Housing Trajectories at Older Ages in Britain and the United States

James Banks*
Zoë Oldfield**
James P. Smith***

Institute for Fiscal Studies and University College, London
*****RAND***
****Institute for Fiscal Studies**

In this paper, we will document and model the housing mobility choices of the elderly in Great Britain and the United States. In an earlier paper (Banks, Blundell, Oldfield, and Smith (2007)), we found that downsizing was an important part of life for many older households in both places. This downsizing took multiple forms, including reductions in the number of rooms per dwelling and the value of the home. However, our comparative evidence also indicated that there was much less evidence of downsizing in Britain than in the US. Consequently, consumption, at least housing consumption, appeared to decline more rapidly at older ages in America compared to Britain.

The main factor underlying lower rates of downsizing in Britain was a much smaller number of movers among the British compared to Americans. While lower rates of British mobility were characteristic of both owners and renters, the differential was particularly high among renters indicating that higher transactions costs associated with owning are unlikely to be a full explanation.[1]

In this paper, we highlight these patterns in more detail and seek to examine reasons for quite different patterns of mobility at older ages in the United States and in Britain. There are several possible reasons for housing mobility at older ages. These include demographic transitions (particularly those associated with marital transitions and/or children leaving home), and labor force transitions due primarily at these ages to retirement. Individuals may also move at older ages to be closer to their children, grandchildren, and other relatives, to consume higher levels of amenities such as a warmer winter climate, or to reduce the cost of living. Cost of living factors may include lower housing costs for either renters or owners or lower income and property taxes.

For many factors thought to induce greater mobility at older ages, there may be simply less opportunity in Britain to achieve these goals given the much smaller size of the country. Temperature and sunshine may exhibit less within country variation, taxes and other location specific costs may be less spatially variable, and the structure of local tax rates may be more uniform in Britain compared to the

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[1] 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 of course not captured in our data although the empirical importance of such transitions in Britain is limited as we discuss briefly below.

United States. We document the extent of within country variation in factors that are believed to encourage migration among older people and the degree to which actual moves that are made among older people appear to buy better amenities and lower taxes.

Higher mobility related transactions costs may also differentiate the two countries. Many British renters have lived in council houses for long periods of time at subsidized rents with long waiting lists for new admissions. The incentives to remain in place for these people may be quite high. Higher transactions costs may also be associated with home ownership in Britain due to stamp taxes on sales of home. Taking into account all the factors mentioned in the last few paragraphs, these mobility decisions for renters and owners in both countries will be modeled separately. We also separately model moves that take place within a region or State and those that cross between them.

This paper is divided into five sections. Section 1 describes the data sources used in both Britain and the US. Section 2 documents the principal facts about differential mobility of older households in Britain and the United States and describes their implications for housing consumption at older ages. In Section 3 we summarize the major factors that may produce differential mobility between these two countries. Section 4 presents the results of models predicting mobility in the two countries for both renters and owners. In the final section, our principal conclusions are highlighted.

1. Data

This research will rely on micro-data from the US (the Panel Survey of Income Dynamics (PSID)) and Britain (the British Household Panel Survey (BHPS)). Besides the standard set of demographics on age, schooling, family income, marriage and other aspects of family building, information available in all these surveys include several aspects of housing choice—ownership, size of house, and value of house.

The Panel Study of Income Dynamics

The PSID has gathered almost 30 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. Our analysis uses data from the years to 2005.

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.

British Household Panel Survey—BHPS

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[2]. 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. We use data for the years 1991- 2004.

2.1 Homeownership Rates and Tenure Transitions at Older Ages

Especially at older ages most Americans are homeowners. Based on multiple waves of the PSID, Table 1 presents tenure status for individuals by age of the household head for ten year age groups starting at age 50, concluding with a residual category of those 80 plus years old. Table 1 shows that more than 80% of all Americans over age 50 are homeowners. Approximately one in every six Americans in this age group are renters, while a relatively small fraction in the catch all 'other categories' that largely

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[2] With the exception of 1992 when house value was only collected for those living at new addresses.

consist of those living with relatives or in a nursing home. Among older Americans, there is a gradual decline in the fraction who are home owners across age groups after age 70. Before age 70, home ownership rates are about 83%—above age 80 the rate is 66%. 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 70, reflects an increase in the likelihood of living with others or in a nursing home.

For British individuals over age 50, the probability of being a homeowner is about ten percentage points lower than that of Americans, a deficit mostly offset by a higher probability of renting. There is a much sharper negative homeownership age pattern in Britain compared to the US in Table 1. Among those in their fifties for example, there is about a three percentage point difference in home ownership rates between the two countries—by ages 80+ the likelihood of owning a home is 17 percentage points lower in Britain compared to the US. As documented in Banks, Blundell, and Smith (2003), this sharp negative age gradient in home owning rates in Britain largely reflects cohort effects associated with the sale at subsidized rates of government owned council housing that made the previous renters now owners.

2.2 Changes in Housing Tenure with Age

The very pronounced cohort effects in housing status in Britain mentioned 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 the salient transitions using the panel nature of the data in the US and Britain are highlighted.

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 transitions conditional or originally being a homeowner. Table 2 examines these tenure transitions in the United States (using the PSID) and Britain (using the BHPS) for a sub population who are at least 50 years old and who were originally home owners in the initial period. Because the extent of any transitions that take place will depend on the length of the window during which households are allowed to adjust their status, the data are presented for ten year durations between the waves of the panel. Table 3 organizes the data in precisely the same way for those who were initially renters.

Over a decade, almost one in every three American home owners who were at least 50 years old moved out of an originally owned home. Among Americans who did move, however, 71% remained homeowners by purchasing another home. Another 22% of them became renters while the rest do a combination 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, about one in every four British homeowners relocated compared to about one in three American households.

Table 3 demonstrates that—not surprisingly—renters in both countries are far more mobile than owners. Across the ten year survey interval, 72% of American renters moved at least once compared to only 35% 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 rented apartment or flat. But around one in three American renters who do relocate over age 50 subsequently become homeowners. The comparable British number is around half that – one in six.

Turning to homeowners, in the United States, until after 80, about two-thirds 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 move into rental properties and to a less 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 US and it is a good deal less likely at older ages for an home owner 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 during the 80s in the US. Forty-one percent of American renters in their seventies stay in the same place over a ten year horizon compared to 22% of American renters in the fifties. Seventy-five percent of British renters over age 80 stay in the same place

2.3 Consumption Trajectories at Older Ages

The implications of lower mobility in Britain among older ages are profound. One of the more hotly debated issues regarding life-cycle patterns of consumption with age concerns 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. 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 is whether consumption declines in addition to any changes induced by 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 more resistant to any downward changes at older age.

Figure 1 plots changes in number of rooms across age adjusted for all demographic and labor forces changes occurring at older ages. Figure 2 provides similar plots except in this case the sample consists of all households whether or not they change residence.[3] For both Figures 1 and 2, we plot estimated age trajectories obtained whilst controlling for other transitions between waves and estimated from a more restricted model with the demographic and employment status transition variables excluded.[4]

Figure 1 demonstrates in both countries a clear decline in housing consumption (as measured by change in number of rooms for movers), a decline that accelerates after age 65. Except for very old ages (ages 75 and older) this decrease in housing consumption is roughly similar in both countries. The declines in housing consumption are not trivial—about one room in the US and a half a room in Britain. If we control for the other demographic and work transitions, 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 age patterns of declining housing consumption are not the result of either work or family transitions that are associated with aging.

The age patterns that are plotted in Figure 2 for all households (independent of whether they move or not over a five year horizon) dramatize a much larger difference between the two countries. The decline in housing consumption with age across this more relevant sample of all households is clearly

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[3] For the models underlying these graphs see Banks et al 2007. For the purposes of these plots, we used the models estimated over a five year horizon.

[4] In each country the changes are normalized around the value for the 50-54 age group in the models without any controls for demographic and work transitions.

much larger in the US than it is in Britain. Thus the principal reason for the differences between is that older households are much less mobile in Britain than in the US.

3. Factors Related to Geographic Mobility

Why is there so much less mobility at older ages in Britain compared to the United States? To attempt to address that question, Table 4.a lists the distribution at selected percentiles of state level attributes that are potentially related to migration across states in the United States while Table 4.b displays a similar but not identical array of attributes for regions in Britain. These attributes include measures of spatially specific amenities that make a location an attractive place to live or not and the economic costs associated with living in one place rather than another.

