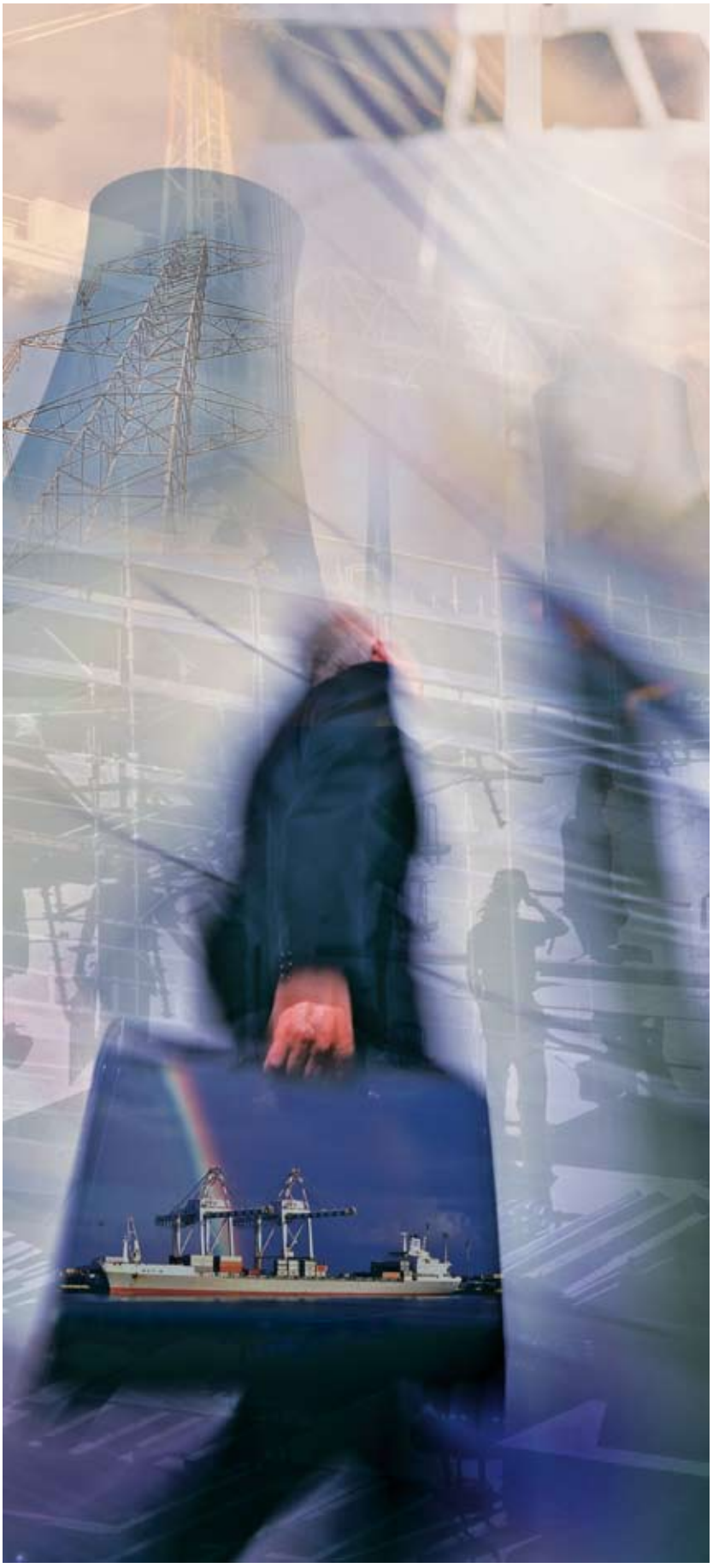

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Does age-pension means testing cause over consumption of housing?: evidence from Australia

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Abstract

International evidence on home ownership and trade-down behaviour of the elderly (Venti and Wise 1987, 1989, 2001) points to a general reluctance of the elderly to draw down equity in their homes. In Australia, the mobility and trade-down decisions of the elderly are complicated by the means-tested nature of the age-pension. The value of the owner-occupier home does not count as an asset in the age-pension assets test. However, proceeds from the sale of the home count as an asset and the interest from the investment of these assets counts as income towards the income test. Therefore, any decision to liquidate wealth held in the owner-occupier home may reduce their age pension entitlements.

In this paper we study the home-ownership and trade-down behaviour of the elderly using the Household, Income and Labour Dynamics (HILDA) data set spanning 5 years from Australia. Our analysis suggests that the means test restricts trades in an important market, and influences the values of the trade-downs where they do occur. We suggest a possible policy solution involving the quarantine of the proceeds from the sale of the owner occupier home, to allow greater flexibility in residential transition amongst the elderly and a more efficient allocation of housing stock, wealth and consumption in retirement.

*We would like to thank Denzil Feibig and Rik Sen for discussions and feedback; Garry Barrett, Gautam Bose, Ajay Shah and Lorraine Ivancic for useful comments. We are grateful to the Australian Research Council for financial support. All remaining errors are our own. We can be reached at, School of Economics, University of New South Wales, Sydney, NSW, 2052, Australia, Email: renukas@gmail.com, j.piggott@unsw.edu.au

1 Introduction

In most industrialised countries, and in Australia in particular, the owner-occupied home is a central asset among mature age cohorts. In Australia, the value of the owner-occupier home is greater on average than the value of all financial assets, including superannuation (AMP.NATSEM 2007). It follows that when the prospect of selling the home confronts households, financial considerations loom large. While non-economic factors often determine the timing of a move, the financial implications of such a change influence its nature, and may dictate whether the move takes place at all.

International evidence (Venti and Wise 1987, 1989, 2001) points to a general reluctance of the elderly to draw down equity in their homes and is a puzzle for economists. Feinstein & McFadden (1987) report an average mobility rate of 7% for households with heads above age 55 in the US between the years 1968-82. Jones (1997) indicates a mobility rate of 14% in the five years between 1980 and 1985 for elderly above the age of 55 in Canada. In more recent data from Canada, Ostrovsky (2002) reports a rate of 14.7% in the 4 years between 1996 and 1999. Census data from Australia reveals that between 1996 and 2001 21% of Australians aged 65 and over moved residence, about 4% each year (Olsberg & Winters 2005), comparable to the estimates from other parts of the developed world.

