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**Do the Elderly Reduce Housing Equity?
An International Comparison**

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Do the elderly reduce housing equity? An international comparison

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Abstract

We explore the shape of the elderly homeownership rate using a collection of microeconomic surveys of 17 OECD countries. In most, the survey is repeated over time. This allows us to construct an international dataset of repeated cross-sectional data, merging 59 national household surveys on about 300,000 individuals. We find that ownership rates decline considerably after age 60 in most countries. However, a large part of the decline should be attributed to cohort effects. After adjusting for such effects, we find that ownership rates fall after age 70 at a rate of about half a percentage point per year. Interestingly, ownership trajectories are quite similar across countries – with the exceptions of Finland and Canada - and unrelated to a wide set of indicators that we examine.

Keywords: homeownership, wealth decumulation, aging
JEL Classification: G2, R2

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1. Introduction

In advanced economies a frequently debated issue is recent demographic trend, which highlights a sharp increase in life expectancy and a rising share of the elderly in total population. As the aging population is undermining current and future sustainability of national welfare systems, understanding the determinants of saving and consumption as people get older is of clear policy interest.

A difficulty in this respect is that so far the Life-Cycle Hypothesis (LCH, henceforth), which is the underlining assumption of most economic models in the field, and which requires individuals to be rationally optimizing over their lifetime, seem not to find clear supportive evidence in the elderly behavior over wealth accumulation. According to the LCH, wealth must decline at some age, such that, unless it is not complemented with the bequest motive, it should approach to zero at the age of death even if the latter is uncertain.

Among the various types of bequeathable wealth, housing is often the most important component but also of a peculiar type, as it is simultaneously an asset and a source of consumption services (Hurd, 1999). Rational and selfish agents that attempt to smooth consumption over their life-cycle should sell or downsize their house, switching from owning to renting or to owning a smaller unit. Alternatively, in many countries, such as the US or the UK, the elderly don't need to sell their property to finance consumption, as they can access appropriate financial instruments (such as reverse mortgages) to release housing equity, at least in principle.

Existing empirical studies, mostly based on US data, find that the elderly are not likely to decumulate housing wealth, see Feinstein and McFadden (1989) and Venti and Wise (2002, 2004). Rather, the US evidence suggests that the elderly prefer staying in their homes, unless they are forced to move by precipitating shocks - as the death of a spouse, health reasons or entry into a nursing home. The evidence for other countries is far more limited. But where the evidence exists, it broadly confirms the slow rates of housing decumulation observed in U.S. data.

One important issue that must be addressed to estimate housing trajectories in old age is that cross-sectional profiles can be quite misleading. Indeed, previous studies in the U.S. and elsewhere show that they are contaminated by cohort effects and that a significant component

of the apparent housing dynamics that one observes in cross-sectional data is due to cohort differences.

Existing literature is mainly based on individual country data and lacks a systematic international comparison of age-trajectories of homeownership. In this paper we aim to understand whether lack of housing decumulation is confined to few countries, and if there are systematic patterns that can be related to international differences in financial markets, institutions or public policy.

We use the Luxembourg Income Study (LIS), which is a collection of microeconomic data from OECD countries. We select 59 national household surveys in 17 countries to study ownership trajectories in old age.[1] In most countries, we use repeated cross-sectional data, allowing us to compare the cross-sectional profiles with cohort-adjusted profiles. To control for selection issues and for the endogeneity of co-residence arrangements, we focus on *individuals* (not *households*) aged 50 to 80, a total of more than 300,000 observations.

The rest of the paper is organized as follows. Section 2 reviews the main empirical findings of previous literature, mainly based on individual country data. Section 3 describes the microeconomic data and highlights the importance to distinguish between households and individuals. In Section 4 we present the estimated age profiles. Section 5 surveys some of the factors that affect ownership trajectories and the estimated international tenure profiles. Section 6 concludes.

2. Existing evidence

The age profile of homeownership and its turnover have been widely regarded as evidence in favor or against models of intertemporal choice where individuals smooth consumption through life. With perfect markets, selfish individuals should run down their wealth – and therefore their stock of housing – even in the presence of life uncertainty or when they buffer income or health risks.

[1] In previous work we used the LIS dataset to analyze the tenure decision of young individuals, and to relate it to international characteristics of mortgage markets (Chiuri and Jappelli, 2003). This paper complements our previous findings, by studying the homeownership profile of the elderly.

Altruism affects the marginal utility of terminal wealth, and therefore the speed of wealth accumulation in old age. Purely altruistic individuals should make transfers occur *inter vivos*, i.e. when the marginal utility of the heir is higher. But strategic bequest motives suggest to transfer wealth at the end of one's life. This might be particularly relevant in the presence of transaction costs in selling the house, indivisibilities, or imperfections in the rental market.

In principle, when negative income shocks occur and when people need resources to finance post-retirement consumption, homeowners could access house equity by means of financial services which do not necessarily require selling the house, as refinancing the home mortgage, or accessing home equity lines of credit, such as reverse mortgages (Mitchell and Piggott, 2004). In particular, lower mortgage rates stimulate refinancing, allowing otherwise liquidity constrained households to access home equity and finance current consumption (Hurst and Stafford, 2004). Similarly, reverse mortgages would allow the elderly to borrow money against the value of the house owned, so as to enhance their consumption.[2] However, such financing possibilities are confined to countries with well developed financial markets.

Empirically, several papers provide evidence with U.S. data showing that the elderly do not decumulate housing equity, or do so to a very limited extent. In particular, Feinstein and McFadden (1989), using the Panel Study of Income Dynamics (PSID henceforth), find a transition from owning to renting of less than one third of a percentage point. In a series of studies, Venti and Wise (2002, 2004) use a variety of microeconomic datasets (the Health ad Retirement Study, the Asset and Health Dynamics Among the Oldest Old, and the Survey of Income and Program Participation) and find no evidence of a decline of homeownership before age 75; after this age, the decline is, on average, 1.76 percentage points per year. Substantial rates of decumulation (near 8 percentage points) are found only among households experiencing precipitating shocks.[3] They also find that decumulation rates do not vary by family composition or presence of children in the households, contradicting one basic argument of the bequest hypothesis that family with children should decumulate wealth at slower rate than singles.

