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# WORKING PAPER NO. 158

# *Do the elderly reduce housing equity? An international comparison*

**Maria Concetta Churi, Tullio Jappelli**

**May 2006**

University of Naples Federico II

University of Salerno

Bocconi University, Milan

CSEF - Centre for Studies in Economics and Finance – UNIVERSITY OF SALERNO
84084 FISCIANO (SA) - ITALY
Tel. +39 089 96 3167/3168 - Fax +39 089 96 3167 – e-mail: csef@unisa.it

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# *Do the elderly reduce housing equity? An international comparison*

**Maria Concetta Churi[*], Tullio Jappelli[**]**

**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 fall after age 70 by about half a percentage point per year. Interestingly, ownership trajectories are quite similar in all countries – except Finland and Canada - and are not correlated with a wide set of indicators that we examine.

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

**Acknowledgments**: This work has been supported in part by the European Union under contracts HPRN-CT-2002-00235 (Economics of Aging in Europe - AGE). We also acknowledge financial support from the Italian Ministry of Education, Universities and Research (MIUR)

[*] University of Bari, CSEF and CHILD

[**] University of Salerno, CSEF and CEPR

# Contents

# 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.

A difficulty in this respect is that so far the Life-Cycle Hypothesis (LCH, for brevity henceforth), which underlies most economic models in the field, and which requires individuals to be rationally optimizing over their lifetime, doe not seem to be backed by clear supportive evidence in the behavior of the elderly as regards wealth accumulation. According to the LCH, 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) to release housing equity.

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 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 whether 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 homeownership trajectories in old age.[1] 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

[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.

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.[2] 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 do not decumulate housing equity, or do so to an extremely 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.[3] 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

[2] In this case no repayment is made until the homeowner dies, when the house is sold and the proceeds used to repay the loan.
[3] In an earlier study, Sheiner and Weil (1993) report a similar finding.

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.[4]

[4] In the theoretical literature, this preference can be justified in three ways: (1) owning eliminates the principal-agent relationship, i.e. the owner can make alterations as desired and is not subject to 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.

## 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 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 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 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.[5]

We exclude women older than 80 (regardless of year of birth). This 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. Clearly the information obtainable from survivors 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), and the pattern is 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 own their house at age 75. Although Figure 1 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

[5] We choose to perform the analysis for women instead of men, because women have longer life

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.[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.

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 $\overline{H}$ 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 with age, year of birth and country, a cohort effect common to all countries ($\delta$) and an error component ($\varepsilon$) :

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expectancies, and are more likely to survive men than the other way around.

[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.

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

Age, time and cohort effects cannot 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 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 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 $w_{i,c,t} = \left[ \frac{n_{a,c,t}}{h_{a,c,t}(1-h_{a,c,t})} \right]^{\frac{1}{2}}$, 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 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.[7]

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

The addition of the year-of-birth variable in the second regression changes the shape of the estimated age profiles considerably. The ownership rate increases by 0.7 percentage points per year between age 50 and 60, flattens 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. So controlling for cohort effects, ownership rates decline only after age 70, and even than the decline is quite 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 have constrained different age groups to display the same coefficients. To check the robustness of the results, we now divide the sample into three age-groups: 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 all countries 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

[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 excessively great concern.

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 for which we have only one survey). Figure 2 shows 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 UK

To compare the ownership trajectories, in Figure 3 we plot the difference between the cohort-adjusted homeownership rates of the 51-60 and 61-70 age groups. The coefficient estimated in Table 4 for the age group 61-70 (-0.1 percentage points per year) conceals considerable dispersion across countries: in Denmark, Canada, Finland, and the Netherlands the ownership rate falls by almost half a percentage point in the 51-60 age group, whereas in Austria, Belgium, France, Germany, Ireland, Italy, and Luxembourg the change in the cohort-adjusted profile is positive (around 0.4 percentage points). Finally, in the US, the UK and Sweden 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 61-70 and 71-80. The 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 over the ten years. At the other end of the spectrum, the UK and Luxembourg feature the lowest rates (less than 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

[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

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 owner 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), 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[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, the effects of reverse mortgages

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third-order age polynomial. The cohort-adjusted profiles are obtained from the estimated age coefficients of a specification that also includes year-of-birth.

[9] In the US, reverse mortgages were authorized in 1987. In Canada borrowers receive a small public subsidy. In the UK 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 US 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.

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.

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.

