

Do the elderly reduce housing equity? An international comparison

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Abstract

We explore the pattern of elderly homeownership using microeconomic surveys of 17 OECD countries. In most countries the survey is repeated over time, permitting construction of 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 depends on cohort effects. Adjusting for this, we find that ownership rates start falling after age 70 and reach a percentage point per year after age 75. Interestingly, we find that differences across country ownership trajectories are correlated with a wide set of indicators measuring the tightness of national mortgage market and economy wide regulation.

Keywords: homeownership, wealth decumulation, aging

JEL Classification: G2, R2

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1. Introduction

In advanced economies a frequently debated issue is the demographic trend, i.e. the rapid gains in life expectancy and the rising population share of the elderly. As population aging is undermining the sustainability of national welfare systems, understanding the determinants of saving and consumption as people get older is of evident policy interest.

The Life-Cycle Hypothesis (LCH, for brevity henceforth), which underlies most economic models in the field, provides perhaps the best perspective to view the housing behaviour of the elderly: under the assumption that individuals rationally optimize over their lifetime, it predicts that at a certain age wealth should begin to decline, so that unless complemented by the bequest motive, it should approach zero at the age of death, even though that age is of course uncertain.

Among the various types of bequeathable wealth, housing is often the largest component, but it is of a peculiar type, in that it is simultaneously an asset and a source of consumption services (Hurd, 1999). Rational and selfish agents who want to smooth consumption over their life-cycle should reduce their housing, switching from ownership to renting or else 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 at least in principle they can access appropriate financial instruments (such as reverse mortgages or mortgage equity withdrawal) to release housing equity.

Empirical studies, mostly based on US data, find limited evidence that the elderly decumulate housing wealth, see Feinstein and McFadden (1989) and Venti and Wise (2002; 2004), Fisher, Johnson, Marchand, Smeeding and Torrey (2007). Rather, the US evidence suggests that the elderly prefer to stay in their homes, unless they are forced to move by outside shocks - the death of a spouse, health problems, entry into a nursing home. The evidence for other countries is far more limited, what evidence there is broadly confirms the slow rates of housing decumulation observed in the US.

One major issue that must be addressed in estimating these housing trajectories is that cross-sectional profiles can be quite misleading. Studies in the US and elsewhere show that

they are contaminated by cohort effects and that a significant component of the shape of the cross-sectional profiles depends on cohort differences.

The literature is mainly based on country data and to our knowledge a systematic international comparison of age-trajectories of homeownership is lacking. In this paper we aim to see whether the absence of decumulation is confined to just a few countries, and if there are systematic patterns that can be related to international differences in financial markets, institutions or public policy. Interestingly enough, we find that differences in ownership trajectories across countries are highly correlated with the degree of mortgage market regulation.

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 homeownership trajectories in old age. In most countries, we use repeated cross-sectional data, allowing us to compare cross-sectional and 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 the literature, mainly based on individual country data. Section 3 describes the microeconomic data and explains the crucial importance of distinguishing between households and individuals. Section 4 presents 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. The evidence to date

The age profile of homeownership and its turnover have been commonly considered as evidence for or against models of intertemporal choice in which 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.

Altruism affects the marginal utility of terminal wealth, and hence the speed of wealth accumulation in old age. Purely altruistic individuals should make transfers *inter vivos*, i.e. when the marginal utility for the heir is greater. But strategic bequest motives suggest transferring wealth at the end of one's life. This may be particularly relevant where there are transaction costs in selling the house, indivisibilities, or imperfections in the rental market.

In principle, when negative income shocks occur and people need resources to finance post-retirement consumption, homeowners could draw on home equity by financial services that do not require selling the house, such as refinancing the mortgage, or 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 their home equity and finance current consumption (Hurst and Stafford, 2004). Similarly, reverse mortgages would allow the elderly to borrow against the value of the house for to increase consumption. However, such possibilities are available only in countries with well developed financial markets.

Empirically, several papers provide evidence with US data showing that the elderly decumulate slowly housing equity, and do so to a limited extent. Feinstein and McFadden (1989), using the Panel Study of Income Dynamics (PSID), 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 and Retirement Study, the Asset and Health Dynamics Among the Oldest Old, and the Survey of Income and Program Participation) and find no decline in homeownership before age 75; and one averaging 1.76 percentage points per year thereafter. Substantial rates of decumulation (near 8 percentage points) are found only among households that undergo some precipitating shock. They also find that decumulation rates do not vary by family composition or presence of children, which contradicts one basic argument of the bequest hypothesis, namely that families with children should decumulate wealth more slowly than singles.

Scattered international evidence confirms the US 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 by about 15 percentage points from the peak of 80 percent at age 50-55 to 65 percent at age 80. Their conclusion 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), using five waves of the British Household Panel Survey, find that residential mobility of the elderly is rare in the UK as well. However, there is some evidence of residential downsizing, mainly due to retirement or to the loss of a spouse.