[2] However, in this case no repayment is required until the homeowner dies; at that time the house is sold and the proceeds are used to repay the loan.
[3] In an earlier study, Sheiner and Weil (1993) report a similar finding.

Scattered international evidence confirms the U.S. findings. Crossley and Ostrovsky (2003) construct a synthetic panel using 18 cross-sections from three Canadian microeconomic surveys and estimate cohort-adjusted profiles of homeownership. They find that the ownership rate declines approximately by 15 percentage points from the peak of 80 percent at the age of 50-55 to 65 percent at the age of 80. The conclusion of this study is "mildly supportive of the life-cycle model which suggests that we should observe at least some transition from ownership to renting in later life." (p. 15).

Ermisch and Jenkins (1999) use five waves of the British Household Panel Survey and document that residential mobility of the elderly is also rare in the U.K.. However, when residential move is made, there is some evidence of downsizing mainly due to head or spouse retirement decision or to the loss of the spouse.

Although international literature is consistent in finding scanty evidence of residential mobility among the elderly, still international comparisons could highlight the potential driving forces restraining the phenomenon. The first paper taking this perspective is Börsch-Supan (1994), who compares housing choices made by the elderly in the U.S. and West Germany. Using the PSID and the German Socio- Economic Panel, Börsch-Supan finds that ownership rates peak in the age-group 55-59 in both countries, although at a different level, but decline thereafter at a similar pace. Börsch-Supan suggests that some of the country differences in the *levels* of homeownership might be induced by the homeownership subsidy policy in the U.S. and the rent adjustment provision in Germany.

Tatsiramos (2004) is the only systematic attempt to compare homeownership profiles across some EU countries. He uses data for six countries in the European Community Household Panel from 1994 to 2001. He finds that residential mobility among the elderly is 1.5 percent per year in Southern Europe (Italy and Spain) vis-à-vis 3 percent in Central Europe (France, Germany, the Netherlands) and the U.K. The paper also reports that in Central Europe downsizing tends to be associated with retirement, while in Italy and Spain it is more often associated with dramatic events, such as the death of the spouse.

In this paper, we consider a long time span and a large set of countries to understand whether lack of housing decumulation is confined to few countries, and if there are systematic patterns that can be related to international differences in financial market development,

national institutions or public policy, demographic composition of the population and permanent income, on top of genuine preferences for owning rather than for renting.[4]

3. The international dataset

Wealth data are generally lacking or difficult to compare internationally. In this respect, the Luxembourg Income Study (LIS) is a unique data-set, based on a research project by CEPS-INSTEAD with the aim to enhance international comparability among several household surveys.

We concentrate on a group of seventeen relatively homogeneous countries (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Norway, Spain, Sweden, United Kingdom and United States); other potentially interesting countries are excluded for lack of data on home ownership. Each of the 59 selected surveys contains information on demographic characteristics of the household and home ownership.

The sample period spans three decades overall. In all selected countries, except for Norway and Spain, the cross-section is repeated over time, providing an opportunity to exploit time-variability in the owner occupation rates of various age groups within and across countries. The earliest surveys are for the United States (the 1974 March Current Population Survey) and Canada (the 1975 Survey of Consumer Finances), the latest ones for Belgium (the 2000 Panel Study of Belgium Households), Canada (the 2000 Survey of Consumer Finances), Finland (the 2000 Income Distribution Survey), Germany (the 2000 German Socio Economic Panel Study), Italy (the 2000 Survey of Household Income and Wealth), Luxembourg (the 2000 Luxembourg Socio Economic Panel Study), and the United States (the 2000 March Current Population Survey). In some cases the survey design has changed (as in Germany, before and after re-unification). For Belgium, the Netherlands, Ireland and UK we rely on two different surveys. Table 1 provides further details.

[4] In the theoretical literature, this preference order can be justified in three ways: (1) owning eliminates the principal-agent relationship, i.e. the owner can alter the house as desired and is not subject to the risk of eviction or rent increases; (2) tax incentives for owning; (3) there may be no alternative to owning because of imperfections and regulations in the rental market.

Most of the empirical studies based on microeconomic surveys refer to the household as the unit of analysis. However, in this context the standard procedure might induce selection bias, as household dissolution due to e.g. the death of a spouse, might interact with homeownership status. Many elderly facing this precipitating shock move in with their children. Standard empirical analysis would refer to the sample of households in the selected group of people who remain independent, and therefore homeowners. But those who move in with their children are effectively "renters" who disappear from the sample of household heads.

Following this argument, we should expect a discrepancy between the two distributions of household heads and individuals by age. Therefore we define ownership on an individual rather than on a household basis, and select a sample of all women aged between 50 and 80 years old, regardless of whether they are living alone, with their spouse, with their children or with other persons.[5]

Women older than 80 (regardless of year of birth) are excluded from our analysis. This exclusion is motivated by a concern over an important source of potential sample bias arising from the mortality problem. It is well known that survival probabilities tend to be positively correlated with wealth and owner occupancy rates, which implies that the non-survivors will tend to have lower wealth and occupancy rates than the survivor sample. Clearly the information obtainable from survivors over 80 cannot be regarded as representative. These are therefore dropped from the analysis.

Table 2 reports the proportion of household heads and women in three age brackets (51-60, 61-70 and 71-80). By considering women as the unit of analysis we increase the incidence of older people in our sample on average of about 2 percentage points, whereas the standard analysis based on the household heads would have created a potentially relevant selection bias. The reason is that a significant fraction of elderly women are merged with other households and don't appear as independent units.

The proportion of women by owner occupancy rate is reported in Table 3 (for three age bands) and the pattern is also reproduced in Figure 1. While Denmark, Finland, Norway and Spain display rapid declines in owner occupancy rates, in Australia, Ireland and the US about 70 percent of the sample still owns a house at the age of 75. Although Figure 1 highlights

[5] We choose to perform the analysis at the level of women instead of men. Since women have longer life expectancies, they are more likely to survive men.

large cross-country differences, each distribution shows a common trend toward housing wealth decumulation.