There is considerable variation amongst American states in many spatial amenities—in particular mean winter temperature, hours of sunshine in January, summer humidity, and yearly rainfall. For example, there is a thirty degree swing between the fifth warmest state in January compared to the fifth coldest state in that month and hours of January sunshine in the sunniest state exceeds that of the darkest by almost four to one. In contrast, there is much less variation across states in mean temperature in July— comparably measured (5th most warmest to 5th least warmest) July temperature variation across states is only 14 degrees Fahrenheit. Cumulative inches of yearly rainfall exhibits variation similar to that of winter temperature—a difference of 38 inches of rain (about the average rainfall of the median state) from the fifth driest to fifth wettest state. Similarly, the fifth most humid state has relative humidity 42 degrees more than the fifth least humid state.

Regional variation in amenities is far less in Britain compared to the US. The minimum to maximum difference in January temperature across British regions is only two degrees Fahrenheit compared to fifty-five degrees in America. It is not particularly sunny anywhere in Britain in January, but the possibility of finding a pleasant sunny January day if one stays within the country is equally bleak. In

the US, variation goes from three to eight hours per day.[5] It also rains a good deal more during the year in Britain compared to the US (twenty inches), but the variation in rainfall while more than that in temperature remains far less than in the US. In general, and largely due to the much smaller size of the country, these types of spatially specific amenities are unlikely to generate much within country migration in Britain as there simply exists so little geographic variation that the opportunities to improve your lot through migration are quite small. This is clearly not the case in the United States.

One possibility that needs to be investigated for our analysis is that migration to Spain or other warmer parts of Europe leads to attrition from the BHPS data whereas equivalent migrations take place internally in the US and hence respondents remain in the PSID sample. Official statistics on migration show that the total numbers of out migrants age 45 or over was 33,000 in 1991 and 68,000 in 2006. Given population totals for those aged 45 and over in the same years these equate to outmigration rates of 0.015% and 0.028% respectively. Whilst this represents a large increase proportionately over the period of our sample, the numbers are far too low to be driving differences observed between mobility rates in the PSID and BHPS data. Hence we ignore international mobility for the rest of our analysis.

Turning to economic variables that might be related to migration, we focus on the following dimensions in the US- income and property taxes and rental and owning price of housing. Once again, there exists considerable variability across American States especially compared to limited regional variation in Britain. Some of this is inherent in governance difference between the two countries in the fiscal role assigned to local government units compared to central government. In the US, income taxes are set at both the state and a common federal level and states and local communities can also access property, sales, and occasionally income taxes. In Britain, the only major tax set at the local level is council tax. This tax was introduced in 1993 (its predecessor was the community charge or poll tax). It is paid by both renters and owners and the level is roughly related to the value of the home you are living in.

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[5] The fact that the US and UK distributions of January sunshine hours hardly overlap suggests that there may be an issue of comparability of measurement technology across the two countries. There are at least a handful of northern States that one would expect to be comparable to the more southern UK regions in terms of winter sunshine. However, while we are investigating such international comparability issues, they are not important for our analysis here which simply uses within-country differences in sunshine and other factors.

Since tax rates vary by income in the United States, average tax rates are computed at four real income levels in each year ($20,000; $40,000; $60,000 and $80,000) for each state using the NBER Taxsim program. A family is assigned the tax rate closest to their family income. Average rather than marginal taxes are used since migration is a discrete choice in that you live either in place A or B. Not surprisingly, average tax rates by state increase significantly by income. Evaluated at the median tax state, average tax rate at the highest income is 20% compared to 5.2% at the lowest income level—a differential of about 15 percentage points. Variation in average tax rates among states is also higher at higher incomes. Comparing the 90th to the 10th percentile, the difference in average taxes is 6 percentage points at the highest income value compared to 2.8 percentage points at the lowest income level.[6]

Similarly, the average price per room whether computed as house price per room for owners or rental price per room for renters also varies considerably across American states. In the fifth most expensive state, houses cost 26 thousand dollars per room while the fifth least expensive state is about one-quarter of that amount— about six thousand dollars per room. Variation in rental prices is not as large but yearly rental prices per room of the fifth most expensive state still exceed that of the fifth least expensive state by more than three to one. Whilst there is variation in house prices in Britain, it is not as great as in the US. The most expensive region in Britain, has house prices per room that were, (on average in 1995), about half that of the least expensive region. A slightly smaller but similar multiple exists for rental prices in Britain: rental prices in the most expensive region are 1.8 times more that in the cheapest region. These average cost variations will obviously be a combination of the composition of dwelling types (and also the quality of the dwellings) and the cost of the area (i.e. the quality of the area characteristics) across the 50 US states or the 12 UK regions.

The final row in Tables 4.a and 4.b capture a different aspect of geographic mobility by showing the fraction of rental homes that are subsidized in some way by government. There are two dimensions of possible subsidies that are recorded in the PSID- whether you live in a public housing project and whether

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[6] In a future version of the paper, the actual tax rates of individual households will be used.

a government subsidies part of the rent.[7] Families in subsidized housing may be more reluctant to move or less able to move whilst retaining their subsidy. In the United States in 1995, about one in four renters aged over fifty live in some form of public or subsidized housing but once again there is a great deal of variation across states in this proportion.

In the UK, subsidized and public rental accommodation makes up a much larger proportion of the rental market particularly for the over fifties. There are two main programs providing financial support for housing. Both are aimed exclusively at renters and are means tested. The first is a system of subsidized housing, often referred to as social housing or council housing.[8] Those who are allocated a property will pay a below-market rent and the landlord will be either the local authority or a housing association. Individuals who are entitled to such a property are placed on a waiting list until suitable accommodation becomes available.[9] Whilst entitlement to live in social housing is subject to a strict means test, once allocated a property, tenants can usually stay for life irrespective of any changes in circumstance.[10]

The second program of financial assistance for renters is the housing benefit system which was introduced in the late 1980s. This is a substantial component of the welfare system and is simply a cash transfer from the government to the renter. It is not tied to a particular property but it is subject to a strict means test. The amount of benefit received is determined by personal circumstances and also the characteristics of the property (for example whether the house a reasonable size for the family). Housing benefit payments may fully cover the total amount of rent or may only partially do so. Social renters are also entitled to receive housing benefit if they pass the means test.

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[7] Section 8 Rental Voucher Program increases affordable housing choices for very low-income households by allowing families to choose privately owned rental housing. The public housing authority (PHA) generally pays the landlord the difference between 30 percent of household income and the PHA-determined payment standard-about 80 to 100 percent of the fair market rent (FMR). The rent must be reasonable. The household may choose a unit with a higher rent than the FMR and pay the landlord the difference or choose a lower cost unit and keep the difference.

8 For more detail of the system of social housing see http://sticerd.lse.ac.uk/dps/case/cr/CASEreport34.pdf

[9] Typically waiting lists are long (find out more). Priority is given to groups who are deemed most in need including households which include dependent children, pregnant women and the mentally ill.
[10] This system is currently under review.

Table 4.b, which shows proportions of renters living in social housing reveals that around 80% of renters aged over fifty in Great Britain live in public rental accommodation (either local authority housing or housing association housing). This proportion varies from 60% to 90% across the regions. Of those living in social housing, around 50% also receive housing benefit (not shown in table). A further 10% of renters aged over fifty live in private rental accommodation but also receive housing benefit which means in total that 90% of the rental market for over fifties consists of some form of subsidized housing.

Social renters have a severely reduced incentive and ability to downsize their property for a several reasons. Even if tenant's current circumstances means that they are still entitled to social housing, moving can be very difficult because of the shortage of social housing: existing tenants are treated in the same way as new applicants so if they are not in a priority group, they may not be allocated a different property. For those whose circumstances have changed in such a way that they would no longer be entitled to social housing if they were to reapply, there is a large incentive not to move as they may not be allocated a different property at all and may have to move into the private sector and pay full market rent.

Receiving housing benefit may also reduce the incentive to downsize. For tenants who receive housing benefit that fully meets the cost of the rent, moving into smaller or cheaper accommodation would reduce their housing consumption and would have no offsetting reduction in cost. The disincentive to move is somewhat reduced for renters who receive housing benefit that only partially covers the rent although it is still present. Whilst a reduction in housing consumption would lead to a reduction in housing costs this would not be a one for one reduction due to the partial subsidy.

Our multivariate analysis will of course control for both social renting and receipt of full or partial housing benefit subsidies. Initial inspection of the data shows that, unconditionally, social housing is highly correlated with mobility rates – 33% of private renters move over a five-year period compared to only 20% of social renters – although the differences by housing benefit category within the private and social renting groups are less systematic. And care needs to be taken because there are many other differences across the various groups, not least in their average incomes. Hence further discussion will be left to the multivariate models of section four.

