Is Manufactured Owned Housing a Good Alternative for Low-Income Households? Evidence From the American Housing Survey

Thomas P. Boehm
The University of Tennessee

Alan Schlottmann
University of Nevada, Las Vegas

Abstract

In terms of developing a housing policy that would improve the quality of housing for lower income households, it seems appropriate to explore the merits of an often-ignored alternative, namely manufactured owned housing. This article employs data from the American Housing Survey (AHS) collected between 1993 and 2001 to compare manufactured owned housing with rented housing and traditional owned housing as a tenure alternative for low-income households. Our results contradict several preconceived notions regarding manufactured owned housing. For example, manufactured owned housing is found to be a low-cost housing alternative. Importantly, it is observed to have higher average quality rankings across both the neighborhood and structural dimensions of housing services than rented housing does (even when the sample is stratified by metropolitan and nonmetropolitan location). Furthermore, those factors that contribute to lower structural quality or lower neighborhood quality, as well as changes in those quality measures over time, are similar between manufactured owned housing and traditional owned housing.

Introduction

Research on homelessness by Quigley, Raphael, and Smolensky (2001), Mansur et al. (2000), and others have focused on the crucial role of housing prices in denying access to housing services and homeownership. This literature reinforces the concerns by HUD (2001) and others about the availability of "affordable housing"; that is, housing that costs no more than 30 percent of the occupant's household income or is available for less than the median price in a given housing market.[1] With the well-recognized increase in income inequality during the 1980s (see, for example, Reed, Glenn-Haber, and Mameesh, 1996) and the increases in rents in the 1990s for those in the bottom quarter of the income distribution who, in addition, faced falling real incomes (HUD, 2001), the issue of promoting homeownership among low-income households faces significant hurdles.[2]

These concerns about housing affordability for low-income households appear to be difficult to resolve by developing policy options that focus only on traditional owned housing and/or rented housing units. In terms of developing a housing policy that would improve the quality of housing for lower income households, it seems appropriate to explore the merits of an often-ignored alternative, namely manufactured owned housing.[3]

Although the manufactured housing industry has struggled over the years with excess inventory, manufactured housing generally has become an increasingly important part of the new housing mix; approximately 14 to 20 percent of new housing starts are manufactured housing (see Beamish et al., 2001; Manufactured Housing Institute, 2003).[4, 5] Belsky and Duda (2002a) clearly document that manufactured housing was a significant factor in the low-income homeownership boom of the 1990s. As noted in Joint Center for Housing Studies (JCHS) (2003) and discussed in detail in Beamish et al. (2001) and Apgar et al. (2002), however, manufactured housing is still often viewed with caution in many communities.[6] As discussed by Genz (2001), this bias has lead to neglect of issues that are important to this housing option and the households that it serves, particularly

[1] As noted by the U.S. Department of Housing and Urban Development (HUD), this 30-percent guideline is deceptive in that the remaining household income for low-income households is associated with minimal consumer expenditures.

[2] The studies discussed in Retsinas and Belsky (2002b) strongly suggest the efficacy of promoting homeownership for low-income households.

[3] Manufactured housing is often termed "mobile homes" and represents a type of factory-built housing manufactured in compliance with HUD codes. It forms part of the spectrum of so-called factory homes that include modular homes, panelized homes, and precut homes. Although the manufacturing and construction distinction is often related to the percentage of the home completed on site versus off site, for public policy purposes, it is important to recognize that manufactured homes often face different local ordinances. For a discussion of these issues, see HUD (2001) and Apgar et al. (2002).

[4] As a result of low interest rates making traditional "stick-built" housing more affordable, shipments of new manufactured housing units have recently reached a 45-year low. For more on this issue, see HUD (2004): p. 6. The U.S. Census Bureau maintains excellent website access to historical statistics on manufactured housing based on HUD-sponsored surveys.

[5] The range of percentages reflects differences in the product mix of increasingly popular double-wide units versus single sections, the use of manufactured homes as vacation units that vary cyclically with the economy over time, and so on.

[6] This caution is related to perceptions that manufactured housing is not "good" housing for the community. Most of the studies in this area are based on surveys and questionnaires of perceptions. Excellent summaries of these studies appear in Beamish et al. (2001) and Apgar et al. (2002) and, as noted previously, the consequences are explored in Genz (2001).

low-income households with little wealth. Most of the available literature, however, focuses on community perceptions of the manufactured housing alternative, resulting special (and often controversial) zoning provisions, and associated land use issues. The actual experience of households in manufactured owned housing, the mobility of these households, and documented effects on family wealth accumulation of this housing alternative are generally missing from the literature.

These observations provide the justification and point of departure for the research questions addressed in this article. Specifically, we employ recent versions of the American Housing Survey (AHS) over the period 1993 to 2001 to compare manufactured owned housing with conventional traditional owned housing and rented housing.

The economics literature on housing has done little to compare factors that influence households' overall ordinal ranking of either the structural quality of their dwelling or the quality of their neighborhood for manufactured owned housing compared with traditional tenure choice alternatives (site-built, owned housing and rented housing).[7] This observation is particularly true for low-income households. As noted previously, the common perception from questionnaire studies and surveys is that manufactured housing is of low quality and is generally undesirable, even though the cost may be relatively low. These surveys, however, beg four important issues:

First, in general, are the same factors important in determining structural quality ranking across tenure type (that is, manufactured owned housing, traditional owned housing, and rented housing)? In this regard, the dynamics of the household's perception of housing quality should be addressed rather than relying on a single cross-section. It is possible that perceived structural quality could deteriorate more rapidly with manufactured owned housing than with the other tenure alternatives (traditional owned housing and rented housing). Such a change in perception could lead to increased mobility by low-income households, which itself is costly and may have negative implications for neighborhood stability in urban areas.

Second, are any differential factors determining neighborhood quality across tenure types? Certainly, neighborhood characteristics are just as important as structural characteristics in determining the level of services received by the occupants of a given residence.

Third, particularly for low-income households, is manufactured owned housing a relatively low-cost and high-quality source of housing services compared with traditional owned housing and rented housing?

Fourth, a fundamental perception of manufactured owned housing is that it will not perform well as an investment vehicle compared with traditional owned housing. To what extent is this perception true?

[7] An exception is the study by Boehm (1995). This study, however, considers only a cross-section of units at a particular point in time and its underlying data are more than a decade old. In addition, it ignores neighborhood characteristics and other issues, such as the asset effect of manufactured owned housing.

Research Issues Addressed in This Article

Initially, we present comparisons of the housing and neighborhood quality rankings and total housing costs across the three tenure types and several time periods (specifically, 1993, 1997, and 2001). These comparisons enable us to see if manufactured owned housing generally appears to be a good value (average quality rankings relative to total housing cost per period) as compared with the other tenure types (traditional owned housing and rented housing) and the extent to which this relationship has remained stable over time. We also consider unit size (in square feet) and break out several individual components of housing cost and compare them as well.

In the second stage of the analysis, we consider the effect of various factors that might influence perceived housing and neighborhood quality for a given tenure type across time. An ordinal probit analysis is used to provide estimates of factors that determine the ordinal structural and neighborhood rankings. Separate equations are estimated for each tenure type: manufactured owned housing, traditional owned housing, and rented housing. In the structural quality equation, various measures of specific structural problems either reported by the resident or observed by the individual administering the survey are included as independent variables. Comparable measures of neighborhood problems make up the set of independent variables in the neighborhood quality equation. This analysis enables us to determine if any differences occur, on average, across tenure types and over time in the importance of various factors that determine how households feel about their structures and the associated neighborhoods.

Third, we consider changes in perceived structural quality and neighborhood quality over time and across tenure types. A practical consideration that arises is that structural and neighborhood ranking changes can only be observed for households that stay in the unit until the next interview period, because the AHS follows housing units rather than households. Given the nature of the AHS, however, it is insightful to observe changes in structural and neighborhood ranking over a longer interval than 2 years.[8] Consequently, we consider 2-year intervals over the period 1993 to 2001 (1993 to 1995, 1995 to 1997, and so on) and 1993 to 1997 and 1997 to 2001 as 4-year intervals. Changes in the structural and neighborhood rankings are related to changes in the detailed structural and neighborhood characteristics included in the AHS.

In the fourth stage, household mobility is modeled to estimate the role of neighborhood stability across tenure type. Specifically, separate mobility equations are estimated for manufactured owned housing, traditional owned housing, and rented housing. Based on the literature, mobility is hypothesized to be a function of three factors: (1) disequilibrium in housing consumption (for example, overcrowding measured by a high persons-per-room ratio or high housing costs relative to household income), (2) factors affecting the cost of moving (for example, older individuals find it more difficult to move than younger ones do), and (3) the quality of the structure and neighborhood in which the household resides before the move. Duration modeling of the mobility choice made by households across housing type is used to investigate adjustments to the level and type of housing consumption as households move from their existing housing. Specifically, we are able

[8] Specifically, the AHS follows housing units rather than households per se over time. Thus, the number of observations falls over the 4-year intervals if households move in 2 years.

to consider the ways in which the dynamics of this process differ for manufactured owned housing and traditional owned housing. In particular, we are able to consider the ways in which the dynamics of this process imply differentials in neighborhood stability.

In the final stage of the analysis, we compare appreciation in property value among three types of ownership: (1) manufactured owned housing in which both the land and structure are owned, (2) manufactured owned housing in which only the structure is owned, and (3) traditional owned housing. Using price data available over time in the AHS allows us to consider differences in appreciation across these ownership categories.

Major Empirical Results and Policy Implications: A Summary

The research results provide new evidence on the question about whether manufactured owned housing is a good alternative for low-income households. Information on area median income suggests that low-income households represent households at 80 percent or below the area median income.[9] Our results contradict several preconceived notions regarding manufactured owned housing as revealed in survey studies. Several noteworthy results are presented in the following text.

1. Manufactured owned housing is a viable alternative for low-income households from the perspective of the consumption of housing services. This observation is true from the perceptions about both perceived structural quality and neighborhood quality.

2. Across all time periods, in terms of included measures of neighborhood quality and structural quality, owned manufactured owned housing is perceived to be (ranked) higher quality than rented housing. This observation holds true even when the sample is stratified by metropolitan and nonmetropolitan location.

   In addition, the cost of manufactured owned housing, even for recent movers, is much lower than other alternatives, including renting.

3. Those factors that contribute to either lower structural quality or lower neighborhood quality are similar between manufactured owned housing and traditional owned housing.

   Communities do not have to develop bifurcated public policies to include manufactured owned housing in the community housing mix. For example, crime is a perceived negative across all housing types.

   Owners of manufactured housing have the same concerns about structural quality as do owners of traditional housing.

4. No evidence supports the idea that perceived structural quality deterioration occurs over time more with manufactured housing than with traditional housing.

   A properly planned manufactured housing development does not "automatically" imply deterioration over time.

[9] In the AHS, HUD assigns area median income status to every household in the national sample in each sampling year. It is important to note that results presented in this article do not vary for alternative definitions of low income, such as 75 or 90 percent of the area median income.

5. A major result of the analysis is that ownership of both manufactured housing and traditional housing is associated with neighborhood stability (that is, a decreasing likelihood to move over time).

   If a tendency for a type of housing to be associated with high mobility relative to all housing choices is apparent, it is rented housing, not manufactured owned housing.

   Manufactured owned housing does not lead to increased instability of neighborhoods.

6. The potential for appreciation of manufactured owned housing is clearly bifurcated on the ownership of the land (lot). Even recognizing the limitations of the price appreciation data in this article, three observations appear worthy of note.

   As a general statement, manufactured owned housing in which the lot is not owned (with the unit) is not an investment in any sense.

   In cases in which the land is owned, manufactured owned housing can yield appreciation amounts that are not dissimilar from those of traditional owned housing; however, data from the AHS suggests that rates of appreciation vary significantly across manufactured owned housing units, which may indicate these homes are riskier investments. This result might also be partially attributable to the smaller number of observations for these homes in the data.

   In many cases, manufactured owned housing is a lower cost alternative for low-income households than rented housing. This housing option could enable low-income households to potentially save toward the preferred investment alternative, namely traditional owned housing.

The American Housing Survey 1993 to 2001: Quality, Size, and Cost of Housing by Tenure Type for Low-Income Households

According to data from the 1993-to-2001 national files of the AHS, manufactured owned housing appears to be providing many lower income households with a relatively low-cost, high-quality, alternative living environment.[10] Exhibit 1 presents a comparison of housing quality and housing cost across tenure type for the full sample and a subsample of lower income households that have recently moved into their current housing unit. For comparison purposes, this information is provided separately for the three time periods (sample waves) of 1993, 1997, and 2001.

Exhibit 1 uses the unique characteristic of the AHS in that it provides measures of the household's perceptions of the quality of its living situation.[11] Specifically, households are asked to rank the quality of both their structures and their neighborhoods on an ordinal scale from 1 to 10 (where a rank of 1 is worst and a rank of 10 is best). Although, as might be expected, traditional owned housing receives the highest rankings, on average, owners of manufactured housing ranked their

[10] As noted, low-income households represent households at 80 percent or below the median income for any time period at a location. Modest changes in this definition do not alter results reported here.

[11] The appendix to this article provides basic data compilations similar to those presented in the three panels of exhibit 1 across the dimensions of metropolitan areas and nonmetropolitan areas. Basic results presented here are similar across these added dimensions.

Exhibit 1a

1993 Quality, Size, and Cost of Housing by Tenure Type for Low-Income Households[a]

Housing Tenure Type	Mean Housing Rank[b]	Mean Neighborhood Rank[b]	Opinion of House Poor[c] (%)	Opinion of Neighborhood Poor[c] (%)	Structures Moderately or Severely Inadequate[d] (%)	Mean Number of Rooms	Mean Square Feet in Unit
Traditional owned housing	8.588	8.258	0.864	3.028	2.140	5.893	1,751.15
Manufactured owned housing	8.109	8.134	2.211	4.643	1.842	4.798	1,003.45
Rented housing	7.600	7.298	3.955	8.574	2.792	4.162	989.29

Housing Tenure Type	Mean Monthly Housing Cost ($)	Average Annual Household Income ($)	Spend > 30% of Income on Housing (%)	Mean Monthly Housing Cost ($)	Average Annual Household Income ($)	Spend > 30% of Income on Housing (%)
	All Households			Recent In-Movers[e]		
Traditional owned housing	420.61	18,331	34.55	555.41	21,816	45.02
Manufactured owned housing	305.13	15,783	30.06	339.25	16,817	33.22
Rented housing	461.04	15,753	56.05	478.07	17,088	56.88

[a] *Low-income households have incomes below 80 percent of the median for a particular year and area.*

[b] *Housing rank and neighborhood rank are measured using an ordinal scale from 1 to 10, with 10 being the best.*

[c] *A ranking of 1, 2, or 3 was deemed poor.*

[d] *Interviewers ranked structures as adequate, moderately inadequate, or severely inadequate.*

[e] *Any household that moved into its dwelling unit in the last 2 years before the interview was deemed as a recent in-mover.*

Exhibit 1b

1997 Quality, Size, and Cost of Housing by Tenure Type for Low-Income Households[a]

Housing Tenure Type	Mean Housing Rank[b]	Mean Neighborhood Rank[b]	Opinion of House Poor[c] (%)	Opinion of Neighborhood Poor[c] (%)	Structures Moderately or Severely Inadequate[d] (%)	Mean Number of Rooms	Mean Square Feet in Unit
Traditional owned housing	8.405	8.168	0.949	2.357	1.554	5.930	1,805.96
Manufactured owned housing	7.832	7.920	3.649	4.809	2.156	4.661	1045.13
Rented housing	7.435	7.264	3.820	6.491	3.212	4.098	1,272.15

Housing Tenure Type	Mean Monthly Housing Cost ($)	Average Annual Household Income ($)	Spend > 30% of Income on Housing (%)	Mean Monthly Housing Cost ($)	Average Annual Household Income ($)	Spend > 30% of Income on Housing (%)
	All Households			Recent In-Movers[e]		
Traditional owned housing	484.81	18,422	40.75	637.80	23,233	51.31
Manufactured owned housing	355.20	15,835	34.17	406.64	18,535	37.18
Rented housing	518.88	16,785	56.41	536.38	19,112	57.94

[a] *Low-income households have incomes below the 80 percent of the median for a particular year and area.*

[b] *Housing rank and neighborhood rank are measured using an ordinal scale from 1 to 10, with 10 being the best.*

[c] *A ranking of 1, 2, or 3 was deemed poor.*

[d] *Interviewers ranked structures as adequate, moderately inadequate, or severely inadequate.*

[e] *Any household that moved into its dwelling unit in the last 2 years before the interview was deemed as a recent in-mover.*

Exhibit 1c

2001 Quality, Size, and Cost of Housing by Tenure Type for Low-Income Households[a]

Housing Tenure Type	Mean Housing Rank[b]	Mean Neighborhood Rank[b]	Opinion of House Poor[c] (%)	Opinion of Neighborhood Poor[c] (%)	Structures Moderately or Severely Inadequate[d] (%)	Mean Number of Rooms	Mean Square Feet in Unit
Traditional owned housing	8.431	8.167	0.891	2.268	1.731	5.888	1,848.01
Manufactured owned housing	7.900	7.871	3.231	4.060	2.651	4.841	1,107.81
Rented housing	7.501	7.433	3.825	5.027	3.605	4.134	1,025.71

Housing Tenure Type	Mean Monthly Housing Cost ($)	Average Annual Household Income ($)	Spend > 30% of Income on Housing (%)	Mean Monthly Housing Cost ($)	Average Annual Household Income ($)	Spend > 30% of Income on Housing (%)
	All Households			Recent In-Movers[e]		
Traditional owned housing	621.66	20,560	44.48	792.59	26,111	54.84
Manufactured owned housing	407.96	17,537	38.11	461.21	19,919	44.48
Rented housing	612.62	18,177	56.67	634.53	21,832	58.94

[a] *Low-income households have incomes below 80 percent of the median for a particular year and area.*

[b] *Housing rank and neighborhood rank are measured using an ordinal scale from 1 to 10, with 10 being the best.*

[c] *A ranking of 1, 2, or 3 was deemed poor.*

[d] *Interviewers ranked structures as adequate, moderately inadequate, or severely inadequate.*

[e] *Any household that moved into its dwelling unit in the last 2 years before the interview was deemed as a recent in-mover.*

neighborhoods and structures higher than the households in rented housing did. In addition, only a very small percentage of the households living in manufactured owned housing (2.2 to 3.6 percent) ranked their structures as poor (that is, a quality ranking of 1, 2, or 3). Although traditional owned housing fared better, rented housing did worse across all three time periods. It is noteworthy that these relative rankings hold for both housing quality and neighborhood quality.

Initially, we might expect that owners of traditional or manufactured housing would have a higher level of satisfaction than renters would, for two reasons. First, because the adjustment costs of changing units are much greater for owners than for renters, owners typically search more extensively to ensure that they have found the most desirable unit possible. Second, because most households that rent aspire to homeownership, they may have purposely selected less desirable and less costly units in order to accumulate the downpayment required for homeownership. It is important to note, however, that exhibit 1 does not represent average-income households but rather low-income households. As is well appreciated, these households face a more limited set of housing choices and, in this context, the results noted previously are particularly encouraging.

The validity of these household perceptions is substantiated by structural adequacy rankings constructed from objective information gathered by the enumerators conducting the survey. In exhibit 1, we see that, for low-income households living in manufactured owned housing, only 1.8 to 2.6 percent of their dwelling units were deemed to be moderately or severely inadequate over the time period.[12] These rates are actually lower than those for rented housing (2.8 to 3.6 percent) over the period.

This quality information becomes even more interesting when the average cost of the various housing tenure types is considered. When one examines the average cost of units in exhibit 1, one is immediately struck by fact that manufactured owned housing is much lower in cost than either of the other alternatives. This observation is true for all households and for households that have recently occupied the dwelling (recent in-movers in exhibit 1). For low-income households, mean monthly housing cost for manufactured owned housing compared with that for rented housing falls slightly when recent movers are compared with all households. Specifically, in exhibit 1a for recent movers, monthly housing cost for owned manufactured housing is approximately 71 percent of that for rental units ($339.25 and $478.07, respectively). Alternatively, for all households, this ratio drops to 66 percent ($305.13 and $461.04, respectively). These figures are consistent with the increases in rents for low-income households noted in HUD (2001). For the different housing categories, all of which are relatively comparable in size, if one factors in the annual cost of maintenance and repairs, owners of manufactured housing have the lowest total out-of-pocket housing cost.[13]

[12] A unit is considered moderately or severely inadequate if it has specific problems relating to plumbing, heating, upkeep, and/or electrical issues. For a detailed list of the problems and the specifics of how the adequacy categorizations are done, see the respective codebooks for the AHS database (Hadden and Leger, 1990; ICF Consulting, 2004).

[13] One element of maintenance cost is not captured by the AHS and, therefore, total maintenance cost is underestimated. Specifically, the AHS does not measure the value of an occupant's contribution of labor for the maintenance of his or her unit. Typically, renters engage in very little, if any, maintenance of their own units; consequently, most maintenance cost should be capitalized in the rent that they pay. For owned units, whether traditional or manufactured, the owner-occupant often contributes a substantial amount of labor, although manufactured owned housing (particularly if it is relatively new) might be expected to require less maintenance than traditional owned housing. Although total maintenance cost for owners may be understated relative to that for renters, one should keep in mind that, for low-income households, this opportunity cost may be minimal. The same cannot be said for out-of-pocket expenditures.

