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Work Package 1: Quantitative Studies

Micro study report

1.1 Introduction

The demographic composition of the European population is fast changing with an "old age burden" that is growing and will continue to do so many years ahead. This development raises serious challenges for politicians as it involves increasing pressure on public budgets, stemming from the demand by elderly citizens with big and increasing voting power for continued "decent living standards". If future big savings deficits in the European nations, i.e. deficits on their balance of payments, are to be avoided, savings must be found inside the countries either as public savings, i.e. as surpluses on public budgets, or as savings in the private sector including households. The pressure on politicians to implement unpopular policies to cope with the problem eases the more the private sector is able to save. Household savings can take a number of different forms depending on the development of financial markets in member states. It may be through the acquisition of financial papers of various kinds, including pension schemes, or it may be through the acquisition of physical assets, e.g. in the form of homeownership. Also tenants can place their savings in housing, e.g. if they buy shares in real estate owning companies, so homeownership does not necessarily influence the saving behaviour of households. However, following the model presented

by Hansen and Skak (2008), homeowners have high preference for individual adaptation of their homes and can be expected to invest (save) more (in their homes) than tenants invest (save) and this may be a driving force behind increased wealth accumulation for households who shifts into ownership. An empirical study by Di, Belsky and Liu (2007) finds, that wealth accumulation tend to increase when households go into ownership. Their study uses panel data containing both a period before and a period after the change of tenure, which should exclude a selection bias in the findings. If homeownership increases the savings ratio of households, high rates of ownership reduces the need for public financed pension systems and this may in part explain "the really big trade off" between on the one hand nations with low welfare provision for the elderly combined with high rates of homeownership and on the other hand nations with high welfare provision for the elderly combined with low rates of homeownership. Castles (1998) finds this trade off as a negative correlation between levels of homeownership and total government expenditures on social protection among OECD countries. Typical representatives of the high ownership rates – low social protection group are found among "New World" countries like Australia, Canada, New Zealand and Unites States and typical representatives of the low ownership rates – high social protection countries are found among European countries: Austria, Germany, the Netherlands and Sweden. Kemeny (2005) argues that high rates of homeownership creates strong resistance to high levels of taxation and public expenditures and so tend to reduce welfare outlays. However, high rates of homeownership may also reduce the needs for welfare provision especially for the elderly. Which one comes first was analysed in the DEMHOW macro analyses, see Doling and Horsewood (2009) who found Granger-causality for both hypothesis.

Homeownership is, however, not only decided by households as part of a financial portfolio optimisation, but influenced by a number of other factors, which may or may not support the hypothesis that homeownership and welfare provision act as substitutes. Thus, according to Linneman (1986) and Hansen and Skak (2008) homeownership rates can be expected to be lower in more densely populated regions, i.e. in high income metropolitan areas, and higher in more remote and poor areas. Hence, densely populated regions with low rates of ownership may be comparatively rich and have means to pay for generous welfare systems if so wanted, whereas poor remote areas with high rates of homeownership may be without means for this. At the micro level, the relation may be opposite because preceding savings out of a comparatively high income supports both the probability for ownership and the accumulation of financial wealth for

consumption during the pension ages. Hence high ownership rates reduce the wish for publicly provided welfare systems, which supports the Kemeny (2005) proposition tested in the macro analysis. We try to look into this and other questions in the following micro analysis. Are homeowners comparatively income rich? Do homeowners use their accumulated wealth to keep current consumption up through their pension years? Have tenants used other saving channels to smooth their lifetime consumption? Does homeownership reduce or increase consumption inequality among pensioners? Answers to these and other questions will be sought in the following.

The analysis takes a closer look at the behaviour of *old age households*, defined as households with at least one member of age 50 or over (of age 50+). Old age households, can be considered to be close to the "top" of their housing carrier in the sense that they have accumulated the maximum of housing wealth over their life cycle, or may even be on their way "down" by using the accumulated housing wealth to secure consumption as their incomes fall away. Their behaviour will be analysed by use of data from the first wave of the cross country panel survey made available through the EU-funded SHARE project. Tables and figures supplemented with statistical and econometric analysis will be employed to identify central traits of old age households in ten EU member states.

1.2 Research questions

The above considerations raise a number of questions, which we will try to answer based on the SHARE data for households with members of age 50+. In the following, the words old age households will be used as a general term for these households, but it should be noted that they cover a generation's time and so quite different types of households. To characterise households in many contexts we use household variables, but also personal characteristics of the head of the household, which incurs some insecurity in the analysis as households with the same type of head may differ widely in other aspects.

Homeownership rates and tenure trajectories

This part of the analysis looks at homeownership among old age households. What factors seem to explain the choice of ownership among these households? Naturally, the decision to become owners is typically taken at an earlier stage of the life, possibly with the intention to smooth consumption over the lifetime as prophesised by the life cycle hypothesis, see e.g. Artle and Varaiya (1978) and Modigliani (1988). But if this is the case, households should release their housing equity for

consumption in their older ages and one way to do this can be to sell the house and become tenants. Can we observe this and other ways to use housing equity when the households' age increases?

Housing wealth, income and consumption

If households save in younger ages to smooth consumption over the lifetime, savings may take different forms among which the acquisition of a home is only one. Can we see substitution between homeownership and the acquisition of other financial asset? It may also be that homeowners accumulate more of all kinds of wealth, and they could even use their housing equity as collateral for loans to quire other types of financial wealth. We look into this and try to answer the question: Are there differences in the inclination to use housing equity versus the use of financial asset for consumption during older ages? Is it easier for old age homeowners to make ends meet than for tenants?

Bequest and homeownership

Does leaving bequest play a bigger role for homeowners than for tenants? An answer to the question is important because bequest limits the use of housing equity for consumption apart from consumption of the housing service. This may have the consequence that old age homeowners have limited means for other consumption, and this would increase homeowners' pressure for public old age pensions. But it could also be that intergenerational "family homeownership" encapsulates the transmission of purchasing power between generations inside the family and so easies the pressure on public social outlays.

Retirement and homeownership

If an increase of the homeownership rate can be taken as a sign of households becoming more aware of the need for self provision of financial means for their pension ages, this would indicate a relief for public finances. However, homeowners could have a tendency to withdraw earlier from the labour market than tenants, which may increase their time as net recipient of public social outlays. If this is the case, increasing homeownership rates will not necessarily relieve the future burden on the shoulders of the public welfare system.

These are important questions for European governments, who are facing an increasing demand for public expenses connected to the demographic change.

1.3 Outlay

The report is structures as follows: The next section briefly describes the SHARE data used in the analysis, after which section three starts looking at homeownership rates and tenure trajectories. Section three take a closer look at homeownership rates and tenure trajectories, and section four analyses the composition of housing wealth, income and consumption. The relation between income, wealth and consumption for European old age households is studied in section five, and section six uses the SHARE data to analyse bequest and homeownership. The final analysis on homeownership and retirement from the labour force is done in section seven, while section eight recalls the most important conclusions from the preceding sections.

2.1 Data

The analysis draws on The Survey of Health, Ageing and Retirement in Europe (SHARE), which is a multidisciplinary, cross-national panel database with micro data on health, socio-economic status and social and family networks of more than 30,000 individuals aged 50 and over. Ten EU countries have contributed to the 2003-2004 SHARE baseline study, ranging from Scandinavia (Denmark and Sweden) through Central Europe (Austria, France, Germany, Belgium, and the Netherlands) to the Mediterranean (Spain, Italy and Greece). The second wave of SHARE 2005-2007 including the Czech Republic, Poland and Ireland was partly released the 28th of November 2008. However, the released data lack cleaning and imputations, which is needed for our statistical purpose. Cleaning and imputation of the data are not expected to be finished before May 2009. A third wave 2008-2009 is envisaged. More about the survey can be found on the SHARE website http://www.share-project.org/. Non EU counties included in SHARE are Switzerland and Israel. The SHARE data have been used extensively for statistical analyses of socio-economic and health related aspects of elderly people and households with older people. A list of these studies can be found and some downloaded from the SHARE website. In the present analysis of old age households; the total number of observations is close to 19,000 with the number of observations in each country ranging between nearly 1200 observations for Denmark and nearly 2500 for Belgium.

We have chosen the *breadwinner* in each household, i.e. the person with the highest gross income, to be *head of the household*. This implies that personal characteristics of this person will be used as household characterising variables in various ways. As an example, when we try to find factors

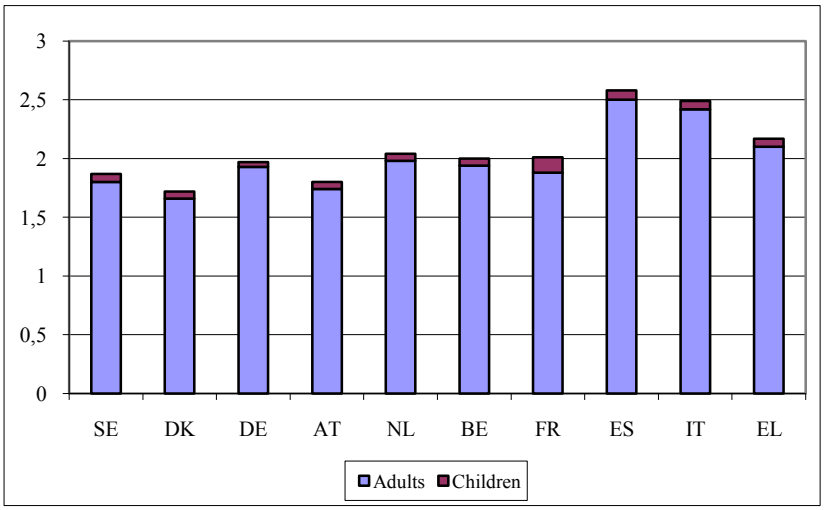
important for the household's choice between ownership and renting, one significant explanatory variable may be the educational level of the breadwinner. However, we do not test for the educational level and other personal characteristics of other household members and combinations of characteristics among household members because this would be extremely burdensome. We use the characteristics of the breadwinner, because we assume that this member of the household is the most important for the household behaviour in many ways. As illustrated in figure 2 below, it also has the implication that household heads may be of age below 50. The reason for this is that persons who are married or firmly cohabitating with persons of age 50+ in the interviewed household are included in the SHARE database, and a number of these persons are both less than 50 years of age and breadwinners.

The Share questionnaire not only covers an impressive number of questions to be answered by persons of age 50+, it also has a number of physical and mental exercises to be performed by the interviewed persons. A fully description of the data is thus far beyond the needed for our purpose. Below we show three figures with background information on size, age and education related to European old age households. Other variables will be brought into the text as we proceed through the analysis.

2.2 Size, age and education

On average there are 2 adults and 0.07 children in the nearly 19.000 households included. Old age households with at least one person of age 50+ are naturally dominated by adults as shown in figure 1. However they are not completely without children and the number of children is comparatively high in France and low in Germany. In general, old age households are somewhat larger in the Mediterranean countries with more than 2 members on average. This indicates that it is more common in Southern Europe to have parents living under the same roof as children of old age. This becomes more seldom when one moves to northern European countries.