4. Estimating ownership trajectories

Use of cross-sectional data to estimate ownership profiles can be highly misleading (Shorrocks, 1975; Mirer, 1979). Individuals interviewed in any cross-section belong to generations that differ in mortality rates, preferences, institutional arrangements, and resources. For instance, a finding that ownership declines with age in a cross-section may derive from the fact that older generations are less productive than younger generations, and tells little about individual behavior. In short, in a cross-section one cannot identify both age and cohort effects (in year *t*, the difference in wealth between a 50 and a 51 years old is equivalent to the difference between the wealth of someone born in year *t*-50 and someone born in *t*-51).

There are two ways to control for the presence of cohort effects: panel data and repeated cross-sectional data. Wealth panel data allow the econometrician to measure decumulation rates of retired people of one particular cohort according to the length of retirement (rather than age). For instance, Diamond and Hausman (1984), find rates of dissaving after retirement of about 5 percent per year in the National Longitudinal Survey of Mature Men. Hurd (1987), using the Retirement History Survey, finds decumulation rates of about 1.5 percent per year and highlights that couples with independent children dissave more during retirement than childless couples. The second approach, pioneered by Shorrocks (1975) and Masson (1986), is to control for differences in productivity and preferences between generations using a time-series of cross-sectional data.[6] Repeated cross-sections allow the econometrician to track cohorts over time. Although the same individual is only observed once, a sample from the same cohort is observed in a later survey.

[6] Shorrocks (1975) used 60 years of estate-duty statistics, concluding that wealth is an increasing function of age. These statistics over-represent the most affluent households. Masson (1986) constructed cohort-adjusted age-wealth profiles using four cross-sections of French data. He found annual rates of decumulation ranging from 0.7 percent for wealthy self-employed persons to 3-4 percent for wage-earners.

We aggregate the data by taking averages of the occupancy rates and the control variables for each age group in each survey. There are 30 age groups (from age 51 to 80) and 59 surveys in 17 different countries, spanning the period 1974-2000. The number of potential observations is 1770; due to missing values for some of the variables, the number of observations is reduced to 1595 (of which 550 between age 51-60, 544 in the 61-70 group, and 501 in the oldest group). We then sort the data by country and year-of-birth (defined as year of the interview less current age) and stack all observations.

Our first econometric model posits that the proportion of owners $\overline{H}$ of age *a* born in year *b* in country *c* is a function of age common to all countries, a set of demographic variables $\overline{X}$ (marital status, working status, and education) that vary by age, year-of-birth and country, a cohort effect common to all countries (δ) and an error component (ε) :

$$\overline{H}_{a,b,c} = \alpha + f(age_{a,b,c}) + \beta \overline{X}_{a,b,c} + \delta\ b_{a,b,c} + \gamma_c + \varepsilon_{a,b,c} \qquad (1)$$

Age, time and cohort effects cannot be identified separately. Therefore we choose to express homeownership as a combination of age and year-of-birth, dropping time dummies and interaction terms between age, time and cohort. The assumption in equation (1) is that there are common age and cohort effects for each of the countries in our sample. This assumption is questionable, and we will complement the analysis estimating separate regressions for each country.

Since the age effect is likely to be non-linear, we choose the following flexible spline function:

f_1(age) = Age if Age $\leq$ 60, f_1(age) = 60 otherwise,
f_2(age) = Min(Age-60, 10) if Age > 60, f_2(age) = 0 otherwise,
f_3(age) = Min(Age-70, 10) if Age > 70, f_3(age) = 0 otherwise,

As a proxy for household resources and preferences, we control for education, marital status and working status. We recode the education variable contained in the original surveys into three levels (low, middle and high), based on the 7 categories defined by the International Standard Classification of Education (ISCED, 1997). We expect the rate of decumulation of couples to be lower than that of singles, as most likely the formers have higher life

expectancy than the latter. Previous evidence shows that retirement is associated to a transition from owning to renting. Therefore we expect working individuals to exhibit higher occupancy rates.

Regressions are estimated with grouped data, where each cell consists of an age/year/country observation. Since the cells are estimated with different numbers of observations, we implement a weighted least squares method using as weights $w_{i,c,t} = \left[\frac{n_{a,c,t}}{h_{a,c,t}(1-h_{a,c,t})} \right]^{\frac{1}{2}}$, where n and h are, respectively, the number of observations and the probability of ownership in age group a, country c and year t. Since the sample is a collection of surveys from different countries, we need to take into account that observations might be positively correlated within each survey. The positive correlation might inflate the standard errors, an application of neighborhood effects induced by survey designs that are based on clusters of observations (Deaton, 1997, p. 73–78). We therefore use a robust variance-covariance matrix assuming that observations between the different samples are independent, but not necessarily within each individual survey.[7]

Table 4 reports the regression results. To highlight the importance of controlling for cohort effects, in the first regression we drop the year-of-birth variable. The reference country is the U.S, which has one of the highest levels of homeownership. Therefore most of the coefficients of the country dummies, which control for international differences in institutions and preferences, are negative and statistically different from zero.

The regression shows that having a high school or a college degree is associated with higher ownership (8.9 percentage points). Being married or employed is associated with an increase in ownership rate of about 10 percentage points. The estimated coefficients of the age spline indicate that the ownership rate increases by 0.4 percentage points per year until age 61, declines by 0.3 points until age 70, and by 1.2 points afterwards.

[7] Detailed information on clustering and stratification in individual surveys is not available. We therefore proceed under the assumption that each of the 59 surveys is drawn randomly, and that individual errors are uncorrelated between different surveys and years. This assumption is questionable, because some of the underlying surveys in the LIS are panel datasets or contain a panel section (e.g., the Italian SHIW). However, in some specifications we control for country and calendar time fixed effects, and therefore the residual correlation between sampling units should not be an excessive concern.

The addition of the year-of-birth variable in the second regression changes considerably the shape of the estimated age profiles. Ownership rates increase by 0.7 percentage points per year between age 50 and 60, flatten out between age 61 and 70 (in contrast to decline of the cross-sectional profile), and falls by 0.8 percentage points per year until age 80. Thus, if one controls for cohort effects, owner occupancy rates decline only after age 70, and even after that age the decline is rather limited. The coefficient of year-of-birth is positive and statistically different from zero at the 1 percent level: homeownership increases by 0.5 percentage points for each year-of-birth.