Exhibit 1 also provides information on the issue of affordability. Although lower income households have a much greater likelihood of falling into the greather-than-30-percent ratio of housing cost to income category for all housing types, manufactured housing owners do (financially) better than any of the other tenure types.[14] Perhaps the most striking result is that, among lower income renters, more than 56 percent spend more than 30 percent of their income on housing as compared with 30 to 38 percent for owners of manufactured housing. When the lower average out-of-pocket housing costs for manufactured owned housing is also taken into account, low-income households certainly appear to reduce their housing expenditures with manufactured owned housing. In summary, the information presented in exhibit 1 on quality and cost suggests that manufactured owned housing provides a good value when compared with the more traditional housing alternatives (traditional owned housing and rented housing).

It is important, however, to examine how legitimate the previous comparisons of manufactured owned, traditional owned, and rented housing are if the manufactured units might be expected to have a very different geographic distribution than the other two tenure categories; that is, with more manufactured units likely to be located in nonmetropolitan areas of the South and West. Actually all tenure types were relatively evenly distributed regionally; however, quite a disparity was evident in the percentage of each tenure type located in metropolitan versus nonmetropolitan areas.[15] Although, some variation occurs across sampling years, approximately 55 percent of manufactured owned units, 75 percent of traditional owned units, and 85 percent of rented units were in metropolitan areas. Consequently, as an experiment, exhibits 1a, 1b, and 1c were recalculated, stratified by metropolitan and nonmetropolitan area. These exhibits are presented in the appendix (A-1a, A-1b, A-1c, A-2a, A-2b, and A-2c).

Several general conclusions can be drawn from this experiment. First, regardless of which area one considers, manufactured owned housing continues to seem a good value; that is, it is low cost given the quality ranking and, in general, neighborhood and structural rankings are better for manufactured owned housing than for rented housing. Another general tendency apparent across these sets of exhibits (that is, all years) is that many of the differences across tenure type are more pronounced for metropolitan areas than for their nonmetropolitan counterparts. For example, consider mean monthly housing cost for recent in-movers in 1993 (exhibits A-1a and A-2a). In the metropolitan areas, mean monthly housing costs range from $370 for manufactured owned units to $604 for traditional owned housing; the latter figure represents a 63-percent increase relative to the manufactured unit cost. In nonmetropolitan areas, the same range is $282 to $365; the latter figure represents a 29-percent difference. Similarly, in 1993, 3.355 percent of the households in traditional owned housing in metropolitan areas had a poor opinion of their neighborhood and 9.166 percent of households in rented housing had a poor opinion, indicating a spread of 5.811 points. For nonmetropolitan areas, the range is 1.887 to 4.672, a spread of 2.785 points. In general, this comparison between metropolitan and nonmetropolitan areas suggests that

[14] As noted previously, a 30-percent ratio of housing cost to income was selected here consistent with discussions in the literature on housing affordability. This rule of thumb is, of course, not an absolute rule. For example, HUD data from the Section 8 Housing Choice Voucher Program, which enables tenants to choose units that meet HUD standards, shows that many low-income families choose units requiring more than 30 percent of their income.

[15] The AHS defines areas as metropolitan or nonmetropolitan according to whether a housing unit is within a standard metropolitan statistical area; both types of areas can have rural and urban subareas.

manufactured owned housing is a more attractive option, relative to rented housing, in metropolitan areas than in nonmetropolitan areas.

The Determinants of Structural Quality and Neighborhood Quality: Model and Estimation

Given the differences in structure satisfaction and neighborhood satisfaction addressed in exhibit 1, it would be beneficial to policymakers to understand more about the relative importance of various individual structural attributes in determining households' perceptions of overall dwelling and neighborhood quality. Most of the research considering the relative importance of individual structural and other (for example, neighborhood, public service, location) housing characteristics on household preferences has been implemented by estimating hedonic price models. In this approach, sales price or contract rent is regressed on a set of variables that describe the structure and its environment. Unfortunately, the hedonic approach has often been criticized because it assumes that consumer preferences are identical. In reality, however, consumer preferences may not be identical. For example, some individuals may not mind cracks in walls or peeling paint while others find them quite objectionable. On the margin, if the household that ends up occupying a given dwelling is indifferent to these structural defects, then the defects will be uncorrelated with rent or value even though most people would consider them to be bothersome.

In lieu of the hedonic approach, we employ the estimating technique discussed in Boehm and Ihlanfeldt (1991), which revealed the importance of individual neighborhood characteristics on the overall quality of the neighborhood. In this analysis, the AHS 10-point scale is interpreted to be an ordinal utility index. There are two primary advantages to this approach. First, for each household group, estimates will represent the group average rather than the preferences of the marginal purchaser of housing services. Second, by focusing on perceptions rather than the relationship between some objective characteristics and dwelling rent or price, we can identify more clearly the factors that influence the way people feel about their living environment.

The Model

Assuming that utility functions are strongly separable, the jth household's utility from its dwelling (U_j^{NG}) can be expressed as a function of individual structural attributes (X_i $i = 1, \ldots, k$),

$$U_j^{NG} = u_j\,(X_1, \ldots, X_k)\ (j = 1, \ldots, s), \tag{1}$$

where G represents a group identification variable. We hypothesize homogenous preference functions for households within a particular group but permit these functions to differ among groups. The utility function for households within the same group then can be defined over the set of structural attributes and, assuming it is linear in its parameters, can be expressed as:

$$U_j^{NG} = u_j^{G}(\mathbf{X}) = \Sigma\, \beta_i X_{ij} + \varepsilon_j, \tag{2}$$

with the stochastic term ε_j accounting for the influence of unobserved attributes of the neighborhood and random deviations in preferences from the average of the subgroup. It is assumed that the ε_j are distributed normally ($N(0, \sigma^2 I)$).

In principle, the ordinary least squares (OLS) regression model could be employed to estimate the relationship between utility and observed structural attributes. This model assumes an interval-level dependent variable, however, which would require a cardinal measure of utility. As is well known, such a measure is not available; however, our data do provide an ordinal version of U_j^N for which the OLS model is satisfied. Households were asked to rank the overall quality of their dwelling on a 10-point scale, with a "1" indicating worst and a "10" indicating best. We assume that greater utility levels from either the structure or the neighborhood are concomitant with higher rankings. This quality ranking, therefore, provides a utility measure of ordinal strength, namely I.

An estimating equation using I_j in lieu of U_j^N as the dependent variable can be derived by first noting that, in the general case, if there are Z distinct structure/neighborhood rankings (R_m, m = 1,. . ., Z), there must be Z + 1 hypothetical category boundaries (α_m, m = 0,. . ., Z) such that the j_{it} household ranks its dwelling or neighborhood as a "1" (R_1) if $\alpha_0 < U_j^N < \alpha_1$, as a "2" ($R_2$) if $\alpha_1 < U_j^N < \alpha_2$, and so on. In other words, we observe the mth ranking if the true (but nonobservable) value of cardinal utility falls within that category's boundaries (α_{m-1}, α_m). Because it has been assumed that U_j^N is normally distributed, the probability of observing the mth rank by the jth household can be expressed as:

$$P(R_{mj}) = F[(U_j^N - \alpha_{m-1})/\sigma] - F[(U_j^N - \alpha_m)/\sigma] \quad (3)$$

where F is the cumulative standard normal density function. Following the convention of setting $\alpha_0 = -\infty$, $\alpha_1 = 0$, and $\sigma^2 = 1$ and substituting from (2), then (3) can be rewritten as:

$$P(R_{mj}) = F[\Sigma \beta_i X_{ij} - \alpha_{m-1}] - F[\Sigma \beta_i X_{ij} - \alpha_m] \quad (4)$$

Equation (4) estimates the conditional probability of observing a particular structure or neighborhood ranking. McKelvey and Zavoina (1975) have provided a model (namely N-chotomous multivariate probit) that simultaneously provides estimates of the β and α vectors of (4) that are minimum variance and are consistent. Furthermore, because the parameter estimates are obtained by maximum likelihood techniques, they are known to be asymptotically normally distributed, allowing for standard statistical tests.[16]

Data, Samples, and Variables

The primary AHS data, time periods of analysis, types of housing choice, and low-income sample are as defined in exhibit 1 and discussed previously. The first sample period from which observations are drawn is 1993. Although our analysis reported in the following text includes the 1997 AHS as representative of the middle of the study period and the 2001 survey as the latest sample period, we include units from the 1997 and 2001 samples that are not present in 1993 to maximize the number of observations (particularly for manufactured housing). The number of observations in the equations for each time period by housing type ranges from 1,200 to more than 12,000.

[16] In surveys such as the AHS, household responses are preferences as expressed by an ordinal ranking. In this regard, there is no significance to the unit distance between the set of observed values (as contrasted with traditional statistical analyses of metric data). Thus, the estimation procedure uses an additional set of variables (breakpoints) that merely preserve the ranking criterion. These variables are shown in the exhibits in the following text (starting with exhibit 4) as a numbered set of parameters denoted as "Mu's." These parameters are included in the exhibits for purposes of completeness but have no economic or public policy interpretation themselves.

A great deal of structural information is provided for each unit included in the AHS, including structure age; unit size (used to construct a measure of crowding); availability and age of major appliances; type and condition of heating, air conditioning, plumbing, and electrical systems; and structural problems with the roof, internal and external walls, windows, and foundation. In addition, a detailed set of neighborhood factors is included in the questions that relate to issues such as crime, noise, litter, abandoned buildings, and general deterioration. Exhibit 2 contains variable names and definitions for all of the variables included in the analysis. Related information is shown in exhibit 3, which contains means for each variable by tenure type for both housing quality and neighborhood quality. The next section considers the effect of these structural characteristics on households' perceived housing quality and neighborhood quality.[17]

Exhibit 2

Variable Names and Definitions: Housing Quality and Neighborhood Quality (1 of 2)

Variable Name	Variable Definition
Structural	
how_h	Housing structural quality ranking: 0 = worst, 8 = best*
age_s	Age of the structure in years
n_porch	1 = housing unit has a porch; 0 = otherwise
n_garage	1 = housing unit has a garage or carport; 0 = otherwise
equipment	Number of the following items the housing unit has at least one of: refrigerator, garbage disposal, stove/oven, dishwasher, washer/dryer
bathroom	1 = unit has a private toilet; 0 = otherwise
water	1 = unit has hot and cold piped water; 0 = otherwise
sewage	1 = unit is connected to a public sewer or septic system; 0 = otherwise
cntrl_air	1 = unit has central air conditioning; 0 = otherwise
struc_prob	Number of structural problems observed by the enumerator: sagging roof, missing roof materials, holes in roof, missing wall material or siding, sloping exterior walls, broken windows, bars on windows, crumbling foundation
ext_leak	1 = exterior leak in last 12 months; 0 = otherwise
int_leak	1 = interior leak in last 12 months; 0 = otherwise
bad_int	1 = cracks or holes in walls or ceiling, holes in floor, or broken plaster or peeling paint more than 1 square foot; 0 = otherwise
wtr_prob	Number of water source breakdowns in last 90 days
tlt_prob	Number of toilet breakdowns in the last 90 days
sew_prob	Number of public sewer breakdowns in the last 90 days
wrg_prob	1 = inadequate electrical wiring; 0 = otherwise
fus_blow	Number of times fuses blew or breakers tripped in the last 90 days
heat_brk	Number of heat breakdowns last winter lasting 6 hours or more
heating1	1 = steam, electric, heat pump, or central warm air furnace; 0 = otherwise
heating2	1 = other built-in electric floor, wall, or heaters; 0 = otherwise
heating3	1 = space heaters, stoves, fireplaces or no heat; 0 = otherwise
vermin	1 = presence of rats or mice in building the last 90 days; 0 = otherwise

[17] As is well appreciated, often, when one incorporates many structural variables in the estimation of an equation, multicollinearity can be a potential problem. Fortunately, this potential problem does not appear to be a significant issue in our low-income household samples.

Exhibit 2

Variable Names and Definitions: Housing Quality and Neighborhood Quality (2 of 2)

Variable Name	Variable Definition
Neighborhood	
how_n	Housing neighborhood quality ranking; 0 = worst, 8 = best *
e_low	1 = enumerator observed single-family or other lowrise buildings within 300 feet of unit; 0 = otherwise
e_mid	1 = enumerator observed midrise residential buildings within 300 feet of unit; 0 = otherwise
e_high	1 = enumerator observed highrise residential buildings within 300 feet of unit; 0 = otherwise
e_mobil	1 = enumerator observed mobile homes within 300 feet of unit; 0 = otherwise
e_com	1 = enumerator observed commercial/institutional/industrial buildings within 300 feet of unit; 0 = otherwise
e_prkg	1 = enumerator observed residential parking lots within 300 feet of unit; 0 = otherwise
e_water	1 = enumerator observed a body of water within 300 feet of the unit; 0 = otherwise
e_green	1 = open space/park/woods/farm/ranch within 300 feet of the unit; 0 = otherwise
old_buildings	1 = buildings in the area are predominantly older than the unit; 0 = otherwise
new_buildings	1 = buildings in the area are predominantly younger than the unit; 0 = otherwise
aban	1 = abandoned buildings within 300 feet of the unit; 0 = otherwise
bars	1 = bars on windows of buildings within 300 feet of the unit; 0 = otherwise
road_prob	1 = roads within 300 feet of the unit in need of repairs; 0 = otherwise
junk	1 = trash litter or junk accumulated in the neighborhood; 0 = otherwise
nucrim_p	1 = crime in the neighborhood is bothersome; 0 = otherwise
noise_p	1 = noise in the neighborhood is bothersome; 0 = otherwise
litter_p	1 = litter or housing deterioration in the neighborhood is bothersome; 0 = otherwise
badsrv_p	1 = poor city/county services in the neighborhood are bothersome; 0 = otherwise
badprp_p	1 = undesirable nonresidential uses in the neighborhood are bothersome; 0 = otherwise
odor_p**	1 = odor in the neighborhood is bothersome; 0 = otherwise
badper	1 = people in the neighborhood are bothersome; 0 = otherwise
othnhd_p	1 = some other feature in the neighborhood is bothersome; 0 = otherwise
schm_p	1 = schools in the area are inadequate; 0 = otherwise
shp_p	1 = shopping in the area is inadequate; 0 = otherwise
good_trn	1 = public transportation in the area is adequate; 0 = otherwise
mh_in_grp***	Number of mobile homes in group

**In the American Housing Survey, these variables range between 1 and 10. Because of the lack of observations on the lower end of distribution options, 1 and 2 were collapsed to a single category. For LIMDEP to do the statistical analysis, these nine remaining rankings had to be coded 0–8.*

***Available only for 1997 and beyond.*

****Available only for manufactured housing.*

Exhibit 3a

Variable Means—Housing Structural Quality Ranking

Variable Name	Manufactured Owned Housing			Traditional Owned Housing			Rented Housing		
	1993	1997	2001	1993	1997	2001	1993	1997	2001
how_h	6.1230	5.8570	5.9094	6.5959	6.4103	6.4367	5.6166	5.4516	5.5173
age_s	17.3918	21.2506	22.5402	41.8054	43.9577	44.7467	40.2837	42.6526	44.6962
n_porch	0.7813	0.7812	0.8701	0.8134	0.8133	0.8823	0.5793	0.5622	0.6478
n_garage	0.3538	0.3187	0.3120	0.7138	0.6948	0.7274	0.2552	0.2642	0.2748
equipment	3.3311	3.2860	3.4410	3.7121	3.7116	3.8433	3.0211	3.0022	3.1285
bathroom	0.9879	0.9991	0.9966	0.9842	0.9977	0.9982	0.9865	0.9966	0.9960
water	0.9977	0.9922	0.9932	0.9975	0.9962	0.9971	0.9985	0.9965	0.9964
sewage	0.5103	0.5202	0.4675	0.2360	0.2629	0.2456	0.0585	0.0512	0.0438
cntrl_air	0.4184	0.4780	0.5333	0.3956	0.4695	0.5511	0.2889	0.3440	0.3930
struc_prob	0.0425	0.2438	0.2821	0.0344	0.2391	0.2589	0.0988	0.3421	0.3582
ext_leak	0.1860	0.1645	0.1350	0.2001	0.1312	0.1196	0.1417	0.1043	0.1006
int_leak	0.1238	0.1068	0.1162	0.0823	0.0687	0.0618	0.1614	0.1294	0.1341
bad_int	0.1116	0.0706	0.0821	0.0943	0.0640	0.0586	0.1787	0.1258	0.1125
wtr_prob	0.0532	0.0715	0.0658	0.0204	0.0265	0.0214	0.0553	0.0520	0.0462
tlt_prob	0.0524	0.0258	0.0085	0.0420	0.0175	0.0136	0.0860	0.0502	0.0455
sew_prob	0.0243	0.0112	0.0111	0.0196	0.0105	0.0117	0.0272	0.0078	0.0217
wrg_prob	0.0304	0.0284	0.0145	0.0339	0.0247	0.0150	0.0548	0.0367	0.0221
fus_blow	0.2422	0.1817	0.1504	0.1930	0.1347	0.1310	0.2635	0.1727	0.1781
heat_brk	0.0243	0.0258	0.0513	0.0217	0.0212	0.0243	0.0652	0.0532	0.0515
heating1	0.8201	0.8846	0.9052	0.7984	0.8379	0.8553	0.6996	0.7575	0.7640
heating2	0.0516	0.0465	0.0333	0.1023	0.0962	0.0884	0.2208	0.1857	0.1902
heating3	0.1283	0.0689	0.0615	0.0993	0.0659	0.0563	0.0796	0.0568	0.0458
vermin	0.0273	0.2317	0.2453	0.0222	0.1802	0.1740	0.0550	0.1455	0.1434
Number of observations	1,317	1,161	1,170	12,347	9,141	9,391	11,782	8,550	8,291

Exhibit 3b

Variable Means—Housing Neighborhood Quality Ranking

Variable Name	Manufactured Owned Housing			Traditional Owned Housing			Rented Housing		
	1993	1997	2001	1993	1997	2001	1993	1997	2001
how_n	6.1519	5.9423	5.8872	6.2712	6.1778	6.1745	5.3398	5.2892	2.0542
e_low	NA	NA	NA	0.1009	0.1916	0.2006	0.5816	0.6194	0.4822
e_mid	NA	NA	NA	0.0144	0.0249	0.0260	0.1224	0.1483	0.3443
e_high	NA	NA	NA	0.0079	0.0127	0.0125	0.0540	0.0753	0.2549
e_mobil	0.3569	0.8174	0.8316	0.0166	0.0904	0.1039	0.0143	0.0467	0.2242
e_com	0.0615	0.1697	0.1744	0.0536	0.2082	0.2088	0.2609	0.5094	0.5000
e_prkg	0.0167	0.1068	0.1385	0.0245	0.1373	0.1329	0.2204	0.4949	0.4998
e_water	0.0175	0.2102	0.2051	0.0141	0.1454	0.1436	0.0257	0.1216	0.3141
e_green	0.1883	0.5349	0.4769	0.0880	0.3560	0.3323	0.1642	0.3244	0.4544
old_bldings	0.0357	0.1525	0.1940	0.0144	0.1145	0.1215	0.0512	0.1249	0.3628
new_bldings	0.0235	0.1972	0.1940	0.0172	0.0756	0.0762	0.0250	0.0786	0.2656
aban	0.0205	0.0439	0.0581	0.0186	0.0494	0.0479	0.0598	0.0874	0.2711
bars	0.0053	0.0215	0.0214	0.0471	0.0880	0.0735	0.1450	0.1620	0.3300
road_prob	0.1936	0.4384	0.4504	0.1016	0.3224	0.3399	0.2386	0.3929	0.4903
junk	0.1503	0.0879	0.0991	0.0932	0.0839	0.0788	0.2971	0.1662	0.3645
nucrim_p	0.0296	0.0792	0.0752	0.0553	0.0906	0.0786	0.1395	0.1551	0.3504
noise_p	0.0630	0.1240	0.1282	0.0707	0.1330	0.1219	0.1275	0.1839	0.3741
litter_p	0.0304	0.0138	0.0120	0.0524	0.0213	0.0211	0.0424	0.0204	0.1481
badsrv_p	0.0106	0.0043	0.0077	0.0133	0.0093	0.0100	0.0137	0.0077	0.1048
badprp_p	0.0114	0.0095	0.0026	0.0151	0.0079	0.0073	0.0149	0.0088	0.0855
odor_p	NA	0.0500	0.0487	NA	0.0427	0.0396	NA	0.0598	0.2326
badper_p	0.1488	0.0474	0.0342	0.1212	0.0439	0.0385	0.1698	0.0614	0.2232
othnhd_p	0.1147	0.0672	0.0684	0.0881	0.0668	0.0730	0.0775	0.0671	0.2629
schm_p	0.0251	0.0112	0.0188	0.0214	0.0094	0.0128	0.0314	0.0187	0.1350
shp_p	0.2688	0.3144	0.2974	0.1706	0.2022	0.1972	0.1040	0.1123	0.3177
good_trn	0.1048	0.1025	0.2248	0.2695	0.2472	0.3988	0.4793	0.4749	0.4829
mh_in_grp	0.5642	0.4746	0.4983	NA	NA	NA	NA	NA	NA
Number of observations	1,317	1,161	1,170	12,347	9,141	9,391	11,782	8,550	8,291

NA = data not available.

Empirical Results

Exhibit 4 contains the N-chotomous probit coefficients for each tenure type over each time period shown, relating structural characteristics to perceived housing quality.[18] In an analogous manner, exhibit 5 focuses on the determinants of neighborhood quality rankings. Due to the number of individual equations reported in these exhibits, we present general findings of relevance to the topic at hand rather than discussing the individual equations.

