Volume Title: Research Findings in the Economics of Aging

Volume Author/Editor: David A. Wise, editor

Volume Publisher: The University of Chicago Press

Volume ISBN: 0-226-90306-0

Volume URL: http://www.nber.org/books/wise08-1

Conference Dates: May 10-13, 2007

Publication Date: February 2010

Chapter Title: Housing Price Volatility and Downsizing in Later Life

Chapter Author: James Banks, Richard Blundell, Zoë Oldfield, James P. Smith

Chapter URL: http://www.nber.org/chapters/c8210

Chapter pages in book: (337 - 379)

12

Housing Price Volatility and Downsizing in Later Life

James Banks, Richard Blundell, Zoë Oldfield, and James P. Smith

In this chapter we will document and model the housing transitions of the elderly in two countries—England and the United States. One important form of these transitions involves downsizing, but there remains considerable controversy even about what the facts are about downsizing at older ages. This controversy stems partly from the absence until recently of long panel data on the housing wealth and circumstances of elderly households. It may also flow from a relatively narrow view of what downsizing is for the purposes of empirical modeling—selling a home and becoming a renter. Other dimensions that are now possible to analyze include selling a home to move into a smaller place either as a renter or owner, or moving in with family or friends, renting out rooms, or simply reducing maintenance and repairs (see Davidoff 2004).

Thus, in addition to the transition into renting, we will document and model the factors associated with downsizing across several of these relevant dimensions.[1] We will examine the extent to which these transitions are

James Banks is deputy research director at the Institute for Fiscal Studies and a professor of economics at University College, London. Richard Blundell is research director of the Institute for Fiscal Studies and a professor of economics at University College, London. Zoë Oldfield is a senior research economist at the Institute for Fiscal Studies. James P. Smith holds the RAND Chair in Labor Market and Demographic Studies at the RAND Corporation.

The authors gratefully acknowledge the financial support of a grant from the National Institute on Aging. Blundell and Banks also acknowledge cofunding from the ESRC Centre for the Microeconomic Analysis of Public Policy at IFS. Smith benefited from the expert programming assistance of David Rumpel. The usual disclaimer applies. This chapter was prepared for presentation at the Boulders Economics of Aging Conference in Carefree, Arizona in May 2007. We very much appreciate the useful and constructive comments of our discussant, Steve Venti, as well as the other participants at the conference.

1. Less immediately transparent forms of downsizing—reducing additions and repairs or renting out rooms—will be dealt with, to the extent that data allow, in subsequent research.

coincident or near other salient events such as retirement or widowhood by estimating models for the empirically important types of housing transitions over multiple waves of our panel data. While other literature has looked at some of these transitions in the United States, the contribution of our analysis, in addition to broadening the empirical analysis to include multiple downsizing measures, is to exploit the longer sample periods now available to look at transitions over a longer horizon where we are more likely to see evidence of downsizing if it does exist in the data. We also provide, to our knowledge, the first systematic comparison of downsizing behavior between the United States and Britain, where there has been much less empirical evidence on downsizing to date.[2]

A second contribution of this chapter is to discuss and model the potential role of house price volatility, which we have previously studied for younger households' home ownership and housing consumption decisions (Banks, Blundell, and Smith 2003a, Banks et al. 2006) in the housing decisions of the elderly. In addition to any type of downsizing in housing consumption that may occur, some housing transitions at older ages may reflect an attempt to escape from the risk associated with a highly price volatile asset, given the relatively short remaining life span. For example, housing price risk at older ages may encourage moving to less price volatile areas but leave intact ownership status as well as the level of real housing consumption. Among those who do sell their homes to buy another, we will therefore also document the transitions between housing price safe and volatile areas even if home size does not change.

Because it places the future flow of nonhousing consumption at risk, greater housing price risk provides an incentive to reduce housing consumption more quickly (at an earlier age) or equivalently to downsize in all forms. Greater (mean preserving) price risk increases the probability that individuals will want to increase their savings in safe assets. Because holding a house in a volatile area is not a safe asset, this implies that the desire to downsize is greater when house price risks are higher. These effects will be mitigated to the extent households have annuitized incomes.

Because housing price volatility is temporally and spatially variable, our empirical analysis will document the importance of the role of house price volatility using comparable panel data analysis for the United States and Britain. One reason motivating our choice of comparison countries is the significant differences in housing price variability between these two countries—Britain has considerably higher house price volatility, with the relatively safe regions having comparable volatility to the most risky regions of the United States (see Banks et al. [2006] for example). Consequently, if volatility matters, one might expect differences in downsizing behavior across countries.

2. For an exception, see Disney, Henley, and Stears (2002), which looked at housing wealth and savings trajectories for older households in the United Kingdom between 1988 and 1994.

Of course there may be many other differences between the two countries and hence, in contrast to the descriptive evidence comparing the two countries, our empirical analysis will exploit within-country regional and time series variation in volatility to identify the effects of volatility on downsizing behavior. This distinction between these two approaches turns out to be important. At the broadest level, our descriptive comparison of the two countries reveals less downsizing behavior in Britain than in the United States—a result at odds with the idea that higher volatility should lead to greater downsizing. Once we look within country and also control for other covariates, however, we find a positive correlation between downsizing and volatility in the United States, and a qualitatively similar although statistically weaker effect within Britain. This suggests that other differences between the two countries are driving the international differences, and some potential factors are discussed briefly in the spirit of topics for future research.

A third contribution of our chapter is to examine more generally the long contested issue of whether households in both countries at sufficiently old age reduce their consumption. In particular the question we ask is whether consumption of housing declines in addition to any changes induced by a set of demographic changes producing smaller households and the decision to retire from the labor force. Because housing is an important component of total consumption and is usually believed to be one of the components most resistant to any downward changes, our finding of a downward path of housing consumption adds important evidence to the more general debate on the nature of consumption trajectories at older ages.

This chapter is divided into six sections. Section 12.1 outlines and discusses implications from a simple theoretical model of the impact of housing price variability on life cycle choices regarding housing decisions with an emphasis on its implications for downsizing during late life. Section 12.2 describes the data sources used in both Britain and the United States. Section 12.3 documents the principal facts about the extent of different forms of late life downsizing in both countries and their possible relation to housing price variability within and between Britain and the United States. In section 12.4 we summarize the predictions to be tested and provide the results of the empirical tests of our model. Section 12.5 uses the results of previous sections to present and discuss age trajectories of housing consumption at older ages in the two countries. In section 12.6 we present our conclusions.

12.1 Theoretical Model

Economic theory has implications about the possibility of downsizing at older ages for a number of reasons. As families progress through the life cycle, the demand for the consumption of housing services is likely to fall. For example, it is a standard implication of life cycle models that at sufficiently older ages as mortality risks rise, total household consumption

(of which housing is an important part) will fall with age. While the extent of the actual fall in total household consumption remains a matter of active debate, it appears to be the case that at sufficiently older ages household consumption does indeed fall with age, most likely reflecting the combined influences of time preferences and mortality risk. When total consumption falls, housing consumption should also fall since if it did not, all reductions in total consumption would have to take place in nonhousing consumption alone.

12.1.1 The Demographic Ladder

The second and perhaps more immediately apparent reason that one might expect reductions in housing consumption at older ages are demographic. One useful description of the demographic forces is the housing ladder, which we see as demographically driven as individuals marry and form families with children aging and growing in their housing needs. Eventually people complete their family building with older children starting to leave home to go off on their own. Figure 12.1, panel A, depicts this demographic process by plotting by age for the United States three dimensions of the demographic ladder—the fraction of families who had completed their family, the fraction of families who ever have had a child at least five years old, and the fraction of families who currently have a child at least five years old in the household.[3] A parallel set of graphs are provided for Britain in figure 12.1, panel B.

The demographic housing life cycle can be divided into five broad stages. In the first stage, an individual lives with their parents; in the second, they form partnerships; and in the third, they go on to have children and complete their family size. In the remainder of the life cycle, in stage four, children leave home, and the final stage is widowhood. At each stage, there is a decision to buy or rent and a decision about a minimum level of housing consumption necessary to meet needs. The demography depicted in figure 12.1, which are remarkably similar in both countries, indicates that housing demand will grow during the early and middle parts of life, but may then reverse as children leave home and go off on their own.

Because the fraction of families with a child over age five in the household peaks around age forty in both countries, the fraction of families with children under age eighteen will peak in the mid-fifties and the demographically driven demand for housing should peak at this age or before. Multiple children should matter as well in housing demand. Further reductions in housing demand at older ages will flow from divorce and/or widowhood as people enter the final stage of life without a partner.

3. This figure plots the cumulative fraction of individuals who completed their family size by age. This was obtained from data on individuals age fifty and over by taking the age at which they had their last child as being the age they completed their family.

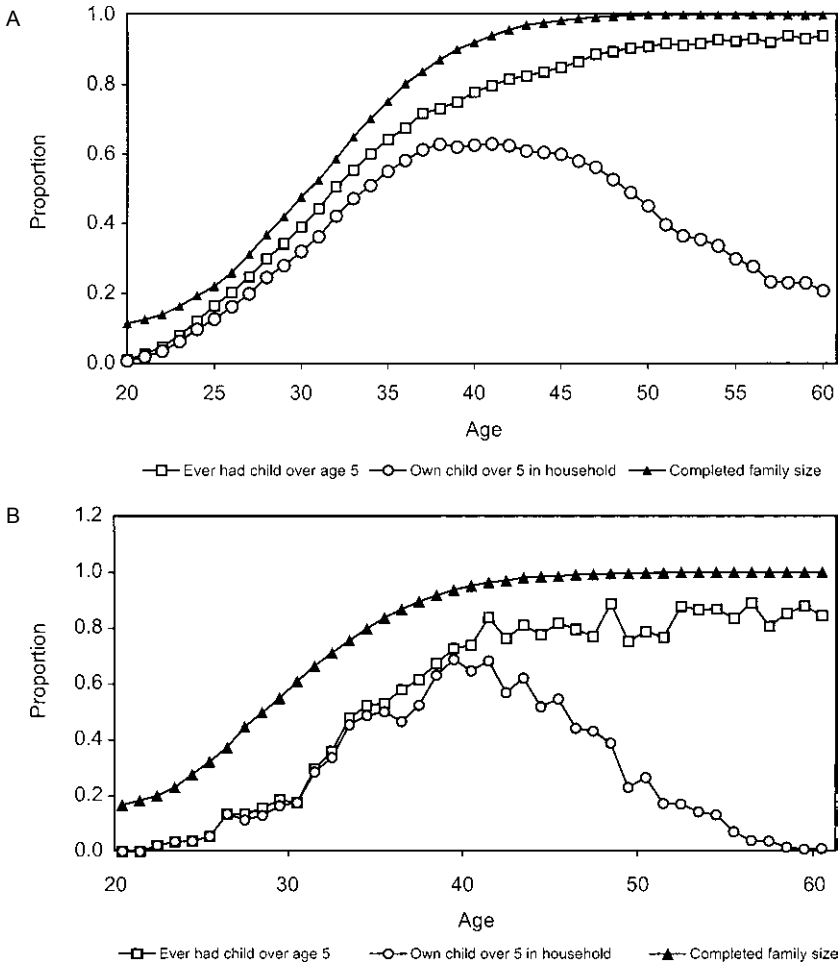

Fig. 12.1 The demographic ladder: *A*, United States; *B*, United Kingdom

12.1.2 Housing Price Risk

The third factor that may influence decisions to downsize concerns the influence of housing price risk. In an earlier paper (Banks et al. 2006), we investigated the influence of housing price risk on the decision to own a home during the rising upward part of the demographic housing ladder. To summarize, one possible solution to the changing housing demand over the life cycle is to simply purchase the amount of housing one requires at each stage, but high transactions costs serve as an effective barrier to that strategy.

Another solution would be to rent in the early stages and then purchase

the "right," presumably larger, home when family size is complete. The difficulty with that strategy is that housing price volatility may mean that you are priced out of this market at the time when you need to purchase your family home. Because there are no market insurance devices that can insure against this risk, one can only self-insure against the future housing price volatility. To provide this insurance, a household wishes to hold an asset with a value correlated with house prices they will face in the future. Holding housing equity essentially provides some insurance against high house prices later. Since, in the absence of a formal market, the only way to obtain housing equity is to buy a house, to insure themselves, individuals must purchase a house earlier than they may have wanted based on housing consumption demographic needs alone. Thus, the more volatile house prices are, the greater the insurance motive of owning a house in the early phases of the demographic ladder depicted in figure 12.1.

This chapter is motivated by an extension of our model into the older stages of the life cycle—the stage that involves children leaving home and widowhood. Are people willing to downsize in order to fund their retirement consumption, and how is this decision affected by the presence of volatile house prices?