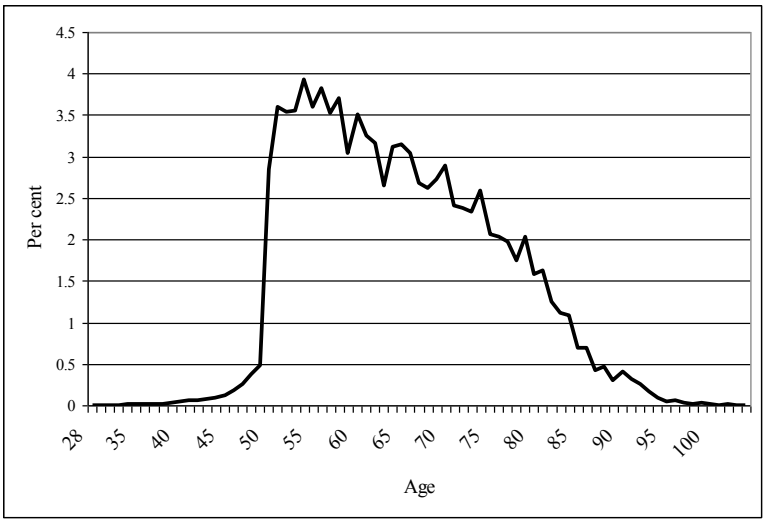
Figure 1: Number of persons in old age households



Source: Calculated mean values from the SHARE 2003-2004 database

Figure 2 shows the age distribution of household heads, i.e. the age of the breadwinner or person with the highest personal gross income in the household. Because spouses or cohabitants to members of age 50+ are included in the SHARE sample and can be heads according to our definition, a number of household heads are below 50 years of age. The figure demonstrates that as low as 28 years old heads are found in the sample, but also that heads below 45 of age are clear exceptions. Household heads are typically above 50 years of age, with a falling density hereafter, and a few heads even pass 100 years of age.

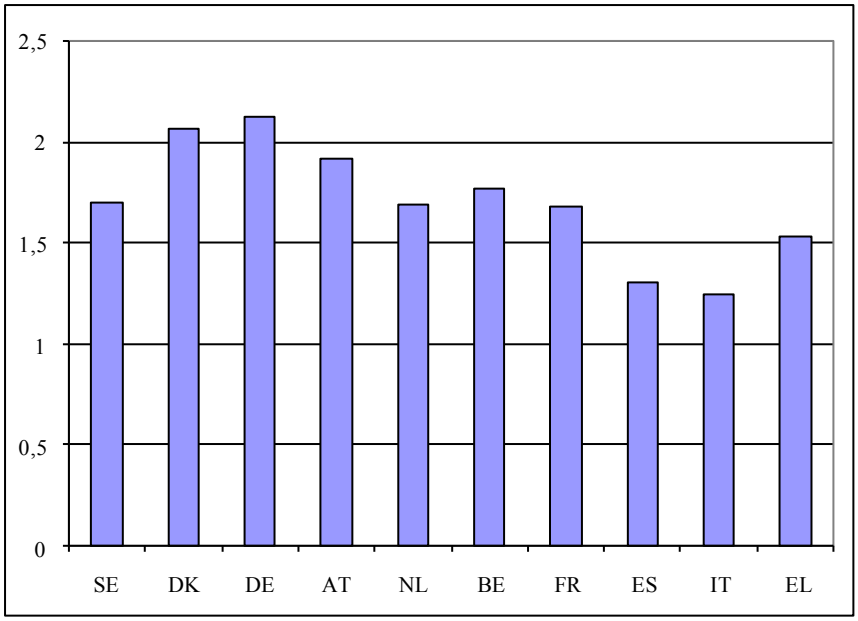
Figure 2: Age distribution of heads of old age households



Source: Calculations from the SHARE 2003-2004 database

Only slightly more than 50 per cent of all household heads are retired. However, to this can be added 3 per cent unemployed and another 3 per cent who are unable to work. As mentioned above, all personal characteristics are those reported for the household head. Naturally, some retired and unemployed heads will have spouses and other household members who are employed.

Figure 3: Educational attainment of heads of old age households



Source: Calculated mean index values from the SHARE 2003-2004 database. See the text on calculations.

An index of educational attainment of household heads has been constructed for the countries based on mean values of the reported levels of educational attainment. The index formula is 1 times the percentage with primary schooling + 2 times the percentage with secondary schooling + 3 times the percentage with tertiary schooling. Figure 3 shows the result. Comparatively high levels of educational attainment are obtained in northern Europe and the lowest levels are found among the Mediterranean countries.

3.1 Homeownership rates and tenure trajectories

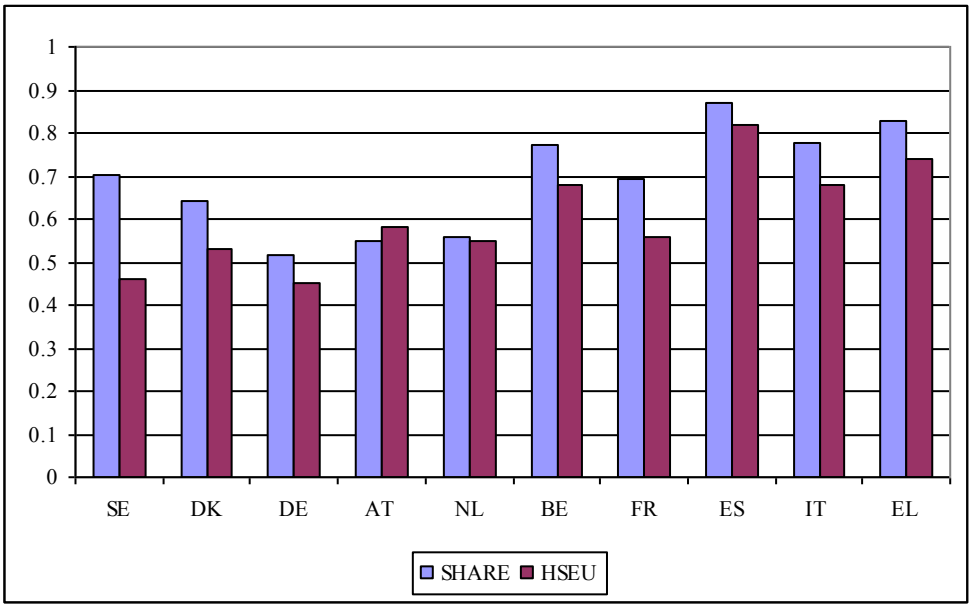
An important research topic under the DEMHOW project is the impact of homeownership on the financial means for old age households. Is it so that home owning households have sufficient means to take care of themselves through their pension ages and homeownership consequently lifts some of the burden of the ageing population from the shoulders of public finances? We try to look into

this in the following; first by stating some statistical facts and then by looking for behavioural relations for old age households.

3.2 The homeownership rate

Because homeownership typically requires preceding savings, homeownership rates tend to increase with the age of households, until finally owners change into tenancy at the oldest ages. As a consequence, homeownership rates can be expected to be higher among old age households than for the average household in a country. Figure 4 confirms this with Austria as the only exception. One can also notice that the difference between old age households and the country average is especially pronounced for Sweden. However, with two different sources behind the two types of columns in the figure, the shown country differences in this respect may not be overly reliable. Country comparison reveals high rates in the Mediterranean countries, both for all households and for old age households.

Figure 4: The homeownership rate among old age households



Notes: The HSEU data are from Housing Statistics of the European Union 2004 and cover all types of households. The years are 2002 or 2003 and 2990 for Italy. The SHARE data only covers old age households.

Source: Housing Statistics of the European Union 2004 and calculated mean values from the SHARE 2003-2004 database.

3.3 Regression on cross section data, country differences

To enlighten factors behind homeownership, a logistic regression on homeownership based on the SHARE 2003-2004 data is run with results reported in table 1[1]. It should be remembered that the regression is done on cross section data and reveal a "comparison" across old age households in the countries included at a specific point of time. It should also be remembered, that the major part of explanations for the tenancy status of the households, which typically are on the top of their housing carrier, should be sought in the past. Consequently, the coefficients of the so-called explanatory variables on the right hand side of the regression equation should be seen more as numbers indicating significant (if so) statistical relations - with control for the influence of other variables - more than causalities.

Table 1: Logit regression of homeownership

Variable	Coefficient	Odds ratio
Germany	reference country	
Sweden	0.9351***	2.547
Denmark	1.5246***	4.593
Austria	0.5494**	1.732
Netherlands	-0.1810	
Belgium	1.2769***	3.586
France	1.4499***	4.263
Spain	2.3266***	10.243
Italy	1.4361***	4.204
Greece	1.9438***	6.985
Log income Germany	0.2074***	
- Sweden	0.1146	
- Denmark	0.5156***	
- Austria	0.1377*	
- Netherlands	0.0062	
- Belgium	0.0035	
- France	0.2387***	

[1] Table A1 in the appendix gives an overview of the variables.

- Spain	-0.0057	
- Italy	0.0918	
- Greece	-0.1383**	
Financial wealth	0.1626***	
Having private pension plans	0.3416***	1.407
Gifts/inheritance from parents	0.000003***	
Other gifts	0.000004***	
Debt	2.3224***	
Number of adult persons	-0.0014	
Number of children	-0.2620***	
Big city	reference variable	
Suburb	0.4561***	1.578
Large town	0.4071***	1.502
Small town	1.1066***	3.024
Rural area	1.3943***	4.032
Male breadwinner	0.0205	
Single	-0.8652***	0.421
Foreign	-0.7058***	0.494
Age	0.1441***	
Age squared	-0.0011***	
Basic educational attainment	reference variable	
- secondary	0.2884***	1.334
- tertiary	0.5011***	1.651
Employed breadwinner	reference variable	
Self-employed	0.2298**	1.258
Unemployed	-0.3174***	0.728
Doing housework	0.4681***	1.597
Retired	0.2521***	1.287
Disabled to work	-0.1711	
Good health	1.0708***	2.918

Note: Personal characteristics are those of the breadwinner of the household. Private pension plans are individual and occupational. The odds ratios are shown where they have a meaningful interpretation. They show the ratio of the probability of finding a home owning household in the respective category divided by the probability of finding a home

owning household in the reference category. Where no reference category is mentioned, the opposite characteristic is the reference category. Income is equivalised gross income of the household. Significance is indicated by *** for 1%, ** for 5%, and * for 10%. Only meaningful significant odds ratios are shown. $R^2 = 0.25$.
Source: Logistic regression on the SHARE 2003-2004 database.

In the regression, Germany, which has a comparatively large rental housing sector, has been chosen as the reference country and, as can be seen from table 1, all other countries except the Netherlands show a significant higher homeownership probability when controlling for differences in the other variables, e.g. income, financial wealth, etc. One can compare the crude or uncontrolled differences in homeownership rates among old age households illustrated in figure 4 with table 1, where the country coefficients show differences compared to Germany, now with control for variation in the other explanatory variables. In figure 4, Germany has the lowest rate of homeownership among old age households, and this is also confirmed by table 1, which has positive coefficients for all other countries except the Netherlands. However, the differences are more pronounced in table 1 when judged by the odds ratio. Thus the odds ratio for Denmark tells us that the probability for homeownership among old age households is 4½ times as high as in Germany, when controlling for variation in other variables. Also Belgium, France and Italy have high ownership probability compared to Germany, and Spain and Greece have extremely high ownership probability, more than six times the rate in Germany.

3.4 Income

It is normally so that increasing income and homeownership goes hand in hand. Ownership most often requires preceding savings out of annual incomes, which by itself should give a positive relation. Furthermore, among old age homeowners some can be expected to move out of ownership in order to smooth consumption as they retire with falling income. Table 1 confirms this with a significant positive relation between gross income per equivalent person and the probability for ownership. However, there may be differences in this relation between countries e.g. because of differences in the income taxation systems. To test for country differences, interaction between the income concept and homeownership is allowed for. Germany has again been chosen as the reference country, and the regression shows that for five countries no significant difference compared to Germany exists. However, the positive relation between income and homeownership is significantly more pronounced in Denmark, Austria and France and significantly less pronounced in Greece.

3.5 Wealth, pension plans, inheritance and debt

Home owning old age households can be expected to have comparatively high total wealth, but there is no a priory reason why they should have high financial wealth as indicated by the positive coefficient in table 1. In fact housing wealth and non housing wealth may be regarded as substituting saving forms, which by it self should tend to give a negative coefficient. However, homeowners may simply be wealthier than tenants, which ceteris paribus tend to raise their financial wealth compared to tenants and gives a positive coefficient in table 1. We take a closer look closer at the wealth composition among old age households in section 4.1.