Although the international literature is consistent in finding scanty evidence of residential mobility among the elderly, international comparisons might be able to spotlight the forces that curb it. The first paper to take this perspective is Börsch-Supan (1994), who compares housing choices made by the elderly in the US and West Germany. Using the PSID and the German Socio- Economic Panel, Börsch-Supan finds that ownership rates peak in the 55-59 age-group in both countries, at different levels, and decline thereafter at a similar pace. Börsch-Supan suggests that part of the difference in the *level* of homeownership may reflect the homeownership subsidy policy in the US and the rent adjustment provision in Germany.

Tatsiramos (2004) is the only systematic attempt to compare homeownership profiles in different EU countries, using data for six countries in the European Community Household Panel from 1994 to 2001. He finds residential mobility among the elderly of 1.5 percent per year in Southern Europe (Italy and Spain) and 3 percent in Central Europe (France, Germany, the Netherlands) and the UK; in Central Europe downsizing tends to be associated with retirement, in Italy and Spain more often with dramatic events such as the death of the spouse.

In this paper, we consider a long time span of a large set of countries to investigate whether the absence of housing decumulation may be typical of just a few countries, and whether there are patterns relating 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 over renting.

3. The international dataset

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

We take 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 surveys selected has information on the demographic characteristics of the household and home ownership.

The sample period spans three decades overall. In all countries except Australia, 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 most recent for Belgium (the 2000 Panel Study of Belgian Households), Canada (the 2000 Survey of Labour and Income Dynamics), 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, Canada, Ireland, the Netherlands and the UK we rely on two different surveys. Table 1 provides further details.

In most of the empirical studies based on microeconomic surveys, the unit of analysis is the household. However, in our framework the standard procedure might induce selection bias, as the dissolution of households due, say, to the death of a spouse, might interact with homeownership status. Many elderly people deal with this precipitating shock by moving in

with their children. Standard empirical analysis would refer to the sample of households in the selected group of people who remain independent, and are still 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. Accordingly we define ownership on an individual rather than on a household basis, and take a sample of all women aged 50 to 80, regardless of whether they are living alone, with their husband, with their children or with other persons.

We exclude women older than 80 (regardless of year of birth) for two main reasons. First, the choice is motivated by the potential sample bias arising by mortality: it is well known that survival probabilities are correlated with wealth and owner occupancy rates, which implies that the non-survivors will have lower wealth and ownership rates than the survivors. Secondly, a further source of bias is related with the entrance in a nursing home. Elderly selling their house and buying long term care cannot be represented in national household surveys. However we expect that this bias could severely affect results especially for the eldest old. Thus, for both reasons, clearly the information obtainable from individual over 80 cannot be regarded as representative, so they are dropped.

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

The distribution of women by owner-occupancy rate is reported in Table 3 (for three age bands). 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 own their house at age 75. Although Table 3 highlights large differences between countries, all the distributions show a common trend of housing wealth decumulation.

4. Estimating ownership trajectories

Use of cross-sectional data to estimate ownership profiles can be highly misleading (Shorrocks, 1975; Mirer, 1979). The 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 be due to the fact that the older generations are less productive, and tell 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 year old and a 51 year old is equivalent to the wealth difference between 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 the 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 emphasizes 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. 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.

We aggregate the data by taking averages of the home ownership 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; omitting the missing values, the actual number of observations is reduced to 1595 (550 for age 51-60, 544 for age 61-70, and 501 for the

oldest group). We then sort the data by country and year of birth (defined as year of the interview less respondent's current age) and stack all observations.

Our first econometric model posits that the proportion of home owners \bar{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 \bar{X} (marital status, working status, and education) that vary with age, year of birth and country, a cohort effect common to all countries (δ) and an error component (ε) :

$$\bar{H}_{a,b,c} = \alpha + f(a) + \beta\bar{X}_{a,b,c} + \delta b + \gamma_c + \varepsilon_{a,b,c} \quad (1)$$

Age, time and cohort effects cannot all be separately identified. Therefore we 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 all the country. This assumption is questionable, and we will supplement the analysis by estimating separate regressions for each country.

Since the age effect is likely to be non-linear, we choose a third order polynomial in age. As a proxy for household resources and preferences, we control for education, marital status and work 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 couples have greater life expectancy. Previous evidence shows that retirement is associated with a transition from owning to renting. Therefore we expect those who are working to exhibit higher ownership rates.

Regressions are estimated with grouped data, each cell consisting of an age/year/country observation. Since the cells represent different numbers of observations,

we use a weighted least squares method, taking as weights $w_{a,t,c} = \left[\frac{n_{a,t,c}}{h_{a,t,c}(1-h_{a,t,c})} \right]^{\frac{1}{2}}$,

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 must consider that observations within each survey could be correlated. The 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 in different samples are independent, but not necessarily those within each individual survey.

Table 4 reports the regression results. To show the importance of controlling for cohort effects, in the first regression we drop the year-of-birth variable. The reference country is the US, which has one of the highest homeownership levels. 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 addition of the year-of-birth variable in the second regression changes the shape of the estimated age profiles considerably. Figure 1 describes the cross-sectional and cohort-adjusted profiles, obtained from the first two regressions reported in Table 4. The cohort-adjusted ownership rate is almost flat up to age 70 (in contrast to the cross-sectional profile), and falls by 0.6 percentage points per year until age 75 and by 1.1 percentage points till age 80. The coefficient of year-of-birth is positive and statistically different from zero at the 1 percent level: homeownership increases by 0.04 percentage points for each year-of-birth.

