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Is Housing an Impediment to Consumption Smoothing?

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EXECUTIVE SUMMARY

Asset accumulation by the elderly has been a major research focus so as to estimate whether old households were well equipped to face their retirement, usually correlated with a reduction in available resources. A buffer stock of wealth might immunize households against bad shock realizations, thus constituting a crucial factor of financial protection. From a policy standpoint, a high level of household wealth generates less pressure for welfare policy interventions in time periods of financial crisis.

The reverse question, on whether the elderly are actually living below their possible standards has been, on the other side, under-studied. What if households do not resort to their wealth in times of instability and income drops? There might be an individual reason for households' decision not to use their assets. However, it is hard to agree that public resources should be the sole response to economic downturns in the presence of unused consistent assets. If over- savings should not worry Governments at first sight, it may become a matter of concern whenever the elderly demand that Governments pay for their reluctance to decumulate assets. Means tested interventions are generally based on income available to the elderlies. Current income, however, is not a comprehensive measure of welfare of individuals since for a given level of income, people who have accumulated more assets are in fact less vulnerable to shocks. Assets, in addition to current income, should be considered as the best proxy for attainable welfare.

The wealth of European households, particularly within the Southern Mediterranean countries, is locked into illiquid assets, which are difficult to deplete when hard economic times hit. Do the elderly bear strong consequences for the inability to use their assets efficiently?

In this study we investigate these innovative research questions. The role of financial literacy in the ability to save has been explored intensively. Retirement should be the starting point of the decumulation phase. However, very little decumulation is observed along the after-retirement path. Is financial illiteracy responsible for the small amount of decumulation in old age? Moreover, is the portfolio allocation affected by the degree of financial knowledge? Our *ex ante* expectation is that more financially sophisticated households should be more active in their decumulation phase, as well as showing a

more balanced portfolio. We also explore the consequences of keeping the illiquid assets as shadow assets. We thus test whether having problems in making ends meet can be dependent on the degree of portfolio illiquidity. Our results, illustrated in Chapter I, show that financial literacy might be imputed as responsible for portfolio imbalance, however, the same does not hold for asset decumulation. More financially literate people are as distant from the optimal life-cycle path as their less financially literate peers.

The evidence on decumulation with particular emphasis on housing is scant. Is housing wealth, in particular, considered as a shadow wealth by households? In order to understand whether this is the case, we first perform, in the same chapter, a descriptive and comprehensive picture of European households and their decumulation patterns of wealth, both with respect to housing and non-housing wealth. The analysis is also corroborated with robust econometric estimations. Our results indicate that little decumulation is present among the elderly in all types of assets. Financial literacy slightly mitigates the accumulation process during old ages, but it is never responsible for any decumulation of assets after retirement. Conversely, we show that financial literacy might reduce the exposure to excessively illiquid portfolios.

In Chapter II we investigate the attitudes of a sample of Italian households with respect to products such as reverse mortgages helping making, at least partially, housing assets liquid. Italy is an interesting case to study the potential of such financial instruments because of its ageing population and because of the widespread homeownership – more than 70 per cent of Italian households own their home. Our empirical analysis draws from a unique survey, the UniCredit 2007, a rather large cross-sectional dataset – 1,686 households – containing detailed information at both household and individual level. A simple descriptive statistic shows that nearly 60 per cent of respondents are not at all interested in the product, which is consistent with previous literature on reverse mortgages in the US and other countries; the remaining 40 per cent expresses various degrees of interest, from quite low (roughly 20 per cent) to very high (roughly 1 per cent), and therefore we can investigate which respondents' features predict a higher level of interest and whether financial literacy plays a role.

We first quantify the benefits a reverse mortgage would yield in terms of income increase for given demographics and socio-economic groups by applying the actuarial formula for an annuity to our sample respondents, and find that very old (over 80s), single females and households with a very large housing equity would be the recipients with the highest gains. This group should therefore show a much higher level of interest. An econometric analysis is then performed to find out whether this is the case.

We create a series of indicators related to both socio-economic variables and respondents' psychological attitudes, and assess their partial effects on our dependent variable (i.e. the level of interest in reverse mortgages). Since only household heads, i.e. the member of the household who is responsible for financial decisions, are asked to express how interested they would be in taking out a reverse mortgage, the econometric analysis is conducted at household level. What we find is that none of the demographics explain interest in the product as we expected, while holding a larger housing equity is negatively, rather than positively correlated with interest in the product. Conversely, higher levels of risk aversion, negative expectations on future pension income and the perception of housing investment as risky are the indicators predicting a higher level of interest, while debt aversion is a strong impediment to the uptake of reverse mortgages, even though the burden of repaying the debt lies with the heirs. Finally, higher levels of financial literacy are not predictors of higher interest, but rather show a negative, albeit not strongly significant, correlation with interest in the product.

In Chapter III we run a simulation exercise under different scenarios to understand if and to what extent poverty alleviation could be realized through resorting to annuitization of financial wealth and reverse mortgages. Particularly for countries such as Italy and Spain, the impact of annuities on poverty rates is impressive. Converting all housing value into an annuity, even at a high interest rate (10%) would generate ten percentage point reduction in the poverty rate. Resorting to reverse mortgage would reduce the degree of vulnerability of the elderly particularly in those countries which are «poor» in current income but «rich» in wealth and could consistently reduce the vulnerability among the elderly.

Chapter I: Asset decumulation

1.1. Patterns of housing wealth decumulation among European elderly.

1.2. Introduction

The welfare of the elderly is one of the main causes of concern for European policy makers, particularly within a society with an increasing share of rapidly aging people. One of the reasons for this being a concern is that elderly individuals are less able to resort to the labour channel to cope with shocks, thus being more vulnerable to a shock materialisation. Having adequate wealth available to face drops in income is therefore of crucial importance.

Asset accumulation by the elderly has been a major focus of research so as to estimate whether old households were well equipped to face their retirement and its correlated reduction in available resources. The reverse question, on whether the elderly are actually living below their possible standards has been, on the other side, under-studied. If over- savings should not worry Governments at first sight, it may become a matter of concern whenever the elderly demand that Governements pay for their reluctance to decumulate assets. Means tested interventions are generally based on income available to the elderlies. Current income, however, is not a comprehensive measure of welfare of individuals since for a given level of income, people who have accumulated more assets are in fact less vulnerable to shocks. Assets, in addition to current income, should be considered as the best proxy for attainable wealth.

The evidence on decumulation with particular emphasis on housing is scant. In a cross-section framework involving 15 OECD countries, Chiuri and Jappelli (2010) recently document how the ownership rates decline after age 60 but this decline turns out to be almost entirely explained by cohort effects. Once cohort effects are controlled for, the ownership rate follows a slow decline as individuals age, reaching a rate of about 1 percentage point per year after age 75. Similar findings have been shown by other studies: housing equity and home ownership do not decrease as individuals get older. Elderly people could exploit their housing wealth in two ways in order to face the drop in income occurring at retirement and finance their general consumption: they could

move to another smaller unit by downsizing or they could exploit financial services such as reverse mortgage. However the evidence does not support a wide-spread use of the latter, whereas the large reductions in home equity are typically associated with exogenous factors such as the death of a spouse, the movement to a nursing home or a worsening in the health status rather than to individual choices. (Venti and Wise; 2002, 2004). Since real (housing) wealth represents the overwhelming share of total wealth, in particular for the elderly, all those aforementioned factors would appear to contradict the standard life-cycle theory which states that individuals should use their accumulated wealth in order to finance their consumption after retirement.

Our study looks at the relationship between financial literacy and wealth from a different perspective, moving from the existing and answering the question of how more financially literate individuals tend to accumulate higher wealth and to save more.

Our analysis aims at detecting how higher levels of financial literacy allow elderly people to make better decisions regarding their wealth accumulation, especially in a life-cycle perspective. Since it has been found that a higher endowment of financial literacy allows elderly people to set better plans for their retirement, in a similar perspective we would expect that the former should prevent elderly from getting to the end of their life with too much (illiquid) wealth, out of the wealth that has been set apart for bequest motives. Therefore, our main question looks at whether any wealth decumulation occurs among elderly people and tries to understand how this behaviour varies across different groups. We also highlight whether more vulnerable groups, such as women, or immigrants display a different behaviour.

Hung et al. (2009) represents the only previous example trying to answer the question of whether financial literacy has any impact on "decumulation planning". They analyze how financial literacy affects three different measures related to planning and decumulation after retirement. Individuals are asked if they have tried to figure out how much to withdraw from their savings after retirement, by spending down Defined Contribution plan assets, if they have made a plan in order to do so and if they are confident that their retirement spending plans will meet their needs[1]. By adopting a

[1] The exact questions are: "Have you ever tried to figure out how much your household would be able to withdraw from your savings every year in retirement?", "Have you made a plan for systematically spending down your

linear probability model their findings are in favour of a positive impact of financial literacy on all these indicators of decumulation planning, however their estimation strategy is flawed buy they fact that they don't account for the endogeneity of the financial literacy which is strongly correlated to other third factors affecting decumulation planning.

2. Literature review

2.1. How dare the elderly not release equity as the life-cycle model predicts?

A robust demonstration of this flaw in the life-cycle model came a little more than twenty years ago, when Venti and Wise showed that elderly were as likely to move into a larger house as to move into a smaller one (Venti and Wise 1989). Analyzing a United States panel interviewed every two years between 1969 and 1979, the evidence suggested that typical elderly families do not use saving in the form of housing equity to finance current consumption as they age, contrary to the usual life cycle theory. This puzzling result had been suggested in earlier work (Merrill 1984), and Feinstein and McFadden (1989) similarly demonstrated the remarkable resilience of elderly households to financial downsizing.

Sheiner and Weil (1992) seemed to provide some reassurance to the conventional life-cycle theorists because they noted that for people in their eighties and beyond there was noticeable downsizing of housing, often as a result of widowhood or serious illness. Their results are not inconsistent with Venti and Wise (1989) since these transitional events are much more frequent for the oldest old, so the overall degree of downsizing tends to be larger for this older group.

Venti and Wise returned in 2002 on this topic armed with much better data from the Survey of Income and Program Participation (SIPP) and Asset and Health Dynamics Among the Oldest Old (AHEAD) on housing choices among the oldest old as well as the younger old. Surprisingly, they continued to find that elderly are not anxious to downsize even at much older ages, aside from serious transitional changes such as illness or death of a spouse.

savings during retirement?" and "Are you confident that your retirement spending plan will be sufficient to ensure that your needs are me in the future?".

Venti and Wise (2004) extend previous studies considering the possibility of releasing housing equity. As housing equity should not, in general, be counted on to support non-housing consumption, the typical aging household is unlikely to seek a reverse annuity mortgage to withdraw assets from home equity. Housing should rather be considered as a reserve or buffer that can be used in catastrophic circumstances that result in a change in household structure. "In this case", the authors concluded, "having used the home equity along the way—through a reverse mortgage for example— would defeat the purpose of saving home equity for a rainy day."

Jonathan Skinner commented on Venti and Wise (2004) observing that their study does not dismantle the conventional lifecycle model but it demonstrates that the conventional interpretation of the model entirely misses the motives for why households are decumulating. This study demonstrate that assets, including housing assets, are held for so long against future contingencies in later life, so in that sense it can be viewed as a life-cycle model. "On the other hand, in the good and bad state of the world, when the assets are not needed directly for very bad adverse outcomes, the household members are happy to pass along a bequest. Only in the "very bad" state of the world are assets largely depleted with regard to bequests."

2.2. Housing wealth as a bequest?

Though bequest could be one motive of the absence of decumulation, empirically there's no sound evidence of that.

In Venti, Wise (1989), the absence of a significant relationship between changes in housing equity and whether the family has children brings into question that attachment to past living arrangements and the maintenance of housing equity may be motivated by a bequest motive.

Most housing will apparently be left as a bequest, judging by the behaviour of the Retirement History Survey (RHS) respondents through age 73.This does not necessarily suggest that to leave a bequest is the reason that housing equity is not consumed. Indeed the change in housing equity at the time of a sale by elderly persons without children is about the same as the change for those with children. There is some evidence that non—housing bequeathable wealth falls less for movers with than without children. The differences are not substantial, however. This suggests that the elderly may well be

attached to their homes for reasons other than or in addition to the bequest motive. This is consistent with the findings of Hurd (1986) for non—housing bequeathable wealth.

2.3. Health status and wealth

As often sickness arises with aging, the possibility of getting ill could lead the elderly non to decumulate and keep housing wealth as a buffer stock that can be used to finance unexpected healthcare expenses.

The impact of health on consumption and savings behavior in old age has been already documented by a few studies (Palumbo, 1999; Lillard and Weiss; 1996; Rosen and Wu; 2004).

The first studies covering this topic focused on the relationship between health status and household wealth: for example, Smith (1998) found that a serious decline in health leads to a large decline in household wealth. Rosen and Wu (2004) go a step further and test the impact of health status on household financial portfolio choices. Using the US Health and Retirement Survey (HRS) data, Rosen and Wu (2004) find that when the head of a household or the spouse is sick, the household is less likely to own stocks, and invests a smaller proportion of its financial assets in stocks relative to healthy ones. A similar correlation is found on Australia in Cardak, Wilkins (2009): people with poor health are less likely to hold risky asset. According to the authors' explanation poor health can be viewed as a source of labour income risk as well as a source of "expense" risk: these may lead people in poor health to be less willing to take financial risks and to have shorter savings horizons.

The relationship between health status and financial portfolio choices is explained in deep by Berkowitz, Qiu (2006). Still considering the HRS data, they show that the impact of health events on household financial and non-financial wealth is asymmetric: a diagnosis of a new illness of a household member leads to a much larger decline in financial wealth than in non-financial wealth. Health status affects household portfolio choices primarily through a wealth effect engendered by a reduction in household financial wealth,therefore, depending on the risk preferences of households, the effect of health status on portfolio choices can be quite different among sick households.

In conclusion, a health event could lead to a significant reduction in household financial wealth and, consequently, to a restructuring of the composition of its financial portfolio. Families do reduce their housing wealth after an health shock but after having reduced their financial wealth, that is easier to liquidate.

2.4. Equity release and financial markets development

Chiuri, Jappelli (2010) try to explain international differences in ownership trajectories. Among the many possible factors affecting the rate at which ownership changes across countries, they focus on transaction and moving costs, the availability of mortgage equity withdrawal, property taxes, generosity of the social security systems, unanticipated health expenditure, availability of nursing homes for the elderly, and differences in mortality rates.

Their empirical findings do not contradict the view that market regulation and financial market development—as proxied by the availability of mortgage equity withdrawal and mortgage market regulation—affect the distribution of owner-occupancy rates across age groups among the eldest old. Even though the decline is slow and their sample limited, the international comparison suggests that indicators of market regulation are correlated with ownership trajectories and therefore with the wealth allocation of the elderly.

2.5. Releasing housing wealth as a relief to financial distress in old age

The impossibility of liquidating housing wealth could make old households more exposed to financial distress. Angelini, Brugiavini, and Weber (2009) show that the low development of mortgage markets not only limits the ability to withdraw equity by using mortgage debt (that could be an obvious result), but has also a negative correlation with the number of own-own transactions later in life, which means that lower fractions of home-owners trade down by selling and buying. The low development of mortgage markets is in turn responsible for higher financial distress among elderly people: the study shows that there is a clear negative relation between the mortgage market development - either measured as the typical loan-to-value ratio for mortgages or as a mortgage market index constructed by Calza, Monacelli and Stracca (2007) – and the proportion of homeowners who report difficulties making end meets.

2.6. Equity release and pension system

Countries where individuals are given more responsibility in their retirement choices may represent a more fertile ground for equity release through reverse mortgages – due to a better experience and confidence in financial instruments. In Australia for example some workers have self-funded retirement system: Cardak, Wilkins(2009) find that those persons are more likely to hold risky assets. Since July 1992, Australia has had in place a mandatory employer-based retirement saving scheme operating in parallel with a longstanding public pay-as-you-go pension scheme, requiring employers by federal law to contribute (initially at least 3% of gross salary, progressively rising to 9% by July 2002) to individual retirement accounts for most employees. While employer-based retirement accounts such as 401(k) plans in the US are important parts of the retirement saving and investment landscape, they are not mandatory.

Australia's experience may have some policy relevance for other countries as compulsory retirement accounts - ensuring all working households indirectly own some risky financial assets - adds an interesting dimension to the stockholding puzzle for working households. This could suggest that in the equity release choices an important role may be played by institutional structures and by the pension system that are different in every country.

2.7. May the elderly not decumulate for a lack of financial literacy?

There has been recently an increasing interest in the role of financial literacy in explaining wealth and savings decisions. Being financially "literate" could help explaining the reluctance to use debt instruments or the failure to use them properly; being able to understand instruments allowing equity release (e.g. reverse mortgages) would allow people to avoid becoming "house-rich, cash-poor", thus helping in solving the puzzle of why many elderly people end up dying with a portfolio almost entirely made up of illiquid assets, such as real (housing) wealth, which are more difficult to be used in order to face hardship such as difficult health conditions.

The suspect that many people may not decumulate for financial literacy deficit grows as many people do really lack in basic financial knowledge: elderly in particular could be thought as a group less financially literate and disadvantaged. Van Rooij, Lusardi and Alessie (2011) show that the majority of Dutch households possesses limited financial

literacy; financial illiteracy is widespread and particularly acute among specific groups of the population, such as women, those with low educational attainment and – in particular – the elderly.

On the contrary in the United States Hung et al(2009) discover that financial literacy is monotonically related to age, with older individuals having higher levels of financial literacy. Data used in this study from Rand's American Life Panel (a national household panel survey) show that lower levels of financial literacy are shared by economically disadvantaged individuals: minorities (Hispanic, African American), women, not married individuals, lower educated (high school or less), not employed (but also not retired), and lower income (household income less than $50,000 per year). Cardak, Wilkins (2009) find that Australian people over 55 are more likely to hold risky assets than people between 25-54: the authors notice that those results are consistent with increased knowledge of the investment landscape and opportunities that come with age and experience.

Still, for making an optimal choice concerning a reverse mortgage, basic financial literacy could just not be enough: individuals should be aware of sophisticated financial concepts.

Lusardi, Mitchell, Curto (2012) consider an HRS sample of respondents age 55 and their knowledge not just on financial concepts, but on sophisticated financial concepts: those are, for example, knowledge of capital markets , the importance of risk diversification, of the impact of fees of mutual funds and on the individual savvy and numeracy with compound interests. They find a rather striking lack of financial sophistication among the older population. In particularly persons over the age of 75 are find to be significantly less sophisticated about financial matters.

2.8. Financial literacy's key role

Understanding the role played by the lack of financial literacy could ultimately help in fostering strategies aimed at making elderly people more confident with the use of equity release instruments.

The relationship between financial literacy and savings decisions has been explored so far mainly pointing out to the positive impact of the former on wealth, arguing that a

higher level of financial literacy fosters the accumulation of wealth (Behrman et al, 2010; Jappelli and Pistaferri, 2011). In a recent study Jappelli and Pistaferri (2011) analyzed the impact of financial literacy on savings decisions of elderly people. Accounting for the endogeneity of the variable of interest, they found that rising financial literacy fosters savings and wealth in a cross-country setting. Financial literacy has been also found to be responsible for higher participation in the stock market (van Rooij, Lusardi and Alessie 2011). This relationship holds true even after accounting for many of the determinants of stock market participation, such as age, education, gender, income, and wealth. Financial literacy has an effect on stock ownership above and beyond the effects of word-of-mouth information of peers. Even considering a measure of risk aversion, both the OLS and GMM estimates of financial literacy remain positive, statistically significant, and do not change appreciably in magnitude.

This suggests that without financial literacy individuals wouldn't be able to make optimal financial decisions.

In addition, poor financial literacy has been found to bring about a failure of planning for retirement (Hung et al., 2009; Lusardi and Mitchell, 2006, 2007a, 2007b, 2008).

Behram, Mitchell, Soo, Bravo (2010) observe that in Chile households that build up more net wealth, particularly via the pension system, may be better able to smooth consumption in retirement and thus enhance risk sharing and wellbeing in old age. Their finding that financial literacy enhances peoples' likelihood of contributing to their pension saving suggests that this is a valuable pathway by which improved financial literacy can build household net wealth.

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3. SHARE data.

3.1. Descriptive evidence.

3.2. An overview of health, financial literacy and wealth in Europe.

For our empirical analysis we use the SHARE dataset, a survey which in 2004 started collecting data on the individual life circumstances of persons aged 50 and over in 12 European countries: Austria, Belgium, Denmark, France, Germany, Greece, Israel, Italy, the Netherlands, Spain, Sweden, and Switzerland. In addition, three new countries joined the survey in wave 2 which was released between 2006 and 2007: the Czech Republic, Poland, and Ireland. The survey covers 19,286 households and 32,022 individuals and the main purpose of the survey was to collect comparable information about health status, income, wealth and household characteristics of elderly people for different European countries, following the example initiated by the US Health and Retirement Study (HRS) and the English Longitudinal Survey on Ageing (ELSA).

Since we want to exploit the longitudinal dimension of the survey, we restrict the analysis to the 11 countries which are present in both waves of the surveys excluding Israel, the Czech Republic, Poland, and Ireland. We are left with the following 11 countries: Austria, Belgium, Denmark, France, Germany, Greece, Italy, Netherlands, Spain, Sweden, and Switzerland.

We want to analyze household wealth and how the latter is related and shaped by health status and financial literacy other than other demographic characteristics, therefore we ideally need to identify the individual who is responsible for the family finances. Since at the beginning of the survey individuals are asked who is the financial respondent, the person responsible for the family finances, we select the latter for the case in which it is uniquely identified, whereas when there is more than one financial respondent (because both members of the couple manage the finances separately), we consider the one with the highest income, or, in case of persons with no income, the oldest one[2].

We consider individuals aged 50 or older over the time-period between 2004 and 2007[3].

[2] Individual income are computed as the sum of earnings, public and private pensions, life insurance payment received, private annuity, alimony, regular payment from charities, and income from rent. Interest from bank accounts, stocks, bonds, and mutual funds are not included because the asset questions in wave 2 refer to the household and not to individuals therefore the relevant variables are only available for wave 1.

[3] The first wave of the SHARE survey is related to 2004 for most countries, for France, Greece and Belgium the data have been collected between 2004 and 2005, whereas the second wave is relevant to the period 2006-2007 with the exception of the Netherlands and Greece whose data have been collected in 2007.

From Figures 1-3 it is evident how the European countries are ranked in terms of the different components of wealth. Figure 1 draws the net worth, obtained as the difference between net real wealth and financial wealth minus liabilities.

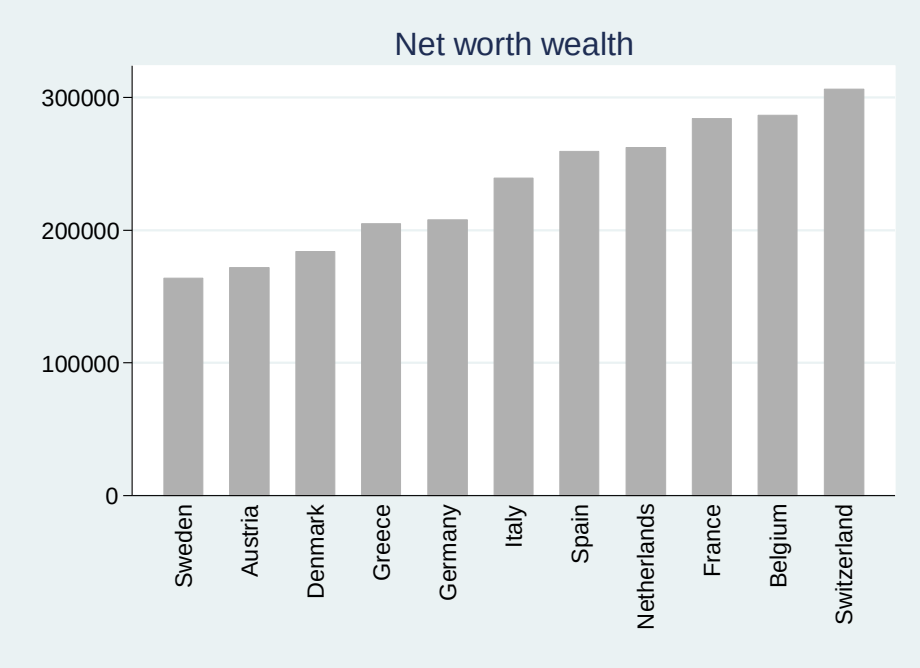

Figure 1. Net worth wealth across European countries. Source: SHARE 2004-2007.

If we compare net worth wealth with the two components of real (Figure 2) and financial wealth (Figure 3) it is evident how there is a group of countries such as Italy, France, and Spain ranked the highest in terms of real wealth and with the lowest levels of financial wealth. This polarization can be reasonably linked to the poor level of financial literacy they are endowed with, which is the lowest (Figure 4), therefore they prefer to invest in less risky assets such as housing wealth.

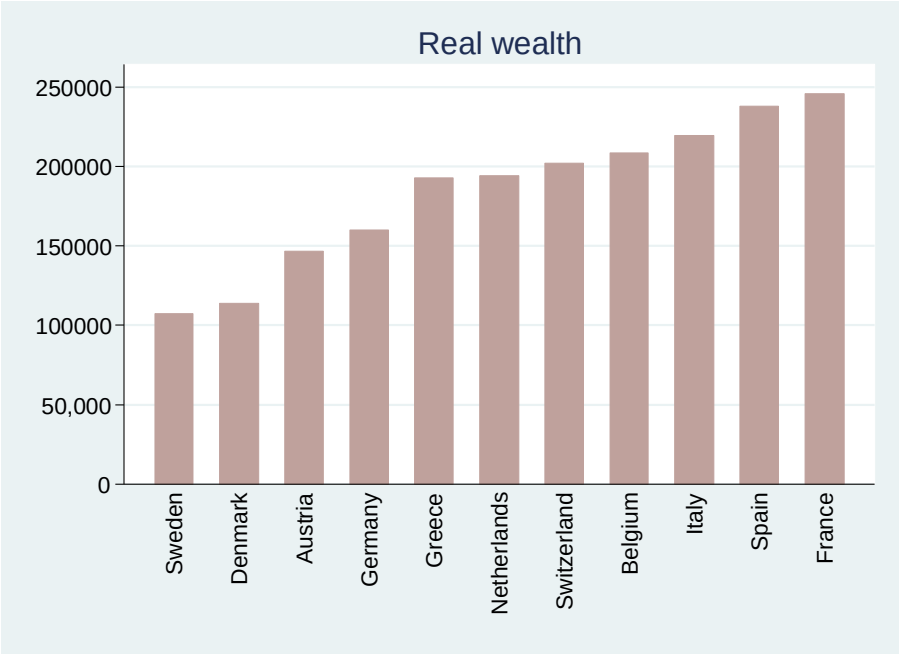

Figure 2. Real wealth across European countries. Source: SHARE 2004-2007.

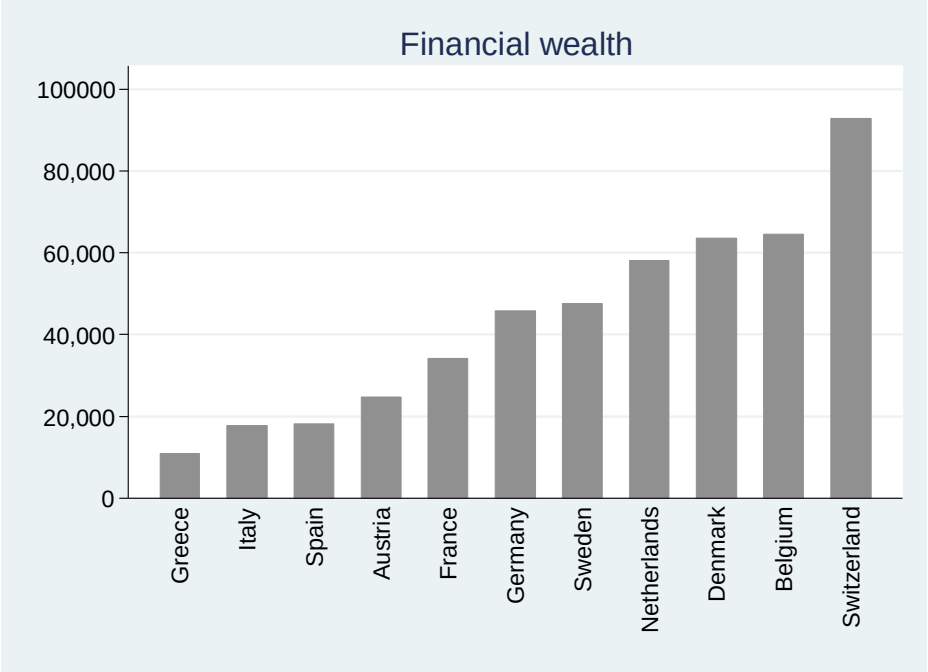

Figure 3. Financial wealth across European countries. Source: SHARE 2004-2007.

Country	Home owner		
	No	**Yes**	**Total**
Austria	991	1,358	2,349
	42.19	57.81	100
Germany	1,563	2,002	3,565
	43.84	56.16	100
Sweden	1,687	2,278	3,965
	42.55	57.45	100
Netherlands	1,422	2,195	3,617
	39.31	60.69	100
Spain	369	2,593	2,962
	12.46	87.54	100
Italy	734	2,833	3,567
	20.58	79.42	100
France	1,101	2,847	3,948
	27.89	72.11	100
Denmark	1,013	1,827	2,840
	35.67	64.33	100
Greece	612	3,407	4,019
	15.23	84.77	100
Switzerland	784	935	1,719
	45.61	54.39	100
Belgium	946	3,566	4,512
	20.97	79.03	100
Total	11,222	25,841	37,063
	30.28	69.72	100

Table 1. Home ownership by country.

Countries with the highest level of real wealth turn out to coincide with those with the highest home ownership rate, in fact countries such as Italy, Spain, France, Belgium, and Greece have both the highest real wealth and home ownership. Those countries, with the only exception of Belgium are also those with relatively low levels of financial wealth as it is clear from Figure 3.

The different pattern of real and financial wealth can be linked to different patterns of financial literacy each country is endowed with (Figure 4). Following Jappelli and Padula (2011) we adopt an indicator for financial literacy as taken from the SHARE survey. This indicator is derived in SHARE from four questions, three questions test the ability of playing with numbers, such as the ability of computing a percentage,

computing the final price of a discounted good from the original price, and the price of a second hand car sold at two-third of its original price. The fourth question is instead related to interest rate compounding in a savings account. The final indicator takes value from 1 to 5 with 5 corresponding to the highest level of financial literacy[4]. In the SHARE dataset the original variable is called "numeracy", as indeed the first questions refer to numerical ability. Jappelli and Padula (2010) illustrate how the stock of financial literacy later in life is determined by early numerical skills, and therefore we can assume that high numeracy can be a proxy for high financial literacy. , For simplicity in the following descriptive statistics we define a binary indicator of financial literacy which we set as equal to one for a value of numeracy equal to 5[5].

From Figure 4 it is evident a clear cross-country correlation between the level of financial wealth and that of financial literacy, the group of countries with the lowest level of financial wealth is characterized by the lowest level of financial literacy (Spain, Italy, France, Greece).

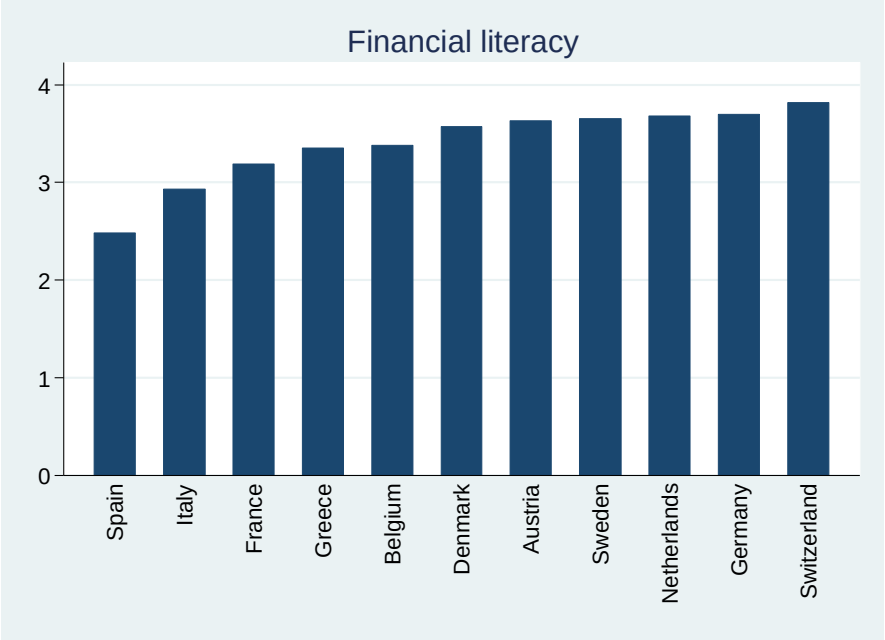

Figure 4. Financial literacy / numeracy across European countries. Source: SHARE 2004-2007.

