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Housing wealth decumulation, portfolio composition and financial literacy among the European elderly*

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Abstract

This paper analyses the role played by financial literacy in savings decisions and wealth decumulation. The broad evidence shows that (elderly) households do not decumulate their assets as they age, contradicting the standard life-cycle theory, which predicts that households should decumulate their assets in order to keep their consumption smooth. In particular, older people seem to be very attached to illiquid assets, such as housing wealth, which is far more difficult to liquidate and use to face unexpected shocks and to smooth consumption. Using the SHARE (Survey of Health, Ageing, and Retirement in Europe) survey, we try to detect whether more financial literacy brings about more optimal behaviour from a life-cycle perspective, and we look at the impact of financial literacy on three different dimensions of savings decisions: an unbalanced portfolio with excessive weight assigned to illiquid assets, the optimal consumption path, and housing wealth decumulation. According to our findings, financial literacy substantially reduces the portfolio imbalance of people aged 50+ by reducing the weight of housing wealth over total net worth; at the same time, it is responsible for a more optimal consumption path and for housing wealth decumulation.

Keywords: Financial literacy, savings, wealth decumulation, housing, portfolio
JEL codes: D14, D91, G11

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1. Introduction

A large strand of the literature on savings focuses on the pivotal factors ruling wealth accumulation. The ability to accumulate wealth constitutes financial stability for a household. 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. 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.

On one hand, Italian GDP growth has shown a poor trend; on the other, Italian per capita assets are at consistent levels compared with those of other European countries.

The assets of Italian households are mainly constituted by housing. Italian households exhibit a high home ownership rate, and the value of housing assets constitutes more than half of the total assets. The wellness of Italian households is tied to illiquid assets, which are difficult to liquidate when hard economic times hit. Italian households are rich, but with their assets being mainly illiquid, they are unable to use them efficiently. Why is the portfolio of Italian households so greatly imbalanced in favour of illiquid assets? Do the elderly bear strong consequences for the inability to use their assets efficiently?

In this paper we want to investigate an innovative research question. Does financial sophistication play a role in the ability to use household wealth efficiently? The role of financial literacy in the ability to save has been explored intensively. Conversely, little attention has been given to the role that financial literacy might play on wealth patterns after retirement occurs. Very little decumulation is observed along the after-retirement path, when depletion should optimally occur. Is financial literacy responsible for the small amount of decumulation in old ages? 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. Our paper also aims to investigate the consequences of the shadow illiquid assets. We thus test whether having problems in making ends meet can be dependent on the degree of portfolio illiquidity. Our results show that whether or not financial literacy might be responsible for portfolio imbalance, 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 rest of the paper is laid out as follows. In section two we revisit the related literature, and in sections three and four we describe the asset decumulation and composition and their relationship to financial literacy. Sections five and six describe the data and the empirical strategy and finally section seven concludes the paper.

2. Literature review

There is poor evidence of housing wealth decumulation as an individual ages: in a recent cross-sectional framework Chiuri and Jappelli (2010) document how the ownership rates decline after the age of 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 become older, reaching a rate of about 1 percentage point per year after the age of 75. Similar findings are shown by other studies (Venti and Wise, 1989, 2002, 2004): housing equity and home ownership do not decrease as individuals reach older ages. Elderly people could exploit other tools 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 mortgages to draw on their home equity assets and obtain additional cash. However, the evidence does not support a widespread use of the latter: also, in the US, the country with the highest take-up rate by far, only 1.4 per cent of elderly home-owners use reverse mortgages (Nakjima and Telyukova, 2011).[1] 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 the worsening of the health status rather than with individual choices (Venti and Wise, 2002, 2004). Walker (2004) analyses how US elderly use their housing wealth and whether the latter is considered as an insurance against the risks of income shocks. By looking at the determinants of home sales, her findings report a strong relationship between housing sales and changes in household structures such as widowhood or long-stay in a nursing home, though housing sales seem not to be driven by the desire to access housing wealth.

Since real (housing) wealth represents the overwhelming share of total wealth, in particular for the elderly, all those aforementioned factors clearly contradict the standard life-cycle theory, which states that individuals should use their accumulated wealth in order to finance their consumption after retirement. In addition, Angelini et al. (2010) provide evidence that the decision to downsize and to move to a smaller house is negatively correlated with the poor development of the mortgage market, which in turn is responsible for higher financial distress among elderly people.

The impact of health status on consumption and savings behaviour in old age has already been documented by a few studies (Lillard and Weiss, 1997; Palumbo, 1999; Rosen and Wu, 2004). On the other hand, there has recently been an increasing interest in the role of financial literacy in explaining wealth and savings decisions. Being financially "literate" can help explain the reluctance to use debt instruments or the failure to use them properly; being able to understand instruments allowing equity release (e.g. reverse

[1] Using US data, Nakjima and Telyukova (2011) identify that bequest motives, moving shocks, and house price fluctuations, as well as the costs of insurance, contribute to the observed low take-up rate.

mortgages) would allow people to avoid becoming "house-rich, cash-poor", thus helping to solve 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 use in order to face hardships such as difficult health conditions. Understanding the role played by (the lack of) financial literacy could ultimately help in fostering strategies aimed at increasing elderly people-s confidence in using instruments that allow equity release.