The third regression includes the demographic variables and shows that a high school or college degree is associated with higher homeownership probability (3 percentage points). Being married is associated with an increase in the ownership rate of about 4 percentage points, whereas being employed increases the likelihood of being homeowner of about 7 percentage points.

The assumption that age profiles and cohort effects are the same in all countries is restrictive. Indeed, an F-test between the restricted specification reported in Table 3 and an unrestricted regression with full interaction of all variables with the country dummies rejects 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 Australia, Norway and Spain for which we have only one survey). Figure 2 shows the cross-sectional and cohort-adjusted profiles. 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 UK.

To compare the ownership trajectories, in Figure 3 we plot the difference between the cohort-adjusted homeownership rates of the 61-65 and 66-70 age groups. The coefficient estimated in Table 4 for the age group 66-70 (-0.2 percentage points per year) conceals considerable dispersion across countries: in Canada, Denmark, Finland, and the Netherlands the ownership rate falls by almost half a percentage point compared with the 61-65 age group, whereas in Belgium, France and Italy the change in the cohort-adjusted profile is positive (although around 0.1 percentage points). Finally, in Austria, Germany, Ireland, Luxembourg, Sweden, the UK and the US the profile is relatively flat.

The country heterogeneity in the change in homeownership rates narrows in Figure 4, where we plot the total change between ages 66-70 and 71-75. The average reduction in ownership is 3.5 percentage points (over a 5-year interval); this is broadly comparable with the age effect estimated in Table 4 (-0.6 percentage points per year). Indeed, most countries exhibit decumulation rates close to 3 points. The exceptions are Canada and Finland, with decumulation rates close to 6 percentage points over the five years. At the other end of the spectrum, Belgium, Luxembourg and the UK feature the lowest rates (less than 2 percentage points).

Figure 5 highlights a further neater trend between ages 71-75 and 76-80, with an average rate of 5.3 percentage points. However, once again Canada and Finland display the highest decumulation rate (8 percentage points), whereas the Netherlands, Luxembourg, Ireland and the UK the lowest (still below 2 percentage points).

5. International differences in ownership trajectories

In standard life-cycle models, consumption smoothing make it optimal to transfer resources from the wealthy periods, after the house has been sold, to earlier cash-poor periods when home is still owned; in short, the theory is that it is optimal to sell one's 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 will downsize 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. the costs of house buying and selling).

Different regulations across countries affect the development of mortgage markets, the availability of housing and the age at which individuals buy their homes. This is particularly relevant for young households. Ortalo-Magné and Rady (1999; 2006) show that in the absence of a bequest motive, a higher down-payment ratio reduces the equilibrium distribution of homeownership 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 home purchase and of the ownership rates of the young. In countries with tighter credit markets (e.g., with higher down- payments) they find lower levels of ownerships 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 their housing stock. In this context, reverse mortgages are potentially important, allowing house-rich but cash-poor old people to sustain consumption without leaving their property. While financial experts expect these products to become more appealing in the future (Mitchell and Piggott, 2004 and Mitchell, Piggott, Sherris and Yow, 2006), at present 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 US and the

UK.

Low demand for reverse mortgages has been blamed in part on large up-front fees. However, the effects of reverse mortgages on ownership transitions are theoretically ambiguous in any case. In an empirical study using data from the US Home Equity Conversion Mortgage (HECM) program, Davidoff and Welke (2005) find that reverse mortgages have enabled people to stay at home longer, but that the kind of people who want to get cash out of their housing wealth turn relatively soon thereafter to disposal of the entire asset.

However wherever reverse mortgages are available as well as in Denmark, Finland, Ireland, the Netherlands, Norway and Sweden consumers can also withdraw housing equity increasing their debt by more than investment in the housing stock. In particular, there are several methods of withdrawing housing equity. The ways that are mostly relevant in the present study are: trading down, over-mortgaging, re-mortgaging or second mortgage. By mortgage equity withdrawing the elderly can finance consumption, without the need to sell their property.

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

An alternative view that needs to be explored is that the cross-country differences in the decumulation rates among the elderly could be rather explained by national differences in the choice of entering in a nursing home. In this respect the local availability of long term care services could allow more easily the elderly to sell their house and finance future consumption.

We collected a wide range of variables and indicators potentially related to the incentive to reduce home equity. Some of these variables are reported in Table 5: an index of mortgage market regulation (taken from Tsatsaronis and Zhu, 2004), as a proxy for

limited mortgage market development, an index of economy wide regulation (Kaufman, Kray and Zoldo Lobaton, 1999) covering many different regulatory areas, property taxes as percentages of national GDP (OECD, 2002) and the average number of beds in nursing homes per thousand inhabitants taken from OECD (2005).

Figure 6 shows that cohort adjusted change in ownership rate between age 71-75 and age 76-80 correlates negatively with the selected index of mortgage market regulation. On the basis of such evidence, in countries such as Austria, Belgium, Germany, Italy and France that feature less developed and efficient mortgage markets the elderly are more likely to decumulate housing wealth. Canada and Finland with average value of the index of financial market regulation but with the highest level of decumulation stand out of the picture.