[4] The answers to these 4 questions are combined into a single indicator, as for details on how the index is implemented see the Appendix.

[5] If not otherwise specified, whenever we mention financial literacy we will be referring to the corresponding numeracy variable in SHARE.

The SHARE dataset is extremely rich in information relevant to health status, both in terms of objective and subjective measures. We compute an indicator for the objective health status which is set equal to one if the individual has not been diagnosed with any chronic conditions or illness by the doctor. We also consider an indicator for subjective health status since individuals are asked to evaluate it[6].

Looking at the pattern of health status (Figure 6) across countries, the correlation between wealth and health status does not appear so clear-cut. A very similar pattern is also reported by self-perceived health status (Figure 7). The real correlation will be clarified in the subsequent empirical analysis when we will disaggregate further the two variables according to other dimensions, such as demographic factors, which can be responsible for composition effects.

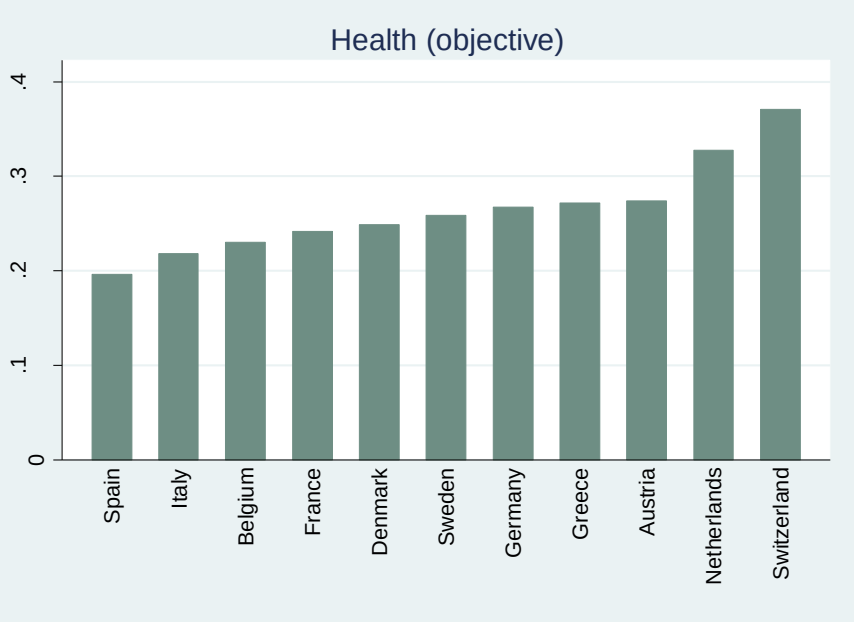

Figure 6. Health (objective) across European countries. Source: SHARE 2004 2007.

[6] Individuals are asked the following question: "Would you say that your health is: excellent, very good, good, fair, or poor."

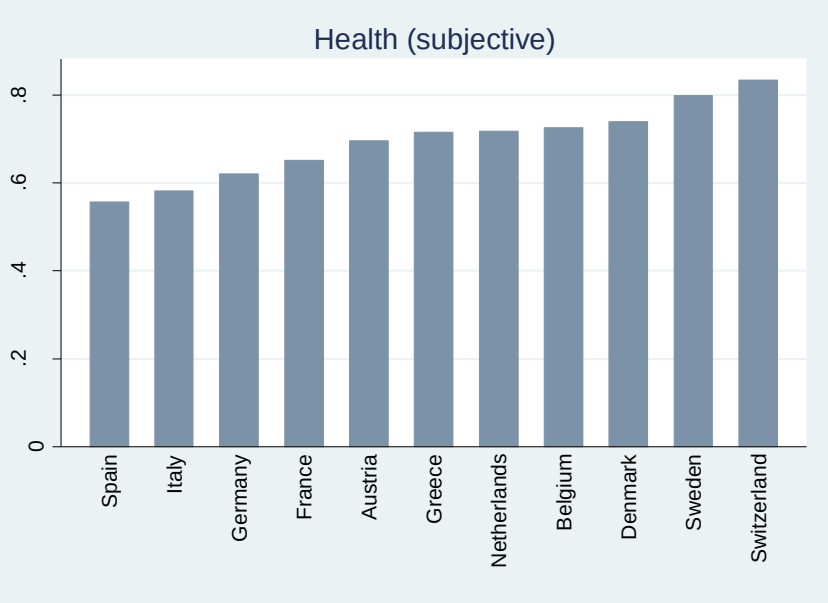

Figure 7. Health (subjective) across European countries. Source: SHARE 2004-2007

3.3. Patterns of asset decumulation across European households.

As already mentioned in our introduction, there is poor evidence of wealth decumulation at older ages. Indeed, our descriptive statistics confirm that individuals hardly decumulate their assets as they get older. This seems to hold true by looking at the two different dimensions of wealth: real, and financial (Figures 8, and 9) and only slightly to be driven by potential cohort effects. In order to disentangle age from cohort effects we define 4 cohorts, given by the following intervals in terms of year of birth: 1904-1925, 1926-1935, 1936-1945, and 1946-1957. The figures clearly report that, with the only exception for the very old individuals (older than 80) there is neither asign of decumulation, nor much evidence of cohort effects.

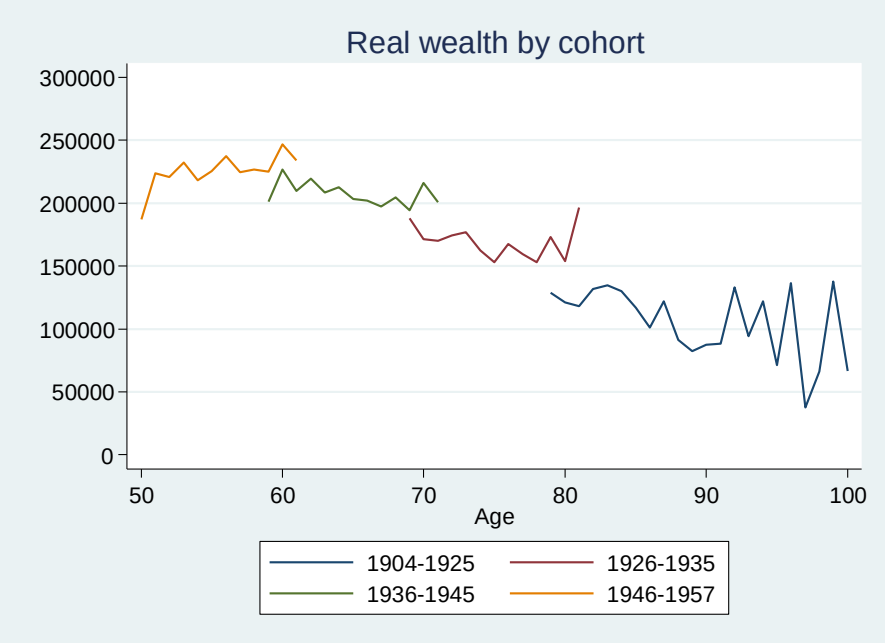

Figure 8. Real wealth by age and cohort.

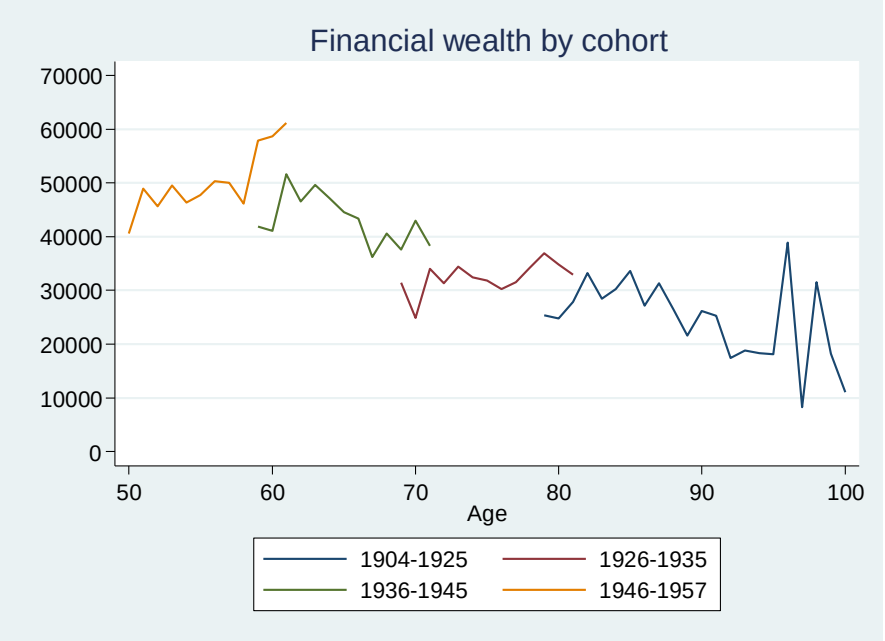

Figure 9. Financial wealth by age and cohort.

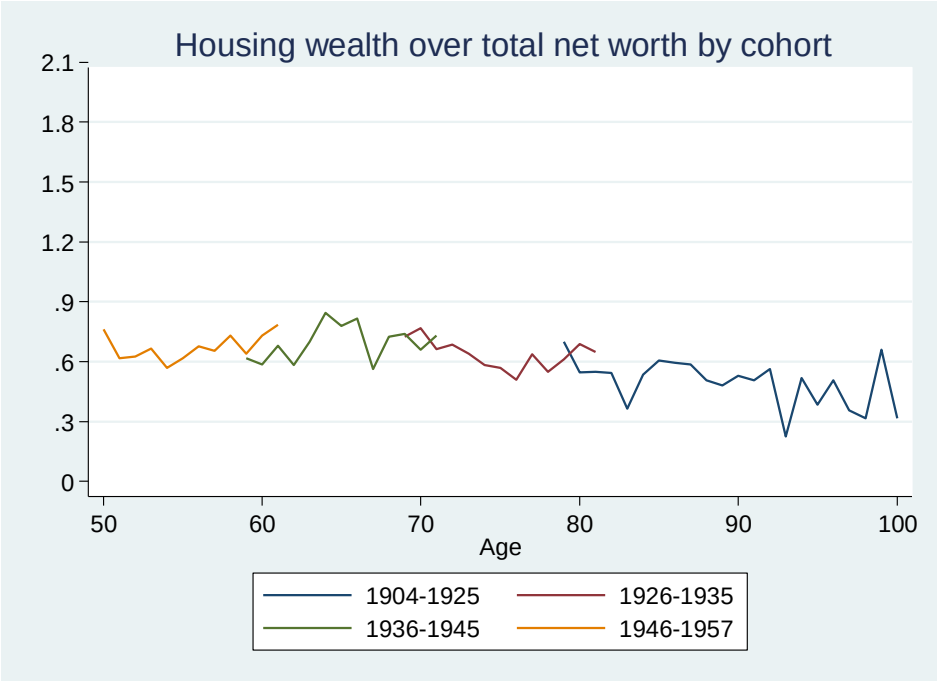

Figure 10. Housing wealth over total net worth by cohort.

On top of that, Figure 10 shows how housing wealth represents a substantial share of households' assets (almost 70 percent on the all sample), but this picture does not unveil the heterogeneity of the countries analyzed. Once we decompose Figure 10 according to two groups of countries, (Figure 11) Northern and Southern[7], we find a lot of heterogeneity in the data. The more inefficient portfolio seems to be accounted for entirely by the group of Southern countries. People living in Northern countries have a less "unbalanced" portfolio towards illiquid assets with respect to the second group, because housing wealth represents always less the half of net worth and it is decreasing for people older than 80. A completely different pattern comes out from the right panel depicting the group of Southern countries. The level of the share is much higher for this group, accounting for almost 90 percent of total net worth; in addition to that, older people don't decumulate their illiquid assets once they get older, in fact the pattern is completely flat.

[7] Northern countries include: Austria, Belgium, Denmark, Germany, Netherlands, Sweden, and Switzerland, whereas the group of Southern countries represent France, Greece, Italy, and Spain.

This evidence seems to contradict the standard life-cycle theory whereby individuals should move towards the end of their life reducing their assets, in particular those assets which are more illiquid, in order to face exogenous and unexpected shocks in terms of health or a partner's death.

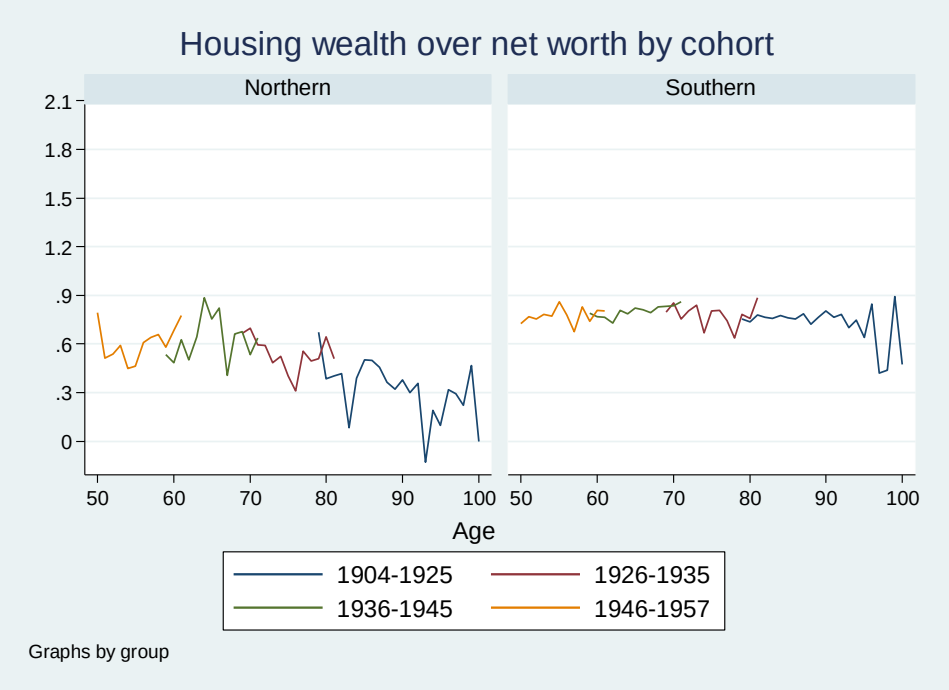

Figure 11. Housing wealth over total net worth by countries and cohort.

3.4. Health status, financial literacy and assets decumulation

The positive relationship between socio economic and health status at individual level has been broadly documented in the economics literature (Deaton and Paxson, 2004; Lleras-Muney, 2005). This correlation is also evident when we consider wealth as a measure of the economic status (Figures 12 and 13). People with better health status are also those with higher level of accumulated wealth, both in terms of real and financial wealth. However, when we look at the path of wealth decumulation, those with a better health status are those decumulating relatively more as they age, this holds true in particular for people older than 80 year.

This empirical evidence can be due to the fact that people use their accumulated wealth as a "buffer" against unexpected shocks, so if they have a better health

presumably they can be positively affected in terms of their expected future health status and accordingly reducing their accumulated stock of wealth. On the contrary, those suffering from worse health conditions can have a higher precautionary motives towards the future and save more[8]. However, reverse causality could be at work here. People with lower level of wealth could be not able to dissave and consume as much as they would like to do because of worsening health conditions, thus lower decumulation being a consequence of their health status

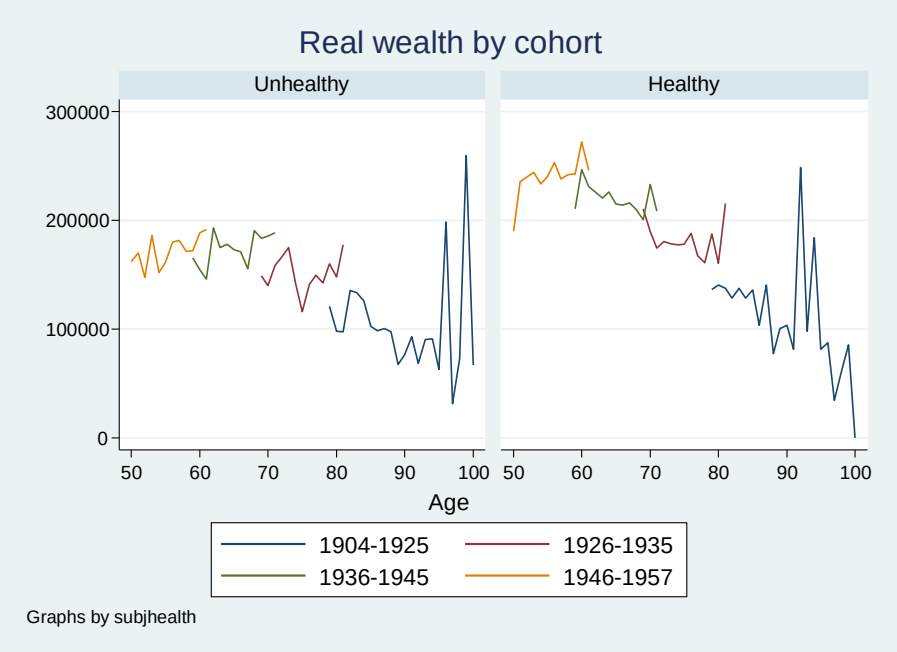

Figure 12. Real wealth by health status and cohort.

[8] The noisy pattern relevant to individuals older than 90 belonging to the older cohort is due to the few observations relative to these age brackets. For the descriptive evidence we consider the sample up to age 100 (included), whereas for the estimation stage we restrict the sample to people younger than 90 year old.

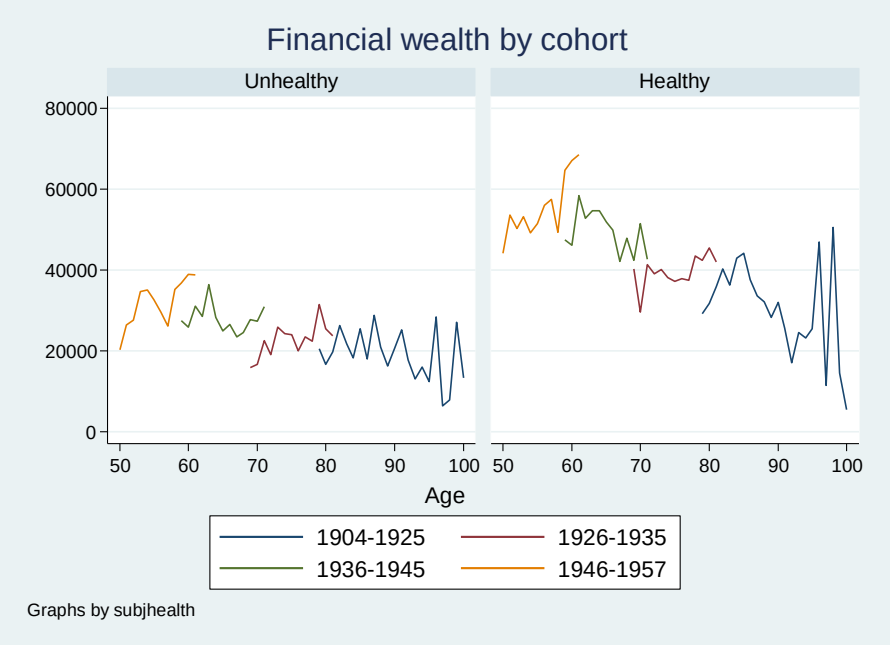

Figure 13. Financial wealth by subjective health status and cohort.

Financial literacy has been documented to play a substantial role in shaping decisions about saving, portfolio allocation, and retirement planning (Berhanm, Mitchell and Soo, 2010; Jappelli and Padula, 2011; Hung et al., 2009; Van Rooij, Lusardi, and Alessie , 2011). Better informed individuals seem to be better prepared in planning for their future retirement period (Hung et al., 2009; Lusardi and Mitchell, 2011), to invest more in risky assets (van Rooij, Lusardi, and Alessie, 2011), such as stocks and to accumulate more wealth (Jappelli and Padula, 2011).

We look at the correlation between financial literacy and different forms of wealth by cohort.

As already mentioned in the previous section our measure of financial literacy is a variable taken from the SHARE dataset and asked in both waves.

Financial Literacy	Men	Women	Total
1=Bad	841	1,889	2,730
	5	10	7.17
2	1,656	3,809	5,465
	9.04	19.26	14.35
3	5,142	6,287	11,429
	28.08	31.79	30.01
4	6,129	5,360	11,489
	33.47	27.1	30.17
5=Good	4,542	2,431	6,973
	24.81	12.29	18.31
Total	18,310	19,776	38,086
	100	100	100

Table 2. Financial literacy by gender. SHARE: 2004-2007.

The distribution of financial literacy by gender (Table 2) shows how women represent a disadvantaged group with respect to men in terms of planning for savings and the ability to make informed choices about their wealth. Men score better than the average respondent, since almost 25 percent of them get the maximum score in financial literacy, whereas only 12 percent of women is able to get the same score. This gap is not explained or accounted for by composition effects, since it doesn't disappear once we control for countries' heterogeneity (Table 3), women systematically underperform compared to men throughout the sample regardless of the country. There is a large variability in the proportion of women getting the maximum score, ranging between the lowest performing women in Spain where only 1 percent of women is "financially literate" to the best performing ones in the Netherlands (20 percent of women).

	Male	Female	Total
Austria	0.230553	0.135567	0.178151
Germany	0.331315	0.188853	0.259482
Sweden	0.334354	0.182944	0.256037
Netherlands	0.383277	0.204488	0.289607
Spain	0.058209	0.012644	0.032468
Italy	0.112692	0.059797	0.085399
France	0.177182	0.074503	0.12257
Denmark	0.36633	0.169705	0.27001
Greece	0.240835	0.104828	0.169365
Switzerland	0.326733	0.173963	0.25211
Belgium	0.184278	0.087803	0.136207
Total	0.248061	0.122927	0.183086

Table 3. Financial literacy by gender and country. Probability of a maximum score (equal to 5) in the financial literacy variable. SHARE: 2004-2007.

In order to analyze whether individuals decumulate their assets as they get older and to relate this pattern to financial literacy, and health status, ideally we should follow the same cohort over time as it ages in order to control for both age and cohort effects. Since we have a very limited time interval (2003-2007) we can't follow the same cohort from the age of 50 up to very old ages. As a consequence, our strategy will be confined to define cohorts made by individuals born in a ten year time-span so as to follow them for a longer time span, taking the average value of the relevant variable for the cohort. From Tables 4 and 5 it is clear how financial literacy has a substantial impact on the level of wealth, as being more financially literate is correlated with higher levels of wealth for each cohort. This is potentially signaling a pure correlation between financial literacy and a third factor, in turn positively correlated with wealth. In addition, from these descriptive statistics it is hard to see whether more financial literacy brings about a more optimizing behavior in terms of reducing illiquid assets (i.e. real wealth) or even reducing financial wealth since, as individuals get older, we face a "negatively" selected sample, since we lose the less healthy and potentially also less wealthy individuals who drop out from the sample because of death, therefore the observed increase in the stock of wealth over time within each cohort can easily be due to this selection mechanism. In fact what we observe is rather an increase in both components of wealth as individuals get older by each cohort in particular for financial wealth.

The pattern of housing wealth over total net worth displays quite a mixed picture, there is no evidence that better informed respondents tend to reduce the unbalance in their portfolio decreasing the weight of the housing wealth over the total as they age, and moving toward assets which are easier to be liquidated, and this trend seems to hold true for all the cohorts[9] .On the contrary we observe rather a decrease in the portfolio imbalance more for the cohorts of less informed individuals. (Table 6)[10].

Confirming the well-known empirical evidence of the positive correlation between socio-economic status and health status, healthier people, both in terms of subjective (Tables 7 and 8), and objective measures (Tables 10 and 11) have systematically higher real and financial wealth. All cohorts, regardless of their health status, seem to

[9] There are very few observations relative to the oldest cohort, therefore also the average value of wealth value should be taken with caution.

[10] However in order to detect the true correlation we plan to rely on a multivariate analysis in the subsequent stage of the project.

accumulate more wealth as they age with the only exception of the two oldest cohort (1904-1925 and 1926-1935); for the latter there is a slight decumulation, in particular for the healthy and for real wealth, while this pattern is less pronounced for less healthy individuals. This pattern is mostly present for the subjective measure of wealth, whereas for the objective indicator the patter is less clear-.cut. We could interpret it as due to buffer stock motivations as they might use the accumulated wealth in order to face negative health shocks which are more likely to occur during the very old stage of the life-cycle. As for the share of housing wealth over total net worth, there is not a clear-cut difference by health status, the weight of housing wealth increases for the younger cohorts up to around their 70's, whereas for the older cohorts the former decreases over the age-interval we examine (Tables 9 and 12). For the subjective indicator of health status it seems that individuals in the very old cohort reduces more the portfolio imbalance as they get older, this trend is instead less pronounced for those less healthy individuals.

The distribution of wealth by gender reveals that women are systematically on average less wealthy than men in terms of both real and financial wealth (the average stock of real and financial wealth for women is 166,037€, and 33451€, respectively, whereas the corresponding values for men are: 208,275€, and 50238€[11)], on the contrary the share of housing wealth held by women is higher than that held by men (66 vs 63 percent). The gap by gender in terms of the stock of wealth doesn't disappear once we control for both cohort and age effects (Tables 13 and 14) and women remain the most disadvantaged group with respect to the two components of wealth, whereas once we account for age and cohort effects men have higher portfolio imbalance than women with a bigger share of their wealth invested in housing (Table 15). Both gender tend to accumulate real and financial wealth as they get older within cohort, with the exception of the oldest cohort (1904-1925) reporting a slight decumulation pattern.

	Low Literacy				**High Literacy**			
Cohort	**1904-1925**	**1926-1935**	**1936-1945**	**1946-1957**	**1904-1925**	**1926-1935**	**1936-1945**	**1946-1957**
Age				**Real Wealth**				
50-54				203334.2				226090

11 Throughout the analysis all monetary values are at ppp-adjusted constant prices taking as a reference Germany for the year 2005.

55-59			152408.4	207126.8			293464.4	247583.7
60-64			189069	227163			255157.8	220773
65-69		176820.6	180140.9			226993.2	238857.3	
70-74		157690.8	194862.2			205587.9	240024.6	
75-79	120997.1	148856.9			134845.1	198542.9		
80-84	121286.4	160068.5			141210.8	205110.1		
85-89	102074				103353.8			
90-100	92367.1				319442.3			

Table 4. Real wealth by age, cohort and financial literacy.

	Low Literacy				**High Literacy**			
Cohort	**1904-1925**	**1926-1935**	**1936-1945**	**1946-1957**	**1904-1925**	**1926-1935**	**1936-1945**	**1946-1957**
Age				Financial Wealth				
50-54				40621.28				65247.84
55-59			36535.51	41804.01			60828.13	74728.41
60-64			40445.21	50568.86			74614.82	89681.69
65-69		28028.6	35279.72			53511.56	66006.05	
70-74		28109.84	36852.74			57614.86	64641.2	
75-79	20848.81	29746.19			59380.57	58494.01		
80-84	26746.08	29520.5			59006.18	89865.44		
85-89	27580.29				59845.72			
90 100	21593.33				62559.58			

Table 5. Financial wealth by age, cohort and financial literacy.

	Low Literacy				**High Literacy**			
Cohort	**1904-1925**	**1926-1935**	**1936-1945**	**1946-1957**	**1904-1925**	**1926-1935**	**1936-1945**	**1946-1957**
Age	**Housing wealth over total net worth**							
50-54				0.594122				0.743637
55-59			0.709736	0.639081			0.312763	0.747468

60-64			0.732165	0.754582			0.521272	0.754458
65-69		0.719386	0.726151			0.746049	0.710994	
70-74		0.679602	0.688352			0.511804	0.701021	
75-79	0.724635	0.567267			0.521205	0.604695		
80-84	0.508545	0.653083			0.418816	0.922141		
85-89	0.576796				0.450573			
90-100	0.460659				0.792629			

Table 6. Housing wealth over total net worth by age, cohort and financial literacy.

	Unhealthy (subjective)				**Healthy (subjective)**			
Cohort	**1904-1925**	**1926-1935**	**1936-1945**	**1946-1957**	**1904-1925**	**1926-1935**	**1936-1945**	**1946-1957**
Age	**Real wealth**							
50-54				157015				221327
55-59			161060.4	165957.4			193261.2	232133.3
60-64			166459.2	175410.8			216004.7	244093.9
65-69		149771.5	168982.5			202423.7	199553.6	
70-74		153403.2	180681			170540.7	211729.9	
75-79	118316.2	136338.3			125765.9	167923.9		
80-84	118390.7	154809.8			127594.3	171963.8		
85-89	94293.68				111848.4			
90-100	84632.73				115401.1			

Table 7. Real wealth by age, cohort and subjective health status.

	Unhealthy (subjective)				**Healthy (subjective)**			
Cohort	**1904-1925**	**1926-1935**	**1936-1945**	**1946-1957**	**1904-1925**	**1926-1935**	**1936-1945**	**1946-1957**
Age	**Financial wealth**							
50-54				30183.47				50676.98

55-59			27415.64	31648.29			47258.6	54850.81
60-64			30333.96	38765.21			53613.21	68128.69
65-69		16567.92	25056.8			39312.19	47255.14	
70-74		22093.44	28793.4			38077.88	47063.88	
75-79	20552.62	23685.21			29196.83	39189.69		
80-84	21012.8	24876.29			37647.52	43910.27		
85-89	22259.09				37203.28			
90-100	18812.6				26803.8			

Table 8. Financial wealth by age, cohort and subjective health status.

	Unhealthy (subjective)				**Healthy (subjective)**			
Cohort	**1904-1925**	**1926-1935**	**1936-1945**	**1946-1957**	**1904-1925**	**1926-1935**	**1936-1945**	**1946-1957**
Age	**Housing wealth over total net worth**							
50-54				0.6334				0.631644
55-59			0.696314	0.599236			0.588526	0.683938
60-64			0.643383	0.751046			0.701478	0.755168
65-69		0.675815	0.681259			0.745949	0.738791	
70-74		0.690797	0.703101			0.638097	0.681391	
75-79	0.522837	0.601887			0.863265	0.548979		
80-84	0.499417	0.61191			0.506238	0.73685		
85-89	0.568166				0.572303			
90-100	0.527461				0.3856			

Table 9. Housing wealth over total net worth by age, cohort and subjective health status

	Unhealthy (objective)				**Healthy (objective)**			
Cohort	**1904-1925**	**1926-1935**	**1936-1945**	**1946-1957**	**1904-1925**	**1926-1935**	**1936-1945**	**1946-1957**
Age				**Real wealth**				
50-54				195624				226906.2

55-59			177864.5	206663.2			203007.3	236812.9
60-64			199431.9	212163.2			213120	250569.7
65-69		176076.5	186504			210244.1	204795.3	
70-74		160277.7	193960.2			183990.8	232200.4	
75-79	127200.3	152118.4			82208.28	167246.4		
80-84	125520.6	157727.7			100020.7	210922.1		
85-89	101408.2				111594.6			
90-100	99098.1				89846.63			

Table 10. Real wealth by age, cohort and objective health status.

	Unhealthy (objective)				**Healthy (objective)**			
Cohort	**1904-1925**	**1926-1935**	**1936-1945**	**1946-1957**	**1904-1925**	**1926-1935**	**1936-1945**	**1946-1957**
Age	**Financial wealth**							
50-54				43252.7				51453.82
55-59			39187.41	46389.64			49801.46	55823.72
60-64			43453.62	54173.88			59144.46	73107.44
65-69		28498.38	38473.31			41330.87	48756.09	
70-74		30779.38	37697.85			37736.61	54287.61	
75-79	25432.43	31790.11			21639.13	37201.41		
80-84	28293.84	32905.61			37488.21	45785.1		
85-89	27781.89				42415.44			
90-100	21330.12				31142.38			

Table 11. Financial wealth by age, cohort and objective health status.