3.1 Geographical mobility and the changes in amenities for movers: Descriptive evidence

Once one moves to a new place and leaves the old, one buys the entire package of amenities and economic costs and benefits of the new location compared to the old. It is possible that one may gain in one dimension (a more pleasant climate) at the expense of another (a more affordable place to live). Table 5 provides some insights into this issue by presenting a correlation matrix of the principal state/region level attributes. States with warmer winters are also less humid, have more annual rainfall, and more Sunshine. Finally, states with warmer winters also have lower income tax rates so on these dimensions migrants would be gaining in both dimensions simultaneously.[11] However, perhaps because this crucial amenity is priced into home values, places with warmer January winters have somewhat more expensive homes. In Britain, regions with warmer winters tend to have slightly less rainfall and lower council tax. These regions also are associated with higher house and rental prices. The relationship is unlikely to be causal however – it is more likely that the association is driven to a large extent by London being in the South of England which typically has better weather than the North and higher house prices.

Even when older householders remain home owners and stay in a home of about the same size, they can purchase spatial amenities and lower costs of living by moving to places where amenities are better and/or costs are lower. The data contained in tables 6 through 8 for the US and Britain indicate that this is precisely what takes place. For those who moved, these set of tables measure differences in amenities or economic costs between the area where they originally lived and the area to which they moved.

Tables 6.A (for the US) and 6.B (for Britain) illustrate our format with the case of January temperature. A positive number in these two tables indicates that the area that a person left was colder than the area to which they moved—that is a household was purchasing some additional warmth. In addition to age stratification, data in these two tables 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.

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[11] Of course, state level income tax rates may be endogenous when viewed from a political economy point of view and hence some of the correlation with winter temperatures may not be entirely coincidental. However the endogeneity of state-level economic variables is not something that is considered in our current analysis.

Since the only temperature variation measured at present in across states and regions, data also are

presented in the second panel for those who moved across our state or region boundaries.[12]

Most of the numbers in Table 6.A are positive indicating that on average American movers are

going to warmer winter climates. Purchasing additional warmth during the winter months is more

common among owners (especially if they remain owners in the new location) than renters and more

common at younger ages within the pre and post retirement ages. In fact those above age 70, and

particularly those above age 80, move to slightly colder winter climates indicating that moves at very old

age may reflect quite different motives, such as being closer to relatives (moving to where relatives live)

when elderly parents become increasingly frail and dependent. Sample sizes are also much lower at these

older ages making the patterns more erratic.

If we limit American moves to those migrating across state lines, the additional winter warming

achieved by a move is not trivial—on average about five degrees. This is certainly an understatement

given the lack of variation within states in amenities as currently measured. The only variation that exists

here is across state and the majority of moves are within state.[13] Especially around the retirement age

span, the increase in temperature associated with moves across states is not trivial. Even across state

moves by younger renters apparently may take into account warmer winter days in the new location. Not

only is the new location more pleasant, winter heating costs are also presumably lower in the new locale.

Not surprisingly in light of the data presented in Table 4.b, Table 6.b which presents parallel

January temperature data for Britain shows virtually no relation between a region's winter climate and

direction of moves at older ages no matter whether the family was an owner or renter or moved across

regions or not. We also examined other amenities listed in Table 4 to determine if there was much of a

change in the attribute associated with migration. Three of the amenities were weakly related to

migrations in the US- June relative humidity, July temperatures, and annual inches of rain. For example,

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[12] In a latter version of the paper, we will incorporate within state variation in this dimension as well.
[13] In the next version of the paper, we will measure these amenities at a lower level of geographic aggregation.

even if we confine moves to those across states, the move was associated with a 0.27 decrease in relative humidity, a two degree July warmer temperature, and three inches more annual rainfall.

The other amenity in the list that did appear to matter was hours of sunshine which is displayed in the same format in Table 6.C. American movers apparently not only desire warmth but also sunlight. For people who move across state, January sunlight hours increase by more than thirteen hours for both renters and owners alike. Once again, the pattern of largest increases in sunlight takes place for those who are less than seventy years old. In fact, after age seventy, the pattern once again reverses as health becomes an increasingly dominant reason for mobility. Table 6.D, which displays the same data for Britain, shows that once again there is little opportunity for gain in Britain in terms of sunshine achieved through migration- in this case the days became a bit darker when people in Britain moved across regions.

We next consider changes in costs associated with the move. These location specific costs might include income or property tax changes or costs of the dwelling. We first examine average tax rates (combined federal and state) associated with a state which are described for four different income levels with people assigned the income bracket closest to their actual income.[14] Since taxes can change both due to a change in average income tax rates between the two locations or a change in income of the household, we evaluate the impact of changing taxes by holding income constant at the time of the move. By doing so, the pure impact of income tax rates can be isolated.

Using the same format as for amenities, Table 7.A lists changes in income tax rates. Even for the high income households, while average state and federal taxes are lower after the move, the changes are relatively small- less than one percentage point in all cases. To some extent, the impact of income tax variation is undoubtedly understated in these computations due to the use of the only four income brackets to assign tax rates, it does not appear at present that this may not turn out to be a primary motive for migration in the pre-and post retirement years.

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[14] In future version of the paper, we will use the actual income of the household which should lead to greater variation in taxes associated with the move.

Table 7.B examines changes in the rank of the state in terms of the size of its average property tax rate. States are ranked from one to fifty with one being the highest property tax rate and fifty the lowest property tax rate. The general tendency, especially for those under age seventy and for moves centered around the retirement age, is for people to move to states with lower property taxes. Once again reflecting a pattern that has been seen before, this pattern reverses after age seventy when economic factors apparently play less of a role in the migration decision. The property tax reduction associated with the move occurs only when the transition is to ownership status in the location. For example for owners who move across states, state property taxes are reduced on average if they remain owners but are increased if they become renters. A similar but less extreme pattern exists for renters.

Tables 8.A and B compare average state housing and rental prices per room of the new location compared to the previous one. To avoid confusion in the units associated with switching between owner and rental prices when the move involves a change in tenure, prices in the destination location reflect the type of tenure of location of origin. To illustrate, if the move was from owner to renter, we compare mean state housing (as opposed to rental) prices in the two locations. In the US, homeowners apparently move to less expensive places than those that they left, particularly when they move across states and remain owners. Owners moving across state boundaries are associated with average state costs about one thousand two hundred dollars less per room. In contrast, renters actually move to a slightly higher cost state than the one that they just left based on average costs per state but the difference is quite small. Thus, holding the number of rooms constant, owners (but not renters) who migrate across state lines do appear to be moving to less expensive states.

Table 8.B shows a similar set of numbers for Britain. In contrast to the US, it appears that when British owners move, they do so on average, to a more expensive region (by around seven hundred pounds per room). However, it should be borne in mind that during the latter part of our period of data, there was rapid house price growth (of up to 25% per year) and although our data are adjusted for economy wide changes in prices, we do not adjust for house price growth and so some part of the increase

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in house value will reflect house price growth.[15] When we look separately at owners who move regions, those who remain owners on average move to a less expensive region. Renters who move and remain renters move to a less expensive area (a reduction of around £11 per room) and if we isolate those renters who move regions, this is even more apparent (a reduction of £141 per room).

The second comparison of changes in housing costs uses actual prices that movers pay in the origin and destination. We know from our earlier work that Americans tend to downsize during these ages so that when they move they select smaller homes which by itself would make them cheaper (see Banks et al 2007). To capture various dimensions of differential housing costs associated with a move, Table 9.A lists American cost transitions associated with total housing costs and housing costs per room (in constant dollars). To keep the dimensionality of the comparative costs meaningful, these costs are presented only for moves where tenure remains the same. Finally, costs are displayed for all moves, for moves across state boundary, and for within state moves.

For moves across state boundaries, the following picture emerges: For owners, especially for those less than seventy years old, the price of the owned house is significantly lower in the new location compared to the old (a cost reduction of about $21,000). However, most but not all of this cost reduction appears to be due to a reduction in the size of the dwelling (i.e. the number of rooms). Across all age groups, the cost per room fell by a little less than eight hundred dollars per room accounting for about four thousand dollars of the total cost reduction.

Continuing owners who move within state (residential mobility) appear actually to spend more on their homes. However, this is mainly due to people buying more expensive homes within the mostly pre-retirement age fifty age group - at all other ages there is a reduction in home price even if a move was within state. While number of rooms is declining for within state residential owners, cost per room increased somewhat possibly indicating they moved to a somewhat nicer house. There appears to be little cost change for renters where costs increase slightly both in terms of total costs and cost per room.