The positive coefficients for the two variables for inheritance and gifts[2] indicate that bequest plays a positive role for homeownership. Inheritance may well be received in ages above 50, in which case the coefficient can be interpreted as a casual relationship, which shows that intergenerational wealth transfers play a positive role for homeownership. However, with few households entering into homeownership at this age, the causality may in fact be weak. We look further into this in section 6.1 below, which treats bequest and homeownership.

Households with private pension plans have forty per cent higher probability of being homeowners than households without pension plans. Thus homeowners seem to add pension plans to the housing equity available for consumption after retirement from the labour force, which may add to the understanding of the mechanism behind the Kemeny (2005) position, arguing that high rates of homeownership create strong resistance against high levels of taxation and public expenditures and so tend to reduce public welfare outlays.

It is no surprise that debt has a positive coefficient against homeownership. The regression is run for all ages and a number of homeowners do not own their homes outright at the time they buy. Furthermore, homeowners have better collateral for loans, especially old age households. Homeowners may also be more familiar with financial transactions than tenants. Among old age households, some can be expected to take up new loans during retirement in order to keep both

[2] The interviewed persons are asked about received gifts over the last 12 month and ever received inheritance.

housing consumption and other consumption unchanged when incomes fall. Section five discusses the extent of this and looks at differences in habits between countries.

The regression furthermore reveals that the number of adult persons in the household is without significant influence on ownership, but an increasing number of children reduce the probability for ownership. Urbanity also has an impact on ownership, which is more common the more distant one is from the metropolitan areas. In fact, the probability of homeownership is 40 per cent higher in rural areas compared to big cities. A number of studies find lower rates of ownership in more densely populated areas, a phenomenon also valid for old age households.

3.6 Characteristics of the household head

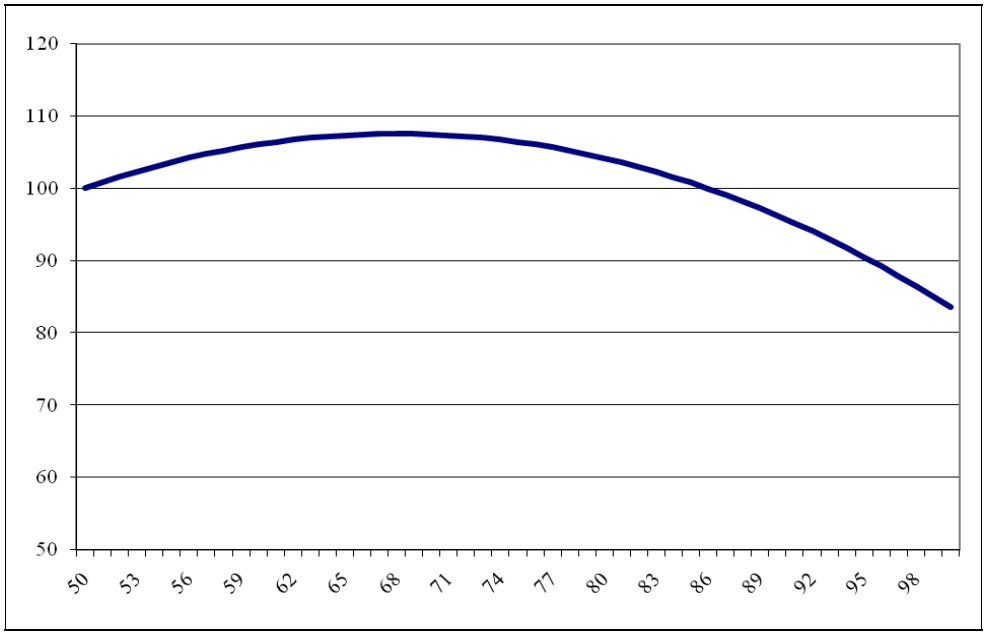
The next variables in table 1 show various characteristics of the household head, i.e. the breadwinner, of the household, which also seem to influence the probability of ownership. Sex has no significance, but singles and heads with foreign origin have reduced probability for ownership. Age will be treated below. More education increases the probability of ownership. Unemployment reduces the probability for ownership compared to an employed wage earning household head whereas self-employment, house working and retirement increase the probability. The positive coefficient for retirement may reflect a problem with endogeneity, which increases the positive coefficient as the causality may be that homeownership gives financial means for earlier retirement from the labour force. Sections seven takes a closer look at retirement.

A big part of the SHARE questionnaire is about old age household member's health, physical and mental abilities. We have included a single one, which catches the health status of the household head. Table 1 shows a significant positive relation between the health of the head and ownership. This may be a result of self selection if households heads go out of homeownership when their health deteriorates, e.g. because of less ability to climb stairs and more need for care. But it could also indicate that ownership has a positive influence on health because of comparatively good housing conditions and/or because it is physically and mentally more challenging to be a homeowner than to be a tenant, and this every day training has a positive influence on the health. We do not go further into this causality problem.

3.7 Age and the tenure trajectory

The regression of table 1 shows a significant connection between homeownership and the age of the head of the household and figure 5 illustrates how the age influences the probability of ownership. The ownership probability reaches maximum around 68 years of age and then starts to fall. The gradual fall of the probability after 68 can be seen as reflecting homeowners' release of housing equity for consumption. This release is partly done through sale of homes with a simultaneous move into rental housing for a number of households. However, the curve may also reflect pure cohort effects, showing (lasting) lower ownership rates for households with heads in the age groups or cohorts from the age 68 and above. Because of this, a single cross section analysis does not allow us to interpret the curve as a tenure trajectory or life cycle behaviour through ages. The second and third SHARE waves will give an indication of possible errors committed in interpreting the age profile of figure 5 as a tenure trajectory. An important study in this context is Fukuda (2008) who studied Japanese and US homeownership rates on panel data and distinguishes between three effects on the homeownership rates. One is the age effect, which gives the tenure trajectory over ages we are looking for. Another is the cohort effect, which gives the difference in ownership rates because of behavioral differences between the cohorts, and the third one is a time effect which is intended to capture the influence of external variables, e.g. changing taxation rates and/or transaction costs, which shifts over time and may affect the ownership rate. The picture in figure 5 is influenced by all three effects. However, Fukuda's (2008) results for Japan and USA show a dominating age effect, which for old ages reveals a picture like the one shown in figure 5. But naturally, cohort effects play a role. Skak (2008) has a figure, which shows steadily increasing ownership rates among for the age group 65-79, but not for the age group 80+. Based on this, it may be expected that tenure trajectories for younger households will show higher ownership effects than illustrated in figure 5 for ages between 65 and 80. Future studies based on two and more SHARE waves will shed light on this.

Figure 5: The homeownership probability and the age of the head of the household



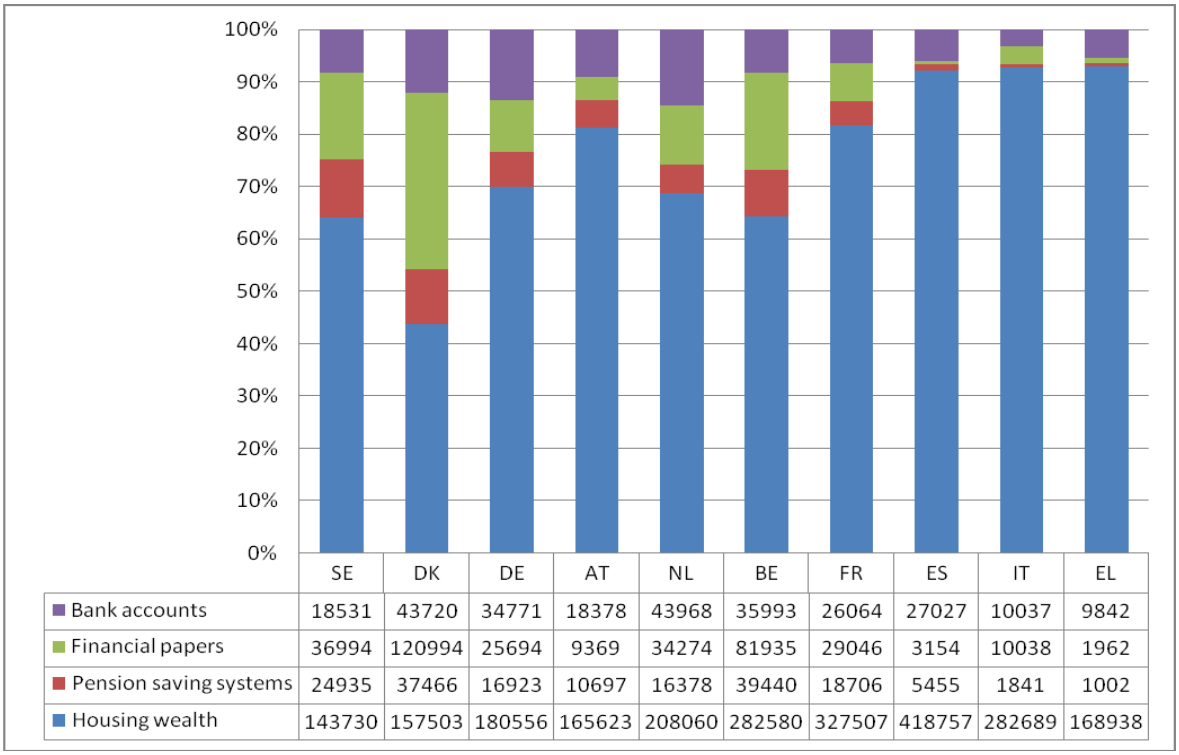
Note: The effect for 50 years of age is set equal to 100.

Source: Housing Statistics of the European Union 2004 and calculated mean values from the SHARE 2003-2004 database.

4.1 Wealth among old age households

According to the DEMHOW inter country macro studies; see Doling and Horsewood (2009), there appear to be substitutability between homeownership and state spending on older people. Is there also substitutability between homeownership and the provision of public or private pension systems when one looks at micro data for elderly households? Before looking at this question, we start with an overview of wealth components among old age households in the 10 European countries, see figure 6.

Figure 6: The wealth components among old age households. PPP corrected euro and per cent.



	SE	DK	DE	AT	NL	BE	FR	ES	IT	EL
Bank accounts	18531	43720	34771	18378	43968	35993	26064	27027	10037	9842
Financial papers	36994	120994	25694	9369	34274	81935	29046	3154	10038	1962
Pension saving systems	24935	37466	16923	10697	16378	39440	18706	5455	1841	1002
Housing wealth	143730	157503	180556	165623	208060	282580	327507	418757	282689	168938

Note: Mean wealth per household in PPP corrected euro. Bank accounts include contractual housing savings. Car value and owner share of business is not included.

Source: Calculated mean values from the SHARE 2003-2004 database.

The picture revealed in figure 6 partly reflects country differences in homeownership rates as shown in figure 4. Thus, high ownership rates in Southern Europe gives high shares for housing wealth out of total wealth. This combined with comparatively high housing wealth[3] in Italy, Spain and France, where the financial wealth components are relatively small, indicates a degree of substitutability between homeownership and the provision of other financial means for pension. However, the

[3] Wealth is in PPP corrected euro. Car value and owner share of business is not included. Car value is probably hard to estimate and can hardly be considered a financial assets, which is intended to be used for non-transport consumption. The reported values of owner share of business are excluded because they seem highly unreliable for some countries when compared with data from national sources. Whereas income reporting by interviewed persons may be realistic, it is an open question how well old age respondents are able to give realistic estimates of housing market values. A recent study on US data by Benitez-Silva, Eren, Heiland, and Jimenez-Martin (2008) finds that self reported housing wealth on average overestimate values by five to ten per cent, but also that this varies with the business climate on the day of purchase. Households who bought in more depressed times tend to be more realistic in their estimation. The Share data does not have information that allows us to correct for misreporting.

regressions in table 1 showed that this macro or inter country substitutability was not confirmed by the micro or intra country regression, where a significant positive coefficient was found between homeownership and both financial wealth and private pension plans. One explanation for the positive micro or intra country relation could be that homeowners save more than tenants, as indicated by the analysis by Di, Belsky and Liu (2007), and thus acquire more financial wealth through their lifetime. It could also be that homeowners use their housing equity as collateral for geared investments in various financial papers including private pension plans.