The integration of housing price risk into a single theoretical framework is complex, and even algebraic closed-form solutions will only be possible under certain forms of preferences. Ideally, however, we want such a framework to use relatively flexible preferences (such as Constant Relative Risk Aversion [CRRA]) that also have some minimum housing needs or requirement that must be met in each period, and such analytical solutions can be hard to come by. We have confirmed the predictions that follow in a numerical simulation of a simple three-period model of the later stages of life to capture the stages of the demographic ladder identified in the previous section, with CRRA utility, house price risk, a minimum housing requirement that rises and then falls with the housing ladder, and a simplified form of mortality risk. For the purposes of this chapter, and in the absence of analytical results, we focus instead on intuitive descriptions of the mechanisms in play.

The first thing to note is that the model is not symmetric with regard to the role of volatility in early as opposed to late life. In the rising phrase of the housing ladder, individuals want to self-insure so that they will not be forced to live in a house that is too small when their housing demand is high in midlife. In volatile areas, expected price volatility induces one to move into home ownership at a younger age and hence, to reduce consumption of other goods.

On the later rungs of the household ladder, however, housing is no longer required in order to meet an insurance need. Instead, when household size is no longer expected to rise, housing reverts to a more straightforward

risky asset which individuals (if they are risk averse) may wish to avoid Put simply, in the later stages of life or the downsize of the housing ladder, one may want to release some housing consumption to consume other goods. Greater housing price risk (whether in the form of greater house equity for a given level of risk, or greater risk for a given level of equity) puts that decision at risk, thereby encouraging homeowners in more price volatile areas to either downsize more rapidly than they might have wanted, to rent, or to move to areas with less house price volatility. Another option is equity withdrawal or reverse mortgages, which not only provide some insurance against mortality risk but also slowly reduces uncertainty about the equity. But like many annuities this market is quite thin, perhaps due to standard adverse selection issues.

Downsizing essentially involves cashing in housing equity. You want to do this because you want to use housing wealth to finance future nonhousing consumption, but as with any approaching asset realization, an optimal path would be to gradually reduce risk and move into safe assets to avoid exposure to shocks at the time of realization that will have permanent effects. (This is a mechanism directly analogous to the prediction in the pensions literature that as retirement approaches the optimal pension portfolio is to gradually switch out of stocks and into bonds.)

There are, of course, many good reasons why individuals may not want to downsize. One is that they may have build up a "habitual" demand for this house as they may over time have fitted it to their tastes, or they may want children to return to the home in which they were raised. The cost of not downsizing is that all other consumption may have to absorb more of the fall.

If you do decide to downsize, the specific timing may be coordinated with other salient events—indeed, our description of the housing ladder is event-specific as opposed to age- or time-specific. One event may be retirement, since one's work is location-specific even if there is housing price risk. The other is widowhood or other forms of marital dissolution where, at a minimum, the old house may be too big. Thus, any downsizing that does take place may be correlated with retirement, widowhood, or divorce and our empirical analysis will need to allow for these transitions.

In the previous discussion we have not addressed the issue that, conditional on location, house price volatility may not be avoidable by switching to the rental sector, since rental prices may be more volatile as well in such areas, which may indeed generate a demand for owner-occupation to avoid rent risk (see Sinai and Souleles 2005). Several things are worth mentioning here. First, the mechanisms previously discussed relate to stock of housing wealth as opposed to the flows of period-by-period housing costs associated with ownership or rental, respectively. Although once mortgages are paid off, the risk associated with house price fluctuations for homeowners

is all related to the value of assets and not post-housing cost incomes, so the relative comparison of ownership to rental is changed in favor of owner-occupation. The fact that horizons are shorter would weaken the importance of such an effect.

Second, in our framework, switching from an owner to a renter is just one way that an individual can choose to downsize. This means that our framework is compatible with that of Sinai and Souleles because individuals who wish to avoid both rental risk and house price risk can do so by downsizing in ways in which they can remain an owner occupier. Finally, even when it comes to homeownership itself, in contrast to the up stage of the ladder the prediction here is that more volatility would lead to lower ownership rates—a mechanism that would work against that previously described, if anything. To the extent that the previous two considerations do not totally remove the relevance of rental price risk (relative to ownership) in volatile areas, we may be underestimating the effect of volatility in our empirical models.

12.1.3 Other Risks

Of course, other risks that may or may not be correlated with house price risk may also matter for households' housing and downsizing decisions. Perhaps the two most natural to think of are income risk and mortality or morbidity risk. On the assumption that most downsizing takes place at or after retirement, income risk is most likely of only second-order importance since there is no earnings risk and large fractions of the incomes of retired households may well have some degree of inflation protection.

More important is likely to be health risks, and there are several ways in which additional health risk may also affect housing wealth and nonhousing wealth accumulation and decumulation decisions at older ages. Especially when health insurance is not complete, it increases the risks of additional out-of-pocket expenditures, particularly at the tails, which should encourage additional precautionary savings.

Before retirement, morbidity risk also shows up as one of the determinants of income risk and thus will have effects similar to those described in the previous section. Holding a risky asset such as housing when prices are highly volatile may be a dubious strategy when one faces additional health risk. A spread in pure mortality risk (making it more likely you will live longer as well as shorter) will make risk-averse agents engage in more precautionary savings in all forms in face of an added risk of living too long. This effect will depend both on the extent to which retirement incomes have been annuitized (which varies a great deal across our countries) and the importance of any bequest motive that might exist. We will not incorporate health risk into this chapter but note that it is an important topic (on which we are gradually gaining a better empirical understanding) for inclusion in future drafts.

12.2 Sources of Data

This research will rely on microdata from the United States and Britain. For the United States, we will use the Health and Retirement Study (HRS) and primarily the Panel Survey of Income Dynamics (PSID). For Britain, we will use the British Household Panel Survey (BHPS). Besides the standard set of demographics on age, schooling, family income, marriage, and other aspects of family building, outcomes information available in all these surveys include several aspects of housing choice—ownership, size of house, and value of house.

HRS This research uses a set of surveys of the over-age fifty population: the original Health and Retirement Study (HRS-original) and the Assets and Health Dynamics of the Oldest Old (AHEAD). The HRS-original is a national sample of about 7,600 households (12,654 individuals) with at least one person in the birth cohorts of 1931 to 1941 (about fifty-one to sixty-one years old at baseline). The AHEAD includes 6,052 households (8,222 individuals) with at least one person born in 1923 or earlier (seventy or over in 1993). Follow-ups have taken place at two-year intervals.

The HRS housing section includes wave-by-wave data about tenure (renter or owner), value and purchase price of the home, outstanding mortgages (and hence, home equity) and monthly mortgage payments, whether the household refinanced since the last interview, other fixed payments (e.g., property taxes, fuels, etc.), rents (if a renter), and number of rooms. Information is also available on second homes. In this chapter, HRS is used simply to confirm the principal patterns of changing housing demand obtained from the PSID during later life.

The Panel Study of Income Dynamics The PSID has gathered almost thirty years of extensive economic and demographic data on a nationally representative sample of approximately 5,000 (original) families and 35,000 individuals who live in those families. Details on family income and its components have been gathered in each wave since the inception of PSID in 1967. Starting in 1984 and in five-year intervals until 1999, PSID asked questions to measure household wealth. Starting in 1997, the PSID switched to a two-year periodicity, and wealth modules are now part of the core interview.

In each wave, the PSID asks detailed questions on family size and composition, schooling, education, age, and marital status. State of residence is available in every year and individuals are followed to new locations if they move. Unlike other American wealth surveys, PSID is representative of the complete age distribution. Yearly housing tenure questions determine whether individuals own, rent, or live with others. Questions on value and

mortgage were asked in each wave of the PSID. Renters are asked the rent they pay, and both owners and renters are asked the number of rooms in the residence. Health conditions and timing of onset were added in 1999.

British Household Panel Survey The BHPS has been running annually since 1991 and, like the PSID, is also representative of the complete age distribution. The wave 1 sample consisted of some 5,500 households and 10,300 individuals. The BHPS contains annual information on individual and household income and employment, as well as a complete set of demographic variables, and has several other features to recommend it. There is an extensive amount of information on mortgages and housing (including number of rooms) that enables us to measure housing wealth in each wave of the data.[4] Regional variation in ownership and housing wealth accumulation will be essential in our tests and the data will provide us with sufficient observations per year in each region to carry out our tests.

12.2.1 Housing Price Volatility

For the United States, housing price data to measure housing price risk were obtained from the Office of Federal Housing Enterprise Oversight (OFHEO) House Price Index. This data contain quarterly and yearly price indexes for the value of single-family homes in the United States in the individual states and the District of Columbia.[5] This data use repeat transactions for the same houses to obtain a quality constant index and is available for all years starting in 1974. All yearly housing prices by state are reported relative to those that prevailed in 1980. By 1995 there were almost 7 million repeat transactions in the data so that the number of observations for each state is reasonably large. No demographic data are available with this index.

For Britain, regional house price data to measure housing price risk will be obtained from the Nationwide Building Society House Price series, which is a quarterly regional house price series going back to 1974. Rather than use a repeat sales index, the prices are adjusted for changes in the mix of sales to approximate a composition constant index, and are also seasonally adjusted.

As with our previous paper (Banks et al. 2006), housing volatility is defined using a moving five-year window. That is, our measure of volatility is the standard deviation of the house price around its trend in the five years prior to the observation. What should matter for individual decisions, of course, is the conditional variance of expected house prices over the individuals' horizon and in this respect our measure is only crude, intending simply to capture that the recent past might be used as a prediction of the future.

4. With the exception of 1992, when house value was only collected for those living at new addresses.

5. For details on this data see Calhoun (1996).

Nevertheless, sensitivity analysis in previous papers revealed the empirical conclusions to be broadly unaffected by choice of window-length within reasonable ranges, and subject to the constraints of, and subsequent impacts on, the amount of time series variation available. Finally, with regard to picking out regional as opposed to time series variation in volatility, we are confident that the measure picks out the risky from the safe regions both within and across countries.

12.3 Establishing the Facts

Even the basic question of whether housing is downsized as people age is not well answered in the literature. For example, Venti and Wise (2001) concluded, based on the AHEAD data in the United States, that after controlling for transitions into widowhood and nursing homes, the elderly do not generally reduce housing equity as they age. Yet Sheiner and Weil (1992) estimated that among households entering old age owning a home, just 41 percent still own when the surviving spouse dies.

One source of the differences that emerge in the current literature is that moving out of home ownership is only but one form downsizing may take. Individuals may sell the original family home to move into a smaller one while remaining owners are either in the same or a different general location. They can also remain homeowners even if the size of the home is the same but move to a less expensive and less volatile place. They may also invest less in upkeep of their home, an implicit form of downsizing, or rent a room out. Or, they may move into the home of another relative (especially children) or have them move into their own home, perhaps with shared ownership. The years around labor market retirement and the death of a spouse may be especially important ones for these transitions. Very little is currently known about the magnitude and reasons for these broader cumulative transitions or about any international differences that might exist. In this section, we document the principal empirical facts around these issues in both the United States and the United Kingdom.

12.3.1 Home Ownership Rates at Older Ages

Especially at older ages, most Americans are homeowners. Based on multiple waves of the PSID, table 12.1, panel A, presents tenure status for individuals by age of the household head for ten-year age groups starting at age fifty, concluding with a residual category of those eighty-plus years old. Using the same format, panel B lists parallel data derived from the BHPS for individuals in Britain. For both countries, the data are also stratified by whether or not the household lives in an area characterized by volatile housing prices.

Table 12.1, panel A, shows that slightly more than 80 percent of all American individuals over age fifty are homeowners. Approximately one

Table 12.1 Tenure status for individuals by age of head of family

	50–59	60–69	70–79	80+	Total
		A United States			
Owner	83.0	83.1	77.5	65.5	80.5
Renter	15.0	14.6	19.2	28.8	16.7
Other	1.9	2.3	2.5	6.7	2.8
Risky areas					
Owner	77.2	74.9	68.4	57.4	73.7
Renter	21.2	22.9	29.9	36.1	24.4
Other	1.6	2.2	1.7	4.6	2.0
Nonrisky areas					
Owner	85.1	85.8	79.9	68.3	81.8
Renter	11.8	12.8	16.2	26.2	14.2
Other	2.2	2.4	3.9	7.4	3.0
		B United Kingdom			
Owner	76.5	71.0	63.2	48.2	67.6
Renter	19.7	25.3	31.8	42.5	27.5
Other	3.8	3.7	5.1	9.3	4.9
Risky areas					
Owner	78.7	74.7	66.2	50.6	70.5
Renter	17.4	21.9	29.2	39.4	24.7
Other	3.9	3.4	4.7	10.1	4.8
Nonrisky areas					
Owner	72.3	64.0	57.8	43.5	62.2
Renter	24.2	31.7	36.5	48.6	32.8
Other	3.5	4.3	5.8	7.9	4.9

Sources: Panel A: PSID—(1968–1999), weighted individual level data. Panel B: BHPS—(1991–2004), weighted individual level data.

in every six Americans in this age group are renters, while a relatively small fraction are in the catch-all "other categories" that largely consist of living with relatives or in a nursing home. Among older Americans, there is a gradual decline in the fraction who are homeowners across age groups post-age seventy. Below age seventy, homeownership rates are about 83 percent—above age eighty the rate is 66 percent. Most of the decline in the probability of owning a home appears as an increase in renting but some of it, particularly among those over age seventy, reflects an increase in the likelihood of living with others or in a nursing home.