In Australia however, the mobility decision is complicated by the unique position of the owner-occupied home: it attracts no income tax, no capital gains tax, and most important for the elderly, its value does not count in the age pension assets test.[1] However, proceeds from the sale of a house count as assets and the returns from the investment of these assets count as income towards the income test. It follows that any decision to liquidate wealth held in the owner-occupied home may reduce age pension entitlements.

These initial observations motivate the paper. Its purpose is to document evidence on residential transition among older Australians. In addition, it also aims to evaluate the impact of the age-pension asset-test rules on trade-down behaviour of the elderly, conditional upon moving. One of our hypotheses is that financial considerations of a trade-down may discourage a household

[1] While the assets test scales are different for owner-occupiers and renters, the value of the home does not itself enter into the assets test.

from selling its owner-occupied home and moving to a smaller one. Depending upon the value of non-housing assets each household in receipt of the age-pension will find itself with a trade-down value such that it can retain the age-pension after the trade-down. To the extent that age pension entitlements are reduced as a result of trading down, mobility will be inhibited. Our results are consistent with this hypothesis. We find that pensioners who have non-housing assets greater than the assets test cut-off have a lower conditional probability of trading down as opposed to non-pensioners with similar asset values.

It follows that changes to age pension assets test rules in Australia may allow greater flexibility in residential transition among the elderly. We believe that this would have a positive impact not only on older people wishing to trade down their residence, but also on resource allocation in the housing market generally. The incidence of a large house being occupied by elderly people to preserve their wealth in a tax and age-pension sheltered form would decline.

Our analysis has more general relevance since many countries have policies offering entitlements contingent on wealth, but exempting the family home. In the US for example, the SSI does not include the home in determining eligibility. The home is also kept out of Medicaid's asset limits. Sheiner & Weil (1992) allude to the possibility of expecting households with a risk of high nursing home expenditures to hold on to the house to preserve wealth. In order to promote elderly mobility, it is first important to understand elderly immobility and the role of policy in encouraging, sometimes unintentionally, such behaviour. Newman & Reschovsky (1987) address this concern by evaluating the impact of the Section 121 tax rule in the US that exempts from gross income the capital gains from the sale of the house on the mobility of the elderly. There is greater need to evaluate the impact of other tax policy measures on elderly mobility.

We begin section 2 with an overview of what is known about home ownership and transition behaviour internationally. In section 3 we provide a sketch of the elderly in Australia and what we know of their transition behaviour. Our focus here is on households whose head is 65+ as the age-pension cannot be received until age 65. With this background, in section 4 we present a simple explanation of elderly housing dynamics and provide some estimates of mobility and trade-down behaviour from a Heckman selection model in section 5. Section 6 concludes.

2 An overview of residential transition amongst the elderly

Research on residential mobility has focused on the home as an asset, and has investigated behaviour around the draw-down of housing equity, primarily through moving to a smaller home, but also through home equity loans or other instruments such as reverse mortgages.

The decision to move is viewed either as an outcome of rational choice within the construct of the Life Cycle Hypothesis (LCH) or as a reaction to some shock, economic or otherwise. With reference to the elderly, the LCH postulates that this group will draw-down home wealth in order to finance current consumption. If the LCH holds, we should see the elderly drawing down on housing wealth to finance consumption and thus greater mobility amongst this group. The evidence, for example (Venti & Wise 1987) however points to the contrary.[2] Venti & Wise (1989) claimed that the elderly had no desire to reduce housing equity, while Venti & Wise (2001) concluded that families who sell and buy a new home increased home equity on average. Tatsiramos (2006) analyses residential mobility and home-ownership of households in Europe whose head is 50 years or older, and finds low residential mobility particularly in Southern Europe. However, he also reports that for older households there is an increasing trend mostly towards renting indicating some dissaving. This finding is similar to that of (Churi & Jappelli 2006) who find that in 17 OECD countries home ownership falls after age 70 at the rate of about 0.5 percentage points per year.

One could hypothesize that high transactions costs or other capital market imperfections inhibit a move.[3] Ostrovsky (2002) finds that transactions costs increase with age and thereby have a negative impact on mobility. Feinstein & McFadden (1987) concern themselves with the latter question while trying to estimate simple models of a rational life-cycle household facing the decision to move and conditional upon the move, the decision to downsize. Their findings seem to reinforce the view that wealthier households are less likely to move and downsize (thus not extract equity from their homes) and it is changes in family composition or retirement status that increase the likelihood of

[2]There are a few studies that claim otherwise. Sheiner & Weil (1992) point out that other studies have looked at the behaviour of the "young old" and when the "old old" were taken into account average levels of home-ownership and housing wealth declined significantly with age. In a similar vein Hurd (1990) claims that wealth does decline, but the age at which we observe such declines depends in a complicated way on the utility function, the time path of annuities and the time path of mortality rates.

[3]Moves might be inhibited, or encouraged by housing opportunities or other macroeconomic variables as well. Economic changes affect fluctuations in house prices and thus indirectly the build up of housing equity (Helderman 2007).

a move. They also find no evidence of capital market imperfections affecting housing behaviour.