	Unhealthy (objective)				**Healthy (objective)**			
Cohort	**1904-1925**	**1926-1935**	**1936-1945**	**1946-1957**	**1904-1925**	**1926-1935**	**1936-1945**	**1946-1957**
Age	**Housing wealth over total net worth**							
50-54				0.628028				0.637735

55-59			0.656592	0.6718			0.514384	0.65427
60-64			0.642585	0.729075			0.81263	0.80722
65-69		0.755069	0.733328			0.575391	0.682538	
70-74		0.652089	0.687258			0.694254	0.693821	
75-79	0.724992	0.599249			0.518444	0.39253		
80-84	0.515349	0.670266			0.387719	0.705376		
85-89	0.575788				0.513339			
90-100	0.517683				0.022092			

Table 12. Housing wealth over total net worth by age, cohort and objective health status

	Men				**Women**			
Cohort	**1904-1925**	**1926-1935**	**1936-1945**	**1946-1957**	**1904-1925**	**1926-1935**	**1936-1945**	**1946-1957**
Age	**Real Wealth**							
50-54				214471.8				205727.7
55-59			216869.5	228627.8			160671.5	206902.9
60-64			228773.6	237289.6			177449.3	215702.6
65-69		190109.7	216622.5			174976.5	165424.7	
70-74		189842.3	229510.5			139268.9	167286.3	
75-79	154628.5	190230.8			92598.74	124128.8		
80-84	140880	200244.7			112580	134497.1		
85-89	125638.1				91842.86			
90-100	120878.7				86497.29			

Table 13. Real wealth by age, cohort and gender.

	Men				**Women**			
Cohort	**1904-1925**	**1926-1935**	**1936-1945**	**1946-1957**	**1904-1925**	**1926-1935**	**1936-1945**	**1946-1957**
Age	**Financial Wealth**							
50-54				52423.47				41557.57
55-59			51564.24	56037.4			32648.86	43616.18

60-64			56563.98	73161.2			38214.96	48472.3
65-69		39230.33	49705.03			22269.34	31817.72	
70-74		40386.42	47486.44			23681.64	32411.38	
75-79	31965.21	41283.76			19461.64	25225.33		
80-84	42274.46	47859.47			20743.37	23617.95		
85-89	44421.92				21334.22			
90-100	29077.68				19159.03			

Table 14. Financial wealth by age, cohort and gender.

	Men				**Women**			
Cohort	**1904-1925**	**1926-1935**	**1936-1945**	**1946-1957**	**1904-1925**	**1926-1935**	**1936-1945**	**1946-1957**
Age	**Housing wealth over total net worth**							
50-54				0.626065				0.639114
55-59			0.653146	0.668023			0.579494	0.663094
60-64			0.656999	0.691731			0.718573	0.810706
65-69		0.748468	0.672309			0.698357	0.77138	
70-74		0.615174	0.797603			0.700386	0.564474	
75-79	0.893659	0.553913			0.51967	0.58651		
80-84	0.416062	0.724634			0.564301	0.629554		
85-89	0.642905				0.531177			
90-100	0.464777				0.472695			

Table 15. Housing wealth over total net worth by age, cohort and gender.

3.4.1. Housing wealth decumulation, portfolio composition and financial literacy among the European elderly[12]

In this section we focus on deviations from optimal saving behavior from a standard life-cycle approach and the potential role played by financial literacy in reducing such deviations.

[12] This chapter is an extract from the paper "Housing wealth decumulation, portfolio composition and financial literacy among the European elderly" jointly written by Agnese Romiti and Mariacristina Rossi.

The question we try to analyse by looking at different perspectives of saving behaviour is whether financial literacy plays a role in the ability to use household wealth efficiently.

The role of financial literacy on the ability to save has been intensively explored (Behrman *et al.*, 2010; Jappelli and Padula, 2011; Lusardi and Mitchell, 2011; van Roji *et al.*, 2012). After retirement, according to the standard life cycle model the decumulation phase should start but very little decumulation is observed along the after-retirement path. Is financial literacy responsible for the little decumulation in the old age? Moreover, is the portfolio allocation affected by the degree of financial knowledge? Our ex-ante expectation is that more financially sophisticated households should be more active in their decumulation phase as well as show a more balanced portfolio. In addition, we consider whether a bigger stock of financial literacy can also help individuals to adopt optimal consumption behaviour. Finally, we want to investigate on the consequences of the shadow illiquid asset. We test whether having problems in making ends-meet can be dependent on the degree of portfolio illiquidity. We thus rely on a multivariate analysis, which allows us to control for all potential factors affecting wealth, with a particular focus on financial literacy.

Our aim is to analyze different measures of household wealth and how the decisions about the latter are related and shaped by the stock of financial literacy other than by other observed and unobserved individual characteristics of those in charge of dealing with household finances, therefore we ideally need to identify the individual who is responsible for them. Wealth-related survey questions refer to the household whereas other questions such as all questions related to cognitive abilities (thus to financial literacy) are asked to each respondent. We need to match the household related variables to the individual characteristics of one person per household, ideally to the person who is most in charge of household finances. The survey is well suited to this purpose because at the beginning of the questionnaire individuals are asked about who is the household financial respondent, the person responsible for the family finances, therefore we select the latter when he/she is uniquely identified, whereas when there are more than one financial respondent because both members of the couple manage the finances separately, we consider the one with the highest income, or, in case of couples with no income, the oldest one. Individual income is computed as the sum of earnings,

public and private pensions, life insurance payment received, private annuity, alimony, regular payment from charities, and income from rent. Interest from bank accounts, stocks, bonds, and mutual funds are not included because those questions in wave 2 refer to the household and not to individuals therefore the relevant variables at the individual level are only available for wave 1.

We analyse household financial behaviour and its relationship with financial literacy under three different perspectives: housing wealth decumulation, portfolio's imbalance, and consumption path. Accordingly we thus consider the following three main dependent variables: the growth rate of household housing wealth (equivalent to the first difference of the log value), the ratio between housing wealth and total net worth (log), and a proxy for the optimal consumption path. The dataset does not provide a proper measure of consumption since the information on total household consumption is only available for one wave, whereas the only measure of consumption available for the two waves consists in the amount spent on food at home or outside home plus the amount spent on telephone. Thus we consider as a proxy for the optimal consumption path an indicator for the self-reported household ability of making ends meet. The relevant question is asked to respondents in charge of answering household-related questions: "Is household able to make meets end? Thinking of your household's total monthly income, would you say that your household is able to make ends meet". From this question we built an indicator set equal to one if the answer falls into one of the following categories: "fairly easily" or "easily" and equal to zero if the answer is "with some difficulties" or "with great difficulties".

After excluding all observations with missing information on the variables of interest we are left with a sample of 18,430 observations.

3.4.2. Empirical strategy

In order to estimate the impact of financial literacy on different dimensions of wealth and saving decisions, we use the three dependent variables as described above: the ratio of housing wealth over net worth (in logs) which we consider as a measure of portfolio imbalance, an indicator equal to one for households being able to make ends meet which is our proxy for optimal consumption, whereas the third dependent variable representing housing wealth decumulation is the growth rate of housing wealth.

Financial literacy is likely to be endogenous for all these dependent variables since individual unobserved characteristics such as individual preferences, innate ability, or the household socio-economic environment are all correlated to both investments in financial literacy and to decisions about savings and portfolio. As a consequence the relevant coefficient is biased if this source of endogeneity is not taken into account. Therefore we need to adopt an IV approach for all the specifications. Our instrument for financial literature is an indicator for the last job or occupation held by the father; we set this indicator equal to one if the father was employed in high skilled occupations, which we define as manager, professional, or technician and associate. The intuition driving this choice is due to the fact that first of all, within the family, it is often the father in charge of dealing with finance and then aware of the role played by financial literacy as opposed to the mother. In addition, being employed in a high skilled occupation is certainly positively correlated to investing in children financial literacy because of the awareness that higher financial literacy can have a positive and important impact on children subsequent planning for retirement other than on dealing with household finances. As a consequence, father employed in high skilled jobs can affect and influence the past stock of children's financial literacy at the same time without having any impact on the children's future decisions about wealth and consumption, assuming that a sufficient time lag can dissipate the potential common socio-economic context shared by both the young children and the father. That is to say that the past father's occupation should not be related to current (un)observed characteristics affecting current decisions about household finances (in particular if we also control for household income, another potential channel through which the children can be affected by the past parental occupation if we assume low socio-economic intergenerational mobility). The drawback with this instrument's choice is that it is time-invariant by its nature, since it is derived by a question ("What is or was the last job your father had?") only asked in the first wave. Therefore we are forced to consider only respondents who were present in the first wave and we attribute the same value of this variable also to the second wave assuming that given the old age of the sample (50+) last parental job would not probably change in the second wave, the large majority of parents would be already retired and also the very few not yet retired would probably do not shift from a skilled to an unskilled category of occupation at the end of their

working career. As a consequence the instrument cannot be used in a longitudinal setting such as a FE estimator. Our strategy is therefore to run first two separated regressions one per each wave, then to compare the endogenous estimates obtained per each wave with FE estimates in order to evaluate the potential incidence of the unaccounted individual unobserved heterogeneity. If the difference between the two estimators is not significant we can consider the cross-sectional IV estimates per wave as the benchmark.

Since we use three dependent variables of different type, accordingly we need to use different models' specifications. The measure of portfolio imbalance is a continuous variable which we model by using two OLS regressions and the relevant IV regressions, one per each wave. Thus we compare the OLS results with a FE linear model. In addition to that this dependent variable is censored because of the log transformation which drops the zero values therefore we also control for potential selection bias by adopting a standard Heckman selection model with its control function version, in order to account for the endogeneity of financial literacy (Tables 16 and 17 – various columns).

The second dependent variable of interest is a dichotomous variable representing an indicator for being in a (self-reported) good financial situation, thus we need to adopt a non linear model, such as a logit regression with a control function approach, and then we contrast the results from the logit specifications with a FE non linear estimation model, such as a conditional logit model (Table 18).

The third dependent variable is the growth rate of housing wealth, a continuous variable, which we treat with OLS and IV specifications, and it is available for one wave only since we only have two waves from which we can compute the growth rate (Table 19). We also replicate the same estimate on the growth rate of financial wealth (third and fourth columns in Table 19).

For all the dependent variables we use the same vector of individual variables given that the determinants underlying each of them are similar and all related to saving decisions. The individual regressors consist in the following: the proxy for financial literacy, three categorical indicators corresponding to being in the following age brackets: 50-64, 65-85, and 85-100 which should account for the fact that three distinct

age-specific phases exist according to the standard life-cycle model, each of them describing different saving behaviour: the younger age when individuals decumulate because they are in the initial stage of their working life, afterwards the accumulation period starts and workers face a steeper earning profile and eventually they enter the retirement period where they should start to decumulate due to the less than unitary pension benefit replacement rate. Since the dataset only involves individuals 50 aged and older, we divide the two left conventional phases in three in order to account for the additional variability due to the oldest-old phase (85-100). In addition we include the self-reported probability of being alive which we assume as a proxy for expected life expectancy assuming that the perceived longevity should have an impact on saving behaviour. Individuals are asked the following question: "What are the chances that you will live to be age (75, 80, 85, 90, 95, 100, 105, 110, 120) or more?" Each respondent can answer by choosing a certain age among the list and then provide the probability of being alive up to the chosen age. We then control for gender, immigration status (based on country of birth), and education level including an indicator for being highly educated where higher education corresponds to a post-secondary, non tertiary education level. We also control for household income per capita (in logs) and its squared value. Additional information is included in order to account for potential determinants or shocks to saving decisions: an indicator for being retired, for being widow/er, and for good subjective health status. From the question "Would you say your health is" with the following possible answers: excellent, very good, good, fair, and poor, an indicator is set equal to one if the respondent's answer is excellent, very good, or good. We also control for potential bequest motives by including the number of children.[13] Additional information included is: country fixed effects and time fixed effects in case of the FE specifications. And we include our measure of portfolio imbalance as an additional regressor in estimating the probability of making ends meet since we want to evaluate whether being tied to excessively illiquid asset can be responsible for deviations from the optimal consumption path.

[13] The dataset also provides with the information about the intention to leave inheritance by asking the following question: "Within the next ten years, what are the chances that you will leave an inheritance worth more than 50,000 euro (in local currency)?"Instead of using this information we opt for using a more exogenous proxy given by the number of living children.

We start commenting the results on financial literacy and portfolio imbalance (Table 16 and 17). The first and second columns report the results obtained for both OLS and IV estimations. Concentrating on the impact of financial literacy, both OLS and IV results show that having a higher endowment of financial literacy brings about a reduction in household portfolio imbalance: a lower proportion of household wealth will consist of housing wealth and this result is consistent in both waves. We also replicate the analysis by controlling for potential selection bias, since 30 percent of the uncensored sample has zero housing wealth therefore it is dropped out because of the log transformation. We adopt the standard likelihood Heckman selection model, and we also account for the potential endogeneity of the financial literacy variable by using a control function approach (columns 3-6 in Tables 16 and 17). Despite the LR test for independent equations signals that the selection mechanism is not ignorable (p-value=0.001), the coefficients relevant to financial literacy are substantially unchanged with respect to the ones obtained on the censored sample. The selection mechanism is instead ignorable in case of wave 2 where we cannot reject the null hypothesis of independent equations (p-value=0.6). As it is reported in column 5, the significance of the residuals' coefficient reports the endogeneity of the financial literacy variable in both waves. We consider the results reported in column 5 as our benchmark estimates because they account for both endogeneity and potential selection bias. According to these results increasing the stock of financial literacy by one point brings about a significant reduction in household portfolio imbalance equal to about 20 percentage points, which is a substantial effect given that the average value of the dependent variable is about .71. We then compare the results obtained from the Heckman specification to those of the FE linear model, since this allows us to control for time-invariant unobserved factors affecting saving decisions and also correlated to the stock of financial literacy. The results, shown in column 6, are consistent with those found for both the OLS and Heckman specifications, suggesting that the unobserved heterogeneity is only in part responsible for our main coefficient of interest; we can argue that the endogeneity might be due to other time-varying factors which we control for in the cross-sectional IV specification. Unfortunately we cannot compare the IV-FE estimator with the cross-section one because our instrument is time-invariant therefore it would be dropped from the estimation. As for the other coefficients, surprisingly

individual factors such as immigration status, gender, being widow/er or retired, and also the number of children do not seem to have an impact on saving decisions, as it is clear from column 5 in Tables 16 and 17, with the only exception for being retired which increases portfolio imbalance (only for the second wave). From the selection equation, which we identify by functional form instead of using any exclusion restriction, we can argue which individual factors mostly increase the probability of having no zero housing wealth. Immigrants are much less likely to own housing wealth, whereas the opposite is true for being a widow/er which can be interpreted as due to the fact that the widows/ers inherit the spouse's housing wealth, moreover a self-perceived longer life is positively correlated to having housing wealth, even though the latter does not exert any impact on portfolio imbalance. The chosen instrument seems not to suffer from any weakness throughout all the specifications, either when we consider the IV estimates or the control function approach (see the bottom panel of Tables 16, 17, 19, and 20), both the first stage F statistics and the t-test in the first stage of the control function specifications are highly above any standard critical values.

The results for the impact of financial literacy on consumption patterns, proxied by the likelihood of making meets end are shown in Table 18, which reports the cross-section logit and its control function version by wave (wave 1 in columns 1 and 2, and wave 2 in columns 3 and 4), whereas the FE results are reported in column 5 where we use a conditional logit model. Both the OLS and the control function specifications report a positive coefficient for financial literacy, thus suggesting the positive impact of the latter on the probability of making meets end, thus having a higher endowment of financial literacy increases the likelihood of optimal consumption behaviour. And this pattern remains stable and significant (even if with a lower magnitude) also controlling for unobserved individual heterogeneity in the FE estimation. Several individual factors affect the probability of an optimal consumption pattern, but once we control for individual fixed effects, we observe a significant positive impact of only higher life expectancy and a negative impact of being a widow/widower. Commenting on the IV specifications, our estimates show that increasing the numeracy score by one point increases the probability of following an optimal consumption pattern of around 30 percent. As a robustness check we also control for unobserved individual heterogeneity which might explain part of the financial literacy endowment and be responsible for the

endogeneity, and in case of the FE specification the impact is lower in magnitude corresponding to a 2 percentage points increase, and loses a bit of significance (10 percent level) but still maintains the same positive sign. As for the role played by financial literacy, since the FE estimates are very similar to the cross-section logit ones, we argue that individual time-invariant unobserved heterogeneity plays a minor role, whereas the endogeneity seems to be an issue as it is clear from the strong significance of the residuals in the cross-section estimates, hence our preferred estimate are the latter which control also for the endogeneity of financial literacy. Interesting to note is the role played by our indicator for portfolio imbalance which exerts a negative effect on the probability of making ends meet and it is strongly significant throughout all different specifications.

The direction of the bias in the OLS estimates is not so clear-cut and it cannot be known *a priori* since it depends on many different factors. Innate abilities can be responsible for an upward bias in OLS estimates, assuming that they are positively correlated to both the stock of financial literacy and the optimal consumption behaviour. However OLS estimates can also be downward biased in case of measurement errors in the financial literacy indicator. Therefore the direction of the bias is an empirical question. Underestimation of the OLS coefficient has also been found by Jappelli and Padula (2011) use the same SHARE dataset to estimate the impact of financial literacy on saving rate. Taking the math test score at the age of 10 as the instrument for the financial literacy indicator, they also found that the OLS coefficient of financial literacy was an underestimation of the IV one.

The last model is related to the impact of financial literacy on housing wealth decumulation, and the relevant results are shown in Table 19. Housing wealth decumulation is measured by its growth rate, our dependent variable.

In order to interpret our results we first derive a model for asset depletion rate in order to have the optimal behaviour according to which people would like to decumulate. Our prediction is that more knowledgeable people dislike the idea of dying with "too much" asset and therefore would be closer to the optimal depletion rate. Conversely, people less financially literate are less conscious of the welfare loss of not disposing of their asset optimally.

We derive the optimal decumulation path as follows. Consider the sum of lifetime resources at time *t*

$$A_t + P\sum_{x}^{T}\frac{1}{(1+r)^{x-t}} = c^*\sum_{x}^{T}\frac{1}{(1+r)^{x-t}}$$

$$A_t + P\frac{-1+(1+r)^{t-T}}{-1+(1+r)} = c^*\frac{-1+(1+r)^{t-T}}{-1+(1+r)} \qquad (1)$$

where T is the expected end of life, r is the real interest rate, A_t is total wealth, P are pensions benefits, and c^* is the optimal consumption; pension benefit are assumed constant due to the institutional design of many pension systems and consumption is constant over time because it represents the optimal consumption[14] as it is the real interest rate, *r*. Computing equation (1) at time $t+1$, dividing A_{t+1} by A_t and taking logs, we obtain the simplified version of the optimal decumulation path as follows

$$\log\left(\frac{A_{t+1}}{A_t}\right) \cong \frac{r}{1-(1+r)^{T-t}} \qquad (2)$$

From this theoretical framework thus follows that asset depletion rate should just depend upon the life expectancy and the interest rate and not be reactive to other factors. However, given the small values taken by *r*, equation (2) simplifies as follows

$$\log\left(\frac{A_{t+1}}{A_t}\right) \cong -\frac{1}{T-t}$$

thus asset depletion turns out to be only a function of individual life expectancy.[15]

We claim that the degree of financial literacy might play a role in this decumulation planning. In particular, those households less financial literate might be less aware of financial instruments to efficiently decumulate wealth and also less able to plan

[14] The optimal consumption is constant under the simplifying assumption of equality between interest rate and the discount rate.

[15] In the empirical implementation we adopt a further simplification, driven by our measure of life expectancy. Since our measure for life expectancy is the self-reported probability of being alive at a given future age, and 5 percent of the sample reports a probability equal to zero, we approximate the factor k=-1/(T-t) with k=-1/(1+(T-t)) in order not to lose the observations with probability equal to zero.

efficiently their welfare during retirement. In the empirical analysis we test this hypothesis introducing as regressors in the regression modelling (housing) wealth decumulation the constant term (k=-1/(1+lifeexp)) and its interaction with the financial literacy indicator. According to our prior, we would expect that the sum of the k coefficient and the coefficient of its interaction with financial literacy should correspond to the optimal behaviour, thus it should be equal to one, the coefficient relevant to the constant as in (1).

From both the OLS and the IV results we argue that financial literacy does not play any role on wealth decumulation, and also its interaction with the constant k factor – as derived from the theoretical framework in the above section and it is computed as an inverse function of life expectancy[16] - is only significant in the OLS estimates (column 1). Even trying to isolate subgroups of individuals which should potentially be more subject to wealth decumulation, such as elderly or retired people, the role of financial literacy is consistent with these results and remains insignificant. This lack of evidence about the role of financial literacy on housing wealth decumulation can be explained by the extremely poor evidence of overall (housing) wealth decumulation in the sample as provided by the above descriptive statistics. Lastly we also replicate the analysis on the growth rate of financial wealth (columns 3 and 4- Table 19) but the same results as for housing wealth are confirmed suggesting no role for financial literacy on financial wealth decumulation.

16 Life expectancy is represented by the same variable also included in all the regressions.

Portfolio imbalance. Housing wealth over total wealth: wave 1							
	OLS	**IV**	**Heck**	**Selec eqn**	**Heck-IV**	**Selec eqn**	**FE**
Fin Lit	-0.0329***	-0.2280**	-0.0203***	0.1154***	-0.1633*	0.5272***	-0.0189***
	-0.0062	-0.1020	-0.0075	-0.0143	-0.0952	-0.2009	-0.0068
Residuals					0.1439	-0.4139**	
					-0.0953	-0.2015	
Age 65-84	0.0069	-0.0446	0.0156	0.0418	-0.0196	0.1440**	0.0178
	-0.0144	-0.0316	-0.0146	-0.0376	-0.0280	-0.0623	-0.0247
Age 85-100	-0.0316	-0.1505**	-0.0575**	-0.2110***	-0.1365**	0.0150	-0.0192
	-0.0258	-0.0679	-0.0277	-0.0561	-0.0579	-0.1232	-0.0385
Life exp	-0.0002	-0.0001	0.0001	0.0026***	0.0003	0.0022***	-0.0003
	-0.0003	-0.0003	-0.0003	-0.0005	-0.0003	-0.0006	-0.0002
Fem	0.0344**	-0.0424	0.0321**	-0.0264	-0.0223	0.1314	
	-0.0140	-0.0431	-0.0144	-0.0302	-0.0394	-0.0819	
Immig	0.0529*	0.0341	-0.0109	-0.4695***	-0.0404	-0.3814***	
	-0.0310	-0.0344	-0.0344	-0.0520	-0.0392	-0.0675	
High Skilled	-0.0255	0.0721	0.0133	0.3737***	0.0923*	0.1474	
	-0.0168	-0.0533	-0.0205	-0.0371	-0.0544	-0.1158	
Income(log)	-0.0201	-0.0295**	-0.0081	0.0720**	-0.0108	0.0793**	-0.0283***
	-0.0128	-0.0143	-0.0134	-0.0325	-0.0134	-0.0327	-0.0106
Income (log)2	0.0011	0.0018*	-0.0005	-0.0111***	-0.0003	-0.0116***	0.0016*
	-0.0010	-0.0011	-0.0011	-0.0023	-0.0011	-0.0023	-0.0009
Health (subj)	-0.0322**	0.0170	-0.0126	0.1748***	0.0265	0.0620	-0.0119
	-0.0127	-0.0295	-0.0150	-0.0318	-0.0295	-0.0635	-0.0134
Retired	0.0220	0.0260*	0.0182	-0.0317	0.0208	-0.0400	-0.0038
	-0.0141	-0.0154	-0.0147	-0.0353	-0.0149	-0.0355	-0.0188
Widow/er	0.0295	-0.0124	0.0494**	0.1795***	0.0294	0.2378***	0.0780
	-0.0196	-0.0302	-0.0214	-0.0430	-0.0255	-0.0518	-0.0607
First stage							
IV		0.1651***					
		0.028					
F		35.621					
Lambda			0.232		0.233		
se (lambda)			0.07		0.069		
p (indep eqn)			0.001		0.001		
N	6472	6472	10102		10102		12754

Note: Robust standard errors in parenthesis. Additional regressors are country fixed effects in columns 1-6) and time fixed effects (column 7).

Table 16. Portfolio imbalance. Wave 1.

Portfolio imbalance. Housing wealth over total wealth: wave 2							
	OLS	**IV**	**Heck**	**Selec eqn**	**Heck-IV**	**Selec eqn**	**FE**
Fin Lit	-0.0216***	-0.1962**	-0.0211***	0.1115***	-0.1863**	0.6252***	-0.0189***
	-0.0055	-0.0918	-0.0055	-0.0166	-0.0831	-0.2369	-0.0068
Residuals					0.1662**	-0.5164**	
					-0.0831	-0.2377	
Age 65-84	0.0553***	0.0078	0.0554***	-0.0110	0.0124	0.1226	0.0178
	-0.013	-0.0281	-0.0131	-0.0453	-0.0246	-0.0768	-0.0247
Age 85-100	0.0121	-0.0886	0.0115	-0.1466**	-0.0821	0.1437	-0.0192
	-0.019	-0.0567	-0.019	-0.0624	-0.0507	-0.1474	-0.0385
Life exp	-0.0003	-0.0001	-0.0002	0.0022***	-0.0001	0.0018***	-0.0003
	-0.0002	-0.0002	-0.0002	-0.0006	-0.0002	-0.0006	-0.0002
Fem	0.0330***	-0.0353	0.0326***	-0.0842**	-0.0308	0.1134	
	-0.0119	-0.0385	-0.0119	-0.0356	-0.0346	-0.0968	
Immig	0.0121	0.0077	0.0098	-0.4229***	-0.0076	-0.3657***	
	-0.0242	-0.0264	-0.0242	-0.0610	-0.0258	-0.0663	
High Skilled	-0.0594***	0.0223	-0.0577***	0.3793***	0.0262	0.1199	
	-0.0148	-0.0465	-0.0147	-0.0429	-0.0455	-0.1264	
Income_pc (log)	-0.0152*	-0.0202*	-0.0148	0.0448	-0.0162*	0.0500	-0.0283***
	-0.0091	-0.0105	-0.0092	-0.0387	-0.0092	-0.0388	-0.0106
Income_pc (log)2	0.0007	0.0012	0.0006	-0.0100***	0.0007	-0.0104***	0.0016*
	-0.0007	-0.0009	-0.0007	-0.0028	-0.0007	-0.0028	-0.0009
Health (subj)	-0.0275**	0.0177	-0.0268**	0.1475***	0.0174	0.0114	-0.0119
	-0.0119	-0.0276	-0.0119	-0.0359	-0.0256	-0.0726	-34
Retired	0.0291**	0.0324**	0.0294**	0.0604	0.0368***	0.0373	-0.0038
	-0.0126	-0.0137	-0.0125	-0.0421	-0.013	-0.0436	-0.0188
Widow/er	0.0209	-0.0134	0.0216	0.1586***	-0.0073	0.2508***	0.078
	-0.0156	-0.0245	-0.0156	-0.0498	-0.0211	-0.0651	-0.0607
First stage							
IV			0.170***				
			0.029				
			34.26				
Lambda					0.017		0.02
se (lambda)					0.014		0.015
p (indep eqn)					0.227		0.191
N	6272	6272	8328	8328	8350		12754

Note: Robust standard errors in parenthesis. Additional regressors are country fixed effects in columns 1-6) and time fixed effects (column 7).

Table 17. Portfolio imbalance. Wave 2.

Optimal consumption. No difficult to make ends meet					
	logit	**logit-cf**	**logit**	**logit-cf**	**FE**
Fin Lit	0.0467***	0.3003***	0.0453***	0.4042***	0.0281*
	-0.0070	-0.1073	-0.0069	-0.1068	-0.0159
Residuals		-0.2549**		-0.3606***	
		-0.1076		-0.1070	
Life exp	0.0004	0.0004	0.0008***	0.0005**	0.0014***
	-0.0003	-0.0003	-0.0003	-0.0003	-0.0005
Hous w/ne worth(log)	-0.1277***	-0.0984***	-0.1545***	-0.1150***	-0.0693*
	-0.0172	-0.0213	-0.0223	-0.0253	-0.0387
Age 65-84	0.0175	0.0825***	0.0231	0.1164***	0.0157
	-0.0172	-0.0316	-0.0172	-0.0319	-0.0551
Age 85-100	0.1061***	0.2095***	0.0695***	0.2130***	0.0653
	-0.0237	-0.0387	-0.0231	-0.0353	-0.0974
Fem	-0.0423***	0.0561	-0.0547***	0.0840*	
	-0.0145	-0.0441	-0.0142	-0.0434	
Immig	0.0049	0.0275	-0.0150	-0.0053	
	-0.0305	-0.0308	-0.0323	-0.0318	
High Skilled	0.1016***	-0.0193	0.1094***	-0.0500	
	-0.0157	-0.0565	-0.0154	-0.0544	
Income_pc (log)	0.0580***	0.0707***	0.0597***	0.0705***	-0.0468
	-0.0136	-0.0147	-0.0132	-0.0134	-0.0382
Income_pc (log)2	-0.0039***	-0.0049***	-0.0043***	-0.0054***	0.0045
	-0.0010	-0.0011	-0.0010	-0.0011	-0.0030
Retired	-0.0031	-0.0090	0.0051	-0.0033	-0.0680
	-0.0164	-0.0166	-0.0164	-0.0165	-0.0450
Widow/er	-0.0294	0.0236	-0.0185	0.0490*	-0.2894**
	-0.0223	-0.0301	-0.0219	-0.0275	-0.1464
Health (subj)	0.1117***	0.0455	0.1176***	0.0218	0.0244
	-0.0166	-0.0317	-0.0157	-0.0314	-0.0322
Number children	-0.0117*	-0.0021	-0.0206***	-0.0166***	0.0014
	-0.0061	-0.0074	-0.0061	-0.0062	-0.037
First stage					
IV		0.1609***		0.1639***	
		0.027		0.028	
N	6482	6482	6272	6272	2032

Note: Marginal effects. Robust standard errors in parenthesis. Additional regressors are country fixed effects in columns 1-4) and time fixed effects (column 5).

Table 18. Probability of making ends meet.

Growth rate of housing wealth			**Growth rate of financial wealth**	
	OLS	**IV**	**OLS**	**IV**
Fin Lit	0.0253	1.0473	-0.3507	2.3187
	-0.0534	-0.7693	-0.7033	-7.0856
k	0.7674	2.563	-3.7698	-22.3785
	-0.4692	-2.2184	-6.1480	-27.3669
kxnum	-0.2164*	-0.7634	1.1097	7.0753
	-0.1296	-0.7023	-1.3049	-8.3829
Life exp	0.0029*	0.0025	0.0404	0.0378
	-0.0017	-0.0016	-0.0354	-0.0339
Age 65-84	0.1203	0.3998	0.7506	1.3705
	-0.126	-0.2502	-0.9076	-2.1568
Age 85-100	0.1181	0.6723	5.8286	6.9359
	-0.1644	-0.4544	-6.2163	-5.8216
Fem	-0.0414	0.342	0.8673	1.7521
	-0.0782	-0.2808	-1.5659	-3.4713
Immigig	-0.1047	-0.0726	3.5264	3.6425
	-0.1215	-0.1325	-3.0360	-3.0081
High Skilled	0.1352	-0.3279	1.0182	-0.0034
	-0.1239	-0.3021	-1.2110	-2.5054
Income_pc (log)	0.0306	0.0578	0.8742	0.9116
	-0.0745	-0.0874	-1.1311	-1.0625
Income_pc (log)2	-0.0019	-0.0047	-0.0331	-0.0367
	-0.0055	-0.0068	-0.0897	-0.0835
Health (subj)	-0.032	-0.2804	-2.6417	-3.1804*
	-0.0676	-0.1997	-1.8627	-1.8221
Retired	-0.2037*	-0.2127*	0.3851	0.5080
	-0.114	-0.1208	-1.0913	-1.0875
Widow/er	0.2143*	0.3956*	-0.9859	-0.6612
	-0.1294	-0.2272	-3.0459	-3.6310
Number children	0.0041	0.0165	-0.3703	-0.3584
	-0.0346	-0.0373	-0.7347	-0.7632
First Stage				
F		17.267	15.225	
N	6288	6288	5346	5346

Note: Robust standard errors in parenthesis. Additional regressors are country fixed effects in columuns..

Table 19. Housing wealth and financial wealth decumulation.

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Appendix.