The relationship between financial literacy and savings decisions has been explored so far, mainly pointing out the positive impact of the former on wealth and arguing that a higher level of financial literacy fosters the accumulation of wealth (Bernheim et al., 2001; Bernheim and Garrett, 2003; Behrman et al., 2010; Jappelli and Padula, 2011; Lusardi and Mitchell, 2011; van Rooij et al., 2012). In a recent study Jappelli and Padula (2011) analyse the impact of financial literacy on the savings decisions of elderly people. Accounting for the endogeneity of the variable of interest, they find that rising financial literacy fosters savings and wealth in a cross-country setting. Financial literacy has also been found to be responsible for greater participation in the stock market (van Rooij et al., 2011a). In addition, poor financial literacy has been found to bring about a failure to plan for retirement (Lusardi and Mitchell, 2007a,b, 2008, 2011; Hung A. and Yoong, 2009; van Rooij et al., 2011b, 2012).

Our study looks at the relationship between financial literacy and wealth from a different perspective, moving from the existing literature, which looks at the relationship between wealth and financial literature and answers the question of how better-informed individuals in terms of financial literacy tend to have greater wealth and to save more.

Our analysis instead aims to detect how a higher level of financial literacy allows elderly people to make better decisions regarding their wealth accumulation, especially from a life-cycle perspective. As 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 the elderly from reaching the end of their life with too much (illiquid) wealth, out of the wealth that has been set apart for bequest motives.

In a recent paper Brunetti et al. (2012) explore the potential link between an illiquid household portfolio and financial fragility, which they define as having insufficient liquid assets to cope with unexpected expenses. Their main findings are that, in addition to standard demographic factors such as financial literacy (education), gender, wealth, and employment status, home-ownership plays a large role in augmenting the probability of financial fragility, in particular for the elderly.

Our main question first looks at whether any wealth decumulation occurs among elderly people, then we consider the role played by financial literacy in the following dimensions: (housing) wealth decumulation, potential imbalance in portfolio allocation, and potential deviations from the optimal consumption behaviour. It might be the case that

individuals who are better endowed with more financial literacy can invest their wealth in more liquid assets, or can follow a consumption path that better resembles the optimal one from a life-cycle perspective.

To the best of our knowledge, there are no existing studies that examine the relationship between financial literacy and portfolio imbalance or the optimal consumption path, whereas the study by Hung et al. (2009) represents the only previous work that tries to answer the question of whether financial literacy has any impact on "decumulation planning". The authors analyse how financial literacy affects three different measures related to planning and decumulation after retirement.

Individuals are asked whether they have tried to figure out how much to withdraw from their savings after retirement, by spending down defined contribution plan assets, whether they have made a plan in order to do so, and whether they are confident that their retirement spending plans will meet their needs. By adopting a 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 suffers from not taking into account the endogeneity of the financial literacy, which is likely to be strongly correlated with individual specific unobserved factors affecting decumulation.

3. Asset Decumulation

One of the main intuitions of the life cycle is that asset accumulation is not a goal *per se*; rather, it is ancillary to the accomplishment of the consumption smoothing principle. Irrespective of income fluctuations, consumption is kept constant. Assets do not enter the utility function directly as what matters for consumers is the level of consumption they are able to achieve. It is certainly hard to reconcile this strong prediction with what the empirical evidence shows. Looking at the European scenario, it is evident that household decumulation does not occur as individuals age (Figure 1).[2] Controlling for both cohort and age effects, the average net worth increases for individuals aged up to 80, whereas only for the age bracket 80-95 is there a very slow decline.[3] Housing wealth follows quite a similar pattern over age and by cohort and it is stable throughout the life cycle, apart from the increasing trend between age 50 and age 60 (Figure 2). Household financial wealth is even more stable and also slightly increasing for the youngest cohort (Figure 3). Why are the elderly so attached to their assets? Is it because of the fear of outliving the assets? If this is the reason, it is not understandable why people do not, at least partially, annuitize their wealth. Yaari (1965), in his seminal paper, and, more recently, with a

[2]We consider a sample of all individuals aged 50 and older, and accordingly we define 4 cohorts, given by the following intervals in terms of year of birth: 1902-1925, 1926-1935, 1936-1945, and 1946-1957.

