Housing Tenure Transitions of Older Households: Life Cycle, Demographic, and Familial Factors

by

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Abstract

Understanding the housing choices of the older households will grow in importance as the baby boom generation starts to retire. This proposed analysis utilizes a rich longitudinal data set (PSID) to provide insight into the reasons that older households leave homeownership to become renters. Because of the richness of the data, this analysis is able to control for life transitions, a household's income and wealth, and connection to one's children in predicting when a homeowner will become a renter. The results have important implications for the life cycle hypotheses and the relationship between bequest motivated savings and housing tenure choice. We find that age is not related directly to housing tenure choice for older households. Instead, having lower health status and being a single head of household is an important predictor of housing tenure transitions. At the same time, very few life changing events immediately lead a homeowner to become a renter. Finally, living next to one's children lowers the probability of becoming a renter, and having richer children increases the probability of becoming renter and therefore consuming one's housing wealth.

The aging of the baby boom generation is predicted to have wide ranging consequences across many sectors of the economy. While a lot of the focus has been placed on the implications of this demographic transition on the federal budget obligations, there has been less recent attention on the potential impacts on housing markets (Myers and Ryu, 2008). Evidence over the past 4 decades in the US suggests that homeownership among the elderly has been fluctuating, but with a gradual upward trend since 1980 (Figure 1). In 1980, the homeownership of the elderly over age 75 near 70 %, and by 2003, it was at 78%. While these trends are suggestive that we are unlikely to observe large declines in homeownership as the baby boom generations ages, there remains much unknown about the reasons that the elderly make transitions from homeownership. Despite the fact that elderly households have had increasing rates of homeownership over the past decades, there remains a peak around age 75, and a decline in homeownership rates thereafter (Figure 1). The rate of decline after age 75 may have slowed in recent years, but it remains to be seen it whether this trend will continue as the baby boomers move to retirement age.

Research has suggested that the reasons that older households will transition from homeownership typically fall into two categories (Jones, 1997). The first category is based on the lifecycle hypothesis (Yaari, 1965), which predicts that households will desire to consume a portion if not all of their accumulated wealth over their lifetime. While a few studies have found support for this hypothesis (Jones, 1997) as part of the explanation for downsizing, many studies (e.g. Hurd, 1990) find that households may not view housing wealth as retirement wealth at all, and therefore are unlikely to liquidate housing wealth. Instead, households may view housing wealth as a source of

precautionary savings (Sheiner and Weil, 1993) or bequeathable wealth. In either case, households would not be likely to consume out of housing wealth during retirement years, or would consume out of financial wealth first.

A second set of explanations focus on the factors that may change a household's taste for homeownership or that may induce a change in housing tenure status (Venti and Wise, 1990). Such factors could be changes in marital status, health status, or the loss of a spouse that may lead a household to transition from homeownership despite the fact that they may not be liquidity constrained or have a desire to spend down their wealth (Feinstein and McFadden, 1989). Neglected in past studies of tenure transitions among older households are controls for the circumstances of their children. Presumably, the financial status of a household's children as well as the location of one's children can influence the decision to transition from homeownership. Either through interaction with a household's saving for bequest motives or through a desire to live near children, an older household may make the tenure transition decision based on these additional factors.

This study builds upon past literature on elderly tenure transitions by estimating a discrete hazard model to estimate the likelihood that a homeowner will become a renter. Using data from the Panel Study of Income Dynamics 1968-2005 (PSID), we are able to include a fuller set of control variable that have past studies. In addition to controlling for various household demographic transitions, we include important controls for household wealth and information about the children of older households. Beginning in 1984, the PSID started collecting information on household financial wealth, and most past studies lack good information to capture a household's entire financial portfolio over

time. In addition, we are able to link households with their children. In so doing, we can test whether living close to one's children will influence the desire to move, and we can test whether the financial status of one's children affects the decision to exit homeownership. Finally, we estimate models that test for the likelihood a household will downsize or take out a loan as a means of consuming housing wealth.

Background and theory

The most common model that has been tested to explain household consumption patterns as they age is the life cycle model. Using insights from Jones (1997), Artle and Variaya (1978), and Venti and Wise (1990), we develop a model that provides for both life cycle and non life cycle reasons that a household may choose to transition from homeownership. The model below will then provide a basis for the reduced form, empirical specification that will be estimated. In a standard life cycle model (e.g., Jones 1997), it is assumed that at each age, the household will maximize

$$E_t \sum_{t=n}^{N} D_t U(C_t, H_t, B)/(1+\delta)^{t-n} \quad (1)$$

subject to

$$W_t = W_{t-1}(1+r) + A_t + L_t - M_t - C_t - H_t - B. \quad (2)$$

In this formulation, C_t is consumption net of the consumption of medical expenses (M_t) H_t is the desired level of the consumption of housing services, and B is the desired level of bequests. D_t is a state variable that is equal to 1 if the individual is alive at time t and equal to 0 otherwise, and N is maximum number of years that one could possibly expect to live. Finally, W_t consists of both housing and nonhousing wealth, A_t is all forms of annuity based income, L_t consists of any labor earnings, and r is a real after-tax return.

A standard life cycle model will predict that at some point, the consumer will reach the stage where

$$C_t + H_t + M_t + B > rW_{t-1} + A_t + L_t. \quad (3)$$

After this point, the household will finance desired spending by spending W_t, and the exact shape of the consumption path is determined by household preferences for consumption and bequests, and the other parameters of the model. As the Artle and Variaya (1978) model predicts, households with no bequest motives will be constrained by the objective $W_N = 0$, and will at some point sell their principal residences and become renters.

The model above differs from the standard model described in Jones (1997) because households explicitly have preferences over the desired level of housing consumption at time T and of the desired level of bequests. The model outlines above makes no predictions about what wealth will be spent first, and as Hurd (1990) suggests housing wealth may be spent last due to issues of transactions costs, precautionary saving motives, and desired bequests. Also, as Levin (1998) has noted, because Medicaid rules for nursing home care coverage exempts a principal residence, households are likely to spend other financial wealth before selling their principal residence. Therefore, decisions to reduce housing wealth may be very different from decisions to reduce other financial wealth.

In addition, preferences for housing consumption may be a function of many items not traditionally included in life cycle models of consumption. As a household's health status changes and as a household's family circumstances change, they may have reduced demand for housing. Given this reduced demand, they may sell their house and either

buy a smaller one or choose to rent. For example, an older household member may desire to live closer to their children if a spouse has just died, or if health status has fallen. For many, the transaction costs of selling a house may be an important impediment to consuming housing wealth. While some of the financial impediments to consuming housing wealth have reduced in the past decades, the psychological desires to live near their children would not be affected by changes in financial markets.

The final variable in the model that can affect a household's desire to consume out of housing wealth is the desired level of bequests. The mechanism by which desired bequests may influence housing tenure and the adjustment of housing wealth is likely to be indeterminate. Previous literature suggests that bequest motivations are likely tied to a household's relationship with their children and their children's wealth (McGarry, 1999). While in this study, we can measure factors like marital status and geographic proximity to their children, we will not be able to measure directly an individual's relationship with their children. Instead, we will be able to measure the relative financial well being of an individual's children.

Previous literature suggests two things about the relationship between a parent's desired level of bequests and their children's financial status. First, research (McGarry, 1999; Kopczuk and Lupton, 2006) suggests that if children have more wealth, parents are likely to reduce bequests, although many of these results are insignificant. The implication for this research is that a household may be more likely to hold on to their home as a source of bequeathable wealth if their children have more wealth, and more likely to consume their own wealth. On the other hand, if children have less wealth, McGarry's (1999) results demonstrate that parents are more likely to give their wealth as

an *inter-vivo* transfer. Because these effects are in opposite direction, theory and past evidence does not yield a prediction as to how the financial status of children are likely to affect a household's tenure decision over the life cycle.