For British individuals over age fifty (summarized in panel B of table 12.1), the probability of being a homeowner is about 13 percentage points lower than that of American individuals, a deficit mostly offset by a higher probability of renting. There is a much sharper negative age pattern in Britain compared to the United States across the age groups depicted in table 12.1. Among those in their fifties, for example, there is less than a 7 percentage point difference in homeownership rates between the two countries—by

ages eighty and over the likelihood of owning a home is 17 percentage points lower in Britain compared to the United States. As documented in Banks, Blundell, and Smith (2003), this sharp negative age gradient in homeowning rates in Britain largely reflects cohort effects and the sale at subsidized rates of government-owned council housing.

In the United States, homeownership rates are much higher in nonrisky housing price locales than in the risky ones. One might be tempted to attribute this difference to the fact that housing prices are also considerably higher in the risky places, but that temptation is deterred by the fact that the reverse pattern appears to be the case in Britain even though housing prices in Britain are also higher in the more volatile housing price places.

12.3.2 Changes in Housing Tenure with Age

Our principal concern in this chapter involves not homeownership status per se but rather the transitions in tenure that takes place at older ages. The very pronounced cohort effects in housing status in Britain documented in the previous section indicate that it would be perilous to attempt to read housing transitions from cross-sectional age housing tenure patterns, especially in Britain. Instead, in this section we will highlight the salient transitions using the panel nature of the data in the United States and Britain.

Since much of the existing research on downsizing at older ages focuses on the decision to sell one's original home and become a renter, we begin with the transitions conditional on originally being a homeowner. Table 12.2 examines these tenure transitions in the United States (using the PSID) and Britain (using the BHPS) for a subpopulation who are at least fifty years old and who were originally homeowners in the initial period. Because the extent of the transitions that place will depend on the length of the window during which we allow households to adjust their status, the data are presented for three different durations between the waves of the panel—two years apart, five years apart, and ten years apart. All tenure transitions are presented separately for risky and nonrisky price areas. Finally, table 12.3 organizes the data in precisely the same way for those who were initially renters.

These two-year transitions may illustrate why there is some skepticism about downsizing being an important dimension of behavior at older ages. Across a two-year period, only 11 percent of American homeowners move and only one in twenty relocate during a single year. Such mobility is even less in Britain, where only about 6 percent of British homeowning households relocate over a two-year horizon. However, as we allow the number of years between the survey waves to expand, the extent of mobility taking place increases significantly. To illustrate, over a decade, almost one in every three American homeowners who were at least fifty years old moved out of an originally owned home. Among those Americans who did move, however, 71 percent of them remained homeowners by purchasing another home. Another 22 percent of them became renters while the rest do a col-

Table 12.2 Housing transition among owners in the United States and in the United Kingdom

	All	Risky	Nonrisky
Two-year transitions			
United States			
Owner, Owner, No move	88.9	89.4	88.7
Owner, Owner, Moved	8.0	7.7	8.1
Owner, Renter	2.2	2.3	2.1
Owner, Other	0.9	0.6	1.0
United Kingdom			
Owner, Owner, No move	94.0	93.7	94.8
Owner, Owner, Moved	4.2	4.5	3.5
Owner, Renter	1.2	1.2	1.2
Owner, Other	0.6	0.6	0.5
Five-year transitions			
United States			
Owner, Owner, No move	80.0	79.8	80.1
Owner, Owner, Moved	14.3	14.7	14.1
Owner, Renter	4.2	4.4	4.2
Owner, Other	1.5	1.1	1.6
United Kingdom			
Owner, Owner, No move	86.5	86.1	87.3
Owner, Owner, Moved	10.7	11.2	9.6
Owner, Renter	2.1	2.0	2.3
Owner, Other	0.7	0.7	0.8
Ten-year transitions			
United States			
Owner, Owner, No move	68.2	65.6	69.0
Owner, Owner, Moved	22.7	26.0	21.7
Owner, Renter	6.8	6.5	6.9
Owner, Other	2.3	1.8	2.5
United Kingdom			
Owner, Owner, No move	76.1	75.6	77.3
Owner, Owner, Moved	20.2	20.8	19.0
Owner, Renter	2.8	2.6	3.0
Owner, Other	0.9	1.0	0.7

Source: U.S. data based on PSID for all years 1968–1999—Population ages fifty and over. UK data are based on BHPS. All data are weighted and are individual level data.

lection of things, including moving in with family members or into group dwellings.

Mobility among homeowners is clearly less in Britain for older households. Across the same ten-year span between survey waves, about one in every four British homeowners relocated compared to about one in three American households. In these simple tabulations, in neither Britain nor the United States does an owner's propensity to sell a home appear to depend on whether one lives in a housing price risky or nonrisky locale.

Table 12.3 **Housing transitions among renters in the United States and in the United Kingdom**

	All	Risky	Nonrisky
Two-year transitions			
United States			
Renter, Renter, No move	61.1	68.5	56.8
Renter, Renter, Moved	27.0	22.7	29.4
Renter, Owner	9.8	6.8	10.2
Renter, Other	3.0	2.0	3.6
United Kingdom			
Renter, Renter, No move	88.2	87.9	90.1
Renter, Renter, Moved	6.6	7.5	5.4
Renter, Owner	4.0	4.0	3.9
Renter, Other	0.6	0.7	0.6
Five-year transitions			
United States			
Renter, Renter, No move	59.0	64.6	56.3
Renter, Renter, Moved	28.5	26.8	29.3
Renter, Owner	8.4	6.7	9.2
Renter, Other	4.1	1.9	5.2
United Kingdom			
Renter, Renter, No move	76.6	75.3	78.5
Renter, Renter, Moved	14.3	15.7	12.3
Renter, Owner	8.0	7.8	8.3
Renter, Other	1.1	1.2	0.9
Ten-year transitions			
United States			
Renter, Renter, No move	28.2	37.1	22.5
Renter, Renter, Moved	43.5	39.5	46.0
Renter, Owner	24.2	20.9	26.2
Renter, Other	4.2	2.5	5.2
United Kingdom			
Renter, Renter, No move	59.8	58.7	61.4
Renter, Renter, Moved	24.1	24.7	23.4
Renter, Owner	14.6	14.8	14.2
Renter, Other	1.4	1.8	1.0

Source: U.S. data based on PSID for all years 1968–1999—Population ages fifty and over. UK data are based on BHPS. All data are weighted and are individual level data.

Table 12.3 demonstrates that—not surprisingly—renters in both countries are far more mobile than owners. Across the ten year survey interval, 72 percent of American renters moved at least once compared to 40 percent of British renters, so that once again British households are less mobile than their American counterparts. Most of these originally renting households remain so and simply settle into another apartment or flat. But a little more than one in every four American renters who do relocate over age fifty subsequently become homeowners—the comparable British number is one-third.

While these transitions rates were similar between risky and nonrisky areas for homeowners, it appears that renters in nonrisky areas are more likely to move in the United States.

Table 12.4 displays patterns of housing tenure transitions by ten year age groups for those owners who are at least age 50, and table 12.5 does the same for those who were originally renters. In the United States, until after eighty, roughly two-thirds of homeowners do not move to another place over a ten-year window. However, among those who do move, a growing fraction of them do not purchase another home. Rather, they increasingly

Table 12.4 **Housing transition among owners by age of head (of family)—ten year transitions**

	50–59	60–69	70–79	80 plus
		United States		
Overall				
Owner, Owner, No move	70.8	70.2	62.9	42.8
Owner, Owner, Moved	24.5	20.6	15.5	12.9
Owner, Renter	3.6	6.3	12.2	38.0
Owner, Other	1.1	2.9	5.8	6.3
Risky areas				
Owner, Owner, No move	64.5	65.7	74.9	46.9
Owner, Owner, Moved	29.2	25.4	10.9	18.6
Owner, Renter	4.8	7.5	10.9	25.5
Owner, Other	1.6	1.5	3.4	9.0
Nonrisky areas				
Owner, Owner, No move	70.8	70.2	62.9	42.8
Owner, Owner, Moved	24.5	20.6	15.2	12.9
Owner, Renter	3.6	6.3	16.2	38.0
Owner, Other	1.1	2.9	5.8	6.3
		United Kingdom		
Overall				
Owner, Owner, No move	73.5	74.0	81.1	79.0
Owner, Owner, Moved	24.2	22.9	15.2	11.8
Owner, Renter	1.7	1.9	3.2	7.1
Owner, Other	0.6	1.1	0.6	2.1
Risky areas				
Owner, Owner, No move	73.2	73.5	81.1	76.1
Owner, Owner, Moved	24.7	23.2	15.3	13.9
Owner, Renter	1.4	2.0	2.9	7.9
Owner, Other	0.7	1.3	0.8	2.2
Nonrisky areas				
Owner, Owner, No move	74.1	75.3	80.8	84.5
Owner, Owner, Moved	23.0	22.2	14.9	7.8
Owner, Renter	2.5	1.7	3.9	5.7
Owner, Other	0.4	0.7	0.3	2.1

Source: U.S. data based on PSID for all years 1968–1999—Population ages fifty and over. UK data are based on BHPS 1991–2004. All data are weighted and are individual level data.

Table 12.5 Housing transition among renters by age of head—ten year transitions

	50–59	60–69	70–79	80 plus
		United States		
Overall				
Renter, Renter, No move	21.6	31.1	41.4	26.9
Renter, Renter, Moved	40.6	47.0	41.8	56.4
Renter, Owner	33.3	17.1	12.0	8.2
Renter, Other	4.6	2.9	4.9	8.4
Risky areas				
Renter, Renter, No move	30.7	39.4	51.7	37.3
Renter, Renter, Moved	38.8	41.1	37.3	44.5
Renter, Owner	27.5	18.5	8.0	8.4
Renter, Other	3.0	1.1	3.0	9.8
Nonrisky areas				
Renter, Renter, No move	15.3	25.7	35.3	22.6
Renter, Renter, Moved	41.9	50.7	44.4	61.1
Renter, Owner	37.2	19.5	14.4	8.2
Renter, Other	5.7	4.0	5.9	7.8
		United Kingdom		
Overall				
Renter, Renter, No move	45.5	61.2	61.5	71.0
Renter, Renter, Moved	27.0	23.6	25.5	20.3
Renter, Owner	26.1	13.8	11.3	7.6
Renter, Other	1.4	1.5	1.7	1.1
Risky areas				
Renter, Renter, No move	43.4	54.3	64.3	72.5
Renter, Renter, Moved	26.0	24.6	27.7	19.5
Renter, Owner	28.3	18.3	6.4	7.5
Renter, Other	2.3	2.9	1.6	0.5
Nonrisky areas				
Renter, Renter, No move	48.9	69.1	57.5	69.0
Renter, Renter, Moved	28.5	22.4	22.2	21.3
Renter, Owner	22.6	8.6	18.6	7.7
Renter, Other	0.0	0.0	1.8	1.9

Source: U.S. data based on PSID for all years 1968–1999. Population ages fifty and over. UK data are based on BHPS. All data are weighted and are individual level data.

move into rental properties and, to a lesser extent, into either assisted living or to stay with family members. The probability of a homeowner moving into a rental property is far less in Britain than in the United States and it is a good deal less likely at older ages for a homeowner in Britain to subsequently become a renter.

In the United States and in Britain, renters become increasingly less mobile with age, once again with an important exception noted for those aged eighty through eighty-nine in the United States. Compared to 22 percent of American renters in their fifties, 41 percent of American renters in their seventies stay in the same place over a ten-year horizon. Across all age

groups, many more American renters relocate in the nonrisky areas compared to the risky ones.

Table 12.5 demonstrates that a good deal of the additional mobility among renters in the United States in nonrisky areas involves larger movements from renter to owner status (compared to the risky areas). To this point, we have emphasized the incentives involved in these housing decisions from the point of view of owners. However, the arguments are completely symmetric. From the perspective of those who were originally renters, changing from being a renter to an owner of housing in a house price risky area would make little sense indeed. That transition is less problematic in places where housing price risk is less problematic. Thus, our model predicts that mobility of owners should be higher in housing price risky areas but mobility of renters should be the reverse—that is, mobility will be higher among renters in the nonrisky areas.