Table 2: Mean housing and financial wealth. PPP corrected euro and per cent.

	Homeowners		Tenants	
Housing wealth	309,526	77 %	14,021	27 %
Financial wealth	93,403	23 %	37,537	73 %
	Debtors		Non-debtors	
Housing wealth	316,416	74 %	319,222	78 %
Financial wealth	113,627	26 %	88,974	22 %
	With pension plans		Without pension plans	
Housing wealth	290,020	63 %	218,032	83 %
Financial wealth	171,543	37 %	46,040	17 %

Note: Housing wealth is gross value excl. outstanding mortgage. Car value and owner share of business is not included. Tenant covers tenant, sub-tenant, rent free, and member of a cooperative. Debtors are households with outstanding mortgage. Number of observations: Homeowner/non-owner: 10290/4471 households with no indication 4075. Debtor/non-debtor: 3314/10725 households with no indication 4797. With pension plans/without pension plans: 5076/13760.

Source: Calculated mean values from the SHARE 2003-2004 database. Wealth and debt are as stated by respondents when asked in 2004.

Table 2 sheds more light on this. Row three in the table shows that the financial wealth of old age homeowners is two and a half times higher than tenants' financial wealth. One may also note that tenants are not completely without housing wealth, which in their case must be placed in secondary homes. Row five of the table shows that housing wealth does not differ much between debtors, who in the table are defined as households with outstanding mortgage, and non-debtors. But debtors, the majority of whom must be homeowners, have 26 per cent of their wealth placed in financial wealth against 22 per cent for non-debtors, who have smaller total wealth. Thus, the possibility to use

housing equity as collateral to build up financial wealth seems to be used. Finally, row 8 shows that households with pension plans have a lower share of their wealth placed in housing wealth than households without pension plans, which confirms the macro inter country substitutability. However, the table show both cross country and inter country cross households effects, whereas the coefficient for pension plans in table 1 only shows cross household effects. This is because cross country effects are captured by the first country specific coefficients in the logistic regression. Thus the cross country or inter nations effect dominates the intra nation cross household effect in table 2.

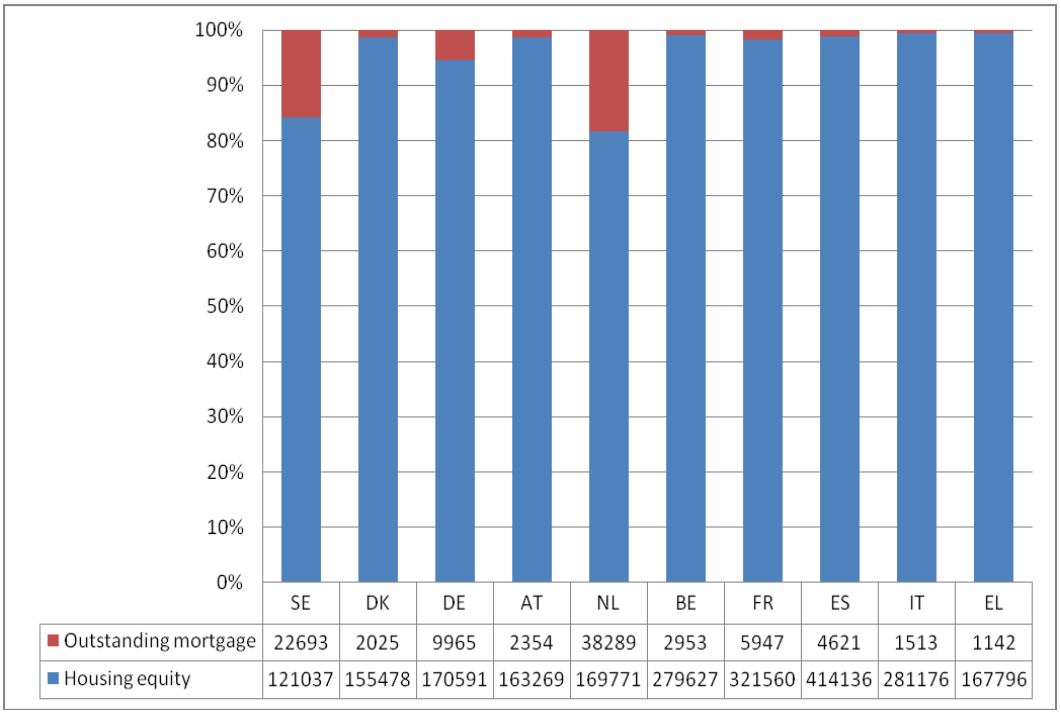
4.2 The release of housing equity

Based on cross section regressions, figure 5 showed gradual falling ownership rates among households with age above 68. An interpretation of this is that it reflects a release of housing equity through pension ages. Besides sale of the home, housing equity can be released through an increase of the outstanding mortgage. But, as figure 7 shows, releasing housing equity to smooth consumption over the life cycle in this way does not seem to be an acceptable option for many households. Only in Sweden and the Netherlands is the average mortgage ratio above 10 per cent of the house value, and it is close to zero in Southern Europe where nearly all elderly households are outright owners[4].

The result of a regression on the mortgage percent among homeowners with outstanding mortgage, see table 3, gives the development over ages illustrated in figure 8. The figure shows a falling mortgage rate as the age of the head of the household increases and so shows no tendency for a "use" of housing equity for consumption through the pension ages. The curvature comes from the coefficient of the age squared. This coefficient is not significantly different from zero, but is included in the illustration because if not the straight line will go into the negative.

[4] Based on data from the European Community Household Survey, Duygan-Bump and Grant (2009) report that households with outstanding mortgage as a fraction of all households with couples where the male is of age 30 to 60 years cover from 13.2 to 29.4 per cent in Greece, Italy and Spain; 35 to 55 per cent in Austria, France and Belgium; and 66.1 to 70.8 per cent in the Netherland and Denmark. Germany and Sweden is not included.

Figure 7: Housing equity and outstanding mortgage among old age households. PPP corrected euro and per cent.



	SE	DK	DE	AT	NL	BE	FR	ES	IT	EL
Outstanding mortgage	22693	2025	9965	2354	38289	2953	5947	4621	1513	1142
Housing equity	121037	155478	170591	163269	169771	279627	321560	414136	281176	167796

Note: Mean values per household in PPP corrected euro.

Source: Calculated mean values from the SHARE 2003-2004 database.

Table 3: LS regression of mortgage per cent among homeowners with outstanding mortgage

Variable	Coefficient
Germany	reference country
Sweden	0.0134
Denmark	-0.0365
Austria	-0.1606***
Netherlands	0.0249
Belgium	-0.1898***
France	-0.0359
Spain	0.0981**
Italy	-0.0788
Greece	-0.1365***
Log income	0.0113
Housing wealth	-0.0224***

Financial wealth	-0.0006
Having private pension plans	-0.0296*
Number of adults	-0.0341***
Number of children	0.0331**
Male breadwinner	0.0100
- age	-0.0186*
- age^2	0.0001
Basic educational attainment	reference variable
- secondary	-0.0151
- tertiary	0.0009
Big city	reference variable
Suburb	0.0243
Large town	0.0116
Small town	0.0468*
Rural area	0.0202

Note: Personal characteristics are those of the head of the household. Income is gross income of the household per equivalised person. The table gives the result of a regression where only significant explanatory variables are included, but with insignificant dummy variables included where needed to complete the array of outcomes. Adding other (insignificant) variables does not improve the explanatory power, but reveals robustness of the coefficients for the variables included in the table. Significance is indicated by *** for 1%, ** for 5%, and * for 10%. $R^2 = 0.06$. F = 9.15***.

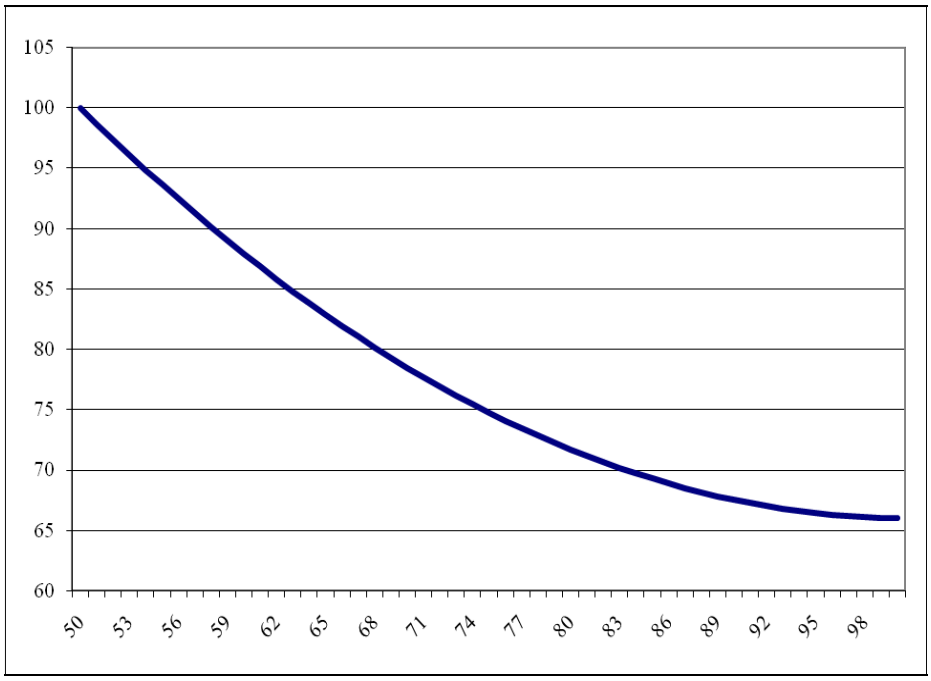
Source: LS regression on the SHARE 2003-2004 database.

A somewhat surprising result in table 3 is the lack of a significant higher level of outstanding mortgage in the Netherlands compared to the level in Germany. The high level revealed in figure 7 apparently has to be explained by differences in the other explanatory variables of table 3 and not as an idiosyncratic characteristic of the Netherlands[5]. The significant higher mortgage ratio for Spain compared to Germany is also surprising whereas the negative coefficients for Austria, Belgium and Greece are as expected. One could also note that income is without influence on the need for mortgage, which falls with housing wealth, but is untouched by financial wealth. A higher number of adult persons in the household reduce the need for mortgage, whereas it increases with the

[5] Interest payments are fully deductable in the tax base in the Netherlands, which makes it less costly to take up new mortgage in order to keep consumption up over the pension ages.

number of children. Education has no significant influence on the percentage outstanding mortgage, and this is by and large also the case for the location. All in all, the poor R^2 for the regression indicates difficulties in explaining differences in the percentage outstanding mortgage among European homeowners. One reason for this could be the influence from actual developments of interest rates and national income as reported by Doling and Horsewood (2009).

Figure 8: The age effect on the per cent outstanding mortgage



Note: The effect for 50 years of age is set equal to 100. As discussed in section 3.6, the curve contains both cohort, age and year effects and so cannot be interpreted as a pure age trajectory or life cycle behaviour through ages.
Source: The figure drawn by use of the estimated coefficients reported in table 3.