Data and Methodology

In this study, we utilize the Panel Study of Income Dynamics (PSID) as collected by the Survey Research Center at the University of Michigan. PSID is a longitudinal data set beginning in 1968 with approximately 4,800 families and provides detailed family histories that include housing choice. In addition to families in the original sample in the 1968 PSID data, the panel contains sample families that split off from the original 1968 families in later years and Latino sample families that are recently added. While the PSID is a representative sample of U.S. individuals (men, women, and children) and the family units in which they reside, it over-samples low-income families. To account for the oversampling, all estimates of our analysis are weighted using the PSID family weight.

Although the PSID is not a panel of older households, it contains a fairly large number of older households, including some who are very old. We conduct our analysis with the family as the unit of analysis. Because the PSID data exist at both the individual and family levels, we were able to assign a unique ID for each family unit and observe it over years. Therefore we are able to capture extensive demographic transitions such as the death of a spouse and divorce. As these transitions occur, we made the following assumptions for the sample. After the head of household dies, the wife would become the new head, and the observation remains classified as the same family unit. When the divorce happens, we follow the head of the original family unit if further observations of

his exist after the divorce. In this case, observations of the wife from the original family unit would show up as a new family unit. If no further observations of the head exist after the divorce, we follow the wife for observations of the original family unit.

The PSID is also ideally suited for testing our hypothesis on the relationship between the tenure transition of older households and the financial well-being of their children. The Family Identification Mapping System (FIMS) is used to merge data on the children of older households. The FIMS provides identification codes for each of family members by the type of relationship (e.g. biological parent, non-biological parent, biological grandparent, full sibling, half sibling). This FIMS ensures that our linking of families to their children is straightforward and accurate.

In most years, the PSID contains good information on housing status, including tenure, the value of the home, and mortgage-related questions. The PSID also has excellent variables describing respondents' income and demographics. Because of the longitudinal nature of the data, we use a permanent income measure as the variable indicating the income of the household, using a 5-year moving average. The demographic variables of the older households used in our analysis are age, education, race, marital status, retirement status, and a subjective measure of the head's physical limitation. Since housing market dynamics can affect the tenure decisions of older households, we also capture geographic heterogeneity in our analysis. In the public release sample of the PSID, we are able to obtain the information of the state where families reside and a variable indicating the size of the largest city in the county of residence. Finally, demographic information related to the children of older households are primarily focused on their financial well-being (income and wealth), and their

geographic proximity to children (a categorical variable indicating whether the older household have their children who live in the same state). The complete list of variables is presented in Table 2.

For a portion of the times series, the PSID also provides detailed wealth information, which is important in understanding the timing of housing tenure choices. The PSID wealth data have been found to be of high quality and correspond well with the wealth data from the Survey of Consumer Finance and form Health Retirement Study (Juster, Stafford, and Smith, 1999). Housing wealth is equal to the home equity reported in this wealth data and financial wealth is measured as the sum of shares of stock in publicly held corporations, mutual funds or investment trusts, including stocks in IRAs, checking and savings accounts, and etc. While we are able to compute housing wealth for the entire sample period using the self reported housing value and the principal remaining, financial wealth can be only be calculated after 1984. In addition, the PSID wealth supplements are in 5 year intervals from 1984-1999, and then every other year after 1999. Thus, the financial wealth data is excluded from the analysis before 1984, and after 1984, we impute the financial wealth for those years that the data does not exist using a linear trend.

For the model described below, we restrict the sample to households whose head or wife is 50 or more years old. Households are included in the sample if household head is a homeowner at least once after they are 50 years old. Then, each household is followed throughout the period until they exit homeownership, die (not considered as a housing tenure transition to rental status), or are completely dropped from the PSID sample. For each household, periods that could not be followed (e.g., become institutionalized, simple

non-response, or for some other reason were lost to the sample) were excluded from the analysis (5% of observations are dropped from this exclusion). There are a total of 5,097 that meet the initial criterion, but the sample size used for the model estimated below is reduced to 4,018 after excluding families who were renters continuously after the age of 50.

Methodology

To determine the influence of both life-cycle determinants of housing tenure and of the influence of various taste parameters for homeownership, we conduct survival analysis, which examines and models the time it takes for events of transitions from homeownership to occur. For this study, we focus on the relationship between survival (remaining as homeowners) and predictors such as socio-economic and demographic factors of households. In our primary analysis, we estimate a Cox (1972) proportional hazard model, a broadly applicable and the most widely used method of survival analysis.

In the Cox proportional hazard model estimated here, T represents the time until a change in tenure transition from homeownership occurs. In this case the reference point will be the beginning year of each family in our sample. Also, let t represent calendar time measured from that same reference point. We regard T as a random variable with cumulative distribution function $P(t) = \Pr(T \leq t)$ and probability density function $p(t) = dP(t)/dt$. The survival function $S(t)$ is the complement of the distribution function, $S(t) = \Pr(T > t) = 1 - P(t)$. The probability that a household remains in its initial ownership status at calendar time t, $\Pr(T > t)$, must be determined indirectly by estimating the hazard function h, the likelihood that $T > t$ given the household achieves a change in

tenure status in a very small interval from t to $t + \Delta t$. This hazard rate can be made a function of a set of time-varying covariates and specified more formally as

$$h(t) = \lim_{\Delta t \to 0} \frac{\Pr[(t \leq T < t + \Delta t) | \mathrm{T} \geq \mathrm{t}]}{\Delta t} \qquad (4)$$

As mentioned, survival analysis is used in this study in order to examine the relationship of the survival distribution to covariates. Based on Eq. (4), this analysis utilizes the specification of a linear-like model for the log hazard. The model based on the exponential distribution may be written as

$$\log h_i(t) = \alpha + \beta_1 x_{i1} + \beta_2 x_{i2} + \cdots + \beta_k x_{ik}$$

or equivalently,

$$h_i(t) = h_0(t) \exp(\beta_1 x_{i1} + \beta_2 x_{i2} + \cdots + \beta_k x_{ik}) \qquad (5)$$

that is, as a linear model for the log-hazard or as a multiplicative model for the hazard. Here, i is a subscript for observation, and the x's are the covariates. In the Cox proportional hazard model, the baseline hazard function ($\alpha(t) = \log h_0(t)$) is left unspecified. In Eq. (5), $h_0(t)$ is the cumulative hazard model that returns the estimate of the baseline survivor function, $S_0(t)$. The models are estimated in STATA 10 using the stcox command.

When estimating the basic model, we use a sample of homeowners over the age of 50 at t = 1. A failure is defined as changing housing tenure status from owning to renting.[1] As mentioned previously, when a household head passes away, we do not assume a tenure transition. If the household head is married when he/she passes away, then we switch the head status to the surviving spouse, and include controls for the timing

[1] At this point in the research design, household who experience multiple spells are treated as independent observations, and therefore each failure is treated independently.

of the death of the spouse. If there is no surviving spouse, then the homeownership spell ends as a right censored spell. However, if a household was an owner, and then moves in with the child who is also a homeowner, this is classified as a transition from homeownership. Spells can start at any age during the study period (1968-2005), and will be right censored if the household head remains a homeowner in 2005. Households may enter the estimation sample as a homeowner for two primary reasons. They can enter the sample by marrying a sample household that was previously not a homeowner, and they can enter the sample as a homeowner at age 50. In order to control for some of the characteristics of the household as they enter the sample, we include variables that denote their previous tenure history and their marital status at age 50 (Hayward, 2003). In some cases, this information is missing, and categorical variables are included to denote the missing information.

Results

Summary statistics

As highlighted in Figure 1, the homeownership rates of older households have been increasing slightly over the past two decades. This may reflect a change in preferences, or may simply reflect the increasing secular trend in homeownership at all ages. Despite the fact that overall homeownership rates are high, there remain significant changes in homeownership status in the sample. As indicated in Table 3, over twenty five percent of the sample changes tenure status at least once after age 50. Almost fifteen percent of the sample makes a single transition from owning to renting, and another three and half percent start off owning, but then experience multiple housing tenure transitions. Those that are renting at age 50 or when they enter the sample and then later become

owners at least once make up eight percent of the sample. The remainder of the sample comprises those that always own (53 percent) or always rent (21 percent).