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[15] In the next version of the paper, we will constrain the British numbers for origin and destination to be evaluated in the same year. The American numbers are evaluated in the same year in this version.

For the British sample, owners who move, regardless of whether within or across region, on average reduce the total cost of their house. For those who move across region, this reduction is over £15,000. Even for those who remain in the same region, the reduction in cost is nearly £4,000. However, if we look at change in the cost *per room*, it appears that owners are spending more per room on their house. Owners are downsizing in terms of total cost/value but increasing the quality of their house (in terms of cost per room). For renters, the total change in the (annual) cost of the accommodation is small. However, as for owners, on average there is an increase in the cost per room associated with moving.

4. Modeling mobility

In this section, we present our empirical findings about the determinants of mobility at older ages in the US and Britain. The factors that enter these models reflect our discussions in the previous section and, based on those discussions, inter-state (and inter-region) migration is modeled separately.

There are several factors that are hypothesized to be related to mobility at older ages that are included in our mobility models. These are conceptually organized into four groups—economic, location specific amenities, family, and institutional constraints each of which potentially vary across our spatial units which will be States in the US and regions in Britain. In the US models, economic factors include area specific housing costs—rents per room and housing prices per room average income tax rates and average property tax rates, and the transition into retirement. Amenities include mean temperature in January, mean relative humidity in July, mean annual hours of rainfall, and hours of sunshine in January.

Family related forces include whether there were any demographic transitions in the household in terms of marital status, whether any kids are at home, and the number of people in the household. Institutional factors are meant to capture institutional arrangements in the two countries that may promote or inhibit mobility at older ages particularly among renters- whether one lives in public or subsidized housing (in the US) or in council housing in Britain.

All models have the following sets of demographic variables—a quadratic in age, 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[16]). The marital and child transition indicators tell us, conditional on the changes in number of residents, whether type of resident matters.

The probability of moving may also be related to work transitions especially retirement that take place at these ages. Therefore, a set of work transitions are entered into the models (work-no work, no work-work, no work-no work with work-work as the omitted category). Unlike demographic variables discussed above which are common to the family unit, work variables are individual level indicators.

Economic indicators include the ln of real annual family income and education. In the United States education is separated into three groups—13-16 years of schooling, 16 or more years of schooling with 12 or fewer years the reference group. In Britain, broadly comparable groups are constructed 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.

The models contain measures of baseline house value and home equity (for home owners only) and a linear time trend. Data used for estimation are based on a sample of individuals ages 50 and more using the PSID for the US (years 1968-2005) and the BHPS for Britain (years 1993-2004[17]). Based on preliminary analysis, separate models were estimated for owners and renters. Tables 10 and 12 (for owners) and Tables 11 and 13 (for renters) lists estimated derivatives and associated z statistics obtained from probit models of three types of migration decisions- probability of changing residence (regardless of destination), probability of moving across a state or region boundary, and the conditional probability of moving across a state or region boundary given that you relocate. All decisions are modeled over a five year time frame.

If we examine first the set of transition variables included in the model for the US (marriage, kids, and work), the stable reference group (married-married, kids-kids, and work-work) is generally the one

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[16] For the UK, due to lack of observations in "no kids – kids" group, it is combined with "no kids-no kids" group.
[17] Although 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.

least associated with residential mobility for both owners and renters. The one exception to that rule is that single-single households are less mobile than married-married. The transition into marriage generates the highest probability of a move. These marital transitions appear equally likely to generate within and across state moves. For Britain, a similar pattern is found in that the most stable reference group is generally least likely to move with the exception of a significant negative effect on the probability of moving when children leave home for renters.

All 'kids' transitions motivate additional mobility both within and across states for renters and owners alike in the US. Especially for owners, the transition from no kids to kids in the home is associated with a move across states and for higher induced mobility (compared to the other kids transitions) for renters. This is most likely due to parents moving to their kid2s home and place of residence as they get older. The effect of these children transitions is much less apparent in Britain.

Work transitions also generate mobility both within and across states for both renters and owners in the US and for owners only in Britain. The transition from work to non-work, which in this age group is most likely associated with retirement, induces households to move across state boundaries, presumably as the link between place of work and place of residence is broken.

We next describe estimated impacts of the economic variables. Several dimensions of economic resources are measured, including household income, education, and house value and home equity among home owners. Statistically significant positive effects on the probability of moving are estimated for education and income, and higher incomes (but not more schooling) are also more likely to generate inter-states moves in the US. Given the phase of the life-cycle we are examining, income is not a proxy for job market opportunities in alternative labor markets. Instead these income effects more likely capture the ability to finance moves or to purchase amenities associated with localities that are no longer tied to jobs.

In Britain socioeconomic status variables - schooling and income - are less important for mobility outcomes than in the US. We find a significant positive (at least at the 10% level) effect of education on the probability of moving for both owners and renters. There is no income effect on the probability of

moving, either unconditionally or conditionally for owners, but higher income is associated with a higher probability of unconditional moves for renters.

Conditional on being homeowner mobility rises with the value of the house but declines with home equity when both variables are in the model both in the US and Britain. One interpretation of the home value effect (in addition to a normal income effect) is that as the value of home goes up people are consuming a lot of housing relative to their income inducing them to want to downsize their house. Conditional of the value of 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. In both countries, these house value variables do not affect whether or not the move is inter or intra-state (with the exception of a possible positive effect of ln house value on probability of moving regions in Britain).

There are four indicators of the economic costs associated with living in one's current location-average income tax rate (US only), average property tax or council tax rate[18], cost of housing per room (house price per room for owners and rental price per room for renters), and the fraction of rental residents of that state who live in public or subsidized housing. Based on transitions tables discussed above, all variables are interacted with whether the respondent was seventy years old or older.

Among owners who are less than 70 years old, higher state or region wide cost per room encourages additional mobility and makes it more likely that the move is across states in the United States or regions in Britain. These effects disappear when people are over seventy years old. Among renters in both countries these effects are much weaker.

A high income tax in the origin state encourage additional mobility among owners and makes the move more likely to one across state boundaries, but once again these economic motivates disappear and may even reverse after age seventy. Renters in high tax states are discouraged from moving although if they do move it will be across state, but they are less mobile in terms of intra-state moves. We have no explanation for this result.

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[18] In the UK we also include a dummy variable to capture the years where the poll tax regime was in place (1991 and 1992) as we do not (yet) have data on average poll tax per region.

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In the US, the property tax index runs from one to fifty with one being the highest property tax state and fifty the lowest. Since an increase in this index implies a lower property tax, increases in property taxes encourage mobility among young renters especially across states. In Britain, the explanatory variable for property tax is simply the average tax rate for a typical property in that region. The average council tax rate has no effect on mobility for owners and renters under 70. For renters over 70, a higher average council tax rate is negatively associated with mobility.

Finally, a larger fraction of state rental units in public or subsidized housing discourages mobility in the US although this effect is quite small. In Britain, for owners, the fraction of public housing has a large negative effect on the probability of moving but a large positive effect on the conditional probability of moving region. For renters, although the proportion of public housing in the region has no effect on the unconditional probability of moving, it has a positive effect on the probability of moving region both unconditionally and conditionally. In addition, in the rental models, we also include an individual level dummy which indicates whether the individual is a social renter and, given our previous discussion about the possible effect of housing benefit on mobility, we also include two separate dummies which indicate whether they individual receives housing benefit at either 100% rate or at a partial rate. As expected, being a social renter is negatively associated with moving in all three models (although the effect on the unconditional probability of moving region is small).

Estimated impacts of amenity variables are more mixed. In the US higher January temperature deters mobility across states, but only for those less than seventy with much stronger effects for owners than for renters. Very similar effects are found for January temperature in Britain. The effects of January sunshine are quite weak in the US, but more January sunshine appears to increase across region mobility for those less than seventy in Britain.

5. Conclusion

Housing wealth is a major component of individual retirement resources and the dynamics of housing wealth trajectories at older ages are not well understood. But housing is also durable good providing, for homeowners at least, consumption services both contemporaneously and in the future.

Consequently wealth trajectories need to be analyzed somewhat differently to other forms of wealth where one might naturally expect individuals to run down their wealth as they age in order to finance consumption in retirement.