Regulation in financial market is indeed difficult to distinguish from other economy-wide regulation. This is confirmed by a strong correlation between the index of mortgage market regulation and the index of economy wide regulation. Moreover, in Figure 7 we find clear evidence supporting this view, as changes in homeownership are also negatively correlated with the index of economy-wide regulation, proxing the bureaucratic quality, rule of law and grafts in each country.

On the contrary, we find no direct evidence that property taxes to GDP ratio nor the number of beds in nursing homes per thousand inhabitants are related to the change in ownership rate among the eldest group.

As a sensitivity analysis, we then regress the change in homeownership between age 71-75 and age 76-80 on the set of indicators selected and control for the homeownership rate in the age group 71-75. The results are reported in Table 6, where the six columns, containing various econometric specifications, show the robustness of our results. In each of the regressions the coefficient of the index of mortgage market regulation (in columns 1 and 5) , or alternatively, the index of economy-wide regulation (in columns 2 and 6) are negative and statistically significant. These results are consistent with our previous findings (Chiuri and Jappelli, 2003) for the young age groups. In other words, the availability of mortgage finance – as measured by down payment ratios, mortgage equity withdrawal or reverse mortgages– affects the distribution of owner occupancy rates across age groups, not

only at the young end, but also for the eldest old.

6. Summary

The paper estimates the shape of the homeownership rate for the elderly using microeconomic surveys of 17 OECD countries. In most, the survey is repeated over time. This gives an international dataset of repeated cross-sectional data, merging data from 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 the ownership rate declines considerably after age 60 in most countries, but that much of the decline is due to cohort effects. After adjusting for these effects, the ownership rate falls after age 70 and reaches a rate of about 1 percentage points per year after age 75.

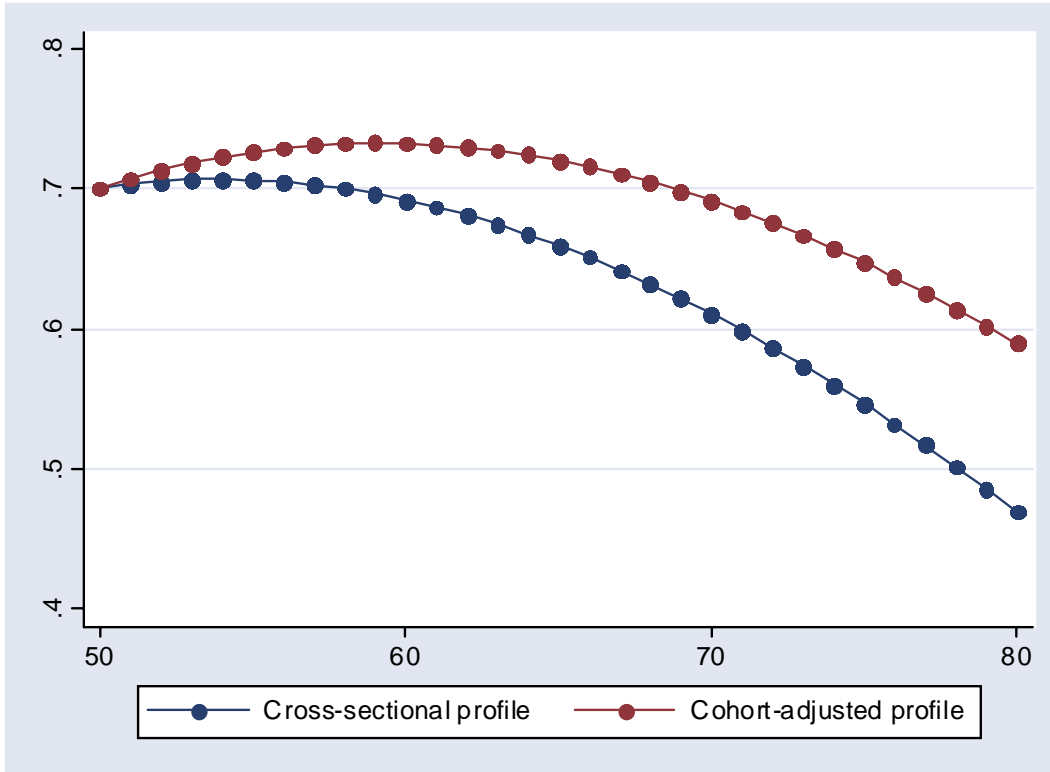
Although the decline is slow, as previous literature had already found for single countries, still we find that differences in ownership trajectories across countries are highly correlated with the degree of mortgage market regulation. The econometric estimates show that the availability of financial instruments allowing housing equity withdrawals is an important determinant of the timing and dimension of saving decumulation at the old ages. We then conclude that credit market imperfections are a key explanatory factor for international differences in the aggregate saving rate for the old generations.