Table 4 presents the basic summary statistics and summary of the variables that we will use for the analysis. This table briefly sketches the socioeconomic and demographic profiles of the older households that never transition from homeownership after age 50 (column 1) and those that do (column 2). Families who never transition are younger, compared to those who do not. This clearly shows that in the older age groups, elderly households are more likely to leave homeownership and this is especially true for those who are older than 75. The statistics of current and past demographic characteristics in Table 4 are consistent to results in Table 5 presented at the family level. The mean values of single male and female are much higher in column 2, indicating that current marital status matters. Similarly, the proportion of those households that experience the loss of a spouse and divorce among families appear who exit homeownership is higher, so those variables appear to be related to the decision to tenure transition. The health status of the household head is also likely to increase the probability of leaving homeownership. Finally, the statistics demonstrate that past marital transitions and tenure status influence tenure changes after age 50.

There are also important differences across the financial circumstances of the households. Mean values of all income and wealth measures are higher in the sub-sample of the households who never transition than those who leave homeownership. While values of regional dummies do not systematically across the two sub-samples, the proportion of households who live in the large metropolitan areas is higher for those who become renters.

Also evidenced in Table 4 are systematic differences in the financial well-being and geographic proximity of an older household's children. We first observe that households with children who live in the same state are less likely to transition. Next, the data demonstrates that the income and financial wealth of the children of older households who do not transition are higher than the income and financial wealth of the children of those who leave homeownership. This difference may suggest suggests that parents of children who are not doing well financially are more likely to stay in their own home and accumulate wealth as means of establishing higher levels of bequests for their children who may need it. This finding is consistent with that of Megbolugbe, Sa-Aadu, and Shilling (1995).

For those households that become renters, there exists only limited data to characterize what type of residence they move to. Excluding households where both the household head and spouse has passed away or the hold become non-response because of other reasons, Table 6 presents the various types of housing types that households have moved into. It should be noted, however, that the Health Care Institution data exist only from 1984 and that "Retirement Housing" data exist only from 1990. Therefore, we do not know if households had moved to these housing types in earlier years.[2] The dominant chosen housing type is the category labeled non-apartment. This type of housing, while not all single family housing, appears to most closely resemble the living arrangements of a household previous to the tenure transition. Only 5 percent of households move in with their children.

Duration model results

[2] Thus, actual numbers for each category could be bigger since data do not exist across the years. These households are placed in the Non-Apartment category.

Table 7 presents results of the Cox proportional hazard models that predict the likelihood that a household over the age of 50 will leave homeownership. The first model includes only age as a predictor of housing tenure transitions. As expected from the life cycle hypothesis, households that are older are more likely to become renters. However, once you add variables (Table 7: Model 2) that control for various demographic factors, the age variables are not significant.[3] In fact, households in the age category age 65-75 are less likely to experience a transition than younger households. Because all of these changes are related to the aging of the population, it is difficult to establish causality, but it is unlikely that age itself is the dominant driving force. Households with higher incomes are also likely to leave their homes. This can be due to the fact that these households experience less financial stress or because they view housing as a luxury good, and demand more housing. Households that are headed by a single male or female are much more likely to transition from homeownership, with single male households the most likely to transition. Finally, education level and racial or ethnic status has no influence on the likelihood that a household will transition from homeownership.

Also included in the second model are demographic transitions that might be related to housing tenure transitions. While the death of a spouse in the current year does not increase the likelihood of leaving homeownership, there is an increase in the probability of becoming a renter if your spouse died in the past 2 years. Recall that the variable that captures status as single head of household will also capture some of the impact of the death of a spouse. The effect of leaving homeownership are much stronger for

[3] We find that the dominant factor in eliminating the age effect is the inclusion of the controls for being single.

households that experiencing a divorce in the present year or in the past 2 years. The results also demonstrate that having a disability increases the likelihood that a household will exit from homeownership. At the same time, there does not appear to have an additional increase in the probability of moving to rental status if the household head recently experienced a disability. Surprisingly, retirement status and recent retirement does not change the likelihood of becoming a renter.

In order to control for how status at age 50 may influence future homeownership transitions, we include family status at age 50 and histories of housing tenure choice at age 50 (Table 7: Model 2). Although the other coefficients in the model do not change, these variables do have independent effects. If you were divorced at age 50, you are more likely to exit homeownership later in life. The same is not true if you were widowed or never married at age 50. The results also demonstrate that one's ownership status at age 50 is a good predictor of future transitions. If a household was a renter at age 50, but then later purchased a house, that household is more likely to transition from homeownership after age 50 than a household that owned their house at age 50. This is true whether the household head had previously been an owner or not.

The final model in Table 7 tests for the importance of the geographic location of households (Table 7: Model 3). Although not shown, the model predicts no systematic differences across regions. On the other hand, living in a large metro area increases the likelihood of a transition from homeownership. This may be due to higher volatility in house prices (or greater equity that has been accrued). In addition, controls for location do not impact the other coefficients in the model.

In Table 8, we add information on household wealth and on a household's children's residential location and financial well-being. Presumably, it is not the contemporaneous income of households that would be most important determinant of household decisions to exit homeownership. Instead, a household would make the decision to exit homeownership based on the household's wealth portfolio. We also note that higher housing wealth reduces the probability Table 9 (Model 1) demonstrates that household's with higher levels of housing equity are much less likely to leave homeownership. This may be due to the fact these households have a larger cushion from which to stay in their own home.

The results also demonstrate that households that live in the same state as their children are less likely to leave homeownership than those that do not live in the same state. Presumably, an older household that lives in a different state than their children would be more likely to move to be closer to their children, thereby increases the chances that they will transition to being a renter. Alternatively, children that live nearby may be able to help a parent stay in their home, although there is not direct evidence of income transfers in the data. The results also show if a household's children have higher incomes then a household is slightly more likely to exit homeownership. This may suggest that if one's children are better off, then there are reduced bequest motives for maintaining wealth.

We next add financial wealth measures to the model, but because the PSID do not include these data until 1984, the model is first presented without the financial wealth measures (Table 8: Column 2). As is evident, most of the results are the similar across time periods. The only difference is that experiencing a recent death of a spouse is not

significant in the later period. In addition, past demographic characteristics are slightly less important, and one's own income and housing wealth is slightly more important (differences are not significant), but their children's income is no longer significant.

As is evident in Table 8 (Column 3), the financial wealth of the household and the financial wealth of their children are important in predicting the likelihood that a household will leave homeownership. While not as important as a household's housing wealth, having greater financial wealth predicts that a household will remain a homeowner. This does lower the importance of a household's current income, but does not eliminate. On the other hand, adding a measure of financial wealth of children does eliminate the importance their children's income. While the coefficient on children's wealth is positive, it is not significant, which may suggest that changes in a children's wealth does not alter bequests significantly.

Additional Results

In the previous section, we have focused our analysis on a household's decision to move from homeownership status to rental status, but a household may experience other housing transitions that may be related to the consumption of housing wealth. Rather than become renters, some households may choose to purchase smaller homes or reduce home equity as a way to consume housing wealth. In Table 9, we present hazard model estimates which assume that a household downsizes if they purchase a smaller house or become a renter. Overall, the results are very similar to the results on becoming a renter, but there are a few differences worth noting. Now the death of a spouse is a more significant predictor of downsizing, whereas households with less education and households whose head is black are less likely to downsize. The results also suggest that

a household's own income and wealth are less important to the downsizing decision than the tenure transition decision. Finally, we note that living in the same state as one's children signifies that a household is less likely to downsize.

In Table 10, we estimate a logit model to discover the influences on the probability that a household may extract home equity. This extraction variable is equal to one if a household increases their loan balance by more than $2000.[4] Other larger cutoff points were used with similar results. In the first model that includes the full sample period, minority households are found to take out more loans. Single male household heads and divorced household heads are less likely to take out loans. As expected, households with recent disabilities are more likely to take out loans, presumably to help out with increased medical expenses. Finally, we find that retirees are much less likely to take out loans overall. This may be due to the reduced income that may be required to take out a home equity loan. At the same time, recent retirees are more likely to increase their loan balance, which may suggest the funding of retirement consumption. Finally, we find that once wealth is included in the model, most demographic characteristics are not important. In this sample, we find that those with higher housing equity are more likely to extract it, while those with greater financial wealth are less likely.