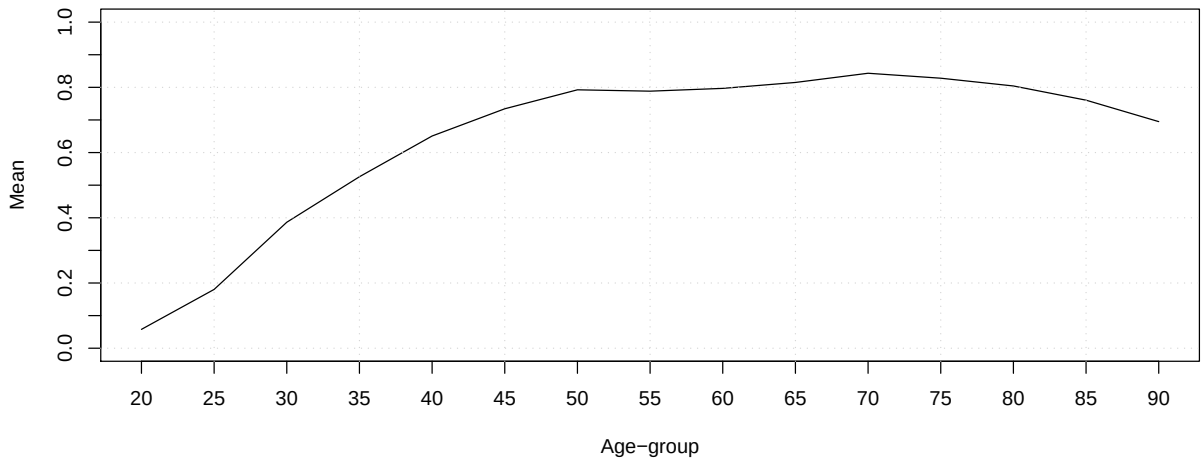
If economic motivations are ostensibly not the reason people move, then it must be that non-economic factors are the "triggers" that lead people to make the decision. Wiseman (1980) was one of the first to develop a model of migration specific to the elderly where migration was described as a series of related decisions set off by specific "triggering" mechanisms. Venti and Wise (1987, 1989, 2001), Feinstein & MacFadden (1987) find that moving is often a response to a precipitating shock, such as death of a spouse or a change in marital status. [4] One way of looking at a trigger is that in some sense non-economic factors impact the decision to move by changing the economic status of the elderly. Such a view was taken by VanderHart (1998). He used a dynamic choice technique to take account of the influence of expected future economic conditions of the households whose heads are aged 50 or more in the present. Once this is recognised, economic factors such as income and financial assets were found to be more important than the literature had thus far suggested.

An important paper by Reschovsky (1990) articulates a model which focuses on the nature and quantity of housing services consumed. He begins by reporting that in the US, households with heads under age 65 are 3.5 times more likely to move in a year than older households. The differential remains after taking into account change in marital status. He next addresses the issue of tenure, proposing that renters are able to adjust housing services to suit their needs relatively easily, while owners face more substantial adjustment costs. In his terminology, owners are more likely to remain in a position of housing disequilibrium, because the costs of adjusting to more appropriate accommodation are too high. He found that elderly homeowners are more likely to be in disequilibrium than others, and that nearly all who are in disequilibrium over-consume rather than under-consume housing services. He is unable to shed much light on the reasons why households do not move, however. Attachment to location is a possibility, although this would not preclude downsizing. He suggests that search costs might be greater for elderly households.

While we do not estimate a measure of housing disequilibrium, our idea is consistent with this hypothesis. We believe that the means-tested nature of the age pension and the structure of assets

[4] The greater influence of non-economic factors on the mobility decision as compared to the economic factors has also been documented by other researchers such as Vanderhart (1994), Ellwood & Kane (1989), Boersch-Supan (1989), Merrill (1984), Megbolugbe et al. (1997).

Figure 1 Home-ownership in Australia



test in Australia leads households to continue to occupy family homes. We turn next to a more detailed analysis of home ownership and residential transition of the Australian elderly.

3 The elderly in Australia: home ownership and residential transition

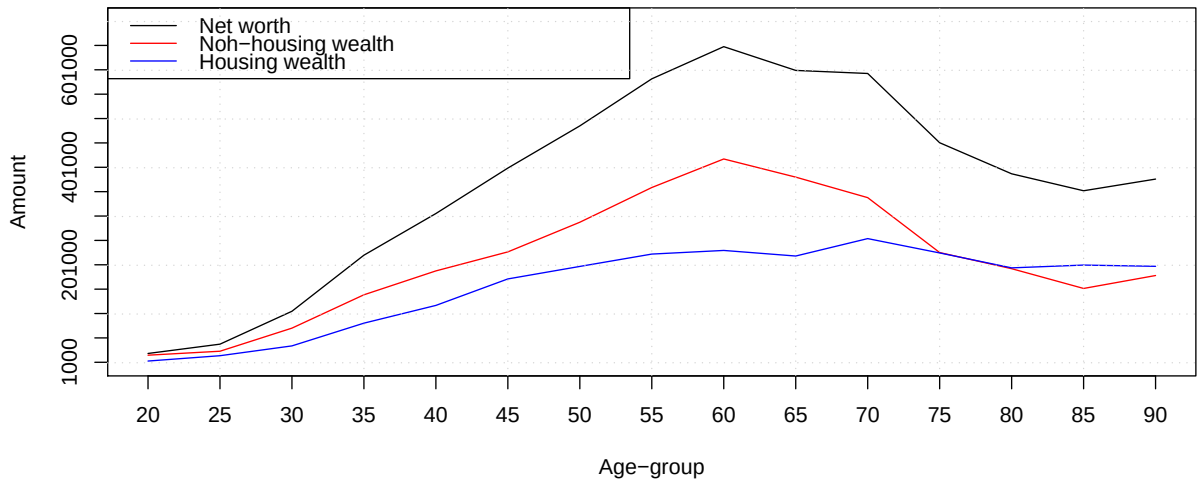
The family home is one of the most important assets in net wealth for the elderly. We examine more detailed wealth and residential transitions of the elderly between 2001-2005 from the the Household, Income and Labour Dynamics (HILDA) panel data set from Australia. We rely on this database for our analysis. Detailed wealth estimates of households were collected in the second wave in 2002, and we therefore use the household data from this wave (Wave 2) to provide a snapshot of the elderly.

Consistent with most anecdotal and other published evidence[5] we find that about 80% of the elderly are home-owners (See Figure 1). More than 75% of these people own their house without a mortgage.