When looking at trajectories of housing consumption (as measured by number of rooms) or housing wealth, differences between the US and Britain are driven not so much by differences in behavior of movers, but by differences in proportions of households who move. In this paper, we have investigated possible causes of these mobility differences, whether these be constraints in terms of the possible improvements that could be had by moving (in terms of climate etc.) or disincentives to move that may be inherent in the various national and state-level economic institutions. We found a role for geographic, demographic, economic and social factors that was surprisingly consistent across countries. However, in each case, the magnitude of the underlying variation in factors within each country leads to less mobility in Britain than the US. For example, whilst subsidized housing disincentivises mobility in both countries, the higher proportion of subsidized renters in Britain (combined with a greater marginal effect of subsidized renting on mobility) means less mobility in Britain. Similarly, while living in a colder or darker region leads to more mobility at older ages in both countries, the fact that regions differ by only one or two degrees (or one or two hours of sunshine) in Britain again leads to less mobility for older British households than for their American counterparts where state climate variation is much larger.

One obvious omission from our analysis is a measure of geographical proximity to other members of the family, and in particular children and grandchildren. While we do not have information on this in the individual level data we use in our analysis, the international differences are likely to be such that this would be in line with other effects we find. There is less geographical mobility at younger ages in the UK than there is in the US, and thus older adults are already closer to their families and their children's families in their working years. Hence if geographical proximity to family is a motivation for mobility at older ages then it is likely to lead to more mobility in the US than in Britain.

There are important consequences of our analysis for understanding wealth trajectories at older ages. First, it suggests that in order to understand wealth trajectories one needs to first understand

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constraints placed on housing and location choices and various disincentives to housing mobility that might be in place for owner-occupiers. Second, for both owner-occupiers and renters, housing consumption trajectories at older ages will be highly dependent on the same factors. Finally, these two points together mean that mobility choices, constraints and outcomes will have knock-on effects to non-housing consumption either indirectly through the budget constraint (in the case that preferences are such that non-housing consumption is separable from housing) or even directly (when preferences are non-separable). Understanding consumption and wealth trajectories at older ages is important for policy purposes and, provides a possible test of the life-cycle model. As such, our next steps will be to use the factors identified as driving housing mobility in this paper as explanatory variables in an analysis of differences between the US and Britain in non-housing consumption and non-housing wealth trajectories.

Table 1
Tenure Status for Individuals by Age of Head

United States

	50-59	60-69	70-79	80+	Total
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

Source: PSID—(1968-1999), weighted individual level data.

Great Britain

	50-59	60-69	70-79	80+	Total
Owner	79.8	73.4	64.5	48.3	70.2
Renter	17.7	24.2	32.4	45.1	26.7
Other	2.5	2.3	3.1	6.7	3.2

Source: US data based on PSID for all years 1968-1999—Population ages 50+. UK data are based on BHPS 1991-2004. All data are weighted are individual level data.

Table 2

Housing Transition among Owners by Age of Head (of Family)—Ten Year Transitions

	50-59	60-69	70-79	80 plus	All
United States					
Owner, Owner, No move	70.8	70.2	62.9	42.8	68.2
Owner, Owner, Moved	24.5	20.6	15.5	12.9	22.7
Owner, Renter	3.6	6.3	12.2	38.0	6.8
Owner, Other	1.1	2.9	5.8	6.3	2.3
Great Britain					
Owner, Owner, No move	75.9	78.3	79.0	77.8	77.3
Owner, Owner, Moved	21.0	18.5	16.3	7.2	19.2
Owner, Renter	2.4	2.9	3.3	15.0	2.9
Owner, Other	0.8	0.3	1.4	0.0	0.7

Source: US data based on PSID for all years 1968-1999—Population ages 50+. UK data are based on BHPS 1991-2004. All data are weighted are individual level data.

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Table 3
Housing Transition among Renters by Age of Head—Ten Year Transitions

	50-59	60-69	70-79	80 plus	All
United States					
Renter, Renter, No move	21.6	31.1	41.4	26.9	28.2
Renter, Renter, Moved	40.6	47.0	41.8	56.4	43.5
Renter, Owner	33.3	17.1	12.0	8.2	24.2
Renter, Other	4.6	2.9	4.9	8.4	4.2
Great Britain					
Renter, Renter, No move	57.4	62.6	74.6	75.4	64.8
Renter, Renter, Moved	30.1	32.0	23.2	24.6	28.7
Renter, Owner	12.1	3.6	1.0	0.0	5.4
Renter, Other	0.5	1.8	1.2	0.0	1.1

   Source: US data based on PSID for all years 1968-1999- Population ages 50+. UK data are based on BHPS. All data are weighted are individual level data.

Table 4.a
Distribution of State Attributes—US

				Percentiles				
	Min	10	25	50	75	90	Mean	Max
Mean January Temperature	6.8	17.8	24.8	30.9	38.8	48.5	32.0	61.7
Mean January Sunshine	67.6	105.6	126.5	150.9	173.4	202.1	151.0	251.5
July Relative Humidity	15.5	29.7	47.6	60.5	67.0	71.5	55.6	73.9
Mean July Temperature	66.1	68.5	71.2	74.7	78.7	82.0	75.2	87.8
Cumulative Inches of Rainfall/Year	7.1	12.5	26.4	37.0	43.6	50.8	34.3	59.7
Average Tax Rate-Lowest Income[a]	0.026	0.043	0.043	0.052	0.068	0.071	0.054	0.080
Average Tax Rate-Second Lowest	0.096	0.097	0.109	0.125	0.133	0.143	0.122	0.159
Average Tax Rate-Third Highest	0.121	0.121	0.144	0.156	0.170	0.177	0.155	0.194
Average Tax Rate-Highest Income	0.161	0.161	0.188	0.202	0.214	0.221	0.199	0.234
Average Rent per room–1995	225	659	783	1010	1473	2241	1309	5882
Average House Price per room-1995[b]	1.75	6.11	10.71	13.90	18.00	25.60	15.06	32.93
Property Taxes-1995	49.8	317.8	568.8	823.3	1337.7	1914.3	1149.4	8240.6
% in Public or Subsidized Housing-1995[c]	NA	0.00	0.036	0.229	0.405	0.519	0.267	NA

[a] All taxes in year 1995

[a] Thousands of dollars per room.

[c] Renters only.

Table 4.B
Distribution of regional attributes - Britain

		Percentiles						
	Min	10	25	50	75	90	Max	Mean*
January Mid-Temperature (farenheit)	36.3	37.0	37.3	37.9	38.8	39.0	39.6	37.5
January Hours of Sunshine	34.4	42.8	46.8	48.9	52.6	52.6	52.6	43.9
July Mid-Temperature (farenheit)	55.6	57.9	58.5	59.7	61.4	61.5	61.5	57.9
July Hours of Sunshine	145.9	166.2	169.3	181.2	198.2	202.9	202.9	167.1
Annual rainfall (inches)	23.7	29.7	29.9	30.3	49.0	56.5	59.9	43.3
Average Annual Rent/room – 1995	569	600	632	730	819	970	1715	777
Average House Price per room[a] - 1995	12.49	13.83	14.18	15.27	19.76	21.48	26.48	16.85
Average Council Tax - 1995 £ per year	395	565	575	613	637	680	711	600
Fraction of renters - 1995	0.18	0.20	0.22	0.26	0.33	0.39	0.40	0.24
Fraction of renters in Subs Housing - 1995	0.61	0.70	0.75	0.86	0.89	0.90	0.91	0.81

a £'000
*The mean weather variables are the mean values for the UK
The January and July temperatures are the mid-point between the average minimum temperature and the average maximum temperature

Table 5.A
Correlation Matrix of State Attributes—USA

	Jan Temp	Rel Hum	Rainfall	Sunshine	Tax Rate	Rent per room	Price per room
Jan Temp	1.00	0.16	0.42	0.31	-0.11	0.03	0.11
Rel Hum		1.00	0.72	-0.21	0.24	0.15	-0.02
Rainfall			1.00	-0.12	-0.01	-0.09	-0.11
Jan Sunshine				1.00	-0.30	-0.12	0.17
Tax Rate					1.00	-0.36	-0.15
Rent per room						1.00	0.46
Price per room							1.00

Table 5.B
Correlation Matrix of State Attributes—Britain

	Jan Temp	Rainfall	Council tax	Rent per room	Price per room
Jan Temp	1	-0.05	-0.57	0.46	0.66
Rainfall		1.00	-0.21	-0.17	-0.23
Council Tax			1.00	-0.15	-0.20
Rent per room				1.00	0.77
Price per room					1.00

Table 6.A

Differences in Mean January Temperature by State in USA among Movers by Age Group