Finally, this analysis investigated the role of an institutional impediment to making tenure transitions that may be relevant to a household's decision to exit homeownership or downsize. Despite the fact that the region and state effects were largely insignificant, there may be some common characteristics across states that may be related to housing tenure choice. In particular, voters in states and localities have passed

[4] We used a cutoff of $2000 to avoid cases where a loan amount may be coded as slightly higher either due to miscoding or due to the nature of self-reports.

a variety of property tax limitations that can effect the decision to exit homeownership or to move (see Appendix 2 for details). While these were passed to limit the ability of government to raise money, some of them may influence a household's decision to move or change tenure status.

As literature (e.g., Glickman and Painter, 2004) has shown, some of these limits are likely to have more impact than others. States with limits on overall property tax rates are likely to be more attractive for the elderly who have lower post retirement incomes. Therefore, if one lives in a state with lower property tax rates, a household is less likely to want to leave it. Limits on assessment increases may be especially important for the elderly who have lived in their house for a long time period. Because the tax base for the elderly will be lower in those states, a homeowner may be unlikely to downsize because such a move would increase their property tax liability.

The results in Table 11 presents some evidence that households that live in states with some tax and expenditure limits may have different housing tenure behavior than those that do not live in such states. Living in a state with limits on overall tax rates does decrease the probability that a household will exit homeownership. These results do not hold in the sample after 1984 which include the financial wealth data. This could be due to the fact that the major wave of new tax and expenditure limits in the late 1970s and early 1980s, and that they affected behavior more in the sample pre-1984. Interestingly, households that lived in states where both limits were in force were more likely to take out loans than those that lived in states without both limits. This is expected because households would be expected to be much more inclined to extract home equity when

consuming housing wealth than by downsizing, because they may face much higher property taxes if they would downsize.

Other Robustness Checks

One decision that was made in the previous models is to consider estimate the likelihood of some type of housing transition based on a sample of households whose head or wife is 50 or more years old. To test whether this restriction is robust to other choices, we the same models with a sample of families whose head or wife is over 60 years old. Despite a slight change in hazard ratios and coefficients of the independent variables, the results, especially the signs of the estimates and the degrees of significance, are found to be robust to the choice of the initial age in the sample.

Some older households experience multiple tenure transitions (see Table 3). Since such repeated events are unlikely to be independent, the Cox proportional hazard model for single event data might lead to erroneous variance estimates and possibly biased estimates. One possible solution to this problem is to consider only the first occurrence of an event. This specification, however, makes the strong assumption that the time to the first event is similar to the time to all events. Moreover, this specification implies throwing away some data.

Some semi-parametric proportional hazard-type models have been proposed in the literature to be used in case of repeated events, such as the independent increments model (Anderson and Gill, 1982), the conditional risk-set model in either elapsed or gap time (Prentice, Williams and Peterson, 1981), and the marginal risk-set model (Wei, Lin and Weissfeld, 1989). All these models are variance-correction models for repeated events and differ in the way they define the risk set and the event time.

To test for the robustness of the various model assumptions, we estimated the conditional risk-set model in gap time (Prentice, Williams and Peterson, 1981), in addition to Anderson and Gill (AG) model from which our original results are derived. In this model, an older household is not at risk for a later event until all prior failures have occurred and failure time is defined as time elapsed since the previous failure. To estimate this model, we cluster on family identification and stratify by failure number. While the AG model assumes that all failure types are equal or indistinguishable, the conditional risk set model assumes that the underlying hazards may vary from event to event by using time-dependent strata. Despite the differences in assumptions, we found that almost all results are identical in the two models.

Conclusion

Understanding the housing choices of older households will grow in importance as the baby boom generations starts to retire. This analysis utilizes a rich longitudinal data set (PSID) to provide insight into the reasons that older households leave homeownership to become renters. The results of this analysis provide mixed evidence for the predictions of the life cycle hypothesis. Age itself does not affect the probability of becoming a renter suggesting that households do not spend wealth with the goal of having no wealth upon retirement. On the other hand, consistent with the life cycle hypothesis, households with fewer resources are more likely to spend their remaining wealth and therefore more likely to become a renter.

This analysis also investigated the role of demographic characteristics and of recent demographic transitions, such as retirement, divorce, disability, and loss of a spouse. Presumably, these households may have experienced a change in their desire to

remain a homeownership, and therefore become a renter. The results suggest that the only event that consistently predicts a housing tenure transition is a divorce. A recent disability, recent retirement, and experiencing the recent loss of a spouse do not have an immediate impact on the likelihood of becoming a renter. On the other hand, having a disability or being a single head of household does increase the probability that someone will become a renter. This suggests that the timing of various life changing events is not as important as overall health status or marital status.

This analysis was the first to consider the role of the geographic proximity and the financial well being of an older household's children in their decision to remain a homeowner. Presumably, these factors can be important because they can influence a household's tastes for being a homeowner and for accumulating bequeathable wealth. The results suggest that it is important that older households live in the same state as one's children. Presumably, a child can help a parent remain if their home if they live nearby and there will not be the same desire to leave the home as if their children do not live near to them. This may cause some older households to sell their house to move closer to their children. On the other hand, it may signal that a household has fewer connections to their children, and will be more likely to spend their wealth rather than save it as a bequest. We also present weak evidence that households are more likely to become renters if their children have higher levels of wealth, which we suggest is due to a smaller bequest motive.

Finally, the study conducted a series of additional analyses to test whether alternative tenure transitions or housing wealth extractions were influenced by the demographic and familial factors in the same way. We find that the decision to buy a

smaller home is influenced in a similar way by these factors, but that financial variable variables are less important, and demographic transitions are more important. We also found that while demographic factors are largely not predictive of the extraction of home equity, households are more likely to do so if they have greater housing wealth or less financial wealth. Lastly, we tested for the role that living in states with tax and expenditure limits may have in the decision to move from one's house. The results suggest that these limits play a restrictive role on households' downsizing, and increase the likelihood of home equity extraction.

While this study is an important step in developing a more broad understanding of what leads the older homeowners to become renters, there is much more work that can be done. First, the present study does not directly account for housing market volatility, which may be very important in predicting the timing of home sales (Banks et al, 2007). While the study has controls for year effects and geography, more precise estimation of the regional variation in housing market is likely to have additional explanatory power.

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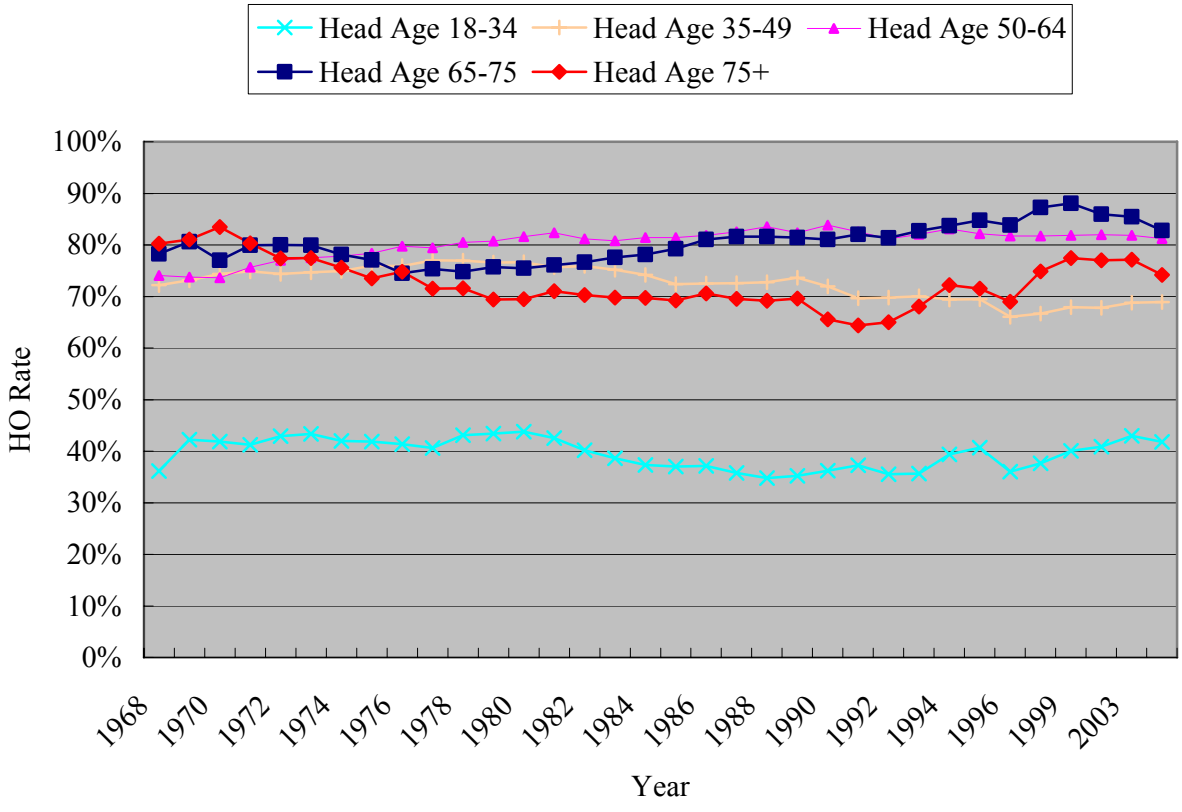
Figure 1. Homeownership Rate (1968-2005)