As shown in Figure 2, at older ages, though there is a slight fall in the housing wealth, it does not fall as much as non-housing wealth, suggesting low trade-downs amongst the elderly.

[5]See Olsberg & Winters (2005).

Figure 2 Wealth portfolio by age



To obtain a measure of housing service consumption, we examined the number of bedrooms elderly households had to spare. Of the 65-69 age group, about 48% said that they had two bedrooms to spare. The number was 55% for the 75-79 age group and 40% for the 80 plus age group, indicating that there is spare capacity in the houses that the elderly live in.[6] This is consistent with the findings of Reschovsky (1990) for the US. We also find that the elderly are either a couple family or a lone person household. At older ages lone person households come to dominate.

To understand residential transition in our data, we follow respondents who were present in Wave 1 and ignore new entrants in subsequent waves. This implies that the mobility numbers that we report also reflect an ageing of the cohort effect. We lose respondents in subsequent waves owing to death, illness/infirmity or refusal and our sample size gets smaller each wave.[7] Because the composition of a "household" may often change from wave to wave, we focus on individual respondents and treat them as representing their "household" whatever that may be. We use only one respondent per household. Any changes in household composition will show up in variables such as marital status or demographic group the respondent belongs to. Our income and wealth variables are that of the

[6]These numbers are derived from the 2003-04 ABS Household Expenditure Survey (HES).

[7]In total, we lose 168 of the 1505 (11%) respondents between Wave 1-2, 125 of the 1337 (9.3%) respondents between Wave 2-3, 118 of the 1212 (9.7%) respondents between Wave 3-4 and 73 of the 1094 (6.4%) respondents between Wave 4-5. The number of respondents who are untraceable in the next wave are very few: between 1-10 people in each wave are lost because of that reason.

household the respondent belongs to. Table 1 presents results of wave-wise moves and is consistent with the 4% moves each year in the data reported earlier.[8] Also, our numbers reflect households

Table 1 Households whose address has changed between waves

Wave	Movers (%)	Excl. to nursing home
1-2	4.59	4.2
	(0.60)	(0.57)
2-3	4.22	3.8
	(0.57)	(0.54)
3-4	4.18	3.8
	(0.63)	(0.61)
4-5	3.46	3.2
	(0.59)	(0.58)

Source: HILDA
The numbers in the parenthesis indicate standard errors

moving and not necessarily downsizing their home. Moves could be associated with trade-downs or trade-ups, tenure changes or could even be to non-private dwellings such as nursing homes.

One of the most important triggers identified in the literature on elderly mobility is the health of the members of the household. Our findings reinforce this view (See Table 2). People with a long term health condition are more likely to move than people without one. For example in between Wave 4 and 5, 2.07% of the movers had a long term health condition, whereas 1.39% did not have a long term health condition.

Table 2 Incidence of movement by health

	Movers with a health problem	Movers without a health problem	Total
Wave 1-2	2.91	1.68	4.59
	(0.49)	(0.35)	
Wave 2-3	2.23	1.99	4.22
	(0.45)	(0.36)	
Wave 3-4	2.65	1.53	4.18
	(0.53)	(0.33)	
Wave 4-5	2.07	1.39	3.46
	(0.45)	(0.39)	

Source: HILDA
The numbers in the parenthesis indicate standard errors

[8] A difference in the numbers that we report and those reflected in the studies from the US is that the US panels are of longer duration and the years between subsequent interviews are also greater, thus spanning a greater amount of time. Most US studies have included people above the age of 55, whereas our focus is the elderly above the age of 65 as we are interested in studying the impact of age-pension on mobility and the age-pension is received only after 65.

In keeping with the move as a response to a shock or event, we trace the impact of events in each wave on mobility in future waves. For example, if the household faced a major event, it is likely that the response in the form of a move will be seen in the next 2-3 years. Of the people who witnessed death of a spouse in 2001, none registered a move in subsequent waves. Of the people who retired in 2001, 12% registered a move in subsequent waves. Of the people who witnessed an injury to a family member, about 11% moved in the next few waves. Another interesting observation is that only 7% of home-owner pensioners who claimed to be unsatisfied with their house, moved. The corresponding number for home-owner non-pensioner was 12%.[9] These numbers are quite small and suggest a reluctance amongst the Australian elderly to leave their primary residence, compared to international evidence where such shocks have led to moves (Vanderhart 1994, Merrill 1984, Ellwood & Kane 1989).

Central to our hypothesis, is the effect that the age-pension has on the incidence of a move by the elderly. About 70% of the respondents are on an age-pension. Table 3 indicates that there is not much of a difference between the mobility of pensioners and non-pensioners except for Wave 2-3, where non-pensioners had a surprisingly low mobility. One can only conjecture that non-pensioners held on to the rise in house prices in 2002-03 more than pensioners.

Table 3 Incidence of movement by age-pension status

	Pensioner	Non-pensioner
Wave 1-2	4.54	4.74
	(0.69)	(1.16)
Wave 2-3	4.76	2.95
	(0.72)	(0.91)
Wave 3-4	4.14	4.29
	(0.65)	(1.42)
Wave 4-5	3.52	3.31
	(0.67)	(0.12)

Source: HILDA
The numbers in the parenthesis indicate standard errors

However, this might not correctly disentangle the influence of home-ownership and pension status on the decision to move as a lot more pensioners are also renters and it is tenure that may be the dominant factor causing a move. For example, 7.5% of non home-owners moved between Wave 2-3 as opposed to 4.3% of outright owners.

[9] These numbers reflect Wave 1-2.

We look at tenure changes amongst movers for all waves, but report the numbers for the Wave 2-3 transition as all other waves show similar trends. Of the movers between Wave 2-3 (Table 4), most people continued in the same tenure as before. For example, of the 41 outright owners who moved, 32 continued being outright owners.