Five Year Transitions—All Movers					
	50-59	60-69	70-79	80+	Total
All owners who move	1.26	1.78	-0.73	0.26	1.04
Owner to renter	1.06	0.70	-1.54	0.35	0.09
Owner to owner	1.26	2.11	-0.52	0.44	1.30
All renters who move	0.38	1.37	0.99	-0.79	0.71
Renter to renter	0.08	1.15	0.33	-0.82	0.39
Renter to owner	0.92	1.62	3.26	0.00	1.34
All movers	0.87	1.40	-0.15	-0.41	0.79

Five Year Transitions—Moved across State					
	50-59	60-69	70-79	80+	Total
All owners who move	6.61	7.88	-4.43	1.60	5.29
Owner to renter	5.32	3.83	-11.20	9.92	0.60
Owner to owner	6.63	8.89	-3.35	1.53	6.34
All renters who move	3.65	9.69	9.68	-7.30	6.06
Renter to renter	1.47	11.86	4.05	-6.64	7.28
Renter to owner	5.61	6.55	19.58	NA	4.85
All movers	5.56	7.51	-1.07	-3.16	4.87

PSID Ages 50+ 1968-1999. NA = empty cell

Table 6.B
Differences in Mean January Temperature by Region in UK among Movers by Age Group
Five year transitions- All movers

	50-59	60-69	70-79	80+	Total
All owners who move	-0.01	0.05	0.01	-0.04	0.01
Owner to renter	0.00	-0.06	0.31	*0.11*	0.07
Owner to owner	0.00	0.06	-0.08	*-0.39*	0.00
All renters who move	-0.03	0.00	0.03	0.03	0.00
Renter to renter	0.00	0.01	0.03	0.03	0.01
Renter to owner	-0.11	-0.07	*0.00*		-0.09
All movers	-0.01	0.03	0.02	0.00	0.01

Five year transitions- moved across Region*

	50-59	60-69	70-79	80+	Total
All owners who move	-0.03	0.24	0.06	*-0.15*	0.07
Owner to renter		*-0.25*	*1.23*		0.35
Owner to owner	0.01	0.30	-0.34		0.00
All renters who move	-0.29	*0.07*			-0.03
Renter to renter	*0.00*	*0.12*			0.25
Renter to owner	*-0.60*				-0.72

Empty cells are where the cell size is less than 10. Grey text indicates a cell size of between 30 and 50 and grey italicized text indicates a cell size of between 10 and 30

Table 6.C
Differences in Hours of January Sunlight Hours- United States

Five Year Transitions—All Movers					
	50-59	60-69	70-79	80+	Total
All owners who move	4.00	4.52	-2.43	0.08	2.87
Owner to renter	5.17	-0.58	-4.15	-0.07	0.25
Owner to owner	4.14	5.72	-2.00	-0.19	3.76
All renters who move	1.45	3.00	2.77	-4.95	1.67
Renter to renter	0.27	2.17	0.27	-5.47	0.32
Renter to owner	3.40	4.23	9.65	0	4.21
All movers	2.97	3.49	-0.61	-2.58	2.18

Five Year Transitions—Moved across State					
	50-59	60-69	70-79	80+	Total
All owners who move	20.83	19.98	-14.69	0.49	14.55
Owner to renter	26.01	-3.17	-30.13	-2.03	1.64
Owner to owner	21.69	24.15	-12.81	-0.65	18.33
All renters who move	13.75	21.25	27.21	-45.99	14.35
Renter to renter	4.80	22.50	3.29	-44.49	3.96
Renter to owner	20.67	17.08	57.92		22.80
All movers	18.94	18.79	-4.35	-19.81	13.49

PSID Ages 50+ 1968-1999.

Table 6.D
Differences in Hours of January Sunshine Hours- Britain

Five year transitions- All movers

	50-59	60-69	70-79	80+	Total
All owners who move	-0.31	-0.35	0.08	0.65	-0.22
Owner to renter	-0.18	-1.17	1.57	*0.70*	0.06
Owner to owner	-0.33	-0.27	-0.39	*-0.40*	-0.32
All renters who move	-0.23	-0.12	0.08	0.02	-0.11
Renter to renter	-0.06	-0.09	0.09	*0.02*	-0.03
Renter to owner	-0.63	-0.23	*0.00*		-0.46
All movers	-0.29	-0.26	0.08	0.31	-0.18

Five year transitions- moved across Region*

	50-59	60-69	70-79	80+	Total
All owners who move	-2.08	-1.76	0.37	*2.65*	-1.22
Owner to renter		*-4.55*	*6.29*		*0.30*
Owner to owner	-2.04	-1.41	-1.73		-1.76
All renters who move	*-2.27*	*-2.11*			-1.67
Renter to renter	*-0.94*	*-1.85*			-0.59
Renter to owner	*-3.44*				*-3.69*
All movers	-2.12	-1.81	0.54	*2.55*	-1.30

*Weather region - which is slightly more broad than standard region (8 categories rather than 12)

Table 7.A
Differences in Average State Taxes by State in USA among Movers by Age Group

Five Year Transitions—All Movers

	50-59	60-69	70-79	80+	Total
All owners who move	-0.002	-0.002	-0.001	-0.001	-0.002
Owner to renter	-0.003	-0.004	-0.004	0.001	-0.003
Owner to owner	-0.002	-0.002	0.000	-0.004	-0.002
All renters who move	-0.003	-0.001	-0.001	0.001	-0.002
Renter to renter	-0.001	-0.001	-0.001	0.002	-0.001
Renter to owner	-0.005	-0.001	-0.000	-0.000	-0.003
All movers	-0.002	-0.001	-0.001	0.001	-0.002

Five Year Transitions—Moved across State—All Movers

	50-59	60-69	70-79	80+	Total
All owners who move	-0.006	-0.003	-0.000	0.002	-0.004
Owner to renter	-0.010	-0.011	-0.006	0.022	-0.008
Owner to owner	-0.006	-0.002	0.004	-0.007	-0.004
All renters who move	-0.011	-0.006	-0.011	0.015	-0.007
Renter to renter	-0.000	-0.009	-0.018	0.015	-0.005
Renter to owner	-0.015	-0.003	-0.000		-0.009
All movers	-0.007	-0.004	-0.003	0.007	-0.005

Five Year Transitions—Moved across State—Highest Income Movers

	50-59	60-69	70-79	80+	Total
All owners who move	-0.008	-0.010	0.045	0.059	-0.005
Owner to renter	-0.025	-0.055			-0.029
Owner to owner	-0.005	-0.009	0.042	0.071	-0.004
All renters who move	-0.015	-0.018	0.010	-0.001	-0.013
Renter to renter	0.001			-0.001	-0.001
Renter to owner	-0.016	-0.018	0.010		-0.014
All movers	-0.010	-0.012	0.036	0.026	-0.007

PSID Ages 50+ 1968-1999. NA = empty cell

Table 7.B
Change in Property Tax Rank by State

Five Year Transitions—All Movers

	50-59	60-69	70-79	80+	Total
All owners who move	0.59	1.18	-0.58	-0.17	0.55
Owner to renter	0.15	-0.45	-1.28	0.14	-0.43
Owner to owner	0.60	1.54	-0.05	-0.06	0.82
All renters who move	0.05	0.60	0.61	-0.24	0.29
Renter to renter	-0.02	0.29	0.04	-0.22	0.07
Renter to owner	0.10	1.15	3.26	0	0.70
All movers	0.43	0.80	-0.17	-0.25	0.41

Five Year Transitions—Moved across State

	50-59	60-69	70-79	80+	Total
All owners who move	2.99	5.29	-3.54	-1.03	2.74
Owner to renter	0.77	-2.47	-9.28	3.95	-2.75
Owner to owner	3.03	6.58	-0.32	-0.21	3.97
All renters who move	0.47	4.15	6.02	-2.21	2.50
Renter to renter	-0.42	2.86	0.44	-1.77	0.86
Renter to owner	0.65	4.66	18.93		3.83
All movers	2.68	4.32	-1.20	-1.93	2.50

PSID Ages 50+ 1968-1999. 1= highest property tax rate: 50 is lowest property tax rate. A positive number equates to a reduction in the state property tax.

Table 8.A
Differences in Average State Housing Costs per Room by State in USA among Movers by
Age Group

	Five Year Transitions—All Movers				
	50-59	60-69	70-79	80+	Total
All owners who move	-90	-417	-45	-302	-200
Owner to renter	-38	289	-329	-115	-57
Owner to owner	-89	-549	53	-1047	-257
All renters who move	-8	-11	39	39	3
Renter to renter	-2	-1	34	46	10
Renter to owner	-17	-34	69	0	-12

	Five Year Transitions—Moved across State				
	50-59	60-69	70-79	80+	Total
All owners who move	-451	-1,865	-274	-1,829	-998
Owner to renter	-188	1,574	-2,389	-3,302	-368
Owner to owner	-442	-2,342	338	-3,640	-1,231
All renters who move	-83	-70	387	354	23
Renter to renter	-45	-5	389	354	124
Renter to owner	-104	-132	502	NA	67

PSID Ages 50+ 1968-1999.