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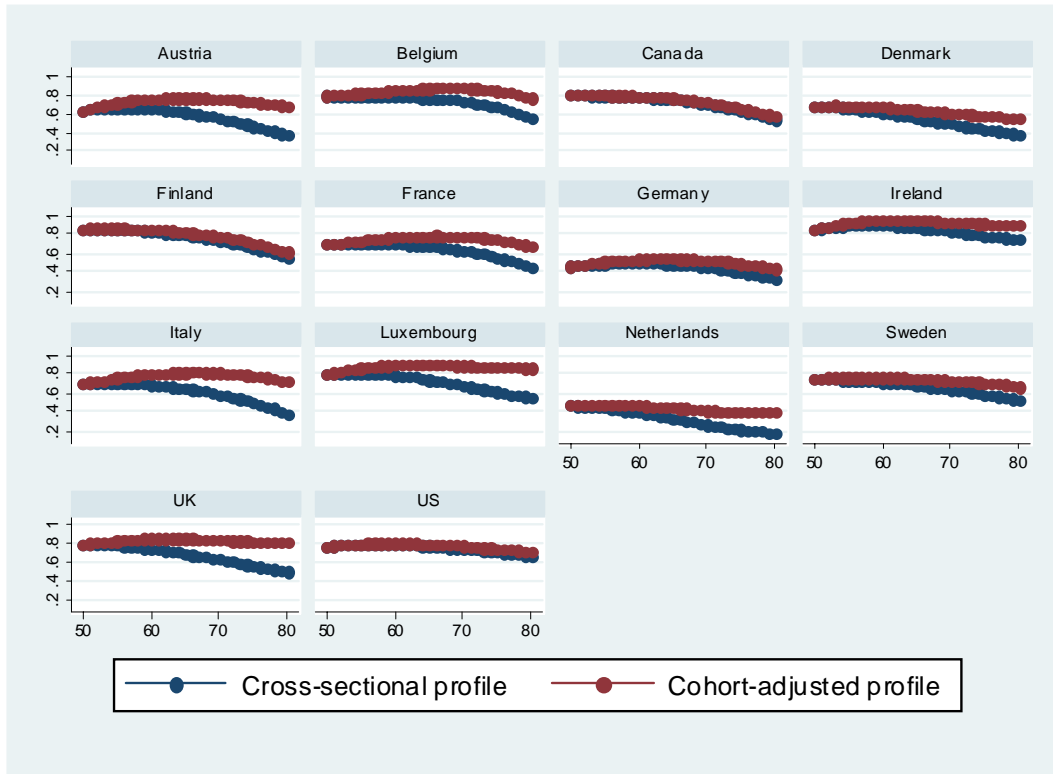
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Figure 1
Age profile of ownership



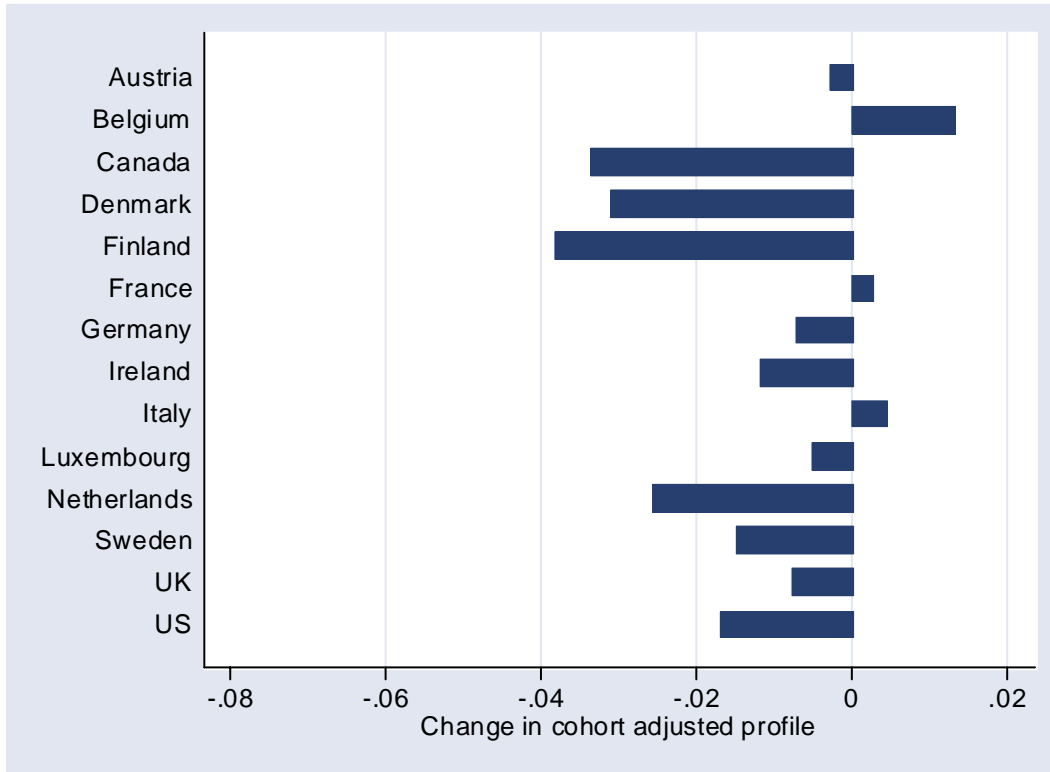
Note. The figure plots an age profile of homeownership. Data refer to women aged 50 to 80 and are pooled across all surveys and all the 17 countries of the LIS sample.