Structural Quality

The results presented in exhibit 4 demonstrate not only that most of the variables describing the structural characteristics of the dwelling are significant, but also that a great deal of consistency occurs in their relative importance across *both* tenure types *and* time periods.[19] Specifically, factors such as structure age (age_s), the presence of new appliances (equipment), the presence of structural problems (struc_prob), the presence of leaks (ext_leak and int_leak), major deterioration of the interior of the dwelling (bad_ int), the presence of central air conditioning (centr_air), and neighborhood quality (how_n) are generally significant with the expected sign across not only all three tenure types but also across all time periods. Very few "peculiar" results are shown in exhibit 4.[20]

The fundamental implication from exhibit 4 for manufactured owned housing is deceptively simple, namely that household satisfaction with manufactured owned housing is determined by exactly the same type of structural factors that are associated with other housing options. For example, interior and exterior leaks and structural problems are particularly important factors in affecting perceived structural quality. This assertion is robust in that it holds across all three time periods. Thus, communities do not need to devise special guidelines for manufactured owned housing as a special type that diverges from rented housing, stick-built owned housing, and so on. Households both act and react to structural characteristics in manufactured owned housing just as community residents in other types of housing act and react to structural characteristics in their respective environments.

[18] As in Boehm (1995), we conducted basic pooling tests to determine if a single aggregate relationship was appropriate. This hypothesis was rejected. Based on the housing literature, this result is hardly surprising. Thus, our estimates are presented by tenure type. A similar comment applies to neighborhood quality rankings.

[19] As noted previously (in footnote 13), the series of variables shown in exhibit 4 (and subsequent exhibits) as a set of Mu's are breakpoints required in the estimation procedure due to the ordinal ranking of the survey. They do not have any policy interpretation per se.

[20] For example, in the 1997 sample the presence of a garage or carport reduces the desirability of rental units. Somewhat unexpectedly, the presence of a porch appears to be an important feature for households residing in traditional owned housing and rented housing but not for households in manufactured owned housing.

Exhibit 4

N-Chotomous Probit Results by Housing Type and Time Period—Housing Quality Dependent Variable = how_h, Coefficient Estimates (1 of 2)

Variable Name	Manufactured Owned Housing			Traditional Owned Housing			Rented Housing		
	1993	1997	2001	1993	1997	2001	1993	1997	2001
age_s	– 0.0127**	– 0.0089**	– 0.0058**	– 0.0016**	– 0.0009*	– 0.0015**	– 0.0016**	– 0.0010**	– 0.0006
n_porch	0.0324	– 0.0966	0.0297	0.0874**	0.0422*	0.0971**	0.0515**	0.0521**	0.0414*
n_garage	0.2836**	0.1650**	0.1067*	0.1322**	0.0648**	0.0200	– 0.0263	– 0.0549**	0.0112
equipment	0.1037**	0.0439	0.0665**	0.0689**	0.0632**	0.0357**	0.0318**	0.0318**	0.0292**
bathroom	– 0.1892	1.6418**	0.7596**	– 0.0027	0.7364**	0.1831	0.1296**	0.6863**	0.3241**
water	1.5249**	– 0.4035*	0.1544	1.3493**	0.2058	0.7459**	1.2844**	0.4131**	0.5101**
sewage	– 0.0936*	– 0.0740	0.0309	– 0.0688**	0.0019**	0.0038	– 0.1214**	– 0.1163**	– 0.0609
cntrl_air	0.1252**	0.1636**	0.2796**	0.0505**	0.0391**	0.0983**	0.0747**	– 0.0194	0.0360
struc_prob	– 0.1011	– 0.1868**	– 0.1475**	– 0.1370**	– 0.1119**	– 0.1135**	– 0.1133**	– 0.1163**	– 0.0977**
ext_leak	– 0.4405**	– 0.2570**	– 0.1916**	– 0.2551**	– 0.1855**	– 0.1060**	– 0.2933**	– 0.1723**	– 0.2157**
int_leak	– 0.0116	– 0.1231	– 0.1921**	0.0187	– 0.1157**	– 0.1400**	0.0846**	– 0.1539**	– 0.2317**
bad_int	– 0.3007**	– 0.3865**	– 0.2482**	– 0.3842**	– 0.3268**	– 0.3224**	– 0.4318**	– 0.4366**	– 0.4122**
wtr_prob	– 0.0040	– 0.0652	– 0.0737	– 0.0551	– 0.0056	0.0812*	– 0.0584**	– 0.0595**	– 0.0760**
tlt_prob	0.0102	0.1404	– 0.1254	– 0.0376	0.0305	– 0.0285	– 0.1343**	– 0.0764**	– 0.0687**
sew_prob	– 0.0521	0.2282	– 0.0387	– 0.0779**	0.1241	– 0.0674	– 0.0696**	– 0.0263	– 0.0821**
wrg_prob	– 0.0944	– 0.1025	– 0.3079	– 0.3171**	– 0.2644**	– 0.1495**	– 0.2404**	– 0.2544**	– 0.2396**
fus_blow	– 0.0889**	– 0.0275	– 0.0484	– 0.0544**	– 0.0455**	– 0.0477**	– 0.0710**	– 0.0491**	– 0.0322**
heat_brk	– 0.3258*	0.0342	0.0057	– 0.1260**	0.0011	– 0.0933**	– 0.1133**	– 0.0461**	– 0.0319
heating2	0.0972	– 0.0377	– 0.1004	– 0.0547**	– 0.0779**	0.0437	– 0.0379*	– 0.0586**	– 0.0499*
heating3	– 0.1765**	0.0904	– 0.0956	– 0.1733**	– 0.0699*	– 0.0183	– 0.1728**	– 0.1992**	– 0.0565
vermin	0.0892	– 0.1544**	– 0.1221	– 0.1576**	– 0.0556**	– 0.0391*	– 0.3213**	– 0.0680**	– 0.1187**
Mu(1)	0.3970**	0.3589**	0.3870**	0.2807**	0.3251**	0.3312**	0.2799**	0.3738**	0.3387**
Mu(2)	0.6008**	0.6478**	0.7182**	0.5067**	0.6413**	0.6322**	0.5682**	0.7230**	0.6386**
Mu(3)	1.5428**	1.3980**	1.4560**	1.3674**	1.5159**	1.5296**	1.3362**	1.5864**	1.4385**
Mu(4)	1.7827**	1.6480**	1.7380**	1.6682**	1.8819**	1.8736**	1.6747**	1.9897**	1.8284**

Exhibit 4

N-Chotomous Probit Results by Housing Type and Time Period—Housing Quality Dependent Variable = how_h, Coefficient Estimates (2 of 2)

Variable Name	Manufactured Owned Housing			Traditional Owned Housing			Rented Housing		
	1993	1997	2001	1993	1997	2001	1993	1997	2001
Mu(5)	2.2462**	2.1372**	2.2436**	2.1411**	2.4442**	2.4844**	2.1900**	2.6047**	2.5004**
Mu(6)	3.0079**	2.8758**	2.9616**	2.9143**	3.3296**	3.4327**	2.9090**	3.4648**	3.3817**
Mu(7)	3.3169**	3.1890**	3.3752**	3.3339**	3.7732**	3.8992**	3.3084**	3.8632**	3.8243**
Log likelihood function	– 2,043.69	– 1,924.01	– 1,932.03	– 17,637.29	– 13,219.70	– 13,297.02	– 20,517.22	– 14,322.13	– 13,729.36
Restricted log likelihood	– 2,265.32	– 2,127.37	– 2,157.86	– 19,281.68	– 14,983.13	– 15,210.61	– 22,538.36	– 16,434.32	– 15,831.94
Chi-squared	443.27	406.73	451.65	3,288.78	3,526.87	3,827.19	4,042.28	4,224.38	4,205.15

**Statistically significant at the 10-percent level (one-tailed test).*

***Statistically significant at the 5-percent level (one-tailed test).*

Neighborhood Quality

As shown in exhibit 5, variables that significantly affect the perceived quality of neighborhoods tend to be similar across *both* tenure types *and* time periods. In this regard, the results for neighborhood quality tend to reinforce the similar results for perceived structural quality. Specifically, factors such as open spaces and parks (e_green), neighborhood noise (noise_p), trash and litter (junk), the perception of bothersome crime (nucrim_p), and undesirable nonresidential property uses (badprp_p) generally are significant with the expected sign across not only all three tenure types but also for all time periods. As with structural quality, very few peculiar results occur.[21]

Once again, the fundamental implication from exhibit 5 for manufactured owned housing is deceptively simple, namely that owner households in manufactured owned housing view the determinants of neighborhood quality as resulting from the same neighborhood factors that are associated with traditional owned housing and rented housing. This observation is true across all three time periods. For example, resident owners of manufactured housing appreciate parks and open space and disapprove of criminal activity in their neighborhoods, just as other owners do. Thus, communities planning for future growth need only to focus on traditional determinants of resident satisfaction, irrespective of housing type. This idea is particularly important to communities facing growth in relatively low-wage service industries, where the potential need for planned neighborhoods is most acute. The key lesson from exhibit 5 is the need for proper planning to maximize the perceived quality of neighborhoods.

Changes in Structural Quality and Neighborhood Quality Over Time

To more fully explore changes in the perceptions of structural and neighborhood quality, in this section we extend the previous analysis to consider changes over time and across tenure types. This process enables us to investigate the factors driving the changes in quality rankings over time.

Data, Samples, and Variables

As is well known, changes in a household's structural and neighborhood rankings can only be observed for those who stay in the unit until the next interview period, because the American Housing Survey follows housing units rather than households. Our basic time period of analysis covers changes over the 2-year waves of the AHS from 1993 to 2001. Thus, we do separate analyses for changes over time for four intervals, namely 1993 to 1995, 1995 to 1997, 1997 to 1999, and 1999 to 2001. It could be insightful, however, to observe changes in structural and neighborhood rankings over a longer interval than 2 years, even though the sample size would be expected to decline somewhat and out-movers in the initial 2 years might be expected to have experienced the most dramatic changes during that period. Consequently, we also include the 4-year intervals of 1993 to 1997 and 1997 to 2001. Because six time intervals with regressions for two independent variables are cumbersome to examine, and because the results do not differ substantially across the

[21] As shown in exhibit 5, enumerators' observations about surrounding properties (e_low, e_mid, e_high, and so on) follow no particular pattern. Also note that bars on windows on nearby properties (bars) always have the anticipated sign but tend to skip statistical significance across time period and housing type.

Exhibit 5

N-Chotomous Probit Results by Housing Type and Time Period—Neighborhood Quality Dependent Variable = how_n, Coefficient Estimates (1 of 2)

Variable Name	Manufactured Owned Housing			Traditional Owned Housing			Rented Housing		
	1993	1997	2001	1993	1997	2001	1993	1997	2001
e_low	0.1819	NA	NA	– 0.1379**	– 0.1287**	– 0.0905**	0.0594**	– 0.0457**	– 0.0205
e_mid	0.3135	NA	NA	– 0.0771	– 0.1368*	– 0.1041	0.0169	– 0.0817**	– 0.0435
e_high	0.8745	NA	NA	– 0.2302*	– 0.0060	0.2389**	– 0.0290	0.0719*	0.0857**
e_mobil	1.1074	0.1311*	– 0.0129	– 0.0068	0.0102	– 0.1047**	0.1010	0.1263**	0.1096**
e_com	1.5094*	– 0.0030	0.0588	0.0143	– 0.0582**	– 0.0381	– 0.0037	– 0.0253	0.0298
e_prkg	2.2091	0.0004	– 0.1388	– 0.0157	0.0107	0.0240	– 0.0509**	0.0238	0.0230
e_water	2.5974	0.0880	0.2306**	0.2296**	0.0395	0.0695**	– 0.0229	0.0716**	0.0582*
e_green	**	0.3305**	0.2321**	0.2085**	0.1963**	0.1722**	0.1476**	0.1532**	0.1124**
old_buildings	– 2,010.43	0.2849**	0.2342**	0.0608	0.0900**	0.0940**	– 0.0587*	0.2232**	0.2184**
new_buildings	**	– 0.0578	– 0.1167*	0.2775**	– 0.1551**	– 0.0605*	0.2779**	– 0.0953**	– 0.0213
aban	– 2,300.56	– 0.0828	– 0.1397	– 0.1325**	– 0.2493**	– 0.2650**	– 0.2229**	– 0.1719**	– 0.1130**
bars	580.25	0.2072	– 0.3789*	– 0.0139	– 0.1890**	– 0.0749**	– 0.1154**	– 0.0414	– 0.0083
road_prob	– 0.1395*	– 0.0852	– 0.0940*	0.1112**	– 0.1136**	– 0.1239**	0.0635**	– 0.0368*	– 0.0784**
junk	– 0.0506	– 0.2704**	– 0.2844**	– 0.1051**	– 0.3495**	– 0.4474**	– 0.0561**	– 0.1648**	– 0.2525**
nucrim_p	– 0.8724**	– 0.7722**	– 0.3226**	– 0.9362**	– 0.5636**	– 0.5613**	– 0.8838**	– 0.6422**	– 0.6390**
noise_p	– 0.4060**	– 0.2551**	– 0.4181**	– 0.3592**	– 0.3893**	– 0.3321**	– 0.3326**	– 0.2457**	– 0.2717**
litter_p	– 1.0118**	– 0.1193	– 0.3686*	– 0.8402**	– 0.6104**	– 0.3412**	– 0.3538**	– 0.1922**	– 0.1586**
badsrv_p	0.0731	0.4456	0.1176	– 0.2615**	0.2246**	– 0.1218*	– 0.1837**	– 0.0929**	– 0.1438*
badprp_p	– 0.5262**	0.5917*	– 0.0270	– 0.4497**	– 0.2200**	– 0.1347**	– 0.2041**	– 0.0261**	– 0.0415
odor_p	NA	– 0.4343**	– 0.3517**	NA	– 0.1987**	– 0.1509	NA	– 0.0631**	– 0.0448
badper	– 0.8321**	– 0.8311**	– 0.3979**	– 0.8053**	– 0.5907**	– 0.5175**	– 0.6380**	– 0.3750**	– 0.3606**
othnhd_p	– 0.5661**	– 0.2841**	– 0.0153	– 0.5138**	– 0.3142**	– 0.3102**	– 0.3076**	– 0.1470**	– 0.1666**
schm_p	– 0.2691*	– 1.1862**	– 0.5164**	– 0.1108**	– 0.2894**	– 0.2521**	– 0.0542	– 0.1415**	– 0.1584**
shp_p	0.1283**	0.0966*	0.1882**	0.0098	0.0549**	– 0.0003	0.0288	0.0485*	0.0315
good_trn	0.0979	0.1008	0.2789**	– 0.0515**	0.0119	– 0.0102	0.0641**	0.0605**	0.0550**
mh_in_grp	– 0.0857	– 0.1683**	– 0.2719**	NA	NA		NA	NA	NA

Exhibit 5

N-Chotomous Probit Results by Housing Type and Time Period—Neighborhood Quality Dependent Variable = how_n, Coefficient Estimates (2 of 2)

Variable Name	Manufactured Owned Housing			Traditional Owned Housing			Rented Housing		
	1993	1997	2001	1993	1997	2001	1993	1997	2001
Mu(1)	0.1819**	0.1769**	0.2120**	0.1472**	0.1662**	0.2146**	0.1878**	0.2401**	0.2296**
Mu(2)	0.3135**	0.3264**	0.3970**	0.3338**	0.3941**	0.4821**	0.4007**	0.4970**	0.4933**
Mu(3)	0.8745**	0.9142**	0.9986**	0.9395**	1.0861**	1.1751**	0.9903**	1.1891**	1.2000**
Mu(4)	1.1074**	1.1496**	1.2852**	1.2189**	1.4467**	1.5124**	1.2709**	1.5559**	1.5643**
Mu(5)	1.5094**	1.6381**	1.7945**	1.6683**	2.0023**	2.0984**	1.7180**	2.1439**	2.1909**
Mu(6)	2.2091**	2.4058**	2.5240**	2.4467**	2.9249**	3.0882**	2.3975**	2.9789**	3.0545**
Mu(7)	2.5974**	2.8083**	2.9280**	2.8809**	3.4546**	3.6207**	2.7997**	3.4769**	3.5658**
Log likelihood function	– 2,010.43	– 1,873.34	– 1,940.351	– 18,478.11	– 13,532.43	– 13,781.72	– 20,710.02	– 14,638.85	– 13,859.85
Restricted log likelihood	– 2,300.56	– 2,115.94	– 2,167.232	– 21,174.63	– 16,009.04	– 16,372.68	– 23,546.52	– 17,060.88	– 16,218.08
Chi-squared	580.25	485.20	453.763	5,393.05	4,953.22	5,181.91	5,673.00	4,844.07	4,716.46

NA = data not available.

**Statistically significant at the 10-percent level (one-tailed test).*

***Statistically significant at the 5-percent level (one-tailed test).*

period, results for the two longer intervals are presented in the text, while those for the four shorter intervals are provided for the interested reader in the appendix (exhibits A-3a, A-3b, A-4a, A-4b, A-5a, A-5b, A-6a, and A-6b).

The change in the structural and neighborhood rankings generally depends on the detailed structural and neighborhood characteristics included in the preceding estimation. Despite that observation, several variants in this analysis are important to note. First, very large changes in quality rankings rarely occur in the AHS due, in part, to the ordinal nature of the rankings. Thus, for estimation purposes, to have sufficient observations at the extreme ends of the scale, the few large positive changes (of more than plus four) were grouped together in the ordinal category "plus four." In a similar manner, the few large negative changes (of less than minus four) were included in the ordinal category "minus four." Thus, our ordinal change categories include nine categories, namely -4 or less, -3, -2, -1, 0, 1, 2, 3, and 4 or more, a progression from worst to best.[22] Second, we also control for both crowding (ratio of persons to rooms) and housing cost to income. Third, the basic level of structural quality and neighborhood quality (how_h or how_n) is included in the appropriate changes equation as recognition of the fact that if a housing unit starts out as either very high or very low, it can really only change in the other direction.[23] Finally, a few variables such as age of structure and exterior leaks had to be included as a level (not a change) due to data issues. In this respect, a couple of variables are excluded, particularly for the smallest sample (manufactured owned housing), due to a lack of variance in the variable.

Exhibit 6 contains variable names and definitions for all of the variables included in the analysis of the change in structural quality. Exhibit 7 shows similar information for the change in neighborhood quality.

Empirical Results

The basic empirical findings are shown in a set of four exhibits, namely exhibits 8 through exhibit 11.[24] Exhibit 8 presents the N-chotomous probit coefficients for each tenure type over the first set of time periods (1993 to 1997), relating changes in perceived structural quality to the factors discussed previously. In a similar manner, exhibit 9 focuses on the determinants of changes in neighborhood quality rankings. The next two exhibits (exhibit 10 and exhibit 11) are analogous to the first two exhibits but are based on the later time period (1997 to 2001). Due to the large number of individual equations reported in these exhibits, including those for the shorter subintervals reported in the appendix, we present general findings of relevance to the topic at hand rather than discussing the individual equations.

[22] For simplicity of interpretation, the categories were recoded in the ordinal probit estimation as 0, 1, 2, 3, 4, 5, 6, 7, and 8.

[23] The level of structural quality and level of neighborhood quality are determined, of course, by many of the same variables included in the analysis of changes in these measures. Thus, in this section we might expect less significance in the individual factors, although the analysis does provide additional insights to that presented previously.

[24] Not included as separate exhibits are the extensive mean values of all variables across housing type and time periods. Note that the changes in quality rankings between households in manufactured owned housing and traditional owned housing are statistically the same. For example, (traditional owned housing, manufactured owned housing) of (3.99, 3.93), (3.77, 3.80), and so on. In simple average terms, quality perceptions change in a similar manner.

The basic determinants of changes in either structural quality or neighborhood quality, where significant, tend to reinforce results reported previously. In general, not having an amenity (such as a garage) or gaining a negative feature (such as developing wiring problems) tends to increase the change in perceived structural quality in the anticipated direction. For changes in neighborhood quality, a similar observation can be made.

For changes in structural quality, a number of factors relatively consistently influence structural quality. In particular, interior and exterior leaks have a significant effect on the change in housing quality for each tenure type, as do interior and exterior structural problems. Also, concerns about crowding and structure age consistently affect the change in household ranking of the structural quality.

For changes in neighborhood quality, it is clear that the most consistent single influence on the level of change is the perception that crime has become a problem over the period.

Clearly, feedback occurs on the size of quality changes between changes in structural quality and changes in neighborhood quality. Owners of any housing type are willing to forgive some structural problems in neighborhoods that are perceived as becoming better (and vice versa).

The perceptions of owners of manufactured housing are similar to those of owners of traditional housing in terms of public policy issues such as changes in crime, noise, and litter and trash.

Communities do not appear to have to consider any special factors that affect manufactured owned housing relative to traditional owned housing.