The price-income ratio might also be relevant. Banks et al. (2004) show that ownership might be a form of insurance against house price fluctuations. They provide comparative evidence from the US and the UK (based on the PSID and the BHPS) and 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 home equity. Some of these variables are reported in Table 5: the LTV ratio, as a proxy for mortgage market development, the average price-income ratio, property taxes, judicial efficiency (proxied by how long it takes to evict a tenant) and the social security income 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 the ownership rate in the age group 71-80 (or 61-70). The fact is that, with the exception of Canada and Finland, there is only limited international dispersion of the change in the cohort-adjusted profile.

## 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 at a rate of about 0.5 percentage points per year. Although we formally reject the hypothesis that the shape of the age-profile of ownership is the same across countries, we do find that ownership trajectories are very similar across countries – with the exceptions of Finland and Canada - and are not correlated with any of a broad range of variables that we examine.

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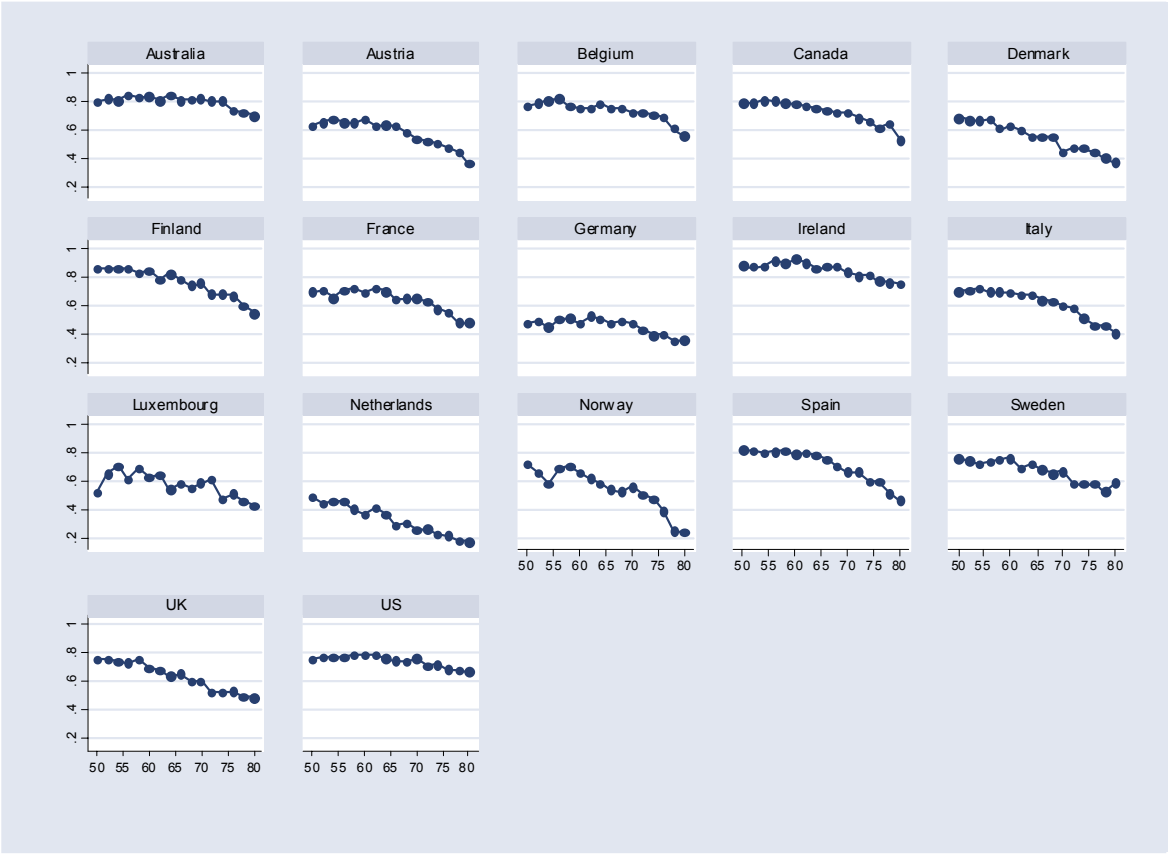
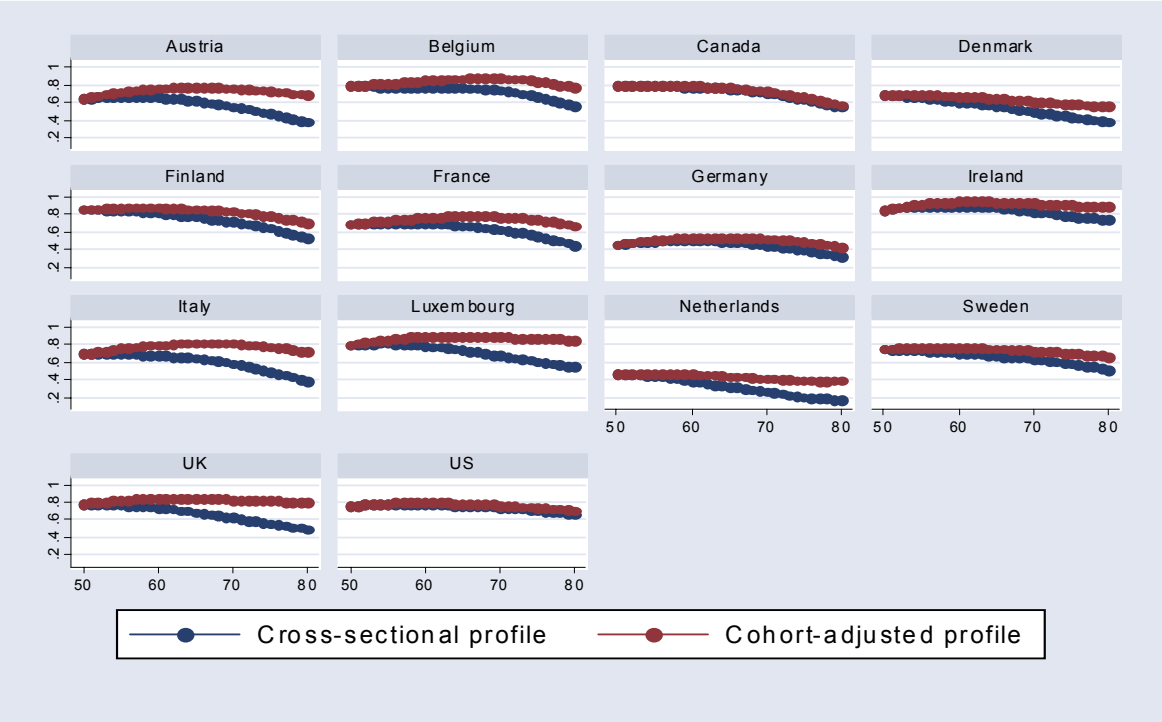
**Figure 1**
**Age profile of homeownership by country**