4.3 The release of financial wealth

Figure 6 showed that not only housing wealth but also deposits on bank accounts, holdings of bonds and shares, and pension saving plans have an important weight in the wealth of elderly households in Nordic and Central European countries. Pension plans are directly designed to be released for consumption through the pension ages and this is probably also the intention behind most of the other components of financial wealth. In order to study what factors may influence the acquisition and use of financial wealth in more detail, we have run a regression on financial wealth as a function of age and a number of control variables, see table 4. We have chosen to show a regression on financial wealth per equivalised person, i.e. household wealth divided with (1 for the first adult

person + 0.5 per each other adult + 0.3 per each child) because we can expect the number of persons in the household to fall as the age of the household head increases and this would by itself create an upward bias for the estimated age effect. However, as figure 9 shows, the financial wealth per equivalent person increases only up to the end of the 60's after which it falls. Thus in some contrast to the reluctance to release housing equity for consumption through new mortgage loans backed by housing collateral, European households have no problems with the release of financial wealth for consumption during the pension ages. With this in mind, and remembering the composition of wealth shown in figure 6, the picture seem to be that old age households in Central European and Nordic countries, where comparatively low rates of homeownership are found, have a high level of liquid financial assets, which they use for consumption during their pension life. In contrast to this, the high rates of ownership and so housing equity in southern Europe is only to a very modest degree released for continued consumption after retirement.

Table 4: LS regression of financial wealth per equivalised person

Variable	Coefficient
Germany	reference country
Sweden	-0.2653***
Denmark	1.6115***
Austria	-0.3259***
Netherlands	0.2078**
Belgium	0.7119***
France	0.0677
Spain	-0.3423***
Italy	-0.5453***
Greece	-0.6806***
Log income Germany	0.1548***
- Sweden	0.1044**
- Denmark	1.0189***
- Austria	0.0366
- Netherlands	0.1885***
- Belgium	0.3561***
- France	0.2481***

- Spain	0.0382
- Italy	0.0002
- Greece	-0.0157
Homeownership	0.2083***
Number of adult persons	-0.0628***
Number of children	-0.0650*
Single	-0.2839***
Age	-0.0340**
Age squared	-0.0002**
Basic educational attainment	reference variable
- secondary	0.1335***
- tertiary	0.40327***
Employed breadwinner	reference variable
Self-employed	0.3990***
Doing housework	0.0634

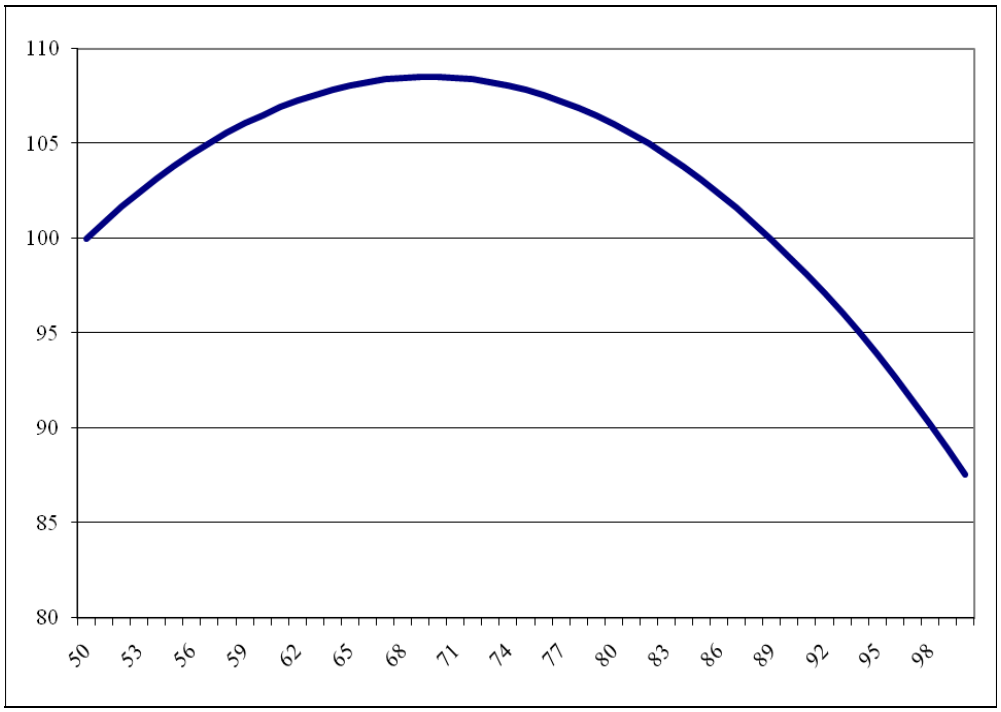
Note: Personal characteristics are those of the breadwinner of the household. Income is gross income of the household per equivalised person. Significance is indicated by *** for 1%, ** for 5%, and * for 10%. $R^2 = 0.10$. F = 56.04***.
Source: LS regression on the SHARE 2003-2004 database.

As was the case for the regression on the per cent outstanding mortgage, the low R^2 of the regression in table 4 shows that it is not easy to explain the level of financial wealth among old age households. Significant country differences on the level of financial wealth compared to Germany are found for all countries except France. Not surprisingly, a positive relation between income and financial wealth is found and the effect is significantly stronger in the Nordic countries, the Benelux countries and France compared to Germany.

Homeownership increases financial wealth per equivalised person, whereas an increasing number of adult persons and children in the household reduce financial wealth per equivalised person. This is also the case for households head living single. Higher tertiary educated households head increases financial wealth per equivalised person and self-employment has a similar effect. The effect on financial wealth in case the households head is doing housework is not significant[6].

[6] A number of other variables with no significant effect has been deleted.

Figure 9: The age effect on financial wealth per equivalent person



Note: The effect for 50 years of age is set equal to 100. As discussed in section 3.6, the curve contains both cohort, age and year effects and so cannot be interpreted as a pure age trajectory or life cycle behaviour through ages.
Source: The figure is drawn by use of the estimated coefficients reported in table 4.

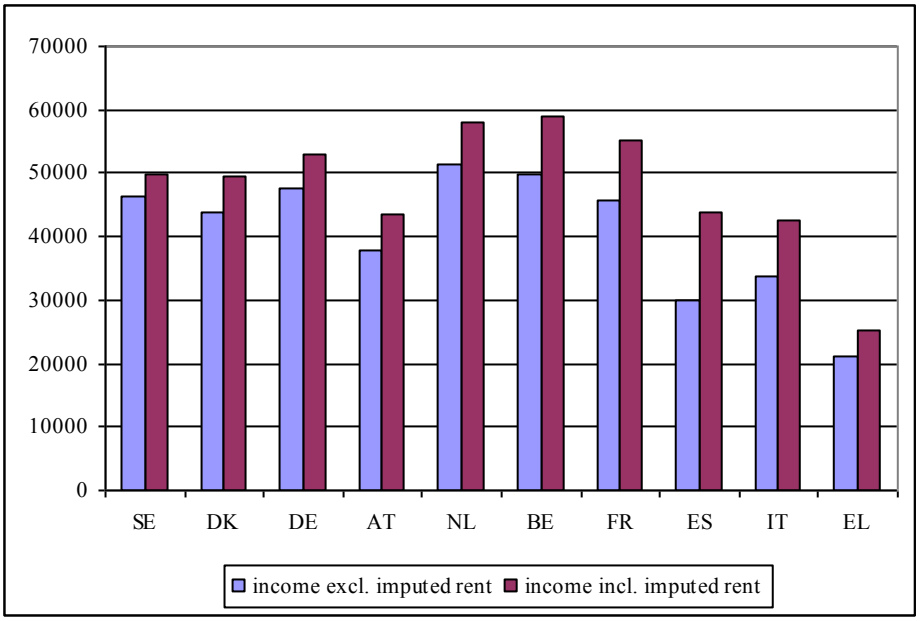
The analysis above indicated some structural differences in the impact housing has on consumption possibilities for elderly households when one travel from Southern Europe and up north. Households in Southern Europe are typically homeowners and the value of their homes can be fairly high when measured by the purchasing power of the housing wealth on the local market. In these countries, owners are most often outright owners, implying that elderly households in principle have good means for a continued high consumption under the pension ages. However, the inclination to release the housing equity through new mortgage is limited. An explanation for this may be that housing wealth is considered a family property, and not a property which can be used for consumption by the actual generation occupying the house. The family property must be kept available and in unchanged conditions for future generations and so is an untouchable bequest. We will look a little more into this in section six. Going up north through Europe, the picture changes as financial wealth like bank deposits, bonds, shares and pension savings become a more important part of the household wealth vis-à-vis housing wealth. This change in composition of old age household wealth opens for the release of past savings in order to smooth consumption over the life

cycle and into pension ages as prophesised by the life cycle hypothesis. A first tentative conclusion seems to be that a composition of household wealth where homeownership plays a more modest role could lower the demand for public sector assistance to an increasing old age population. A corollary would be that it is important for governments to encourage the introduction of pension schemes, either individual or occupational as part of employment contracts or collective agreements. Below we will add some amendments to this preliminary conclusion.

5.1 Income and consumption

The SHARE data allows us to look at income elements among old age households. The income concept used is household gross income as reported by the best informed person in the interviewed household. The gross income is easiest to handle because we can split it into components like public and private pension incomes, non-pension incomes etc. In addition, the SHARE secretariat has calculated an imputed rent for homeowners.

Figure 10: Annual household incomes ex- and inclusive imputed rent. PPP corrected euros.



Note: The figures presented above are not per equivalised person in the household, but a calculation per equivalised person does not change the overall impression.

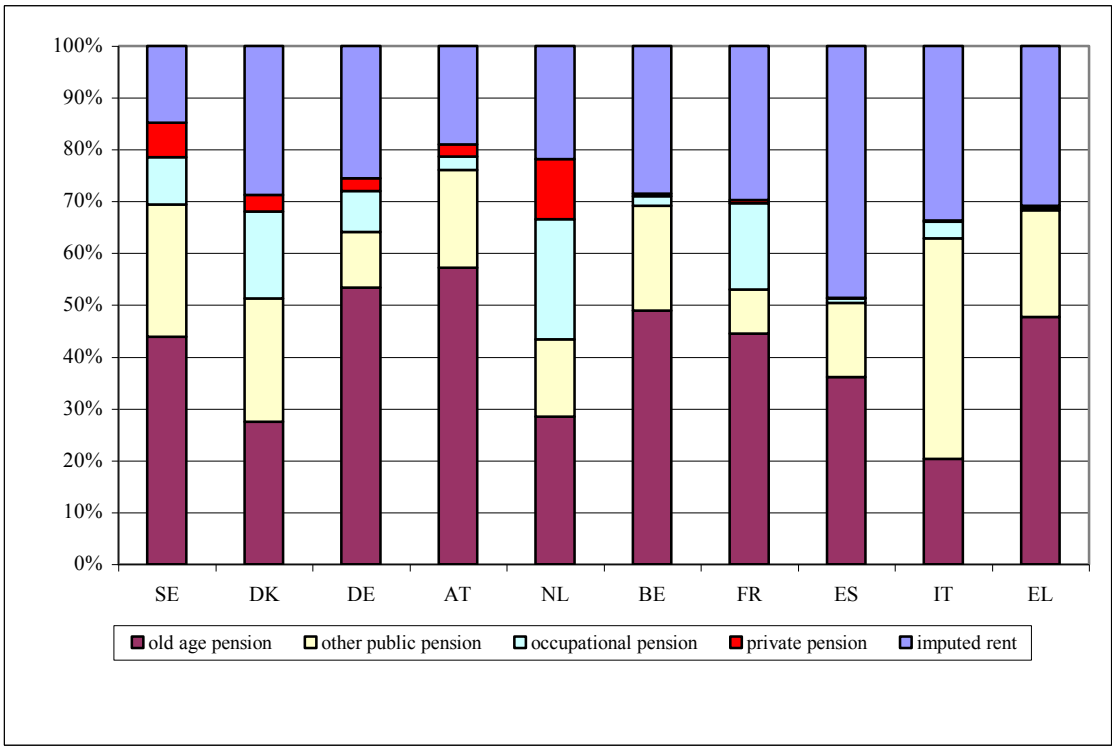
Source: Calculated mean values from the SHARE 2003-2004 database.