A.1. Numeracy

The 4 questions relevant to the variable numeracy are the following. Possible answers are shown in a card while the interviewer is instructed not to read them out to the respondent:

1.If the chance of getting a disease is 10 per cent, how many people out of one thousand would be expected to get the disease?
The possible answers are 100, 10, 90, 900 and another answer.
2. *In a sale, a shop is selling all items at half price. Before the sale a sofa costs 300 euro. How much will it cost in the sale?*
The possible answers are 150, 600 and another answer.
3. *A second hand car dealer is selling a car for 6,000 euro. This is two-thirds of what it costs new. How much did the car cost new?*
The possible answers are 9,000, 4,000, 8,000, 12,000, 18,000 and another answer.
4. *Let's say you have 2,000 euro in a saving account. The account earns ten per cent interest each year. How much would you have in the account at the end two years?*
The possible answers are 2,420, 2,020, 2,040, 2,100, 2,200, 2,400 and another answer.

The variable numeracy has been built as follow. If a person answers (1) correctly she is then asked (3) and if she answers correctly again she is asked (4). Answering (1) correctly results in a score of 3, answering (3) correctly but not (4) results in a score of 4 while answering (4) correctly results in a score of 5. On the other hand if she answers (1) incorrectly she is directed to (2). If she answers (2) correctly she gets a score of 2 while if she answers (2) On the basis of these four questions Dewey and Prince (2005) construct a numeracy indicator, which ranges from 1 to 5

Financial Literacy and portfolio imbalance in Italy: SHIW data[(a)]

The Bank of Italy's Survey on Household Income and Wealth (SHIW) allows us to investigate the relationship between FL and housing investment as a share f total portfolio.

To gauge respondents' level of FL, we follow Fornero and Monticone (2010) and exploit three survey questions regarding inflation, interest rates and a basic understanding of stocks and bonds.

Question 1: Imagine leaving 1,000 euros in a current account that pays 1% interest and has no charges. Imagine that inflation is running at 2%. Do you think that if you withdraw the money in a year's time you will be able to buy the same amount of goods as if you spent the 1,000 euros today? (Yes/Less/More/Don't know/No answer)

Question 2: Which of the following investment strategies do you think entails the greatest risk of losing your capital? (Investing in the shares of a single company/[…] more than one company/ Don't know/No answer)

Question 3: Which of the following types of mortgage do you think would allow you from the very start to fix the maximum amount and number of instalments to be paid before the debt is extinguished? (Floating-rate mortgage/ Fixed-rate mortgage/ Floating-rate mortgage with fixed instalments/ Don't know/No answer)

We first create three dummy variables taking the value of 1 for every correct answer for each individual, and then sum them up to build an indicator ranging from 1 to 3.

$$FL_i = \sum_{i=1}^{3} Q_{ij} \qquad i = 1,...N \qquad \text{and} \quad j = 1,2,3$$

The descriptive statistics confirm what was found in the SHARE data, i.e. the level of FL is quite low among Italians: less than one third of respondents (28.5%) is able to answer correctly all 3 FL questions, and the percentage of financially literate household heads is considerably lower among the over 65.

We define our dependent variable, HOMESHARE, as the ratio of housing wealth (net of mortgages) over total wealth (net of any financial liability) and estimate the partial effect of FL on portfolio imbalance with a fixed effects econometric specification.

The (preliminary) results show that a higher level of FL is indeed correlated with a lower share of housing investment, controlling for several demographics. If we isolate a sample of over 50 we find an even stronger and more significant effect.

	All sample	**Over 50**
	b/se	**b/se**
Financial Literacy index	-0.009**	-0.010***
	(0.00)	(0.00)
Marital Status		
Single	-0.021	-0.073*
	(-0.03)	(-0.04)
Separated/divorced	-0.096***	-0.130***
	(-0.03)	(-0.04)
Widow(er)	-0.030	-0.047**
	(-0.02)	(-0.02)
House inherited	0.179***	0.127***
	(-0.01)	(-0.01)
Log of household income	-0.033***	-0.051***
	(-0.01)	(-0.01)
Log of average house price	-0.006	0.048
	(-0.04)	(-0.04)
Healthy	0.007	0.009*
	(0.00)	(0.00)
Year 2006-2010	YES	YES
Constant	1.162***	0.348
	(-0.37)	(-0.50)
Number of observations	1,2145	7,960
Loglikelihood	4310.999	4753.258
Pseudo R^2		

*[(a)] Mean housing wealth is estimated taking the natural logarithm of housing value per square metre, by region and city size. The superscripts ***, **, and * indicate the 1%, 5%, and 10% levels of statistical significance, respectively. Control variables with insignificant effects are not reported: second order polynomial for age, female, household head graduate, number of average children, healthy household head, risk averse and area of residence.*

(a) The information is taken form a MIMEO paper by Riccardo Calcagno and Csira Urzí Brancati on FL and portfolio imbalance.

4. ELSA data on the UK.

4.1. Descriptive evidence

The English Longitudinal Study of Ageing (ELSA) has been designed to represent people aged 50 and over, living in private households in England. The sample was drawn from households that had previously responded to the Health Survey for England (HSE) in 1998, 1999 or 2001; the data collected is known as "ELSA Wave 0", and forms the basis for all subsequent waves of the study. As the name suggests, ELSA is a longitudinal study, hence participants have been followed and re-interviewed every two years. Eligible households have at least one member born on or after 1952, but as the study progresses the respondents get older, and therefore a refreshment sample of younger HSE members has been added at Wave 3 (2006). For the sake of consistency, we will only use ELSA wave 2 and wave 3 which refer to the same time frame as the first two waves of SHARE; this leaves us with a rather large pooled sample of 17,590 individuals or 12,716 households.

The ELSA dataset did not provide the definition of "head of household", i.e. the breadwinner, so we chose the household component with the highest earnings; if the earnings were defined for the couple, we chose the eldest and if two householders were the same age, we chose the man. The majority of Female headed households is to be found in the first cohort – 1904-1925, where approximately 45% is divorced and 36% is widowed (not reported).

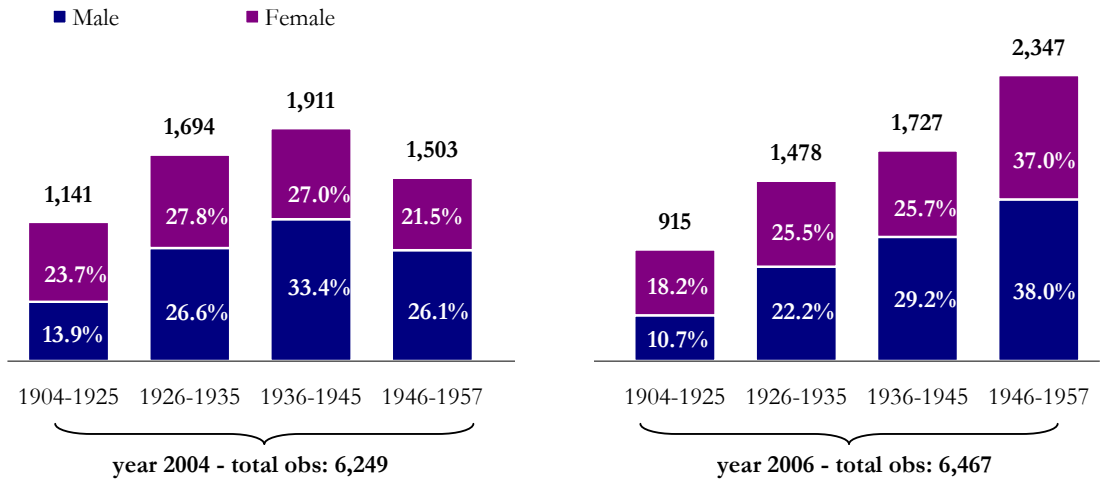
Table 1: Heads of household by gender and cohort

	Cohort				
	1904-1925	**1926-1935**	**1936-1945**	**1946-1957**	**All**
Male	861	1,702	2,181	2,236	6,980
Female	1,195	1,470	1,457	1,614	5,736
Total	2,056	3,172	3,638	3,850	12,716

Source: ELSA wave 2 and 3.

Graph 1 shows the composition of the sample by wave, gender and cohort: as a refreshment sample was added in wave 3, the percentage of younger householders increases in approximately equal number for men and women.

Graph 1: ELSA composition by gender, cohort and year



Source: ELSA wave 2 and 3.

One of the strengths of ELSA is that it combines expertise from a number of disciplines, supplying very detailed information on both health and economic conditions of participants. Assessment of wealth is important not only because it provides a summary measure of economic fortunes through the life cycle, but because it also offer a measure of security for the future.

Indicators for real and financial wealth were built by combining a few different measures. The indicator of real (net) wealth includes the value of owned property and other estates, net of mortgage; the indicator of financial (net) wealth includes deposits and savings accounts, bonds, stocks, mutual funds, individual retirement account, whole life insurance net of liabilities. We then converted the values in Euros (PPP) and in current prices to make them compatible with the SHARE data.

Table 2: Average real wealth and financial wealth by gender and cohort (per household)

	Real Wealth (in €)		Financial Wealth (in €)	
Cohort	**Male**	**Female**	**Male**	**Female**
1904-1925	219,122	151,241	57,094	29,366
1926-1935	267,733	190,532	59,473	34,910
1936-1945	331,556	280,491	94,826	70,480
1946-1957	334,199	266,644	135,678	94,620

Source: ELSA wave 2 and wave 3. Pooled sample. Euro at constant prices (PPP).

As Table 2 clearly shows, younger male household heads have substantially higher real and financial wealth.

Table 3: Average real wealth and financial wealth by gender and cohort (per individual)

	Real Wealth (in €)		Financial Wealth (in €)	
Cohort	**Male**	**Female**	**Male**	**Female**
1904-1925	117,524	90,663	49,557	28,074
1926-1935	145,396	115,473	47,791	36,138
1936-1945	186,228	169,432	78,608	63,687
1946-1957	199,993	193,800	107,239	82,394

Source: ELSA wave 2 and wave 3. Pooled sample. Euro at constant prices (PPP).

Since approximately 78% sample households own their own home – 56% own it outright and 22% with the help of a mortgage – it is not surprising to find that housing represents the greatest share of wealth.

Table 4: Share of net real wealth over total portfolio by gender and cohort

	Cohort			
Gender	**1904-1925**	**1926-1935**	**1936-1945**	**1946-1957**
Male	63.8%	70.1%	71.2%	67.6%
Female	55.9%	62.7%	70.5%	67.8%

Source: ELSA wave 2 and wave 3. Pooled sample.

Overall, only a small proportion of people in the sample have one or more children living in the household; however, approximately 86% have children either living in or outside the household. (Table 5)

Table 5: Average real wealth and financial wealth by parental status and cohort

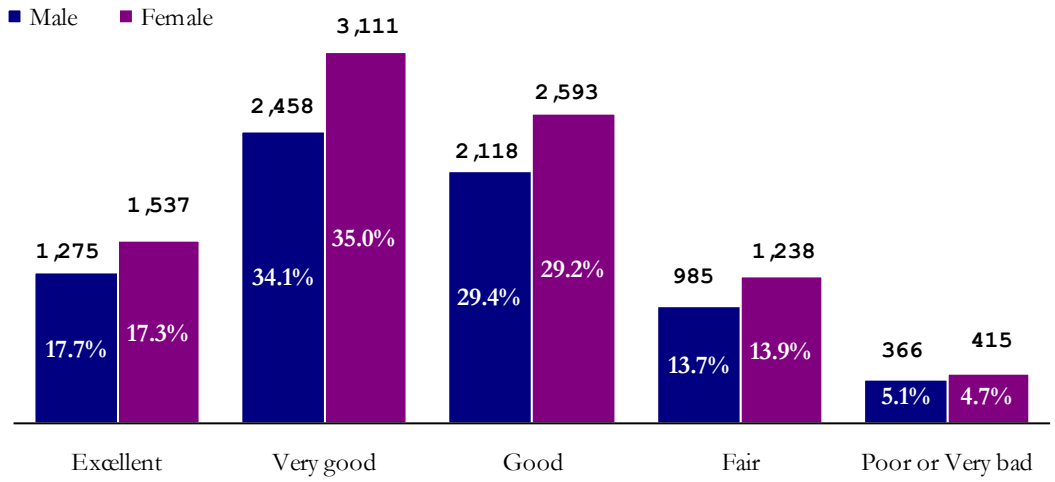
	Real Wealth (in €)		Financial Wealth (in €)	
Cohort	**Without Children**	**With Children**	**Without Children**	**With Children**
1904-1925	151,500	175,000	45,219	38,242
1926-1935	191,823	224,983	45,089	46,139
1936-1945	267,961	281,419	90,253	80,967
1946-1957	282,387	254,532	141,660	107,563

Source: ELSA wave 2.

4.2. Health

The ELSA dataset provides a vast array of health indicators, therefore we have been able to adopt a few different ones for our analysis: firstly, an indicator of subjective health, ranging from "excellent" to "very bad": more than 80 percent of the sample declares to be in good health of better, and there is no difference between men and women. (See Graph 2).

Graph 2: Subjective health by gender



Source: ELSA wave 2 and 3.

We are interested in finding out whether households may be reluctant to decumulate their wealth for fear of unexpected health shocks

Table 6: Average net real wealth by cohort and subjective health

	Real wealth by cohort (in €, constant prices)			
Subjective Health	**1904-1925**	**1926-1935**	**1936-1945**	**1946-1957**
Excellent	70,766	121,394	184,003	229,243
Very good	97,861	111,666	183,543	192,415
Good	107,305	144,009	174,830	204,688
Fair	130,236	151,975	178,034	136,838
Poor or very bad	96,654	107,616	127,931	158,110

Source: ELSA wave 2 and 3.

Table 7: Average net financial wealth by cohort and subjective health

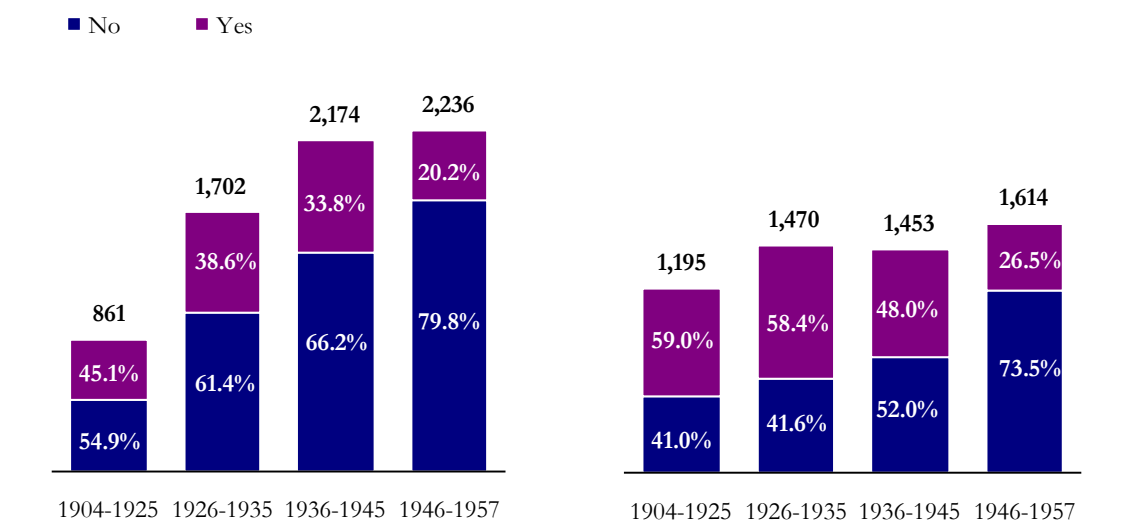
	Financial wealth by cohort (in €, constant prices)			
Subjective Health	**1904-1925**	**1926-1935**	**1936-1945**	**1946-1957**
Excellent	45,894	51,123	103,838	126,101
Very good	46,622	52,200	84,642	100,697
Good	35,442	38,661	54,711	85,020
Fair	27,861	25,178	36,426	42,719
Poor or very bad	20,109	16,161	22,481	30,920

Source: ELSA wave 2 and 3.

The relationship between wealth decumulation and subjective health is not clear-cut and cannot be easily inferred by simple descriptive statistics. However, a quick glance at Table 10 and Table 11 seems to validate the predicted negative correlation between real wealth and subjective health for the older generations, while maintaining a positive correlation between subjective health and financial wealth.

To build indicators of objective health, we used information regarding the presence of any chronic illnesses, such as cancer or a heart condition[17]. Interestingly, the correlation between subjective and objective health (defined as no chronic conditions) is quite low (not reported). Overall, women appear healthier than men when younger, but the situation reverts for the older generations, most likely because more women survive (see Graph 3.)

Graph 3: Health status by cohort and gender – do you any chronic disease?



Source: ELSA wave 2 and wave 3. Pooled sample.

The correlation between objective health and real or financial wealth appears to be negative.

Table 8: Average real wealth and financial wealth by parental status and cohort

	Real Wealth (in €)		Financial Wealth (in €)	
Cohort	Without chronic diseases	With chronic diseases	Without chronic diseases	With chronic diseases
1904-1925	201,911	173,040	46,473	39,157
1926-1935	276,488	207,184	58,870	41,564
1936-1945	341,813	271,387	98,958	68,615
1946-1957	338,339	252,739	134,877	80,385

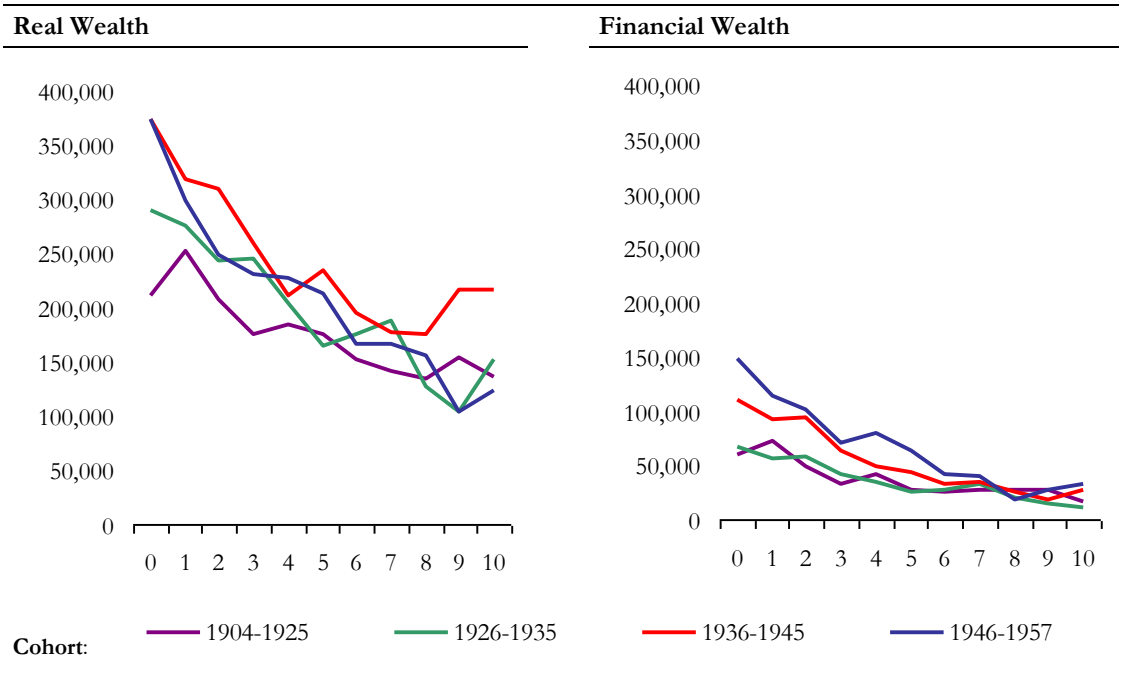
Source: ELSA wave 2 and wave 3. Pooled sample.

Another indicator of objective health is given by the presence of conditions limiting the respondent's daily activities, and specifically whether she had problems: walking 100 yards, sitting for about two hours, getting up from a chair after sitting for long periods, climbing one or several flights of stairs without resting, stooping, kneeling, or crouching,

[17] The chronic conditions mentioned are arthritis, osteoporosis, cancer or a malignant tumour (excluding minor skin cancers), Parkinson's disease, any emotional, nervous or psychiatric problems, Alzheimer's disease, dementia, organic brain syndrome, senility or any other serious memory impairment, however we do not differentiate between types of conditions.

reaching or extending their arms above shoulder level, pulling or pushing large objects, lifting or carrying weights over 10 pounds, like a heavy bag of groceries and picking up a 5p coin from a table.

Graph 4: Average Real and Financial wealth by cohort and number of limitations (in € at constant prices)



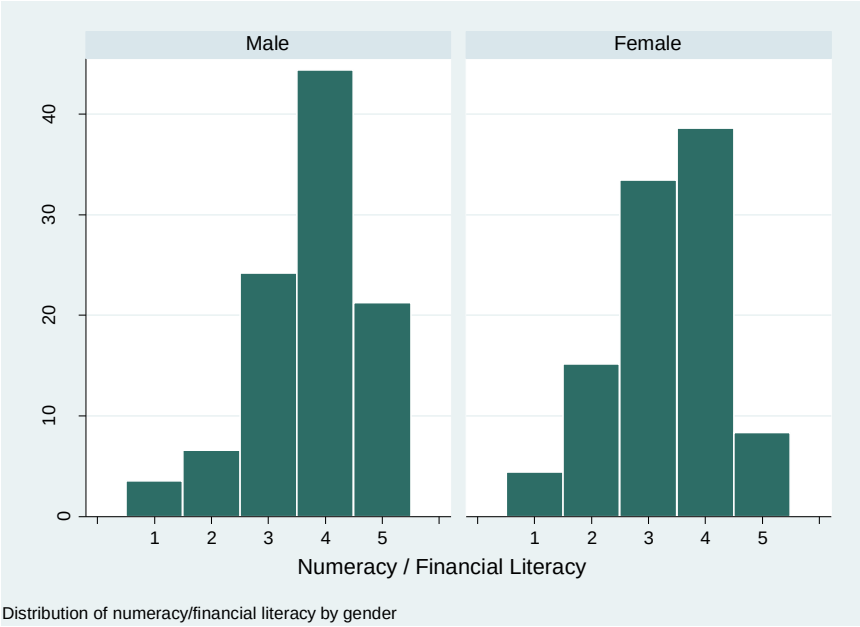
Source: ELSA wave 2 and wave 3. Pooled sample.

Once again, there seems to be a negative correlation between average real or financial wealth and number of limitations.

4.3. Numeracy – or financial literacy

ELSA wave 1 features numeracy/financial literacy questions which we used to construct a financial literacy indicator: the first question investigated respondents' ability to calculate a simple percentage (ten percent of a thousand), the second and third questions asked respondents to work out the initial price of an item on sale, with the new price set at 50 percent or two thirds of the original, and the last one assessing respondents' ability to calculate compound interest in a savings account, commonly regarded as a good proxy for financial literacy. We followed the same methodology adopted by Jappelli and Padula (2011) and built an indicator ranging from 1 to 5 (low to high numeracy). In particular, if respondents answered the second, third and fourth questions correctly, we awarded 5 points; if they only answered correctly the second and third, but not fourth, 4 points, and if they only answered correctly the second question, 3 points. If they didn't answer the second question correctly, but got the first one right, we awarded them 2 points, and if they didn't give any correct answer, they were awarded only 1 point.

Graph 5: distribution of Numeracy/Financial Literacy by gender



Source: ELSA wave 1.

As reported in Table 9, roughly half of the sample (48%) scores 3 or less, with a marked difference between men (38%) and women (57%), while approximately 20% of men and 8% of women scores 5, the highest score. It is worth noting that the score of 5 is assigned only to people who could calculate compound interest correctly.

Table 9: Financial literacy (numeracy) by gender – ELSA wave 1

Score	Men	Women	All
1	274	405	679
	5.6%	6.9%	6.3%
2	383	1,022	1,405
	7.8%	17.4%	13.0%
3	1,229	1,920	3,149
	24.9%	32.6%	29.1%
4	2,062	2,085	4,147
	41.9%	35.4%	38.3%
5	979	459	1,438
	19.9%	7.8%	13.3%
Total	4,927	5,891	10,818
	100%	100%	100%

Source: ELSA wave 1.

As shown in Table 10 and Table 11, average real and financial wealth are positively correlated with financial literacy.

Table 10: Average real wealth by cohort and numeracy/financial literacy score

Financial Literacy Score	Real wealth by cohort (in €)			
	1904-1925	**1926-1935**	**1936-1945**	**1946-1957**
1	103,634	119,489	122,209	150,315
2	100,691	127,889	135,807	121,726
3	156,141	196,553	204,541	201,296
4	206,167	267,812	306,421	264,994
5	250,270	301,505	420,629	352,170

Source: ELSA wave 2.

Table 11: Average financial wealth by cohort and numeracy/financial literacy score

Financial Literacy Score	Financial wealth by cohort (in €)			
	1904-1925	**1926-1935**	**1936-1945**	**1946-1957**
1	17,010	18,613	19,529	79,346
2	14,793	18,191	23,939	37,575
3	30,510	33,745	53,243	72,655
4	54,986	59,454	88,466	103,142
5	103,311	80,663	153,804	195,771

Source: ELSA wave 2.

Chapter II: How to make real asset liquid.

1. The use of reverse mortgages around the word

1.1. Reverse mortgage in the US

The most common - and usually the least expensive - type of reverse mortgage in the US[18] is the FHA[19]'s Home Equity Conversion Mortgage (HECM) program, which is designed for homeowners aged 62 or older. It has been authorized since 1987. People who are interested in obtaining a reverse mortgage are obliged to participate in a consumer information session given by a HUD[20] approved HECM counsellor. This ensures that borrowers are fully informed about the financial implications of this kind of mortgage and about its alternatives.

There are five different payment plans:

- **Tenure**: equal monthly payments as long as at least one borrower lives and continues to occupy the property as a principal residence.
- **Term**: equal monthly payments for a fixed period of months selected by the borrower. At the end of the term, the borrower does not have to repay immediately the loan, but he does not receive any other payment.
- **Line of Credit**: unscheduled payments or in installments, at times and in an amount selected by the borrower until the line of credit is exhausted. An attractive feature of this method is that the amount of cash available and not withdrawn grows over time at the same interest rate applied to the reverse mortgage plus 0.5%. For instance, suppose the borrower has a credit-line of $120,000, the interest rate is 5.5%, and he immediately withdraws $20,000, leaving $100,000. After one year, the available credit-line would be $106,000, i.e. $100,000 plus (5.5%+0.5%) times $100,000.
- **Modified Tenure**: combination of line of credit and scheduled monthly payments for as long as the borrower remain in the home.

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18 Other reverse mortgages are: Deferred Payment Loans (DPLs) offered by several local and state government agencies, Property Tax Deferral (PTD) offered by the public sector only to pay borrowers' property taxes, and Proprietary Reverse Mortgages developed by private companies mainly for homeowners whose house worth more than the HECM limit

19 Federal Housing Administration.

20 U.S. Department of Housing and Urban Development.

- **Modified Term**: combination of line of credit plus monthly payments for a fixed period of months selected by the borrower.

The FHA is responsible for paying the lender for any difference between the total loan amount and the amount for which the mortgaged property is actually sold. FHA insurance also ensures payments to the borrower in the event the lender is unable or unwilling to make payments, and regardless of what happens to the property's value. For this reason, there is an initial Mortgage Insurance Premium (MIP). In case of HECM Standard it is 2% of the lesser of the appraised value of the home, the FHA HECM mortgage limit of $625,500 or the sales price. On the other end, the HECM Saver - introduced on October 4, 2010 - only charges 0.01%. However, in the latter case it is possible to borrow a lower amount of money. Moreover, in both cases it is applied an annual MIP of 1.25% of the mortgage balance[21].

Other costs includes interests, third party charges, servicing fees, and origination fees. The latter is equal to $2500 if the value of the house is less than $125,000, otherwise it is equal to 2% of the first $200,000 of the home's value plus 1% of the amount over $200,000. The cap for this fee is $6,000.

Table shows how much it is possible to get from a HECM at different ages and using different interest rates[22].

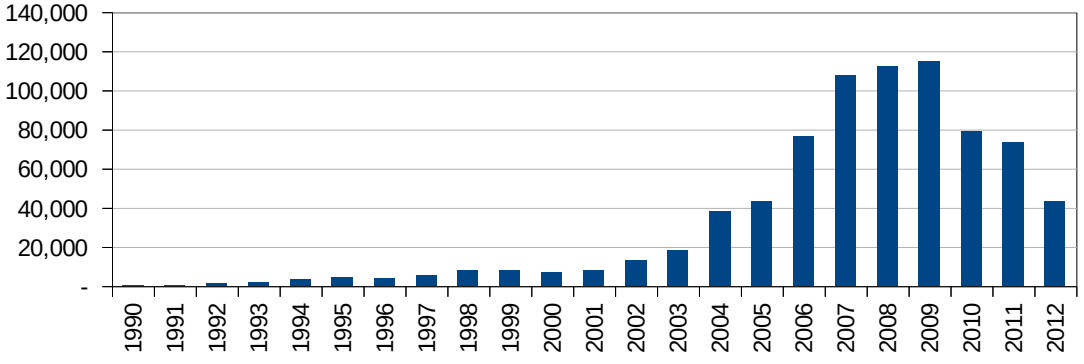
[21] A mortgage balance is the full amount owed at any period of time during the duration of the mortgage.
[22] The servicing fee is $35, closing costs are $2,500, and the origination fee is the maximum allowed by HUD. This table has been taken by AARP(2010)

Table 12: HECM Lump Sum or Credit Line

		Lump sum or creditline when expected rate is		
Home Value	Age	6%	7%	8%
$150,000	65	$74,325	$59,626	$47,530
	70	81,782	68,513	56,965
	75	89,638	78,084	67,672
	80	97,930	88,228	79,088
	85	106,260	98,400	90,820
	90	114,250	108,233	102,207
$250,000	65	$129,925	$105,026	$84,530
	70	142,182	119,713	100,165
	75	155,038	135,484	117,872
	80	168,530	152,128	136,688
	85	181,960	168,700	155,920
	90	194,650	184,533	174,407
$350,000	65	$186,025	$150,926	$122,030
	70	203,082	171,413	143,865
	75	220,938	193,384	168,572
	80	239,630	216,528	194,788
	85	258,160	239,500	221,520
	90	275,550	261,333	247,107

As shown in Table 13 the number of reverse mortgages has increased exponentially in the last decade, although it has dropped sharply after 2009. However, this could be interpreted as a short-lived reaction to the sub-prime crisis, rather than a change in the long-term trend.

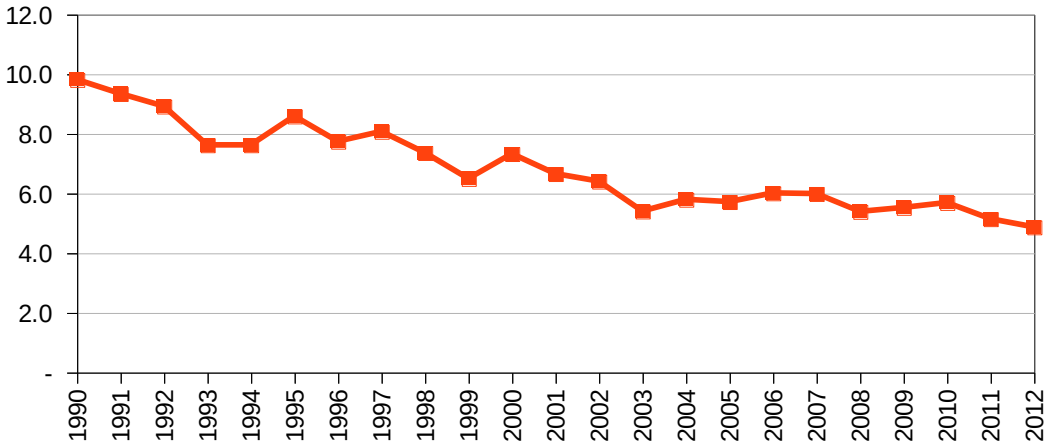
Table 13: Number of HECM in the US, 1990-2012



Source: HUD, June 2012

Furthermore, Table 14 shows the gradual decrease in HECM average interest rates. More precisely, it represents the expected interest rate for HECM, i.e. the 10-Yr constant maturity treasury rate at closing plus lender margin.