Source: PSID (Panel Study of Income Dynamics Family Data 1968-2005), Weighted

Table 2. Variables and Definitions

Variable	Variable Description
Current Demographic Characteristic	
age50	1 = maximum age among the household head/wife 50-64; 0 = otherwise
age65	1 = maximum age among the household head/wife 65-74; 0 = otherwise
age75	1 = maximum age among the household head/wife 75-84; 0 = otherwise
age85	1 = maximum age among the household head/wife >= 85; 0 = otherwise
lesscollege	1 = household head is not a college graduate or more; 0 = otherwise
white	1 = household head is White; 0 = otherwise
black	1 = household head is Black; 0 = otherwise
latino	1 = household head is Latino; 0 = otherwise
other	1 = household head is other than White, Black, and Latino; 0 = otherwise
married	1 = household head is married; 0 = otherwise
singlemale	1 = household head is single male; 0 = otherwise
singlefemale	1 = household head is single female; 0 = otherwise
spousedead	1 = household head becomes widowed; 0 = otherwise
lagspousedead	1 = household head became widowed within the past 2 years; 0 = otherwise
leadspousedead	1 = household head 1-2 years before the interview; 0 = otherwise
divorce	1 = household head divorces at the time of the interview; 0 = otherwise
lagdivorce	1 = household head divorced within the past 2 years; 0 = otherwise
leaddivorce	1 = household head divorce 1-2 years before the interview; 0 = otherwise
disability	1 = household head is disabled at the time of the interview; 0 = otherwise
lagdisability	1 = household head was disabled within the past 2 years; 0 = otherwise
retired	1 = household head is retired at the time of the interview; 0 = otherwise
lagretired	1 = household head was retired within the past 2 years; 0 = otherwise
Income and Wealth	
lfamy	Natural log of 5-year moving average of family income
lhousingwealth	Natural log of housing wealth
lfinancialwealth	Natural log of financial wealth
Location	
pacific	1 = Pacific (ME, VT, NH, MA, CT, RI); 0 = otherwise
mountain	1 = Mountain (MT, ID, WY, NV, UT, CO, AZ, NM); 0 = otherwise
westsouthcentral	1 = West South Central (TX, OK, AR, LA); 0 = otherwise
eastsouthcentral	1 = East South Central (WV, KY, TN, MS, AL); 0 = otherwise
southatlantic	1 = South Atlantic (DE, MD, VA, NC, SC, GA, FL, DC); 0 = otherwise
westnorthcentral	1 = West North Central (ND, SD, NE, KS, MN, IA, MO); 0 = otherwise
eastnorthcentral	1 = East North Central (MI, WI, IL, IN, OH); 0 = otherwise
middleatlantic	1 = Middle Atlantic (NY, NJ, PA); 0 = otherwise
newengland	1 = New England (ME, VT, NH, MA, CT, RI); 0 = otherwise
Residence	
lgmetro	1 = Largest city in MSA's population >= 500,000; 0 = otherwise
otmetro	1 = Largest city in MSA's population 50,000–499,999; 0 = otherwise
smallcity	1 = Largest city in county's population 10,000–49,999; 0 = otherwise

rural	1 = Largest city in county's population < 10,000 or no city in county
Past Demographic Characteristic	
onlymarriage50	1 = household head was married and had never divorced or widowed at the age of 50; 0 = otherwise
divorced50	1 = household head had divorced at the age of 50; 0 = otherwise
widowed50	1 = household head had widowed at the age of 50; 0 = otherwise
nevermarried50	1 = household head had never married at the age of 50; 0 = otherwise
owner50	1 = household head owned home at the age of 50; 0 = otherwise
alwaysrenter50	1 = household head rented home at the age of 50, and had always rented; 0 = otherwise
rentonceowner50	1 = household head rented home at the age of 50, but had once owned before; 0 = otherwise
unknown50	1 = tenure data of household at the age of 50 does not exist; 0 = otherwise
Children	
samestate	1 = household has any child who live in the same state as the state of its residence; 0 = otherwise
lchildfamy	Natural log of average of 5-year moving average of family income of all children who do not live with the household and who have their own family
lchildfwealth	Natural log of average of financial wealth all children who do not live with the household and who have their own family

Table 3. Tenure Transitions after Age 50

Tenure Transitions	Number of Families	Percentage
Always Own	2,688	52.74%
Always Rent	1,079	21.17%
Own to Rent (Single Change)	756	14.83%
Rent to Own (Single Change)	251	4.92%
Own to Multiple Changes	171	3.35%
Rent to Multiple Changes	152	2.98%
Total	5,097	100.00%

Note 1. For the simplification, in this table, "Rent" category includes all non-own tenure statuses, including "rent", "neither rent nor own", and "living with their children or relatives". These detailed categories are presented in Table 8, later in the paper.

2. The data for our model excludes families in the "Always Rent" category since our interests lie in the survival times and hazard ratio of leaving homeownership. For these reasons, households in the "Rent to Own" category, who became homeowners after their 50 and stay as homeowners, are treated same as those in the "Always Own" category. These households altogether are 2,939.

3. "Multiple Changes" refers to those who have changed their tenure both rent to own and own to rent. Because these households may experience multiple transitions from homeownership, actual number of failures (1,124) in our analysis is bigger than the number of households who have exited ownership (756 + 171 + 152 = 1,079).

4. For the tenure changes, we only consider the actual transitions from homeownership. Thus, cases that both the household head and wife are dead or that the entire household become non-response because of other reasons may still fall in the "Always Own" category. In this sense, then number of families in the "Always Own" category may be somewhat overestimated.