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



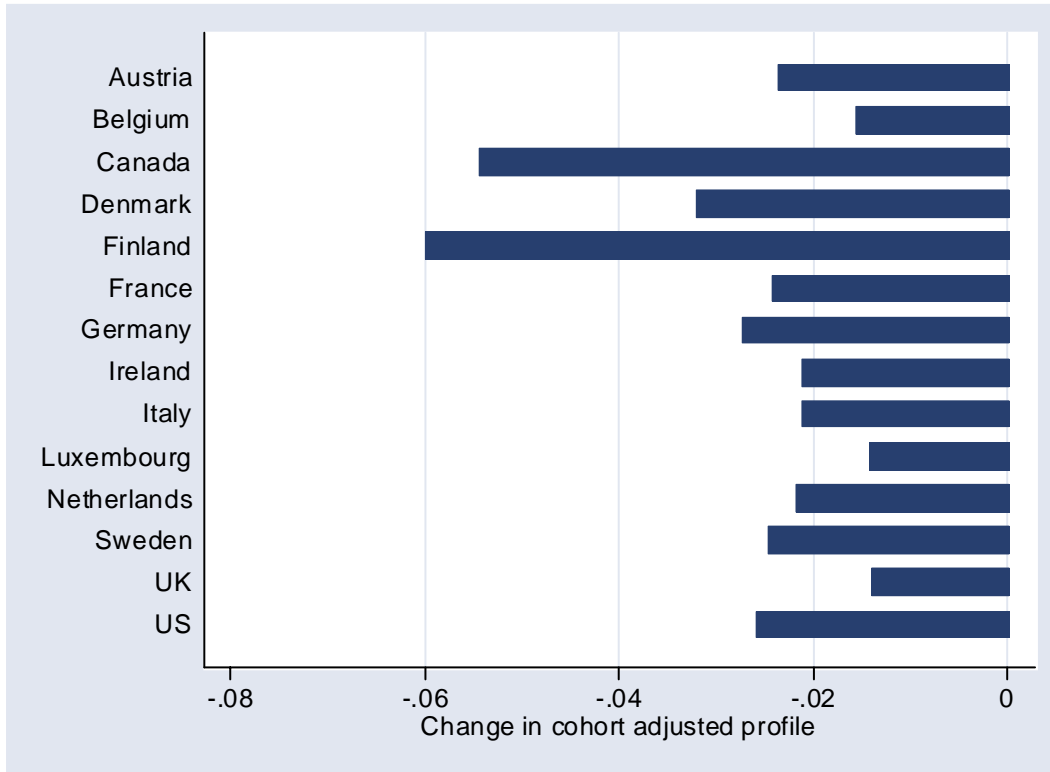
Note. The country-specific cross-sectional profiles are obtained by the age effect generated by a regression of homeownership on a third-order age polynomial. The cohort-adjusted profiles are obtained by the age effect generated by a regression of homeownership on a third-order age polynomial and “year-of-birth”. 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 ownership: from age-group 61-65 to 66-70



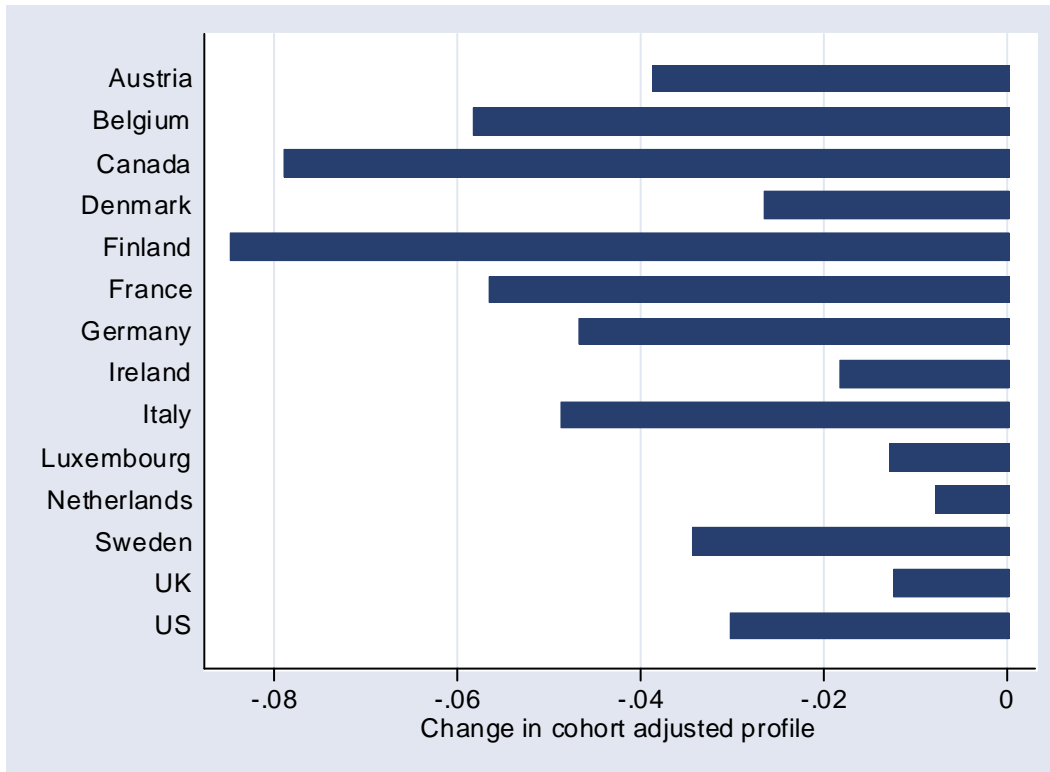
Note. The figure reports the difference between the homeownership rate in the age groups 61-65 and 66-70. Each of the difference is calculated from the country-specific cohort-adjusted profiles displayed in Figure 2.