5.2 Income components

Lefebure, Mangeleer and Van den Bosch (2006) have looked upon income inequality among households with and without imputed rent and conclude that the inclusion of imputed rent reduces welfare inequality in most European counties. Figure 10 gives a first glance at the average picture for the included EU countries.

There is no surprise in the ranking of the countries based on household gross incomes. The Mediterranean countries show the lowest pre tax income levels, with higher levels in central Europe and the Nordic countries. Adding the imputed rent naturally increases the average income and more so in countries with high ownership rates. This is especially apparent for Spain and Italy, but less so for Greece where the housing wealth per household is modest in spite of high ownership rates. The figure does not reveal a major element of income equalisation among EU states due to differences in homeownership rates.

Figure 11: Annual household income components. PPP corrected euros.



Note: The figures presented above are not per equivalised person in the households.

Source: Calculated mean values from the SHARE 2003-2004 database.

However, the importance of imputed rent in southern European countries becomes evident, when one looks at figure 11. For the Mediterranean countries with high ownership rates, imputed rent is a comparatively big income component. More generally, old age pension is a big part of incomes for old age households. But also other public pensions, which include pensions given in case of pre-retirement, disability and unemployment, loss of spouse, invalidity and war participation have an impressive size; not least in Italy where it on average is bigger than the old age pension. Occupational pension systems play a minor role in Southern Europe, but are especially important in the Netherlands and France, whereas purely private pension income are common in Nordic countries, Germany, Austria and the Netherlands, but seems literally absent in southern Europe.

5.3 Consumption

Are homeowners in a better position to keep their consumption up when they have retired from the labour force? Judged from our earlier analyses, which showed that owners had more accumulated financial wealth than tenants, see table 2, this seems a natural consequence, and it is supported by table 5, which shows higher consumption for homeowners both with and without housing consumption included.

Table 5: Mean value for monthly outlays per households. PPP corrected euro.

	Consumption outlays	Consumption incl. paid rent	Consumption incl. paid and imputed rent
Owners	1,553	1,567	2,075
Tenants	736	1,097	1,097

Note: Tenant covers tenant, sub-tenant, rent free, and member of a cooperative. Consumption outlays are the amounts spend on a typical month on all goods and services, including groceries, eating out, telephone and everything else. Current consumption incl. paid rent includes paid rents and housing related charges and services. Finally Current consumption adds imputed rent for homeowners. Number of observations: Owner/tenants: 8460/3651 households with no indication 3222.

Source: Calculated mean values from the SHARE 2003-2004 database.

The determinants of household consumption are revealed in table 6, which gives the result of regressions on three different concepts of consumption. The income concept chosen for the regressions is the household sum of gross incomes. Income net of income taxes is not chosen because paid interests on loans are deductable in some countries, and this implies that home owning

households deduct their interest payments on mortgages from the taxable income leading to higher income net of taxes. This would tend to give an upward bias in a (positive) coefficient for the income coefficient. Instead, taxation differences together with other country idiosyncratic differences are captured by the country dummies in the regression. Note also that both consumption and income is divided by the number of equivalent persons in the household.

Table 6: OLS regression of log current consumption per equivalised person. PPP corrected euro.

Variable	Consumption outlays	Consumption incl. paid rent	Consumption incl. paid and imputed rent
Germany	reference country	reference country	reference country
Sweden	-0.0885**	0.0363	-0.1027***
Denmark	-0.2291***	-0.1576***	0.1384***
Austria	-0.0489	-0.0458	0.0381
Netherlands	0.1992***	0.2051***	0.2506***
Belgium	0.1678***	0.1640***	0.1415***
France	0.1727***	0.1697***	0.1929***
Spain	0.0532	0.0337	0.0233
Italy	0.1281***	0.1208***	0.1239***
Greece	-0.1862***	-0.2058***	-0.2701***
Log income	0.0728***	0.0698***	0.0569***
Housing wealth	0.0066***	0.0061***	0.0582***
Financial wealth	0.0189***	0.0188***	0.0193***
Homeowner	-0.0164	-0.3610***	0.1421***
Mortgage per cent	0.0247	-0.0029	-0.2433***
Having private pension plans	0.0033	-0.0047	0.0079
Number of adult persons	-0.1402***	-0.1388***	-0.1353***
Number of children	-0.0886***	-0.0888***	-0.0946***
Big city	reference variable	reference variable	reference variable
Suburb	-0.0054	-0.0270	-0.0671***
Large town	0.0117	-0.0075	-0.0596***
Small town	-0.0796***	-0.1176***	-0.1548***

Rural area	-0.1065***	-0.1583***	-0.1845***
Male head	0.0205	0.0089	0.0109
Single	-0.1393***	-0.1233***	-0.0990***
Foreign	-0.0292	-0.0427	-0.0817*
Age	-0.0078***	-0.0077***	-0.0038***
Basic educational attainment	reference variable	reference variable	reference variable
- secondary	0.1514***	0.1439***	0.1402***
- tertiary	0.2802***	0.2746***	0.2520***
Employed breadwinner	reference variable	reference variable	reference variable
Self-employed	0.0818**	0.0747**	0.0813***
Unemployed	-0.0962*	-0.0918*	-0.1053***
Doing housework	-0.0362	-0.0485	0.0203
Retired	0.0020	0.0094	0.0283
Disabled (to work)	-0.0595	-0.0720	0.0171
Good health	0.0686	0.0502	0.1639**

Note: See notes to table 5 and the text. Significance is indicated by *** for 1%, ** for 5%, and * for 10%. R^2 = 0.12, 0.13, 0.35. F = 36.31***, 39.42***, 141.88***.

Source: LS regression on the SHARE 2003-2004 database.

Consumption outlays are stated in the SHARE questionnaire as the "amounts spend on a typical month on all goods and services including groceries, eating out, telephone and everything else." Thus it is not a very precise concept, e.g. we do not know whether or not it includes vacation expenses or how much less typical months like December with its big Christmas outlays influence the stated amounts. However, the robustness of the coefficients over the three regressions in table 6 is encouraging.

The country specific coefficients are significantly different from Germany with Austria and Spain as the only exceptions. Furthermore, they are fairly robust over the three consumption concepts except for Denmark where the sign changes and becomes positive, when imputed rent of owned homes is included. The positive country coefficient for consumption with imputed rent included for all countries except Sweden and Greece is most likely because homeownership rates are higher than the German rate. It is a surprise that the income elasticity for the three consumption concepts is so low, but one explanation may be that many old age households only consume the most necessary,

which is invariable to income. In addition, consumption is significantly influenced by the level of wealth, both housing and financial wealth. Moreover, the effect on non-housing consumption outlays from financial wealth is more than double the effect from housing wealth, which confirms the earlier found reluctance of old age households to use housing equity for current consumption expenses.

Non housing consumption outlays – the first column of coefficients – is not significantly influenced by ownership, but ownership has a significant positive coefficient when housing outlays including imputed rent for owners is added. This tells us that old age home owning households have significantly higher consumption than tenants, but the difference is larger housing consumption for owners. Many old age homeowners has the possibility to take up new mortgage in order to keep consumption up after retirement from the labour force, but the coefficient for the mortgage per cent is not significant for consumption outlays, and has a significant negative coefficient, when imputed rent is included. This adds to the impression given by figure 8, namely that old age households prefer to continue running down the outstanding mortgage after retirements, and do not take up new mortgage in order to consume the proceeds. Also having private pension plans does not contribute significantly to higher consumption levels although the sign is positive.

Going further down table 6 gives a number of significant coefficients with the expected signs. The household consumption per equivalised person falls with the number of persons in the household, adults or children, and consumption falls the farther away from city cores the location is. Household heads living single have higher consumption per equivalent head, and the consumption falls with higher age. Higher education means higher consumption and so does self employment whereas unemployment reduces consumption. Finally, good health gives higher consumption when imputed rent is included. Presumably, an element of endogeneity plays a role here as ownership may have a positive influence on the health.

The last column in table 6 has included imputed rent on owned homes in consumption, but there may be a further element of consumption among old age homeowners. If maintenance of their premises is postponed, this is also a use of the housing equity for consumption. We have tried to look into this by running regressions with housing wealth as the dependent variable, and the age of the household head, the length of stay in the home and a number of other possible explanatory

variables on the right side. Although we found some reasonable explanations for the housing wealth, the R^2 was very low and the results showed no indication of a deterioration of the housing wealth over the ages. Because of this we have chosen not to show a table with the results of this analysis.

5.4 Making ends meet

A household with a low level of consumption does not necessarily perceive itself to be economically constrained. The household may well be satisfied with its living conditions if they are as expected and its consumption approximately equal to other old age households in the neighbourhood. The SHARE questionnaire reveals some information on this from a question with the wording "Thinking of your household's total monthly income, would you say that your household is able to make ends meet?" Four answers are possible: With great difficulty, With some difficulty, Fairly easy and Easily. We have merged the answer in a dummy variable where two first answers stand for economic distress = 1 and the two last for economic distress = 0, i.e. no economic distress. Based on this, a logistic regression on economic distress is reported in table 7.

Table 7: Logistic regression of economic distress of households

Variable	Coefficient	Odds ratio
Germany	reference country	
Sweden	-0.1848	
Denmark	-0.0327	
Austria	0.0078	
Netherlands	-0.6221***	0.537
Belgium	0.2506**	1.285
France	0.2666**	1.306
Spain	0.9529***	2.593
Italy	1.2655***	2.797
Greece	1.7251***	4.613
Log income	-0.2207***	
Housing wealth	-0.0495	
Financial wealth	-0.2263	
Homeowner	-0.3051**	0.737

Mortgage per cent	0.5485***	
Having private pension plans	-0.3791***	0.684
Number of adult persons	0.1317***	
Number of children	0.3090***	
Big city	reference variable	
Suburb	0.3021***	1.353
Large town	0.2007**	1.222
Small town	0.2925***	1.340
Rural area	0.3693***	1.447
Male breadwinner	-0.1351**	0.874
Single	0.3577***	1.179
Foreign	0.1645	
Age	-0.0150***	
Basic educational attainment	reference variable	
- secondary	-0.5048***	0.604
- tertiary	-0.7133***	0.490
Employed breadwinner	reference variable	
Self-employed	-0.0268	
Unemployed	1.1157***	3.052
Doing housework	-0.0315	
Retired	0.1304*	1.139
Disabled (to work)	0.6865***	1.987
Good health	-2.7393***	0.065

Note: A positive significant coefficient indicates a higher stress level and a negative significant coefficient indicates a lower stress level. Significance is indicated by *** for 1%, ** for 5%, and * for 10%. Only meaningful significant odds ratios are shown. $R^2 = 0.23$.

Source: Logistic regression on the SHARE 2003-2004 database.

Looking for significant country differences, only households in the Netherlands have a significantly lower economic stress level than German households. It is on the same level for Nordic households, but seems to be higher in other countries and more so among Southern European households. High income reduces economic stress, whereas wealth is without influence on economic stress. Homeownership reduces the stress level, but it increases with higher mortgage debt. Having private

pension plans significantly reduces economic stress in spite of the fact that it had no influence on consumption, see table 6. It may be that households with private pension plans are better prepared for the change of living standard after retirement and so are less disappointed over a possible reduction of their financial abilities during the pension ages.

Economic stress increases with the number of persons in the household. It is lowest in big cities, has 22 per cent higher probability in larger towns, and tends to increase the farther away from the city centres one comes. Male breadwinners are in less distress than female, and living single increases economic stress. Economic stress falls over the ages, and with better education. Not surprisingly, stress increases strongly with unemployment and to a minor extent with retirement and disabilities. Finally, good health reduces the reported stress level, possibly influenced by more optimism when the health is good[7].