Table 4 Tenure change amongst movers (Wave 2-3)

2-3	Non-owner	Own on mortgage	Own outright
Non-owner	15	0	2
Own on mortgage	3	0	0
Own outright	8	1	32

Source: HILDA

Tenure change encompasses moves to non-private dwellings such as nursing homes. A home-owner moving from own home to a nursing home is recorded as a non-owner in the next wave. 9% of the movers moved to a non-private dwelling between Wave 1-2, 10% between Wave 2-3, 12% between Wave 3-4 and 19% between Wave 4-5, again reflecting the ageing of the panel.

In conclusion, the HILDA database provides us with both the number and characteristics of movers between years, over a five year period. Both pensioners and non pensioners have similar mobility rates and tenure persistence is the norm. Surprisingly, very few people who reported an event also reported a move in subsequent waves. If the age-pension constraint is binding (as we suppose it is), it is perhaps not surprising to see a reluctance to move.

4 Analysing elderly housing dynamics

A household evaluates the utility from continuing to stay in its current residence and from a move. The household then chooses that which gives it a higher expected utility. Utility is dependent on housing (HC) and non-housing services (NHC) consumption, subject to the sum total of housing wealth (HW), non housing wealth or other assets (OA) and annuity value of future income (labour or transfer payments, such as the age-pension in the case of Australia). In other words a household maximizes,

$$\begin{aligned} U &= U(HC, NHC) \\ s.t. W &= HW + OA + PV_{income} \end{aligned}$$

The potential disequilibrium for a household, is a large amount of housing consumption at the cost of non-housing consumption. If the household were to reallocate wealth into other assets by drawing down their housing equity, it would be possible to enjoy greater non-housing consumption. For example, an elderly couple may be unable to maintain a big house, or the death of a spouse may mean that the family home is too big for one person. Whenever a household finds itself in such a situation, it should move and trade-down. However, a trade-down which essentially leads to a rise in OA may make the assets test binding and lead to a fall in the PV_{income} leaving the household in the same position if not worse-off. The choice, given the age-pension rules, and focusing on the assets test is essentially as follows:

A household can choose between an allocation of wealth in housing (HW) and other assets (OA) and a level of pension (P) that it is entitled to given the combination of HW and OA.[10]

$$HW \neq 0$$

$$P = \begin{cases} x1 & \text{if } OA \leq y1 \\ x1 - (OA - y1/1000) * 1.5 & \text{if } y1 \leq OA \leq y2 \\ 0 & \text{if } OA \geq y2 \end{cases}$$

$$HW = 0$$

$$P = \begin{cases} x1 & \text{if } OA \leq z1 \\ x1 - (OA - z1/1000) * 1.5 & \text{if } z1 \leq OA \leq z2 \\ 0 & \text{if } OA \geq z2 \end{cases}$$

These rules essentially lead to a kink in the budget constraint of the household at the full and part pension cut-offs.[11] The household can release into other assets an amount that ensures that it stays within the bounds of the asset test. Thus, the constraint is not that the household cannot trade down at all, the constraint is that it can trade-down a value, which depends on the value of the other assets in the portfolio. This value would differ for each household: a household with a home that will sell for very little, might be able to release the entire amount to other assets, switch to being a renter and still retain the pension. On the other hand, households with home values that are very large, will be able to trade-down only a fraction of the home value to be able to retain the pension. To simplify our analysis, we generalise households into four categories based on the

[10] The exact values of the cut-offs are given in the appendix.

[11] Here y1 and z1 are the full pension cut-offs and y2 and z2 are the part pension cut-offs. More detailed data on the current full and part pension cut-offs is presented in the appendix.

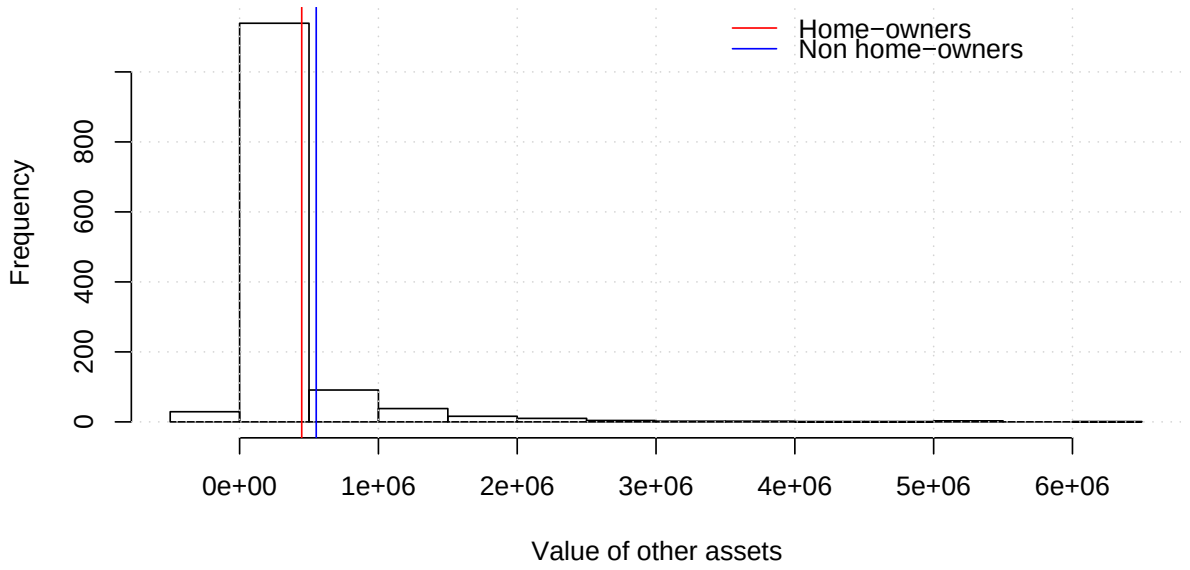
combination of other assets and the value of the family home. Assets are defined as large or small in relation to the assets test cut-off and homes in relation to the median home value.

- Small assets, small home.
- Large assets, small home.
- Small assets, large home.
- Large assets, large home.