So far we constrain different age groups to display the same coefficients. To check the robustness of the results, we divide the sample into 3 age groups: age 51-60, 61-70, and 71-80. In each of the three sub-samples, the age coefficients are remarkably stable with respect to the full sample specification.

The assumption that age profiles and cohort effects are the same in each country is restrictive. Indeed, the F-test (60, 1688) between the restricted specification reported in Table 3 and an unrestricted regression with full interaction of all variables with the country dummies has a value of 10.48, rejecting the null hypothesis that the slope coefficients are the same across countries at the 1 percent level.

We therefore estimate cross-sectional and cohort-adjusted ownership trajectories separately for each country (except Norway, Spain and Australia where we have only one survey). We then report in Figure 2 the cross-sectional and cohort-adjusted profiles.[8] As one expects, in all countries the cross-sectional profile lies below the cohort-adjusted profile, showing that homeownership is higher for younger cohorts. The difference between the cross-sectional and cohort profiles is largest in Italy, Austria and the U.K.

To compare the ownership trajectories, we plot in Figure 3 the difference between the cohort adjusted homeownership rate in the age groups 51-60 and 61-70. The coefficient estimated in Table 4 for the age group 61-70 (-0.1 percentage points per year) hides considerable dispersion across countries: in Denmark, Canada, Finland, Netherlands the ownership rate falls by almost half of a percentage point in the 51-60 age group. On the other hand, in Austria, Belgium, France, Germany, Ireland, Italy, and Luxembourg the change in

[8] The regressions used to generate Figure 2 are available on request. The cross-sectional profiles are obtained from the estimated age coefficients of a regression of the owner occupancy rates against a

the cohort adjusted profile is positive (around 0.4 percentage points). Finally, in the U.S., the U.K. and Sweden the profile is rather flat.

The country heterogeneity in the change in homeownership rates narrows in Figure 4, where we plot the total change between age 61-70 and 71-80. The country average reduction in ownership is 5.2 percentage points (over a 10-year interval); this is broadly comparable with the age effect estimated in Table 4 (–0.8 percentage points per year). Indeed, most countries exhibit decumulation rates close to 5 points. The exceptions are Canada and Finland, with decumulation rates close to 15 percentage points. At the other side of the spectrum, the U.K. and Luxembourg feature the lowest rates (less than 2 percentage points).

5. International differences in ownership trajectories

In standard life-cycle models, the desire to smooth consumption implies that it is optimal to transfer resources from the wealthy periods, once the house is sold, to earlier and cash-poor periods when home is still owned; in short, that it is optimal to sell home at some age, and make a transition from owning to renting. For this reason, the finding of low mobility rates among the elderly has been often interpreted as a clash with the theory.

Previous literature suggests that well functioning rental markets increase the likelihood that the elderly downsize and/or sell their house, and that moving costs from owning to renting explain the behavior of the elderly. Indeed, mobility rates from owning to renting tend to be negatively correlated with transaction costs (e.g. costs associated with house buying and selling).

Boleat (1987) and Lea and Diamond (1991) point out that different regulations across countries affect the development of mortgage markets, the availability of housing and the age at which individuals move to owner occupied dwellings. This is particularly relevant for young households. Ortalo-Magné and Rady (1999, 2005) show that, in the absence of a bequest motive, a higher down payment ratio reduces the equilibrium distribution of owner occupancy rates of young generations. Chiuri and Jappelli (2003) provide econometric evidence showing that the down payment ratio is an important determinant of the timing of

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third order age polynomial. The cohort-adjusted profiles are obtained from the estimated age

home purchase and of the owner occupancy rates of the young. In countries with tighter credit markets (e.g., with higher down payment) they find lower levels of owner occupancy rates among the young than in countries where credit is more easily available.

The degree of financial market development might also explain the limited availability of financial instruments to help the elderly reduce the house stock. Reverse mortgages in this context are potentially important, as they allow house-rich but cash-poor elderly to sustain consumption without selling their property. Even though financial experts believe that these financial products will become more appealing in the future (Mitchell and Piggott, 2004), at the moment adverse selection, moral hazard and high transaction costs explain why take-up rates among the elderly are still low even in countries with well developed financial markets, such as Australia, Canada, the U.S. and the U.K.[9]

Low demand for reverse mortgages seems to contradict life cycle consumption theory and has been blamed in part on large up-front fees. However, even where reverse mortgages exist, their effects on ownership transitions are *a priori* ambiguous. In an empirical study using data from the U.S. Home Equity Conversion Mortgage (HECM) program, Davido and Welke (2004) find that reverse mortgages have enabled longer stays at home, but that the kind of people who want to cash out their housing wealth have turned first to a reverse mortgage and relatively soon thereafter to disposal of the entire asset.

In many countries the tax code gives preferential treatment to owning relative to renting, encouraging homeownership. One of the most compelling reasons that justify these incentives is to shift the allocation of wealth towards goods to which society assigns an important weight in creating positive externalities and raising living conditions, much like targeting retirement saving is a remedy to household myopia and potential free-riding problems. Legal costs, property taxes, and transaction costs are also potentially important determinants of the decision to move and to reduce equity holding in the house.

The price-income ratio might also be relevant. Banks et al. (2004) show that housing might be an insurance against house price fluctuations. They provide comparative evidence

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coefficients of a specification that includes also year-of-birth.

[9] In the U.S, reverse mortgages have been authorized in 1987. In Canada borrowers receive a small public subsidy, In the U.K. local governments have been recently involved in granting the loans. In none of these countries, however, reverse mortgages are widespread. For instance, in 2004 the U.S. the eligible population of homeowners over 62 was more than 14 million, but only 60,000 loans were granted: a take-up rate of less than 1 percent.

from the U.S. and the U.K. (based on the PSID and the BHPS, respectively) and find that in the absence of financial products to insure house price risk, people living in areas with higher house price volatility buy their first home earlier in life and are less likely to refinance.