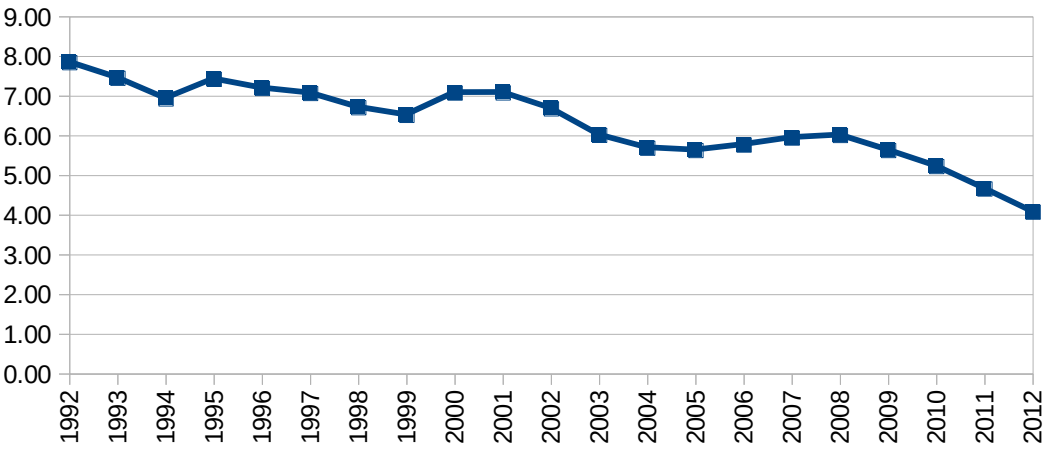
Table 14: Average expected interest rate for HECM in the US, 1990-2012



Source: HUD, June 2012

It is interesting to compare it with the historical pattern of the average interest rates for FHA-Insured 30-yr fixed rate one living unit home mortgages[23] displayed in Table 15.

Table 15: Average expected interest rate home mortgage in the US, 1990-2012



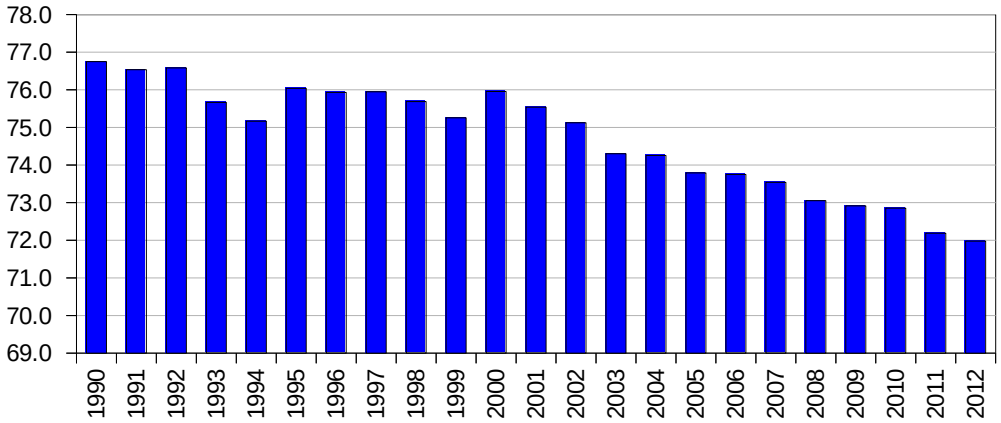
Source: HUD, May 2012

In addition to this, according to FED, in June 2012 the average 30-year fixed-rate conventional mortgage rate was 3.68%.

[23] The interest rates are computed without considering the HECM loans

Table 16 shows the average age of those who have applied for the HECM programme. Starting from 2000, there has been a constant decrease in the average age. This could be interpreted as a signal in favour of the life-cycle model, showing that people are starting to decumulate at early stage, as it would be expected.

Table 16: Average borrower age in the US, 1990-2012



Source: HUD, June 2012

On the other hand, since reverse mortgages are often used as an extreme solution to liquidity constraints, this decrease could indicate an increase in poverty among the elderly (see Table 17, Table 18 and Table 19 below[24])

24 These tables have been taken by Banerjee[2012].

Table 17: Poverty rates for different age groups over age 50, 2001-2009

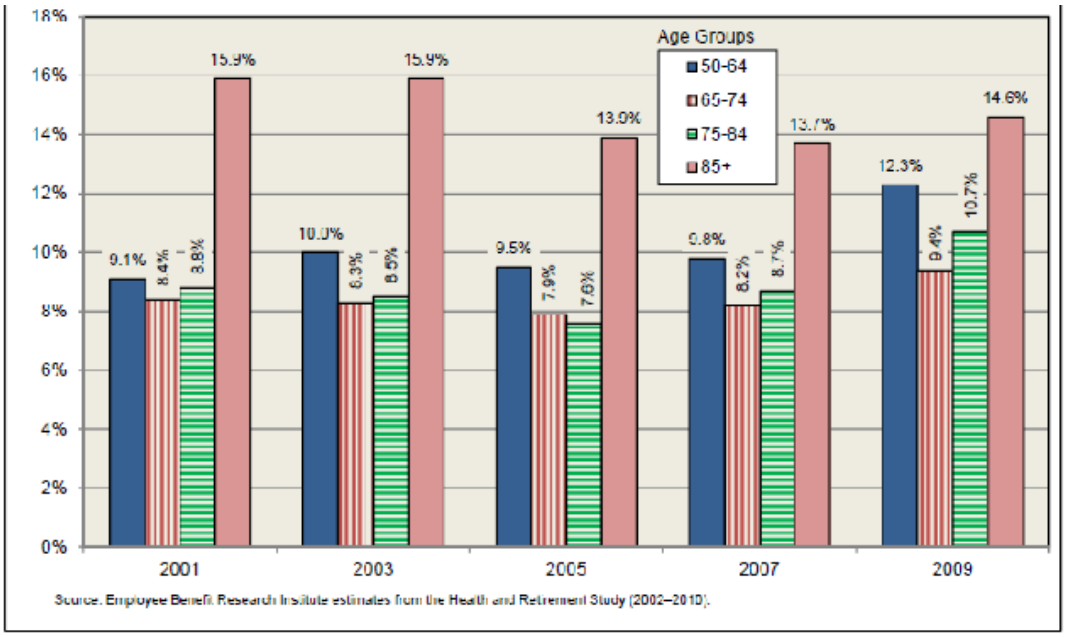
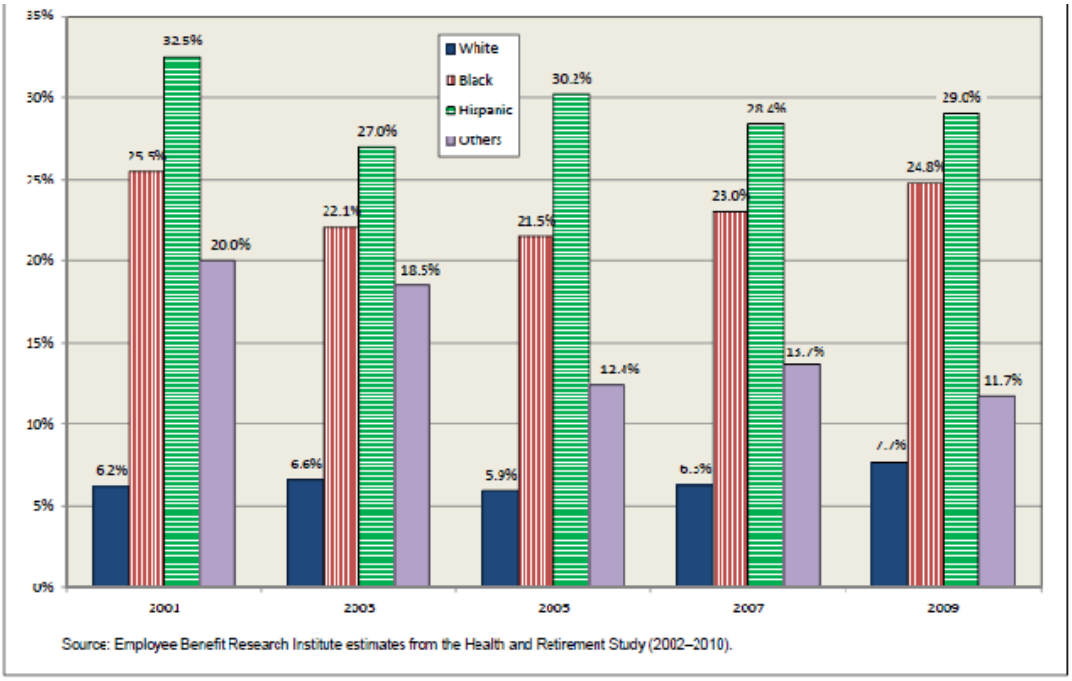


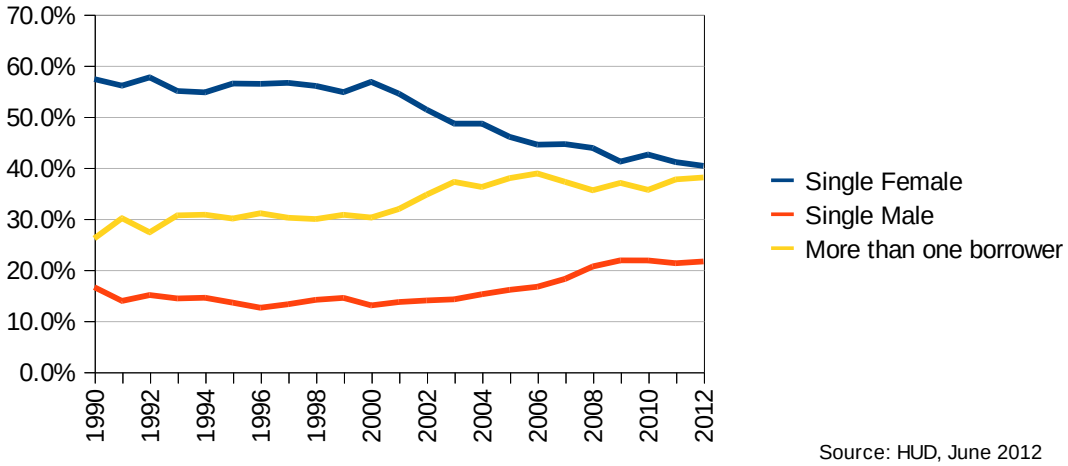
Table 18: Poverty rates for men and women ages 65 or above, 2001-2009

Table 19: Poverty rates across different races for ages 65 or above, 2001-2009



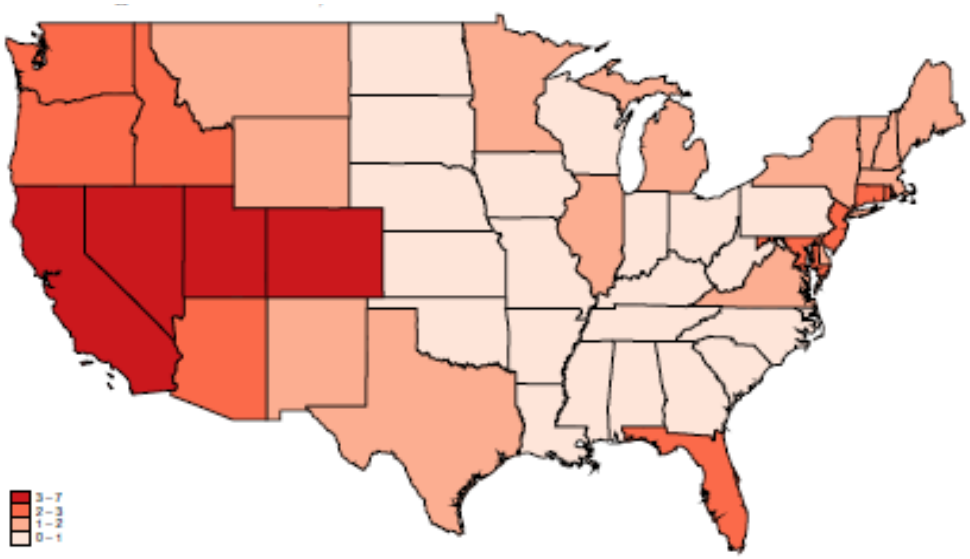
It is possible to verify from Table 20 how the type of HECM borrower has evolved over time in the US. The proportion of single female has decreased over time, although remaining the highest one.

Table 20: Type of borrower in the US, 1990-2012



Source: HUD, June 2012

Figure 1: Reverse mortgage originations as a percentage of owner-occupied units with householders aged 60 or above, 1989-2007



1.2. Reverse mortgage in the UK

There are two types of equity release available to individuals aged 55 and over in UK: Lifetime Mortgages and Home Reversion plans.

In the past decades reverse mortgages have been criticized in the United Kingdom because of their unexpected impact on some consumers. Indeed, in the late 1980s thousands of retired people took out variable rate reverse mortgages and put the money thereby obtained into stock market-related investment bonds. The income from these bonds was expected to be sufficient to pay the interest on the mortgage and provide additional regular income. However, the market produced poor returns on the bonds, and at the same time interest rates rose and property values fell. Many consumers' debts exceeded the value of their properties, so that providers evicted them and a significant number are still involved in court actions with providers.

For this reason, in 1991 Safe Home Income Plans (SHIP) was established as a self-regulatory body for equity release products. From October 2004, the United Kingdom's Financial Services Authority (FSA) has regulated mortgages, including reverse mortgages and home reversion schemes. In particular, in the new regime reverse mortgages are

considered to be higher risk and, accordingly, the FSA provides extensive guidance relating to the sale of these products to protect vulnerable older consumers[25].

Types of equity release:

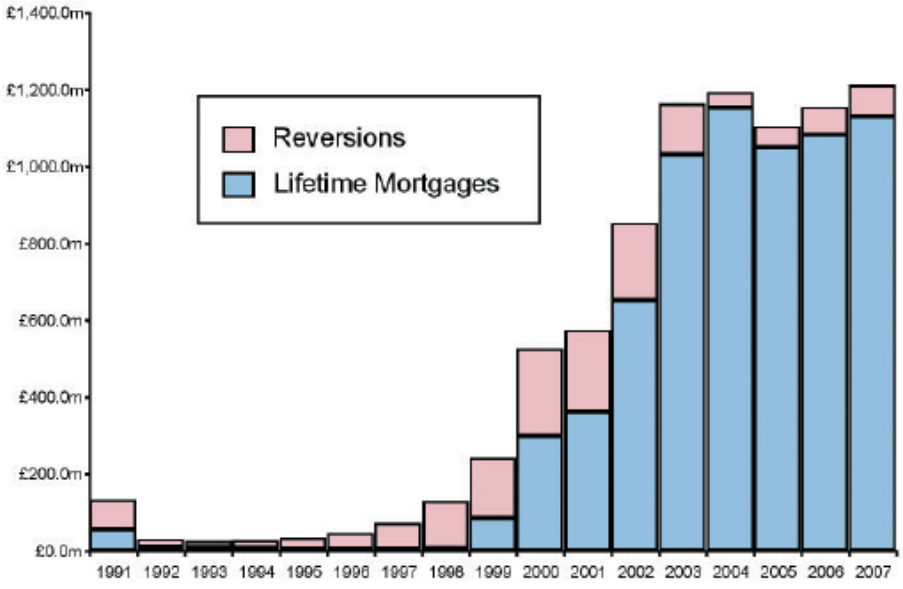
- **Roll-up lifetime mortgage:** elderly people receive an agreed sum against the value of their property and interest payments are added each year to the loan. The total amount repaid to the provider when the property is eventually sold is the initial loan amount plus any accumulated interest. For most plans the interest rate is fixed and does not change during their lifetime.
- **Drawdown lifetime mortgage:** Works the same as a roll-up lifetime mortgage except people can choose to release the money flexibly, as and when they need it. They can choose to have money in a reserve account, ready to withdraw. Interests will not accrue on the money held in reserve until borrowers released it. It allows to reduce the interest charge and have the safety of a cash reserve.
- **Interest only lifetime mortgage:** As with the Roll-up and Drawdown lifetime mortgages, borrowers receive a cash lump-sum and maintain 100% home ownership. Unlike the others, though, borrowers can choose to pay the interest on a monthly basis. In fact, they can choose to pay anything from £25 per month up to the full amount of interest due. Any interest not paid will accrue as with the Roll-up lifetime mortgage. It is possible to decide how long they want to pay interest for (for example, 1 year, 5 years or even up to the lifetime of the loan). If they decide they don't want to make monthly payments any more, they can stop and the plan will change to a regular Roll-up lifetime mortgage.
- **Home reversion plan:** A home reversion scheme involves the elderly selling part or all of the value of their property to the equity release provider in exchange for a lump sum**.** The cash lump sum that they would receive is the actual value of the full market value of the property.

In the next tables[26] it is possible to see the growth of equity release products over the last years in the UK. Lifetime mortgages are by far the most important product. As

[25] Despite all these regulations, international researches show that advice given to borrowers is often inadequate. Cfr. ASIC (2005).

in the case of the US, it is possible to see an absolute reduction in the number of reverse mortgage after the sub-prime crisis. Nevertheless, from a relative point of view things change. Indeed, according to FSA, there was a slight increase in the sales of lifetime mortgages between the second quarter of 2010 and the first quarter of 2011. The proportion of lifetime mortgages over total mortgages increased slightly - by 0.1 percentage points - up to 2.2% during this period; however, the biggest rise took place between the first quarter of 2008 and the second quarter of 2009 (from 1.1% to 2.4%), at the height of the crisis. In fact, in that period total sales of mortgages contracted by 52%, whilst lifetime mortgages expanded by 0.3%. The main reason behind this trend is that for elderly people reverse mortgage might have been the only source of income, particularly if their pensions were below or around subsistence level.

Table 21: Equity release product growth



Source: SHIP

[26] All tables have been taken by SHIP (2009) and SHIP (2012

Table 22: Value of plans advised on (1992-2010)

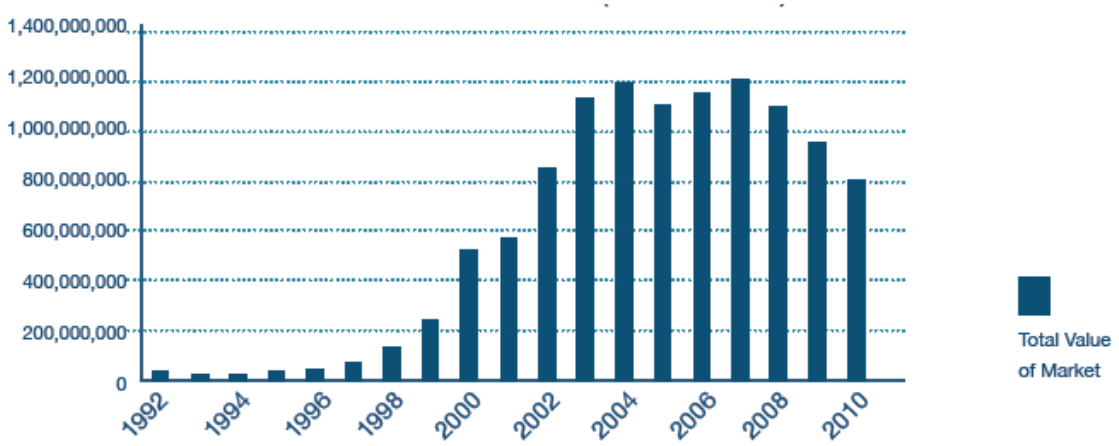
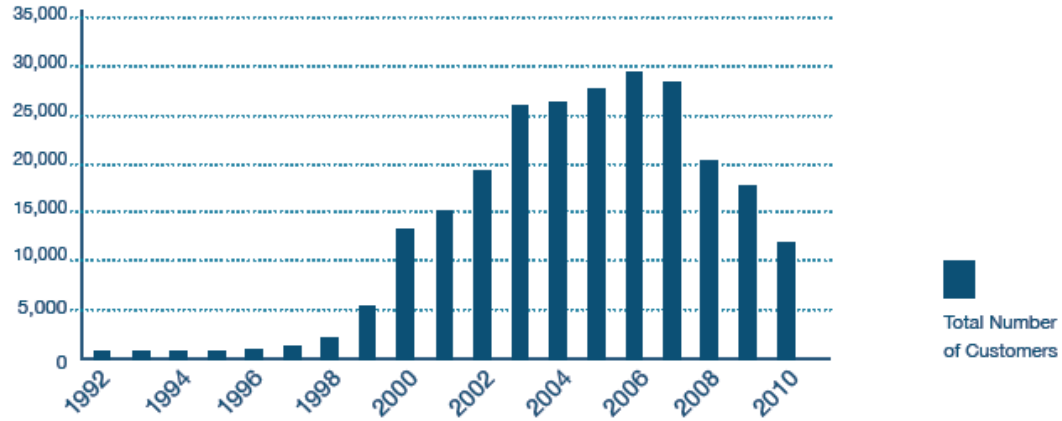


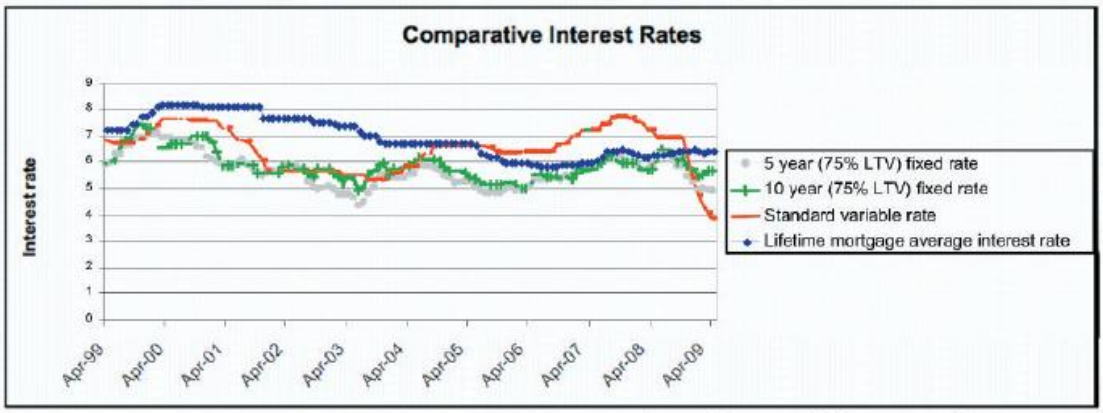
Table 23: Volume of plans advised on (1992-2010)



There is a common perception that the interest rates applied to lifetime mortgages are significantly higher than the interest rates associated with standard mortgages. In fact, as the graph below demonstrates, the differential should not be overstated. Between April 1999 and April 2009, the lifetime mortgage interest rate was on average 1.3% higher than the average five year fixed mortgage interest rate; 1.1% above the average 10 year fixed mortgage interest rate; and just 0.5% above the standard variable rate[27]. These spreads narrowed sharply after 2006.

27 The Standard Variable Interest Rate (SPV) is based on Bank of England's base lending rate.

Figure 2: Comparative interest rates



Source: Ernst and Young analysis, June 2009

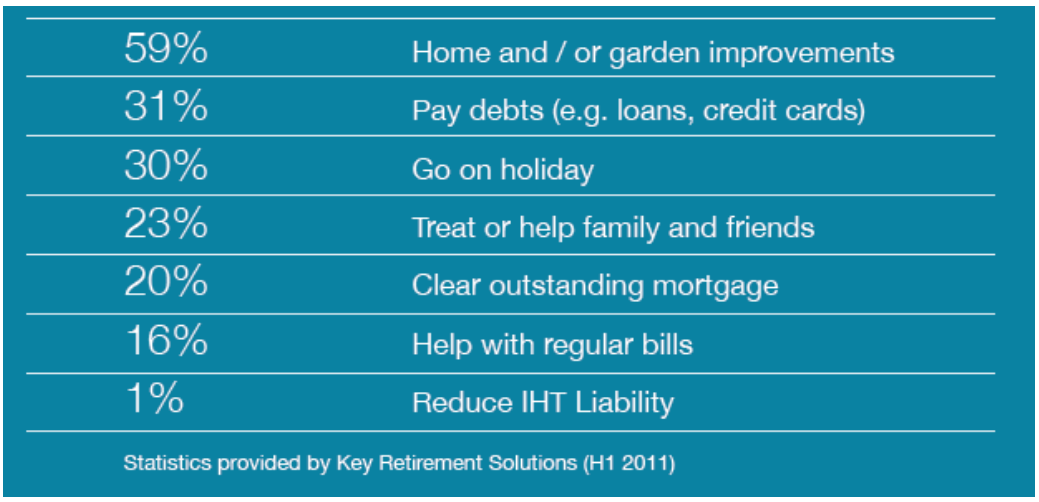
It is worth noting that the higher lifetime mortgage interest rate is due to a number of factors. Firstly, the NNEG[28] and other guarantees need to be financially sustained. Secondly, the fact that the average duration of a lifetime mortgage is longer than that of a standard mortgage introduces additional interest rate risk for the provider. Last but not least, the investor perspective is important here. Indeed, reverse mortgages have been introduced relatively recently, and its market is still thin and not liquid. Moreover, lifetime mortgage assets tend to be viewed as longer-term and somewhat less certain. Therefore, markets impose a premium price for risk when they do not feel familiar with a product. These factors combine to increase the required interest rates on these products. However, if the equity release market becomes more mainstream, it may be likely to see a decline in the interest rates on lifetime mortgages.

Overall, borrowers surveys - as the one below - suggest there are two distinct (and somewhat opposing) trends: an increase in people using released equity for lifestyle purposes (holidays, leisure time, etc.), while several people use reverse mortgages to pay back their debts. This latter trend might be a result of increased indebtedness of the UK population over the last ten years, combined with the recent economic crisis which has left many pensioners without an adequate income from their savings. On the other hand, the former trend is likely to be the result of overall higher house prices - at least before the recent economic crisis, a shift in attitudes towards using housing equity in

[28] Borrowers have a no negative equity guarantee (NNEG), which means that they will never owe more than the value of their home.

retirement, and the higher expectations of retiring baby boomers looking to maintain their standards of living in later life.

Figure 3: Popular uses for equity release



1.3. Reverse mortgage in Australia

Starting from 2004, Australia has seen a rapid development in the range of equity release products[29]. The three types of products available - or soon to be available - in Australia are:

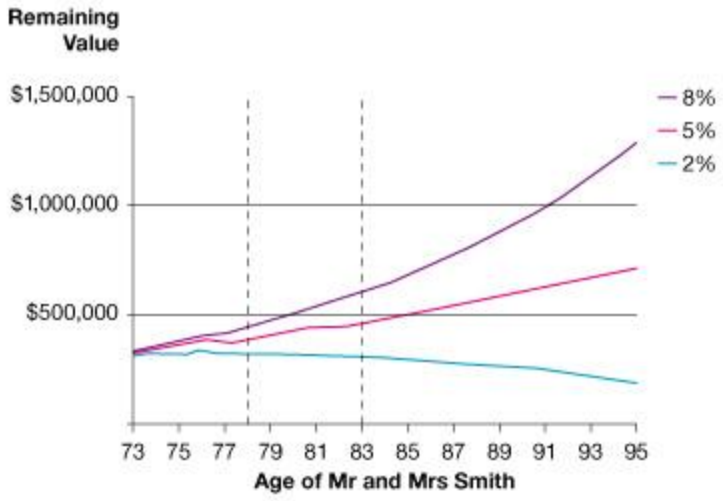
- **Reverse mortgages:** the consumer's house is used as collateral for a loan, which is provided to the consumer in the form of a lump sum, a regular stream of payments or both.
- **Home reversion schemes:** borrowers sell part or all of their homes to a reversion company. The homes are sold for less than their market prices - namely, the actual prices of their market value - but borrowers can remain in the property until they die or voluntarily leave the homes.
- **Shared appreciation mortgages (SAMs):** borrowers give up the rights to some of the capital gains on the properties in return for paying reduced or no interest on those parts of their borrowings.

[29] Between the first quarter of 2004 and the first quarter of 2005, the number of new loans provided was 8,899, going in actual terms from $468 million to $770 million. This growth was mainly due to ageing population and rising housing prices.

These products are usually available for homeowners aged 60 or over, also without an income. The sector is monitored by the Australian Securities&Investments Commission (ASIC).

To better understand the product, it can be useful to have a look at the simulation provided by ASF[30]. Suppose that Mr and Mrs Smith are both aged 73 and own their home. Their property is valued at $350,000. They apply for $30,000. Then, after five years, they apply for a further advance of $20,000. Five years later, they decide to and apply for a further advance of $20,000.

The graph below shows the amount of capital remaining for Mr and Mrs Smith, or their beneficiaries, after the loan is repaid. This is illustrated for three different property growth rates - 2%, 5% and 8% growth per annum. Moreover, it is assumed that Establishment fee is $995, variable interest rate is 8.30% per annum, Mortgage Discharge fee is $395, and Variation fee is $295



1.4. Reverse mortgage in New Zealand

Equity release schemes have been introduced only recently in New Zealand. The Housing Corporation of New Zealand began a pilot scheme *Helping Hand Loans* in November 1990. So far, reverse mortgages have been almost synonymous with home

30 Australian Seniors Finance (ASF) is an Australian company specialized in home equity release

equity release in New Zealand and are the most common form of scheme currently available, provided by the main players in the market as well as by smaller providers.

In general, firms have offered this kind of products to people aged at least 60. Usually, if a couple apply for a reverse mortgage, the youngest partner is the one who has to be 60-year-old or more, although Sentinel may consider applications where the younger spouse is aged 55-59. In practice, people tend to enter the schemes at an older age.

Reverse mortgages can take the form of lump sums - by far the most common - annuities, and line-of-credit schemes. In this latter case, there is usually an inflation clause, which means that the amounts not drawn will increase at 5% annually. Moreover, most schemes guarantee that the borrower's liability will never exceed the market value of the home ("no negative equity guarantee").

Looking at the market before the 2007-2009 crisis, Trowbridge Deloitte actuaries published a study of the New Zealand reverse mortgage sector in late 2006[31]. This research found that in 2006 the market doubled over the year. Indeed, more than 4,500 loans were issued with a overall value of $227 million.

Albeit reverse mortgages do not have a good reputation, as in the US and UK, surveys of equity release clients have found high levels of satisfaction.

In order to offer a case study, it is possibly to see below the terms and conditions offered by one of the most important operators in this market, namely Sentinel.

According to the table below[32], borrower aged 60 can borrow up to 15% of their home's value. This percentage increase of 1 percentage point for each year of age.

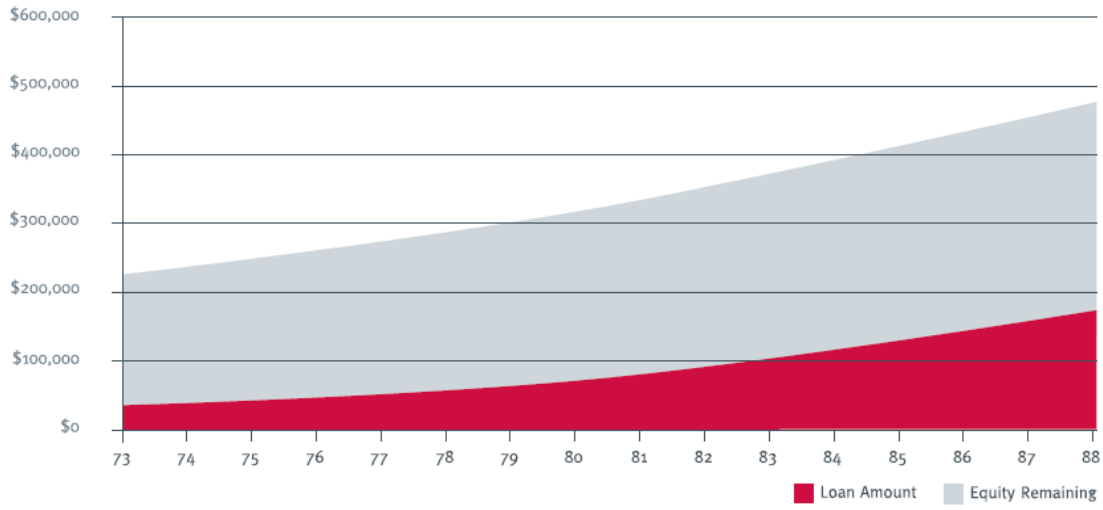
31 Hickey and Sorbello (2007).
32 Taken by Sentinel (2011).

Table 24: Reverse mortgage, sentinel calculation

Age of Youngest Borrower	Maximum % of Home's Value Available
60	15%
67	22%
70	25%
73	28%
80	35%
84	39%
90 and over	45%

Moreover, the minimum value of the house has to be $150,000, whereas the maximum loan amount is $250,000. As far as the interest rate is concern, in 2011 Sentinel did not offer reverse mortgages with fixed interest rate, while the variable rate was 6.7% per annum compound and added to the loans monthly. However, Sentinel aims to maintain the variable rate at approximately 1.5% above the major banks' variable mortgage lending rates.