Table 4. Summary Statistics of Variables

Variable	Sub-Sample of Families who Never Transition from Ownership (1)		Sub-Sample of Families who Transition from Ownership (2)		Whole Sample (3)	
	Mean	Std. Dev	Mean	Std. Dev	Mean	Std. Dev
Current Demographic Characteristic						
age50	0.648	0.478	0.524	0.499	0.609	0.488
age65	0.225	0.418	0.279	0.448	0.242	0.428
age75	0.090	0.286	0.137	0.343	0.105	0.306
age85	0.037	0.188	0.061	0.240	0.045	0.206
lesscollege	0.807	0.395	0.861	0.346	0.824	0.381
white	0.738	0.440	0.700	0.458	0.726	0.446
black	0.223	0.416	0.274	0.446	0.239	0.427
latino	0.021	0.144	0.012	0.108	0.018	0.134
other	0.017	0.130	0.014	0.118	0.016	0.126
married	0.707	0.455	0.537	0.499	0.655	0.475
singlemale	0.062	0.241	0.093	0.290	0.071	0.258
singlefemale	0.231	0.421	0.370	0.483	0.274	0.446
spousedead	0.015	0.120	0.021	0.143	0.017	0.128
lagspousedead	0.028	0.166	0.040	0.196	0.032	0.176
leadspousedead	0.027	0.163	0.039	0.194	0.031	0.174
divorce	0.003	0.053	0.006	0.080	0.004	0.063
lagdivorce	0.008	0.087	0.015	0.122	0.010	0.099
leaddivorce	0.004	0.062	0.009	0.096	0.006	0.074
Current Demographic Characteristic						
disability	0.272	0.445	0.370	0.483	0.303	0.460
lagdisability	0.096	0.294	0.110	0.313	0.100	0.301
retired	0.647	0.478	0.677	0.467	0.656	0.475
lagretired	0.588	0.492	0.635	0.481	0.603	0.489
Income and Wealth						
lfamy	10.767	0.821	10.283	1.305	10.616	1.022
lhousingwealth	11.046	1.989	9.442	3.902	10.542	2.838
lfinancialwealth	9.873	3.396	8.430	4.178	9.474	3.686
Location						
pacific	0.115	0.320	0.119	0.324	0.116	0.321
mountain	0.043	0.202	0.043	0.202	0.043	0.202
westsouthcentral	0.101	0.301	0.114	0.318	0.105	0.306
eastsouthcentral	0.089	0.284	0.088	0.283	0.088	0.284
southatlantic	0.225	0.418	0.238	0.426	0.229	0.420
westnorthcentral	0.082	0.275	0.084	0.277	0.083	0.276
eastnorthcentral	0.176	0.381	0.166	0.372	0.173	0.378
middleatlantic	0.115	0.319	0.104	0.305	0.111	0.315
newengland	0.042	0.201	0.036	0.185	0.040	0.196
Residence						

lgmetro	0.203	0.402	0.235	0.424	0.213	0.409
otmetro	0.366	0.482	0.306	0.461	0.347	0.476
smallcity	0.239	0.426	0.241	0.428	0.239	0.427
rural	0.192	0.394	0.218	0.413	0.200	0.400
Past Demographic Characteristic						
onlymarriage50	0.681	0.466	0.609	0.488	0.658	0.474
divorced50	0.293	0.455	0.348	0.476	0.311	0.463
widowed50	0.020	0.141	0.025	0.157	0.022	0.146
nevermarried50	0.025	0.158	0.044	0.204	0.031	0.174
owner50	0.675	0.468	0.483	0.500	0.615	0.487
alwaysrenter50	0.035	0.184	0.069	0.254	0.046	0.209
rentonceowner50	0.024	0.152	0.037	0.188	0.028	0.164
unknown50	0.265	0.441	0.409	0.492	0.310	0.463
Children						
samestate	0.775	0.418	0.716	0.451	0.756	0.429
lchildfamy	6.747	5.270	6.569	5.242	6.691	5.262
lchildfwealth	3.591	4.605	3.021	4.352	3.412	4.535
Number of Families	2,939		1,079		4,018	

Table 5. Demographic Comparison at the Family Level

	Families who Never Transition from Ownership		Families who Transition from Ownership	
Experienced the Death of Spouse during the Study Period	478	16%	312	29%
Divorced during the Study Period	91	3%	93	9%
Disabled during the Study Period	1,540	52%	718	67%
Widowed before the Study Period	60	2%	22	2%
Divorced before the Study Period	470	16%	205	19%
	2,939		1,079	

Note 1. Disability means that the head of households has any physical or nervous condition that limits the type of work or the amount of work he or she can do.
2. Our "Study Period" includes years of each family whose head or wife's age is 50 year or older. However, if one older spouse dies before the other one becomes 50 or over, we also track them.

Table 6. Details of the Own to Rent Transition

Where Those Families Went	Number of Families	Percentage
Apartment	162	13.34%
Non-Apartment	816	67.22%
Health Care Institution	31	2.55%
Retirement Housing	133	10.96%
Children's House	61	5.02%
Other People's House	11	0.91%
Total	1,214	100%

Note 1. Health case institution includes hospitals. Non-apartment arrangements refer to all housing types except for multi-family housing (e.g. single family housing, duplex, etc.).

Table 7. Cox Proportional Hazard Model of Tenure Transition from Homeownership I

	Age Only			+ Demographic Characteristic + Income			+ Location		
	(1)			(2)			(3)		
	(a) Coef.	(b) Hazard Ratio	(c) Robust S.E of H.R	(d) Coef.	(e) Hazard Ratio	(f) Robust S.E of H.R	(g) Coef.	(h) Hazard Ratio	(i) Robust S.E of H.R
Current Demographic Characteristic									
age65	0.152	1.164	0.174	-0.383	0.682	0.094**	-0.377	0.686	0.095**
age75	0.696	2.005	0.381**	-0.133	0.876	0.163	-0.125	0.882	0.165
age85	1.197	3.310	0.832**	0.103	1.108	0.278	0.113	1.120	0.283
lesscollege				-0.030	0.970	0.112	-0.029	0.971	0.112
black				0.013	1.013	0.117	-0.020	0.980	0.121
latino				0.465	1.592	0.549	0.408	1.503	0.534
other				0.376	1.457	0.366	0.284	1.328	0.346
singlemale				1.155	3.174	0.417**	1.176	3.242	0.420**
singlefemale				0.737	2.090	0.235**	0.722	2.059	0.236**
spousedead				0.257	1.293	0.256	0.268	1.307	0.260
lagspousedead				0.223	1.250	0.168*	0.226	1.253	0.168*
divorce				1.377	3.962	1.002**	1.399	4.053	1.026**
lagdivorce				0.984	2.676	0.502**	1.003	2.727	0.510**
disability				0.458	1.581	0.136**	0.450	1.568	0.135**
lagdisability				0.105	1.110	0.101	0.100	1.105	0.101
retired				0.181	1.199	0.177	0.194	1.215	0.178
lagretired				-0.122	0.885	0.133	-0.125	0.883	0.133
Past Demographic Characteristic									
divorced50				0.442	1.555	0.141**	0.432	1.540	0.140**
widowed50				-0.318	0.728	0.202	-0.329	0.720	0.203
nevermarried50				0.213	1.237	0.230	0.217	1.242	0.226
alwaysrenter50				0.625	1.868	0.312**	0.582	1.790	0.289**
rentonceowner50				0.980	2.665	0.533**	0.942	2.566	0.527**
unknown50				0.224	1.251	0.162*	0.201	1.223	0.159
Location									
lgmetro							0.316	1.372	0.196**
otmetro							0.064	1.067	0.132
smallcity							0.174	1.190	0.148
Income and Wealth									
lfamy				-0.327	0.721	0.036**	-0.345	0.708	0.037**
Dummies									
year dummies		Yes			Yes			Yes	
region dummies		No			No			Yes	
Number of Families		3,783			3,783			3,783	
Number of Obs.		44,342			44,342			44,342	
Log Pseudo-Likelihood		-6,569.08			-6,256.04			-6,245.15	
Wald χ^2		131.25			804.12			871.09	
Model d.f.		35			56			67	

Note 1. All models include year dummies (1968-2003, controlled for 2005).