Amongst the four categories above, we expect that households with small assets and a large home would have the highest probability of moving and trading-down. Households with large assets and small home might find it beneficial to actually trade-up and reallocate wealth into the family home. One additional concern however is that a rise in investment income (from the other assets) may also lead the household to lose the pension, not because the assets test binds, but because the income test does. This implies that the household can trade-down small amounts at each instance, and thus reallocate wealth over several moves. However, if transactions costs are sufficiently high, this might generate behaviour where households don't move at all as making many small value trade-downs becomes costly. If transactions costs are low, it might lead to households making many moves, whereby a small value is traded down at each move.

We distinguish between home-owners on a pension and those without one. We find that of all the home-owners about 68% are on an age pension. We also find that on average, home-owners pensioners (h+p) have lower disposable incomes than home-owner non-pensioners (h+np). This is not surprising given that the income test needs to be satisfied as well to be eligible for the age-pension. h+p also have lower home values: the median home value is around $200,000 and for a h+np is $300,000. We also observe the value of other assets for households and find that most households have assets lower than the part-pension cut-offs for home owners and non home-owners indicating that the assets-test cut off is binding (Figure 3). A closer look at the data reveals that 60-80% of home-owner pensioners traded down between the five waves with a median trade-down of about $60,000 each wave, which is less than half the median value of the family home reported earlier.We also examined the move and trade-down behaviour of the four categories of households we mentioned earlier. We report results for the moves between wave 2 and 3 as this is the wave for

Figure 3 Other assets of households and part-pension cut-offs



which we have data on the value of the other assets of the household. Small and large homes are determined in relation to the median value of the home, and small and large assets are determined in relation to the assets-test cut-off for the full pension. We find that households with small assets

Table 5 Move behaviour of homeowners pensioners (Wave 2-3)

	Small assets Small home	Large assets Small home	Small assets Large home	Large assets Large home
Moved (homeowners only)	4.1	3.9	4.7	3.7
Traded-down (only movers)	54%	42%	79%	68%
Post-move pension (only movers)	85.7%	85.4%	100%	100%

and a large home have moved and conditional upon moving have traded down the most consistent with our expectations. Households with large assets but a small value of home have traded-down the least, perhaps indicating that these households actually trade-up. Given that their home-value is lower than median, an allocation of wealth from other assets to the family home might actually lead the household to become eligible for the age pension and perhaps is a reason of low trade-down

behaviour. Another interesting thing to note is that most of the moves do not result in a loss of the age-pension suggesting that there is a prevalence of moves that ensure that the mover stays within the bounds of the assets (and income) test and is consistent with a low median trade-down of $60,000.

5 Econometric model

We are ultimately interested in modeling trade-down behaviour. However a trade-down is meaningful only if the household has moved. This causes a potential selection issue and applying a binary probit model of trade-down may lead to biased estimates. An econometric model which deals with this problem can be defined as a selection model in terms of the marginal probability that a household will move in a year, and conditional upon moving, trade-down.

$$
\begin{aligned}
y_{it}^{*} &= x_{it}\beta + \epsilon_{2it} && (1)\\
z_{it}^{*} &= w_{it}\gamma + \epsilon_{1it} && (2)\\
Corr(\epsilon 2_{it}, \epsilon 1_{it}) &= \rho && (3)\\
y_{it} &= 1[y_{it}^{*} > 0] && (4)\\
z_{it}^{*} &= 1[z_{it}^{*} > 0] && (5)
\end{aligned}
$$

Here z_{it}^{*} is a latent variable indicating whether the household moved or not and y_{it}^{*} indicates a trade-down conditional upon moving. y_{it} is observed only if $z_{it} = 1$. Thus our selection equation models Pr(move) and the outcome equation models Pr(trade-down|move).

We estimate this model using data from five waves of HILDA. We observe whether the respondent (representing the household) indicates a move between two waves. We also observe the value of the home prior to and post a move and a lower value post a move indicates a trade-down. We focus only on home-owners who did not move to a nursing home. A move to a nursing home is different from all others as it is made on most occasions out of compulsion and not out of a desire to reallocate wealth out of the family home to other assets.

There are two potential problems with modeling the initial decision to move. The first is that of individual heterogeneity. A binary probit model treats the observations across waves as independent

and ignores the possibility of a correlation over time. However, unobserved characteristics of households will be correlated across the choice occasions (in our case time). To control for unobserved heterogeneity we estimate a random effects probit model for the move decision. As presented in Table 10 in the Appendix, we find that the correlation estimate ρ is insignificant and we therefore do not incorporate this in our final selection model and instead assume housing behaviour can be modeled as an independent Bernoulli process over years (with time dependent explanatory variables). The second potential problem is that of state dependence owing to few multiple movers in our data set. We deal with state dependence by restricting ourselves to the first move of households. Once a household moves, we remove it from our data set.

Because we pool data from all the waves and do not explicitly account for the panel structure of the data, the resulting estimates are likely to be biased and should be interpreted with caution. However, we do specify standard errors that allow for intragroup correlation i.e. we assume that observations are independent across groups, but not within groups, where group refers to the respondent (household) in our estimation. Our analysis is focused on examining the incidence of "trade-downs" and does not model transitions between alternative states.

For our selection equation, we use variables which have been outlined as important to mobility in the literature. These include the number of years spent in the current home (yrs.home) , age and age-square (age2), sex, existence of a long-term health condition (health prob.), a dummy variable (age pension) indicating whether the person is a pension recipient, amount of the age pension received by the household (pen. inc.), annual income from all sources (hh inc), home value (hh val), dummy variable indicating whether other assets of the household are greater than the full pension assets-test cut-off (obig), dummy variable indicating whether the value of the home is greater than the median (hval big), number of resident (res. child) and non-resident children (non. res. child), a dummy variable for family type with a couple family as the base, and a lone person, and other being the remaining two, a variable to indicate satisfaction with financial situation (fin. satis), satisfaction with the home (home satis) the household resides in and satisfaction with the neighbourhood of current residence (neigh. satis). We finally interact receipt of the age-pension with home values greater than the median (pen*hvalbig) and other assets greater than the full pension assets test cut off (pen*obig). We are comparing pensioners with assets greater than the full pensions cut off with pensioners with smaller assets and non-pensioners. For the outcome

equation we use a subset of the variables in the selection equation. Housing choices will also be sensitive to housing prices, but we do not construct housing prices for the full panel of the elderly in HILDA, and leave the analysis of their effect for future research.