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.

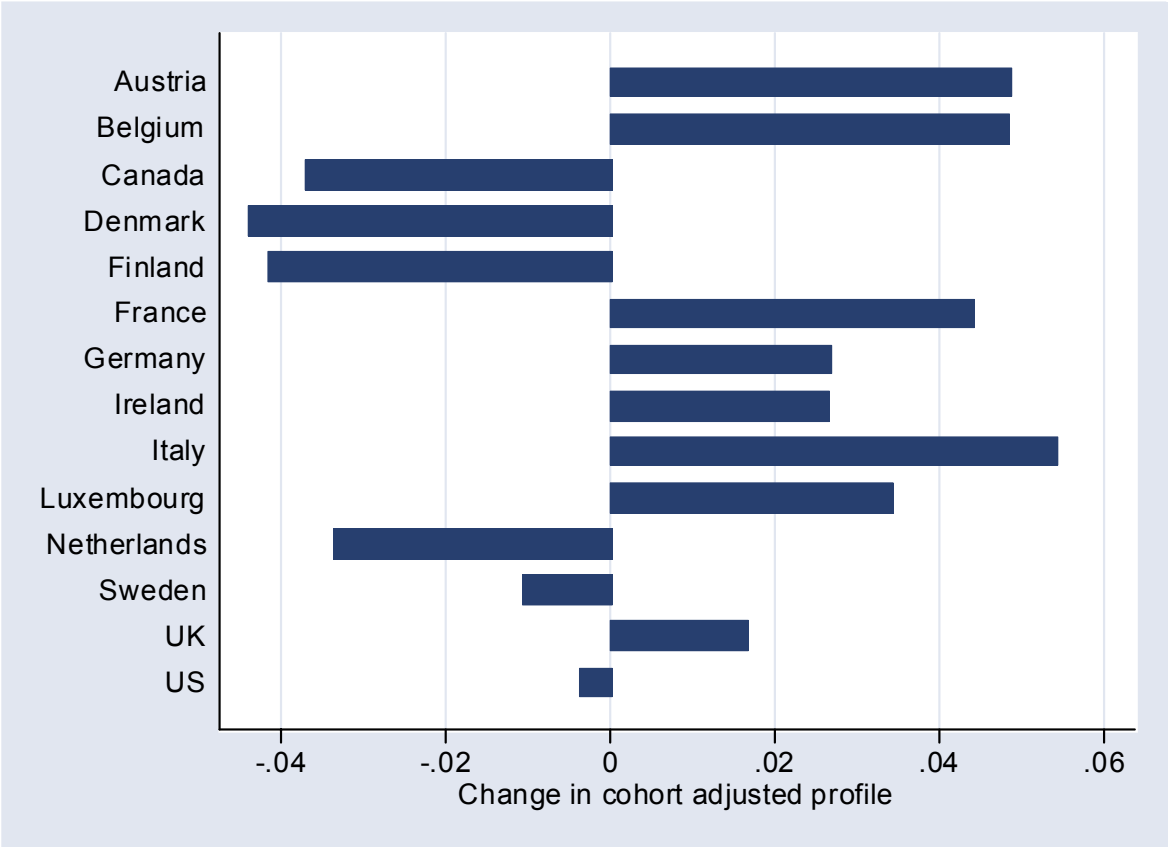
**Figure 2**
**The cross-sectional and cohort-adjusted profiles of homeownership**