We collected a wide range of variables and indicators potentially related to the incentive to reduce equity holding. Some of these variables are reported in Table 5: the LTV ratio, as a proxy for mortgage market developments, the average price-income ratio, property taxes, judicial efficiency (as proxied by the duration for eviction of a tenant) and the social security replacement rate, as a proxy for the importance of social security wealth in total wealth around retirement. Not surprisingly, given the pattern in Figure 4, we find no evidence that any of these variables is related to the change in ownership in the age group 71-80 (or in the 61-70 group). The reason is that, with the exception of Canada and Finland, we find limited international dispersion of the change in the cohort-adjusted profile.

6. Summary

The paper estimates the shape of the elderly homeownership rate using a collection of microeconomic surveys of 17 OECD countries. In most, the survey is repeated over time. This allows us to construct an international dataset of repeated cross-sectional data, merging data on 59 national household surveys. The analysis is conducted at the level of individuals, not households, and therefore is not subject to the critique of the endogeneity of household formation and dissolution. We find that ownership rates decline considerably after age 60 in most countries. However, a large part of the decline should be attributed to cohort effects. After adjusting for such effects, we find that the ownership rate falls after age 70 at a rate of about 0.5 percentage points per year. Although we reject formally the hypothesis that the shape of the age-profile of ownership is the same across countries, we find that ownership trajectories are very similar across countries – with the exceptions of Finland and Canada - and unrelated to a wide set of indicators that we examine.

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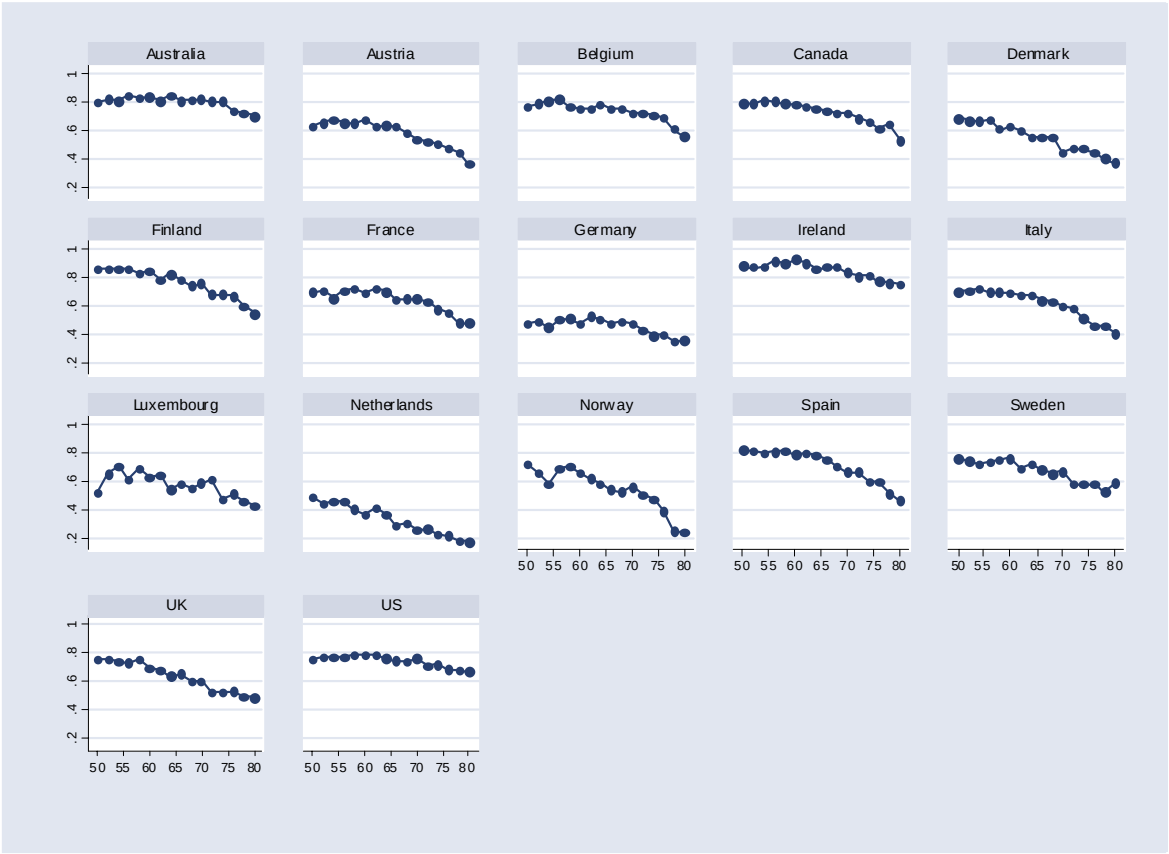
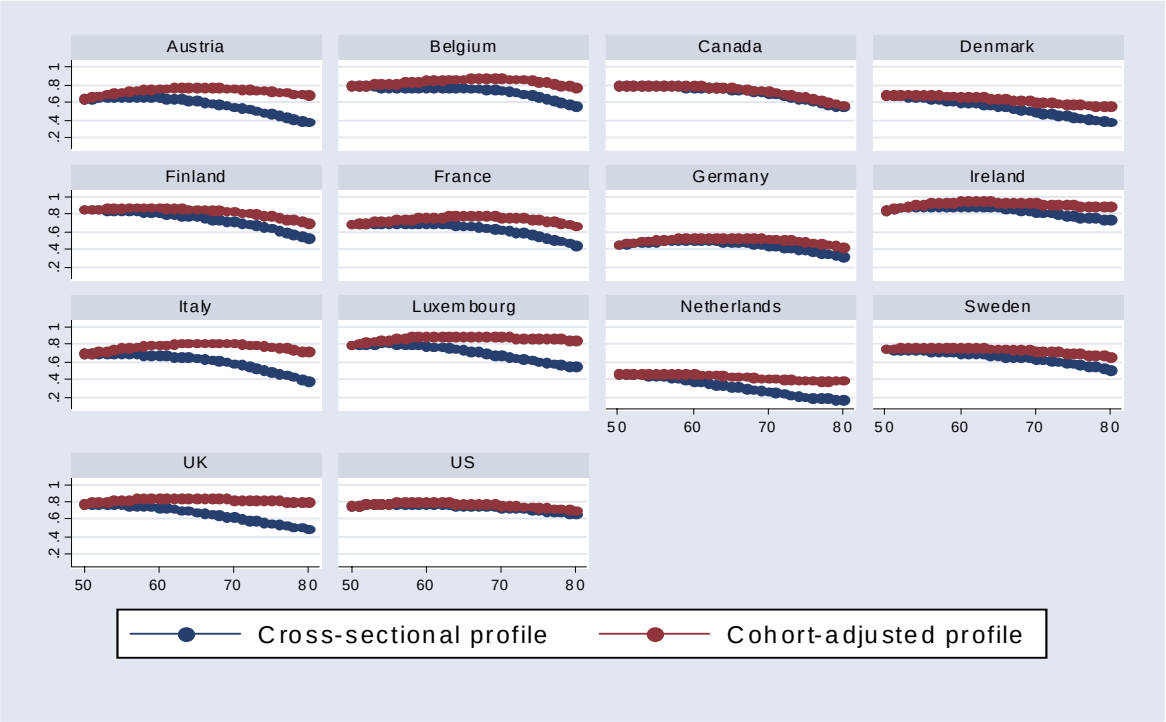
Figure 1
Age profile of homeownership by country