Figure 4
Change in ownership: from age-group 66-70 to 71-75



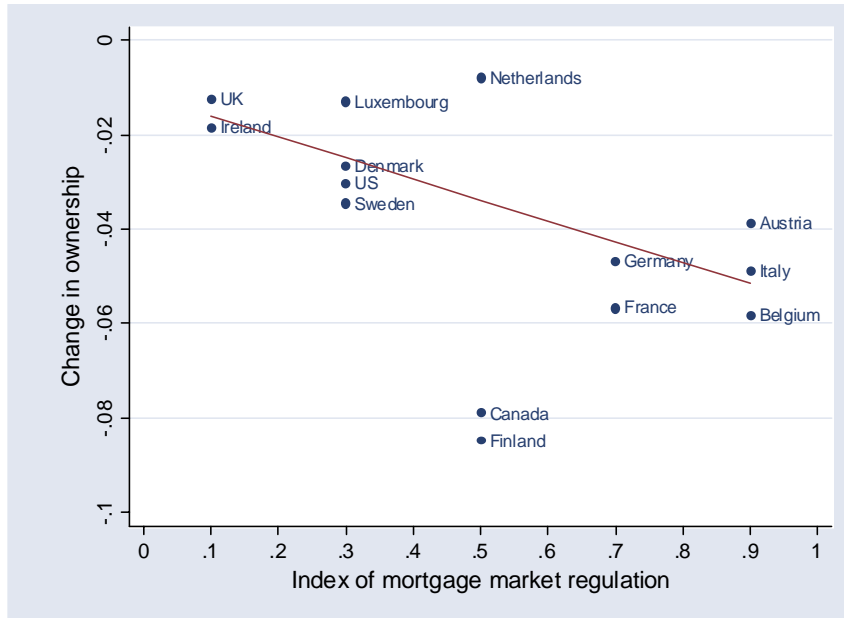
Note. The figure reports the difference between the homeownership rate in the age groups 66-70 and 71-75. Each difference is calculated from the country-specific cohort-adjusted profiles displayed in Figure 3.

Figure 5
Change in ownership: from age-group 71-75 to 76-80



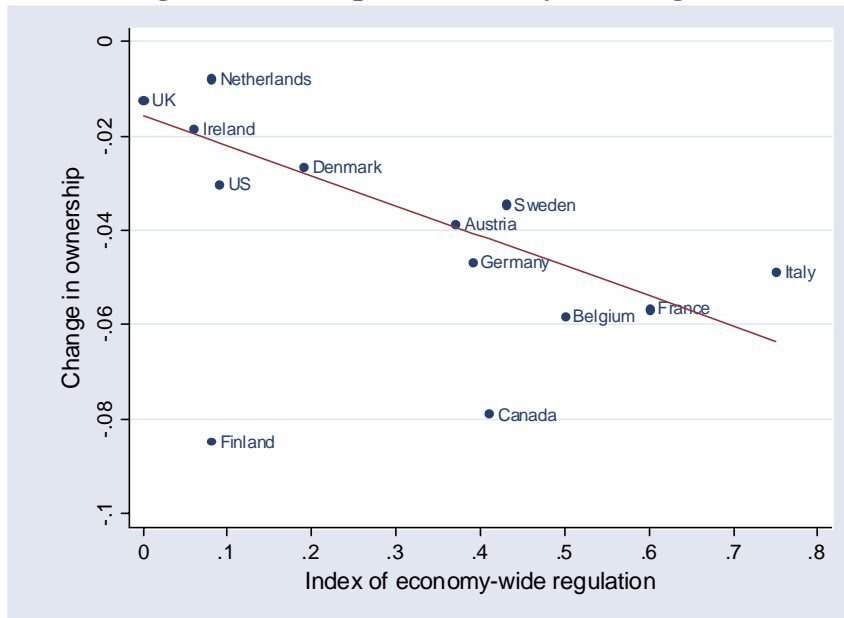
Note. The figure reports the difference between the homeownership rate in the age groups 71-75 and 76-80. Each difference is calculated from the country-specific cohort-adjusted profiles displayed in Figure 3.

Figure 6
Change in ownership and mortgage market regulation



Note. The change in ownership is the cohort-adjusted change in ownership between age 71-75 and age 76-80.

Figure 7
Change in ownership and economy-wide regulation



Note. The change in ownership is the cohort-adjusted change in ownership between age 71-75 and age 76-80.