Exhibit 6

Variable Names and Definitions—Change in Housing Quality (1 of 2)

Variable Name	Variable Definition
d_howh	Change in housing quality ranking over the period (range +4 to -4)*
how_h	Level of housing quality at the start of the period
age_s	Age of the housing the structure in years at the start of the period
crowding	Ratio of persons per room
zsmhc	Monthly housing costs (as defined by the AHS) at the beginning of the period
zinc2	Annual household income in dollars at the start of the period
hc2inc	Ratio of monthly housing costs to household income at the beginning of the period
get_porch	1 = porch added to the unit during the period; 0 = otherwise
lose_porch	1 = porch removed from the unit during the period; 0 = otherwise
get_garage	1 = garage added to the unit during the period; 0 = otherwise
lose_garage	1 = garage removed from the unit during the period; 0 = otherwise
d_equip	Change in the number of the following items during the period: refrigerator, garbage disposal, stove/oven, dishwasher, washer/dryer
get_bathroom	1 = bathroom added to the unit during the period; 0 = otherwise
lose_bathroom	1 = bathroom removed from the unit during the period; 0 = otherwise
get_water	1 = hot and cold piped water added to the unit during the period; 0 = otherwise
lose_water	1 = hot and cold piped water removed from the unit during the period; 0 = otherwise

Exhibit 6

Variable Names and Definitions—Change in Housing Quality (2 of 2)

Variable Name	Variable Definition
ext_leak	1 = exterior leak in the last 12 months; 0 = otherwise
get_sewage	1 = unit connected to public sewer or septic system during the period; 0 = otherwise
lose_sewage	1 = unit disconnected from public sewer or septic system during the period; 0 = otherwise
get_cntrl_air	1 = central air conditioning added to the unit during the period; 0 = otherwise
lose_cntrl_air	1 = central air conditioning removed from the unit during the period; 0 = otherwise
d_struc_prob	Change in the number of the following structural problems during the period: sagging roof, missing roof materials, holes in roof, missing wall materials or siding, slopping exterior walls, broken windows, bars on windows, and/or crumbling foundation
get_int_leak	1 = interior leak developed during the period; 0 = otherwise
lose_int_leak	1 = interior leak eliminated during the period; 0 = otherwise
get_bad_int	1 = the following interior problems developed during the period: cracks or holes in walls or ceilings, holes in floor, broken plaster, and/or peeling paint more than 1 square foot; 0 = otherwise
lose_bad_int	1 = the following interior problems corrected during the period: cracks or holes in walls or ceilings, holes in floor, broken plaster, and/or peeling paint over one square foot; 0 = otherwise
d_wtr_prob	Change in the reported number of water source breakdowns from the beginning to the end of the period
d_tlt_prob	Change in the reported number of toilet breakdowns from the beginning to the end of the period
d_sew_prob	Change in the reported number of sewer breakdowns from the beginning to the end of the period
d_wrg_prob	Change in the reported number of wiring problems from the beginning to the end of the period
d_fus_blow	Change in the reported number of times fuses blew from the beginning to the end of the period
d_heat_brk	Change in the reported number of heating breakdowns last winter from the beginning to the end of the period
d_2goodheat	1 = changed to steam, electric, heat pump, or central warm air furnace from some other less desirable way of heating during the period; 0 = otherwise
get_vermin	1 = rats or mice infested the unit during the period; 0 = otherwise
lose_vermin	1 = rat or mouse infestation eliminated from the unit during the period; 0 = otherwise
mh_in_grp**	1 = two or more mobile homes in group; 0 = otherwise
ownlot**	1 = resident of manufactured housing owns the land on which the unit is located; 0 = otherwise

AHS = American Housing Survey.

**A change of +4 or -4 represents a change of 4 or more in either direction.*

***Available only for manufactured housing.*

Exhibit 7

Variable Names and Definitions—Change in Neighborhood Quality (1 of 3)

Variable Name	Variable Definition
d_hown	Change in neighborhood quality ranking over the period (range +4 to -4)*
how_n	Level of neighborhood quality at the start of the period
age_s	Age of the housing the structure in years at the start of the period
crowding	Ratio of persons per room
zsmhc	Monthly housing costs (as defined by the AHS) at the beginning of the period
zinc2	Annual household income in dollars at the start of the period
hc2inc	Ratio of monthly housing costs to household income at the beginning of the period
get_e_low	1 = single-family or other lowrise buildings built within 300 feet of unit during the period; 0 = otherwise
lose_e_low	1 = single-family or other lowrise buildings removed from within 300 feet of unit during the period; 0 = otherwise
get_e_mid	1 = midrise residential buildings built within 300 feet of unit during the period; 0 = otherwise
lose_e_mid	1 = midrise residential buildings removed from within 300 feet of unit during the period; 0 = otherwise
get_e_high	1 = highrise residential buildings built within 300 feet of unit during the period; 0 = otherwise
lose_e_high	1 = highrise residential buildings removed from within 300 feet of unit during the period; 0 = otherwise
get_e_mobil	1 = mobile homes located within 300 feet of the unit during the period; 0 = otherwise
lose_e_mobil	1 = mobile homes removed from within 300 feet of the unit during the period; 0 = otherwise
get_e_com	1 = commercial/institutional/industrial building built within 300 feet of the unit during the period; 0 = otherwise
lose_e_com	1 = commercial/institutional/industrial building removed from within 300 feet of the unit during the period; 0 = otherwise
get_e_prkg	1 = residential parking lots built within 300 feet of the unit during the period; 0 = otherwise
lose_e_prkg	1 = residential parking lots removed from within 300 feet of the unit during the period; 0 = otherwise
get_e_water	1 = body of water established within 300 feet of the unit during the period; 0 = otherwise
lose_e_water	1 = body of water removed from within 300 feet of the unit during the period; 0 = otherwise
get_e_green	1 = green space/park/woods/farm/ranch established within 300 feet of the unit; 0 = otherwise
lose_e_green	1 = green space/park/woods/farm/ranch removed from within 300 feet of the unit; 0 = otherwise
get_aban	1 = housing units become abandoned within 300 feet of the unit during the period; 0 = otherwise
lose_aban	1 = abandoned housing units become occupied within 300 feet of the unit during the period; 0 = otherwise

Exhibit 7

Variable Names and Definitions—Change in Neighborhood Quality (2 of 3)

Variable Name	Variable Definition
get_bars	1 = bars are placed on windows within 300 feet of the unit during the period; 0 = otherwise
lose_bars	1 = bars are removed from windows within 300 feet of the unit during the period; 0 = otherwise
get_rd_prob	1 = road problems develop within 300 feet of the unit during the period; 0 = otherwise
lose_rd_prob	1 = road problems are eliminated within 300 feet of the unit during the period; 0 = otherwise
get_junk	1 = trash, litter, or junk has become a problem in the neighborhood during the period; 0 = otherwise
lose_junk	1 = a trash, litter, or junk problem in the neighborhood has been eliminated during the period; 0 = otherwise
get_nucrim_p	1 = during the period residents have become concerned with crime as a problem; 0 = otherwise
lose_nucrim_p	1 = during the period crime has been eliminated as a concern for the household; 0 = otherwise
get_noise_p	1 = during the period noise has become bothersome in the neighborhood; 0 = otherwise
lose_noise_p	1 = during the period noise has been eliminated as bothersome in the neighborhood; 0 = otherwise
get_litter_p	1 = during the period litter or housing deterioration has become a concern in the neighborhood; 0 = otherwise
lose_litter_p	1 = during the period litter or housing deterioration has been eliminated as a concern in the neighborhood; 0 = otherwise
get_badsrv_p	1 = during the period poor city or county services in the neighborhood has become a concern; 0 = otherwise
lose_badsrv_p	1 = during the period poor city or county services in the neighborhood has been eliminated as a concern; 0 = otherwise
get_badprp_p	1 = during the period undesirable residential uses have become a problem in the neighborhood; 0 = otherwise
lose_badprp_p	1 = during the period undesirable residential uses have been eliminated as a problem in the neighborhood; 0 = otherwise
get_badper	1 = during the period undesirable people in the neighborhood have become a problem; 0 = otherwise;
lose_badper	1 = undesirable people in the neighborhood are no longer a problem at the end of the period; 0 = otherwise
get_othnhd_p	1 = during the period some other feature has become a problem; 0 = otherwise
lose_othnhd_p	1 = during the period some other feature has been eliminated as a problem; 0 = otherwise
get_schm_p	1 = during the period schools in the area have come to be viewed as inadequate; 0 = otherwise
lose_schm_p	1 = during the period schools in the area have come to be viewed as adequate; 0 = otherwise
get_shp_p	1 = during the period shopping in the area has come to be viewed as inadequate; 0 = otherwise

Exhibit 7

Variable Names and Definitions—Change in Neighborhood Quality (3 of 3)

Variable Name	Variable Definition
lose_shp_p	1 = during the period shopping in the area has come to be viewed as adequate; 0 = otherwise
get_good_trn	1 = during the period public transportation in the area has come to be viewed as inadequate; 0 = otherwise
lose_good_trn	1 = during the period public transportation in the area has come to be viewed as adequate; 0 = otherwise
mh_in_grp**	1 = two or more mobile homes in group; 0 = otherwise
ownlot**	1 = resident of manufactured housing owns the land on which the unit is located; 0 = otherwise

AHS = American Housing Survey.

**A change of +4 or -4 represents a change of 4 or more in either direction.*

***Available only for manufactured housing.*

Exhibit 8

N-Chotomous Probit Results—Change in Housing Quality, 1993–1997 (1 of 2)

Variable Name	1993–1997					
	Traditional Owned Housing		Manufactured Owned Housing		Rented Housing	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
Constant	5.342	47.924	4.490	12.420	4.241	28.128
how_h	– 0.434	– 43.185	– 0.378	– 12.008	– 0.339	– 24.766
age_s	– 0.003	– 6.023	– 0.001	– 0.126	– 0.003	– 2.884
crowding	– 0.167	– 3.055	– 0.305	– 1.729	– 0.296	– 4.360
hc2inc	0.000	– 0.010	– 0.001	– 1.052	0.000	– 1.121
get_porch	0.036	0.739	– 0.149	– 0.894	0.023	0.288
lose_porch	– 0.041	– 0.893	0.006	0.043	– 0.115	– 1.581
get_garage	– 0.030	– 0.448	0.587	2.608	0.093	0.998
lose_garage	0.017	0.315	– 0.475	– 2.618	0.032	0.292
d_equip	0.026	1.159	0.133	1.995	0.108	2.988
get_bathroom	– 0.012	– 0.118	– 0.131	– 0.131	0.173	0.751
lose_bathroom	0.250	0.340	NA	NA	NA	NA
get_water	0.046	0.133	NA	NA	8.259	1.000
lose_water	– 0.194	– 0.771	1.545	0.711	– 0.338	0.496
ext_leak	– 0.084	– 2.591	– 0.119	– 1.038	– 0.184	0.003
get_sewage	0.109	0.908	0.329	1.509	0.039	0.880
lose_sewage	0.036	0.407	0.021	0.122	0.201	0.184
get_cntrl_air	0.083	1.412	0.330	1.790	– 0.007	0.952
lose_cntrl_air	– 0.108	– 1.276	0.358	1.315	0.080	0.525
d_struc_prob	– 0.140	– 7.729	– 0.207	– 3.002	– 0.136	0.000
get_int_leak	– 0.024	– 0.402	– 0.092	– 0.529	– 0.167	0.027
lose_int_leak	– 0.110	– 1.797	0.340	1.484	– 0.335	0.000
get_bad_int	– 0.288	– 5.179	– 0.473	– 2.278	– 0.446	0.000
lose_bad_int	– 0.037	– 0.647	– 0.258	– 1.154	0.250	0.001
d_wtr_prob	0.013	0.267	– 0.212	– 1.494	– 0.130	0.003
d_tlt_prob	0.015	0.426	0.141	0.774	– 0.083	0.047
d_sew_prob	0.040	0.768	0.054	0.222	0.032	0.699

Exhibit 8

N-Chotomous Probit Results—Change in Housing Quality, 1993–1997 (2 of 2)

Variable Name	1993–1997					
	Traditional Owned Housing		Manufactured Owned Housing		Rented Housing	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
d_wrg_prob	– 0.111	– 2.023	– 0.024	– 0.113	0.160	0.048
d_fus_blow	– 0.008	– 0.519	– 0.028	– 0.588	– 0.012	0.625
d_heat_brk	– 0.004	– 0.100	– 0.186	– 0.837	– 0.055	0.133
d_2goodheat	0.094	1.914	0.045	0.315	0.040	0.613
get_vermin	– 0.119	– 3.597	– 0.106	– 0.999	– 0.077	0.172
lose_vermin	– 0.041	– 0.354	0.076	0.007	0.125	0.339
mh_in_grp	NA	NA	– 0.048	– 0.397	NA	NA
ownlot	NA	NA	0.108	0.890	NA	NA
Mu(1)	0.468	0.468	0.591	6.413	0.471	12.340
Mu(2)	1.174	1.174	1.191	11.125	1.017	21.991
Mu(3)	1.735	1.735	1.639	14.749	1.570	31.845
Mu(4)	3.122	3.122	2.741	20.863	2.658	45.694
Mu(5)	3.754	3.754	3.373	23.538	3.239	50.226
Mu(6)	4.502	4.502	4.051	21.975	3.829	49.192
Mu(7)	5.096	5.096	4.543	22.485	4.383	48.391
Number of observations	6,344		602		2,196	
Log likelihood function	– 9,794.004		– 1,014.336		– 3,749.38	
Restricted log likelihood	– 11,372.28		– 1,190.434		– 4,324.191	
Chi-squared	3,156.542		352.1962		1,149.621	
Degrees of freedom	33		33		32	

NA = not applicable.

Exhibit 9

N-Chotomous Probit Results—Change in Neighborhood Quality, 1993–1997 (1 of 2)

Variable Name	1993–1997					
	Traditional Owned Housing		Manufactured Owned Housing		Rented Housing	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
Constant	5.166	56.546	4.734	12.566	4.118	29.842
how_n	– 0.439	– 52.153	– 0.410	– 12.550	– 0.348	– 28.521
hc2inc	0.000	– 0.327	– 0.004	– 4.877	0.000	0.215
get_e_low	– 0.066	– 1.662	0.009	0.028	0.007	0.124
lose_e_low	– 0.165	– 2.160	– 0.648	– 1.057	0.084	1.146
get_e_mid	– 0.197	– 1.776	1.005	1.246	– 0.070	– 0.857
lose_e_mid	0.418	2.482	– 7.939	0.000	– 0.045	– 0.438
get_e_high	0.084	0.471	– 0.435	– 0.574	– 0.187	– 1.822
lose_e_high	– 0.006	– 0.017	NA	NA	– 0.018	– 0.139
get_e_mobil	– 0.078	– 1.729	0.043	0.404	0.063	0.515
lose_e_mobil	0.081	0.465	0.463	1.757	– 0.189	– 0.679
get_e_com	– 0.039	– 1.046	0.078	0.500	– 0.082	– 1.584
lose_e_com	– 0.153	– 1.414	– 0.246	– 0.724	0.057	0.571
get_e_prkg	– 0.022	– 0.521	– 0.104	– 0.554	0.007	0.131
lose_e_prkg	– 0.049	– 0.293	– 0.444	– 0.730	– 0.088	– 0.810
get_e_water	0.036	0.892	0.196	1.623	0.091	0.996

Exhibit 9

N-Chotomous Probit Results—Change in Neighborhood Quality, 1993–1997 (2 of 2)

Variable Name	1993–1997					
	Traditional Owned Housing		Manufactured Owned Housing		Rented Housing	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
lose_e_water	– 0.053	– 0.135	– 0.070	– 0.025	0.326	1.328
get_e_green	0.084	2.712	0.022	0.211	0.141	2.315
lose_e_green	– 0.044	– 0.589	– 0.037	– 0.127	0.039	0.424
get_aban	– 0.227	– 4.027	– 0.632	– 2.719	– 0.249	– 3.060
lose_aban	0.051	0.378	– 0.178	– 0.405	– 0.125	– 1.105
get_bars	– 0.157	– 3.261	– 0.080	– 0.226	0.004	0.050
lose_bars	– 0.351	– 3.198	– 0.132	0.000	– 0.050	– 0.605
get_rd_prob	– 0.117	– 3.927	– 0.217	– 2.055	– 0.093	– 1.752
lose_rd_prob	0.041	0.650	0.062	0.331	– 0.009	– 0.118
get_junk	– 0.363	– 7.837	– 0.265	– 1.231	– 0.093	– 1.109
lose_junk	– 0.087	– 1.461	– 0.033	– 0.175	– 0.069	– 1.079
get_nucrim_p	– 0.534	– 11.917	– 0.960	– 5.748	– 0.757	– 10.988
lose_nucrim_p	0.249	3.084	0.066	0.142	0.069	0.859
get_noise_p	– 0.359	– 9.368	– 0.550	– 3.248	– 0.475	– 7.400
lose_noise_p	– 0.102	– 1.635	– 0.609	– 2.602	0.021	0.260
get_litter_p	– 0.772	– 9.328	– 0.649	– 1.056	0.066	0.384
lose_litter_p	– 0.001	– 0.020	0.137	0.547	– 0.364	– 3.299
get_badsrv_p	– 0.281	– 2.287	– 0.434	– 0.539	0.178	0.477
lose_badsrv_p	0.302	2.216	– 0.106	– 0.158	0.229	1.311
get_badprp_p	– 0.163	– 1.135	– 0.412	– 0.548	– 0.502	– 1.883
lose_badprp_p	0.014	0.136	0.046	0.071	– 0.168	– 0.840
get_badper	– 0.712	– 10.838	– 0.916	– 3.076	– 0.680	– 6.694
lose_badper	0.000	– 0.005	0.167	0.984	– 0.017	– 0.261
get_othnhd_p	– 0.376	– 6.851	– 0.073	– 0.337	– 0.280	– 2.920
lose_othnhd_p	0.005	0.105	0.149	0.913	0.023	0.257
get_schm_p	– 0.404	– 3.143	– 1.798	– 4.118	– 0.402	– 2.537
lose_schm_p	– 0.226	– 2.677	0.439	1.335	– 0.004	– 0.030
get_shp_p	– 0.001	– 0.029	0.004	0.028	– 0.128	– 1.426
lose_shp_p	– 0.041	– 0.929	0.031	0.213	0.174	2.024
get_good_trn	0.021	0.479	– 0.127	– 0.623	0.025	0.366
lose_good_trn	0.028	0.605	0.045	0.201	0.031	0.414
mh_in_grp	NA	NA	– 0.007	– 0.053	NA	NA
ownlot	NA	NA	0.224	1.844	NA	NA
Mu(1)	0.501	18.352	0.387	4.915	0.474	12.000
Mu(2)	1.201	36.771	1.086	10.697	1.016	21.005
Mu(3)	1.800	53.044	1.615	15.002	1.545	29.837
Mu(4)	3.142	81.279	2.932	22.905	2.710	43.640
Mu(5)	3.838	89.388	3.531	24.684	3.238	47.494
Mu(6)	4.581	88.220	4.311	24.586	3.856	48.640
Mu(7)	5.180	83.568	4.933	21.376	4.346	48.981
Number of observations	6,344		602		2,196	
Log likelihood function	– 9,771.438		– 942.4089		– 3,649.236	
Restricted log likelihood	– 11,825.6		– 1,146.982		– 4,385.621	
Chi-squared	4,108.316		409.1458		1,472.769	
Degrees of freedom	47		48		47	

NA = not applicable.

Exhibit 10

N-Chotomous Probit Results—Change in Housing Quality, 1997–2001 (1 of 2)

Variable Name	1997–2001					
	Traditional Owned Housing		Manufactured Owned Housing		Rented Housing	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
Constant	5.4113	48.175	5.0519	13.305	4.1973	25.897
how_h	– 0.4419	– 43.577	– 0.4141	– 12.651	– 0.3350	– 23.106
age_s	– 0.0036	– 5.584	– 0.0058	– 1.264	– 0.0045	– 3.991
crowding	– 0.1669	– 2.935	– 0.2723	– 1.404	– 0.2191	– 2.852
hc2inc	0.0000	– 0.539	– 0.0004	– 0.563	0.0000	0.159
get_porch	0.0412	0.937	– 0.0351	– 0.249	0.0945	1.309
lose_porch	– 0.0322	– 0.443	0.4407	1.911	– 0.0674	– 0.518
get_garage	0.0108	0.211	0.3101	2.033	– 0.0111	– 0.108
lose_garage	0.0534	0.777	0.2510	1.089	0.0622	0.571
d_equip	0.0300	1.098	0.1934	2.183	0.0611	1.493
get_bathroom	– 0.6440	– 1.509	NA	NA	NA	NA
lose_bathroom	1.6150	0.000	– 0.0897	– 0.136	NA	NA
get_water	0.3017	0.891	0.9689	0.688	0.6371	0.774
lose_water	– 1.6969	0.000	– 0.8997	– 1.360	0.0575	0.069
ext_leak	– 0.1553	– 4.004	– 0.1987	– 1.746	– 0.0870	– 1.123
get_sewage	– 0.2751	– 1.979	– 0.4363	– 1.530	0.1041	0.385
lose_sewage	0.0582	0.782	– 0.2116	– 1.291	0.5345	2.431
get_cntrl_air	0.0492	0.906	0.0424	0.269	0.0920	0.840
lose_cntrl_air	– 0.1304	– 1.333	0.1070	0.546	0.1723	1.134
d_struc_prob	– 0.0905	– 6.259	– 0.1219	– 2.194	– 0.1059	– 5.131
get_int_leak	– 0.1721	– 3.065	– 0.4061	– 2.457	– 0.4651	– 5.391
lose_int_leak	– 0.1913	– 3.299	0.0333	0.174	– 0.2065	– 2.839
get_bad_int	– 0.1971	– 3.340	– 0.7624	– 3.873	– 0.3025	– 3.349
lose_bad_int	– 0.0920	– 1.482	– 0.4247	– 2.000	– 0.0750	– 0.843
d_wtr_prob	0.0245	0.597	– 0.0031	– 0.035	0.0153	0.372
d_tlt_prob	– 0.0664	– 0.887	0.0924	0.354	– 0.1127	– 2.140
d_sew_prob	0.0168	0.282	– 0.3877	– 0.815	0.0447	0.330
d_wrg_prob	0.0192	0.254	– 0.0413	– 0.168	0.0797	0.947
d_fus_blow	– 0.0554	– 2.900	– 0.0357	– 0.538	– 0.0245	– 0.938
d_heat_brk	– 0.0513	– 1.547	– 0.0093	– 0.091	– 0.0771	– 2.154
d_2goodheat	0.0120	0.148	– 0.2818	– 1.113	0.0810	0.584
get_vermin	– 0.0223	– 0.523	– 0.1588	– 1.203	– 0.2310	– 3.005
lose_vermin	– 0.0288	– 0.697	0.1508	1.114	– 0.0376	– 0.428
mh_in_grp	NA	NA	– 0.1059	– 0.848	NA	NA
ownlot	NA	NA	– 0.1952	– 1.611	NA	NA
Mu(1)	0.5529	15.850	0.4151	5.661	0.4926	10.837
Mu(2)	1.2278	30.390	1.0337	10.648	1.1534	20.856
Mu(3)	1.8053	43.389	1.5101	14.737	1.7376	30.038
Mu(4)	3.1711	69.221	2.7729	21.326	2.8563	44.652
Mu(5)	3.9047	79.185	3.3636	23.429	3.4304	50.288
Mu(6)	4.7650	81.306	4.0745	23.052	4.1794	50.947
Mu(7)	5.3897	77.945	4.7194	21.625	4.7045	49.855
Number of observations	5,994		614		2,004	
Log likelihood function	– 9,112.10		– 992.6159		– 3,311.410	

Exhibit 10

N-Chotomous Probit Results—Change in Housing Quality, 1997–2001 (2 of 2)

Variable Name	1997–2001					
	Traditional Owned Housing		Manufactured Owned Housing		Rented Housing	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
Restricted log likelihood	– 10,817.53		– 1,202.662		– 3,930.412	
Chi-squared	3,410.86		420.0928		1,238.005	
Degrees of freedom	33		34		31	

NA = not applicable.