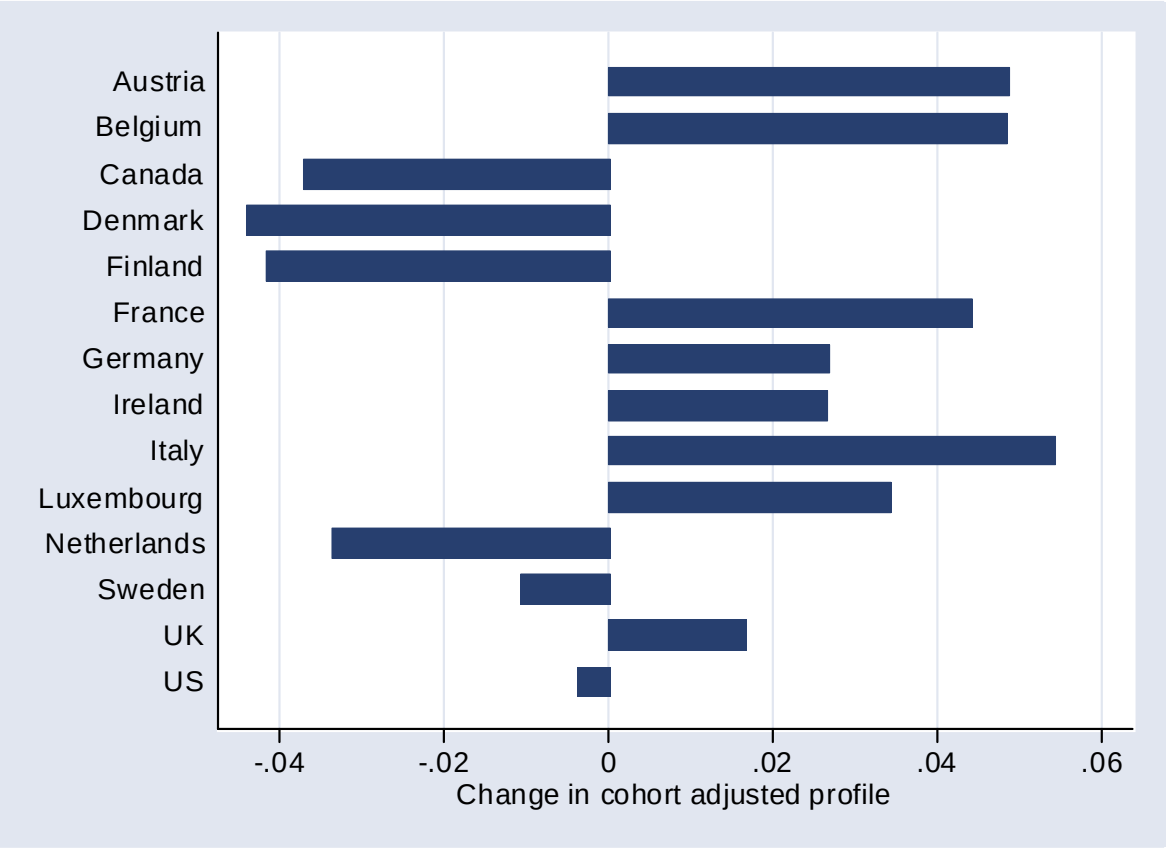
Note. The figure plots the age profile of homeownership in the 17 countries of the LIS sample. In each country, data refer to women aged 50 to 80 and are pooled across all surveys.