Table 8.B

Differences in Average Regional Housing costs per Room by Region in Britain among Movers by Age Group Age group

Five year transitions- All movers

	50-59	60-69	70-79	80+	Total
All owners who move	899	466	594	1467	730
Owner to renter	1816	-6	*998*	*1731*	1103
Owner to owner	926	478	417	*242*	693
All renters who move	19	-39	12	143	5
Renter to renter	20	-81	3	*155*	-11
Renter to owner	12	164	*135*		68
All movers					

Five year transitions- moved across Region

	50-59	60-69	70-79	80+	Total
All owners who move	-1,188	-1,619	-720	*2,733*	-1,097
Owner to renter	*1,569*	*-2,656*	*2,658*		1,023
Owner to owner	-747	-1,677	-1,827		-1,298
All renters who move	-43	*-244*	*95*		-99
Renter to renter	*-68*	*-298*	*111*		-141
Renter to owner	*-25*				*-32*
All movers					

Empty cells are where the cell size is less than 10. Grey text indicates a cell size of between 30 and 50 and grey italicized text indicates a cell size of between 10 and 30

Table 9.A
Differences in Actual Housing Costs per Room by State in USA among Movers
by Age Group

1. Housing Costs

Five Year Transitions—All Movers

	50-59	60-69	70-79	80+	Total
Owner to owner	7,931	-9,682	-1,728	-6,154	196
Renter to renter	183	-125.2	762.3	1753	354.0

Five Year Transitions—Moved across State

	50-59	60-69	70-79	80+	Total
Owner to owner	-23,383	-26,781	8,765	-4,681	-20,906
Renter to renter	797	-70	272	1,546	406

Five Year Transitions—Moved within State

	50-59	60-69	70-79	80+	Total
Owner to owner	16,032	-4,316	-3,690	-6,753	5,913
Renter to renter	151	-132	820	1,790	350

2. Housing Costs Per Room

Five Year Transitions—All Movers

	50-59	60-69	70-79	80+	Total
Owner to owner	2434.7	-55.0	1136.1	-362.9	1317.8
Renter to renter	32.1	-31.6	747.4	1895.6	320.0

Five Year Transitions—Moved across State

	50-59	60-69	70-79	80+	Total
Owner to owner	-469.8	-2002.6	3094.6	-1699.8	-776.2
Renter to renter	354.5	-98.5	-100.7	1402.7	159.9

Five Year Transitions— Moved within State

	50-59	60-69	70-79	80+	Total
Owner to owner	3,178	550	773	190	1,880
Renter to renter	16	-24	849	1950	335

PSID Ages 50+ 1968-1999.

Table 9.B

Differences in Actual Housing Costs per Room by State in Britain among Movers by age group

1. Housing costs

	50-59	60-69	70-79	80+	Total
		Five year transitions- All movers			
Owner to owner	-2,349	-9,874	-14,064	*-9,262*	-6,708
Renter to renter	-101	127	76	*4,214*	319
		Five year transitions - Moved across region			
Owner to owner	-11,822	-21,300	-17,829		-15,377
Renter to renter	*-1,026*	*-155*	*-454*		-376
		Five year transitions - Moved within region			
Owner to owner	384	-6,125	-12,519	*-21,786*	-3,923
Renter to renter	-46	167	110	*4,479*	382

2. Housing costs per room

	50-59	60-69	70-79	80+	Total
		Five year transitions- All movers			
Owner to owner	2012.9	3374.2	3932.3	*-171.0*	2718.7
Renter to renter	94.5	249.3	34.4	*4616.9*	427.7
		Five year transitions - Moved across region			
Owner to owner	961.6	-66.7	-611.7		150.8
Renter to renter	*-344.1*	*467.2*	*-77.9*		259.8
		Five year transitions - Moved within region			
Owner to owner	2316.1	4503.1	5797.1	*3585.7*	3543.7
Renter to renter	121.2	217.6	41.8	*4810.1*	443.2

Empty cells are where the cell size is less than 10. Grey text indicates a cell size of between 30 and 50 and grey italicized text indicates a cell size of between 10 and 30

Table 10
Probit Models of the Probability of Moving Between Waves—Unites States
Five Year Horizon—Owners

	Any mobility		Cross-state mobility		Cross-state mobility if a mover	
	df/dx	z	df/dx	z	df/dx	z
Education 13-15 baseline	.01238	3.68	.00732	2.70	.00042	0.03
Education ≥ 16 baseline	.02507	3.98	.00328	1.25	-.00502	0.39
Year at baseline	-.00462	14.56	-.00105	7.40	-.00215	3.04
Age	-.00243	6.09	-.00021	1.13	-.00007	0.07
Age squared	3.09e-06	6.42	1.41e-07	0.74	-6.75e-07	0.70
≥ age 70	.05913	2.21	-.01241	1.19	-.07739	1.47
ln income at baseline	.01444	3.63	.00889	5.00	.02541	2.99
Negative income	.16122	2.88	.26092	4.60	.35004	2.44
Married/single	.12704	15.41	.01966	5.00	-.01305	0.86
Single/married	.36939	16.66	.05259	5.60	-.02742	1.09
Single/single	.05564	9.89	.00652	2.69	-.00343	0.28
Kids/no kids	.09024	11.67	.02797	6.43	.03971	2.10
No kids/kids	.12005	7.80	.03411	4.38	.07869	2.41
No kids/no kids	.08738	16.43	.02220	8.90	.04439	3.30
Change in household size	-.00341	1.25	.00564	3.87	.02014	3.58
Work/not work	.05649	9.29	.03529	11.64	.11844	8.68
Not work/work	.07061	5.42	.02327	3.60	.04076	1.47
Not work/not work	.04524	8.67	.02209	9.23	.06636	5.47
ln house value (baseline)	.02519	5.93	.00975	4.87	.02457	2.97
ln home equity (baseline)	-.05353	15.35	-.00907	6.00	.00655	0.97
(Have negative home equity)	-.14955	13.41	-.02578	5.26	.03182	1.11
Mean January temperature	.00122	4.38	-.00048	4.13	-.00409	6.99
≥70 x Mean January temp	.00003	0.06	.00079	3.21	.00397	3.23
Mean January sunshine	9.74e-06	0.12	.00004	1.08	.00037	2.23
≥70 x Mean January sunshine	.00019	1.01	.00012	1.55	.00027	0.76
Cost of housing per room	3.86e-06	9.32	1.39e-06	8.13	3.96e-06	4.19
≥70 x Cost of housing per room	-2.86e-06	3.41	-1.22e-06	3.27	-3.53e-06	1.76
Average tax rate	.15478	3.50	.03845	2.05	.12908	1.32
≥ 70 x Average tax rate	-.33415	3.86	-.12285	3.35	-.33853	1.71
Property tax rate	-.00016	0.90	.00004	0.45	.00039	0.96
≥70 x Property tax rate	.00034	0.85	-.00013	0.78	-.00078	0.87
Public or subsidized housing	-.04154	3.50	-.00796	1.64	-.05484	2.14
≥70 x Public or sub housing	.04725	1.68	.00696	0.53	-.00293	0.05

Table 11
Probit Models of the Probability of Moving Between Waves—Unites States
Five Year Horizon—Renters