Exhibit 11

N-Chotomous Probit Results—Change in Neighborhood Quality, 1997–2001 (1 of 2)

Variable Name	1997–2001					
	Traditional Owned Housing		Manufactured Owned Housing		Rented Housing	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
Constant	4.5975	49.572	4.5991	14.941	4.2095	28.363
how_n	– 0.3810	– 45.027	– 0.3878	– 12.991	– 0.3620	– 26.142
hc2inc	0.0000	– 0.123	– 0.0004	– 0.895	0.0000	– 0.484
get_e_low	0.0063	0.122	– 0.1185	– 0.556	0.0126	0.169
lose_e_low	0.1338	2.455	0.1317	0.602	0.0250	0.372
get_e_mid	– 0.3045	– 2.539	– 0.2043	0.000	– 0.0003	– 0.003
lose_e_mid	0.1213	0.823	– 7.7943	0.000	– 0.0415	– 0.474
get_e_high	0.2284	0.649	NA	NA	0.0339	0.233
lose_e_high	0.4473	2.348	NA	NA	– 0.2696	– 2.171
get_e_mobil	– 0.0795	– 1.438	0.1758	0.930	0.2243	1.584
lose_e_mobil	– 0.0782	– 1.240	0.2964	1.401	– 0.0481	– 0.279
get_e_com	– 0.0927	– 2.050	– 0.2266	– 1.246	– 0.0465	– 0.639
lose_e_com	– 0.0109	– 0.210	– 0.0427	– 0.245	0.0654	0.951
get_e_prkg	0.0542	0.993	– 0.0377	– 0.212	0.0477	0.584
lose_e_prkg	– 0.0899	– 1.509	– 0.0171	– 0.073	0.0001	0.002
get_e_water	0.0601	0.995	– 0.0185	– 0.128	0.0357	0.304
lose_e_water	0.0065	0.108	– 0.0337	– 0.204	0.0427	0.398
get_e_green	– 0.0494	– 1.208	0.0089	0.064	0.0111	0.154
lose_e_green	0.0327	0.833	0.0438	0.361	– 0.0364	– 0.554
get_aban	– 0.3306	– 5.234	– 0.3346	– 1.618	– 0.3426	– 3.416
lose_aban	– 0.2179	– 3.345	0.2879	0.987	– 0.1198	– 1.304
get_bars	0.0821	1.313	– 0.2888	– 0.730	– 0.0504	– 0.541
lose_bars	– 0.0993	– 1.784	– 0.3373	– 0.967	– 0.0214	– 0.285
get_rd_prob	– 0.1011	– 2.856	– 0.1281	– 1.015	– 0.1230	– 2.005
lose_rd_prob	0.0144	0.392	– 0.0176	– 0.133	– 0.1002	– 1.673
get_junk	– 0.5984	– 12.083	– 0.7349	– 3.877	– 0.3599	– 4.485
lose_junk	– 0.0875	– 1.748	– 0.0532	– 0.209	– 0.1512	– 2.131
get_nucrim_p	– 0.5507	– 10.110	– 0.2184	– 0.993	– 0.5783	– 7.230
lose_nucrim_p	0.0914	1.748	0.1120	0.485	0.0347	0.435
get_noise_p	– 0.2350	– 4.995	– 0.1079	– 0.608	– 0.3071	– 4.065
lose_noise_p	– 0.0037	– 0.075	– 0.0346	– 0.205	0.0480	0.649

Exhibit 11

N-Chotomous Probit Results—Change in Neighborhood Quality, 1997–2001 (2 of 2)

Variable Name	1997–2001					
	Traditional Owned Housing		Manufactured Owned Housing		Rented Housing	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
get_litter_p	– 0.4315	– 5.255	– 0.2433	– 0.499	– 0.1497	– 0.968
lose_litter_p	– 0.0255	– 0.259	0.1081	0.103	– 0.1280	– 0.641
get_badsrv_p	– 0.7115	– 6.338	– 0.0276	– 0.054	– 0.2948	– 1.038
lose_badsrv_p	– 0.1328	– 0.876	7.0334	0.000	– 0.1291	– 0.419
get_badprp_p	– 0.2464	– 1.900	0.7044	0.000	– 0.1727	– 0.677
lose_badprp_p	0.0429	0.325	0.0116	0.007	0.1072	0.478
get_badper	– 0.5272	– 8.560	– 0.8275	– 2.672	– 0.4186	– 3.757
lose_badper	– 0.0476	– 0.757	– 0.1051	– 0.449	0.0944	0.974
get_othnhd_p	– 0.3551	– 6.649	0.1360	0.612	– 0.2242	– 2.520
lose_othnhd_p	– 0.1468	– 2.729	– 0.1704	– 0.850	– 0.0145	– 0.134
get_schm_p	– 0.6356	– 5.483	0.1668	0.430	– 0.1723	– 0.671
lose_schm_p	– 0.1973	– 1.404	0.2511	0.567	– 0.2345	– 1.278
get_shp_p	– 0.0196	– 0.454	– 0.4373	– 2.653	– 0.0700	– 0.807
lose_shp_p	0.0420	0.980	0.0938	0.689	0.0121	0.126
get_good_trn	0.0079	0.221	0.2690	1.928	0.0007	0.011
lose_good_trn	0.0093	0.156	0.0487	0.164	– 0.1327	– 1.445
mh_in_grp	NA	NA	– 0.0569	– 0.476	NA	NA
ownlot	NA	NA	0.0884	0.778	NA	NA
Mu(1)	0.5373	17.155	0.4281	4.754	0.4725	10.075
Mu(2)	1.1680	31.783	1.1233	10.008	1.0800	18.945
Mu(3)	1.7743	46.576	1.6571	14.135	1.6667	27.615
Mu(4)	3.0561	73.282	2.9473	21.486	2.7501	40.689
Mu(5)	3.7865	84.436	3.6292	24.240	3.4178	46.953
Mu(6)	4.5467	84.951	4.4129	24.654	4.1361	49.221
Mu(7)	5.1490	82.494	4.8387	23.565	4.7238	48.894
Number of observations	5,994		614		2,004	
Log likelihood function	– 9,365.427		– 963.6032		– 3,292.085	
Restricted log likelihood	– 11094.61		– 1,169.484		– 4,014.898	
Chi-squared	3,458.358		411.7607		1,445.626	
Degrees of freedom	47		47		47	

NA = not applicable.

Household Mobility and Manufactured Owned Housing: Implications for Neighborhood Stability

The results presented previously indicate that households in manufactured owned housing and traditional owned housing are quite similar in their assessments of both the structural aspects of housing and neighborhood quality. Indeed, housing policy for low-income households is considerably simplified by the simple yet powerful observation that quality is invariant across low-income housing options.

Despite these observations, the questionnaire studies cited in the first section reveal a general belief that manufactured housing is somehow associated with less community stability. The purpose of the analysis in this section is to explore this conjecture.

In this section, we explore stability in terms of whether households that reside in manufactured owned housing tend to move more than households in traditional owned housing and rented housing do. Specifically, even if we adjust for the structural characteristics of housing options and characteristics of the neighborhood, is there a tendency to observe additional mobility due solely to an effect associated with manufactured owned housing? Is there a negative effect on community stability that is peculiar to the manufactured owned housing option for low-income households? In other words, does manufactured owned housing lead to movement of low-income households from one housing alternative to the next at a more rapid rate than that of low-income households in traditional owned housing and rented housing?

The Model

In much of the mobility literature, the traditional estimation approach to the likelihood of moving generally involves a regression format (as a logit or probit specification) with the likelihood of "moving-staying" subsequently evaluated at the mean values of the sample. This likelihood is an average value over the sample period. In contrast, our model specification provides the opportunity to calculate a cumulative probability that varies over time and across different household types. To obtain the likelihood of household mobility reported here, we use the duration modeling approach of the continuous time model (CTM) as extensively developed by James Heckman in such works as Heckman and Walker (1990, 1986) and recently used by Boehm and Schlottmann (2004). Continuous time duration models, and the CTM approach in particular, provide superior insights into the intertemporal dynamics of economic relationships. To estimate the hazard function, these models make use of all the information available in a panel data set on the timing of change from one economic state of existence to another, as well as the timing and magnitude of changes in the values of the independent variable hypothesized to influence the transition from one state of existence to another.[25] The critical feature of the CTM model for the issue of manufactured owned housing and neighborhood stability is that it allows for estimation of a so-called duration term (parameter) that represents the separate effect of time in residence in a specific type of housing on the likelihood of moving. This effect on mobility is independent of other factors included in the

[25] Heckman and Flinn (1982) present a good discussion of the practical advantages of using continuous time duration models to analyze a problem as opposed to regression approaches and discrete time probability models.

analysis, such as household structure and neighborhood characteristics, and represents a unique push or pull factor associated with the specific housing type.[26]

Data, Samples, and Variables

The time period for the analysis of mobility among low-income households is the entire sample period; that is, 1991 to 2001. Over this period, mobility is estimated for households that reside in the three types of housing of interest (manufactured owned housing, traditional owned housing, and rented housing). Exhibit 12 shows the names and definitions of all the variables included in the analysis of household mobility. As shown in exhibit 12, mobility is hypothesized to be a function of three factors: (1) disequilibrium in housing consumption (for example, overcrowding measured by a high persons-per-room ratio, or high housing costs relative to household income), (2) factors affecting the cost of moving (for example, older individuals find it more difficult to move than younger ones do), and (3) the quality of the structure and neighborhood in which the household resides at a specific point in time.

Exhibit 13 shows the relative number of movers and stayers by housing option over the sample period. Not surprisingly, residents of traditional owned housing have the lowest (average) likelihood of moving over the period while residents of rented housing, not manufactured owned housing, have the highest probability of moving. Mobility rates among households that reside in manufactured owned housing fall in between these two extremes but, in percentage terms, are closer to traditional owned housing than to rented housing. These observations are, of course, based on average rates of mobility and do not necessarily reflect variation in causal factors. Exhibit 14 contains means for each included variable by tenure type. Most of the values shown appear to be consistent with prior work. For example, movers tend to be younger, with lower marital rates and higher incomes.

Empirical Results

Exhibit 15 contains the estimated coefficients in the CTM model for each tenure type. In general, the estimates are broadly consistent with expected results; for example, the age selectivity of mobility is shown across housing type (older households move less) and increased household size impedes mobility, where significant households with minority heads or single heads have lower mobility.[27] Based on the previous discussions on structural quality and neighborhood quality, we would expect higher values for either of these factors to decrease household mobility. This scenario is indeed the case in exhibit 15, where both variables are consistently negative across all housing options (if not statistically significant).

[26] More formally, the technical literature refers to this effect as duration dependence. Positive duration dependence implies that a household is more likely to leave its current situation over time and negative duration dependence implies that the household is less likely to leave its current situation over time. In the current instance, negative duration dependence, given other factors included in the analysis, implies greater neighborhood stability; that is, less moving in and out by neighborhood residents.

[27] The education selectivity of migration (household heads with more education are more likely to move) is only partially seen in the results. This trend is due to the inclusion of income (which is generally significant), a factor obviously directly related to education.

A major point of interest in exhibit 15 is the results for duration dependence for the individual housing types; that is, what effect (if any) does time in residence have on mobility independent of traditional issues such as structural quality and neighborhood quality? As shown in exhibit 15, *both* manufactured owned housing and traditional owned housing exhibit statistically significant negative duration dependence. That is to say, controlling for the effects of all the independent variables included in the mobility equation, the likelihood of moving decreases over time for households residing in these housing options. In simple terms, no empirical evidence of neighborhood instability is associated with manufactured owned housing. Residents of manufactured owned housing tend toward stability of location in a manner quite similar to that of residents of traditional owned housing. To the best of our knowledge, this is the first time such an observation has been validated in the literature on either low-income housing or manufactured housing. In direct contrast, rented housing exhibits positive duration dependence; that is, a tendency for a household to move the longer it resides in a rented housing unit. This trend could, of course, reflect households purchasing homes, but, whatever the reason, it represents an attempt to leave an environment that has become less desirable over time. The main point, however, is that manufactured owned housing does not inherently generate movement over time by the low-income households residing in this type of housing unit.

Exhibit 12

Variable Names and Definitions—Mobility Regression (1 of 2)

Variable Name	Variable Definition
how_h	Ranking of the overall quality of the structure by the household: 10 (best) to 1 (worst)
how_n	Ranking of the overall quality of the neighborhood by the household: 10 (best) to 1 (worst)
northeast	1 = current residence located in the northeastern United States; 0 = otherwise
midwest	1 = current residence located in the midwestern United States; 0 = otherwise
south	1 = current residence located in the southern United States; 0 = otherwise
rural	1 = current residence located in a rural area; 0 = otherwise
married	1 = household headed by husband and wife or partners; 0 = otherwise
s_male	1 = household headed by a single male; 0 = otherwise
s_female	1 = household headed by single female; 0 = otherwise
white	1 = race of household head is White; 0 = otherwise
black	1 = race of household head is Black; 0 = otherwise
hispanic	1 = race of household head is Hispanic; 0 = otherwise
other	1 = race of household head is other than White, Black, or Hispanic; 0 = otherwise
no_hs	1 = household head did not graduate from high school; 0 = otherwise
hs_grad	1 = household head is high school graduate without additional education; 0 = otherwise
post_hs	1 = household head has additional education beyond high school, but is not a graduate of a 4-year college or university; 0 = otherwise
c_grad_p	1 = household head has a degree from a 4-year college or university, or more; 0 = otherwise

Exhibit 12

Variable Names and Definitions—Mobility Regression (2 of 2)

Variable Name	Variable Definition
yrs_in_res91	Number of years the household head resided in current residence before 1991, the start of the observation period.
age	Age of the household head in years.
fsize	Number of people in the household
income	Annual income of the household measured in $10,000 units
hc2inc	Monthly housing cost/monthly household income
per2rms	Persons per room for a given household
mf_ownlot	1 = if in manufactured owned housing and own lot; 0 = otherwise

Exhibit 13

Mobility Transition Matrix, 1991–2001

Housing Type	Stayed Entire Time	Moved During Period
Traditional Owned Housing		
Count	3,169	2,043
Percent of total	60.80%	39.20%
Mean duration in years	10	3.68
Manufactured Owned Housing		
Count	260	323
Percent of total	44.60%	55.40%
Mean duration in years	10	2.57
Rented Housing		
Count	761	5,248
Percent of total	12.66%	87.34%
Mean duration in years	10	1.98

Exhibit 14a

Variable Means—Owners Traditional Housing, 1991–2001 (1 of 2)

Variable Name	Movers 1991	Movers Year Moved	Stayers 1991	Stayers 1999
age	56.911	58.500	60.779	66.739
how_n	8.131	8.110	8.347	8.269
how_h	8.550	8.464	8.643	8.505
s_female	0.339	0.405	0.310	0.411
s_male	0.164	0.201	0.084	0.123
mar	0.496	0.394	0.606	0.466
fsize	2.267	2.137	2.382	2.087
income	2.905	2.589	2.590	3.114
zsmhc	469.415	488.357	371.287	448.369
black	0.063	0.062	0.113	0.115
white	0.879	0.876	0.824	0.816
hispanic	0.044	0.047	0.051	0.054

Exhibit 14a

Variable Means—Owners Traditional Housing, 1991–2001 (2 of 2)

Variable Name	Movers 1991	Movers Year Moved	Stayers 1991	Stayers 1999
other	0.015	0.015	0.012	0.014
yrs_in_res91	16.767	16.767	22.165	22.175
per2rms	0.398	0.378	0.413	0.366
northeast	0.174	0.174	0.208	0.208
midwest	0.322	0.322	0.296	0.296
south	0.321	0.321	0.345	0.345
west	0.183	0.183	0.151	0.151
msa_ccity	0.302	0.302	0.273	0.273
msa_suburban	0.352	0.352	0.326	0.326
msa_rural	0.113	0.113	0.141	0.141
non_rural	0.135	0.135	0.168	0.168
non_urban	0.098	0.098	0.092	0.092
no_hs	0.265	0.263	0.323	0.317
hs_grad	0.390	0.378	0.420	0.360
post_hs	0.175	0.194	0.145	0.210
c_grad_p	0.170	0.164	0.111	0.113
mf_ownlot	NA	NA	NA	NA
Number of observations		2,043		3,169

NA = not applicable.

Exhibit 14b

Variable Means—Manufactured Owned Housing, 1991–2001 (1 of 2)

Variable Name	Movers 1991	Movers Year Moved	Stayers 1991	Stayers 1999
age	49.576	50.573	58.185	64.892
how_n	7.960	7.833	8.435	8.419
how_h	8.149	7.947	8.250	8.169
s_female	0.356	0.372	0.331	0.415
s_male	0.183	0.186	0.146	0.173
mar	0.461	0.443	0.523	0.412
fsize	2.288	2.285	2.238	1.919
income	2.077	2.067	1.843	2.253
zsmhc	316.291	333.988	257.331	324.077
black	0.040	0.040	0.065	0.065
white	0.901	0.898	0.892	0.904
hispanic	0.040	0.040	0.031	0.027
other	0.019	0.022	0.012	0.004
yrs_in_res91	6.731	6.731	11.415	11.415
per2rms	0.504	0.503	0.463	0.402
northeast	0.115	0.115	0.150	0.150
midwest	0.248	0.248	0.192	0.192
south	0.372	0.372	0.427	0.427
west	0.266	0.266	0.231	0.231
msa_ccity	0.090	0.090	0.069	0.069
msa_suburban	0.269	0.269	0.200	0.200
msa_rural	0.313	0.313	0.281	0.281

Exhibit 14b

Variable Means—Manufactured Owned Housing, 1991–2001 (2 of 2)

Variable Name	Movers 1991	Movers Year Moved	Stayers 1991	Stayers 1999
non_rural	0.276	0.276	0.362	0.362
non_urban	0.053	0.053	0.088	0.088
no_hs	0.322	0.322	0.415	0.423
hs_grad	0.464	0.449	0.419	0.358
post_hs	0.161	0.170	0.127	0.181
c_grad_p	0.053	0.059	0.038	0.038
mf_ownlot	0.260	0.248	0.438	0.454
Number of observations		323		260

Exhibit 14c

Variable Mobility Means—Rented Housing Units, 1991–2001

Variable Name	Movers 1991	Movers Year Moved	Stayers 1991	Stayers 1999
age	40.133	40.910	54.368	61.319
how_n	7.318	7.254	7.691	7.737
how_h	7.513	7.427	8.058	7.883
s_female	0.453	0.460	0.531	0.568
s_male	0.250	0.254	0.201	0.201
mar	0.296	0.287	0.268	0.231
fsize	2.381	2.365	2.205	2.068
income	2.108	2.098	1.847	2.471
zsmhc	451.636	463.885	401.523	504.689
black	0.175	0.176	0.209	0.217
white	0.645	0.642	0.614	0.602
hispanic	0.137	0.137	0.142	0.148
other	0.044	0.045	0.035	0.033
yrs_in_res91	3.865	3.865	9.811	9.811
per2rms	0.580	0.577	0.517	0.485
northeast	0.200	0.200	0.382	0.382
midwest	0.237	0.237	0.210	0.210
south	0.310	0.310	0.226	0.226
west	0.253	0.253	0.181	0.181
msa_ccity	0.500	0.500	0.510	0.510
msa_suburban	0.324	0.324	0.302	0.302
msa_rural	0.046	0.046	0.038	0.038
non_rural	0.045	0.045	0.078	0.078
non_urban	0.086	0.086	0.072	0.072
no_hs	0.255	0.256	0.389	0.381
hs_grad	0.366	0.359	0.352	0.305
post_hs	0.208	0.215	0.138	0.197
c_grad_p	0.171	0.171	0.121	0.117
mf_ownlot	NA	NA	NA	NA
Number of observations		5,248		761

NA = not applicable.