6.1 Bequest and homeownership

As discussed in section four above, an owned home may be part of life cycle savings with the intention to use the housing equity for non housing consumption after retirement. However, an owned home may as well be perceived as a family property that - for the time being – is in the hands of the present generation, but with the obligation to leave it untouched – and in many cases with higher real value - as bequest for coming generations. If the last case dominates, homeownership can hardly be seen as a perfect substitute for other savings indented to be used for non-housing consumption after retirement. There may, however, be elements of non-housing consumption attached to the last case. Thus, Horioka (2009) finds for Japanese households that more than half of the Japanese parents either leave no bequest or require some kind of assistance during old age in exchange for the bequest. Where generations live under the same roof, this exchange seems apparent, but it may also be the case where children live close to their parents and provide daily assistance. Also financial assistance from more distant children in exchange for bequest is a possibility.

[7] The endogeneity tends to lift the coefficient above the one-way influence.

The analysis of factors influencing homeownership in table 1 revealed a positive relation between ownership and the reception of gifts and inheritance from parents[8]. The SHARE surveys also ask about gifts given and the chance of leaving inheritance[9], which is used for two logistic regressions with the results reported table 8.

Table 8: Logistic regression on gifts given and the chance of leave inheritance

Variable	Gifts		Inheritance	
	Coefficient	Odds ratio	Coefficient	Odds ratio
Germany	reference country			
Sweden	0.0262		0.6557***	1.926
Denmark	-0.4919***	0.611	0.1150	
Austria	-0.1936**	0.824	-0.0173	
Netherlands	-0.3728***	0.689	-0.6552***	0.519
Belgium	-0.3911***	0.676	0.1439	
France	-0.3454***	0.708	-0.4326***	0.649
Spain	-0.9714***	0.379	-0.6728***	0.510
Italy	0.0508		-0.3827***	0.682
Greece	0.4956***	1.642	0.1955	
Log income	-0.1441***		0.0981***	
Housing wealth	0.0370***		0.3412***	
Financial wealth	0.0062		0.0206	
Debt	0.0160		-0.0557*	
Homeowner	0.2677***	1.307	2.2207***	9.214
Gifts/inheritance from parents	2.216E-7**		2.472E-6***	
Other gifts	9.67E-7***		5.07E-6***	
Number of adult persons	0.0400		-0.0425	
Number of children	-0.1166**		-0.1617**	

[8] The reported gifts may also go to other relatives or persons outside the household.

[9] The interviewed persons are first asked about gifts given over the last 12 month and then about gifts received over the last 12 month and ever received inheritance, with the answers on reception used as explanatory variable in the regressions shown in table 1 and table 8. Questions about the chances of leaving inheritance are placed late in the interview and far away from the aforementioned questions.

Big city	reference variable			
Suburb	0.1417**	1.152	0.0353	
Large town	0.1304**	1.139	-0.0035	
Small town	0.0252		0.0965	
Rural area	-0.0513		0.3078***	1.360
Male breadwinner	0.0463		0.0963	
Single	-0.1408**	0.869	-0.1293*	0.879
Foreign	-0.0490		-0.2597*	0.771
Age	0.0771***		0.0029	
Age squared	-0.0006***		0.0000	
Basic educational attainment	reference variable			
- secondary	0.4344***	1.544	0.3413***	1.407
- tertiary	0.7499***	2.117	0.6075***	1.836
Employed breadwinner	reference variable			
Self-employed	-0.0947		0.0023	
Unemployed	-0.5402***	0.583	-0.7594***	0.468
Doing housework	-0.4446***	0.641	-0.2438**	0.784
Retired	-0.2456***	0.782	-0.1334	
Disabled (to work)	-0.4493***	0.638	-0.4200***	0.657
Good health	0.4975**	1.645	2.0128***	7.484

Note: A positive significant coefficient indicates a higher stress level and a negative significant coefficient indicates a lower stress level. Significance is indicated by *** for 1%, ** for 5%, and * for 10%. Only meaningful significant odds ratios are shown. $R^2 = 0.11, 0.22$.

Source: Logistic regression on the SHARE 2003-2004 database.

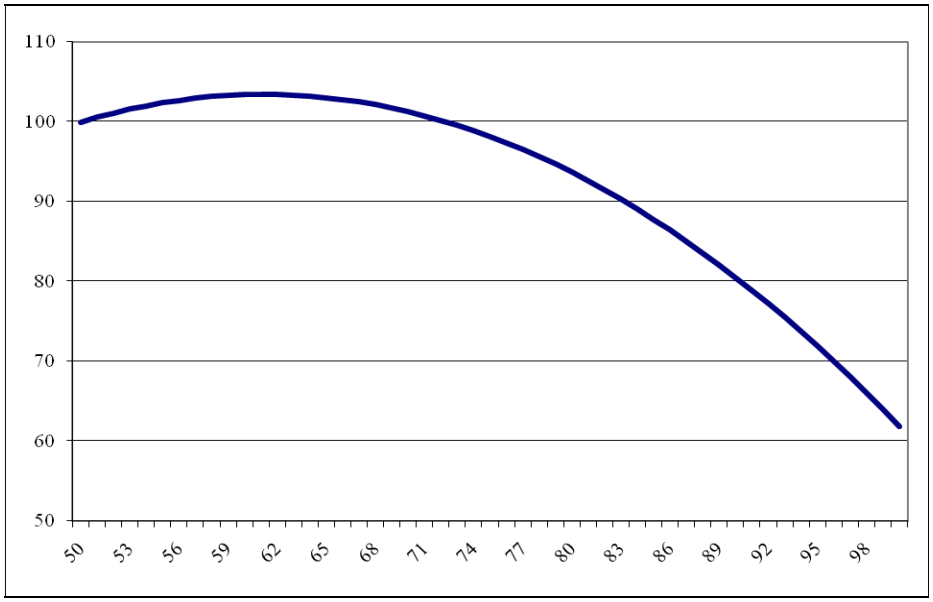
The table shows a number of countries with a significant deviation from Germany, mostly with a tendency for households in the other countries to give less and leave fewer bequests. We have no good explanation for this, but it should be remembered that these idiosyncratic country differences are the unexplained residual differences after correction is made for the influence of country differences among the other explanatory variables, e.g. wealth and homeownership. Higher income reduces the inclination to give gifts, but raises the chances of bequest. Also housing wealth has a significant positive influence on gifts given and the chances of leaving inheritance, whereas financial wealth has no influence. This confirms the earlier findings, see figure 8 and 9 that

financial wealth fits nicely into the life cycle hypothesis, while this is not the case for housing wealth.

Whereas debt has a slight negative influence on the probability of leaving inheritance, the inclination for bequest is heavily influenced by homeownership, which increases the probability more than 8 times compared to renting. Also the reception of gifts and inheritance increases the probability of giving gifts and leaving inheritance, thus indicating that the habit of intergenerational financial transfers is carried over between generations.

The number of adult persons in the household has no effect on gifts given and the chance of leaving inheritance, but an increasing number of children reduce the probability. The location of the household has modest influence, but living on the countryside increases the probability of leaving inheritance. Living single reduces the probability, whereas the age of the household head influences the probability for gifts with the curvature illustrated in figure 12. The top point around the age of 60 may be because high needs of the children are typically met in time before the retirement from the labour force of the household head.

Figure 12: The age effect on the probability of gifts given



Note: The effect for 50 years of age is set equal to 100. As discussed in section 3.6, the curve contains both cohort, age and year effects and so cannot be interpreted as a pure age trajectory or life cycle behaviour through ages.
Source: The figure is drawn by use of the estimated coefficients reported in table 8.

Higher education of the head of the household significantly increases the probability for both gifts given and the chance of leaving inheritance. It is however reduced for household heads being unemployed, going home doing housework, being retired or being disabled. Finally, good health seems to have a remarkably high positive influence especially on the probability of leaving bequest. The coefficient is probably lifted because of endogeneity. Corresponding to the findings by Horioka (2009), a high chance of leaving inheritance may be in exchange for the children's provision of assistance during old age, which tend to raise the health. But it may also be that good health is positively correlated with an optimistic attitude that promotes the transfer of bequest between generations. If both effects are working, the coefficient in table 12 overestimates the influence going from good health to the chance of leaving inheritance.

7.1 Retirement and homeownership

As earlier stated, the recent increase of the homeownership rate in most European countries may be taken as an indication of households becoming more aware of the need for self provision of financial means for their pension ages. However, if homeowners have a tendency to withdraw earlier from the labour market than tenants, this will increase homeowners' time as net recipient of public social outlays, which by itself will increase the burden on the shoulders of the public welfare systems.

We have tried to establish a relation between homeownership and retirement by use of a logistic regression for household heads of age 50 to 70 years. The heads may be retired or in the labour force, i.e. wage earner, self employed or unemployed. Household heads doing homework or being unable to work are excluded from the regression. The result is shown in table 9.

Table 9: Logistic regression of household head with age 50-70 being retired

Variable	Coefficient	Odds ratio
Germany	reference country	
Sweden	-0.5803***	0.560
Denmark	-0.1807	
Austria	1.5960***	4.933
Netherlands	0.0300	
Belgium	1.0292***	2.799

France	0.7313***	2.078
Spain	-0.3139*	0.731
Italy	0.8879***	2.430
Greece	0.2438	
Homeowner	0.2645***	1.303
Housing wealth	-0.0134**	
Financial wealth	-0.0034	
Having private pension plans	-0.3395***	0.712
Gifts/inheritance from parents	-2.59E-8	
Other gifts	-2.15E-7	
Debt	-0.2606***	
Number of adult persons	-0.0818	
Number of children	-0.3259***	
Big city	reference variable	
Suburb	-0.0577	
Large town	0.0941	
Small town	0.0905	
Rural area	-0.0845	
Male breadwinner	-0.1116	
Single	-0.0278	
Foreign	-0.6433***	0.526
Age	-0.6154***	
Age squared	-0.0086***	
Basic educational attainment	reference variable	
- secondary	0.0040	
- tertiary	-0.4673***	0.627
Good health	-4.5412***	0.011

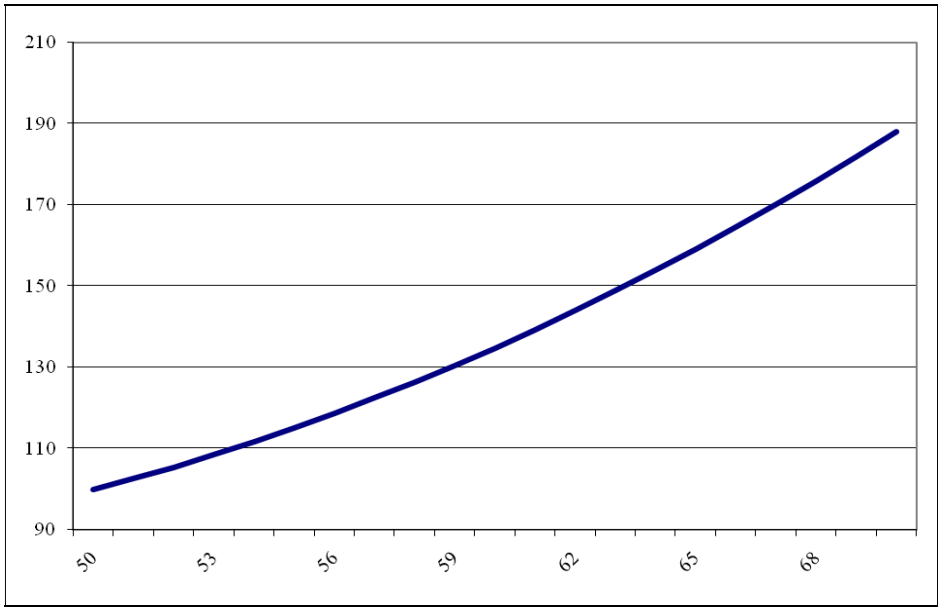
Note: Significance is indicated by *** for 1%, ** for 5%, and * for 10%. Only meaningful significant odds ratios are shown. $R^2 = 0.56$.