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.

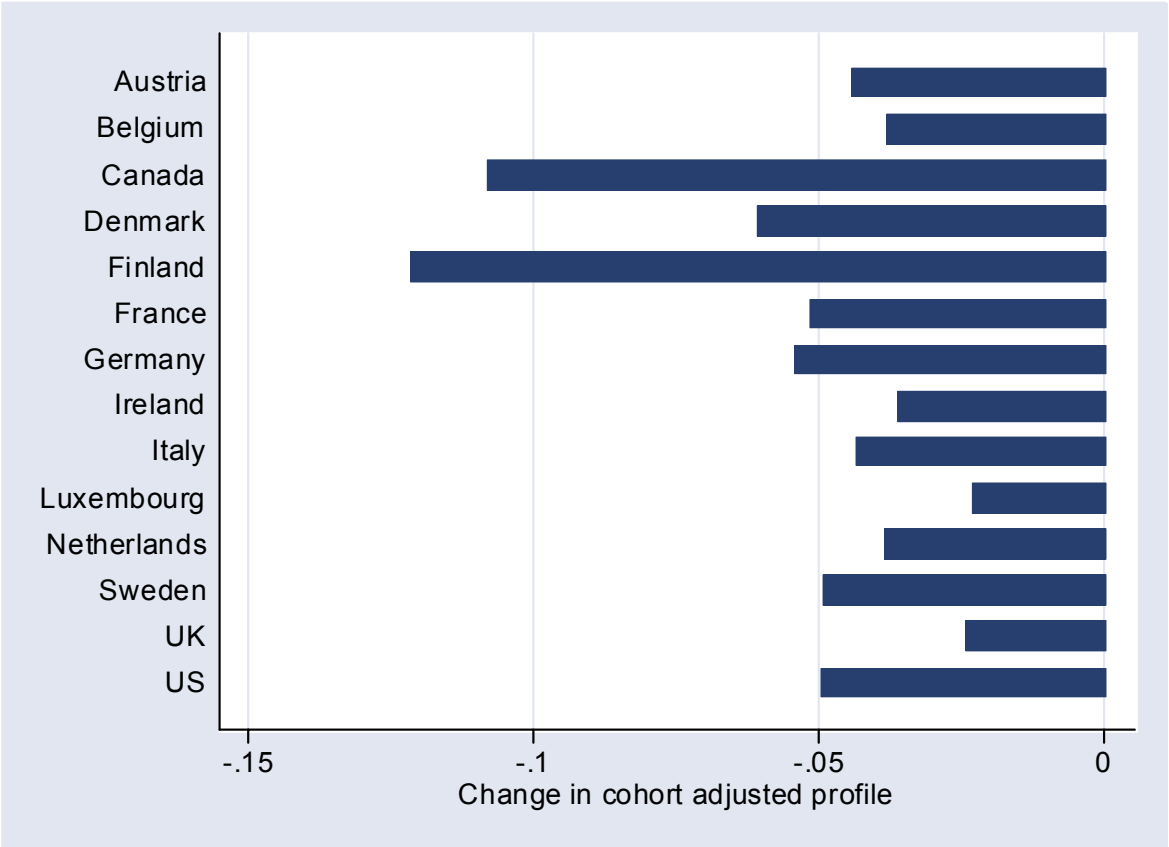
Figure 3

**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 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<br>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:<br>1975, 1981, 1987, 1991, 1994, 1997, 2000 | 61,718 | 290 |
| Denmark | Income Tax Survey:<br>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<br>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**

| *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 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**
**Homeownership by age-group**

| *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 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 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 one lives in. The US 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 (2006). The property tax to GDP ratio is drawn from OECD (2002). 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).