Exhibit 15

Mobility Coefficients and t-Statistics

Variable Name	Traditional Owned Housing		Manufactured Owned Housing		Rented Housing	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
intercept	0.8383	2.1827	1.8351	3.4629	3.3703	24.6842
duration	– 0.1856	– 6.0759	– 0.2463	– 3.0306	0.0670	3.2644
how_h	– 0.0272	– 0.3140	– 0.0184	– 0.5123	– 0.0365	– 4.5516
how_n	– 0.1282	– 2.1771	– 0.0115	– 0.3804	– 0.0470	– 1.6543
howh_sq	0.0016	0.2696	NA	NA	NA	NA
hown_sq	0.0071	1.6370	NA	NA	0.0040	1.8088
midwest	0.1544	2.3601	0.1146	0.5412	0.2768	7.7210
south	0.0810	1.2200	0.1339	0.6643	0.3264	9.5870
west	0.1582	2.1198	0.2759	1.2965	0.2929	8.1970
rural	– 0.1712	– 2.5681	– 0.1895	– 1.4523	– 0.3256	– 5.9115
s_female	0.4571	7.8776	0.1468	1.0087	– 0.0628	– 1.7810
s_male	0.7557	11.4036	– 0.0557	– 0.3106	– 0.0619	– 1.5298
black	– 0.6814	– 7.4451	– 0.3304	– 1.0757	– 0.1527	– 4.3637
hispanic	– 0.2281	– 2.1434	– 0.1969	– 0.6122	– 0.2568	– 6.2913
other	– 0.1561	– 0.8947	0.8249	1.7163	– 0.0542	– 0.8039
hs_grad	– 0.0622	– 1.0583	– 0.0455	– 0.3320	0.0072	0.2141
post_hs	– 0.0653	– 0.9297	– 0.2796	– 1.5803	– 0.0508	– 1.2914
c_grad_p	0.1696	2.2487	– 0.0444	– 0.1822	0.0365	0.8446
mf_ownlot	NA	NA	– 0.4005	– 2.9170	NA	NA
yrs_in_res91	– 0.0184	– 10.1395	– 0.0626	– 6.0176	– 0.0817	– 29.3149
age	– 0.0112	– 6.5826	– 0.0221	– 5.1270	– 0.0229	– 24.8623
fsize	– 0.0838	– 2.2938	– 0.2122	– 1.7572	– 0.0905	– 5.8619
income	0.0122	1.0654	0.0705	1.8318	0.0250	2.5290
hc2inc	0.4536	4.5113	0.4467	1.5578	0.2766	4.0225
per2rms	0.2638	1.4034	0.8169	1.4340	0.2440	3.8671
Number of observations	5,212		583		6,009	

NA = not applicable.

Note: All equations statistically significant at 5 percent or better based on log likelihood test statistics.

Notes on Housing Appreciation: The Case for Manufactured Owned Housing

As is well documented in Retsinas and Belsky (2002b), low-income homeownership can, by its very nature, be a potentially risky investment.[28] In this section, we present the evidence on price appreciation for manufactured owned housing and traditional owned housing based on the American Housing Survey for the period 1993 to 2001. We also distinguish between two types of manufactured owned housing, specifically, whether the household owns the lot or does not own the lot. Consistent with the time periods used in this article, we have computed this information for the 2-year intervals (1993 to 1995, 1995 to 1997, 1997 to 1999, and 1999 to 2001) and the 4-year intervals (1993 to1997 and 1997 to 2001).

[28] See the introduction to Part 3 (DeGiovanni, 2002) and associated papers (Belsky and Duda, 2002a, 2002b; Case and Marynchenko, 2002; and Goetzmann and Spiegel, 2002).

Exhibit 16 presents information on housing values (prices) and percent appreciation over the period.[29] As is well known, the distribution of housing values does not necessarily follow a normal (symmetric) distribution. Thus, exhibit 16 presents results computed for both average housing values (mean) and mid-range values (median). In our opinion, four basic observations can be made:

1. Traditional owned housing appears to be a reasonable investment, particularly when one considers that exhibit 16 focuses on low-income housing.

2. As a general rule, manufactured owned housing in which the lot is owned may offer an opportunity for appreciation, but such appreciation is highly variable and occurs on a much smaller base (value) than traditional owned housing.[30]

3. In cases in which the land is owned, manufactured owned housing can yield (total) appreciation amounts that are not dissimilar from those of traditional owned housing. This trend can be seen by applying mean percentage changes to mean starting values in exhibit 16. In four of the six time periods shown, manufactured owned housing does well relative to traditional low-income housing. It must be noted, however, that significant variation occurs in rates of appreciation across manufactured owned housing units, which may indicate these homes are riskier investments. This result might also be partially attributable to the smaller number of observations for these homes in the data.

4. Manufactured owned housing in which the household does not own the lot is not an investment in any sense. It should be thought of as a type of consumer durable.

Regarding the last observation in the preceding text, it is important to note that the cost of manufactured owned housing over the time period 1993 to 2001 in the AHS is considerably lower than average rents (see exhibit 1). As pointed out by Belsky and Duda (2002b), one justification for efforts to support low-income homeownership is "its potential to insulate households from rent inflation." In particular, it might be possible for low-income households to use manufactured owned housing as a means to save for traditional owned housing, the most preferred alternative from a purely investment perspective.

[29] We experimented with running a regression to try to explain pricing differentials, but, given the information available to us, the results, particularly for manufactured owned housing units, did not merit presentation or comparison with traditional owned housing units.

[30] The reported values in the AHS represent owners' estimates of value. Perhaps this is one reason for the variability shown in the computations for manufactured owned housing. In addition, as shown for manufactured owned housing where the lot is also owned, the percentage changes (although applied to a low base) are high.

Exhibit 16

Value and Appreciation Comparison

Number of Observations	Period	Mean Percentage Change in Value (%)	Mean Value Beginning of Period ($)	Median Percentage Change in Value (%)	Median Value Beginning of Period ($)
		Traditional Owned Housing			
6,425	1993–1995	11.48	82,524	4.88	69,000
6,154	1995–1997	12.25	87,448	4.35	75,000
5,381	1993–1997	19.74	81,898	10.00	70,000
6,115	1997–1999	13.97	88,347	6.67	78,000
6,057	1999–2001	14.87	96,049	7.14	85,000
5,109	1997–2001	27.65	87,761	15.79	79,000
		Manufactured Owned Housing—Lot Is Owned			
302	1993–1995	77.10	17,192	13.81	12,000
258	1995–1997	27.43	20,147	– 1.39	16,000
225	1993–1997	106.52	17,151	7.14	12,000
334	1997–1999	30.81	24,166	0.00	15,000
335	1999–2001	150.28	20,970	2.56	15,000
267	1997–2001	155.48	23,382	30.00	17,000
		Manufactured Owned Housing—Lot Is Not Owned			
351	1993–1995	16.56	16,368	0.00	14,000
320	1995–1997	10.03	16,475	0.00	14,000
253	1993–1997	20.16	16,937	– 1.69	14,000
344	1997–1999	0.68	16,866	0.00	11,500
303	1999–2001	57.10	16,563	0.00	12,000
241	1997–2001	62.13	18,685	0.00	12,000

Appendix. Supplementary Exhibits

Exhibit A-1a

1993 Quality, Size, and Cost of Housing by Tenure Type for Low-Income Households[a] in Metropolitan Areas

Housing Tenure Type	Mean Housing Rank[b]	Mean Neighborhood Rank[b]	Opinion of House Poor[c] (%)	Opinion of Neighborhood Poor[c] (%)	Structures Moderately or Severely Inadequate[d] (%)	Mean Number of Rooms	Mean Square Feet in Unit
Traditional owned housing	8.631	8.181	0.785	3.355	1.887	5.932	1,773.18
Manufactured owned housing	8.105	7.982	2.243	5.431	1.653	4.808	1,014.45
Rented housing	7.563	7.183	4.085	9.166	2.918	4.137	980.72

Housing Tenure Type	Mean Monthly Housing Cost ($)	Average Annual Household Income ($)	Spend > 30% of Income on Housing (%)	Mean Monthly Housing Cost ($)	Average Annual Household Income ($)	Spend > 30% of Income on Housing (%)
	All Households			Recent In-Movers[e]		
Traditional owned housing	458.39	19,439	36.12	603.86	23,153	46.76
Manufactured owned housing	333.63	17,047	32.74	370.06	18,045	34.57
Rented housing	481.76	16,302	57.00	499.98	17,751	57.76

[a] *Low-income households have incomes below 80 percent of the median for a particular year and area.*

[b] *Housing rank and neighborhood rank are measured using an ordinal scale from 1 to 10, with 10 being the best.*

[c] *A ranking of 1, 2, or 3 was deemed poor.*

[d] *Structures were ranked by interviewers as adequate, moderately inadequate, or severely inadequate.*

[e] *Any household that moved into its dwelling unit in the last 2 years before the interview was deemed as a recent in-mover.*

Exhibit A-1b

1997 Quality, Size, and Cost of Housing by Tenure Type for Low-Income Households[a] in Metropolitan Areas

Housing Tenure Type	Mean Housing Rank[b]	Mean Neighborhood Rank[b]	Opinion of House Poor[c] (%)	Opinion of Neighborhood Poor[c] (%)	Structures Moderately or Severely Inadequate[d] (%)	Mean Number of Rooms	Mean Square Feet in Unit
Traditional owned housing	8.417	8.081	0.899	2.726	1.293	5.997	1,838.33
Manufactured owned housing	7.802	7.693	3.582	5.671	1.791	4.616	1,079.01
Rented housing	7.402	7.172	3.861	6.895	3.389	4.078	1,267.96

Housing Tenure Type	Mean Monthly Housing Cost ($)	Average Annual Household Income ($)	Spend > 30% of Income on Housing (%)	Mean Monthly Housing Cost ($)	Average Annual Household Income ($)	Spend > 30% of Income on Housing (%)
	All Households			Recent In-Movers[e]		
Traditional owned housing	533.94	19,912	42.96	687.40	24,833	52.19
Manufactured owned housing	406.01	17,448	36.10	461.94	21,290	34.59
Rented housing	541.82	17,471	56.61	561.57	19,977	57.84

[a] *Low-income households have incomes below 80 percent of the median for a particular year and area.*

[b] *Housing rank and neighborhood rank are measured using an ordinal scale from 1 to 10, with 10 being the best.*

[c] *A ranking of 1, 2, or 3 was deemed poor.*

[d] *Structures were ranked by interviewers as adequate, moderately inadequate, or severely inadequate.*

[e] *Any household that moved into its dwelling unit in the last 2 years before the interview was deemed as a recent in-mover.*

Exhibit A-1c

2001 Quality, Size, and Cost of Housing by Tenure Type for Low-Income Households[a] in Metropolitan Areas

Housing Tenure Type	Mean Housing Rank[b]	Mean Neighborhood Rank[b]	Opinion of House Poor[c] (%)	Opinion of Neighborhood Poor[c] (%)	Structures Moderately or Severely Inadequate[d] (%)	Mean Number of Rooms	Mean Square Feet in Unit
Traditional owned housing	8.430	8.102	0.876	2.469	1.619	5.925	1,871.60
Manufactured owned housing	7.872	7.708	2.748	3.359	2.748	4.846	1,101.14
Rented housing	7.469	7.356	3.898	5.355	3.655	4.112	1,012.02

Housing Tenure Type	Mean Monthly Housing Cost ($)	Average Annual Household Income ($)	Spend > 30% of Income on Housing (%)	Mean Monthly Housing Cost ($)	Average Annual Household Income ($)	Spend > 30% of Income on Housing (%)
	All Households			Recent In-Movers[e]		
Traditional owned housing	681.51	22,041	46.37	852.39	27,553	56.49
Manufactured owned housing	457.55	19,276	41.63	501.26	20,921	49.38
Rented housing	641.37	18,849	57.20	666.14	22,733	59.61

[a] *Low-income households have incomes below 80 percent of the median for a particular year and area.*

[b] *Housing rank and neighborhood rank are measured using an ordinal scale from 1 to 10, with 10 being the best.*

[c] *A ranking of 1, 2, or 3 was deemed poor.*

[d] *Structures were ranked by interviewers as adequate, moderately inadequate, or severely inadequate.*

[e] *Any household that moved into its dwelling unit in the last 2 years before the interview was deemed as a recent in-mover.*

Exhibit A-2a

1993 Quality, Size, and Cost of Housing by Tenure Type for Low-Income Households[a] in Nonmetropolitan Areas

Housing Tenure Type	Mean Housing Rank[b]	Mean Neighborhood Rank[b]	Opinion of House Poor[c] (%)	Opinion of Neighborhood Poor[c] (%)	Structures Moderately or Severely Inadequate[d] (%)	Mean Number of Rooms	Mean Square Feet in Unit
Traditional owned housing	8.437	8.531	1.139	1.887	3.026	5.758	1,679.70
Manufactured owned housing	8.118	8.394	2.157	3.333	2.157	4.782	985.16
Rented housing	7.846	8.062	3.093	4.672	1.957	4.326	1,039.28

Housing Tenure Type	Mean Monthly Housing Cost ($)	Average Annual Household Income ($)	Spend > 30% of Income on Housing (%)	Mean Monthly Housing Cost ($)	Average Annual Household Income ($)	Spend > 30% of Income on Housing (%)
	All Households			Recent In-Movers[e]		
Traditional owned housing	293.49	14,463	29.35	365.22	16,569	38.20
Manufactured owned housing	257.85	13,684	25.58	281.88	14,533	30.69
Rented housing	324.36	12,128	49.87	341.66	12,966	51.39

[a] *Low-income households have incomes below 80 percent of the median for a particular year and area.*

[b] *Housing rank and neighborhood rank are measured using an ordinal scale from 1 to 10, with 10 being the best.*

[c] *A ranking of 1, 2, or 3 was deemed poor.*

[d] *Structures were ranked by interviewers as adequate, moderately inadequate, or severely inadequate.*

[e] *Any household that moved into its dwelling unit in the last 2 years before the interview was deemed as a recent in-mover.*

Exhibit A-2b

1997 Quality, Size, and Cost of Housing by Tenure Type for Low-Income Households[a] in Nonmetropolitan Areas

Housing Tenure Type	Mean Housing Rank[b]	Mean Neighborhood Rank[b]	Opinion of House Poor[c] (%)	Opinion of Neighborhood Poor[c] (%)	Structures Moderately or Severely Inadequate[d] (%)	Mean Number of Rooms	Mean Square Feet in Unit
Traditional owned housing	8.370	8.418	1.092	1.294	2.305	5.740	1,727.26
Manufactured owned housing	7.869	8.210	3.731	3.731	2.612	4.716	1,002.45
Rented housing	7.636	7.816	3.571	4.048	2.143	4.221	1,286.45

Housing Tenure Type	Mean Monthly Housing Cost ($)	Average Annual Household Income ($)	Spend > 30% of Income on Housing (%)	Mean Monthly Housing Cost ($)	Average Annual Household Income ($)	Spend > 30% of Income on Housing (%)
	All Households			Recent In-Movers[e]		
Traditional owned housing	343.56	14,133	34.31	461.33	17,541	48.17
Manufactured owned housing	291.67	13,818	31.80	349.17	15,671	39.87
Rented housing	380.30	12,639	55.24	392.67	14,178	58.48

[a] *Low-income households have incomes below 80 percent of the median for a particular year and area.*

[b] *Housing rank and neighborhood rank are measured using an ordinal scale from 1 to 10, with 10 being the best.*

[c] *A ranking of 1, 2, or 3 was deemed poor.*

[d] *Structures were ranked by interviewers as adequate, moderately inadequate, or severely inadequate.*

[e] *Any household that moved into its dwelling unit in the last 2 years before the interview was deemed as a recent in-mover.*

Exhibit A-2c

2001 Quality, Size, and Cost of Housing by Tenure Type for Low-Income Households[a] in Nonmetropolitan Areas

Housing Tenure Type	Mean Housing Rank[b]	Mean Neighborhood Rank[b]	Opinion of House Poor[c] (%)	Opinion of Neighborhood Poor[c] (%)	Structures Moderately or Severely Inadequate[d] (%)	Mean Number of Rooms	Mean Square Feet in Unit
Traditional owned housing	8.435	8.359	0.934	1.665	2.071	5.775	1,779.01
Manufactured owned housing	7.931	8.066	3.804	4.891	2.536	4.835	1,115.91
Rented housing	7.694	7.892	3.387	3.065	3.306	4.265	1,102.04

Housing Tenure Type	Mean Monthly Housing Cost ($)	Average Annual Household Income ($)	Spend > 30% of Income on Housing (%)	Mean Monthly Housing Cost ($)	Average Annual Household Income ($)	Spend > 30% of Income on Housing (%)
	All Households			Recent In-Movers[e]		
Traditional owned housing	441.58	16,101	38.78	577.08	20,916	48.92
Manufactured owned housing	349.12	15,474	33.86	404.00	18,487	37.50
Rented housing	440.85	14,163	53.52	461.51	16,904	55.28

[a] *Low-income households have incomes below 80 percent of the median for a particular year and area.*

[b] *Housing rank and neighborhood rank are measured using an ordinal scale from 1 to 10, with 10 being the best.*

[c] *A ranking of 1, 2, or 3 was deemed poor.*

[d] *Structures were ranked by interviewers as adequate, moderately inadequate, or severely inadequate.*

[e] *Any household that moved into its dwelling unit in the last 2 years before the interview was deemed as a recent in-mover.*

Exhibit A-3a

N-Chotomous Probit Results—Change in Housing Quality, 1993–1995

Variable Name	1993–1995					
	Traditional Owned Housing		Manufactured Owned Housing		Rented Housing	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
Constant	5.253	53.835	4.027	13.349	4.073	33.827
how_h	– 0.406	– 46.736	– 0.321	– 12.707	– 0.309	– 29.302
age_s	– 0.004	– 7.371	– 0.007	– 1.449	– 0.003	– 3.807
crowding	– 0.263	– 4.913	– 0.420	– 2.802	– 0.219	– 4.024
hc2inc	0.000	0.992	– 0.001	– 1.125	0.000	1.142
get_porch	0.062	1.267	– 0.023	– 0.169	0.054	0.821
lose_porch	– 0.093	– 2.038	– 0.149	– 1.220	– 0.102	– 1.574
get_garage	– 0.029	– 0.463	0.245	1.419	0.019	0.227
lose_garage	– 0.169	– 2.958	– 0.060	– 0.421	– 0.129	– 1.422
d_equip	0.023	0.791	0.165	2.082	0.107	3.082
get_bathroom	0.002	0.018	– 0.194	– 0.339	0.351	1.839
lose_bathroom	– 0.013	– 0.123	0.399	0.719	0.015	0.070
get_water	– 0.749	– 0.926	– 1.105	– 1.944	– 0.210	– 0.642
lose_water	– 1.578	– 2.357	NA	NA	– 0.798	– 1.304
ext_leak	– 0.061	– 1.976	– 0.105	– 1.092	– 0.163	– 3.416
get_sewage	– 0.253	– 2.310	– 0.144	– 0.676	– 0.104	– 0.662
lose_sewage	– 0.067	– 0.696	– 0.115	– 0.669	0.190	1.075
get_cntrl_air	0.279	4.039	0.148	0.863	0.158	1.404
lose_cntrl_air	– 0.258	– 2.729	0.127	0.591	0.116	0.989
d_struc_prob	– 0.077	– 2.914	– 0.139	– 1.590	– 0.052	– 1.652
get_int_leak	0.049	0.805	0.029	0.106	0.083	1.115
lose_int_leak	– 0.044	– 0.668	0.290	1.268	– 0.117	– 1.553
get_bad_int	– 0.414	– 7.232	– 0.275	– 1.051	– 0.438	– 6.128
lose_bad_int	– 0.009	– 0.145	– 0.133	– 0.520	0.005	0.062
d_wtr_prob	– 0.036	– 1.169	– 0.029	– 0.352	0.002	0.067
d_tlt_prob	0.001	0.050	0.005	0.035	– 0.085	– 3.332
d_sew_prob	0.092	2.949	– 0.001	– 0.007	– 0.061	– 1.593
d_wrg_prob	– 0.153	– 3.200	– 0.161	– 1.012	– 0.195	– 3.639
d_fus_blow	– 0.024	– 1.997	– 0.025	– 0.574	– 0.028	– 1.834
d_heat_brk	– 0.118	– 3.603	0.150	0.953	– 0.074	– 3.315
d_2goodheat	– 0.062	– 1.052	0.196	1.295	– 0.076	– 0.983
get_vermin	– 0.273	– 3.517	0.226	1.079	– 0.462	– 5.257
lose_vermin	0.079	1.115	0.190	0.898	– 0.026	– 0.304
mh_in_grp	NA	NA	0.158	1.605	NA	NA
ownlot	NA	NA	0.007	0.067	NA	NA
Mu(1)	0.027	14.235	0.441	6.383	0.441	13.494
Mu(2)	0.034	29.743	0.821	10.261	0.958	24.144
Mu(3)	0.035	44.297	1.332	15.595	1.535	36.017
Mu(4)	0.040	77.782	2.680	25.541	2.630	54.716
Mu(5)	0.043	87.644	3.240	27.563	3.236	61.145
Mu(6)	0.053	85.700	3.794	27.383	3.902	61.386
Mu(7)	0.064	80.213	4.315	27.787	4.438	59.610
Number of observations	7,061		813		3,396	
Log likelihood function	– 10,347.82		– 1,322.02		– 5,759.376	
Restricted log likelihood	– 11,926.45		– 1,499.238		– 6,526.888	
Chi-squared	3,157.26		354.4366		1,535.024	
Degrees of freedom	33		34		33	

NA = not applicable.