In the following simulation, it is assumed that a couple aged 73 and 74 year takes out a lifetime loan for $40,000 in the form of lump sum, while their home's value is $230,000. Moreover, it is supposed that the average interest rate during a 15 year loan period is 9.95%. After 15 years, the chart below shows how the value of the home has increased, whilst the red area shows how much of that value will be used to repay the Sentinel Lifetime Loan. Please note that 15 years is just an example.



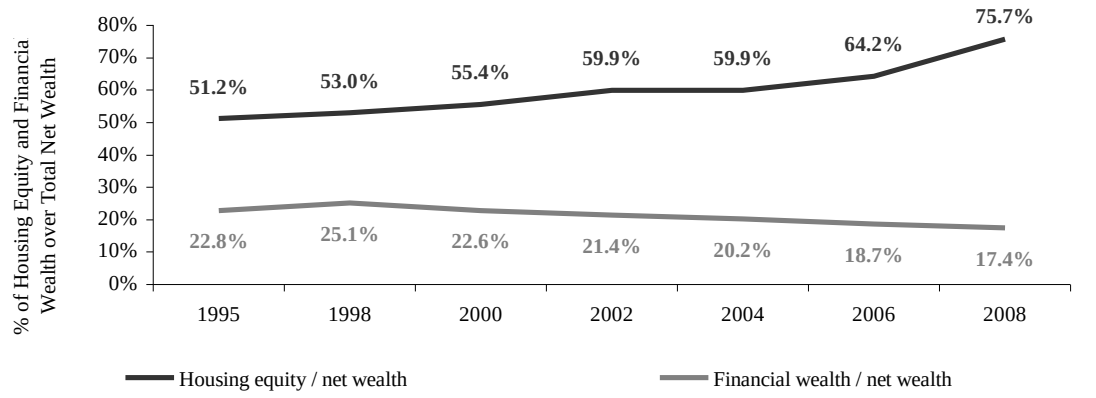
In addition to private cost and benefits, reverse mortgages may be a useful tool in order to increase individual responsibility by making use of capital tied up in homes. Policies may aim at exploiting housing wealth to provide funds for the care of older people, in the community as well as institutional care, to meet health costs and to maintain the housing stock. These could help to ease the strain on the public sector budget in the face of population ageing.

2. Empirical Investigation: The Reverse Mortgage in Italy

Our empirical investigation aims at clarifying Italian households' attitudes on liquidating their housing wealth, and in particular elderly homeowners' interest for the reverse mortgage (RM). The RM was formally introduced in Italy in 2005 under the name of Prestito Vitalizio Ipotecario and is available only to homeowners aged over 65 whose housing equity exceeds 70,000 euros.

Figure 4 illustrates the relationship between housing wealth and net total wealth through a 13 years time series extracted from Bank of Italy's Survey of Household Income and Wealth (SHIW, 1995 – 2008)[33]. The ratio between housing wealth and net total wealth fluctuates around 0.7 and has been steadily increasing throughout the years, from 0.51 in 1995 to 0.76 in 2008; such ratio is even higher when median values are considered – from 0.56 in 1995 to 0.82 in 2008; conversely, the ratio between financial wealth and net wealth has been steadily decreasing, from 0.23 in 1995 to 0.17 in 2008. Liabilities have also increased, from 0.1 in 1995 to 0.21 in 2008. Figure 1 shows how the rate of homeownership among Italian households has been steadily increasing since 1995, reaching 71.2% in 2008.

Figure 4: Percentage of Housing Equity (first Home) and Financial Wealth over Total Net Wealth[34]

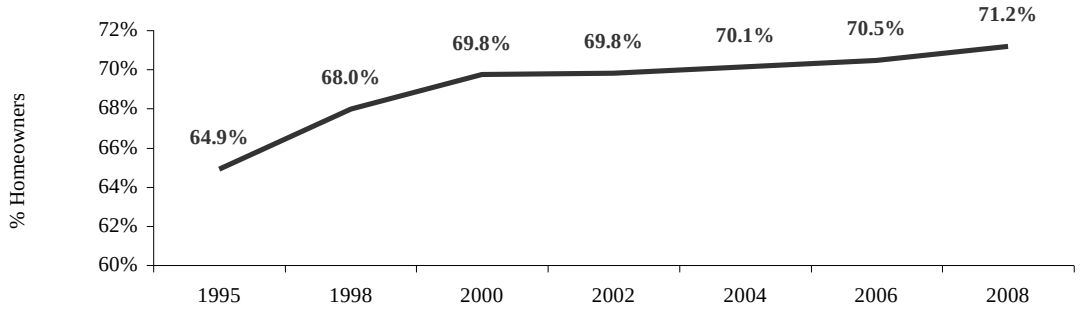


Source: Bank of Italy's Survey of Household Income and Wealth (SHIW), 1995-2008.

[33] By housing wealth we mean only the value of the first home; real wealth includes all properties, such as second homes, farmland, private businesses and valuables; total net wealth is the sum of real and financial wealth, minus liabilities; by financial wealth we mean bonds, deposits and other financial instruments.

[34] Mortgages are not included.

Figure 5: Evolution of homeownership rate



Source: Bank of Italy's Survey of Household Income and Wealth (SHIW), 1995-2008.

Given the high rates of homeownership and the substantial housing wealth, financial instruments capable of unlocking such wealth could be welfare-improving for a large number of elderly households. Our analysis will focus on the prospective market for a RM in Italy and we will draw on a unique dataset (UniCredit 2007) to investigate the potential determinants of its demand.

2.1. RM literature overview

Several studies on the potential use of RM have been carried out in the US and other Anglo-Saxon countries, while a few newspaper articles (Sole24 ore) deal specifically with the Italian market. They all draw on the idea that households accumulate housing wealth as a buffer stock, often at the expenses of a more diversified, and therefore more efficient allocation of savings.

Excessive illiquid wealth and poor portfolio diversification leave elderly households particularly exposed to financial risks and house prices fluctuations, and a sound financial literacy[35] might reduce such risks. Furthermore, as reverse mortgages entail the payment of compound interests, and are regulated under different tax regimes depending on whether they are granted by a Bank or other institutions, a good level of financial literacy, becomes a prerequisite for an effective choice. The lack of it may

[35] Lusardi and Mitchell (2006) defines financial literacy as a set of tools enabling one to better allocate financial resources; it is often associated with numerical skills, such as the ability to calculate rates of return on investments, the interest rate on debt, or the understanding of economic concepts such as the trade-off between risk and return, the benefits of diversification, and the benefits and risks associated with specific financial decisions.

induce miscalculation about the future gains granted by the loan and lead to disappointment, as reported by Leviton (2002) in her study on elderly Australian homeowners and Reverse Mortgage decision-making.

Economics literature itself is not univocal about the share of potential beneficiaries from a RM, however, the general consensus is that the market is under-developed: Venti and Wise (1991) maintain that, as RM determine only a small percentage increase in income even at low income levels, the potential market is limited to very old, single persons. Mayer & Simons (1993) claim instead that the potential market for RM is quite large, as many elderly could use it to pay off pre-existing debts. Mitchell & Piggot (2003) highlights the potential for RM not only to boost consumption among the elderly, but also to reduce public pension liability, and mitigate the demand for long term care facilities. In her study of the Australian market, Ong (2003) states that who would benefit the most from a RM are single women aged 80 or over, and that RM had the potential to lift out of poverty 95% income-poor elderly Australians. More recently, Shan (2009)'s report to the US Federal Reserve Board of Governors, states that the trend in the RM market has reversed: despite a slow uptake during the first ten years, the number of loans more than decupled during the following seven, from less than 10,000 in 2001 to over 100,000 in 2007. His explanation for such exponential growth in RM uptake lies primarily in a decrease of the interest rates, house price appreciation and an increased willingness to take on debt – he shows that the fraction of indebted homeowners has increased from 44% in 1989 to 57% in 2007.

Like all (intertemporal) choices, taking out a reverse mortgage involves a trade-off: a euro borrowed on a reverse mortgage and consumed today is a euro (plus interest and fees) which will not be available for other purposes tomorrow, (Webb 2009), therefore it is worth analysing a series of possible reasons which could motivate a weak response on behalf of the homeowners. First of all, the homeowners' bequest motive, as reverse mortgages severely reduce the inheritance they intend to leave; however, Mayer & Simons (1993) mention a vast literature according to which the bequest motive may not be as important in explaining savings behaviour, and that often bequests are involuntary. Rodda et all (2000) confirms that, based on lenders' perceptions, many actual borrowers do in fact have children and that often it was the children who suggested they take out the loan. A negative attitude towards borrowing (debt-aversion), may hamper the

willingness to take out any type of non strictly necessary loan, that is to cover basic expenses or repay outstanding debt. Gibler and Rabianski (1993) consider debt-aversion among the elderly as a deterrent; they find that older consumers do not generally like to buy on credit and would rather live on less income than taking out a loan. Caplin (2000) relates the presence of debt with an increase in uncertainty, suggesting that households may prefer a lower level of consumption in a debt-free house to a somewhat higher level in a debt-ridden one.

Lending is a trust intensive activity (Guiso, Sapienza, Zingales 2001), therefore a lack of trust in financial advisers or financial institutions, could exacerbate homeowners' scepticism towards new products such as RM. Finally, the products' high costs, might turn a potentially profitable financial instrument into a last resort remedy for liquidity constrained households.

In order to better understand what could spark interest in RM, we exploit some insights provided by qualitative research conducted in the US and Australia. The first paper, Leviton (2002), is based on open-ended interviews of American elderly homeowners who had received reverse mortgage counselling, and explores the decision making process leading to the uptake of the loan. Leviton portrays the process as slow and painful, both because of the uncertainty regarding the level of future payments, and because of the irreversibility of the choice; she reveals that elderly homeowners prided themselves with frugality, that RM directly conflicted with the desire to leave a legacy, and highlights how for most households, RM had been a last resort choice, an instrument to pay off debts rather than increase consumption. Support for Levitons' analysis can be found in Shan (2009), where it is underlined that the fraction of indebted homeowners has sharply increased and that only 10% of HECM borrowers had chosen the tenure payment plan or the modified tenure payment plan, suggesting that the annuity aspect of reverse mortgages is irrelevant to most borrowers and that consolidating pre-existing debts is one of the driving motives to apply for the loan.

The second paper, Reed (2009), investigates Australian homeowners' experience with RM, focusing on their understanding of the product. Reed draws on two different surveys: the first conducted by SEQUAL (Senior Australians Equity Release Association of Lenders) in 2008, interviewing 1,000 homeowners, and the second conducted by

ASIC (Australian Securities & Investments Commission) in 2007 interviewing only 29 homeowners who had already taken out a reverse mortgage. Both surveys meant to ascertain whether RM could benefit elderly Australians or alternatively be misunderstood; the SEQUAL survey showed that, even though more than 70% of the respondents were aware of reverse mortgages, only 40% understood their basic features, and specifically that no repayments were due and the house would not be sold. As for the ASIC survey, it focused on lenders behaviour and exposed that many did not explain the workings of compound interest rates, or show a projection of how much the loan would cost over time.

Tversky and Kahneman's Prospect Theory (Kahneman & Tversky, 1979) provides an important framework to analyse asymmetric or inertial behaviour[36]; loss aversion induces a bias that favours the preservation of the status quo over other options, and this would encourage inaction over action and usual behaviour over innovative behaviour. Debt-aversion combined with loss-aversion and preference for the status quo can account for the initial lack of interest in RM.

The demand side is not entirely responsible for the perceived underdevelopment of the RM market: inadequate supply and the lack of appropriate regulation also play a big role. Limitations on the supply side can be explained by the risk factors faced by the credit institutions, primarily related to the dynamics of interest rates and house prices, but also by the potential adverse selection in case of extremely long lived mortgagors, and moral hazard in case of meagre house maintenance by homeowners intending to default on their contract obligations. In order to compensate for all such risks, lenders charge hefty insurance fees, which together with high commissions and compound interests make RM rather costly. Davidoff & Welke (2005) ignore moral hazard in house maintenance as they see it as irrelevant, and investigate adverse selection by comparing the mobility rates between RM borrowers and not borrowers. Interestingly, they unearth *advantageous selection*, as the homeowners who take out RM are also more likely to sell their home and therefore repay the loan earlier. Caplin (2000) places more emphasis on moral hazard in home maintenance; he argues that, as the typical RM borrower is very

[36] Tversky and Kahneman (1991) state that (financial) decisions depend on the status quo, individual choices are not independent from initial entitlements and the outcome of risky prospects are evaluated by a value function that has the following three characteristics: *reference dependence* – the values of gains and losses are defined relatively to a reference point; *loss aversion* – the value function is steeper in the negative than in the positive domain; and *diminishing sensitivity* – the marginal value of both gains and losses decrease with their size.

old, very poor and likely to suffer from health problems, she is also more likely to let her property deteriorate, and given such characteristics, the legal provisions put in place to protect the lender may not be enforced. Caplin advocates a rationalisation of regulatory system as a means to foster financial innovation in general, and promote RM in particular.

As for what concerns RM regulation, Ong (2003) highlights the unfavourable tax regimes as one of the reasons behind the scarce development of RM market in the UK, where RM income was taxed and could reduce social security entitlements. While Reed (2009) expresses concern among Australian RM users regarding the possibility for negative equity to occur, where the amount of the loan exceeds the value of the house and the homeowner is potentially evicted (and the house sold). Mitchell and Piggott (2003)'s study on housing equity in Japan maintains that improving the efficiency of capital markets and providing safeguards for both borrowers and lenders is a necessary prerequisite for the development of a market for RM.

Albeit acknowledging the role played by credit institutions and regulators, we will focus our empirical analysis on the demand side and will try to shed some light on Italian households' preferences and decisional dynamics.

2.2. Descriptive statistics on microeconomic data

2.2.1. The UniCredit sample

Our analysis draws from the 2007 UniCredit Survey (UCS). As well as collecting detailed demographic and financial data on a sample of 1,686 individuals, the survey elicits respondents' opinions towards risk, investments and savings, and tests their level of financial education. A specific question is asked to ascertain respondents' interest in RM. Additional data have been extracted by Bank of Italy's Survey of Household Income and Wealth (SHIW) 2006 to compare the characteristics of our respondents with a representative sample of all Italian population.

We will consider households and not individual homeowners, and the interest in RM expressed by householders: a brief description of the product – only the tenure option – was given by the interviewer, who then asked respondents to assign a value between 1 and 5 according to their level of interest; 1.1% claimed to be "Very interested", 6.2%

"Quite interested", 12.9% "Somewhat interested", 20.4% "Barely interested" and 59.4% "Not interested". Again, if we consider only the over 65, they are nearly twice as likely to be "Very interested" (1.6% vs. 0.9%), but then the percentage of "Quite interested" decreases from 6.7% to 5.1%, so from a first glance, the thesis that elderly homeowners are more interested in the product does not find much support. (see Table 25)

Table 25: Interest in Reverse Mortgage

Interest in Reverse Mortgage (% of total)	Under 65		Over 65		
	Male	Female	Male	Female	All
Very interested	0.7	1.7	1.6	1.4	1.1%
Quite Interested	6.6	7.2	5.3	4.2	6.2%
Somewhat interested	14.1	14.4	9.2	12.7	12.9%
Barely interested	20.3	19.4	20.7	22.5	20.4%
Not interested	58.3	57.2	63.2	59.2	59.7%

Source: UniCredit survey 2007

2.2.2. Demographics and socio-economic indicators

The survey has been conducted by phone interviews targeting the bank's clients aged 21-75 with at least €10.000 in deposits.

Age and gender – The average (male or female) householder in UCS is about 55 years old, only a couple of years younger than the average householder in Bank of Italy's SHIW; the percentage of female householders is 22% in UCS, and 37.0% in SHIW, and the percentage of elderly (over 65) is 29.6% in UCS and 36.3% in SHIW. The average household is composed of 2.6 members in UCS and 2.5 in SHIW. (see Table 26)

Geography – UCS partitions Italy into four macro areas, North East, North West, Centre and South, resulting in an over-representation of residents in the North 51.3% (accounting for 43% of the Italian population according to the Italian national office of statistics) and the Centre 24% (19% of the population), and under-represents the South and Islands, 24% (35% of the population).

Education – Table 26 also shows the different levels of education attained by sample householders. It is worth mentioning that a small percentage of respondents did not complete the level started (be it a higher education degree or a lower education diploma), in which case the extra years have not been included and respondents have been assigned to the immediately preceding level. The UCS sample is by far more educated than average Italians: 5.3% of SHIW's householders have no education vs.

0.5% in UCS; 26.5% have primary education in SHIW, vs. 8.9% in UCS; 28.2% have lower secondary education in SHIW, vs. 20.4% in UCS; 24.2% have secondary education in SHIW vs. 40.8% in UCS; and 8.9% have higher education in SHIW vs. 24.4% in UCS.

Occupation – As for the occupational status, the most striking difference between the two samples is the high percentage of self-employed in UCS, 29.4% against the relatively low one in SHIW, 10.2%. Pensioners, employees and unemployed, represent a larger share of the population in SHIW.

Table 26: Summary statistics for demographics

	UniCredit	**SHIW**
Total number of observations / households	1,686	7,768
Average age of householder	56.0	57.6
% of female householders	22.0%	37.0%
% of elderly householders	29.6%	36.3%
Area of residence		
North	51.3%	44.6%
Centre	24.3%	20.16%
South	24.4%	35.3%
Education[37]		
No education	0.5%	5.3%
Primary education (5 years)	8.9%	26.5%
Lower secondary education (8 years)	20.4%	28.2%
Middle education / professional schools (11 years)	3.9%	6.7%
Upper secondary education (13 years)	40.8%	24.2%
Higher education (degree or more)	24.4%	8.9%
Occupation		
Pensioner – retired from work	32.3%	36.1%
Pensioner – not retired from work (disability benefits, etc)	2.6%	9.3%
Employee	30.8%	34.9%
Self-employed	29.4%	10.2%
Unemployed	4.0%	9.1%[38]
Household size	2.6	2.5

Source: UniCredit survey 2007 and Banca d'Italia "Survey of household Income and Wealth" (SHIW) 2006

Income and wealth – UCS average household is also considerably wealthier than the average Italian in SHIW[39]. Table 27 describes the summary statistics for income levels

37 *The years of unfinished levels of education are added to the immediately preceding level attained.*
38 *Includes housewives and voluntarily unemployed.*

and distribution in both UCS and SHIW: the average individual income in UCS is 50,717 euros (median 31,000), 2.75 times higher than the average SHIW income of 18,450 euros (median 15,349); the average UCS household income is 71,325 euros (median 48,393), roughly 2.2 times the average SHIW household income of 31,893 euros (median 26,217). UCS does not provide reliable point values regarding households' financial wealth, as more than 75% or the respondents refuses to indicate an amount, however, households are categorised according to their wealth bracket value, defined by the amount of money deposited in UniCredit current accounts, ranked from 1 to 6, ranging from 10,000 to 5 million euros. While the average financial wealth in SHIW amounts to 25,246 euros (median 6,674), with 18% households having no financial wealth at all, the average wealth bracket in UCS is 100,000 to 150,000 euros (with minimum wealth being 10,000 euros).

Table 27: Summary statistics for income levels and distribution

Percentile	UniCredit		SHIW	
	Household net disposable income	Individual net disposable income	Household net disposable income	Individual net disposable income
Total Observations	1,686	1,686	7,768	13,428
5th	17,934	9,500	9,078	3,767
10th	22,000	13,883	11,968	5,562
25th	31,733	20,000	17,169	10,000
50th	**48,393**	**31,000**	**26,217**	**15,349**
75th	76,655	55,000	39,766	22,487
90th	129,600	100,000	55,823	32,000
95th	195,827	150,239	69,275	41,294
Mean	**71,325**	**50,717**	**31,893**	**18,450**
Standard Deviation	**86,024**	**67,847**	**27,276**	**18,578**

Source: UniCredit survey 2007 and Banca d'Italia "Survey of household Income and Wealth" (SHIW) 2006

Housing equity – The percentage of home-owners is around 71% in SHIW, while in UCS it approximates 90%. As for the housing equity, Table 28 shows how the average house value in UCS is 1.8 times the average house value in SHIW. The data regarding housing equity were somewhat misleading, as a few hundred respondents provided inaccurate numbers (1s, 999s or 100 millions); after a sensible correction[40] the average

[39] However Banca d'Italia's official report on Household Wealth (2008) specifies that the sample is affected by selection bias, as in lower participation of wealthier households, and under-reporting regarding income and wealth.

[40] excluding all properties with less than 4 digits, losing 184 observations, and above 5 millions, losing 13 observations.

house value in the UCS amounts to 387,367 euros (with a standard deviation of 337,694), while the average value for the Italian population is 215,418 euros (median 180,000).

Table 28: Summary statistics for housing wealth levels and distribution

Percentile	UniCredit		SHIW	
	Household Housing Wealth	Housing Wealth per squared metre	Household Housing Wealth	Housing Wealth per squared metre
Total Observations	1,686	1,686	7,768	13,428
5th	120,000	1,166.7	50,000	666.7
10th	150,000	1,400.0	70,000	892.9
25th	200,000	1,875.0	110,000	1,307.7
50th	**300,000**	**2,500.0**	**180,000**	**1,875.0**
75th	465,000	3,582.0	250,000	2,560.0
90th	700,000	5,000.0	400,000	3,529.4
95th	975,000	6,383.0	500,000	4,285.7
Mean	**387,367**	**2,988.5**	**215,418**	**2,095.9**
Standard Deviation	**337,694**	**1,721.9**	**176,288**	**1,196.1**

Source: UniCredit survey 2007 and Banca d'Italia "Survey of household Income and Wealth" (SHIW) 2006

Saving rates and Precautionary Savings – Saving rates are divided into 7 categories, ranging from "over 50% of Yearly income" to "Could not save anything", and predictably they are slightly higher among the elderly. The average saving rate lies in the "5% to 10%" interval, while more than 21% of householders declares not to have saved anything. Predictably, saving rates are lower among the elderly, as approximately 25% of the over 65 has no savings. Albeit dealing with a wealthier sample, we have lower saving rates compared to what is reported in SHIW, where the average saving rate is 8.8%, and only 18.5% has zero or negative savings. (See Table 29). Householders' desired amount of precautionary savings, that is the amount of money put aside to protect oneself from increased uncertainty about their future earnings or unexpected expenses, is on average 4.5 times household income, and approximates 167,000 euros on average. Respondents were also presented with several reasons for saving and were requested to rank them according to their importance: as Table 30 shows, avoiding future debts, coping with medical expenses or dealing with unforeseen circumstances are generally considered more important than integrating one's future pension, leaving an inheritance and undertaking entrepreneurial activities.

Table 29: Summary statistics for household savings

% of Savings over disposable income	Age groups and sex householder			
	Under 65		Over 65	
	Male	Female	Male	Female
No savings	191 (20.7%)	64 (20.1%)	95 (24.1%)	28 (26.7%)
1% to 5%	121 (13.4)	40 (15.1)	48 (12.2)	18 (17.1)
5% to 10%	155 (16.8)	47 (17.7)	67 (17.0)	18 (17.1)
10% to 20%	169 (18.4)	59 (22.2)	81 (20.6)	20 (19.1)
20% to 30%	171 (18.6)	28 (10.5)	54 (13.7)	15 (14.3)
30% to 50%	82 (8.9)	23 (8.7)	34 (8.6)	5 (4.8)
More than 50%	32 (3.5%)	5 (1.9%)	15 (3.8%)	1 (0.9%)

Source: UniCredit survey 2007

Table 30: Summary statistics: reasons for savings

Reasons for saving (% of all)	Very Important	Quite Important	Somewhat Important	Not very Important	Not important
Dealing with unforeseen circumstances	46.5%	44.4%	7.7%	3.1%	1.3%
Providing for family's future needs	36.7	37.7	9.9	9.1	6.6
Integrate pension (after retirement)	24.0	36.6	14.1	13.5	11.9
Deal with medical expenses	40.4	41.1	8.8	6.3	3.4
Undertake entrepreneurial activities	7.3	15.5	11.2	17.3	48.7
Leaving a legacy / inheritance	11.0	33.9	18.7	19.6	16.8
Not having future debts	49.2	36.5	6.6	4.3	3.5
Buy a house	19.8	25.4	12.9	17.0	24.9
Buy durable goods	7.0	28.9	23.7	25.2	15.3
Have profitable assets	18.2%	43.4%	20.8%	11.0%	6.6%

Source: UniCredit survey 2007

2.2.3. Preferences and attitudes

The UniCredit survey provides a wealth of qualitative responses regarding preferences and attitudes, allowing us to outline a more detailed picture and better investigate respondents characteristics. Whenever similar questions are to be found in SHIW, a comparison between the two samples will be drawn.

Risk and Uncertainty – Many questions investigate respondents' risk attitude. A preliminary one prompts them to choose between a lottery with a 50/50 chance of winning, and one whose odds were unknown; 53.6% prefers the more certain lottery, 24.7% are indifferent and less than 24% prefers (or slightly prefers) the uncertain option. A second one looks into the perceived trade-off between risk and return, revealing that the majority of respondents are moderately risk averse or rather risk neutral, according to how the question is interpreted: less than 2% is willing to take on high risks in order to have high returns, 27.6% prefers good returns, but a discrete level

of safety, about 52% requires a discrete return together with a good level of safety, and less than 19% opts for low returns, as long as the risk is none. The same question is present in SHIW, and the results show a much more prudent attitude as nearly 50% or householders chooses the last option, low returns with no risks (See Table 31).

Table 31: Trade-off between risks and returns

Perception of risk/return (All)	UniCredit	SHIW
Total number of observations / households	1,686	7,768
High returns, high risks	1.8%	1.0%
Good returns, decent safety	27.6%	14.9%
Decent returns, good safety	52.0%	35.0%
Low returns, no risks	18.6%	49.2%

Source: UniCredit survey 2007 and Banca d'Italia "Survey of household Income and Wealth" (SHIW) 2006

The third set of risk-related questions is associated with the concept of *framing* – how a choice or an option can be affected by the way it is presented to a decision maker – and exposes respondents' risk attitude in two opposite scenarios: *gain* and *loss*. In the first scenario respondents were asked whether they would prefer a 50/50 chance to win 10,000 euros, or another amount – progressively increasing from 100 to 9,000 for every negative answer – for certain. In the second scenario the situation is reversed, and respondents have to decide whether they would prefer a sure loss of a smaller amount – progressively increasing from 100 to 9,000 euros – or a 50/50 chance to lose 10,000 euros. If we define all respondents who prefer less than the expected value (5,000 euros) as *risk-averse*, those who choose the expected value as *risk-neutral*, and the rest *risk-loving*, we see that their percentages among the sample population are 54%, 16.1% and 29.9%, respectively in a gain scenario, and 15.3%, 9.7% and 75% respectively, in a loss scenario, confirming the asymmetric behaviour predicted by Kanheman and Tversky's value function. The combination of risk-aversion in gains and risk-loving in losses is denoted as *loss-aversion* and characterises about 48% of the respondents. However, as much as 73.8% appears to increase their risk attitude of at least one degree in a loss scenario, measured as the percentage of respondents who gamble a higher amount in the second set of questions. Both elderly male and female householders are more risk averse and more loss averse than their younger counterpart in a gain scenario, women under 65 years of age are the most risk loving, particularly in a loss scenario. (see Table 32).

Table 32: Risk attitude

Risk attitude (% of total)	Under 65 Male	Under 65 Female	Over 65 Male	Over 65 Female	All
Gain Scenario					
Risk averse	52.2	50.8	58.6	61.9	54.0
Risk neutral	16.4	15.4	15.2	18.1	16.1
Risk loving	31.4	34.2	26.1	20.0	29.9
Loss Scenario					
Risk averse	16.1	12.0	15.0	18.1	16.3
Risk neutral	10.1	7.2	11.4	6.7	9.7
Risk loving	73.8	80.8	73.6	75.2	75.0
Loss averse	46.5	49.6	50.5	59.5	48.7

Source: UniCredit survey 2007

Finally, respondents are asked to assess their perception of risk connected to several types of financial investments (see Table 33), from which it results that single company stocks/equity, as well as equity mutual funds are considered very or quite risky by the majority of people, while bank deposits and real estate are considered the safest. Repo (*pronti contro termine*) and unit linked life insurances are the least known products. Among the 10% who perceive housing as a very or "quite risky investment, interest in RM is higher.

Table 33: Investments' perceived risk

Financial Investments	Very Risky	Quite Risky	Somewhat Risky	Not very Risky	Not Risky	Do not know them
Bank deposits	2.2	6.0	12.9	**28.4**	**48.8**	1.8
Repo (*Pronti Contro Termine*)	3.6	10.4	17.3	21.2	16.1	**31.7**
Government bonds	3.1	9.6	16.7	**36.2**	**30.8**	3.5
Bonds	4.5	17.5	27.1	32.4	11.9	7.4
Bond mutual funds	4.9	18.7	31.6	28.5	7.4	8.9
Stock mutual funds	**16.3**	**42.1**	23.1	8.3	2.0	8.3
Single company stocks/equity	**39.2**	**38.0**	12.3	4.0	1.1	5.5
Unit linked life insurance	**5.7**	**16.9**	21.5	27.2	13.5	**18.3**
Real estate	3.2	6.5	10.6	**31.2**	**46.4**	2.2

Source: UniCredit survey 2007

Trust in financial institutions – Informational asymmetries, particularly strong in case of new products, are often associated with a lack of trust towards the more informed party; as RM is a relatively new product and is better known by financial advisers or lenders, a lack of trust in financial institutions may have a negative effect on respondents' interest. Trust in financial institutions/advisers is ascertained mainly by two questions, the first

one directly soliciting how much the respondents trusted their adviser (if they had one), and the second one asking whether respondents' trust in financial institutions had decreased over the past few years (we are in pre subprime crisis time). About 45% of respondents admit that their trust in financial institutions has decreased in the past few years, while more than 72% of respondents places a lot, or enough trust in their financial adviser. The percentage of respondents who have both trust in their adviser and in financial institutions is around 38%.

Debt aversion – Few questions in the UniCredit survey cover respondents' opinions on borrowing and indebtedness; the desire of not having future debts is one of the main reasons for saving (already mentioned above), considered "very" or "quite important" by over 85% of respondents; when asked directly what they thought about borrowing, only 10.5% replied not to have any qualms in taking out a loan, while over 70.5% would rather not have any debt. When asked how they would finance a hypothetical expenditure of 20,000 euros, more than 60% replied they would draw from their savings, 20% would sell their financial assets, and about 16% would recur to a bank loan. Respondents' subjective debt aversion is reflected in their borrowing practices: only 19.3% of surveyed households have outstanding loans other than mortgages, have accessed their overdraft or purchased something in instalments. (See Table 34).

Table 34: Reasons for buying on credit

UCS	
Renovation of real estates	1.9%
Purchase of vehicles (car, motorbike)	6.4%
Purchase of electrical appliances - furniture	1.8%
Purchase of computers, electronic goods	0.9%
Holiday	0.3%
Expensed for household health	0.5%
Other	2.1%
Total borrowers (for any of the above or more than one)	12.5%

Source: UniCredit survey 2007

Financial Literacy – The respondents' financial literacy has been gauged by four questions about inflation, interest rates and portfolio diversification, plus a self-assessment of how well respondents thought they knew specific financial instruments. 19% did not give any correct answer, 37% only managed one, 32% managed two, 11% three and only 0.8% gave a correct answer to all four questions. Elderly female householders have an overall worse performance. A comparison with SHIW is possible,

as the 2006 wave includes a few financial literacy questions, however, while the ones about interest rates and inflation were very similar, the ones on diversification were considerably more difficult in UCS and may account for the lower score reported by UCS respondents despite their higher general education.[41] (See Table 35).

Table 35: Financial literacy

Financial Literacy (% of correct answers)	Under 65 Male	Female	Over 65 Male	Female	All
Inflation	35.8	36.8	28.4	35.2	34.2
Interest	52.1	48.1	57.4	40.0	52.0
Diversification - theoretical	44.0	33.1	38.6	25.7	39.9
Diversification - practical	12.4	12.8	15.2	10.5	13.0
0 – 2 correct answers	86.1	91.0	86.6	96.2	87.6
3 – 4 correct answers	13.9	9.0	13.4	3.8	12.4

Source: UniCredit survey 2007

As for the self reported knowledge of financial products, *self-assessed portfolio literacy* (PL), the respondents were asked to assign a value from 1 to 5 (from "I don't know it at all" to "I know it very well") and assess their knowledge of ten financial products (the list of products is reported in the appendix). The results are that 41% claim to know less than three products, 41% between four and seven and 18% more than seven products. The more knowledgeable – or more confident, are male householders under 65 years of age, while the least knowledgeable are elderly female householders. (See Table 36) The index of PL is important even if it overestimates actual knowledge, as it reveals the respondent's exposure to financial products. Arguably, the more familiar the elderly are with all types of financial products, the less sceptical they will be about RM.