12.3.3 Changes in the Number of Rooms

In addition to changing ownership status—the most commonly used measure of downsizing—another form may involve selling an existing home and buying a new one that is spatially smaller or constitutes less housing consumption in other ways. One definition of objective home size available in all our data sets is the number of rooms. Using the PSID for those ages fifty or more, table 12.6 examines changes in the number of rooms of the primary dwelling among those who changed residences between the waves of the data. These patterns are presented by type of area (whether a risky price area or not), initial type of housing tenure (owner or renter), and three time durations between the PSID waves—two, five, and ten years.

These data indicate convincingly that among older Americans, once they decide to relocate, they do tend to move into a smaller dwelling. On average, the new house is around 0.7 of a room smaller than the prior one, a scaling down of about 16 percent, using rooms as the metric. This tendency to downsize is almost entirely due to a movement to smaller places among those who were initially homeowners. Moreover, most of that reduction in size is due to those who change in housing tenure from owner to renter—a new rental dwelling that is on average two-and-a-third rooms smaller than the prior owned one. But—especially as the duration between the waves of the PSID increases—even those who remain homeowners purchase a new home that is on average about one-third of a room smaller.

At least in these univariate descriptive statistics, this tendency of American homeowners to downsize their house at older ages appears to be somewhat stronger if they originally lived in a risky housing price area. This is especially the case among those homeowners who sell and then buy another home. Using the ten-year interval horizon, the change in the number of rooms is twice as high in the risky areas when homeowners buy another

Table 12.6 **Change in number of rooms among movers—PSID ages fifty and over by number of years**

	Delta no. of rooms		
	2 years	5 years	10 years
Overall			
Owners	–0.574	–0.739	–0.817
Owners-renters	–2.016	–2.102	–2.149
Owners-new owners	–0.191	–0.319	–0.395
Renters	–0.004	–0.084	–0.176
Renters-owners	0.692	0.639	0.631
Renters-new renters	–0.151	–0.311	–0.527
Risky areas			
Owners	–0.776	–0.970	–0.992
Owners-renters	–2.219	–2.358	–2.670
Owners-new owners	–0.383	–0.558	–0.641
Renters	–0.094	–0.211	–0.357
Renters-owners	0.336	0.413	0.348
Renters-new renters	–0.158	–0.339	–0.629
Nonrisky areas			
Owners	–0.517	–0.668	–0.756
Owners-renters	–1.943	–2.023	–2.114
Owners-new owners	–0.137	–0.242	–0.308
Renters	0.034	–0.025	–0.078
Renters-owners	0.818	0.727	0.764
Renters-new renters	–0.158	–0.297	–0.470

Source: PSID ages fifty and over (1968–1999) rooms limited to eight. All data are weighted and are individual level data.

home. In nonrisky areas, there is little difference in size of dwelling among renters, but renters do appear to downsize in the risky area.

One limitation of the PSID is that sample sizes become thin once one stratifies by age. Tables 12.7 and 12.8 list similar data on the changing number of rooms associated with housing mobility for two HRS cohorts where relatively long horizons are possible to track housing changes. Table 12.7 provides data from the original HRS cohort (those fifty-one to sixty-one years old in 1992), while table 12.8 does the same for the AHEAD cohort (those seventy-plus years old in 1993.) These two cohorts are of particular interest since the first captures transitions associated with the pre-retirement years while the second focuses on the nature of post-retirement mobility.

During the pre-retirement years, we do find a tendency of Americans to downsize, but this is concentrated completely on homeowners and appears to be more pronounced in the price risky places. Over a ten year time horizon, homeowners who lived in price risky areas when they moved reduced the size of their dwelling by 1.6 rooms if they became a renter and half a

Table 12.7 **Change in number of rooms among movers—original HRS cohort by number of years**

	Delta no. of rooms		
	2 years	6 years	10 years
Overall			
Owners	–0.298	–0.214	–0.796
Owners-renters	–1.276	–0.779	–1.191
Owners-new owners	–0.152	–0.134	–0.758
Renters	0.310	0.149	0.323
Renters-owners	1.180	0.633	0.919
Renters-new renters	–0.120	–0.206	–0.319
Risky areas			
Owners	–0.352	–0.234	–0.805
Owners-renters	–1.008	–0.659	–1.632
Owners-new owners	–0.268	–0.169	–0.668
Renters	0.123	0.025	–0.054
Renters-owners	1.411	0.753	0.477
Renters-new renters	–0.360	–0.442	–0.498
Nonrisky areas			
Owners	–0.250	–0.210	–0.793
Owners-renters	–1.348	–0.821	–0.996
Owners-new owners	–0.078	–0.124	–0.787
Renters	0.381	0.204	0.537
Renters-owners	1.085	0.599	1.126
Renters-new renters	–0.132	–0.084	–0.191

Source: HRS—original cohort ages 51–61—rooms unlimited. All data are weighted and are individual level data.

room on average if they remained a homeowner. The comparable figures for those in less housing price risky areas were about a one-room reduction if they became a renter and a .8 reduction if they remained a homeowner—about half as large as the amount of downsizing taking place among those living in the price risky areas.

If anything, these size reductions appear to be even larger in the post-retirement AHEAD cohort who are examined in table 12.8. Conditional on relocation, there is a tendency to move to a smaller place even if one remains a homeowner. This tendency is much stronger among those who initially resided in a place with a lot of housing price risk.

The comparable data on number of rooms for the sample ages fifty-plus in Britain are contained in table 12.9 based on data from the BHPS. Downsizing at older ages characterizes households in both countries, although it is a less pervasive phenomenon in Britain than in the United States. The term "less pervasive" applies not only to a smaller probability of changing residences at all older ages in Britain, but also to a smaller change in the size of dwelling, given that a move takes place. If we compare tables 12.6 and

Table 12.8 **Change in number of rooms among movers—HRS Ahead cohort by number of years**

	Delta no. of rooms		
	2 years	4 years	8 years
Overall			
Owners	–0.509	–0.578	–0.646
Owners-renters	–2.039	–1.829	–1.619
Owners-new owners	–0.231	–0.389	–0.507
Renters	0.126	–0.073	–0.002
Renters-owners	0.748	0.636	0.951
Renters-new renters	–0.297	–0.046	–0.300
Risky areas			
Owners	–0.789	–0.800	–0.807
Owners-renters	–2.695	–2.001	–2.362
Owners-new owners	–0.242	–0.489	–0.387
Renters	0.178	0.174	0.166
Renters-owners	1.054	1.352	1.041
Renters-new renters	–0.261	–0.405	–0.540
Nonrisky areas			
Owners	–0.424	–0.508	–0.592
Owners-renters	–1.848	–1.731	–1.434
Owners-new owners	–0.228	–0.355	–0.554
Renters	0.105	–0.171	–0.091
Renters-owners	0.586	0.361	0.872
Renters-new renters	–0.311	–0.485	–0.167

Source: HRS—AHEAD Cohort—rooms unlimited. All data are weighted and are individual level data.

12.9, the changes in number of rooms are almost half as large in Britain compared to the United States. The principal difference lies in the switch from owner to renter status, where the reduction in number of rooms in Britain is 1.4 compared to 2.2 in the United States. As was the case in America, the magnitude of the downsizing that takes place is somewhat larger in the housing price risky areas of Britain compared to places with more stable housing prices.

12.3.4 Escaping Housing Price Volatility

Even when older householders remain homeowners and stay in a home of approximately the same size, they can avoid some of the costs of housing price risk by moving to places where housing prices are less volatile. The data contained in table 12.10 (panel A for the United States and panel B for Britain) indicate that this is precisely what takes place. For those who moved, this table measures the difference in our measure of housing price risk (the standard deviation in housing prices) between the area where they originally lived and the area to which they moved. Thus, a positive nega-

Table 12.9 Change in number of rooms among movers—UK (BHPS) by number of years

	Delta no. of rooms		
	2 years	5 years	10 years
Overall			
Owners	–0.629	–0.586	–0.449
Owners-renters	–0.558	–1.176	–1.442
Owners-owners	–0.876	–0.472	–0.314
Renters	–0.396	–0.486	–0.442
Renters-owners	–0.036	–0.103	–0.019
Renters-renters	–0.615	–0.704	–0.699
Risky areas			
Owners	–0.683	–0.613	–0.466
Owners-renters	–0.861	–1.286	–1.593
Owners-owners	–0.636	–0.493	–0.322
Renters	–0.433	–0.502	–0.456
Renters-owners	0.048	0.079	0.105
Renters-renters	–0.695	–0.792	–0.795
Nonrisky areas			
Owners	–0.484	–0.521	–0.293
Owners-renters	–0.906	–0.964	–1.140
Owners-owners	–0.335	–0.416	–0.409
Renters	–0.333	–0.461	–0.421
Renters-owners	–0.158	–0.345	–0.195
Renters-renters	–0.460	–0.541	–0.560

Source: BHPS—rooms unlimited. All data are weighted and are individual level data.

tive number indicates that the area that they left was characterized by more housing price volatility than the area to which they moved—that is, the household was reducing their exposure to housing price risk. In addition to age stratification, the data in table 12.9 (based on the PSID) and table 12.10 (based on the BHPS) are stratified by whether one was originally an owner or a renter and within each housing tenure type by the housing tenure type to which one moved. Additional data for the American sample based on the two HRS cohorts are provided in the appendix, table 12A.1. In these tables, the American units of volatility were defined as ten times the British units.

There are a number of salient patterns, foremost of which is that after age fifty, when they do move, people move on average to a place with less housing price volatility. The tendency of Americans to move to less price volatile areas peaks during the dominant retirement years (ages sixty to sixty-nine) and actually reverses after age eighty. This may not be surprising since housing decisions at very old age may have more to do with attempts to provide care for the elderly when they become frailer. This would include moving to assisted living communities and to live with relatives.

Second, as predicted by the theory, the tendency to move to areas with

Table 12.10 **Differences in housing price volatility by state among movers by age group**

	50–59	60–69	70–79	80+	Total
		A United States			
Two-year transitions					
All owners who move	0.055	0.065	–0.007	–0.008	0.044
Owner to renter	0.074	0.062	0.003	0.005	0.017
Owner to owner	0.064	0.070	–0.017	0.003	0.053
All renters who move	0.020	0.062	0.032	–0.002	0.033
Renter to renter	0.009	0.055	0.017	0.002	0.023
Renter to owner	0.054	0.097	0.015	0	0.074
All movers	0.042	0.062	0.008	–0.005	0.038
Five-year transitions					
All owners who move	0.090	0.072	0.014	–0.010	0.066
Owner to renter	0.047	–0.025	0.006	–0.014	0.011
Owner to owner	0.096	0.095	0.009	–0.075	0.081
All renters who move	0.033	0.104	0.048	–0.000	0.055
Renter to renter	0.011	0.072	0.025	–0.014	0.032
Renter to owner	0.073	0.199	0.163	–0.008	0.116
All movers	0.070	0.078	0.027	–0.004	0.060
Ten-year transitions					
All owners who move	0.152	0.067	0.011	–0.023	0.102
Owner to renter	0.118	–0.029	0.029	–0.041	0.030
Owner to owner	0.160	0.094	0.013	0.193	0.127
All renters who move	0.058	0.103	0.108	–0.097	0.074
Renter to renter	0.027	0.048	0.111	–0.103	0.043
Renter to owner	0.102	0.252	0.084	–0.187	0.138
All movers	0.121	0.075	0.038	–0.016	0.091
PSID Ages 50+ 1968–1999					
		B United Kingdom (BHPS)			
Two-year transitions					
All owners who move	0.015	0.020	0.014	0.018	0.016
Owner to renter	0.020	0.018	0.015	0.023	0.019
Owner to owner	0.014	0.021	0.013	0.011	0.016
All renters who move	0.014	0.020	0.025	0.020	0.019
Renter to renter	0.014	0.022	0.028	0.022	0.021
Renter to owner	0.015	0.016	0.019	0.017	0.016
All movers	0.015	0.020	0.019	0.019	0.017
Five-year transitions					
All owners who move	0.036	0.038	0.035	0.041	0.037
Owner to renter	0.056	0.039	0.028	0.056	0.045
Owner to owner	0.034	0.038	0.037	0.026	0.035
All renters who move	0.028	0.037	0.045	0.028	0.035
Renter to renter	0.030	0.042	0.044	0.039	0.038
Renter to owner	0.027	0.026	0.046	0.006	0.029
All movers	0.033	0.038	0.040	0.035	0.036
Ten-year transitions					
All owners who move	0.076	0.079	0.076	0.086	0.078
Owner to renter	0.087	0.087	0.068	0.096	0.085
Owner to owner	0.075	0.079	0.078	0.080	0.077
All renters who move	0.077	0.069	0.069	0.069	0.072
Renter to renter	0.078	0.073	0.070	0.071	0.073
Renter to owner	0.075	0.063	0.066	0.066	0.069
All movers	0.076	0.077	0.073	0.078	0.076

less price volatility is far more prevalent among homeowners than among renters. The difference for Americans in the pre- and post-standard deviation of housing prices is six times larger among homeowners compared to renters. Among homeowners, there is almost no change in volatility if the one changes status from being an owner to a renter, but a very large one if one remains a homeowner.