	Any mobility		Cross-state mobility		Cross-state mobility if a mover	
	df/dx	z	df/dx	z	df/dx	z
Education 13-15 baseline	.02992	1.63	-.00724	1.10	-.02478	2.00
Education ≥ 16 baseline	.01005	0.41	.00115	0.14	-.00211	0.14
Year at baseline	-.00017	0.22	.00054	1.91	.00067	1.21
Age	-.01118	6.65	-2.84e-06	0.01	.00094	1.32
Age squared	.00023	4.14	7.16e-08	0.18	-9.22e-07	1.25
≥ age 70	-.15366	2.12	.-1476	0.54	.02874	0.53
ln income at baseline	.01508	1.90	.01599	3.92	.02719	3.57
Negative income	.14017	1.70	.33729	2.93	.44235	2.68
Married/single	.17557	9.09	.02491	2.80	.02079	1.40
Single/married	.23759	8.21	.03278	2.59	.00588	0.31
Single/single	.03878	3.43	-.00021	0.05	-.00169	0.19
Kids/no kids	.05142	3.00	.03019	3.42	.04435	2.75
No kids/kids	.16986	6.05	.13197	6.86	.16579	5.53
No kids/no kids	.06131	5.07	.03399	6.54	.05335	5.38
Change in household size	-.00546	1.14	-.00157	0.68	-.00191	0.48
Work/not work	.09071	5.93	.02114	3.44	.02002	1.83
Not work/work	.06361	2.02	.03249	2.26	.04012	1.57
Not work/not work	.03705	2.97	.00236	0.45	-.00357	0.36
Mean January temperature	.00169	2.22	-.00049	1.67	-.00082	1.63
≥70 x Mean January temp	-.00076	0.47	.00095	1.61	.00146	1.33
Mean January sunshine	-.00008	0.31	.00008	0.72	.00009	0.48
≥70 x Mean January sunshine	.00163	3.06	-.00004	0.19	-.00003	0.10
Cost of housing per room	.00004	4.06	4.52e-06	1.34	2.71e-06	0.42
≥70 x Cost of housing per room	-.00001	0.64	-8.08e-06	1.29	-.00002	1.41
Average tax rate	-.69107	5.93	.07217	1.63	.31640	3.55
≥ 70 x Average tax rate	-.35519	1.23	-.09094	0.90	-.18295	0.86
Property tax rate	.00131	3.12	.00020	1.24	.00009	0.30
≥70 x Property tax rate	-.00636	6.09	-.00163	4.05	-.00196	2.47
Public or subsidized housing	-.05095	1.61	.00172	0.13	.01213	0.50
≥70 x Public or sub housing	.25917	3.66	-.00185	0.06	-.04983	0.84

Table 12
Probit Models of the Probability of Moving Between Waves—Britain
Five Year Horizon—Owners

	Any mobility		Cross-region mobility		Cross-region mobility if a mover	
	df/dx	z	df/dx	z	df/dx	z
Education: A-level	.01985	1.89	.00570	1.28	.01962	0.56
Education: Higher	-.01363	-1.66	.00408	1.16	.10640	2.91
Year at baseline	-.00244	-1.27	-.00169	-2.33	-.01627	-2.30
Age	-.02315	-4.75	-.00358	-1.93	.02147	1.20
Age squared	.00016	4.19	.00002	1.39	-.00020	-1.43
≥ age 70	-.42310	-2.09	-.30878	-1.02	-.93379	-5.30
ln income at baseline	-.00261	-0.47	-.00224	-1.15	-.01746	-0.99
Negative income	-.04235	-0.43				
Married/single	.15027	6.31	.03458	2.98	.03413	0.75
Single/married	.32198	5.39	.04786	1.72	.00584	0.09
Single/single	.03880	4.61	.00373	1.23	-.00413	-0.16
Kids/no kids	.01618	0.56	-.00815	-0.95	-.07478	-0.87
No kids/no kids or No kids/kids	.02763	1.45	.01063	1.98	.09913	1.81
Change in household size	.01169	2.35	.00292	1.56	.00350	0.26
Work/not work	.06172	5.29	.07329	5.96	.33147	6.73
Not work/work	.05368	2.19	.04080	1.98	.24241	2.42
Not work/not work	.02663	2.96	.03229	8.06	.24959	7.70
ln house value (baseline)	.07155	6.33	.00900	1.91	.01789	0.45
ln home equity (baseline)	-.05580	-6.27	-.00350	-0.89	.01652	0.54
Have negative home equity	-.11880	-39.78	-.01408	-1.27	.20977	0.41
Mean January temperature	-.03025	-5.12	-.00923	-3.72	-.04720	-2.16
≥70 x Mean January temp	.02554	2.42	.00976	2.51	.08552	2.23
Mean January sunshine	-.00024	-0.25	.00187	4.08	.01565	4.23
≥70 x Mean January sunshine	-.00295	-1.52	-.00156	-2.05	-.00988	-1.41
Cost of housing per room	.00000	4.31	2.56E-06	6.46	.00002	5.92
≥70 x Cost of housing per room	-9.21E-07	-0.37	-1.04E-06	-1.34	-.00001	-1.82
Band d council tax rate in region	.00008	1.35	-.00001	-0.47	-.00015	-0.67
≥ 70 x Band d council tax rate	-.00002	-0.69	.00001	0.96	.00012	0.92
Poll tax regime (1991 and 1992)	-.00535	-0.17	-.01508	-3.03	-.14994	-3.39
Public or subsidized housing	-.17256	-4.54	.01047	0.78	.48082	3.69
≥70 x Public or sub housing	.02191	0.25	.01350	0.48	.22170	0.77

Table 13
Table 13
Probit Models of the Probability of Moving Between Waves—Britain
Five Year Horizon—Renters

	Any mobility		Cross-region mobility		Cross-region mobility if a mover	
	df/dx	z	df/dx	z	df/dx	z
Education: A-level	.07394	2.12	.01178	1.37	.05389	1.17
Education: Higher	.09715	2.46	.02429	1.82	.08942	1.57
Year at baseline	.00102	0.26	.00128	2.12	.01211	2.64
Age	-.00964	-1.16	.00320	2.07	.02672	2.22
Age squared	.00007	1.11	-.00002	-2.01	-.00020	-2.17
$\geq$ age 70	.98095	12.08	-.00609	-0.05	.26775	0.08
ln income at baseline	.06586	4.78	.00312	1.56	-.01201	-0.79
Negative income	.80562	19.93				
Married/single	.14841	3.45	.02458	1.75	.13059	1.77
Single/married	.31665	3.93	.06957	1.74	.12991	1.57
Single/single	-.00430	-0.32	-.00191	-0.94	-.01062	-0.67
Kids/no kids	-.11378	-3.91	-.00123	-0.21	-.00694	-0.15
No kids/no kids or No kids/kids	-.06628	-1.24	.00200	0.50	-.00675	-0.14
Change in household size	.03682	3.36	-.00311	-2.18	-.02237	-2.38
Work/not work	.07940	2.71	.00422	0.82	-.00379	-0.15
Not work/work	.08008	1.71	-.00427	-1.86	-.04106	-3.76
Not work/not work	.02650	1.26	.00153	0.54	-.01427	-0.47
Mean January temperature	.03979	3.13	.00134	0.70	-.00686	-0.48
$\geq$70 x Mean January temp	-.03347	-1.70	.00060	0.18	-.00110	-0.03
Mean January sunshine	-.00497	-2.63	.00089	2.77	.01025	4.08
$\geq$70 x Mean January sunshine	.00310	0.95	-.00044	-0.70	-.00697	-1.46
Cost of housing per room, £annual	-2.17E-06	-0.98	4.01E-07	1.57	4.23E-06	1.90
$\geq$70 x Cost of housing per room	1.72E-06	0.43	1.18E-07	0.25	.00001	1.35
Band d council tax rate in region	-.00001	-0.06	.00001	0.36	.00006	0.44
$\geq$ 70 x Band d council tax rate	-.00019	-3.68	-.00002	-2.31	-.00005	-0.88
Poll tax regime (1991 and 1992)	-.01800	-0.31	.01579	0.58	.17358	0.81
Public or subsidized housing	-.03763	-0.44	.04980	3.72	.47163	4.67
$\geq$70 x Public or sub housing	-.19077	-1.28	.00744	0.31	.15624	0.77
Subsidised renter	-.11529	-6.12	-.01308	-2.54	-.05140	-2.26
100% housing benefitr recipient	.11441	6.27	.01731	2.98	.07405	2.85
Partial housing benefit recipient	.05522	3.39	.01594	3.21	.08774	2.69

Figure 1

Normalised change in number of rooms by age, movers only

— US without covariates
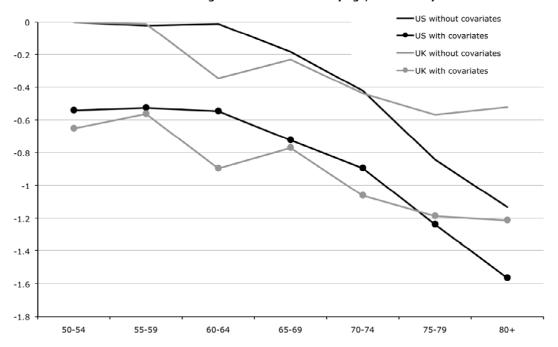—●— US with covariates
— UK without covariates
—●— UK with covariates

Figure 2

Normalised change in number of rooms by age, all households

— US without covariates
—●— US with covariates
— UK without covariates
—●— UK with covariates