2. Original number of families = 4,018 (after excluding always renters), Total observations = 47,958, Ignored observation due to the missing data = 2,527 (5% of observations are dropped), Number of failures = 1,214, Time at risk = 45,431

2. Number of families with all data applied in Table 9 = 3,783 (5.8% of original families are dropped).

3. In columns (b), (e), (h), hazard ratio is standardized. *Standardized hazard ratio* = exp (coefficient × standard deviation); for dummy variables, it equals exp (coefficient).
4. Standard errors (columns c, f, i) are clustered on individual families; *significant at 10%; **significant at 5%

Table 8. Cox Proportional Hazard Model of Transition from Homeownership II

	+ Housing Wealth + Income and Location of Children (1)			Same Specification as (1) after 1984 (2)			+ Financial Wealth of Elderly and Children (3)		
	(a) Coef.	(b) Hazard Ratio	(c) Robust S.E of H.R	(d) Coef.	(e) Hazard Ratio	(f) Robust S.E of H.R	(g) Coef.	(h) Hazard Ratio	(i) Robust S.E of H.R
Current Demographic Characteristic									
age65	-0.361	0.697	0.094**	-0.375	0.687	0.129**	-0.392	0.676	0.126**
age75	-0.043	0.958	0.174	-0.290	0.748	0.187	-0.318	0.728	0.182
age85	0.227	1.255	0.306	0.037	1.038	0.328	-0.015	0.985	0.306
lesscollege	-0.046	0.955	0.109	-0.124	0.884	0.120	-0.185	0.831	0.115
black	-0.066	0.936	0.114	-0.113	0.893	0.158	-0.236	0.790	0.138
latino	0.354	1.425	0.515	0.378	1.459	0.643	0.276	1.318	0.560
other	0.311	1.365	0.344	0.419	1.520	0.443	0.368	1.445	0.426
singlemale	1.148	3.153	0.405**	0.966	2.627	0.413**	0.986	2.681	0.423**
singlefemale	0.692	1.999	0.229**	0.661	1.938	0.267**	0.655	1.925	0.271**
spousedead	0.288	1.334	0.265	0.364	1.440	0.363	0.380	1.462	0.365
lagspousedead	0.244	1.276	0.172*	0.201	1.223	0.209	0.214	1.238	0.210
divorce	1.418	4.129	1.050**	1.686	5.398	1.716**	1.639	5.151	1.625**
lagdivorce	0.977	2.658	0.472**	0.755	2.127	0.537**	0.718	2.050	0.527**
disability	0.418	1.519	0.130**	0.406	1.501	0.165**	0.406	1.501	0.164**
lagdisability	0.113	1.120	0.102	0.087	1.091	0.128	0.086	1.090	0.127
retired	0.178	1.195	0.176	0.101	1.106	0.254	0.120	1.127	0.258
lagretired	-0.081	0.922	0.137	-0.006	0.994	0.241	-0.010	0.990	0.240
Past Demographic Characteristic									
divorced50	0.408	1.503	0.136**	0.489	1.630	0.193**	0.481	1.618	0.190**
widowed50	-0.294	0.745	0.213	-0.537	0.585	0.220	-0.518	0.595	0.216
nevermarried50	0.316	1.372	0.259*	0.262	1.300	0.315	0.275	1.317	0.330
alwaysrenter50	0.458	1.581	0.255**	0.092	1.096	0.263	0.035	1.035	0.252
rentonceowner50	0.772	2.164	0.437**	0.561	1.753	0.421**	0.518	1.678	0.406**
unknown50	0.214	1.238	0.160*	0.152	1.165	0.204	0.155	1.168	0.202
Location									
lgmetro	0.362	1.436	0.205**	0.361	1.435	0.287*	0.373	1.452	0.288*
otmetro	0.102	1.107	0.136	0.174	1.190	0.187	0.185	1.203	0.188
smallcity	0.183	1.200	0.148	0.201	1.223	0.202	0.208	1.231	0.201
Income and Wealth									
lfamy	-0.289	0.749	0.042**	-0.353	0.703	0.046**	-0.254	0.775	0.059**
lhousingwealth	-0.163	0.849	0.014**	-0.187	0.829	0.017**	-0.173	0.841	0.018**
lfinancialwealth							-0.064	0.938	0.013**
Children									
samestate	-0.258	0.773	0.115*	-0.307	0.736	0.128*	-0.339	0.713	0.124**
lchildfamy	0.038	1.038	0.015**	0.041	1.041	0.019**	0.016	1.016	0.027
lchildfwealth							0.032	1.033	0.024
Dummies									
year dummies		Yes			Yes			Yes	
region dummies		Yes			Yes			Yes	
Number of Families		3,783			3,217			3,217	
Number of Obs.		44,342			24,905			24,905	
Log Pseudo-Likelihood		-6,208.30			-3,111.64			-3,100.97	
Wald χ^2		1,111.30			697.36			727.18	

Model d.f.	70	55	57

Note1. While the original number of families is after excluding always renters is 4,018, the number of families with all data applied here is 3,217 (about 20% of original families are dropped).
2. Because we analyze only years that contain the data of financial wealth, year dummies before 1985 are dropped and degrees of freedom in column 2 and 3 are smaller.

Table 9. Cox Proportional Hazard Model of Downsizing (Including Tenure Transition)

	Demographic + Location + Housing Wealth + Income and Location of Children (1)			Same Specification as (1) after 1984 (2)			+ Financial Wealth of Elderly and Children (3)		
	(a) Coef.	(b) Hazard Ratio	(c) Robust S.E of H.R	(d) Coef.	(e) Hazard Ratio	(f) Robust S.E of H.R	(g) Coef.	(h) Hazard Ratio	(i) Robust S.E of H.R
Current Demographic Characteristic									
age65	-0.222	0.801	0.089**	-0.257	0.773	0.129	-0.251	0.778	0.126
age75	-0.066	0.936	0.145	-0.344	0.709	0.155	-0.334	0.716	0.154
age85	0.292	1.340	0.271	0.075	1.078	0.310	0.071	1.073	0.303
lesscollege	-0.055	0.947	0.078	-0.160	0.853	0.081*	-0.197	0.821	0.078**
black	-0.161	0.851	0.093	-0.189	0.828	0.125	-0.300	0.741	0.113**
latino	0.346	1.413	0.354	0.447	1.563	0.486	0.360	1.433	0.461
other	-0.280	0.756	0.174	-0.225	0.799	0.222	-0.265	0.767	0.214
singlemale	0.840	2.317	0.228**	0.723	2.061	0.234**	0.734	2.084	0.237**
singlefemale	0.530	1.698	0.143**	0.478	1.613	0.161**	0.483	1.621	0.163**
spousedead	0.352	1.421	0.215**	0.378	1.460	0.278**	0.381	1.464	0.277**
lagspousedead	0.269	1.309	0.153**	0.145	1.156	0.168	0.155	1.167	0.170
divorce	1.262	3.534	0.710**	1.400	4.056	1.015**	1.391	4.021	0.988**
lagdivorce	0.888	2.429	0.327**	0.614	1.848	0.320**	0.612	1.844	0.319**
disability	0.320	1.377	0.091**	0.336	1.400	0.112**	0.337	1.400	0.112**
lagdisability	0.114	1.120	0.080	0.068	1.070	0.095	0.067	1.069	0.095
retired	0.125	1.134	0.124	0.177	1.193	0.206	0.186	1.204	0.207
lagretired	0.023	1.023	0.116	0.083	1.086	0.184	0.078	1.082	0.183
Past Demographic Characteristic									
divorced50	0.333	1.395	0.098**	0.374	1.453	0.124**	0.369	1.446	0.123**
widowed50	-0.177	0.838	0.168	-0.184	0.832	0.206	-0.184	0.832	0.198
nevermarried50	-0.060	0.942	0.149	-0.071	0.932	0.182	-0.064	0.938	0.187
alwaysrenter50	0.227	1.255	0.179	-0.085	0.919	0.186	-0.128	0.880	0.172
rentonceowner50	0.437	1.548	0.217**	0.258	1.294	0.214	0.237	1.267	0.211
unknown50	0.004	1.004	0.098	-0.028	0.973	0.130	-0.021	0.979	0.130
Location									
lgmetro	-0.038	0.963	0.103	0.031	1.032	0.150	0.040	1.040	0.150
otmetro	-0.101	0.904	0.077	-0.029	0.971	0.102	-0.023	0.977	0.102
smallcity	-0.013	0.987	0.086	-0.033	0.967	0.106	-0.029	0.971	0.106
Income and Wealth									
lfamy	-0.102	0.903	0.042**	-0.128	0.880	0.050**	-0.051	0.951	0.060
lhousingwealth	-0.051	0.951	0.009**	-0.051	0.951	0.010**	-0.046	0.955	0.010**
lfinancialwealth							-0.045	0.956	0.012**
Children									
samestate	-0.397	0.672	0.065**	-0.399	0.671	0.077**	-0.430	0.651	0.075**
lchildfamy	0.046	1.047	0.010**	0.042	1.043	0.013**	0.039	1.040	0.020**
lchildfwealth							0.006	1.006	0.018
Dummies									
year dummies		Yes			Yes			Yes	
region dummies		Yes			Yes			Yes	
Number of Families		3,785			3,237			3,237	
Number of Obs.		45,659			25,754			25,754	
Log Pseudo-Likelihood		-11,291.75			-6,000.91			-5,993.36	