These data on the change in housing price volatility associated with a move are also arrayed by the length of the time transition between the surveys. The longer the time duration between the surveys the greater the difference in location-specific price volatility associated with the move. This effect is particularly large among those who were originally in their fifties. In this age group, the longer the time duration examined the more likely the move is associated with the retirement decision, where other factors are less likely to play a major role.

With this consideration in mind, table 12A.1 presents a similar array of data for two important cohorts in the HRS data. The first is the original HRS cohort, those who were fifty-one to sixty-one years old in 1992. This cohort was largely in the immediate pre-retirement phrase of the life cycle when the survey began. The second is the AHEAD cohort, a random sample of individuals who were at least seventy years old in 1970. Most of these individuals were in the post-retirement phase of life. Individuals in both cohorts tend to move to less price volatile locations when they do move, especially if they were originally homeowners and especially if they remain homeowners after the move. However, the escaping of price volatility is much larger in the pre-retirement cohort, especially as the duration of time between the survey snapshots increases. One reason that this effect is smaller in the post-retirement AHEAD cohort is that many of them have already moved after retirement to a less price volatile place.

Table 12.10, panel B, lists parallel numbers for Britain. Just as in the United States, British citizens also tend to move to less volatile housing areas if they do decide to move, but on average the escape from volatility is less dramatic there than in the United States. In spite of this similarity, there are some important differences between the two countries as well. For example, the escape from volatility in Britain appears not to vary substantially by age and also appears to be as large among renters as among owners.

12.4 Model Estimates

We will estimate a number of empirical models that relate to the downsizing decisions at older ages. These models include the following for those who did change residences across the waves of the data (i.e., movers): the change in the number of rooms, the change in the price volatility of the location in which one lives, and the change in the value of the house (for those who remained homeowners). Since these models condition on the decision to

move, we also use the full sample to estimate a probit model of the decision to change residence (where our dependent variable takes a value of one if the individual moves) and the change in the number of rooms. Having these two models side by side allows us to distinguish between the effects of variables on the probability of moving and then conditional on that probability, the probability that one downsizes housing. These models are also combined into a single model of downsizing at older ages.

We include in all models the following sets of demographic variables—a set of five-year age dummies beginning at ages fifty to fifty-four, with those ages eighty and over the reference group, the change in the number of people living in the house, three marital status transitions (married-single, single-married, single-single with married-married as the omitted group), and children living at home transitions (kids-no kids, no kids-kids, no kids-no kids with kids-kids as the omitted group). The marital and child transition variables tell us, conditional on the changes in the number of residents, whether the type of resident matters. For example, one might suspect that children would matter more than spouses in these transitions since they might have a bigger impact on the number of rooms. Because not all transitions from married to single are the same, we also include a dummy variable for whether or not one became widowed across the waves.

The probability of moving and hence, the possibility of downsizing, may be related to work transitions including retirement that take place at these ages. Therefore, a set of work transitions are included in these models (work-no work, no work-work, no work-no work with work-work as the omitted category). Unlike the demographic variables above which are common to the family unit, the work variables are individual level variables.

The economic variables include the ln of real annual income and education, measured by years of schooling. In the United States education is separated into three groups—thirteen to sixteen years of schooling, sixteen or more years of schooling, and with twelve or fewer years the reference group. In Britain we construct broadly comparable groups based on educational qualifications—the lowest education (reference) group are those with compulsory schooling only, the middle group has some post-compulsory schooling or vocational qualifications but less than a college degree, and the final group has college degrees or higher.

We also include a measure of baseline house value (for homeowners only) and home equity and baseline housing price volatility. A linear time trend is part of all models. The data used for estimation are based on a sample of individuals ages fifty and more using the PSID for the United States (for all years 1968 to 1999) and the BHPS for Britain (years 1993 to 2004).[6]

6. Although the BHPS sample began in 1991, data on house value was only collected for those who were interviewed at a new address in 1992. Since our models are based on differences, we effectively have data starting in 1993.

12.4.1 The Probability of Moving

Table 12.11 (panel A for the United States and panel B for the United Kingdom) list estimated derivatives and the associated *z* statistics obtained from probit models of the probability of changing residence (leaving aside the issue of changing areas or locations for the time being). For each country, models are estimated across three time horizons—one, five, and ten years.

If we examine first the set of transition variables included in the model (marriage, kids, and work), the reference group (married-married, kids-kids, and work-work) is generally the one least associated with residential mobility. Next in line tends to be the other category, which also does not involve a transition between states over the time period under consideration (single-single, no kids-no kids, and no work-no work). The higher effect compared to the reference group may reflect lagged effects of transitions into the single, no kids, or no work states. If a marriage transition did take place, the demographic one most likely to lead to higher residential mobility is from single to married. Compared to the transition from married to single of which it is a part, becoming widowed is less likely to result in mobility, presumably since it is not necessary that someone move in this case. The impact of kids leaving home on mobility appears to be larger in the United States than it is in Britain. The estimated magnitude of these demographic transitions effects do not change significantly with the time horizon over which the effects are estimated. The two work transitions are about equally likely to induce additional mobility in both countries. The results are generally remarkably similar in the two countries with the principal transitional difference taking place in the dimension of the kids at home variables.

We next describe the estimated impacts of the economic variables included in the models. Several dimensions of economic resources are measured, including ln household income, education, whether or not one is initially a homeowner, house value, and home equity among homeowners. Statistically significant positive education and income effects are estimated for both countries, effects that increase in size with the duration of the horizon. Given the stage of the life cycle that we are examining, income is not a proxy for job market opportunities in alternative labor markets. These are more likely income effects that capture the ability to finance moves and the ability to purchase amenities associated with localities that are no longer tied to jobs.

Consistent with the previous descriptive tables, homeowners in both countries are less mobile than renters even after controlling for this set of economic and demographic variables. However, conditional on being a homeowner in both countries, mobility rises with the value of the house but declines with home equity when both variables are in the model. One interpretation of the home value effect (in addition to the normal income effect mentioned previously) is that as the value of the home goes up, people

Table 12.11 Probit models of the probability of moving between waves

	Horizon					
	One year		Five years		Ten years	
	df/dx	*t*	df/dx	*t*	df/dx	*t*
	A United States					
Education 13–15 baseline	.027	6.81	.035	5.31	.042	4.37
Education ≥ 16 baseline	.021	5.16	.044	6.41	.043	4.45
Year at baseline	–.001	7.69	–.004	12.98	–.007	13.00
Age 50–54	.036	6.16	.010	0.91	–.090	3.65
Age 55–59	.020	3.54	–.019	1.69	–.118	4.86
Age 60–64	.004	0.81	–.036	3.30	–.129	5.38
Age 65–69	–.006	1.03	–.062	5.79	–.157	6.68
Age 70–74	–.013	2.37	–.055	4.95	–.158	6.59
Age 75–79	–.013	2.10	–.073	6.10	–.150	5.85
ln income at baseline	.007	5.04	.011	3.81	.018	4.08
Volatility at baseline	–.001	5.38	–.001	3.43	–.000	0.98
Married/single	.149	13.54	.164	16.55	.144	12.21
Single/married	.345	16.63	.343	17.88	.331	13.59
Single/single	.025	7.44	.060	9.21	.065	6.63
Became widowed	–.007	2.13	–.016	2.45	.001	0.06
Kids/no kids	.085	11.02	.085	11.69	.106	11.72
No kids/kids	.110	9.82	.144	10.49	.125	6.91
No kids/no kids	.038	14.97	.087	17.39	.113	13.95
Change in household size	–.002	0.84	–.004	1.55	.004	1.54
Work/not work	.063	10.65	.075	12.03	.057	7.72
Not work/work	.057	7.21	.072	5.55	.102	4.79
Not work/not work	.028	9.67	.047	9.11	.067	8.47
Owner	–.396	20.81	–.506	21.82	–.548	20.12
ln house value (baseline)	.033	11.11	.042	8.56	.047	6.88
ln home equity (baseline)	–.051	20.89	–.061	14.71	–.055	9.47
(Have negative home equity)	–.149	16.33	–.208	12.82	–.197	8.44
	B United Kingdom					
Education—compulsory level only	.012	3.46	.048	5.48	.085	4.41
Education—A levels	.001	0.43	.027	3.46	.046	2.60
Year at baseline	.001	2.01	.001	0.87	.004	0.69
Age 50–54	.013	2.97	.064	5.18	.075	2.68
Age 55–59	.012	2.81	.058	4.94	.092	3.51
Age 60–64	.003	0.69	.034	3.03	.042	1.73
Age 65–69	–.005	1.38	.026	2.38	.019	0.80
Age 70–74	–.007	1.99	.002	0.22	.025	1.13
Age 75–79	–.003	0.89	–.002	0.20	.022	0.97
ln income at baseline	.000	0.09	.010	2.16	.020	1.92
Volatility at baseline	.035	1.17	.084	1.03	.242	1.53
Married/single	.175	7.69	.294	11.01	.241	5.56
Single/married	.262	10.66	.342	12.12	.232	5.43
Single/single	.005	2.08	.020	3.27	–.001	0.04
Became widowed	–.029	4.65	–.099	5.84	–.144	3.81
Kids/no kids	.015	1.55	–.020	1.52	–.072	2.54
No kids/kids	.023	1.16	.012	0.29	.060	0.81
No kids/no kids	.005	1.19	–.010	0.86	–.063	2.03
Change in household size	.003	1.42	.005	1.31	.012	1.71
Work/not work	.039	6.83	.052	5.79	.077	4.35
Not work/work	.025	3.47	.054	3.46	.061	1.87
Not work/not work	.008	3.16	.020	2.64	.030	1.66
Owner	–.036	3.32	–.081	3.15	–.077	1.47
ln house value (baseline)	.015	3.73	.050	5.54	.039	2.14
ln home equity (baseline)	–.013	3.96	–.051	7.27	–.051	3.24
(Have negative home equity)	–.027	2.58	–.076	2.48	–.095	1.37

are consuming a lot of housing relative to their income, inducing them to want to downsize their house. Conditional on the value of the house, an increase in home equity is equivalent to a reduction in the stock and flow of mortgage payments, which makes it less likely that people move to reduce those payments.

We estimate positive but statistically weak impacts of price volatility on mobility in Britain. One reason for not being able to estimate volatility effects in Britain may be that there are much fewer years over which to estimate the volatility effect in Britain, a point which will become a theme in what follows. Particularly for the longer differences, the time series variation is extremely limited in the British sample—with twelve years of data we have $t = 2$ for a ten-year difference—and since our identification of the volatility effects depends on time-series as well as regional variation, there is only a very limited extent to which we could detect volatility effects.

We estimate a negative effect of price volatility in the United States; that is, higher price volatility is associated with a lower probability of moving. As explained before, there is no unambiguous prediction of the effect of price volatility on the geographic mobility. On the one hand, higher price volatility should encourage owners to move in order to either downsize or escape the volatility. On the other hand, higher price volatility makes renters more constrained in their moves since they should not be eager to change their tenure status by buying a house. To test this idea, we ran separate models in the United States for the ten-year horizon for owners and renters. The estimated effect (derivative) of volatility on mobility was 0.001 ($z = 3.26$) for owners and –0.003 ($z = 5.92$) for renters. These results also suggest that it may be more appropriate to estimate the models on alternative forms of transitions (owners-owners, owners-renters, renters-owners, or renters-renters), for the predictions differ.

Conditional on the attributes included in the model (which include incomes that will be growing with time), negative mobility time trends are estimated in the United States and no time trends in Britain. Finally, especially as the horizon expands to the ten-year interval, we find that in the United States those ages eighty and over are the most mobile. This no doubt reflects the increasing necessity of moving into assisted living arrangements or moving in with relatives as individuals' health deteriorates at very old age. However, among the other age groups, those in their fifties are the most mobile, with mobility falling until people are in their early seventies. In contrast, mobility in Britain is lowest among those eighty or more years old and peaks among those in their late fifties.

12.4.2 The Change in the Number of Rooms—Movers

The decision to move at older ages does not necessarily imply that downsizing of housing is occurring. For that to be true, those who do move would have to reduce their housing consumption in some form. The most direct

quantitative measure of housing consumption available in both countries is the number of rooms per dwelling. Table 12.12 (panel A for the United States and panel B for Britain) list estimated coefficients and the associated t = statistics obtained from ordinary least squares (OLS) models of the change in the number of rooms per dwelling estimated across a sample of movers. Once again, models are estimated across three time horizons—one, five, and ten years.