Exhibit A-3b

N-Chotomous Probit Results—Change in Housing Quality, 1995–1997

Variable Name	1995–1997					
	Traditional Owned Housing		Manufactured Owned Housing		Rented Housing	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
Constant	5.202	51.255	4.098	14.680	3.712	29.678
how_h	– 0.417	– 45.327	– 0.314	– 13.062	– 0.295	– 26.289
age_s	– 0.003	– 5.991	0.000	– 0.066	– 0.001	– 1.809
crowding	– 0.280	– 5.402	– 0.386	– 2.480	– 0.260	– 4.728
hc2inc	0.000	– 1.086	0.000	0.099	0.000	0.320
get_porch	0.018	0.378	– 0.178	– 1.166	0.019	0.293
lose_porch	– 0.054	– 1.202	– 0.038	– 0.269	– 0.030	– 0.452
get_garage	– 0.013	– 0.213	0.115	0.632	0.079	0.972
lose_garage	0.035	0.687	– 0.064	– 0.358	– 0.011	– 0.121
d_equip	0.060	2.761	0.056	0.823	0.068	2.170
get_bathroom	0.123	1.210	– 0.503	– 1.538	– 0.409	– 2.290
lose_bathroom	2.145	0.353	NA	NA	0.456	0.036
get_water	0.069	0.168	NA	NA	1.783	0.000
lose_water	– 0.568	– 2.943	– 0.001	– 0.003	0.612	0.092
ext_leak	– 0.087	– 2.784	– 0.109	– 1.148	– 0.104	– 1.989
get_sewage	0.066	0.585	0.317	1.522	0.248	1.393
lose_sewage	0.111	1.252	0.223	1.253	0.064	0.412
get_cntrl_air	0.108	1.718	0.308	1.667	0.002	0.021
lose_cntrl_air	0.033	0.382	0.180	0.753	0.021	0.174
d_struc_prob	– 0.125	– 8.021	– 0.223	– 4.274	– 0.119	– 5.977
get_int_leak	– 0.021	– 0.392	0.089	0.567	– 0.182	– 2.835
lose_int_leak	– 0.101	– 1.703	– 0.264	– 1.575	– 0.230	– 3.015
get_bad_int	– 0.303	– 6.005	– 0.367	– 2.190	– 0.443	– 7.481
lose_bad_int	0.072	1.258	0.139	0.831	0.083	1.193
d_wtr_prob	0.011	0.289	– 0.111	– 1.050	– 0.129	– 4.127
d_tlt_prob	– 0.038	– 1.126	0.114	0.970	– 0.056	– 1.997
d_sew_prob	0.066	1.249	– 0.113	– 0.367	– 0.061	– 0.762
d_wrg_prob	– 0.183	– 3.399	– 0.159	– 1.020	0.020	0.313
d_fus_blow	– 0.016	– 1.107	– 0.019	– 0.532	– 0.007	– 0.434
d_heat_brk	– 0.022	– 0.754	– 0.034	– 0.265	– 0.022	– 0.818
d_2goodheat	0.004	0.088	– 0.056	– 0.428	– 0.018	– 0.288
get_vermin	– 0.105	– 3.381	– 0.062	– 0.707	– 0.073	– 1.495
lose_vermin	0.133	1.242	0.390	1.169	0.231	2.064
mh_in_grp	NA	NA	– 0.098	– 0.982	NA	NA
ownlot	NA	NA	0.017	0.172	NA	NA
Mu(1)	0.495	18.777	0.385	5.940	0.436	13.505
Mu(2)	1.152	36.603	0.950	11.419	0.989	24.759
Mu(3)	1.758	53.702	1.432	16.057	1.565	36.463
Mu(4)	3.156	83.879	2.621	25.080	2.654	53.752
Mu(5)	3.815	91.011	3.103	27.661	3.264	59.813
Mu(6)	4.539	86.787	3.684	27.896	3.869	58.072
Mu(7)	5.126	81.424	4.221	27.760	4.363	56.710
Number of observations	7,203		762		3,143	
Log likelihood function	– 11,057.66		– 1,301.995		– 5,337.673	
Restricted log likelihood	– 1,2802.7		– 1,447.644		– 6,072.802	
Chi-squared	3,490.088		291.2984		1,470.256	
Degrees of freedom	33		33		33	

NA = not applicable.

Exhibit A-4a

N-Chotomous Probit Results—Change in Neighborhood Quality, 1993–1995 (1 of 2)

Variable Name	1993–1995					
	Traditional Owned Housing		Manufactured Owned Housing		Rented Housing	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
Constant	4.354	55.248	3.973	16.339	3.455	33.483
how_n	– 0.353	– 50.405	– 0.307	– 14.600	– 0.278	– 29.583
hc2inc	0.000	0.575	0.001	1.046	0.000	– 0.038
get_e_low	0.101	1.350	– 0.731	– 1.105	– 0.076	– 1.352
lose_e_low	– 0.003	– 0.045	– 0.153	– 0.106	– 0.040	– 0.690
get_e_mid	– 0.132	– 0.837	0.133	0.000	– 0.004	– 0.048
lose_e_mid	0.006	0.030	NA	NA	0.006	0.078
get_e_high	– 1.046	– 2.950	1.852	0.000	– 0.057	– 0.571
lose_e_high	0.201	0.585	NA	NA	0.129	1.167
get_e_mobil	– 0.020	– 0.216	0.030	0.244	0.224	0.877
lose_e_mobil	0.025	0.227	0.025	0.195	– 0.139	– 0.989
get_e_com	– 0.103	– 1.461	0.259	0.765	– 0.016	– 0.260
lose_e_com	– 0.103	– 1.479	– 0.128	– 0.517	– 0.030	– 0.532
get_e_prkg	0.007	0.073	0.339	0.310	– 0.097	– 1.528
lose_e_prkg	0.130	0.903	– 0.960	– 2.183	– 0.091	– 1.573
get_e_water	– 0.157	– 1.149	0.563	1.748	0.274	1.445
lose_e_water	– 0.278	– 1.708	– 0.469	– 0.941	0.238	1.622
get_e_green	0.223	3.648	0.065	0.506	0.118	1.704
lose_e_green	0.001	0.027	0.017	0.118	0.042	0.680
get_aban	– 0.294	– 2.916	0.456	1.695	– 0.019	– 0.229
lose_aban	– 0.007	– 0.063	– 0.098	– 0.315	– 0.283	– 3.520
get_bars	0.027	0.325	0.184	0.092	– 0.157	– 1.948
lose_bars	– 0.094	– 1.032	0.098	0.000	0.129	1.941
get_rd_prob	– 0.008	– 0.151	– 0.200	– 1.226	0.036	0.639
lose_rd_prob	– 0.126	– 2.264	0.091	0.554	0.111	1.954
get_junk	– 0.210	– 3.585	0.045	0.289	– 0.160	– 2.836
lose_junk	– 0.065	– 1.084	– 0.212	– 1.197	– 0.153	– 2.729
get_nucrim_p	– 0.943	– 17.079	– 1.238	– 5.454	– 0.918	– 14.733
lose_nucrim_p	0.066	1.102	– 0.358	– 1.212	0.255	3.806
get_noise_p	– 0.498	– 9.208	– 0.499	– 3.008	– 0.424	– 6.950
lose_noise_p	– 0.186	– 3.604	0.261	1.238	0.012	0.206
get_litter_p	– 0.661	– 11.263	– 0.509	– 2.360	– 0.462	– 5.346
lose_litter_p	0.040	0.672	0.780	2.833	0.103	1.047
get_badsrv_p	– 0.431	– 2.928	– 0.887	– 1.306	– 0.534	– 3.023
lose_badsrv_p	0.060	0.553	0.003	0.002	0.099	0.741
get_badprp_p	– 0.477	– 5.009	– 0.924	– 1.068	– 0.232	– 1.307
lose_badprp_p	– 0.055	– 0.570	0.480	1.097	0.209	1.499
get_badper	– 0.687	– 16.356	– 0.968	– 7.023	– 0.564	– 9.572
lose_badper	0.160	3.688	0.556	3.993	0.026	0.466
get_othnhd_p	– 0.389	– 9.205	– 0.252	– 1.766	– 0.249	– 3.538
lose_othnhd_p	– 0.006	– 0.138	0.094	0.719	– 0.118	– 1.753
get_schm_p	– 0.021	– 0.190	0.158	0.405	– 0.392	– 3.256
lose_schm_p	– 0.253	– 2.859	– 0.125	– 0.339	– 0.219	– 2.151
get_shp_p	0.017	0.398	– 0.113	– 1.078	– 0.095	– 1.287

Exhibit A-4a

N-Chotomous Probit Results—Change in Neighborhood Quality, 1993–1995 (2 of 2)

Variable Name	1993–1995					
	Traditional Owned Housing		Manufactured Owned Housing		Rented Housing	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
lose_shp_p	– 0.033	– 0.794	0.004	0.032	– 0.026	– 0.399
get_good_trn	0.010	0.221	0.151	0.786	0.061	1.117
lose_good_trn	0.007	0.160	– 0.070	– 0.327	0.065	1.200
mh_in_grp	NA	NA	– 0.194	– 1.885	NA	NA
ownlot	NA	NA	0.064	0.664	NA	NA
Mu(1)	0.375	15.561	0.439	6.148	0.402	13.596
Mu(2)	0.950	31.261	0.965	10.892	0.956	25.733
Mu(3)	1.520	47.169	1.463	15.566	1.449	36.503
Mu(4)	2.969	81.305	2.921	27.092	2.573	55.932
Mu(5)	3.630	91.650	3.558	29.730	3.115	62.147
Mu(6)	4.334	90.744	4.202	29.786	3.691	63.062
Mu(7)	4.840	85.782	4.907	27.222	4.132	62.902
Number of observations	7,061		813		3,396	
Log likelihood function	– 10,696.2		– 1,248.47		– 5,760.979	
Restricted log likelihood	– 12,520.53		– 1,493.735		– 6,699.628	
Chi-squared	3,648.65		490.5308		1,877.297	
Degrees of freedom	47		47		47	

NA = not applicable.

Exhibit A-4b

N-Chotomous Probit Results—Change in Neighborhood Quality, 1995–1997 (1 of 2)

Variable Name	1995–1997					
	Traditional Owned Housing		Manufactured Owned Housing		Rented Housing	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
Constant	4.818	57.428	4.264	16.707	3.840	33.090
how_n	– 0.400	– 52.291	– 0.341	– 14.921	– 0.321	– 31.631
hc2inc	0.000	– 0.393	0.000	0.343	0.000	0.425
get_e_low	– 0.106	– 2.905	– 0.281	– 1.256	0.029	0.587
lose_e_low	– 0.176	– 2.325	0.835	0.545	0.041	0.721
get_e_mid	– 0.212	– 2.301	– 0.099	– 0.161	– 0.132	– 1.935
lose_e_mid	0.143	0.581	NA	NA	0.031	0.336
get_e_high	0.399	2.017	– 0.652	– 0.373	0.031	0.334
lose_e_high	0.153	0.401	0.445	0.000	– 0.067	– 0.553
get_e_mobil	– 0.065	– 1.523	0.092	0.978	– 0.055	– 0.568
lose_e_mobil	– 0.148	– 1.024	0.311	1.335	– 0.001	– 0.003
get_e_com	0.013	0.370	0.067	0.531	– 0.061	– 1.479
lose_e_com	– 0.046	– 0.431	0.028	0.064	0.125	1.439
get_e_prkg	– 0.083	– 2.084	– 0.043	– 0.259	0.052	1.210
lose_e_prkg	0.054	0.369	0.327	0.664	– 0.016	– 0.172
get_e_water	0.019	0.526	0.067	0.621	0.047	0.725
lose_e_water	0.118	0.483	0.446	0.691	0.317	1.214
get_e_green	0.059	2.011	– 0.061	– 0.690	0.012	0.256
lose_e_green	– 0.056	– 0.826	0.015	0.086	– 0.062	– 0.781
get_aban	– 0.348	– 6.545	– 0.154	– 0.771	– 0.277	– 3.942
lose_aban	– 0.320	– 2.678	– 0.293	– 0.970	– 0.011	– 0.110
get_bars	– 0.171	– 3.763	– 0.089	– 0.291	0.007	0.099
lose_bars	– 0.252	– 2.724	0.122	0.154	– 0.203	– 2.754
get_rd_prob	– 0.132	– 4.747	– 0.031	– 0.330	– 0.196	– 4.466
lose_rd_prob	– 0.055	– 0.912	0.132	0.755	0.049	0.793
get_junk	– 0.343	– 7.886	– 0.403	– 2.423	– 0.187	– 2.808
lose_junk	– 0.009	– 0.174	– 0.096	– 0.710	– 0.069	– 1.385
get_nucrim_p	– 0.570	– 13.446	– 0.814	– 5.517	– 0.573	– 10.251
lose_nucrim_p	0.120	1.863	0.160	0.562	0.100	1.447
get_noise_p	– 0.432	– 11.894	– 0.317	– 2.339	– 0.350	– 6.567
lose_noise_p	0.016	0.243	0.135	0.646	0.092	1.289
get_litter_p	– 0.558	– 6.232	– 0.173	– 0.499	– 0.516	– 3.597
lose_litter_p	– 0.026	– 0.453	– 0.164	– 0.714	0.053	0.610
get_badsrv_p	– 0.156	– 1.262	– 1.275	– 0.816	– 0.055	– 0.303
lose_badsrv_p	– 0.226	– 2.007	– 0.089	– 0.206	0.053	0.289
get_badprp_p	– 0.396	– 3.702	0.446	0.895	– 0.378	– 2.061
lose_badprp_p	– 0.309	– 3.395	– 0.578	– 1.235	– 0.286	– 1.897
get_badper	– 0.608	– 9.162	– 0.301	– 1.154	– 0.309	– 3.557
lose_badper	– 0.047	– 1.196	0.337	2.110	– 0.070	– 1.292
get_othnhd_p	– 0.290	– 5.842	– 0.250	– 1.509	– 0.231	– 2.987
lose_othnhd_p	0.070	1.613	– 0.075	– 0.517	– 0.074	– 0.994
get_schm_p	– 0.152	– 1.251	– 2.109	– 3.877	– 0.568	– 4.161
lose_schm_p	– 0.161	– 1.520	– 0.674	– 2.456	0.034	0.282
get_shp_p	– 0.091	– 2.359	– 0.037	– 0.314	– 0.041	– 0.573
lose_shp_p	0.033	0.781	– 0.105	– 0.846	– 0.019	– 0.250
get_good_trn	0.033	0.781	0.355	1.693	0.033	0.604
lose_good_trn	– 0.004	– 0.092	0.174	0.771	0.105	1.662
mh_in_grp	NA	NA	– 0.254	– 2.408	NA	NA
ownlot	NA	NA	0.122	1.133	NA	NA
Mu(1)	0.514	19.674	0.356	5.270	0.527	14.601

Exhibit A-4b

N-Chotomous Probit Results—Change in Neighborhood Quality, 1995–1997 (2 of 2)

Variable Name	1995–1997					
	Traditional Owned Housing		Manufactured Owned Housing		Rented Housing	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
Mu(2)	1.176	38.053	1.003	11.253	1.122	25.930
Mu(3)	1.796	55.832	1.549	16.104	1.695	36.687
Mu(4)	3.147	85.798	2.794	24.573	2.762	52.221
Mu(5)	3.808	94.067	3.384	26.702	3.378	58.154
Mu(6)	4.549	92.973	3.878	26.731	3.989	58.692
Mu(7)	5.133	88.506	4.547	25.433	4.500	58.171
Number of observations	7,203		762		3,143	
Log likelihood function	– 11,148.78		– 1,239.578		– 5,272.048	
Restricted log likelihood	– 13,195.51		– 1,448.692		– 6,277.065	
Chi-squared	4,093.451		418.2289		2,010.034	
Degrees of freedom	47		48		47	

NA = not applicable.

Exhibit A-5a

N-Chotomous Probit Results—Change in Housing Quality, 1997–1999 (1 of 2)

Variable Name	1997–1999					
	Traditional Owned Housing		Manufactured Owned Housing		Rented Housing	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
Constant	5.087	50.129	4.8001	16.580	4.0510	31.225
how_h	– 0.403	– 46.016	– 0.3899	– 15.476	– 0.3282	– 28.894
age_s	– 0.003	– 5.508	– 0.0061	– 1.625	– 0.0031	– 3.578
crowding	– 0.336	– 6.729	– 0.0012	– 0.009	– 0.2526	– 4.444
hc2inc	0.000	0.715	– 0.0002	– 0.828	0.0000	– 0.543
get_porch	– 0.110	– 2.416	– 0.0322	– 0.242	– 0.0062	– 0.108
lose_porch	– 0.180	– 2.536	– 0.3101	– 1.254	0.1720	1.509
get_garage	0.023	0.445	0.1385	0.816	0.0049	0.058
lose_garage	– 0.008	– 0.146	0.3121	1.747	– 0.0925	– 0.986
d_equip	0.048	1.641	0.1509	1.396	0.0285	0.685
get_bathroom	– 1.113	– 1.943	NA	NA	– 0.8724	– 0.792
lose_bathroom	– 0.349	– 0.905	NA	NA	– 1.8499	0.000
get_water	0.704	1.845	– 0.2654	– 0.317	1.2563	1.150
lose_water	– 0.213	– 0.538	0.7705	0.285	1.6109	0.000
ext_leak	– 0.128	– 3.442	– 0.2579	– 2.532	– 0.0531	– 0.957
get_sewage	– 0.054	– 0.479	0.1225	0.460	0.3551	1.543
lose_sewage	0.005	0.054	– 0.2479	– 1.036	0.0923	0.636
get_cntrl_air	0.076	1.285	0.2391	1.542	0.1836	1.680
lose_cntrl_air	0.138	1.142	– 0.2336	– 1.168	– 0.0425	– 0.327
d_struc_prob	– 0.038	– 2.639	– 0.0478	– 0.993	– 0.0864	– 5.144
get_int_leak	– 0.129	– 2.344	– 0.1281	– 0.837	– 0.2326	– 3.783
lose_int_leak	– 0.213	– 3.803	– 0.2851	– 2.100	– 0.1487	– 2.451
get_bad_int	– 0.355	– 6.855	– 0.4695	– 2.468	– 0.6613	– 10.629
lose_bad_int	– 0.037	– 0.635	– 0.1312	– 0.644	– 0.1458	– 1.949
d_wtr_prob	– 0.008	– 0.188	0.0558	0.875	– 0.0191	– 0.521
d_tlt_prob	– 0.031	– 0.575	0.2356	1.412	– 0.0667	– 1.831
d_sew_prob	– 0.009	– 0.213	– 0.4664	– 3.182	– 0.0605	– 0.852
d_wrg_prob	– 0.082	– 1.305	– 0.1490	– 0.731	0.0691	0.957
d_fus_blow	– 0.036	– 2.174	– 0.0011	– 0.024	– 0.0030	– 0.148
d_heat_brk	– 0.050	– 1.241	0.0247	0.159	– 0.0280	– 0.943
d_2goodheat	– 0.080	– 1.036	0.5787	2.587	0.1173	1.055
get_vermin	– 0.158	– 3.959	– 0.3893	– 3.244	– 0.1852	– 2.938
lose_vermin	– 0.045	– 1.116	– 0.0854	– 0.740	– 0.0090	– 0.129
mh_in_grp	NA	NA	– 0.0926	– 0.970	NA	NA
ownlot	NA	NA	0.0095	0.100	NA	NA
Mu(1)	0.446	14.699	0.4173	6.353	0.4602	12.994
Mu(2)	1.168	31.542	0.9910	12.264	1.0187	23.724
Mu(3)	1.777	46.481	1.5345	18.150	1.5700	34.368
Mu(4)	3.199	76.170	2.6969	26.709	2.7018	52.271
Mu(5)	3.934	87.263	3.2805	30.110	3.3159	59.493
Mu(6)	4.773	88.334	4.0689	30.009	4.0301	60.410
Mu(7)	5.344	83.729	4.5472	29.529	4.5041	60.115

Exhibit A-5a

N-Chotomous Probit Results—Change in Housing Quality, 1997–1999 (2 of 2)

Variable Name	1997–1999					
	Traditional Owned Housing		Manufactured Owned Housing		Rented Housing	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
Number of observations	7,117		809		3,136	
Log likelihood function	– 10,574.02		– 1,338.067		– 5,219.503	
Restricted log likelihood	– 12,476.99		– 1,566.364		– 6,101.015	
Chi-squared	3,805.929		456.5944		1,763.023	
Degrees of freedom	33		33		33	

NA = not applicable.