Table 1
The international dataset

<i>Country</i>	<i>Survey and years available</i>	<i>Number of individuals per survey</i>	<i>Average cell size</i>
Australia	Australian Income and Housing Costs Survey: 1981	14,916	262
Austria	Austrian Micro-census: 1987, 1995	16,524	178
Belgium	European Community Household Panel: 1997 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; Survey of Labour and Income Dynamics: 2000	61,718	290
Denmark	Income Tax Survey: 1987, 1992	7,530	121
Finland	Income Distribution Survey: 1995, 2000	15,716	212
France	Household 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

<i>Country</i>	<i>Age 51-60</i>		<i>Age 61-70</i>		<i>Age 71-80</i>	
	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 percentage of household heads and women by each age-group. Statistics are computed using sample weights. Country values are aggregated over different years.

Table 3
Ownership by age-group

<i>Country</i>	<i>Age 51-60</i>	<i>Age 61-70</i>	<i>Age 71-80</i>
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 percentage of individuals owning a home by age-group. In each country the sample includes women aged 50 to 80. Country values are averaged over different years.

Table 4
Regressions for ownership

	No cohort effects	With cohort effects	With cohort effects and demographics
Age	0.038 (0.025)	0.078 (0.024)**	0.104 (0.025)**
Age ²	-0.047 (0.018)*	-0.046 (0.018)**	-0.037 (0.018)*
Age ³	0.003 (0.004)	0.003 (0.004)	-0.000 (0.004)
Year of birth		0.004 (0.000)**	0.005 (0.000)**
Married			0.041 (0.017)*
High school and college degrees			-0.032 (0.022)
Employed			0.071 (0.017)**
Constant	0.821 (0.010)**	0.666 (0.016)**	0.543 (0.022)**
Country dummies	yes	yes	yes
R-squared	0.78	0.80	0.81

Note. The table reports regressions for the probability of ownership. The US is the reference country. The sample size is 1595. T-statistics are reported in parentheses. One star denotes significance at the 5% level; two stars at the 1% level.

Table 5
Index of mortgage market and economy-wide regulation, property taxes, and number of beds in nursing homes: international comparisons

	<i>Index of mortgage market regulation</i>	<i>Index of economy wide regulation</i>	<i>Property tax to GDP ratio</i>	<i>Number of beds in nursing homes</i>
Australia	.1	.30	.027	4.8
Austria	.9	.37	.006	1.7
Belgium	.9	.50	.013	2.9
Canada	.5	.41	.037	12.2
Denmark	.3	.19	.017	5.1
Finland	.5	.08	.011	4.3
France	.7	.60	.024	1.3
Germany	.7	.39	.01	8.6
Ireland	.1	.06	.016	6.9
Italy	.9	.75	.023	2.7
Luxembourg	.3		.036	5.9
Netherlands	.5	.08	.019	3.8
Norway	.3	.34	.011	9.1
Spain	.5	.42	.02	0.3
Sweden	.3	.43	.02	5.4
UK	.1	.0	.038	3.1
US	.3	.09	.032	5.4

Note. The *index of mortgage market regulation* is taken from Tsatsaronis and Zhu (2004). The score adds one point for fulfilling each of the following five criteria: (i) Mortgage rate arrangements are primarily extended on the basis of fixed rate contracts; (ii) Mortgage equity withdrawals are absent or limited; (iii) The loan-to-value ratio does not exceed 75 percent, (iv) Valuation methods of property are based on historical values, rather than based on market values (v) Mortgage backed securitization is absent or limited. The index is then normalized to one.

The *index of economy wide regulation* is taken from Kaufman, Kraay and Zoldo Lobaton (1999). The index is a very wide indicator of the degree of economic regulation covering many different regulatory areas (state control, barriers to entrepreneurship, administrative regulations, tariff and non-tariff barriers, etc.) aggregated through factor analysis.

The *property tax to GDP ratio* is drawn from OECD (2002).

Number of beds in nursing homes per thousand inhabitants refers to 2003 or closest year available and is taken from OECD Health Data (2005) CD -Rom.

Table 6
Regressions for change in ownership

	(1)	(2)	(3)	(4)	(5)	(6)
Index of mortgage market regulation	-0.045 (0.018)**				-0.048 (0.024)*	
Index of economy-wide regulation		-0.063 (0.016)***				-0.060 (0.016)***
Property tax to GDP ratio			1.006 (0.730)		0.096 (0.641)	0.187 (0.416)
Number of beds in nursing homes				0.003 (0.003)	-0.001 (0.003)	-0.001 (0.002)
Ownership in age group 71-75	-0.020 (0.036)	-0.011 (0.028)	-0.036 (0.054)	-0.007 (0.050)	-0.029 (0.035)	-0.019 (0.026)
Constant	0.003 (0.030)	-0.008 (0.020)	-0.032 (0.039)	-0.042 (0.042)	0.016 (0.041)	-0.003 (0.024)
Observations	14	13	14	13	13	12
R-squared	0.36	0.61	0.15	0.06	0.49	0.72

Note. The table reports regressions for cohort-adjusted change in ownership between age 71-75 and age 76-80. Standard errors are reported in parentheses. One star denotes significance at the 10% level; two stars at the 5% level; three stars at the at the 1% level.