Source: Logistic regression on the SHARE 2003-2004 database.

The country coefficients show idiosyncratic country differences compared to Germany. They are intended to catch differences in national pension system, public as well as private personal or

occupational pensions. Based on European Labour Force surveys Eurostat (2009) has data on the expected exit age from the labour force, which for the year 2003 show higher than German exit age in Sweden and Greece, equal for Denmark and lower for the other countries included in the table. Thus, ceteris paribus, one should expect positive country coefficients except for Sweden and Greece where it should be negative, and with insignificant sign for Denmark. Based on this, we are surprised to see a significant negative coefficient for Spain.

Figure 12: The age effect on the probability of being retired



Note: The effect for 50 years of age is set equal to 100. The absolute age effect is negative for 50 years of age, where the probability for being in the labour force is highest over the shown ages. As discussed in section 3.6, the curve contains both cohort, age and year effects and so cannot be interpreted as a pure age trajectory or life cycle behaviour through ages.
Source: The figure is drawn by use of the estimated coefficients reported in table 9.

With control for the influence from other variables, homeownership has a significant positive influence on retirement; with a coefficient which implies that homeowners have a probability of retirement which is thirty per cent higher than for tenants. This by itself increases the number of pension years for owners and so increases the demand for public provided old age support. Housing wealth, on the other hand, reduces the probability of retirement, so that more wealthy owners tend to stay longer on the labour market. A little surprisingly, financial wealth seems not to have any effect on retirement, but households with private pension plans tend to stay longer in the labour force. Also debt reduces the probability for retirement; may be because debt gives higher economic

stress, which induces longer participation time on the labour market. A somewhat similar explanation may lay behind the negative coefficient for the number of children.

Location has no effect on the decision to retire, whereas being a foreign household head gives postponed retirement. Naturally, higher age increases the probability for being retired. Figure 12 illustrates the effect, which has a curvature where one extra year of age has a more pronounced effect on retirement the older the household head is. Also tertiary education keeps people longer on the labour market, and so does good health very remarkably.

8.1 Conclusions

In accordance with the task of the DEMHOW project, we raised a number of research questions for the micro analysis in section 1.2. We have tried to give answers to these questions by use of data from the Survey of Health, Ageing and Retirement in Europe (SHARE), a multidisciplinary, cross-national panel database with micro data on health, socio-economic status and social and family networks. We have only been able to use data from the first SHARE wave based on surveys covering European households with persons of age 50 and above in ten EU countries. Unfortunately, we have not been able to use the second wave SHARE data because they still need cleaning and imputations essential for our statistical analysis. As a consequence we have are not able to describe changes in household behavior over time. But we have gained important insight in the behavior of old age households that allow us to answer a number of questions relevant for the DEMHOW project.

8.2 Homeownership rates and tenure trajectories

This part of the analysis looked at factors behind homeownership among old age households. The homeownership rate differs considerably between the European member states with high rates in southern Europe, gradually falling when one travel northwards.

Naturally, the decision to become a homeowner is typically taken at an earlier stage of the life, possibly with the intention to smooth consumption over the lifetime. A consequence of this is that the found relations cannot be taken to literally explain why ownership is chosen, but must be seen as statistically cleaned relations. Among the more important results found is a positive relation between ownership and financial (non-housing) wealth. Hence, our findings on the micro level do

not support the hypothesis of substitutability between housing wealth and financial wealth including private pension systems, which were found in the macro cross country study. Another result is a positive relation between received inheritance and gifts, which shows a transfer of wealth between generations. This intergenerational transfer may include inheritance of both family owned homes not sold on the market, and a transfer of financial means partly in the form of proceeds from a sale of the parents' home. It may also be worth noting that unemployment and disablement reduces the probability for ownership, showing that ownership is not an option for many old age households in high need for public support.

If the acquisition of a home is seen as an investment to be used for consumption after retirement from the labour force, we should be able to see some indications of the use of housing equity over the ages. Our study also shows a trajectory for ownership over the ages with falling probability after 68 years of age, which indicates a use of housing equity for consumption purposes simply by selling the home and moving into rental housing during the pension ages. It should however be stressed that our cross section study covers age, cohort and year effects and formally cannot be interpreted as an age trajectory. However, other studies have found that the age trajectory is very dominant for the shape of the age profile.

8.3 Housing wealth, income and consumption

Another way to release homeowners housing equity for consumption is to raise new mortgage credit. The SHARE data allow us to calculate the outstanding mortgage as a per cent of the housing wealth, and we find very low percentages showing that the number of outright owners is very high. Only in Sweden and the Netherlands cover the outstanding mortgage more than 10 per cent of the housing wealth and it is extremely low in southern Europe. A regression on the percentage outstanding mortgage shows a significant age profile where home owning old age households continue to reduce the mortgage after retirement. Using housing equity for consumption by the way of increasing the mortgage debt is in general not used by old age European pensioners.

Another picture emerges for financial or non-housing wealth. Financial wealth covers deposits on bank accounts, holdings of bonds and shares, and pension savings systems. It is less than ten percent of total household wealth in southern Europe and above thirty percent in Nordic countries. A regression on financial wealth reveals an age profile with a top point around the age of 68 after

which the financial wealth is run down in accordance with the life cycle model. It seems evident that savings in the various forms of financial wealth during the younger years are done with the intention to use this wealth for consumption after retirement. With this in mind, the political recommendation must be to encourage, possible through the taxation system, private savings in financial assets like private and occupational pension plans. In the light of the recent financial turmoil, an obvious disadvantage of this way of saving is the higher price volatility of financial wealth backed by shares compared to the price volatility for homes.

In the description of the tasks for this work package, households' behaviour with respect to savings should be studied. The above conclusions concerning the composition of European old age household wealth cover this task partly. Furthermore, the SHARE survey contains questions about consumption outlays, rent paid and calculates the imputed rent for homeowners, but the information on amounts used for current consumption does not allow us to study the savings behaviour of households in any precise manner. The information on household consumption, nevertheless, reveals some quite important traits. The most interesting is probably that ownership has no significant effect on non-housing consumption per equivalised person, but that old age homeowners have significantly higher consumption when housing consumption including imputed rent for owners is added. Other researchers have shown that ownership tend to increase households savings i.e. their wealth increases more rapidly; what we find is that the higher savings is used for higher housing consumption with unchanged non-housing consumption after retirement. Another result is a positive relation between wealth and consumption, both for housing wealth and financial wealth, but with financial wealth having more than double effect compared to housing wealth on the non-housing consumption. When housing consumption is included, housing wealth has more than double the effect of financial wealth. As states above, financial wealth is meant for non-housing consumption after retirement, whereas housing wealth mainly is acquired to be used for old age housing consumption.

An analysis of economic distress among old age European households gives significantly lower stress for homeowners after controlling for differences in other variables including income and wealth. A plausible explanation for this may be that owners are more prepared for the change of economic conditions after retirement, and thus less disappointed when the income falls after retirement.

8.4 Bequest and homeownership

The SHARE surveys ask respondents about gifts given and the chance of leaving inheritance. By use of this, we found that both gifts given and the chance of leaving inheritance is positively affected by the size of housing wealth, but not affected by the size of financial wealth. Moreover homeowners have 30 per cent higher probability than tenants for giving gifts and nine times higher probability for expressing a positive chance of leaving inheritance. To this can be added, that the reception of gifts and inheritance also so have a significantly positive effect on gifts given and the chance of leaving inheritance. Together with the earlier observed positive relations between gifts and inheritance received and homeownership, this indicates a strong intergenerational transmission of the inclination for ownership. The transmission of ownership between generations may, especially in southern European countries, have the consequence that old age homeowners have limited means for other necessary consumption, and this would increase their pressure for public old age pensions. But it could also be that intergenerational "family homeownership" encapsulates the transmission of purchasing power between generations inside the family and so easies the pressure on public social outlays.

8.5 Retirement and homeownership

An increasing rate of homeownership may be a sign of households becoming more aware of a need for self provision of financial means for their pension ages, which by itself reduces the need for publicly financed pension systems. However, this effect can be partly or fully neutralised if homeowners tend to retire earlier than tenants. We have run a regression on retirement from the labour force among household heads of the age 50 to 70, which shows that ownership have a significantly positive effect on the probability of retirement. It also shows that high housing wealth, having private pension plans and having tertiary education reduces the probability of retirement. A corollary from this is that early retirement is most outspoken among homeowners in the low wealth layers who are most in need of public provided pension systems.

8.6 Demography and housing: Policy implications of the analysis

Our analysis showed that homeownership for European households can be considered an element in a life time savings profile. However, ownership is first and foremost used for higher housing consumption during the pension ages, whereas the accumulation of financial wealth is done with the

intention to use the proceeds for non-housing consumption after retirement. Based on this, the policy implication for governments seems to be that a use of the taxation system with the aim to encourage private savings through private and occupational pension systems may lift some of the future burden from the shoulders of publicly provided pension systems. This seems more important than to encourage homeownership. However, one should not neglect that in some countries, especially in southern Europe, family ownership over generations with the understanding that the premises belongs to the family rather than to the present generation, encapsulates the financial pension burden inside the individual families and so relieves some of the old age burden from the public budget. In this way, high homeownership rates if combined with tight intergenerational family ties seem to be an asset for public finances.

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Appendix

Table A1: Descriptive statistics (Max number of observations = 18836)

Variable	Mean	Min	Max
Sweden	0.1136	0	1
Denmark	0.0624	0	1
Germany	0.1063	0	1
Austria	0.0748	0	1
Netherlands	0.1037	0	1
Belgium	0.1344	0	1
France	0.1120	0	1
Spain	0.0931	0	1
Italy	0.0944	0	1
Greece	0.1052	0	1
Homeowner	0.6971	0	1
Income	41,245	0	1,169,839
Housing wealth	237,431	0	17,644,983
Financial wealth	79,861	0	10,299,500
Having private pension plans	0.2695	0	1
Gifts/inheritance from parents	20,233	0	9,527,842
Other gifts	6,262	0	7,480,535
Debt	83,338	0	4,285,644
Mortgage per cent	0.0625	0	7,923
Gifts given	0.2739	0	1
Chance of leave inheritance	0.8501	0	1
Consumption outlays per equivalised person	953	0	799,960
Consumption incl. paid rent per equivalised person	1,060	0	799,960
Consumption incl. paid and imputed rent per equivalised person	1,426	0	800,351
Economic distress	0.3536	0	1
Number of adult persons	2.0011	1	9
Number of children	0.0734	0	4

Big city	0.1499	0	1
Suburb	0.1856	0	1
Large town	0.1951	0	1
Small town	0.2536	0	1
Rural area	0.2158	0	1
Male breadwinner	0.5368	0	1
Single	0.3583	0	1
Foreign	0.0265	0	1
Age	64.8785	28	104
Basic educational attainment	0.5090	0	1
- secondary	0.2895	0	1
- tertiary	0.2015	0	1
Employed breadwinner	0.2503	0	1
Self-employed	0.0646	0	1
Unemployed	0.0302	0	1
Doing housework	0.1026	0	1
Retired	0.5216	0	1
Disabled (to work)	0.0307	0	1
Retired among heads of age 50-70[1)]	0.4516	0	1
Good health	0.8640	0.5570	0.9450

Note: Personal characteristics are those of the breadwinner of the household. Country means are the fractions of observations in the sample. 1) Among able heads not doing housework.

Source: the SHARE 2003-2004 database.