Exhibit A-5b

N-Chotomous Probit Results—Change in Housing Quality, 1999–2001 (1 of 2)

Variable Name	1999–2001					
	Traditional Owned Housing		Manufactured Owned Housing		Rented Housing	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
Constant	5.1145	50.203	4.2721	13.683	4.0469	31.185
how_h	– 0.4181	– 45.502	– 0.3278	– 12.569	– 0.3155	– 27.711
age_s	– 0.0038	– 6.564	– 0.0049	– 1.394	– 0.0042	– 4.991
crowding	– 0.1761	– 3.198	– 0.3219	– 2.051	– 0.2640	– 4.478
hc2inc	0.0000	– 0.996	– 0.0003	– 0.329	0.0000	– 0.095
get_porch	– 0.0041	– 0.067	– 0.0002	– 0.001	– 0.0478	– 0.666
lose_porch	0.0141	0.194	0.4463	1.993	0.0065	0.059
get_garage	– 0.1230	– 2.430	– 0.1871	– 1.336	0.1888	2.111
lose_garage	– 0.0104	– 0.189	0.1904	0.715	0.2130	2.395
d_equip	0.0043	0.130	0.2121	1.984	0.0496	1.284
get_bathroom	– 1.7303	0.000	– 0.6840	0.000	0.3118	0.482
lose_bathroom	– 0.0707	– 0.068	– 0.2010	– 0.115	0.0206	0.040
get_water	1.4820	0.000	– 0.6394	0.000	0.1593	0.263
lose_water	0.2395	0.246	NA	NA	0.5147	0.716
ext_leak	– 0.1644	– 4.510	– 0.2960	– 2.606	– 0.2194	– 3.769
get_sewage	0.1057	0.953	0.4338	1.192	– 0.0605	– 0.338
lose_sewage	0.0929	1.299	0.1550	0.84	– 0.3205	– 1.892
get_cntrl_air	0.0800	1.166	0.0957	0.51	– 0.0123	– 0.119
lose_cntrl_air	– 0.0144	– 0.157	– 0.1308	– 0.484	0.1151	0.958
d_struc_prob	– 0.0697	– 4.805	– 0.0758	– 1.673	– 0.0686	– 4.121
get_int_leak	– 0.1719	– 3.258	– 0.2212	– 1.598	– 0.2562	– 3.960
lose_int_leak	– 0.1164	– 2.302	0.2476	1.689	– 0.2033	– 3.175
get_bad_int	– 0.1998	– 3.453	– 0.4802	– 2.655	– 0.4319	– 7.435
lose_bad_int	– 0.1217	– 2.102	– 0.2537	– 1.39	– 0.1049	– 1.420
d_wtr_prob	0.0670	1.970	0.0704	0.769	– 0.0985	– 2.336
d_tlt_prob	0.0264	0.440	– 0.6238	– 1.132	– 0.0739	– 1.600
d_sew_prob	– 0.0572	– 1.580	– 0.1898	– 0.462	– 0.1171	– 2.434
d_wrg_prob	– 0.0626	– 0.755	– 0.6788	– 3.374	– 0.0448	– 0.575
d_fus_blow	– 0.0301	– 1.890	– 0.0075	– 0.15	0.0010	0.051
d_heat_brk	– 0.1165	– 2.950	0.0189	0.11	– 0.0762	– 2.573
d_2goodheat	0.0522	0.441	– 0.1498	– 0.467	0.4836	2.861
get_vermin	– 0.0094	– 0.231	– 0.0536	– 0.493	– 0.0932	– 1.544
lose_vermin	– 0.0349	– 0.875	0.1160	0.967	– 0.0305	– 0.448
mh_in_grp	NA	NA	0.0808	0.825	NA	NA
ownlot	NA	NA	0.0703	0.751	NA	NA
Mu(1)	0.423	14.833	0.5931	6.104	0.4879	12.795
Mu(2)	1.130	32.150	1.2033	10.843	1.1177	23.994
Mu(3)	1.741	47.671	1.7205	14.899	1.6918	34.333
Mu(4)	3.182	77.895	2.8376	21.745	2.8074	51.504
Mu(5)	3.898	88.944	3.3425	24.293	3.4337	58.367
Mu(6)	4.814	88.560	4.0569	25.320	4.1870	60.079
Mu(7)	5.392	81.314	4.5539	24.248	4.7315	55.708

Exhibit A-5b

N-Chotomous Probit Results—Change in Housing Quality, 1999–2001 (2 of 2)

Variable Name	1999–2001					
	Traditional Owned Housing		Manufactured Owned Housing		Rented Housing	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
Number of observations	7,132		761		3,077	
Log likelihood function	– 10,542.48		– 1,289.091		5090.007	
Restricted log likelihood	– 12,462.53		– 1,464.814		– 5,936.899	
Chi-squared	3,840.094		351.4468		1,693.784	
Degrees of freedom	33		34		33	

NA = not applicable.

Exhibit A-6a

N-Chotomous Probit Results—Change in Housing Quality, 1997–1999 (1 of 2)

Variable Name	1997–1999					
	Traditional Owned Housing		Manufactured Owned Housing		Rented Housing	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
Constant	4.3353	50.846	4.9963	16.571	4.0383	35.395
how_n	– 0.3679	– 47.861	– 0.3895	– 13.780	– 0.3283	– 30.927
hc2inc	0.0000	0.851	0.0002	0.539	0.0000	– 0.017
get_e_low	– 0.0101	– 0.215	– 0.2077	– 0.791	– 0.0676	– 1.252
lose_e_low	0.0508	1.027	– 0.1749	– 0.817	– 0.1446	– 2.749
get_e_mid	– 0.1945	– 2.029	– 0.5925	– 0.903	0.0233	0.264
lose_e_mid	0.0173	0.159	0.5872	0.961	0.0269	0.350
get_e_high	– 0.0375	– 0.179	– 0.2309	0.001	0.0065	0.060
lose_e_high	0.1685	0.910	0.8681	0.000	– 0.0565	– 0.515
get_e_mobil	0.0287	0.481	– 0.0571	– 0.397	– 0.1066	– 0.831
lose_e_mobil	– 0.0523	– 0.834	0.0519	0.304	0.0884	0.635
get_e_com	– 0.0748	– 1.706	– 0.0350	– 0.264	– 0.0084	– 0.149
lose_e_com	– 0.0110	– 0.238	0.1401	0.802	0.0229	0.413
get_e_prkg	– 0.0721	– 1.393	0.3387	1.892	– 0.0485	– 0.820
lose_e_prkg	– 0.0346	– 0.721	– 0.2248	– 1.262	– 0.0560	– 0.993
get_e_water	0.0298	0.560	0.0663	0.419	0.0031	0.035
lose_e_water	– 0.0275	– 0.524	0.1685	1.245	– 0.0125	– 0.132
get_e_green	0.0546	1.409	0.0122	0.108	– 0.0458	– 0.853
lose_e_green	0.0228	0.595	0.0546	0.503	0.0082	0.149
get_aban	– 0.2858	– 4.927	0.0837	0.360	– 0.1941	– 2.619
lose_aban	– 0.0693	– 1.072	0.3962	1.699	– 0.2064	– 2.687
get_bars	– 0.0341	– 0.606	0.2196	0.513	– 0.0404	– 0.569
lose_bars	– 0.0360	– 0.702	– 1.4088	– 3.440	0.0002	0.004
get_rd_prob	– 0.1054	– 3.068	– 0.1773	– 1.561	– 0.1008	– 2.022
lose_rd_prob	0.0239	0.694	– 0.1965	– 1.852	– 0.0419	– 0.849
get_junk	– 0.3362	– 7.334	– 0.7872	– 3.908	– 0.2482	– 3.957
lose_junk	– 0.0142	– 0.290	0.1091	0.620	– 0.0790	– 1.301
get_nucrim_p	– 0.4765	– 8.589	– 0.4174	– 2.123	– 0.3584	– 5.207
lose_nucrim_p	0.1140	2.282	0.0160	0.071	0.1717	2.667
get_noise_p	– 0.2671	– 5.948	– 0.3789	– 2.314	– 0.4280	– 7.262
lose_noise_p	0.0618	1.418	– 0.0405	– 0.249	– 0.0764	– 1.319
get_litter_p	– 0.3813	– 4.922	– 0.1857	– 0.537	– 0.3188	– 2.744
lose_litter_p	– 0.0725	– 0.921	0.0818	0.204	– 0.2638	– 1.765
get_badsrv_p	– 0.2720	– 2.353	– 1.2489	– 2.148	– 0.0866	– 0.488
lose_badsrv_p	– 0.1141	– 0.959	0.6059	0.860	0.0133	0.067
get_badprp_p	– 0.4056	– 3.289	– 2.9020	– 2.270	0.0415	0.196
lose_badprp_p	– 0.1683	– 1.250	– 0.2362	– 0.466	0.1797	1.054
get_badper	– 0.3229	– 5.714	– 0.7322	– 4.065	– 0.4724	– 6.103
lose_badper	– 0.0680	– 1.111	– 0.2001	– 0.983	0.0090	0.104
get_othnhd_p	– 0.1989	– 4.133	– 0.6027	– 3.485	– 0.3599	– 5.068
lose_othnhd_p	– 0.0171	– 0.338	– 0.2916	– 1.758	– 0.1627	– 1.943
get_schm_p	– 0.1941	– 1.446	– 0.4153	– 1.507	– 0.4309	– 3.112
lose_schm_p	0.0508	0.313	– 0.9231	– 2.226	– 0.0622	– 0.461
get_shp_p	– 0.0704	– 1.711	– 0.1755	– 1.386	– 0.1577	– 2.216
lose_shp_p	0.0380	0.900	0.0934	0.737	– 0.0907	– 1.300

Exhibit A-6a

N-Chotomous Probit Results—Change in Housing Quality, 1997–1999 (2 of 2)

Variable Name	1997–1999					
	Traditional Owned Housing		Manufactured Owned Housing		Rented Housing	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
get_good_trn	– 0.0785	– 1.841	– 0.1304	– 0.856	– 0.0100	– 0.168
lose_good_trn	– 0.1046	– 2.643	– 0.1291	– 0.729	– 0.0346	– 0.627
mh_in_grp	NA	NA	– 0.0744	– 0.713	NA	NA
ownlot	NA	NA	– 0.0378	– 0.379	NA	NA
Mu(1)	0.4527	16.553	0.3698	4.804	0.4733	12.323
Mu(2)	1.0836	32.877	1.0024	10.038	1.0922	23.368
Mu(3)	1.7336	50.395	1.5632	14.616	1.6684	33.879
Mu(4)	3.0264	79.894	2.8655	22.825	2.7291	50.424
Mu(5)	3.7782	91.854	3.4987	25.631	3.3747	57.979
Mu(6)	4.5221	93.940	4.3409	25.595	4.0432	60.750
Mu(7)	5.1504	89.118	4.8038	26.137	4.5768	61.361
Number of observations	7,117		809		3,136	
Log likelihood function	– 11,004.04		– 1,264.497		– 5,233.982	
Restricted log likelihood	– 12,999.61		– 1,504.027		– 6,208.414	
Chi-squared	3,991.153		479.0597		1,948.864	
Degrees of freedom	47		49		47	

NA = not applicable.

Exhibit A-6b

N-Chotomous Probit Results—Change in Housing Quality, 1999–2001 (1 of 2)

Variable Name	1999–2001					
	Traditional Owned Housing		Manufactured Owned Housing		Rented Housing	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
Constant	4.3400	49.909	4.1806	15.055	3.6959	30.377
how_n	– 0.3666	– 46.260	– 0.3367	– 12.675	– 0.3106	– 28.429
hc2inc	0.0000	1.168	0.0009	0.993	0.0000	0.333
get_e_low	– 0.0731	– 1.587	0.2061	1.126	0.1263	2.174
lose_e_low	0.0608	1.169	0.0223	0.091	0.0696	1.220
get_e_mid	– 0.1068	– 0.943	0.2337	0.302	0.0772	1.057
lose_e_mid	– 0.0348	– 0.230	0.4599	0.785	0.1630	1.975
get_e_high	– 0.1233	– 0.553	NA	NA	– 0.0300	– 0.349
lose_e_high	– 0.2278	– 1.112	– 1.4563	0.000	– 0.0836	– 0.816
get_e_mobil	– 0.0634	– 1.180	0.0339	0.238	0.1178	1.045
lose_e_mobil	– 0.0301	– 0.485	– 0.0340	– 0.170	– 0.0335	– 0.216
get_e_com	– 0.0408	– 0.974	0.0253	0.156	– 0.0632	– 1.149
lose_e_com	0.0001	0.002	0.1004	0.669	0.0031	0.058
get_e_prkg	0.0198	0.382	– 0.1667	– 0.985	0.1363	2.191
lose_e_prkg	– 0.0301	– 0.567	– 0.2591	– 1.070	– 0.0055	– 0.101
get_e_water	0.0289	0.562	0.0704	0.493	– 0.0777	– 0.905
lose_e_water	0.0228	0.438	0.0677	0.454	– 0.0196	– 0.237
get_e_green	0.0450	1.154	0.1060	0.814	0.0092	0.155
lose_e_green	0.0135	0.359	0.1020	0.900	0.0660	1.165
get_aban	– 0.3343	– 5.614	– 0.6210	– 3.793	– 0.2078	– 2.853
lose_aban	– 0.3124	– 5.012	– 0.1101	– 0.509	– 0.0831	– 1.122
get_bars	– 0.1023	– 1.688	0.0196	0.064	– 0.1268	– 1.832
lose_bars	– 0.0990	– 1.767	0.1559	0.348	– 0.0425	– 0.667
get_rd_prob	– 0.1310	– 3.982	0.0587	0.526	– 0.0157	– 0.326
lose_rd_prob	0.0459	1.323	0.0792	0.684	0.1356	2.522
get_junk	– 0.4490	– 9.566	– 0.3462	– 2.405	– 0.2760	– 4.524
lose_junk	– 0.0348	– 0.693	– 0.0116	– 0.054	– 0.1187	– 1.807
get_nucrim_p	– 0.5877	– 11.530	– 0.1566	– 0.991	– 0.6406	– 11.171
lose_nucrim_p	– 0.0142	– 0.247	– 0.2614	– 1.179	0.0177	0.256
get_noise_p	– 0.3363	– 8.012	– 0.3523	– 2.394	– 0.4409	– 7.183
lose_noise_p	0.0045	0.099	0.0399	0.248	– 0.0552	– 0.906
get_litter_p	– 0.3846	– 4.659	– 0.5101	– 1.874	– 0.3245	– 2.853
lose_litter_p	– 0.0821	– 0.965	– 0.1573	– 0.376	– 0.1933	– 1.595
get_badsrv_p	– 0.4241	– 3.588	– 0.2009	– 0.464	– 0.2821	– 1.753
lose_badsrv_p	– 0.0734	– 0.502	– 0.0445	– 0.090	0.1411	0.662
get_badprp_p	– 0.2997	– 2.342	0.7741	0.000	– 0.1258	– 0.654
lose_badprp_p	– 0.3816	– 3.032	– 0.3430	– 0.581	0.3238	1.563
get_badper	– 0.4927	– 8.197	– 0.8318	– 3.723	– 0.5683	– 6.983
lose_badper	– 0.0636	– 1.053	– 0.0503	– 0.272	– 0.0798	– 0.957
get_othnhd_p	– 0.2756	– 5.655	– 0.0076	– 0.039	– 0.2071	– 2.859
lose_othnhd_p	– 0.0116	– 0.239	– 0.1366	– 0.709	– 0.0492	– 0.591
get_schm_p	– 0.5855	– 4.125	– 0.2650	– 0.845	– 0.1708	– 1.040
lose_schm_p	– 0.1174	– 0.933	– 0.3765	– 1.141	0.1268	0.937
get_shp_p	0.0085	0.218	– 0.1519	– 1.266	– 0.0872	– 1.124
lose_shp_p	0.0013	0.032	– 0.0227	– 0.190	0.0590	0.875

Exhibit A-6b

N-Chotomous Probit Results—Change in Housing Quality, 1999–2001 (2 of 2)

Variable Name	1999–2001					
	Traditional Owned Housing		Manufactured Owned Housing		Rented Housing	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
get_good_trn	0.0315	0.993	0.1383	1.171	– 0.0084	– 0.181
lose_good_trn	– 0.0609	– 1.117	– 0.2718	– 1.158	– 0.0350	– 0.454
mh_in_grp	NA	NA	– 0.2906	– 2.912	NA	NA
ownlot	NA	NA	0.0211	0.228	NA	NA
Mu(1)	0.4504	16.697	0.418	5.913	0.4587	12.662
Mu(2)	1.1130	33.757	1.148	12.632	1.1169	24.824
Mu(3)	1.7477	50.790	1.712	18.103	1.6984	36.037
Mu(4)	3.0519	80.421	2.765	26.641	2.7665	52.524
Mu(5)	3.7719	92.592	3.338	28.849	3.4342	60.662
Mu(6)	4.6044	91.636	4.121	27.593	4.1415	62.121
Mu(7)	5.2086	84.774	4.607	24.689	4.6170	58.733
Number of observations	7,132		761		3,077	
Log likelihood function	– 10,990.79		– 1,282.765		– 5,116.507	
Restricted log likelihood	– 12,936.77		– 1,456.395		– 6,035.134	
Chi-squared	3,891.961		347.260		1,837.253	
Degrees of freedom	47		48		47	

NA = not applicable.

Acknowledgments

The authors thank Chris Herbert for helpful suggestions in developing the research concept of this article. They also acknowledge the suggestions of anonymous reviewers from the U.S. Department of Housing and Urban Development whose insights substantially improved the quality of the research.

Authors

Thomas P. Boehm is a professor of finance and Regions Bank Scholar at The University of Tennessee.

Alan Schlottmann is a professor of economics at the University of Nevada, Las Vegas and a senior research fellow at Claremont Graduate University.

References

Apgar, William, Allegra Calder, Michael Collins, and Mark Duda. 2002. *An Examination of Manufactured Housing as a Community and Asset Building Strategy.* Report to the Ford Foundation by Neighborhood Reinvestment Corporation in collaboration with the Joint Center for Housing Studies of Harvard University. Report Number W02-11. Cambridge, MA: Joint Center for Housing Studies.

Beamish, Julia O., Rosemary C. Goss, Jorge H. Attiles, and Younggioo Kim. 2001. "Not a Trailer Anymore: Perceptions of Manufactured Housing," *Housing Policy Debate* (12) 2: 373–392.

Belsky, Eric S., and Mark Duda. 2002a. "Anatomy of the Low-Income Homeownership Boom in the 1990s." In *Low Income Homeownership,* edited by Nicolas P. Retsinas and Eric S. Belsky. Washington, DC: The Brookings Institution and Joint Center for Housing Studies of Harvard University: 15–63.

Belsky, Eric S., and Mark Duda. 2002b. "Asset Appreciation, Timing of Purchases and Sales, and Returns to Low-Income Homeownership." In *Low Income Homeownership,* edited by Nicolas P. Retsinas and Eric S. Belsky. Washington, DC: The Brookings Institution and Joint Center for Housing Studies of Harvard University: 208–238.

Boehm, Thomas P. 1995. "A Comparison of the Determinants of Structural Quality Between Manufactured Housing and Conventional Tenure Choices: Evidence From the American Housing Survey," *Journal of Housing Economics* (4) 4: 373–391.

Boehm, Thomas P., and Keith R. Ihlanfeldt. 1991. "The Revelation of Neighborhood Preferences: An N-Chotomous Multivariate Probit Approach," *Journal of Housing Economics* (1) 1: 33–59.

Boehm, Thomas P., and Alan M. Schlottmann. 2004. "The Dynamics of Race, Income and Homeownership," *Journal of Urban Economics* (55) 1: 113–130.

Case, Karl, and Maryna Marynchenko. 2002. "Home Price Appreciation in Low- and Moderate-Income Markets." In *Low Income Homeownership,* edited by Nicolas P. Retsinas and Eric S. Belsky. Washington, DC: The Brookings Institution and Joint Center for Housing Studies of Harvard University: 239–256.

DeGiovanni, Frank. 2002. "Introduction to Part 3: Returns to Home Ownership." In *Low Income Homeownership,* edited by Nicolas P. Retsinas and Eric S. Belsky. Washington, DC: The Brookings Institution and Joint Center for Housing Studies of Harvard University: 201–207.

Genz, Richard. "Why Advocates Need to Rethink Manufactured Housing," *Housing Policy Debate* (12) 2: 393–414.

Goetz, William, and Matthew Spiegel. 2002. "Policy Implications of Portfolio Choice in Underserved Markets." In *Low Income Homeownership,* edited by Nicolas P. Retsinas and Eric S. Belsky. Washington, DC: The Brookings Institution and Joint Center for Housing Studies of Harvard University: 257–274.

Hadden, Louise, and Mirielle Leger. 1990. *Codebook for the American Housing Survey: 1973–1993*. Cambridge, MA: prepared by Abt and Associates and revised by HUD and the Census Bureau.

Heckman, James, and Christopher Flinn. 1982. "Models for the Analysis of Labor Force Dynamics," *Advances in Econometrics* (1) 35–95.

Heckman, James, and James Walker. 1990. "The Relationship Between Wages and Income and the Timing and Spacing of Births: Evidence from Swedish Longitudinal Data," *Econometrica* 58: 1411–1441.

———. 1986. Using Goodness of Fit and Other Criteria to Choose Among Competing Duration Models: A Case Study of Hutterite Data. Unpublished paper. University of Chicago. (A shorter, published version appears in *Sociological Methodology 87.)*

ICF Consulting. 2004. *Codebook for the American Housing Survey, Public Use File: 1997 and Later.* Version 1.77. Fairfax, VA: ICF Consulting.

Joint Center for Housing Studies (JCHS) of Harvard University. 2003. *The State of the Nation's Housing.* Cambridge, MA: Harvard University, John F. Kennedy School of Government.

Mansur, Erin, John M. Quigley, Steven Raphael, and Eugene Smolensky. 2000. Examining Policies to Reduce Homelessness in California Using a General Equilibrium Model of the Housing Market. Working paper. University of California, Berkeley.

Manufactured Housing Institute. 2003. *Consumer Statistics* and *Quarterly Economic Report*. Arlington, VA: Manufactured Housing Institute

McKelvey, Richard, and William Zavoina. 1975. "A Statistical Model for the Analysis of Ordinal Level Dependent Variables," *Journal of Mathematical Sociology* 4: 103–120.

Quigley, John, Steven Raphael, and Eugene Smolensky. 2001. "Homeless in America, Homeless in California," *Review of Economics and Statistics,* 83: 37–51.

Reed, Deborah, Melissa Glenn-Haber, and Laura Mameesh. 1996. *The Distribution of Income in California.* San Francisco: Public Policy Institute of California.

Retsinas, Nicolas P., and Eric S. Belsky, eds. 2002. *Low Income Homeownership.* Washington, DC: The Brookings Institution and Joint Center for Housing Studies of Harvard University.

U.S. Department of Housing and Urban Development (HUD). 2004. "Manufactured Housing: Past, Present, and Future," *Recent Research Works* (1): 2–7.

———. 2001. *A Community Guide to Factory-Built Housing.* Washington, DC: U.S. Department of Housing and Urban Development, Office of Policy Development and Research.