Table 6 Estimates of the selection model

Log-psuedo likelihood	-580.68			
	Estimate	Std. Error	z value	
Tradedown				
(Intercept)	-2.897	11.15	-0.26	
age	0.0043	0.294	0.01	
age2	- 0.00004	0.0019	-0.02	
(age-pen)	0.5853	0.3965	1.48	
pen. income	0.0025	0.0011	2.34	*
hh inc	-0.0018	0.0008	-2.09	*
hh value	0.0013	0.0006	2.09	*
obig	0.8681	0.5053	1.72	.
hval big	0.8899	0.5027	1.77	.
pen*obig	-1.0964	0.6172	-1.78	.
pen*hvalbig	-0.3798	0.4666	-0.81	
Move				
(Intercept)	7.010	5.1408	1.36	
yrs.home	-0.0152	0.0027	-5.69	***
age	-0.2255	0.1336	-1.69	.
age2	0.0015	0.0009	1.75	.
(sex)	-0.0560	0.0845	-0.66	
(health)	0.0779	0.0809	0.96	
(age-pen)	-0.0087	0.2072	-0.04	
pen. inc	0.0006	0.0003	2.03	*
hh inc	0.0003	0.0002	1.46	
hh value	-0.00003	0.0002	-0.23	
obig	0.2301	0.1824	1.26	
hval big	-0.1335	0.1800	-0.74	
res. child	-0.0842	0.1992	-0.42	
non res. child	0.0131	0.0211	0.62	
(lone person)	0.0457	0.1014	0.45	
(other)	-0.4528	0.2440	-1.86	.
fin. situation	0.0060	0.0360	0.17	
home. satis	-0.0333	0.0270	-1.23	
neigh. satis	-0.0486	0.0270	-1.80	.
pen*obig	-0.1441	0.2060	-0.70	
pen*hvalbig	0.4101	0.1984	2.07	*
ρ	0.8389	0.1751		
$\rho = 0$			3.17	.
Significance code	***0.001	**0.01	*0.05	.0.1

Our results are presented in Table 6. We find that higher the number of years spent in a particular home, the lower is the probability of moving. As people get older, the probability of a move falls,

rising again at older ages consistent with the intuition that the "old old" exhibit greater mobility. The greater the pension income and the value of the home and other assets, the greater is the conditional probability of a trade-down. However, when other assets are interacted with the age-pension we find that the probability of a move and a trade-down conditional on the move is lowered. This is true of large value homes as well. Also, the greater the household total income, the lower is the probability of a trade-down, probably implying that if total income rises, then the household has a lower need of accessing housing wealth. It also has a bearing on the income test: higher income would make the income test bind and the household may lose the age-pension. The greater the satisfaction with ones neighbourhood, lower is the probability of a move. We also find that ρ is significant at a 10% LOS, implying our selection model is significant.

To gain insight on the impact of these results on the probabilities of moving and trading down, we derive the probability of a move and a trade-down conditional upon the move for each respondent in the sample. We then calculate the means of these estimated probabilities over the entire sample and over selected groups. This allows us to compare an "average" respondent between the groups. We present these in Table 7. Pensioners have a greater average conditional probability of trading down

Table 7 Mean estimated probabilities

	Pr(Tradedown=1|move=1)	Pr(move=1)
All	0.70	0.034
Pensioners	0.71	0.04
Non-pensioners	0.68	0.03
Big assets, pensioner	0.54	0.04
Big assets, non-pensioner	0.71	0.03
Large assets, big home, pensioner	0.63	0.05
Small assets, big home, pensioner	0.86	0.04
Large assets, big home, non-pensioner	0.79	0.03
Small assets, big home, non-pensioner	0.81	0.02
Large assets, small home, pensioner	0.39	0.03
Small assets, small home, pensioner	0.64	0.03
Large assets, small home, non-pensioner	0.37	0.03
Small assets, small home, non-pensioner	0.31	0.03

than non pensioners as well as a greater predicted probability of moving. This perhaps captures the fact that pensioners are poorer and therefore need to trade-down more than non-pensioners to be able to smooth consumption. Pensioners with assets greater than the full pension cut-off have a greater probability of moving, but lower probability of trading down conditional upon moving than

non-pensioners in the same asset group. This is surprising because one would expect pensioners to trade-down more than non-pensioners and perhaps the structure of the age-pension has an impact on the low predicted trade-downs.

A comparison between pensioners having big homes also shows that the group with large assets has a lower conditional probability of trading down than pensioners with small assets (0.63 compared to 0.86). Pensioners with smaller assets seem to have a greater propensity to trade-down as their low value of other assets allows them some flexibility before their age-pension entitlement gets lowered. In comparison to non-pensioners in the big-homes group, pensioners with large assets have a lower conditional probability of trading down (0.63 as opposed to 0.79). This also suggests an inhibition to a trade-down due to the assets-test constraint.

Pensioners and non-pensioners with small homes trade-down the least. This suggests that there is a desire to increase housing wealth even at older ages and is consistent with international evidence which indicates that the elderly increase housing wealth when they move. Pensioners with large assets trade down very little (0.39). This group has the greatest incentive to increase wealth in their family homes so as to continue to be within the bounds of the assets test and therefore trade-up. Pensioners with small assets trade-down the most (0.64). A small release into other assets may not change the assets test configuration and lead to a loss of the age-pension.

Because other circumstances also impact the decision to move, it is extremely difficult to disentangle the exact impact of the age-pension on mobility and trade-downs. Another point to note is that we have used the full pension cut-off for our econometric specification and predicted probabilities. A pensioner could move from being a full pensioner to a part-pensioner and be better off if the rise in the income from the draw-down of equity is greater than the fall in the pension. This may be one reason that may explain greater mobility within particular other asset-home wealth configurations. This can be approached by using more sophisticated specifications that take into account the kinked nature of the budget constraint or multinomial choice specifications that can model transitions between various states and is left for further research.