Demographic attributes of the household are not surprisingly strong predictors of the magnitude of housing demand. Reductions in the size of household (the dominant direction of change during this phase of the life cycle) are strongly associated with reductions in the number of rooms. The impact of people moving out also depends on the types of people who are leaving. In the United States, having no remaining children at home or having a spouse leave the home reduces the size of the house while entry does the opposite. In the United States, the difference between spouses and no children are not all that large, suggesting that this is not simply a bedroom effect. Lag effects of prior exit are no doubt operating as well since the no spouse-no spouse and no kid-no kid are both associated with reductions in the size of the dwelling. Conditional on changes in the number of household members, these demographic composition effects associated with children are much smaller and less consistent in Britain compared to the United States. Marriage effects are more similar in the two countries.

However, while work transitions were strongly correlated with mobility in both countries, they have little impact on the size of the dwelling unless they are also accompanied by demographic changes in the household structure. The extent of downsizing, at least as measured in this dimension, appears to increase with age in both countries. This age pattern becomes particularly steep after age seventy, when the evidence appears to support reductions in housing consumption with age.

Moreover, the age patterns of downsizing in housing consumption that occur are by and large independent of the other demographic and work transitions (marital status, work status, and kids at home status) in the sense that these estimated age patterns are about the same when all the demographic and work transitions are excluded from the model. Thus, these age patterns lend support to the most basic prediction of the life cycle model that at sufficiently old ages total consumption, of which housing is a very important part, will tend to decline. We return to this point again in section 12.5.

Not only is higher household income associated with higher mobility at older ages, it also is associated, particularly in Britain, with a reduced likelihood of reducing the size of the dwelling once one does move. Given the general desire to downsize at older ages, families in their present houses have more housing than they really need at this stage of their lives. Not downsizing puts the load on other forms of nonhousing consumption to fall. Essentially the amenities of a "too large" house (family memories,

Table 12.12 **Models of changes in number of rooms between waves**

	Horizon					
	One year		Five years		Ten years	
	Coefficient	*t*	Coefficient	*t*	Coefficient	*t*
	A United States—Movers					
Education 13–15 baseline	.048	0.95	.065	1.39	.069	1.38
Education ≥ 16 baseline	.055	0.97	.097	1.98	.115	2.21
Year at baseline	–.001	0.41	–.008	3.65	–.008	2.80
Age 50–54	.521	6.95	1.023	13.40	1.413	12.82
Age 55–59	.455	6.15	1.039	13.84	1.399	12.80
Age 60–64	.526	7.59	1.018	13.66	1.247	11.44
Age 65–69	.486	6.47	.842	11.08	1.059	9.58
Age 70–74	.373	4.69	.672	8.47	.675	5.85
Age 75–79	.347	3.98	.328	3.68	.291	2.30
ln income at baseline	.079	4.34	.124	6.47	.121	5.56
Volatility at baseline	–.006	2.89	–.011	6.23	–.016	8.40
Married/single	–.649	7.06	–.478	8.72	–.565	10.60
Single/married	.248	2.22	.483	5.90	.479	5.51
Single/single	–.210	4.84	–.319	7.76	–.445	9.68
Became widowed	–.050	1.10	–.032	0.81	.019	0.47
Kids/no kids	–.592	7.14	–.588	11.48	–.718	14.28
No kids/kids	.352	3.22	.348	4.18	.600	6.61
No kids/no kids	–.119	3.13	–.324	8.61	–.529	11.84
Change in household size	.310	12.74	.304	21.03	.267	19.83
Work/not work	.068	1.02	–.031	0.76	.025	0.62
Not work/work	–.026	0.28	.070	0.83	.014	0.13
Not work/not work	.067	1.76	.094	2.59	.048	1.16
Owner	–.026	0.19	.131	1.00	.565	3.93
ln house value (baseline)	–.150	4.59	–.204	6.50	–.298	8.68
ln home equity (baseline)	–.068	2.48	–.070	2.57	–.008	0.27
(Have negative home equity)	–.294	2.62	–.202	1.82	.032	0.26
Constant	–.538	2.38	–1.178	5.06	–1.483	5.49
	B United Kingdom—Movers					
Education—compulsory level only	–.292	1.72	–.130	1.32	–.171	1.30
Education—A levels	–.046	0.27	.180	1.90	.098	0.76
Year at baseline	.039	1.89	.019	0.91	–.063	1.19
Age 50–54	.460	1.84	.559	3.58	1.332	6.50
Age 55–59	.388	1.63	.649	4.32	.879	4.55
Age 60–64	–.117	0.48	.322	2.16	.912	4.83
Age 65–69	–.170	0.69	.439	2.96	.708	3.71
Age 70–74	–.043	0.17	.154	1.02	.573	3.19
Age 75–79	–.036	0.14	.032	0.21	.654	3.56
ln income at baseline	.434	4.83	.230	4.05	.296	3.76
Volatility at baseline	.954	0.53	.406	0.37	–1.882	1.52
Married/single	–.250	0.63	–.281	1.51	–.495	2.04
Single/married	.381	1.25	.640	3.82	.856	4.01
Single/single	.062	0.50	–.055	0.69	.048	0.43
Became widowed	.460	0.71	.860	3.17	1.415	4.29
Kids/no kids	–.164	0.37	–.164	0.98	.112	0.53

Table 12.12 (continued)

	Horizon					
	One year		Five years		Ten years	
	Coefficient	*t*	Coefficient	*t*	Coefficient	*t*
No kids/kids	–.326	0.47	–.361	0.85	–.057	0.14
No kids/no kids	–.212	0.84	–.530	3.76	–.420	2.08
Change in household size	.643	8.12	.380	9.32	.498	9.94
Work/not work	–.252	1.19	–.231	2.24	.002	0.02
Not work/work	.560	1.93	–.029	0.17	.266	1.23
Not work/not work	–.079	0.51	–.002	0.02	.113	0.83
Owner	1.53	2.82	1.35	4.37	.875	2.41
ln house value (baseline)	–.497	2.09	–.256	2.21	.071	0.59
ln home equity (baseline)	.071	0.38	–.074	0.86	–.267	2.55
(Have negative home equity)	.979	0.85	–.608	1.39	.081	0.16
Constant	–4.644	4.89	–2.664	4.20	–2.652	2.44

associations with old neighbors, etc.) can be thought of as a luxury good, which the more well-to-do are more able to afford.

In the United States, there is limited evidence of a net impact of education on the size of the house with some tendency for less educated British households to downsize more, even conditional on their lower incomes. Increases in the value of the initial owned home tends to lead to a larger decrease in the size of the dwelling, suggesting that when a lot of resources are tied up in the house, there is a greater tendency to downsize at older ages. The same is true when one has a lot of equity in the home, although this effect is only found in Britain at the ten-year horizon.

In the United States, consistent with the theory outlined before, living in a more price volatile area does encourage additional downsizing among those who do move. There appears to be little effect in Britain, although one obtains the expected negative point estimate of the effect at the ten-year horizon, albeit only with a *t*-value of 1.5.

12.4.3 The Change in the Number of Rooms—Full Sample

In the previous two sections, we estimated separate models for the probability of changing residences at older ages and the change in the number of moves conditioned on being a mover. The advantage of the two-part model is that we can more easily detect whether variables have differential effects on mobility and the consequences of that mobility for housing consumption. We have already seen that in a number of cases the estimated effects are even of different sign. In this section, we ignore that separation by estimating the effect of covariates on the changing number of rooms over the full sample of respondents. Since most people in fact do not move at all at older ages, these estimated effects will of course be necessarily smaller. In table 12.13,

Table 12.13 **Models of changes in number of rooms between waves**

	Horizon					
	One year		Five years		Ten years	
	Coefficient	*t*	Coefficient	*t*	Coefficient	*t*
	A United States—All					
Education 13–15 baseline	.012	1.04	.024	1.38	.006	0.25
Education ≥ 16 baseline	.017	1.41	.045	2.54	.096	3.74
Year at baseline	–.000	0.23	–.001	1.55	.002	1.21
Age 50–54	.085	4.93	.433	13.96	.914	14.05
Age 55–59	.076	4.49	.414	13.60	.890	13.76
Age 60–64	.075	4.50	.404	13.40	.843	13.08
Age 65–69	.073	4.39	.376	12.38	.761	11.73
Age 70–74	.063	3.64	.305	9.66	.619	9.25
Age 75–79	.050	2.67	.227	6.60	.430	5.98
ln income at baseline	.010	2.34	.040	5.30	.048	4.17
Volatility at baseline	–.001	1.35	–.003	4.34	–.006	6.01
Married/single	–.212	7.34	–.273	11.02	–.377	12.25
Single/married	.292	6.06	.286	6.35	.346	5.87
Single/single	–.055	4.87	–.165	9.36	–.252	9.70
Became widowed	.016	1.33	.058	3.25	.073	2.94
Kids/no kids	–.131	6.32	–.220	11.76	–.388	16.18
No kids/kids	.055	1.83	.083	2.43	.268	5.54
No kids/no kids	–.029	3.65	–.136	10.13	–.277	12.70
Change in household size	.128	17.78	.175	28.15	.176	24.21
Work/not work	–.015	0.90	–.053	3.33	–.053	2.68
Not work/work	–.010	0.43	–.002	0.05	–.032	0.56
Not work/not work	.004	0.44	.002	0.15	–.037	1.79
Owner	.062	2.04	.169	3.37	.408	5.60
ln house value (baseline)	–.033	4.49	–.089	7.42	–.150	8.59
ln home equity (baseline)	.005	0.67	.004	0.35	.011	0.74
(Have negative home equity)	.011	0.40	–.021	0.49	.036	0.58
Constant	–.097	1.85	–.463	5.09	–.876	6.07
	B United Kingdom—All					
Education—compulsory level only	–.016	1.08	–.059	2.51	–.103	2.10
Education—A levels	–.011	0.80	.035	1.62	.101	2.25
Year at baseline	.003	1.72	.008	1.74	–.022	1.27
Age 50–54	–.007	0.38	.078	2.39	.373	5.22
Age 55–59	.004	0.24	.070	2.29	.193	2.93
Age 60–64	–.014	0.80	.027	0.93	.225	3.64
Age 65–69	.001	0.05	.032	1.11	.174	2.88
Age 70–74	–.007	0.41	–.016	0.58	.081	1.44
Age 75–79	–.005	0.29	–.009	0.30	.074	1.31
ln income at baseline	.025	3.21	.063	4.74	.120	4.36
Volatility at baseline	.227	1.75	.294	1.28	–.480	1.16
Married/single	–.095	1.31	–.405	6.16	–.555	5.12
Single/married	–.027	0.38	.333	5.02	.446	4.28
Single/single	.001	0.11	–.006	0.32	.025	0.67
Became widowed	.203	2.44	.548	6.95	.897	6.99
Kids/no kids	.046	1.11	–.013	0.33	.024	0.30

Table 12.13 (continued)

	Horizon					
	One year		Five years		Ten years	
	Coefficient	*t*	Coefficient	*t*	Coefficient	*t*
No kids/kids	–.140	1.60	–.055	0.44	.229	1.16
No kids/no kids	–.017	0.84	–.072	2.07	–.215	2.64
Change in household size	.111	9.64	.152	13.35	.227	11.91
Work/not work	–.045	2.14	–.079	3.31	–.106	2.33
Not work/work	.016	0.57	.009	0.22	.051	0.60
Not work/not work	–.012	1.02	–.009	0.43	–.005	0.10
Owner	.108	2.86	.272	4.20	.483	3.60
ln house value (baseline)	–.019	1.00	–.034	1.27	–.016	0.32
ln home equity (baseline)	–.003	0.17	–.016	0.75	–.066	1.51
(Have negative home equity)	.015	0.15	–.244	2.01	–.204	0.92
Constant	–.256	3.16	–.696	4.87	–.844	2.27

panels A and B present the results of these empirical models for the United States and Britain, respectively.

Not surprisingly, the estimated impacts of demographic variables resemble those estimated over the mover sample, but at much diminished magnitude. The size of these demographics associated with family-related transitions tends to increase with the time duration of the window in which a move can take place. In both countries, the transition from married to single is associated with a smaller dwelling, while the reverse is true when people change from the single life to a married one. Two differences between the two countries in the impact of the demographic transitions are first that widowhood has no impact on the size of the house in Britain, while it tends to reduce the number of rooms in the United States. Second, the transitions associated with children appear to have no effect in Britain, but kids leaving home do promote some downsizing in the United States. The only consistent impact of work transitions on the size of the dwelling in either country is that the transition from work to no work (presumably during these ages mostly retirement) leads to a smaller house.

