if the 1990 poverty rate in the destination census tract was 8 percent but in the 2000 Census it was 12 percent, over the decade the rate was assumed to change by .4 percent a year. For a lease up in 1995 in this tract, the estimated poverty rate at that time would be about 10 percent. (The formula used the actual date of the program move and estimated the poverty rate based on days elapsed from April 1, 1990.)

10. For preprogram addresses (when available), the neighborhood indicators were calculated based on ZIP Code areas, which are larger than census tracts and thus less precise. Sensitivity tests on these data showed that the effect of using ZIP Code-level data was to understate the differences between the preprogram neighborhoods and the initial HCV neighborhoods. Details are available from the authors on request.

11. HUD's recent snapshot of the HCV Program in 2000 showed 18 percent of the program population to reside outside metropolitan areas; of the remaining participants, 49 percent were located in central cities and 33 percent were in suburban areas (Devine et al., 2003). By contrast, about 26 percent of the sample for this analysis was living in nonmetropolitan areas at the most recent point in time of the longitudinal file. Of the remainder inside metropolitan statistical areas, 43 percent lived in center cities and 31 percent in suburban areas. We think these differences may be due in part to rural-metropolitan differences in the mix of HCV participants (that is, the share of families with children) and also in part to differences in reporting rates after the MTCS changes made in 2001.

12. Certain other very small deletions and adjustments were made to the data file to make the data fully useable for this analysis. For example, a small number of records with effective dates in 1993 were deleted, but records with effective dates in 1994 (for "program year" 1995) were retained. Note that this is not an estimate of the fraction that were new admissions in this period, but only of those for whom there was good enough evidence to retain them in the study. The balance of families with children is made up of a combination of ongoing participants, records with data problems, and possible missing records.

13. This figure combines "end of participation" and "portability move-out" codes.

14. In this sample, the movers constitute almost 118,000 households nationwide. Second movers amount to about 25,000 households.

15. See, for example, Jargowsky (1997), Wilson (1987, 1996), Jencks and Mayer (1990), and Brooks-Gunn, et al. (1993).

16. For most preprogram locations, the neighborhood indicators were calculated based on ZIP Code areas, which are larger than census tracts and thus less precise. See note 10 above.

17. The appendix table shows the composition of the analysis sample on all these household characteristics.

18. Full results are available from the authors on request.

19. We tested an alternative specification of this model in which we replaced the independent variables measuring the ratio of household income to the poverty line during the household's first year in the program with a variable measuring total household income during the household's first year in the program. The two specifications yielded nearly identical results.

20. We tested alternative specifications of models 1 through 3 for exhibit 10 in which we added the percentage of income from earnings in the household's first year in the program to the standard list of covariates. The new specifications yielded very similar coefficients to those presented here, although the point estimates were very slightly smaller in the new specifications. For example, in the new specification of model 1, the coefficient on "Any Move" is –.033, slightly smaller than the value shown here of –.045.

21. It should be noted that we have not attempted to control for the fact that families whose incomes increase significantly can become over income and thus ineligible for the program. This selective attrition could bias our results *against* finding positive associations between moving (which is correlated with years in the program) and household income and earnings.

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