6 Conclusion

Our results point to several interesting features about mobility and trade down behaviour of the elderly in Australia. Pensioners exhibit greater mobility. Pensioners with higher values of other assets, exhibit lower trade-downs. Pensioners with low values of home exhibit greater trade-ups. This suggests that the age-pension has a bearing on the move and trade-down behaviour of the elderly. A related decision not explicitly modeled by us is that of tenure choice, which also has a bearing on the age-pension assets test applicability. Non home owners can have greater values of other assets before they lose their age-pension and for many pensioners, switching to renting may be the best strategy. Our analysis thus suggest a price distortion in reducing the owner occupied housing assets for 65+households in Australia. In economic efficiency terms, this is likely to be a serious source of economic inefficiency, restricting trades in an important market. While we focus our work on the 65+ households, research also needs to examine the wealth allocation decisions of households between 45 and 65, as many such decisions will get made in anticipation of the age-pension.

Various writers have argued that asset price distortions of this kind are likely to dominate inter-temporal and other price distortions in generating resource misallocations, because of the magnitudes of the infrastructure involved. Hamilton & Whalley (1985) and Hamilton (1987) both argue the dominance of asset price distortions over other forms of economic inefficiency. Given this background, it is important that policymakers pay serious attention to opportunities for reforming policies which introduce such distortions.

The age pension assets test falls squarely into this category. The loss of the age pension may frequently lead to a decision against moving and trading-down. Further, this affects well over half the 65+ population, a group which is steadily growing as the population ages. Quarantining the proceeds from the sale of the family home and not counting them as assets would in effect complete the job started by the superannuation reforms; where they removed the price distortion associated with tax, this would remove the corresponding distortion associated with the assets test.

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Appendix

The age-pension is means tested. There is an asset-test as well as an income test and the lower of the two is binding. There are different constraints for home owners and non homeowners. The cut-offs as of February 2008 are listed in Table 8. A home owner with assets above the full pension cut-off loses $1.5 for every $1000

Table 8 Assets test rules for the age-pension

	Single	Couple
Asset-test		
Homeowners		
Full pension cut-off	$166,750	$236,500
Part pension cut-off	$529,250	$839,500
Non home-owners		
Full pension cut-off	$287,750	$357,500
Part pension cut-off	$650,250	$960,500
Income test		
Full pension cut-off (p.f.)	$132	$233
Part pension cut-off (p.f.)	$1,459.25	$2,492

above the cut-off till the part-pension cut-off is reached[12] after which the pension is reduced to zero. There are similar cut-offs for the income test, and the pension is reduced by 40 cents in the dollar for income over the full-pension cut-off.

[12]The rate of $1.5 per $1,000 was introduced with the Simple Super reform that enacted in September 2007.

Table 9 Estimates of two binary probit models

	Prob(move)		Prob(trade-down)	
Log likelihood	-518.98		-63.28	
(Intercept)	7.33		-6.33	
	(5.16)		(16.38)	
yrs.home	-0.0144			
	(0.0029)	***		
age	-0.2360	.	0.1368	
	(0.1353)		(0.4334)	
age2	0.0016	.	-0.0009	
	(0.0009)		(0.0028)	
(sex)	-0.0570			
	(0.0928)			
(health)	0.1058			
	(0.0853)			
(age-pen)	0.0096		0.7724	
	(0.1947)		(0.6058)	
pen. inc	0.0006	*	0.0025	
	(0.0003)		(0.0012)	
hh inc	0.0003		-0.0024	**
	(0.0002)		(0.0008)	
hh value	-0.00003		0.0016	.
	(0.0002)		(0.0009)	
res. child	-0.1159			
	(0.2971)			
non res. child	0.0176			
	(0.0249)			
(lone person)	0.0599			
	(0.1076)			
(other)	-0.4601			
	(0.2986)			
fin. situation	0.0328			
	(0.2197)			
home. satis	-0.0359			
	(0.0305)			
neigh. satis	-0.0552			
	(0.0255)			
obig	0.2181		0.9778	
	(0.1938)		(0.7373)	
hval big	-0.1276		1.192	
	(0.1944)		(0.7688)	
pen*obig	-0.1458		-1.441	.
	(0.2182)		(0.7907)	
pen*hvalbig	0.4124	.	-0.5128	
	(0.2124)		(0.8231)	
Significance code	***0.001	**0.01	*0.05	.0.1

Random effects probit

Table 10 Estimates of the random effects probit model

Log likelihood	-518.72			
	Estimate	Standard error	z value	
(Intercept)	7.58	5.46	1.39	
yrs.home	-0.0151	0.0032	-4.72	***
age	-0.2443	0.1434	-1.70	.
age2	0.0016	0.0009	1.75	.
(sex)	-0.0603	0.0981	-0.61	
(health)	0.1094	0.0891	1.23	
(age-pen)	-0.0002	0.2038	-0.00	
pen. inc	0.0006	0.0003	1.91	.
hh inc	0.0004	0.0003	1.42	
hh value	-0.00003	0.0002	-0.17	
res. child	-0.1244	0.3113	-0.40	
non res. child	0.0188	0.0263	0.71	
(lone person)	0.0624	0.1132	0.55	
(other)	-0.4784	0.3135	-1.53	
fin. situation	0.0325	0.0229	1.42	
home. satis	-0.0360	0.0318	-1.13	
neigh. satis	-0.0578	0.0268	-2.15	**
obig	0.2239	0.2030	1.10	
hval big	-0.1358	0.2029	-0.67	
pen*obig	-1.442	0.2285	-0.63	
pen*hvalbig	0.4387	0.2247	1.95	.
rho	0.0708	0.09865		
LR test rho=0	0.52			
Significance code	***0.001	**0.01	*0.05	.0.1