Higher incomes strongly discourage downsizing in both countries with somewhat larger estimated impacts in Britain. This implies that the increase in probability of moving is offset by the fact the move is less likely to reduce the size of the dwelling. Across the full sample, higher home values encourage downsizing in the United States, but there is no effect in Britain. Home equity appears to have little impact in either country. Once again the estimated patterns with age indicate that housing consumption does decline with age, a decline that cannot be explained by the other demographic and work transitions included in these models. These adjusted age patterns of

downsizing appear to be larger in the United States than they are in Britain. On net, higher housing price volatility encourages downsizing in the United States with statistically significant effects in Britain.

12.4.4 Changes in House Price

In addition to the number of rooms, the other dimension of housing consumption that we can measure in both countries is the change in the value of the house among those who move. By necessity, the sample over which these models are estimated are homeowners who moved but who remained homeowners. These models are presented in table 12.14 (panel A for the United States and panel B for Britain). In order to control for any state- or region-wide capital gains in housing, these models include two additional variables that are not in the change in rooms equation. The first is the percent change in the real price of housing in the state of origin over the horizon used in the regression (measured as the delta in the geometric means) and the second is whether or not one changed state of residence when a move took place. Not surprisingly, individual level changes in house values when people move are positively correlated with area-wide real housing price changes.

A useful comparison is to compare the results for the two dimensions of downsizing—change in number of rooms among movers (table 12.12) and change in home price (table 12.14). Taking into account that sample sizes are much smaller in the model for the change in ln home value specification, the results for the United States are generally similar but statistically weaker than for the change in number of rooms. In particular, becoming single or having the final child leave home, and more generally reductions in the number of people living in the household, are all associated with a move to a less expensive home. There is little association of the value of the home with any of the work transitions. Most important, volatility at baseline has the expected negative coefficient in both the change in rooms and change in ln home value models, but it is less statistically significant in the home value specification. Perhaps the biggest difference is that income effects are much weaker in the change in home value model in the United States. If anything, the results in Britain are weaker still where we encounter a lack of precision on our estimates of the volatility terms and weaker income effects than in the model for the change in rooms.

12.4.5 Reducing Price Volatility

We have argued that, from an exposure to house price risk point of view, one alternative to downsizing is to protect your assets in housing by moving to a less price volatile housing area. Table 12.15 models the change in housing price volatility among movers for the United States and Britain. The outcome variable is measured as current housing price volatility minus volatility in the new location, so that positive values imply a movement to a less housing price volatile area. The same set of variables that entered the

Table 12.14 Models of change in Ln value of house between waves

	Horizon					
	One year		Five years		Ten years	
	Coefficient	*t*	Coefficient	*t*	Coefficient	*t*
A United States—Homeowners who are movers						
Education 13–15 baseline	–.018	0.51	.004	0.12	.063	1.77
Education ≥ 16 baseline	–.008	0.21	–.046	1.48	.039	1.16
Trend	–.001	0.46	–.001	0.91	–.013	5.69
Age 50–54	.070	1.03	.097	1.27	.124	0.98
Age 55–59	.011	0.17	–.027	0.36	.056	0.44
Age 60–64	.050	0.76	.039	0.52	.103	0.82
Age 65–69	.026	0.38	.033	0.43	.143	1.13
Age 70–74	.017	0.24	–.003	0.03	.013	0.10
Age 75–79	.045	0.57	–.109	1.24	–.075	0.53
ln income at baseline	.029	1.98	–.014	0.92	–.016	0.92
Volatility at baseline	–.004	2.42	–.004	2.89	–.002	1.51
Married/single	–.143	1.62	–.217	4.48	–.229	4.74
Single/married	.031	0.37	.056	0.87	.136	1.90
Single/single	–.060	1.41	–.125	3.08	–.011	0.24
New widow	.100	2.02	.048	1.20	–.031	0.75
Kids/no kids	–.096	1.51	–.159	3.92	–.182	4.37
No kids/kids	–.118	1.30	.316	4.52	.393	4.92
No kids/no kids	–.041	1.39	–.106	3.43	–.142	3.66
Delta state house price	.608	8.78	.545	13.21	.475	11.80
Changed state	–.044	1.06	.137	5.01	–.127	4.51
Constant	–.218	1.41	.367	2.24	.368	1.73
B United Kingdom—Homeowners who are movers						
Education 13–15 baseline	.044	0.64	.054	1.60	.105	1.94
Education ≥ 16 baseline	–.006	–0.08	.101	3.22	.121	2.39
Trend	.002	0.14	.006	0.43	.019	0.50
Age 50–54	.204	1.50	.289	4.46	.250	2.39
Age 55–59	.231	1.74	.252	4.02	.198	1.96
Age 60–64	.068	0.52	.226	3.60	.183	1.86
Age 65–69	.116	0.81	.205	3.21	.133	1.34
Age 70–74	.091	0.65	.145	2.20	.109	1.07
Age 75–79	.099	0.68	.085	1.25	.062	0.61
ln income at baseline	.064	1.69	.024	1.22	.081	2.41
Volatility at baseline	–.725	0.77	.258	0.63	–.276	0.47
Married/single	–.139	0.70	.432	5.75	–.505	4.13
Single/married	–.045	0.31	.094	1.45	.219	2.06
Single/single	–.072	1.18	.038	1.20	–.059	1.05
New widow	.055	0.17	.442	3.92	.496	2.79
Kids/no kids	–.020	0.10	–.074	1.29	–.099	1.14
No kids/kids	–.451	1.58	.015	0.09	–.148	0.84
No kids/no kids	.026	0.24	–.048	0.96	–.144	1.73
Change in household size	.114	2.38	.116	6.63	.047	1.90
Work/not work	–.152	1.62	–.138	3.99	–.081	1.57
Not work/work	.063	0.47	–.039	0.67	.038	0.39
Not work/not work	.005	0.07	–.015	0.44	.013	0.21
Delta region house price	.309	0.68	.838	9.22	.903	6.61
Changed region	–.163	2.71	–.122	4.21	–.019	0.42
Constant	–.721	1.76	–.398	1.58	–1.010	1.68

Table 12.15 Models of change in volatility between waves

	Horizon					
	One year		Five years		Ten years	
	Coefficient	*t*	Coefficient	*t*	Coefficient	*t*
	A United States—Movers					
Education 13–15 baseline	–.102	1.04	–.276	2.52	–.505	3.84
Education ≥ 16 baseline	–.028	0.25	–.496	4.33	–1.01	7.43
Year at baseline	.002	0.43	–.002	0.32	–.007	0.94
Age 50–54	.263	1.83	.434	2.44	.547	1.92
Age 55–59	.303	2.14	.549	3.14	.689	2.43
Age 60–64	.275	1.93	.627	3.61	.596	2.11
Age 65–69	.354	2.45	.347	1.96	.327	1.14
Age 70–74	–.027	0.17	.253	1.37	.348	1.16
Age 75–79	.178	1.07	.310	1.49	.215	0.66
ln income at baseline	.073	2.10	.298	6.71	.509	8.98
Married/single	–.329	1.85	–.046	0.36	.002	0.01
Single/married	–.069	0.31	–.253	1.32	.020	0.09
Single/single	–.130	1.55	–.011	0.11	.116	0.96
Became widowed	.043	0.49	.097	1.07	.113	1.05
Kids/no kids	.392	2.44	.579	4.84	.332	2.53
No kids/kids	.059	0.28	.242	1.24	.344	1.45
No kids/no kids	.163	2.23	.292	3.32	.160	1.37
Change in household size	.074	1.62	.051	1.51	.037	1.06
Work/not work	.499	3.85	.801	8.23	.550	5.31
Not work/work	.233	1.34	.207	1.05	.279	0.99
Not work/not work	.252	3.41	.300	3.52	.193	1.78
Owner	–.302	1.14	–.636	2.09	–1.32	3.52
ln house value (baseline)	.080	1.28	.188	2.57	.375	4.18
ln home equity (baseline)	.074	1.40	.137	2.13	.052	0.65
(Have negative home equity)	.297	1.37	.597	2.30	.225	0.69
Constant	–1.316	3.02	–4.055	7.45	–5.568	7.91
	B United Kingdom—Movers					
Education—compulsory level only	–.000	0.09	.001	0.57	.001	0.42
Education—A levels	–.001	0.61	.001	0.38	–.000	0.28
Year at baseline	.003	15.48	.016	78.48	.038	54.77
Age 50–54	–.006	1.98	.003	1.17	–.003	0.81
Age 55–59	–.007	2.56	.001	0.50	–.007	1.88
Age 60–64	–.005	1.90	.002	1.15	–.000	0.10
Age 65–69	–.004	1.5	–.000	0.12	.003	0.84
Age 70–74	–.002	0.71	–.000	0.21	.002	0.74
Age 75–79	–.004	1.55	–.000	0.03	.006	1.68
ln income at baseline	–.001	0.55	.000	0.57	.004	2.61
Married/single	.002	0.31	–.003	0.95	–.002	0.54
Single/married	–.001	0.31	.002	0.85	.010	2.63
Single/single	–.001	0.75	.002	1.29	.005	2.26
Became widowed	.001	0.09	.010	2.43	.002	0.33
Kids/no kids	.010	1.78	.003	1.27	–.006	1.53
No kids/kids	–.010	1.14	–.001	0.22	–.018	2.47
No kids/no kids	–.004	1.12	.002	0.73	–.005	1.35

Table 12.15 (continued)

	Horizon					
	One year		Five years		Ten years	
	Coefficient	*t*	Coefficient	*t*	Coefficient	*t*
Change in household size	.002	1.99	–.000	0.63	–.002	2.14
Work/not work	–.002	0.86	–.002	0.96	–.003	1.41
Not work/work	–.008	2.07	.004	1.65	.004	1.00
Not work/not work	–.001	0.52	.000	0.10	.001	0.41
Owner	–.009	1.34	.009	1.99	.001	0.21
ln house value (baseline)	.004	1.20	–.004	2.10	–.001	0.51
ln home equity (baseline)	–.002	0.87	.001	1.06	–.001	0.45
(Have negative home equity)	–.019	1.32	.004	0.60	–.007	0.74
Constant	–.017	1.43	–.201	–22.26	–.571	34.66

room downsizing model are included in this model for escaping housing price volatility. Examining first table 12.15, panel B, we can see immediately why it is so difficult to obtain an effect for housing price volatility in Britain. Given the short time span over which models are estimated, there is a very strong time trend in volatility that dominates everything else included in the model. Conditional on this trend (where price volatility is increasing over time), there are little remaining systematic associations with price volatility in Britain.

Given the longer number of years available for analysis, coupled with more systematic and larger differences between the volatile and less volatile areas, more interesting results were obtained for the U.S. model summarized in table 12.15, panel A. A positive coefficient in these models indicates that a variable is associated with moving to an even less price volatile area. To begin with, we see that many of the demographic transition variables associated with other forms of downsizing are also important here. Most importantly, the transition of the last child leaving home is associated with a greater tendency to move to a less housing price volatile area, and those families whose children have already left home (the kids-no kids group) are also more likely to search out a less price volatile area than those whose children remain in the home. Once again, we interpret this as a lagged effect of children leaving home prior to the baseline year since the subsequent decision to relocate may not be instantaneous. Second, those households who either are retired or who become retired are also likely to reduce the housing volatility associated with the place where they decide to reside by more.

In contrast to some of the other measures, however, we do not find significant effects of changes in marital status or widowhood, even over the longest time period horizons. Finally, we find contrasting education and income effects that are somewhat hard to interpret—conditional on income,

the more educated are less likely to reduce their house price volatility, which is somewhat of a puzzle, although the effect of income would be to offset this unconditionally, since those with higher incomes tend to reduce their house price volatility by more. Since the age coefficients tend to become less positive after age groups fifty-five to fifty-nine and sixty to sixty-four, the tendency to seek out places in less volatile areas peaks in that age group.

12.5 Consumption Trajectories at Older Ages

One of the more hotly debated issues regarding life cycle patterns of consumption with age concerns is whether households reduce their consumption at older ages. The importance of the debate stems in part from the fact that it is a basic implication of the life cycle model that such consumption declines should occur, in part due to rising rates of age-specific mortality at older ages. Of course, there are other reasons for consumption to fall with age, particularly related to the shrinking of households as children leave home and widowhood becomes more common. Thus, the question to ask is whether consumption declines in addition to any changes induced by a set of demographic changes producing smaller households and the decision to retire from the labor force. Housing is an important component of total consumption and is believed to be resistant to any downward changes. Thus, we argue that evidence showing a downward path of housing consumption adds important evidence to this debate.