Table 36: Self-assessed PL

Portfolio Literacy	Under 65 Male	Female	Over 65 Male	Female	All
0 – 3 products (Low PL)	37.8%	47.4%	38.6%	61.9%	41.0%
4 – 7 products (Medium PL)	41.3%	39.9%	44.9%	32.4%	41.3%
8 – 10 products (High PL)	21.0%	12.8%	16.5%	5.7%	17.7%
PL index – 0 to 1 (mean values)	0.59	0.56	0.58	0.48	0.58

Source: UniCredit survey 2007

[41] As shown by Fornero & Monticone (2010), most Italian householders lack knowledge of basic financial concepts: their analysis draws on SHIW 2006 and SHIW 2008, and they use three, rather than four questions. In 2006, less than 25% of respondents answers all three questions correctly, and more than 26% gets them all wrong. SHIW allowed for a "Don't know" option, which is not present in UCS.

Retirement Expectations – Respondents were asked whether they were worried about their economic well-being after retirement, and about 40% replied to be "quite" or "very worried". The least worried are elderly or pensioners, who face less uncertainty (see Table 37). As RM are meant to increase welfare after retirement, it is plausible to assume that negative expectations about post-retirement economic well-being raise the probability of being interested in the product, and the data confirm the hypothesis.

Table 37: Retirement expectations

Worry about retirement wealth	Under 65		Over 65		
	Male	Female	Male	Female	All
Not worried	17.5	15.4	31.7	22.9	20.8%
Barely worried	40.3	41.0	40.1	50.5	41.0%
Quite worried	30.3	32.3	22.6	19.1	29.2%
Very worried	10.0	11.3	5.6	7.6	9.0%

Source: UniCredit survey 2007

Preference for Downsizing – A specific question was asked to assess respondents' willingness to sell their home as a means to increase future income and they were given the following options: certainly not (53.1%), probably not (27.0%), probably yes (16.7%) and definitely yes (3.2%). While elderly are much more likely to be willing to downsize (4.2% vs. 2.8%), the percentage is still low, confirming Venti & Wise's claim that elderly homeowners do not wish to reduce their housing assets. (See Table 38)

Table 38: Preference for downsizing

Interested in downsizing (% of total)	Under 65		Over 65		
	Male	Female	Male	Female	All
Definitely yes	2.9	2.2	3.0	9.1	3.2%
Probably yes	18.1	15.2	14.3	18.2	16.7%
Probably not	25.6	32.0	25.7	31.8	27.0%
Certainly not	53.4	50.7	57.0	40.9	53.1%

Source: UniCredit survey 2007

2.3. Estimating the money's worth of a Reverse Mortgage

The money's worth of reverse mortgages is limited by the amount of available equity and by restrictions on loan size, and the main limit on loan size is the age of the

youngest borrower. In Italy, the maximum loan advance ranges from roughly 20% of the housing equity for the 65 years olds, to roughly 50% for the over 90[42]: for example, the maximum loan advance available to a 79 year old, for a house with an appraised value of €387,798, at an expected interest rate of 7.3%, will be €150,000; should the borrower die at age 89, that is 10 years after signing the reverse mortgage contract, the amount to be reimbursed by his inheritors will be equal to €337,093. (Deutsche Bank informative leaflet).

Ong (2003) provides a sink fund formula, based on the HUD HECM handbook (1994) and Rodda et. al (2000), to calculate the monthly payments generated by a reverse mortgage, for a given housing equity level, interest rate and life expectancy.

$$A_i = HD \frac{r}{(1+r)^{e_i+1} - (1+r)}$$

where

A_i = monthly payment to (household) borrower *i*
HD is the housing value at predicted death
r = monthly interest rate (approximated)
e_i = life expectancy at age i(in months), calculated as 100 minus current age

By applying the same formula, we can assess the money's worth of a RM for our average sample household. We will set the interest rate at 7.3%, in line with the Deutsche Bank reverse mortgage rates[43], and consider borrower's life expectancy as 100 minus current age. The money's worth is estimated in terms of percentage increase in average household income for housing equity quintile, gender, status and age groups.

The results are in essence similar to what has been reported by Ong (2003), as over 80s and single females with lower income and above average housing equity are the recipients with higher gains. However, the impact of RM on household income is much weaker, as it would yield on average 16% increase (for median income level), as opposite to a 71% increase in Ong's study. This difference is due partly to the fact that we are considering household and not individual income, that our sample population is

42 The values reported are for single male householders; the corresponding percentages for single females are: 15.3% for the 65 years olds, to 46% for the over 90. The maximum loan amount for couples is lower (14% to 45%).
43 Deutsche Bank informative leaflet for Italian reverse mortgage borrowers.

wealthier, and that the maximum loan advance in Italy is lower than in Australia. (Table 39).

Table 39: Reverse Mortgage monetary value

	Average Housing Equity	Maximum Loan Advance	RM Annuity	Low Income I quartile	RM as % of Low Income	Median Income II quartile	RM as % of Median Income	High Income III quartile	RM as % of High Income
Average Housing Equity	376,989	94,247	7,661	31,733	24%	48,392	16%	76,654	10%
I quintile - up to €180,000	141,792	35,448	2,881	25,800	11%	40,000	7%	54,800	5%
II quintile - up to €250,000	222,309	55,577	4,517	29,183	15%	44,400	10%	65,700	7%
III quintile - up to €350,000	310,992	77,748	6,320	35,300	18%	49,600	13%	69,700	9%
IV quintile - up to €500,000	445,139	111,285	9,046	38,682	23%	59,898	15%	93,000	10%
V quintile - over €500,000	905,217	226,304	18,395	32,324	57%	53,150	35%	87,912	21%
Age Category									
65-69 years	416,875	93,797	7,624	32,000	24%	50,315	15%	83,600	9%
70-74 years	429,384	139,550	11,343	25,763	44%	46,013	25%	74,313	15%
75-80 years	339,500	127,313	10,348	23,600	44%	35,800	29%	61,522	17%
80 years or over	433,333	173,333	14,089	18,356	77%	26,727	53%	70,003	20%
Household Income Unit									
Couple	387,358	96,840	8,306	34,200	24%	52,460	16%	84,400	10%
Single / widower male	342,116	85,529	7,336	29,233	25%	42,000	17%	64,000	11%
Single / widow female	358,432	89,608	7,686	27,500	28%	39,600	19%	62,000	12%
Geographical Area									
North	356,826	89,206	7,652	30,300	25%	47,400	16%	72,000	11%
Centre	421,820	105,455	9,045	32,407	28%	52,000	17%	83,100	11%
South	381,476	95,369	8,180	33,260	25%	46,900	17%	75,155	11%

Source: UniCredit survey 2007

This exercise confirms the original formulation of RM as a product for the house-rich, cash-poor. But in order to find out whether demographics and socio-economic aspects are relevant in determining interest, we will have to further our analysis and carry out an ordered probit regression to investigate the determinant of interest in RM.

2.4. Econometric specification

The respondent's interest in RM in the survey is measured on an ordinal scale, and the levels of interest are represented by a discrete variable which can take one of the following five values:

y_i = 1, if the respondent is "Not Interested"

y_i= 2, if the respondent is "Barely Interested"

y_i = 3, if the respondent is "Slightly Interested"

y_i= 4, if the respondent is "Quite Interested"

y_i = 5, if the respondent is "Very Interested"

We can assume that the discrete values are based on an underlying continuous and latent variable y^*, and that this latent variable is a linear function of all the explanatory variables:

$y_i^* = \boldsymbol{\beta'x} + \varepsilon$ for $I = 1, 2, \ldots N$

where $\boldsymbol{x}$ is a vector of covariates, N is the number of respondents and ε the error term, which we assume to be normally distributed.

Let $\mu_1 < \mu_2 < \mu_3 < \mu_4 < \mu_5$ be the unknown thresholds parameters or cut-off points, then what we observe is:

$y_i = 1$ if $y_i^* \leq \mu_1$,
$y_i = 2$ if $\mu_1 < y_i^* \leq \mu_2$
$y_i = 3$ if $\mu_2 < y_i^* \leq \mu_3$
$y_i = 4$ if $\mu_3 < y_i^* \leq \mu_4$
$y_i = 5$ if $y_i^* > \mu_4$

The threshold parameters will be estimated together with the β's to help match the probabilities associated with each discrete outcome.

The probability of y_i being classified as "Not Interested", "Barely Interested", "Slightly Interested", "Quite Interested" and "Very Interested" are given by:

$\text{Prob}(y_i = 1) = \text{Prob}(\boldsymbol{\beta'x} + \varepsilon \leq \mu_1)$,
$\text{Prob}(y_i = 2) = \text{Prob}(\mu_1 < \boldsymbol{\beta'x} + \varepsilon \leq \mu_2)$,
$\text{Prob}(y_i = 3) = \text{Prob}(\mu_2 < \boldsymbol{\beta'x} + \varepsilon \leq \mu_3)$,
$\text{Prob}(y_i = 4) = \text{Prob}(\mu_3 < \boldsymbol{\beta'x} + \varepsilon \leq \mu_4)$,
$\text{Prob}(y_i = 5) = \text{Prob}(\boldsymbol{\beta'x} + \varepsilon > \mu_4)$,

Both cut-off points and coefficients β can be estimated as an ordered probit model (ORM) by maximum likelihood method (Greene, 2003). Estimating the $\boldsymbol{\beta's}$ is not enough as they do not reflect the marginal change in probability, therefore we have to calculate the marginal effects in order to achieve a clearer interpretation of the results.

2.4.1. Ordered probit's results

A rich set of socio-demographic factors, personal characteristics and preferences has been used to capture respondents' attitude in the ordered probit regression. (See Table 40). Demographic variables do not seem to have the impact we expected, as age, gender

and marital status are not significant; the same can be said for higher or middle education, while having no education at all is negatively correlated with interest in RM. However, given the small amount of respondents with no education (only 9), we cannot consider the result of particular relevance. Both pensioners and self-employed householders are more likely to be interested, as well as those who are resident in the North of Italy, and in cities with fewer than 100,000 inhabitants.

The bequest motive does not emerge as one would expect, as there are not significant differences in the level of interest between households with children and household without, or between householders who consider leaving a bequest as an important reason for saving and householders who do not.

Surprisingly, household income or owning more than one house/property, are not significant, nor is the lack of savings. We must, however, bear in mind that all surveyed households have at least €10,000 in deposits, so declaring that they are not able to save, is not necessarily relevant.

Another interesting result is that, even though the maximum loan advance depends positively on housing equity, housing equity is negatively correlated with interest in RM and raises the probability of a "not interested" by 4.9%; the explanation can be found in the Prospect Theory: as our sample population is wealthy not only in terms of housing assets, but also in terms of income and financial assets, its reference point is higher, and the relative gain from taking out a RM smaller, therefore a median income increase of 16%, which is what has been calculated applying the sink fund formula, may not be profitable enough to compensate for the loss of the status quo.

The expression of interest in RM appears more significantly correlated with preferences and personal attitudes than with demographics or socio-economic status. The most significant, most robust result is that the preference for downsizing raises the probability of being interested in the product by 2.1%, and decreases the probability of not being interested at all by 27.6%. The link between a preference for downsizing and an interest in RM is far from obvious. At a first glance, it seems plausible that those who are not particularly attached to their homes should be more interested in RM – which is what the data confirm. On the other hand, RM is conceived specifically as an alternative to selling one's home, and carries the risks related to homeowner's extended longevity,

house price depreciation and poor maintenance, which account for its high cost. In this framework, willingness to downsize and interest in RM should have opposite sign.

As financial literacy increases (from 0 to 4 correct answers), so does the probability of not being interested in the product (2.8%); however, the results are not very robust, and the correlation becomes not meaningful if controls are added or taken out of the regression. (See robustness checks) As for portfolio literacy, the sign is positive, but its effect is not meaningful.

Risk and uncertainty seem to have a major impact on homeowners' response. Risk aversion, measured by an index taking values from 0.1 to 1, is significantly and positively correlated with interest in RM. However, when using separate dummies for risk averse, risk neutral or risk lover, we see that the only significant correlation is the negative one between risk-loving and interest in RM, while the dummy for risk-averse is not significant. The more simplistic indicator of risk attitude, identified by the preference between high risks or high returns, yields a similar result, but not as significant, and therefore it is used as robustness check, but not included in the main regression.

Negative expectations about post-retirement economic well-being are significantly positively correlated with interest in the product, decreasing the probability of a "not interested" by 9.1%. The implications for Italy are quite clear, as the foreseeable reduction in state funded pensions, due to an rising dependency-ratio and ageing population, could generate a substantial demand for the product.

The rather small percentage (9.9%) of our sample homeowners who perceives housing investment as "quite" or "very" risky is more likely to be interested in RM, as the probability of a "Not Interested" decreases by 15.1%.

The research conducted in US and Australia brought to our attention how elderly homeowners can be particularly averse to debt, and how this attitude may have an effect on their interest in RM. Two questions in the survey could be used to build an indicator of debt-aversion: the first one, closer to the concept of thrift, identifies respondents who indicated not having future debts as an important reason for saving; the second one collects those who simply state their dislike for taking on any debt. Only a general unwillingness to take on debt is significantly negatively correlated with interest in RM: as the binary variable for debt aversion takes the value of one, the probability of not being

interested in the product rises by 14.9%. Since avoiding future debt as a reason for saving is not significant, it has been taken out from the main regression and used as a robustness check.

Table 40: Ordered Probit's (preliminary) Results

Interested in Reverse Mortgage	No Y=1 b/se	Barely Y=2 b/se	Somewhat Y=3 b/se	Quite Y=4 b/se	Very Y=5 b/se
Age householder	0.012	-0.004	-0.005	-0.003	-0.000
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
Single (d)	-0.040	0.012	0.016	0.010	0.002
	(0.05)	(0.01)	(0.02)	(0.01)	(0.00)
Widower (d)	-0.005	0.002	0.002	0.001	0.000
	(0.06)	(0.02)	(0.02)	(0.01)	(0.00)
Female (d)	-0.036	0.011	0.014	0.009	0.002
	(0.04)	(0.01)	(0.02)	(0.01)	(0.00)
Higher Education (d)	-0.038	0.012	0.015	0.009	0.002
	(0.04)	(0.01)	(0.01)	(0.01)	(0.00)
Primary Education (d)	0.025	-0.008	-0.010	-0.006	-0.001
	(0.04)	(0.01)	(0.01)	(0.01)	(0.00)
No education (d)	0.205	-0.090	-0.075	-0.035*	-0.005**
	(0.17)	(0.10)	(0.06)	(0.02)	(0.00)
Households with children (d)	-0.038	0.012	0.015	0.009	0.002
	(0.03)	(0.01)	(0.01)	(0.01)	(0.00)
Householder pensioner (d)	-0.234	0.066**	0.092*	0.063	0.013
	(0.14)	(0.03)	(0.06)	(0.04)	(0.01)
Householder self-employed (d)	-0.211	0.057*	0.083	0.058	0.012
	(0.14)	(0.03)	(0.06)	(0.05)	(0.01)
Householder employed (d)	-0.195	0.055*	0.077	0.052	0.011
	(0.14)	(0.03)	(0.06)	(0.04)	(0.01)
Householder unemployed (d)	-0.223	0.044***	0.088	0.072	0.018
	(0.16)	(0.01)	(0.06)	(0.07)	(0.02)
Log Household Income	0.004	-0.001	-0.002	-0.001	-0.000
	(0.02)	(0.01)	(0.01)	(0.01)	(0.00)
Log Property value	0.049*	-0.016*	-0.019*	-0.012*	-0.002*
	(0.03)	(0.01)	(0.01)	(0.01)	(0.00)
Preference for Downsizing (d)	-0.274***	0.060***	0.108***	0.085***	0.021***
	(0.03)	(0.01)	(0.02)	(0.02)	(0.01)
Fewer than 100,000 inhabitants (d)	-0.052*	0.017*	0.020*	0.012*	0.002
	(0.03)	(0.01)	(0.01)	(0.01)	(0.00)
More properties (d)	-0.027	0.009	0.011	0.006	0.001
	(0.03)	(0.01)	(0.01)	(0.01)	(0.00)
Trust in Financial Institutions	-0.005	0.002	0.002	0.001	0.000
	(0.03)	(0.01)	(0.01)	(0.01)	(0.00)
Financial Literacy	0.026*	-0.009*	-0.010*	-0.006*	-0.001
	(0.02)	(0.01)	(0.01)	(0.00)	(0.00)
Portfolio Literacy	-0.043	0.014	0.017	0.010	0.002
	(0.10)	(0.03)	(0.04)	(0.02)	(0.00)
Bequest (d)	-0.030	0.010	0.012	0.007	0.001
	(0.03)	(0.01)	(0.01)	(0.01)	(0.00)
Risk Aversion (index 0.1 to 1)	-0.108**	0.036**	0.042**	0.026**	0.005*
	(0.05)	(0.02)	(0.02)	(0.01)	(0.00)
Real estate's perceived risk (d)	-0.153***	0.039***	0.061***	0.044**	0.010*
	(0.05)	(0.01)	(0.02)	(0.02)	(0.00)
Negative retirement expectations (d)	-0.091***	0.029***	0.036***	0.022***	0.004**
	(0.03)	(0.01)	(0.01)	(0.01)	(0.00)
Debt Averse (d)	0.149***	-0.043***	-0.059***	-0.039***	-0.008***
	(0.03)	(0.01)	(0.01)	(0.01)	(0.00)
No savings (d)	-0.006	0.002	0.002	0.001	0.000
	(0.04)	(0.01)	(0.01)	(0.01)	(0.00)
Resident in the North (d)	-0.065*	0.021*	0.025*	0.015*	0.003
	(0.03)	(0.01)	(0.01)	(0.01)	(0.00)
Resident in the South (d)	0.001	-0.000	-0.000	-0.000	-0.000
	(0.04)	(0.01)	(0.02)	(0.01)	(0.00)
Number of observations	1,071	1,071	1,071	1,071	1,071
Log likelihood	-1,109.8	-1,109.8	-1,109.8	-1,109.8	-1,109.8
Pseudo R^2	0.065	0.065	0.065	0.065	0.065

***=1% statistical significance level, **=5 % and *= 10%.

It is worth highlighting that those who would benefit the most from taking out a RM, lower income elderly, singles and women, are also much more likely to be debt averse (see Table 41) and therefore less likely to be interested in the product. Debt aversion could also explain the recent growth in the US reverse mortgage market. Shan (2009) reveals that only 10% of American HECM borrowers choose the tenure payment plan or the modified tenure payment plan, suggesting that the annuity aspect of reverse mortgages is irrelevant to most borrowers; given that consolidating off pre-existing debt has been described as one of the reasons elderly might want to take out a RM (Leviton 2001), and given Shan's reported increase in the level of indebtedness, one may be tempted to conclude that the loan was used to pay off debts rather than increase consumption.

Table 41: Probits on main regressors

	Preference for downsizing	Negative Retirement Expectations	Debt Averse	Risk Lover (in gains)
	b/se	b/se	b/se	b/se
Age householder	0.003	-0.050*	0.058**	-0.017
	(0.03)	(0.03)	(0.03)	(0.03)
Age spouse	-0.022**	-0.003	0.021**	-0.004
	(0.01)	(0.01)	(0.01)	(0.01)
Single	-0.280	0.238	0.527***	0.215
	(0.17)	(0.17)	(0.17)	(0.17)
Widower	-0.276	-0.103	-0.002	-0.119
	(0.21)	(0.20)	(0.19)	(0.20)
Female	-0.057	0.005	0.341***	0.209*
	(0.12)	(0.11)	(0.11)	(0.11)
Higher Education	-0.080	-0.073	-0.079	-0.037
	(0.11)	(0.10)	(0.09)	(0.10)
Primary Education	0.070	0.212**	0.033	-0.068
	(0.10)	(0.10)	(0.09)	(0.10)
No education	-	-0.273	0.457	0.340
	-	(0.57)	(0.65)	(0.56)
Households with children (d)	-0.253***	0.245***	-0.027	0.069
	(0.10)	(0.09)	(0.09)	(0.09)
Householder pensioner (d)	0.708	-0.458	0.449	-0.251
	(0.51)	(0.31)	(0.31)	(0.32)
Spouse pensioner	0.119	-0.261	0.105	0.309
	(0.22)	(0.21)	(0.20)	(0.21)
Householder self-employed (d)	0.755	-0.331	0.332	-0.010
	(0.51)	(0.31)	(0.30)	(0.32)
Spouse self-employed (d)	0.269	-0.265	-0.127	0.368*
	(0.21)	(0.20)	(0.19)	(0.20)
Householder employee (d)	0.716	-0.357	0.259	-0.148
	(0.51)	(0.31)	(0.30)	(0.32)
Spouse employee (d)	0.260	-0.161	0.019	0.266
	(0.18)	(0.18)	(0.17)	(0.17)
Householder unemployed (d)	0.610	-0.292	0.362	-0.203
	(0.54)	(0.35)	(0.35)	(0.36)
Spouse unemployed (d)	0.168	-0.016	0.185	0.240
	(0.19)	(0.18)	(0.17)	(0.18)
(log) Individual income	0.071	-0.110**	-0.127***	0.003
	(0.05)	(0.04)	(0.04)	(0.04)
(log) Property value	-0.093	-0.066	0.040	0.000
	(0.07)	(0.07)	(0.06)	(0.07)
Fewer than 100,000 inhabitants	0.087	0.064	-0.060	-0.012
	(0.08)	(0.08)	(0.08)	(0.08)
More properties	0.029	-0.249***	-0.028	-0.010
	(0.09)	(0.08)	(0.08)	(0.08)
Financial Literacy	0.052	0.034	0.034	-0.062
	(0.05)	(0.04)	(0.04)	(0.04)
Portfolio Literacy	0.218	-0.073	-0.244	0.555**
	(0.27)	(0.25)	(0.24)	(0.25)
No savings	-0.032	0.377***	-0.024	-0.046
	(0.11)	(0.09)	(0.09)	(0.10)
Resident in the North (d)	0.058	-0.170*	-0.072	-0.270***
	(0.10)	(0.09)	(0.09)	(0.09)
Resident in the South (d)	-0.056	0.005	-0.019	0.121
	(0.12)	(0.11)	(0.10)	(0.10)
Constant	-0.939	3.915***	-1.380	-0.190
	(1.37)	(1.20)	(1.16)	(1.21)
Number of observations	1,294	1,300	1,300	1,300
Log likelihood	-624.753	-776.800	-816.008	-748.433
Pseudo R^2	0.027	0.093	0.044	0.039

***=1% statistical significance level, **=5 % and *= 10%.

2.4.2. Robustness checks

A preference for downsizing, debt aversion, real estates' perceived risk and retirement expectations retain their significance at the 1% level even after several manipulations.

Given that the decision to take out a RM affects both the householder and her spouse, additional controls indicating spouses' characteristics (age and occupation) have been used as control checks: the sign and magnitude of the abovementioned core regressors do not vary.

If we replace the index for risk aversion with separate dummies for risk averse, risk lover and risk neutral in both a gain and a loss scenario, we can see that only risk loving in a gain scenario is significant (however, only at the 10% level) and increases the probability of not being interested in the product. The sign and significance level of all other core variables remains the same, while the coefficient for retirement expectation decreases in magnitude.

We also built a separate indicator for impatience[44] to see whether it had an effect. The results show that it is negatively correlated with interest in RM, but its effects are not meaningful; I tried replacing debt aversion with an indicator of impatience first, and then I kept both in the regression to see whether any results changed and in both cases the indicator for impatience is not meaningful and it does not substantially alter the significance level, sign and magnitude of the core variables coefficients.

If the variable indicating trust in the financial sector is disaggregated into its two components, trust in financial advisers and trust in the banking system, log housing value and financial literacy lose significance, while having more properties becomes significant and positively correlated with interest in reverse mortgage; once again the core variables maintain the same sign, similar magnitude and significance level. However, the sample size is reduced by 27%, so it is not included in the main regression and only used as robustness check.

[44] Respondents are asked whether they would prefer to get a hypothetical winning of 100,000 euros in a year or a smaller amount – progressively decreasing from 98,000 to 80,000 – today. Manipulating their answers I created an index of intertemporal discount rate (impatience) ranging from 0 to 0.2 (average 0.05). As the variable is not significant, I decided not to include it in the main regression and use it only as robustness check.

2.5. What can we learn from Italy?

The main purpose of this empirical investigation was to examine the potential use for reverse mortgage in Italy. Our analysis shows how, more than income and wealth, uncertainty and risk attitudes affect respondents' interest in the financial instrument. Demographics do not have a significant effect, the unwillingness to borrow (debt aversion) increases the probability of not being interested in the product, while being more risk averse, perceiving housing investment as risky or having negative expectations about post-retirement welfare increase the probability of being interested.

Two opposite forces seem affect the reverse mortgage decision making process: on one side a rough mental accounting exemplified by the unwillingness to take on debt[45] (Loewenstein et all. 2003) presents an initial barrier to homeowners' interest in the product; on the other side, risk-aversion and uncertainty about the future push in the direction of a higher interest. Given the positive correlation between risk aversion, negative retirement expectation and interest for reverse mortgage, it is plausible to conclude that as future public pensions will shrink, the market for reverse mortgage will broaden, especially if accompanied by a simultaneous rise in households' debt. Indeed, the evolution of US reverse mortgage market suggests that an increased willingness to take on debt has positive effects on the demand for the product.

Lastly, as reverse mortgages seem to have a greater appeal among the low earners, alternative financial instruments, more suitable to the wealthy, could arise: one example is the equity key product, in which homeowners agree to give up a percentage of future housing equity (appreciation) for an immediate cash settlement. However the product is still new and only offered by a few US lenders, therefore its drawbacks are not yet known. Other instruments or practices, like circle-lending can replace a government sponsored home equity program, as financial intermediaries could just facilitate the reverse mortgage transaction between two private parties – possibly within the same family – addressing to the potential bequest motive.

[45] A vast literature on self imposed constraints describes rough rules of thumb, or mental accounting as a way to exercise self-control.

Appendix

Survey questions used to build control variables.

Risk aversion / loss aversion –

Gain Scenario

Imagine you are in a room from which you can exit through two doors: if you choose the correct one, you win €10,000, if you choose the wrong one, you win nothing. Of course, you don't know where the prize is. You may also choose a backdoor and withdraw a fixed amount. Answer Yes/No.

1. If I offered €100, would you give up choosing between the two doors and settle for the backdoor? (Continue to the next if she says No)
2. And if I offered €500?
3. And if I offered €1,500?

.

10. And if I offered €9,000?

Loss scenario

Imagine now a more difficult situation. You can still exit the room through two doors, however if you choose the correct one, you win nothing, but if you choose the wrong one, you lose €10,000. You may also choose a third door and lose a fixed amount.

1. Would you pay €9,000 to exit through the backdoor? (Continue to the next if she says No)
2. What about €7,000?

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.10. What about €100?

Debt Aversion – The following two questions have been used:

1. What is your opinion about borrowing?
   a) I have no qualms / impediments in using loans should I need to (10.5%)
   b) I am willing to resort only to limited borrowing, as I would rather not encumber my future with excessive burdens (18.9%)
   c) I would rather not have debts (70.6%)

2. Right now, how important is it for you to save to avoid future debts?
   a) Not important (3.5%)
   b) Barely important (4.3%)
   c) Somewhat important (6.6%)
   d) Quite important (36.5%)
   e) Very important (49.2%)

Trust in financial institutions – The following two questions have been used:

1. Overall, how much do you trust your banking adviser, consultant or financial adviser in relation to your financial investment? (Read)
   a) A lot (17.8%)
   b) Enough (54.6%)
   c) Somewhat (18.6%)
   d) Not much (5.9%)
   e) Not at all (3.1%)

2. My trust in financial institution has decreased in the last years.
   f) Not at all (10.7%)
   g) Not much (17.8%)

h)	Somewhat	(25.1%)
i)	Enough	(30.3%)
j)	A lot	(16.2%)

Financial Literacy (FL)– the respondent has been awarded 1 point for choosing: the third answer for question 1; the second for question 2; the fourth for question 3 and the first one to question 4.

"Suppose a bank account yields a 2% interest per annum (after expenses and taxes). If actual inflation is 2% per year, (assuming you did not access your account) after two years, the amount deposited can buy you (read - 1 answer)"

- More than it could buy today
- Less than it could buy today
- The same than it could buy today
- Cannot answer (cannot read)

"Imagine having a "tip" and know for certain that in 6 months interest rates will rise. Do you think it is appropriate to purchase TODAY fixed rate bonds?"

- Yes
- No
- I do not know

"In relation to investment people often talk about diversification. In your opinion, to have proper diversification of one's investments means ... (read 1 response)"

- Have in their investment portfolio in bonds and shares
- Do not invest for too long in the same financial product
- Investing in the greatest possible number of financial products
- Investing simultaneously in multiple financial products in order to limit exposure to risks associated with individual products
- Do not invest in high-risk instruments
- I do not know (cannot read)

"Look at this card. In your opinion, which one of this portfolios is better diversified (1 answer)"

- 70% Special Treasury Bonds (BPT), 15% euro area equity fund, 15% in 2-3 activities of Italian companies
- 70% Special Treasury Bonds (BPT), 30% euro area equity fund
- 70% Special Treasury Bonds (BPT), 30% in 2-3 activities of Italian companies
- 70% Special Treasury Bonds (BPT), 30% in shares of a company that I know well
- I do not know (cannot read)

Portfolio Literacy (PL)– the respondent has been awarded 1 point for choosing "very well" or "quite well" and 0 points for the other options.

"I am now going to read the names of some investment products. For each one please tell me if you think you know it very well, quite well, somewhat, little or not at all. Show card products and leave them at the respondent's disposal."

- Government Bonds
- Repo (repurchase agreement operations)
- Bonds
- Mutual Funds (cash, stock, bond, balanced, flexible, etc..)
- Options and Futures (derivatives)
- Unit-linked life insurance policies / index-linked
- ETF (synthetic funds that track stocks indices)
- Asset Management (in funds or securities)
- Capital guaranteed products
- Stocks

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Chapter III: Making assets a tool against poverty

1. Introduction

From a rational and economic standpoint, private wealth does not represent a goal per se, as indeed, people derive their utility from what they can consume, rather than what they have accumulated. It seems, thus, a contradiction finding so many households with a substantial amount of wealth even at old age.

Some could argue this is due to bequest motives. However, to this objection economists would still reply that bequest is very difficult to be proven by the data. People are in fact reluctant to declare a strong motive for bequest.

Whatever the reason people still hold a substantial part of wealth around predicted death, the interest for a policy maker becomes crucial when private wealth could represent a powerful tool to be immunized against poverty.

In Western countries, the unsustainability of PAYG system has shifted towards a defined contribution system, much less generous than in the past, by imposing a replacement rate far lower than 80%. Households face, therefore, a more acute drop in their pension benefit than before. Pension benefit increases are often invoked as necessary for reaching acceptable standards of living of low-pension-benefits retirees. However, little is known on how pension benefit is actually reflecting the true potential standard of living of a household. Ideally, the amount of resources available, weighted by the remaining expected life, is the best measure of potential welfare households can achieve.

In other words, assets as well as future pension benefits should be considered in order to understand the degree of vulnerability of each household.

The rest of this chapter is laid out as follows. Section 2 illustrates the Poverty Rates among European older households and quantifies the magnitude of the effect of (partial) annuitization of wealth under different scenarios.

2. Poverty rates among the elderly in selected European countries

The aim of this report is to verify whether financial instruments such as reverse mortgage could be effectively used to reduce poverty among the elderly. With this purpose, t has been necessary, as a first step, to compute a poverty rate within the sample used, namely SHARE.

Table 1 shows three different measures for eleven countries at the time of wave 1 of SHARE, i.e. year 2004. The first one is based on the at-risk-of-poverty thresholds provided by Eurostat in Purchasing Parity Standard (PPS)[46]. The thresholds are set at 60 % of the national median equivalised[47] disposable income (after social transfers)[48]. It is expressed in PPS in order to take into account differences in cost of living across EU Member States. On the other hand, Poverty II has been computed taking as threshold the 60% of the national median income per capita within the sample. Finally, the last index is the one provided by Eurostat using the same thresholds of the first one, but applying them to EU-SILC's sample.