Figure 2
The cross-sectional and cohort-adjusted profiles of homeownership



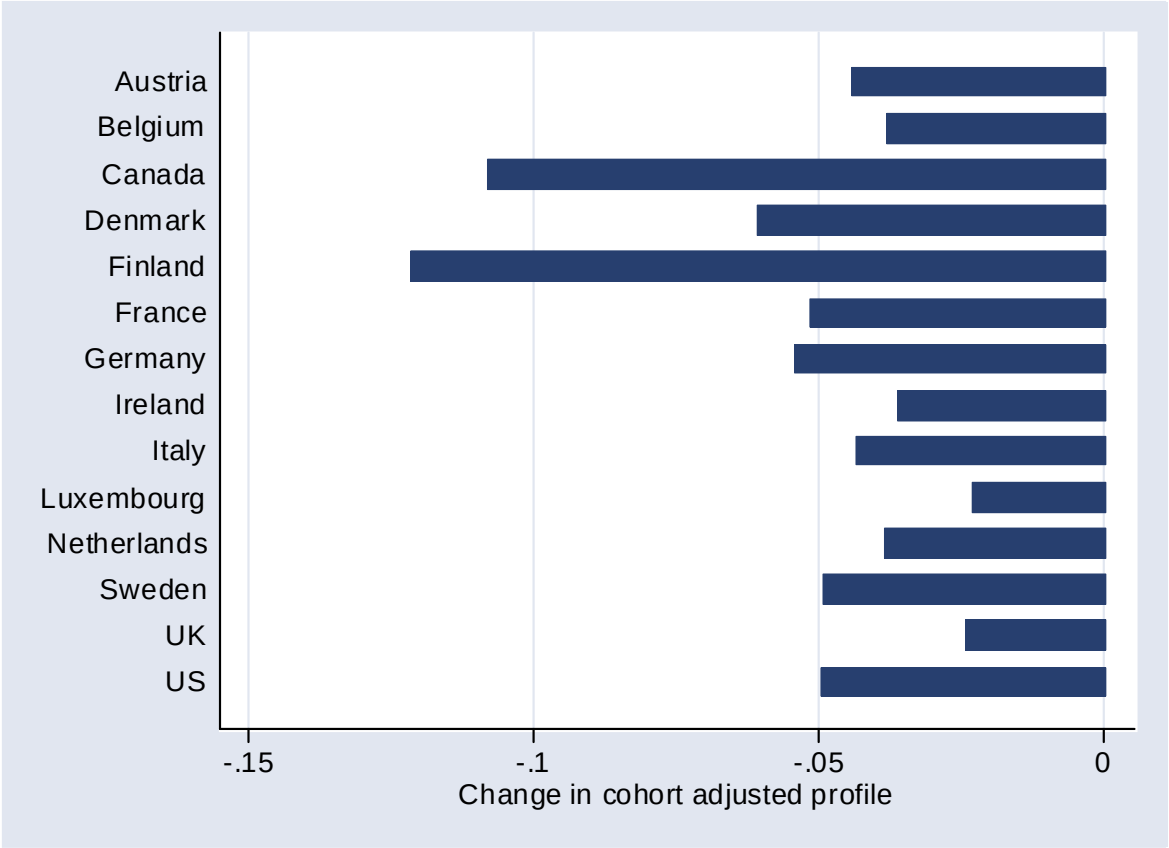
Note. The country-specific cross-sectional profiles are obtained by the age effect generated by a regression of homeownership on a third-order age polynomial. The cohort-adjusted profiles are obtained by the age effect generated by a regression of homeownership on a third-order age polynomial and "year-of-birth". In each country, data refer to women aged 50 to 80. The cohort-adjusted age profiles are identified and reported only for countries with more than one survey.

Figure 3
Change in homeownership: from age-group 51-60 to 61-70



Note. The figure reports the difference between the homeownership rate in the age groups 51-60 and 61-70. Each of the difference is calculated from the country-specific cohort-adjusted profiles displayed in Figure 2.

Figure 4
Change in homeownership: from age-group 61-70 to 71-80



Note. The figure reports the difference between the homeownership rate in the age groups 61-70 and 71-80. Each of the difference is calculated from the country-specific cohort-adjusted profiles displayed in Figure 2.

Table 1
The international dataset

Country	*Survey and years available*	*Number of individuals per survey*	*Average cell size*
Australia	Australian Income and Housing Survey: 1981	14,916	262
Austria	Austrian Micro-census: 1987, 1995 European Community Household Panel: 1997	16,524	178
Belgium	Panel Survey of the Centre for Social Policy: 1985, 1988, 1992, 1997; Panel Study of Belgium Households: 2000	8,567	55
Canada	Survey of Consumer Finances: 1975, 1981, 1987, 1991, 1994, 1997, 2000	61,718	290
Denmark	Income Tax Survey: 1987, 1992	7,530	121
Finland	Income Distribution Survey: 1995, 2000	15,716	212
France	Family Budget Survey: 1984, 1989, 1994	11,974	129
Germany	German Socio Economic Panel Study: 1984, 1989, 1994, 2000	9,724	78
Ireland	ESRI Survey of Income Distribution, Poverty and Usage of State Services: 1987; European Community Household Panel: 1994, 1996, 2000	3,864	31
Italy	Bank of Italy Survey of Household Income and Wealth: 1986, 1991, 1993, 1995, 1998, 2000	23,429	126
Luxembourg	Luxembourg Social Economic Panel Study: 1985, 1997, 2000	2,889	24
Netherlands	Additional Enquiry on the Use of Public Services: 1983, 1987. Socio-Economic Panel: 1991, 1994, 1999	7,427	48
Norway	Income and Property Distribution Survey: 1986	1,801	58
Spain	Expenditure and Income Survey: 1990	11,041	356
Sweden	Income Distribution Survey: 1992, 1995	14,650	236
United Kingdom	Family Expenditure Survey:1991, 1995 Family Resource Survey: 1999	17,298	139
US	March Current Population Survey: 1974, 1979, 1986, 1991, 1994, 1997, 2000	71,899	331
All countries	59 surveys	300,967	157

Note. The number of observations refers to the country average number of women aged 50 to 80.

Table 2
Sample composition by age-groups, percentage values

Country	*Age 51-60*		*Age 61-70*		*Age 71-80*	
	Households	Individuals	Households	Individuals	Households	Individuals
Australia	41.45	39.13	33.91	33.84	24.65	27.04
Austria	42.27	38.74	34.45	34.41	23.28	26.85
Belgium	45.54	44.87	34.76	34.49	19.70	20.64
Canada	43.59	41.95	30.20	29.67	26.21	28.38
Denmark	41.62	40.07	33.76	33.16	24.62	26.77
Finland	52.84	50.99	32.23	31.90	14.93	17.11
France	45.32	43.48	34.00	34.14	20.68	22.38
Germany	48.55	45.54	33.26	33.74	18.20	20.72
Ireland	45.59	44.72	32.87	32.09	21.53	23.19
Italy	46.52	44.89	33.80	33.85	19.67	21.26
Luxembourg	47.63	45.66	31.56	30.91	20.81	23.43
Netherlands	44.44	42.56	34.59	35.22	20.97	22.22
Norway	44.75	44.20	35.47	34.65	19.78	21.15
Spain	46.67	42.79	33.89	35.45	19.44	21.76
Sweden	47.29	45.94	28.61	27.96	24.10	26.10
United Kingdom	41.81	40.47	33.92	33.56	24.27	25.97
United States	46.52	44.90	31.37	31.33	22.12	23.77

Note. The table reports the proportion of household heads and women in each age bracket. Statistics are computed using sample weights. Country values are aggregated over different years.