Wald χ^2	1,017.46	668.83	721.02
Model d.f.	70	55	57

Table 10. Logit Model of Taking Out Loans (Among Owners)

	Demographic + Location + Housing Wealth + Income and Location of Children (1)		Same Specification as (1) after 1984 (2)		+ Financial Wealth of Elderly and Children (3)	
	(a) Coef.	(b) Robust S.E	(c) Coef.	(d) Robust S.E	(e) Coef.	(f) Robust S.E
Current Demographic Characteristic						
age65	-0.246	0.061**	-0.255	0.071**	-0.237	0.072**
age75	-0.498	0.111**	-0.372	0.135**	-0.343	0.135**
age85	-1.190	0.295**	-1.346	0.400**	-1.294	0.395**
lesscollege	0.005	0.064	0.036	0.072	0.007	0.072
black	0.528	0.066**	0.533	0.081**	0.386	0.085**
latino	0.340	0.147**	0.189	0.289	0.030	0.294
other	0.063	0.163	0.016	0.202	-0.036	0.206
singlemale	-0.268	0.104**	-0.218	0.113**	-0.216	0.114*
singlefemale	-0.039	0.072	0.026	0.086	0.038	0.086
spousedead	0.005	0.173	0.015	0.202	0.015	0.203
lagspousedead	-0.118	0.130	-0.217	0.156	-0.208	0.157
divorce	-0.256	0.337	-0.010	0.397	0.004	0.395
lagdivorce	-0.109	0.187	-0.236	0.217	-0.217	0.216
disability	0.066	0.056	0.035	0.065	0.032	0.065
lagdisability	0.123	0.056**	0.090	0.069	0.085	0.069
retired	-0.268	0.071**	-0.304	0.091**	-0.282	0.091**
lagretired	0.329	0.055**	0.284	0.066**	0.280	0.067**
Past Demographic Characteristic						
divorced50	0.149	0.054**	0.192	0.065**	0.193	0.065**
widowed50	0.067	0.149	0.030	0.172	0.034	0.173
nevermarried50	0.088	0.143	0.082	0.180	0.090	0.182
alwaysrenter50	0.281	0.111**	0.254	0.123**	0.237	0.122**
rentonceowner50	0.047	0.148	0.119	0.166	0.080	0.167
unknown50	0.064	0.078	-0.189	0.114*	-0.193	0.114*
Location						
lgmetro	0.068	0.093	0.092	0.114	0.116	0.114
otmetro	0.135	0.075*	0.165	0.088*	0.182	0.087**
smallcity	0.071	0.082	0.092	0.095	0.097	0.094
Income and Wealth						
lfamy	0.246	0.042**	0.256	0.049**	0.355	0.052**
lhousingwealth	-0.013	0.010	0.003	0.012	0.013	0.012
lfinancialwealth					-0.055	0.009**
Children						
samestate	0.183	0.093**	0.216	0.102**	0.178	0.101*
lchildfamy	-0.004	0.009	-0.004	0.010	0.000	0.013
lchildfwealth					-0.003	0.011
Dummies						
year dummies	Yes		Yes		Yes	
region dummies	Yes		Yes		Yes	

Number of Families	3,782	3,214	3,214
Number of Obs.	32,173	20,287	20,287
Log Pseudo-Likelihood	-10,066.20	-6,880.25	-6,858.25
Wald χ^2	896.01	597.59	630.79
Pseudo R^2	0.0589	0.0549	0.0579
Model d.f.	63	55	57

Note1. All observations in years of 1973, 1974, 1975, 1982 were dropped because the data of loan principal remaining in those years are not available.
2. Due to possible errors and the nature of self-reports of PSID, we consider cases that take out loans over $2,000 at a time.
4. Standard errors (columns b, d, f) are clustered on individual families.

Table 11. Testing Impacts of TELs (Tax and Expenditure Limits)

	Hazard Model of Tenure Transition						Logit Model of Taking Out Loans			
	Whole Sample			Sample after 1984			Whole Sample		Sample after 1984	
	(1)			(2)			(3)		(4)	
	(a) Coef.	(b) Hazard Ratio	(c) Robust S.E of H.R	(d) Coef.	(e) Hazard Ratio	(f) Robust S.E of H.R	(g) Coef.	(h) Robust S.E	(i) Coef.	(k) Robust S.E
variables included	all from Table 8(1) excluding region dummies			all from Table 8(3) excluding region dummies			all from Table 10(1) excluding region dummies		all from Table 10(3) excluding region dummies	
assessment	0.112	1.119	0.141	0.107	1.113	0.164	0.121	0.072*	-0.029	0.081
overall	-0.253	0.776	0.098**	-0.137	0.872	0.150	-0.027	0.086	-0.040	0.100
both	0.253	1.288	0.249	0.158	1.172	0.284	0.312	0.120**	0.318	0.139**

Appendix 1. Passages of TELs (Tax and Expenditure Limits)

State	State-Level	Assessment Increase	Overall Property Tax Rate	Specific Property Tax Rate	Local-Level Property Tax Revenue	General Expenditure	General Revenue	Full Disclosure
AL	-	-	-	-	-	-	-	-
AK	1982	-	-	-	1972	-	-	-
AZ	1978	1980	1980	-	1913	1921	-	-
AR	-	2001	-	1883	1981	-	-	-
CA	1979	1978	1978	-	-	1979	1972	-
CO	1977	1999	-	1992	1992	1973	1992	1983
CT	1991	-	-	-	-	-	-	-
DE	-	-	-	-	1972	-	-	1976
FL	-	1995	-	1968	-	-	-	1974
GA	-	2000	-	-	-	-	-	1991
HI	1978	-	-	-	-	-	-	1977
ID	1980	-	1978	1967	1995	-	-	1991
IL	-	2002	-	1961	1991	-	-	1981
IN	-	-	-	1997	1973	-	-	-
IA	-	1978	-	1972	-	1971	-	1983
KS	-	-	-	-	1970	1973	-	-
KY	-	-	-	1946	1979	-	-	1979
LA	1979	-	-	1974	1978	-	-	-
ME	-	-	-	-	2005	-	-	-
MD	-	1957	-	-	-	-	-	1977
MA	1986	-	-	1980	1980	-	-	-
MI	1978	1994	1933	1949	1978	-	-	1982
MN	-	1993	-	-	2001	1971	-	1988
MS	-	-	-	-	1980	-	-	-
MO	1980	-	-	1875	1980	-	-	-
MT	1981	-	-	2000	1987	-	-	1974
NE	-	-	-	1957	1990	1991	-	1990
NV	1979	-	1936	1956	1983	-	-	1985
NH	-	-	-	-	-	-	-	-
NJ	1976	-	-	-	1980	1976	-	-
NM	1987	1979	1914	1973	1979	-	-	-
NY	-	1981	-	1894	-	-	-	-
NC	1991	-	-	1973	-	-	-	-
ND	-	-	-	1929	1981	-	-	-
OH	-	-	1929	-	1976	-	-	-
OK	1985	2003	1933	2000	-	-	-	-
OR	1979	1997	1991	1991	-	-	-	-
PA	-	-	-	1959	1940	-	-	-
RI	1977	-	-	-	1985	-	-	1979
SC	1980	-	-	-	-	-	-	1975
SD	-	-	-	1915	1997	-	-	-
TN	1978	-	-	-	-	-	-	1979
TX	1978	1997	-	1883	1982	-	-	1982
UT	1979	-	-	1929	-	-	-	1986
VT	-	-	-	-	-	-	-	-
VA	-	-	-	-	-	-	-	1976
WA	1979	1997	1944	1973	1971	-	-	1990
WV	-	-	1939	1939	1990	-	-	-
WI	-	-	-	1994	2005	-	1994	-

WY	-	-	-	1911	-	-	-	-

Note1. This table is based on previous research done by Glickman and Painter (2004). For the specific purpose of our study, only four categories of TELs (Assessment Increase, Overall Property Tax Rate, Specific Property Tax Rate, and Property Tax Revenue) were updated beyond their original ending period of 1994.