46 Since data were not available for Germany and the Netherlands in 2004, it has been decided to take for these two countries the data of 2005 and adjust them using the national inflation rates.

47 According to Eurostat, the aim of equivalisation of household income is to adjust for the varying size and composition of households. Eurostat uses the "modified OECD scale" for equivalisation as a standard in income and living condition statistics. This scale assigns a weight of 1.0 to the first person, 0.5 to each subsequent person aged 14 or more, and 0.3 to each child aged under 14. The "equivalised size" of a household is the sum of the weights assigned to each person. The household's total income is divided by its "equivalised size" and the resulting "equivalised income" is assigned to the household and to each of its members.

48 According to Eurostat, Total income is defined as the total net monetary annual income in the year prior to the survey. It covers the following components: income from work, private income, and social transfers. More precisely, private income consists of: property income, capital income, and private transfers.

Table 1. Poverty rates (in percentage)
Wave 1 - 2004

Country	Poverty I	Poverty II	Poverty Eurostat
Austria	11.30	19.02	17.00
Germany	21.35	27.81	
Sweden	11.38	20.77	14.00
Netherlands	14.87	24.35	
Spain	16.88	21.46	29.50
Italy	30.83	23.17	21.00
France	12.09	20.31	15.30
Denmark	24.59	32.86	17.00
Greece	22.00	28.17	28.20
Switzerland		34.59	
Belgium	17.31	19.44	20.90

Sources: SHARE and Eurostat - SILC

Conclusions about the incidence of poverty in European countries strictly depend on the poverty measure adopted. Poverty rate for Italy, for example, ranges between 30 per cent and 21 per cent and the ranking of countries in an hypothetical scale of poverty is not stable across measures. However, ranking countries on the basis of the poverty rates is out of the scope of our exercise as we simply aim at measuring the relative Poverty rates are usually higher in Southern Europe, i.e. Italy, Spain and Greece, where they are usually above 16%, even more than 30% in certain cases. However, poverty is also widespread in some countries in Northern Europe, such as Belgium or Denmark, albeit with lower incidence rates.

Table 2 shows the same indexes with reference to wave 2, i.e. year 2006-2007. It is worth noting that Eurostat has data available for Switzerland only starting from 2008, when the poverty rate among over 65-year-old was 28.3%.

Table 2. Poverty rates (in percentage)
Wave 2 - 2006

Country	Poverty I	Poverty II	Poverty Eurostat
Austria	14.63	11.22	16.2
Germany	25.42	16.20	12.5
Sweden	17.11	13.18	11.3
Netherlands	17.25	13.33	5.8
Spain	26.50	25.35	30.7
Italy	32.93	16.87	21.7
France	17.54	18.55	16.1
Denmark	46.72	25.26	17.4
Greece	26.28	25.08	25.6
Switzerland		18.82	
Belgium	15.88	14.25	23.2

Sources: SHARE and Eurostat - SILC

2.1. One Euro today is worth more than one Euro tomorrow.

House Value converted as a Lump sum

Reverse mortgage does not necessarily have to be converted into an annuity. The subscriber can decide whether to convert the house value in a lump sum as well. The amount of money that can be converted into a lump sum depends on the age of the subscriber as the current value of the house is discounted by the remaining life expectancy. If common wisdom would be suspicious of such a strong discount on the housing value, we are aware that the effect is pretty much due to the compound (high) interest rate and the remaining life expectancy.

The financial instrument of reverse mortgage has been often accused of being unfair, almost a daylight robbery, since the lump sum that the borrowers receive is much lower that the house value, although the whole house is required as collateral and the amount that has to be returned - usually by the heirs when the borrower dies - is much higher.

Table 3 may be useful to give a clearer vision. Among the eleven countries considered, the housing equity for a 65-year-old between 2004 and 2006 was roughly 146,000€ on average. Taking into account the life expectancy of the average respondent - about 18.8 years - and an annual interest rate of 6%, the actual value of the house would be around 49,250€ on average. Moreover, the latter value would be lower the

higher the interest rate, whereas it rises when the borrower is older, corresponding to a shorter life expectancy. For instance, using an interest rate of 8% would bring the house value of average 65-year-old respondent down to 34,843€, while an interest rate of 10% would yield 24,835€ on average. Furthermore, assuming that a 99-year-old customer is expected to live for about 1 year on average, a banker would be happy to grant a reverse mortgage whose value is much closer to the house value. Therefore, the loan amount does not depend - at least in perfect competition - on the fairness of the financial institution, but it is simply the result of a mathematical exercises.

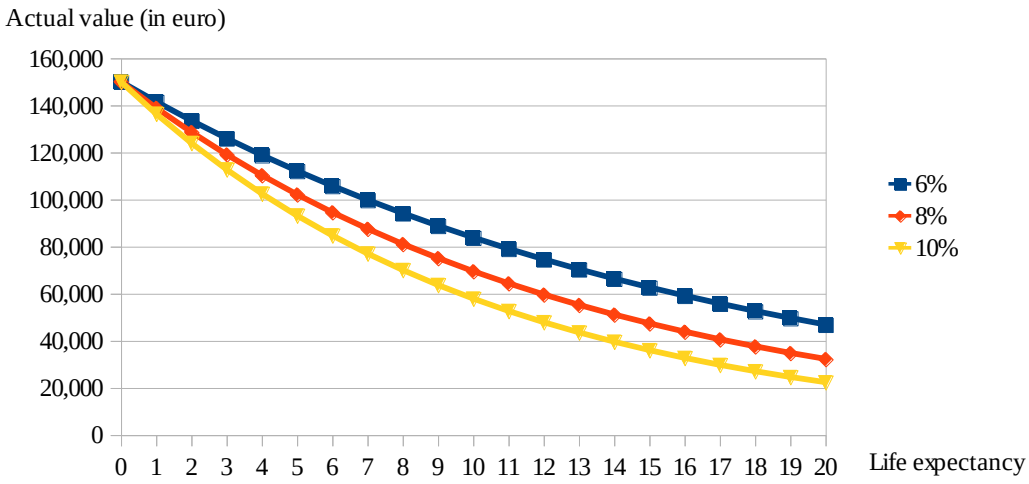
Table 3. Actual value of house net worth (in Euro), by age

Age	House value	Interest=6%	Interest=8%	Interest=10%
65	145,997	49,251	34,843	24,835
66	150,878	53,527	38,485	27,869
67	149,906	55,001	39,968	29,246
68	151,166	58,063	42,812	31,776
69	147,695	58,935	43,990	33,046
70	146,563	61,910	47,044	35,957
71	146,194	64,175	49,364	38,184
72	138,398	63,069	49,102	38,434
73	141,607	67,860	53,675	42,667
74	139,639	69,031	55,147	44,267
75	123,217	63,706	51,626	42,024
76	133,162	71,174	58,285	47,931
77	129,702	72,167	59,862	49,851
78	125,837	71,643	59,858	50,201
79	121,570	71,879	60,787	51,588
80	125,188	76,009	64,824	55,471
81	120,956	76,151	65,692	56,841
82	109,551	71,120	61,955	54,124
83	112,368	74,446	65,282	57,403
84	108,645	73,915	65,364	57,948
85	102,685	71,784	64,026	57,240
86	88,133	63,178	56,804	51,184
87	96,732	70,891	64,191	58,241
88	79,228	59,142	53,881	49,186
89	57,087	44,179	40,715	37,590
90	92,652	73,172	67,875	63,065
91	103,572	86,498	81,691	77,255
92	96,060	80,680	76,342	72,334
93	103,013	88,379	84,178	80,265
94	109,576	95,991	92,038	88,334
95	54,080	48,769	47,203	45,726
96	178,642	158,617	152,754	147,241
97	45,729	42,984	42,140	41,326
98	48,071	44,316	43,180	42,095
99	140,647	132,686	130,229	127,861

Sources: SHARE and Eurostat

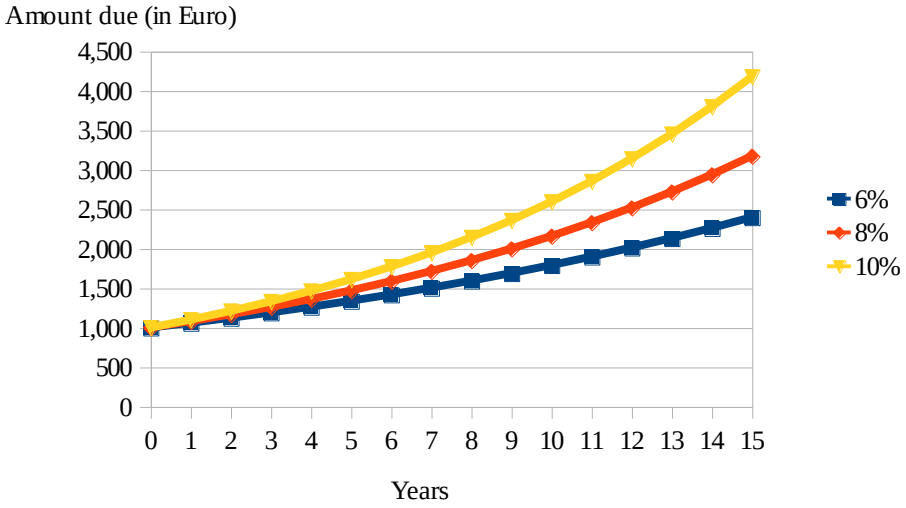
In order to stress upon this point, Chart 1 shows the actual value of 150,000€ from year 0 to 20. If an individual were expected to live for 5 more years, the present value of such amount of money would be around 112,100€ if the interest rate were 6%, around 102,100€ if the interest rate were 8%, and around 93,100€ if the interest rate were 10%. Similarly, under the hypothesis of remaining life expectancy equal to 15 years, the present value would roughly be 62,600€, 47,300€, or 35,900€ if the interest rate were 6%, 8% or 10% respectively.

Chart 1. Actual value of 150,000 euros



Put differently, if the borrower chooses to receive an annuity instead of a lump sum, interests are compounded and, since the loan does not have to be paid back until the borrower is passed away, the amount due by the heirs increases exponentially. Indeed, as suggested in Chart 2, an agent borrowing 1,000€ at time 0 without repaying anything back will generate a value of the loan at death which is obviously amplified by the compounded interest rate effect. As an example, after 15 years if the interest rate were 6%, the heirs should reimburse 2,397€, 3,172€ if the interest rate were fixed at 8%, 4,177€ with 10% as interest rate.

Chart 2. Compound interest rate effect



2.2. House Value converted into annuities

In this first simulation we supposed that all over 65 respondents decide to convert their housing equity into an annuity. Table 4 shows the average house value for each country along with the average annuities computed using, respectively, an interest rate of 6%, 8%, or 10%.

Table 4. Reverse Mortgage - 100% House Value
Annuities (in Euro)

Country	House value	Interest=6%	Interest=8%	Interest=10%
Austria	119,778	4,158	3,492	2,930
Germany	121,436	4,086	3,408	2,837
Sweden	84,317	3,019	2,547	2,148
Netherlands	119,954	4,647	3,957	3,367
Spain	186,104	7,207	6,133	5,214
Italy	176,410	5,906	4,934	4,118
France	184,180	6,422	5,401	4,541
Denmark	97,696	3,955	3,382	2,889
Greece	103,701	4,351	3,745	3,224
Switzerland	126,877	4,646	3,927	3,317
Belgium	147,354	5,680	4,833	4,109

Source: SHARE

If there were perfect competition in financial markets, lenders should compute the annuities taking into account only the house value and the life expectancy of the borrower. However, since real world is far from perfect, and life expectancy does increase over time much more than mortality tables predict, it has been assumed that operators add 5 years when deciding the amount of such annuities in order to increase their profits and reduce their exposure. In fact, another reason which leads operators to increase the life expectancy is that mortality tables computed by Eurostat or other statistical centres usually do not take into account cohort effect. Therefore, a borrower whose house is worth 100,000€ and with a life expectancy of 12 years would obtain an annuity of 3,544€ instead of 5,928€ if the interest rate were 6%.

It is worth noting that a slightly increase in the interest rate produces a sharp reduction in the annuities. For instance, in France home-owners would receive on average an annuity of 6,422€, 5,401€, 4,541€ if the interest rate applied by the lender were 6%, 8%, or 10% respectively.

Tables 5 to 8 display the effect of such annuities on poverty rates. For some countries the outcome is impressive. For instance, using Poverty I as poverty index and looking at wave 1 with interest rate equal to 6%, in Spain the poverty rate would decrease by almost 12 percentage points (Table 5), from 16.88% to 5.2% (-69.20%); and by almost 18 percentage points using Poverty SHARE (Table 6), from 21.46% to 3.54% (-83.50%). Tables 7 (computed using Poverty I as poverty index) and Table 8 (using Poverty SHARE) shows the same figures for wave 2. Also in this case, in Spain the results would be highly effective, reducing poverty rates by 20 percentage points from 26.50% to 5.30% (-80%), and from 25.35% to 4.15% (-83.63%) using Poverty I and Poverty SHARE respectively.

Furthermore, an increase in the interest rate from 6% to 8% or 10% would reduce the magnitude of poverty reduction, but only slightly. In fact, for most of the country the reduction would be only 1 or 2 percentage points lower, showing that the majority of the poor in these countries is just above the poverty line, then these annuities, although not so high, would boost most of them out of poverty.

Table 5. Poverty reduction (percentage points)
100% House Value
Wave 1 - 2004
Poverty I

Country	Interest=6%	Interest=8%	Interest=10%
Austria	4.71	4.52	3.77
Germany	5.95	4.66	3.75
Sweden	3.65	3.20	2.76
Netherlands	7.62	7.43	7.06
Spain	11.67	11.46	10.83
Italy	20.27	17.21	13.80
France	5.93	5.80	4.96
Denmark	11.58	10.40	10.40
Greece	12.83	11.33	10.67
Belgium	8.01	7.26	6.84

Source: SHARE

Table 6. Poverty reduction (percentage points)
100% House Value
Wave 1 - 2004
Poverty II

Country	Interest=6%	Interest=8%	Interest=10%
Austria	7.16	6.40	5.84
Germany	9.31	8.54	8.02
Sweden	6.74	6.08	5.52
Netherlands	9.11	8.18	7.62
Spain	17.92	17.50	16.67
Italy	13.12	11.93	10.90
France	11.00	10.40	9.19
Denmark	13.95	13.00	10.87
Greece	19.83	18.00	16.83
Switzerland	13.16	12.78	11.65
Belgium	12.29	11.97	11.32

Source: SHARE

Table 8. Poverty reduction (percentage points)
100% House Value
Wave 2 - 2006
Poverty II

Country	Interest=6%	Interest=8%	Interest=10%
Austria	6.81	6.41	6.01
Germany	6.01	5.87	5.17
Sweden	5.55	4.97	4.86
Netherlands	7.84	7.25	7.06
Spain	21.20	20.51	19.82
Italy	12.24	11.70	10.88
France	11.78	11.28	9.65
Denmark	15.62	14.74	14.16
Greece	19.49	18.73	18.13
Switzerland	7.87	7.02	6.18
Belgium	9.88	9.25	9.00

Source: SHARE

One of the main reasons explaining why the elderly are so wary of reverse mortgages is that they are worried not to leave enough inheritance to their heirs, or even to leave them with excessive debt.

First of all, it should be reminded that this types of loans usually have a non negative equity clause which ensures that the amount of the loan will never exceed the house value. Then, it is impossible that heirs receive a negative inheritance because of a house with a mortgage loan bigger than the house value. Second, as Table 9 demonstrates, borrowers would manage on average to leave a more than decent inheritance to their offspring. It is interesting to note that even if the interest rate increase from 6% to 8% or 10%, the inheritance becomes higher since the lower annuities more than offset the heavier interest rates[49].

Table 9. Reverse Mortgage - Inheritance (in Euro)
100% House Value

Country	House value	Interest=6%	Interest=8%	Interest=10%
Austria	193,981	77,393	84,540	91,524
Germany	216,808	85,524	93,544	101,386
Sweden	117,698	47,500	51,791	55,984
Netherlands	254,994	106,059	115,032	123,794
Spain	204,692	85,127	92,315	99,333
Italy	201,394	79,302	86,818	94,165
France	247,759	99,007	108,145	117,076
Denmark	150,134	63,547	68,708	73,745
Greece	111,475	47,875	51,680	55,394
Switzerland	250,532	101,968	110,988	119,798
Belgium	190,759	79,189	85,911	92,475

Source: SHARE

2.3. Different Scenarios: partially converting housing equity into annuities

It seems clear from the simulation above that converting all house values into annuities would be the best solution in order to cut sharply the poverty rates among the elderly. However, such outcome is unlikely since not everybody would be happy to provide a mortgage on his or her whole house. Moreover, financial institution would rather oppose to accepting all these houses as collateral, without any kind of diversification.

[49] It is important to stress that it has been assumed that house values do not increase neither decrease during the simulation, since the estimation of such growth rates in different cities and countries lies outside the aims of this report.

Therefore, this second simulation assumes that every home-owner aged more than 65 converts half of his or her house value into annuity. Obviously, the annuities are half of the ones previously computed (see Table 10).

Table 10. Reverse Mortgage - 50% House Value
Annuities (in Euro)

Country	House value	Interest=6%	Interest=8%	Interest=10%
Austria	119,778	2,079	1,746	1,465
Germany	121,436	2,043	1,704	1,418
Sweden	84,317	1,510	1,274	1,074
Netherlands	119,954	2,324	1,978	1,683
Spain	186,104	3,604	3,066	2,607
Italy	176,410	2,953	2,467	2,059
France	184,180	3,211	2,700	2,270
Denmark	97,696	1,977	1,691	1,445
Greece	103,701	2,175	1,872	1,612
Switzerland	126,877	2,323	1,964	1,658
Belgium	147,354	2,840	2,416	2,054

Source: SHARE

Nevertheless, Tables 11 to 14 prove that poverty rates would still decrease significantly, in particular among Mediterranean countries.

Table 11. Poverty reduction (percentage points)
50% House Value
Wave 1 - 2004
Poverty I

Country	Interest=6%	Interest=8%	Interest=10%
Austria	2.82	2.64	2.26
Germany	2.98	2.59	1.81
Sweden	2.32	1.88	1.88
Netherlands	6.69	6.32	5.20
Spain	10.42	9.79	8.96
Italy	11.58	10.39	8.35
France	4.47	4.35	3.75
Denmark	8.27	7.09	6.38
Greece	7.83	6.83	6.33
Belgium	5.56	5.13	4.59

Source: SHARE

Table 12. Poverty reduction (percentage points)
50% House Value
Wave 1 - 2004
Poverty II

Country	Interest=6%	Interest=8%	Interest=10%
Austria	5.27	4.71	4.33
Germany	6.34	5.56	4.92
Sweden	4.42	4.09	3.65
Netherlands	6.69	6.13	5.20
Spain	14.58	13.75	13.33
Italy	9.37	8.69	7.67
France	8.34	7.38	6.17
Denmark	8.51	6.62	5.91
Greece	13.00	11.50	10.83
Switzerland	9.77	9.02	7.89
Belgium	10.04	9.62	7.26

Source: SHARE

Table 13. Poverty reduction (percentage points)
50% House Value
Wave 2 - 2006
Poverty I

Country	Interest=6%	Interest=8%	Interest=10%
Austria	5.21	4.61	3.81
Germany	3.91	3.21	2.65
Sweden	4.74	4.62	4.28
Netherlands	6.67	6.27	5.88
Spain	16.36	14.75	14.29
Italy	15.78	13.47	10.34
France	5.64	5.39	4.76
Denmark	15.91	14.16	12.26
Greece	10.42	9.67	8.61
Belgium	5.38	4.88	4.38

Source: SHARE

Table 14. Poverty reduction (percentage points)
50% House Value
Wave 2 - 2006
Poverty II

Country	Interest=6%	Interest=8%	Interest=10%
Austria	5.21	4.61	4.21
Germany	4.05	3.77	3.49
Sweden	4.28	4.05	3.82
Netherlands	6.47	5.88	5.69
Spain	18.43	17.28	15.67
Italy	9.80	8.57	7.48
France	8.52	7.39	6.14
Denmark	12.41	11.53	10.36
Greece	14.35	13.14	12.24
Switzerland	5.90	5.90	5.34
Belgium	8.75	8.13	7.25

Source: SHARE

An advantage of this kind of deal would be an increase in the inheritance compared to a reverse mortgage on the entire house (see Table 15).

Table 15. Reverse Mortgage - Inheritance (in Euro)
50% House Value

Country	House value	Interest=6%	Interest=8%	Interest=10%
Austria	193,981	135,687	139,260	142,753
Germany	216,808	151,166	155,176	159,097
Sweden	117,698	82,599	84,744	86,841
Netherlands	254,994	180,527	185,013	189,394
Spain	204,692	144,910	148,504	152,013
Italy	201,394	140,348	144,106	147,780
France	247,759	173,383	177,952	182,417
Denmark	150,134	106,841	109,421	111,940
Greece	111,475	79,675	81,577	83,434
Switzerland	250,532	176,250	180,760	185,165
Belgium	190,759	134,974	138,335	141,617

Source: SHARE

Finally, even if the home-owners aged over 65 would convert 30% of their house value into annuities with an interest rate of 8%, the effect on poverty rates would still be sizeable, as shown in Table 16. Indeed, in Spain the poverty rate would still be reduced

by roughly 8-10 percentage points, while in Italy it would decrease from 23.27% to 16.52% (Poverty II), from 28.17% to 19.17% in Greece (Poverty II).

Table 16
Poverty reduction (percentage points)
30% House Value
Interest rate 8%
Wave 1 - 2004

Country	Poverty I	Poverty II
Austria	1.32	3.39
Germany	0.91	4.01
Sweden	1.33	2.43
Netherlands	4.83	4.46
Spain	8.13	10.63
Italy	5.62	6.64
France	3.39	5.20
Denmark	4.49	4.02
Greece	4.50	9.00
Switzerland		6.39
Belgium	4.49	5.56

Source: SHARE

Table 17. Poverty reduction (percentage points)
50% House Value
Wave 1 - 2004

	Poverty I		**Poverty II**	
Country	Interest=5%	Interest=8%	Interest=5%	Interest=8%
Austria	3.01	2.64	5.27	4.71
Germany	3.23	2.59	6.34	5.56
Sweden	2.43	1.88	4.42	4.09
Netherlands	7.06	6.32	6.69	6.13
Spain	10.42	9.79	14.58	13.75
Italy	12.78	10.39	9.37	8.69
France	4.59	4.35	8.34	7.38
Denmark	8.51	7.09	8.51	6.62
Greece	8.33	6.83	13.00	11.50
Switzerland			9.77	9.02
Belgium	5.66	5.13	10.04	9.62

Source: SHARE

Table 18. Poverty reduction (percentage points)
50% House Value
Wave 2 - 2006

	Poverty I		Poverty II	
Country	Interest=5%	Interest=8%	Interest=5%	Interest=8%
Austria	5.41	4.61	5.21	4.61
Germany	4.47	3.21	4.05	3.77
Sweden	4.86	4.62	4.28	4.05
Netherlands	7.06	6.27	6.47	5.88
Spain	16.82	14.75	18.43	17.28
Italy	16.87	13.47	9.80	8.57
France	5.89	5.39	8.52	7.39
Denmark	16.50	14.16	12.41	11.53
Greece	11.18	9.67	14.35	13.14
Switzerland			5.90	5.90
Belgium	6.00	4.88	8.75	8.13

Source: SHARE

Table 19. Poverty reduction (percentage points)
30% House Value
Wave 1 - 2004

	Poverty I		Poverty II	
Country	Interest=5%	Interest=8%	Interest=5%	Interest=8%
Austria	2.26	1.32	4.14	3.39
Germany	1.68	0.91	4.53	4.01
Sweden	1.88	1.33	3.09	2.43
Netherlands	5.58	4.83	5.39	4.46
Spain	8.75	8.13	12.50	10.63
Italy	8.01	5.62	7.84	6.64
France	3.75	3.39	6.41	5.20
Denmark	5.67	4.49	5.44	4.02
Greece	5.67	4.50	10.00	9.00
Switzerland			7.52	6.39
Belgium	4.91	4.49	7.05	5.56

Source: SHARE

Table 20. Poverty reduction (percentage points)
30% House Value
Wave 2 - 2006

	Poverty I		Poverty II	
Country	Interest=5%	Interest=8%	Interest=5%	Interest=8%
Austria	4.01	2.61	3.81	3.21
Germany	2.65	2.37	3.35	2.51
Sweden	3.70	3.24	3.70	3.24
Netherlands	6.08	5.10	5.69	5.29
Spain	13.82	12.67	14.98	13.13
Italy	11.16	8.71	7.48	6.53
France	4.26	3.76	6.14	4.89
Denmark	11.68	9.05	9.49	8.03
Greece	7.70	5.74	11.48	10.57
Switzerland			5.06	5.06
Belgium	4.38	3.75	7.25	5.88

Source: SHARE

2.4. Converting financial wealth into annuities

In this last simulation, it has been decided to convert into annuities the 30%, 50%, and 70% respectively of the household's financial wealth. Also in this case, it has been assumed that financial operators increase life expectancy of each borrower by 5 years. Moreover, it has been taken an interest rate of 2,5% and 5%.

Tables 17 and 18 list the average financial wealth of households aged more than 65 sorted by country along with the average annuities which each individual would have received if they would have decided to convert 30%, 50%, or 70% of their financial wealth using an interest rate of 2.5%.

Table 17
Financial wealth - Annuities (in Euro)
Interest rate: 2.5%
Wave 1 - 2004

Country	Tot. fin. wealth	Fin. wealth: 30%	Fin. wealth: 50%	Fin. wealth: 70%
Austria	20,956	441	735	1,029
Germany	36,113	769	1,282	1,794
Sweden	40,867	898	1,496	2,095
Netherlands	45,011	1,029	1,715	2,401
Spain	13,461	302	504	706
Italy	15,594	322	537	752
France	34,964	788	1,313	1,838
Denmark	35,911	845	1,409	1,973
Greece	10,613	241	402	563
Switzerland	82,902	1,840	3,067	4,293
Belgium	55,421	1,267	2,111	2,956

Source: SHARE

Table 18
Financial wealth - Annuities (in Euro)
Interest rate: 2.5%
Wave 2 - 2006

Country	Tot. fin. wealth	Fin. wealth: 30%	Fin. wealth: 50%	Fin. wealth: 70%
Austria	21,938	455	759	1,062
Germany	36,003	751	1,251	1,751
Sweden	53,909	1,174	1,957	2,739
Netherlands	49,858	1,143	1,905	2,666
Spain	19,106	410	683	956
Italy	18,760	386	643	900
France	35,605	762	1,270	1,778
Denmark	50,964	1,125	1,874	2,624
Greece	8,107	178	297	415
Switzerland	98,463	2,123	3,539	4,955
Belgium	55,971	1,238	2,063	2,888

Source: SHARE

Tables 19-20 provide the same information obtained with an interest rate of 5%. It is interesting to note that the average financial wealth varied greatly among the selected European countries. Indeed, in 2004 it was only 10,613€ in Greece (8,107€ in 2006, even lower), whereas it reached a mean of 82,902€ (98,463€ in 2006) in Switzerland.

Furthermore, in Spain and Italy citizens strongly preferred - and still prefer - to invest their savings into real estate rather than financial markets: average house value was extremely high in 2004 and 2006, whilst financial assets were relatively thin. Conversely, in Sweden real assets held by households were lower than 100,000€ both in 2004 and 2006, while financial assets were above the sample mean. Finally, the financial wealth held by the elderly is usually lower than their house value, then the corresponding annuities are smaller.

Table 19
Financial wealth - Annuities (in Euro)
Interest rate: 5%
Wave 1 - 2004

Country	Tot. fin. wealth	Fin. wealth: 30%	Fin. wealth: 50%	Fin. wealth: 70%
Austria	20,956	526	876	1,227
Germany	36,113	915	1,525	2,134
Sweden	40,867	1,062	1,770	2,478
Netherlands	45,011	1,207	2,012	2,817
Spain	13,461	356	593	831
Italy	15,594	386	643	900
France	34,964	927	1,546	2,164
Denmark	35,911	987	1,644	2,302
Greece	10,613	283	472	661
Switzerland	82,902	2,172	3,621	5,069
Belgium	55,421	1,487	2,478	3,469

Source: SHARE

Table 20
Financial wealth - Annuities (in Euro)
Interest rate: 5%
Wave 2 - 2006

Country	Tot. fin. wealth	Fin. wealth: 30%	Fin. wealth: 50%	Fin. wealth: 70%
Austria	21,938	545	908	1,271
Germany	36,003	897	1,495	2,092
Sweden	53,909	1,391	2,319	3,246
Netherlands	49,858	1,341	2,235	3,129
Spain	19,106	487	811	1,136
Italy	18,760	462	770	1,078
France	35,605	907	1,511	2,115
Denmark	50,964	1,329	2,215	3,100
Greece	8,107	211	351	491
Switzerland	98,463	2,520	4,200	5,881
Belgium	55,971	1,462	2,436	3,411

Source: SHARE

Tables 21-25 show poverty reductions if the interest rates were 8% for reverse mortgage and 5% for financial wealth.

Table 21
Poverty reduction (percentage points)
100% House Value
Interest rate reverse mortgage: 6%
Interest rate financial wealth: 2.5%
Wave 1 - 2004
Poverty I

Country	Fin. wealth: 30%	Fin. wealth: 50%	Fin. wealth: 70%
Austria	4.71	5.08	5.08
Germany	6.99	7.37	7.89
Sweden	5.30	6.08	6.41
Netherlands	9.11	9.11	9.48
Spain	12.08	12.29	12.29
Italy	20.78	20.95	21.12
France	6.17	6.65	7.01
Denmark	14.42	15.84	15.84
Greece	13.00	13.17	13.67
Belgium	9.29	9.94	10.58

Source: SHARE

Table 22
Poverty reduction (percentage points)
100% House Value
Interest rate reverse mortgage: 6%
Interest rate financial wealth: 2.5%
Wave 2 - 2006
Poverty I

Country	Fin. wealth: 30%	Fin. wealth: 50%	Fin. wealth: 70%
Austria	7.62	7.82	7.62
Germany	9.64	10.89	11.59
Sweden	9.71	10.52	11.33
Netherlands	9.02	9.61	10.00
Spain	21.89	22.35	22.35
Italy	23.27	23.40	23.95
France	9.52	9.90	10.28
Denmark	28.76	30.95	31.24
Greece	17.22	17.22	17.22
Belgium	9.25	9.50	9.88

Source: SHARE

Table 23
Poverty reduction (percentage points)
100% House Value
Interest rate reverse mortgage: 8%
Interest rate financial wealth: 5%
Wave 1 - 2004
Poverty I

Country	Fin. wealth: 30%	Fin. wealth: 50%	Fin. wealth: 70%
Austria	4.52	4.90	5.08
Germany	5.95	6.86	7.12
Sweden	5.30	5.97	6.30
Netherlands	8.92	9.11	9.85
Spain	11.88	12.08	12.08
Italy	18.74	19.08	19.42
France	6.17	6.41	6.89
Denmark	13.71	15.37	15.84
Greece	11.67	11.67	11.83
Belgium	8.87	9.62	10.26

Source: SHARE

Table 24
Poverty reduction (percentage points)
100% House Value
Interest rate reverse mortgage: 8%
Interest rate financial wealth: 5%
Wave 2 - 2006
Poverty I

Country	Fin. wealth: 30%	Fin. wealth: 50%	Fin. wealth: 70%
Austria	7.01	7.21	7.21
Germany	9.36	11.03	11.73
Sweden	9.71	10.17	11.10
Netherlands	9.22	9.61	10.20
Spain	20.51	21.43	21.89
Italy	21.22	21.63	21.90
France	8.77	9.40	9.90
Denmark	28.32	30.07	30.80
Greece	15.56	15.86	15.86
Belgium	8.50	9.13	9.25

Source: SHARE

CONCLUSIONS

Our research has investigated the potential impact of wealth annuitization among older European households. The magnitude of the welfare gains, particularly by subscribing to reverse mortgage is of crucial importance. More specifically Italy and Spain would see a reduction in their poverty rates by at least 10 percentage points if (part of) household real wealth were converted in an annuity with a reverse mortgage. However, Italian households do not seem to be interested in products as such, possibly because they do not understand the complexity of the financial products. Moreover, the elderly do not show any interest in decumulation, this evidence holding for most of European countries.

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