Table 3
Homeownership by age groups, percentage values

Country	*Age 51-60*	*Age 61-70*	*Age 71-80*
Australia	82.16	81.02	71.76
Austria	67.04	60.69	47.16
Belgium	77.60	74.89	65.33
Canada	78.62	73.73	58.98
Denmark	65.40	54.02	43.65
Finland	83.54	75.10	61.62
France	69.27	67.56	55.11
Germany	49.62	50.62	41.44
Ireland	89.93	87.82	78.24
Italy	69.74	64.36	50.02
Luxemburg	79.23	71.89	57.90
Netherlands	44.92	33.41	22.67
Norway	67.21	55.93	39.11
Spain	80.02	74.32	57.30
Sweden	75.39	69.12	53.32
United Kingdom	75.93	67.08	55.58
United States	76.52	76.92	72.03

Note. The table reports the proportion of individuals owning a home by age groups. In each country the sample includes women aged 50 to 80. Country values are averaged over different years.

Table 4. Regressions for homeownership

	No cohort effect	*With cohort effect*	*Age 51-60*	*Age 61-70*	*Age 71-80*
Age ≤ 60	0.004	0.007	0.007		
	(3.27)**	(5.74)**	(5.17)**		
61≤ Age ≤ 70	-0.003	-0.001		-0.001	
	(3.70)**	(0.86)		(1.06)	
71≤ Age ≤ 80	-0.012	-0.008			-0.008
	(11.28)**	(8.39)**			(4.63)**
Married	0.101	0.042	0.029	0.031	0.020
	(6.03)**	(2.53)*	(1.23)	(1.20)	(0.49)
High school and college degrees	0.085	-0.033		-0.055	0.022
	(4.22)**	(1.51)		(1.36)	(0.56)
Employed	0.089	0.070	0.220	0.074	0.003
	(5.01)**	(4.07)**	(7.69)**	(2.67)**	(0.02)
Year of birth		0.005	0.001	0.006	0.007
		(12.00)**	(1.97)*	(8.37)**	(8.65)**
Austria	-0.105	-0.178	-0.048	-0.181	-0.233
	(7.53)**	(12.16)**	(2.60)**	(7.00)**	(9.22)**
Belgium	0.040	-0.021	0.085	-0.027	-0.038
	(3.09)**	(1.59)	(4.84)**	(1.14)	(1.59)
Canada	0.001	-0.029	0.042	-0.029	-0.061
	(0.14)	(2.82)**	(3.04)**	(1.70)	(3.14)**
Denmark	-0.165	-0.193	-0.126	-0.218	-0.246
	(11.30)**	(13.61)**	(6.67)**	(9.54)**	(7.70)**
Finland	0.061	-0.030	0.057	-0.031	-0.082
	(3.84)**	(1.76)	(2.93)**	(1.05)	(2.76)**
France	-0.056	-0.104	-0.056	-0.091	-0.125
	(3.97)**	(7.36)**	(3.36)**	(3.71)**	(5.17)**
Germany	-0.235	-0.300	-0.266	-0.286	-0.301
	(17.29)**	(21.27)**	(17.24)**	(11.48)**	(12.42)**
Ireland	0.169	0.092	0.182	0.081	0.081
	(13.52)**	(6.76)**	(10.45)**	(3.52)**	(3.35)**
Italy	-0.054	-0.142	0.009	-0.139	-0.203
	(3.92)**	(9.42)**	(0.48)	(5.25)**	(7.84)**
Luxembourg	0.036	-0.035	0.112	-0.044	-0.092
	(2.73)**	(2.55)*	(5.55)**	(1.84)	(3.76)**
Netherlands	-0.360	-0.420	-0.292	-0.447	-0.467
	(28.45)**	(32.04)**	(18.90)**	(19.34)**	(19.86)**
Norway	-0.170	-0.206	-0.112	-0.199	-0.276
	(8.58)**	(10.69)**	(4.40)**	(6.14)**	(8.27)**
Spain	0.022	-0.043	0.118	-0.036	-0.108
	(1.07)	(2.13)*	(4.26)**	(1.06)	(3.13)**
Sweden	-0.087	-0.115	-0.088	-0.110	-0.173
	(5.98)**	(8.12)**	(4.38)**	(4.96)**	(5.31)**
United Kingdom	-0.041	-0.104	-0.003	-0.114	-0.165
	(3.24)**	(7.91)**	(0.15)	(4.93)**	(7.08)**
Constant	0.413	0.222	0.188	0.620	0.606
	(5.60)**	(3.06)**	(2.10)*	(22.23)**	(20.19)**
Observations	1595	1595	550	544	501
R-squared	0.79	0.81	0.78	0.81	0.81

Note. The table reports regressions for the probability of owning the house of residence. The U.S. is the reference country. T-statistics are reported in parentheses. One star denotes significance at the 5% level; two stars at the 1% level.

Table 5
Loan-to-value ratio, price-income ratio, property taxes, duration for eviction of a tenant and replacement rate: international comparisons

Country	*Maximum LTV ratio*	*Price-income ratio*	*Property tax to GDP ratio*	*Duration for eviction of a tenant*	*Social security replacement rate*
Australia	0.80	9.5	2.7	44	40.9
Austria			0.6	547	79.5
Belgium	0.80	8.4	1.3	120	67.5
Canada	0.80	8.6	3.7	43	51.6
Denmark	0.80	7.6	1.7	225	56.2
Finland	0.80	10.1	1.1	120	60.0
France	0.80	9.8	2.4	226	64.8
Germany	0.80	15.7	1.0	331	55.0
Ireland	0.80	9.1	1.6	121	39.7
Italy	0.60	10.7	2.3	630	80.0
Luxembourg	-.-	-.-	3.6	380	93.2
Netherlands	0.75	11.0	1.9	52	45.8
Norway	0.80	9.6	1.1	365	60.0
Spain	0.80	13.2	2.0	183	100.0
Sweden	0.75	9.6	2.0	160	74.4
United Kingdom	0.95	8.6	3.8	115	49.8
United States	0.80	6.9	3.2	49	56.0

Note. The maximum Loan-To-Value ratio and the price-income ratio are drawn from Almeida et al (2005). The property tax to GDP ratio is drawn from OECD (2000). Duration for eviction of a tenant is drawn from Djankov et al. (2003). The social security replacement rate refers to mid-nineties and is drawn from Disney (2004).