To provide such evidence, figure 12.2, panel A, plots the change in the number of rooms across age bands that is estimated in the models for movers in table 12.12. Figure 12.2, panel B, provides similar plots except in this case the sample consists of all households whether or not they change residence (i.e., the models estimated in table 12.13). For the purposes of these plots, we used the models estimated over the five-year horizon. The declines in housing consumption documented in this section would be even larger if we used instead estimates obtained from the ten-year horizon. For figure 12.2, we plot the estimated age trajectories obtained while controlling for other transitions between waves (i.e., the models in tables 12.12 and 12.13, respectively), and also the trajectories estimated from a more restricted model with the demographic and employment status transition variables excluded. In each country the changes are normalized around the value for the fifty to fifty-four age group in the models without any controls for demographic and work transitions.

Figure 12.2, panel A, demonstrates that there exists in both countries a clear decline in housing consumption (as measured by the change in the number of rooms) for movers, a decline that appears to accelerate after age sixty-five. Except for very old ages (ages seventy-five and older) this decrease in housing consumption appears to be roughly similar in both countries. After age seventy-five, the decrease in the number of rooms is clearly larger in the United States, presumably reflecting the decline in the number of rooms

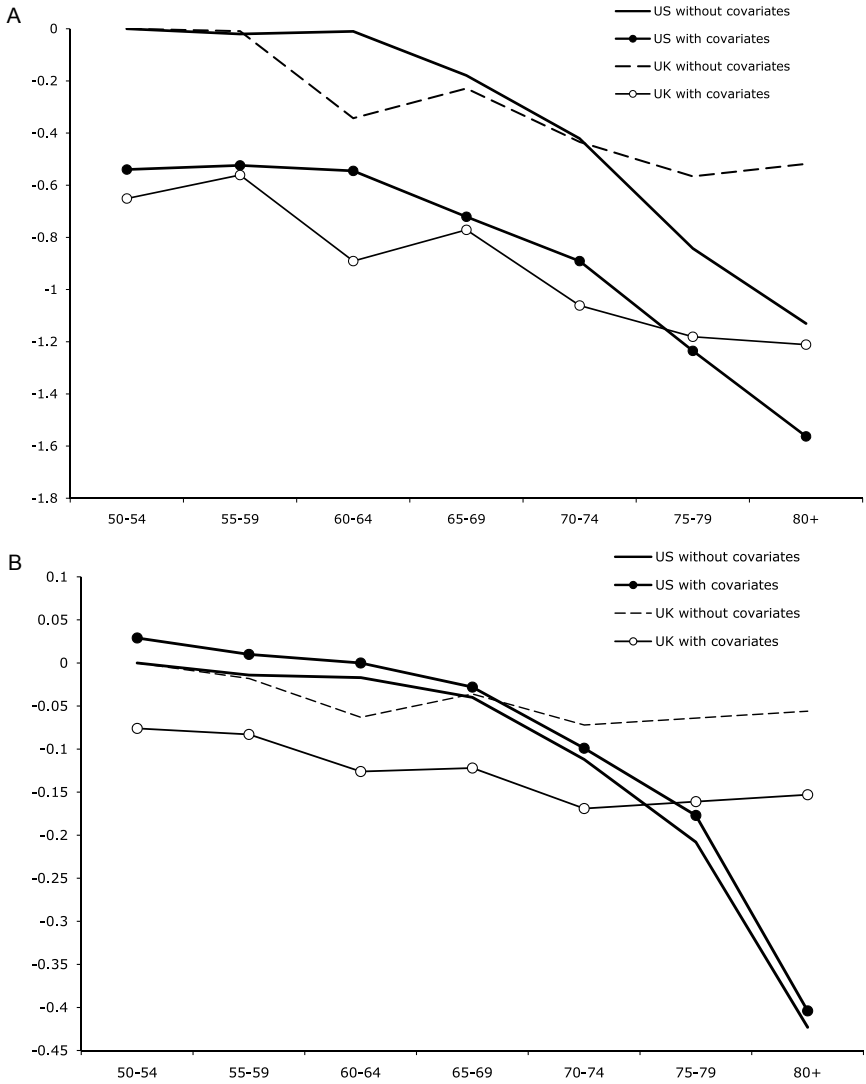

Fig. 12.2 Normalized change in number of rooms by age: *A*, Movers only; *B*, All households

associated with widowhood in the United States and the absence of any such association in Britain. These declines in housing consumption are not trivial—about one room in the United States and half a room in Britain.

If we control for the other demographic and work transitions and all other covariates included in the models in table 12.12, the age patterns are very much the same, indicating declining housing consumption with age in both

countries of about the same order of magnitude. This indicates that the age patterns of declining housing consumption that we document are not the result of either work or family transitions that are associated with aging.

The age patterns that are plotted in figure 12.2, panel B, for all households (independent of whether they move or not over the five-year horizon) dramatize a much larger difference between the two countries. In particular, the decline in housing consumption with age across this more relevant sample of all households is clearly much larger in the United States than it is in Britain. The decline in number of rooms with age is a little less than half a room in the United States and about one-twentieth of a room in Britain. The principal reason for the differences between panels A and B is that households are much less mobile in Britain than in the United States.

Our results indicate that housing consumption appears to decline with age in the United States, even after controlling for the other demographic and work transitions associated with age that would normally produce such a decline. No such fall in housing consumption is found in Britain, largely because British households are much more likely to stay in their original residence. The important question that cannot be answered with data on housing alone is whether these results indicate a more general tendency of less reduction in total household consumption in Britain compared to the United States at older ages. The alternative possibility is that the British adjust their nonhousing consumption downward more than American households do so that the patterns of total household consumption with age are similar.

There may of course be other transitions, not controlled for in our analysis, driving the downwards trajectories observed. The principal candidates for transitions that are correlated with age and not accounted for in our models would be health related. Health conditions are not measured well in either the PSID or the BHPS and we will consider them instead in future work that uses the HRS and ELSA panels. Declines in health in old age are of course closely related to the principal factor (rising mortality risk) emphasized in life cycle models that produce the decline in consumption so that it may be difficult to disentangle these effects in practice.

12.6 Conclusions

In this chapter, we examined and modeled several types of housing transitions of the elderly in two countries—Britain and the United States. One important form of these transitions involves downsizing of housing consumption, the importance of which among older households is still debated. We find that on balance—looking over a number of dimensions over a number of transition intervals—downsizing is an important part of life for many older households in both countries. For example, over a decade, almost one

in every three American homeowners who were at least fifty years old moved out of their originally owned home. And mobility is much higher in both countries (and in particular in the United States) among renters. Moreover, when they do move, we find that on average households in both countries tend to downsize their housing consumption. This downsizing takes multiple forms, including reductions in the number of rooms per dwelling and the value of the home. There is also evidence that this downsizing is greater when house price volatility is greater and, in addition, that American households also try to escape housing price volatility by moving to places that experience significantly less housing price volatility.

Our comparative evidence in the descriptive tables in section 12.3 also suggests that there is less evidence of downsizing in Britain than in the United States, although a note of caution is appropriate here because we have a considerably smaller sample and a different (and shorter) time period in Britain. Nevertheless, given differences in house price volatility across the countries this is a result that is, on the surface, contrary to the predictions of our simple theoretical discussion. Looking within country, however, we find the expected positive correlation between volatility and downsizing (although this correlation is weaker in Britain where we have less variation in volatility to exploit). This in turn suggests that other factors must account for the differences in the average levels of downsizing across the two countries. Possible candidates would include the role of lower mobility in general in Britain. While this is only an incomplete explanation since mobility is itself an outcome measure and one indicator of downsizing, if households are moving less often (and their children and grandchildren are also less likely to move) then there will be less downsizing, to the extent that the number of rooms and a reduction in house value only change on moving.

Hence, other explanations might lie in transactions costs associated with moving in Britain (where stamp duties are levied on house sales and the fixed costs associated with house sales are both high and somewhat uncertain)—the nature of bequests and inheritance tax bases, and the role of housing wealth in other economic institutions such as the means test for long-term care. However, such mechanisms are unlikely to be the full explanation since mobility in Britain is particularly low among renters. In addition, to the extent that retirement-related mobility yields movements outside Britain—to Spain and France, as opposed to Florida and Arizona, for example—such transitions are not captured in our data, although the empirical importance of such transitions in Britain is still likely to be relatively limited. Finally, it is certainly the case that even in the least volatile regions of Britain there is still considerable volatility, so the possibility of avoiding house price volatility altogether is somewhat limited. Such explanations should be considered as topics for future research.

Appendix

Table 12A.1 **Differences in housing price volatility by state among movers in HRS samples**

A HRS original cohort—ages 51–61: Transitions over number of years		
	2 years	10 years
All owners who move	0.078	0.149
Owner to renter	0.035	0.092
Owner to owner	0.084	0.158
All renters who move	0.049	0.066
Renter to renter	0.042	0.069
Renter to owner	0.058	0.050
All movers	0.069	0.128

B AHEAD original cohort ages 70+: Eight-year transitions			
	70–79	80+	Total
All owners who move	0.035	–0.020	0.022
Owner to renter	–0.007	–0.073	–0.022
Owner to owner	0.041	0.054	0.048
All renters who move	–0.030	0.132	0.001
Renter to renter	–0.004	0.059	0.007
Renter to owner	–0.031	0	–0.027
All movers	0.018	0.011	0.020

References

Banks, J., R. Blundell, Z. Oldfield and J. P. Smith. 2006. Housing price volatility and housing ownership over the life-cycle. Institute for Fiscal Studies Research Report, December.

Banks, J., R. Blundell, and J. P. Smith. 2003a. Financial wealth inequality in the United States and Great Britain. *Journal of Human Resources* 38 (2): 241–79.

———. 2003b. Wealth portfolios in the US and the UK. In *Perspectives on the economics of aging,* ed. D. Wise, 205–46. Chicago: University of Chicago Press.

Calhoun, C. A. 1996. OFHEO house price indexes: HPI technical description, March 1996. Washington, DC: Office of Federal Housing Enterprise Oversight. Available at http://www.fhfa.gov/webfiles/896/hpi_tech.pdf

Davidoff, T. 2004. Maintenance and the home equity of the elderly. Fisher Center for Real Estate and Urban Economics Paper no. 03-288. University of California, Berkeley, Haas School of Business.

Disney, R., A. Henley, and G. Stears. 2002. Housing costs, house price shocks and savings behaviour among older households in Britain. *Regional Science and Urban Economics* 32 (September): 607–25.

Sheiner, L., and D. Weil. 1992. The housing wealth of the aged. NBER Working Paper no. 4115. Cambridge, MA: National Bureau of Economic Research, July.

Sinai, T., and N. S. Souleles. 2005. Owner-occupied housing as a hedge against rent risk. *Quarterly Journal of Economics* 120 (2): 763–89.

Venti, S. F., and D. A. Wise. 2001. Aging and housing equity: Another look. In *Perspectives on the economics of aging,* ed. D. Wise, 127–80. Chicago: University of Chicago Press.

Comment

Steven F. Venti

Housing is the largest single asset in the portfolios of most households in the United States and the United Kingdom. This chapter takes up, once again, the important question of what happens to housing as households age. The analysis is very well done, so much so that I have nary a complaint about their methods. The findings first add to the large and growing body of evidence that housing eventually declines at older ages. This finding is shown to be robust to the choice of four different ways to measure housing. The authors then address a more unsettled and perhaps more important question: why do households downsize? I will devote most of my comments to what their findings tell us about the motives for housing decumulation.

Housing is a peculiar asset because it has both consumption and investment aspects. This dual role makes it difficult, as a matter of theory, to pin down what motivates households to accumulate, hold, and—at some point in the life cycle—to decumulate housing assets. Of particular importance is the lack of consensus on whether retired households intend to spend-down home equity to replace earnings or whether they want to hold on to housing assets for other purposes. Most financial planners consider most nonhousing assets such as IRAs, pensions, and financial assets as "saving" for retirement in the sense that these assets will be used to replace earnings to finance general consumption in retirement. A typical target, recognizing that consumption may fall after retirement, is that income from savings should replace 80 percent of pre-retirement earnings. When it comes to housing the treatment of housing assets is more ambiguous. Some financial advisors "count" housing assets as saving for retirement; others do not. Similarly, some financial software programs designed to help investors set retirement goals include housing wealth; others do not. And the vast academic literature on the "adequacy of saving" has been equally inconsistent (see, e.g., Bernheim 1992; Engen, Gale, and Uccello 1999; Gustman and Steinmeier 1999, and Scholz, Seshadri, and Khitatrakun 2006). Some studies ignore housing wealth, some include it, and others assume some arbitrary fraction of housing wealth should be considered among the assets that will be used to finance consumption in retirement.

Steven F. Venti is the DeWalt Ankeny Professor of Economic Policy and a professor of economics at Dartmouth College and a research associate of the National Bureau of Economic Research.