[3]The large jumps and noisy pattern after the age of 90 are due to the small magnitude of the sample for this age bracket; as such, the underlying trend is not reliable enough to be considered as representative of the relevant population.

much less restrictive hypothesis, Davidoff et al. (2005), prove that all wealth should be annuitized at some point. The reason is that an annuities' return incorporates survival probabilities and thus, if the price is fair, their return will always be superior to any bond that does not incorporate longevity risk. This condition obviously holds in the absence of bequests, as no utility is associated with the time after death. Even if bequests are taken into account, and markets for annuities are distant from fairness, there is still room for a substantial demand for annuities. Despite the strong rationale for claiming annuities, the market of annuities is very thin, not only in countries with a very limited range of financial products, such as Italy, but also in countries such as the UK and the US (see, among others, Mitchell, 1999).

Moreover, bequests, despite being cited as the most likely explanation for the lack of annuities (Lockwood, 2012), are very difficult to detect effectively in respondents' intentions for their savings. Little evidence, in fact, points in favour of this direction (Altonji et al., 1997; Laitner and Ohlsson, 2001; Poterba, 2001; Gan et al., 2004); it is more likely that positive assets at death are associated with unintended bequests. In our sample the respondents are asked about the chance that they will leave any inheritance. The question asked is the following: "Including property and other valuables, what are the chances that you or your husband/wife/partner will leave an inheritance totalling 50,000 euro (in local currency) or more?". Of our sample members, 51 per cent answer with a probability higher than 50. However, other studies have found no strong support for a bequest motive. In this paper we want to explore whether wealth, particularly housing, is depleted at a higher pace among financial literate households. In fact, financial literate individuals might be less attached to their houses, as they are unlikely to attach a utility to assets *per se*; rather, they attach a value to the consumption those assets could generate.

We first derive a benchmark for the asset depletion rate in order to determine 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 many" assets and therefore would be closer to the optimal depletion rate. Conversely, people who are less financially literate are less conscious of the welfare loss of not disposing of their assets optimally. We derive the optimal decumulation path as follows. Consider the sum of lifetime resources at time t

$$A_t + P_t \frac{-1 + (1+r)^{T-t}}{-1 + (1+r)} = c_t \frac{-1 + (1+r)^{T-t}}{-1 + (1+r)} \tag{1}$$

where T is the expected end of life, r is the real interest rate, A_t is wealth, P are pensions benefits, and c is current consumption, assuming that pension benefit and consumption are both constant over time as it is the real interest rate, r. Computing equation (1) at

t+1, dividing A_{t+1} by A_t and taking logs, we obtain the simplified version of the optimal decumulation path as follows[4]

$$\log\left(\frac{A_{t+1}}{A_t}\right) \simeq -\frac{r}{1-(1+r(T-t))} \tag{2}$$

From our 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

$$\log\left(\frac{A_{t+1}}{A_t}\right) \simeq -\frac{1}{T-t} \tag{3}$$

Thus, asset depletion turns out to be a function of individual life expectancy only. [5] We claim that the degree of financial literacy might play a role in this decumulation planning. In particular, those households that are less financially literate might be less aware of the financial instruments available to decumulate wealth efficiently as well as being less able to plan their welfare during retirement efficiently. In the empirical analysis we test this hypothesis by introducing as regressors in the regression modelling of (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 the sum of the k coefficient and the coefficient of its interaction with financial literacy to correspond to the optimal behaviour, thus it should be equal to one, the coefficient relevant to the constant as in (1). Greater financial literacy should help individuals to take decisions that are closer to the optimal behaviour from a life-cycle perspective. The intertwining of decumulation and asset composition is of crucial relevance. The majority of assets are tied to housing; moreover, the housing assets are represented by the home residence in the majority of cases. People accumulate housing wealth during their lifetime, which is probably an easy and efficient way to save. However, after retirement, they do not know how to make the capital embedded in the house liquid and therefore consume much less than their potential level.

[4]See the Appendix for details on how we derive equation (2)

[5]In the empirical implementation we adopt a further simplification, driven by our measure of life expectancy. Since our measure of life expectancy is the self-reported probability of being alive at a given future age, and 5 per cent 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 those observations with a probability equal to zero.

4. Asset composition

There is a vast strand of literature on portfolio decisions of households and how efficiently households allocate their savings among risky and riskless assets (see, among others, van Rooij et al., 2011a). The general conclusion of this line of research is that households, particularly those with poor financial literacy background, tend to under invest in the stock market (van Rooij et al., 2011a, van Rooij et al., 2012). Using a simple framework of expected utility maximisation, it is shown that the households maximize their expected utility by having a diversified portfolio that mixes riskless with risky assets. Particularly the ratio of risky asset out of total asset should always be positive and its amount positively correlated to the excess return rate (to the riskless return rate) and inversely related to the variance of the risky return rate shock (Viceira, 2001). In all circumstances, every portfolio should contain some share of stocks. Observing zero asset in the stock market hence comes as a contradiction to the agents' rational behaviour.

However, if risky and riskless assets have always been identified as stocks and bonds, housing investment role has largely been ignored. Housing investment is difficult to deal with as housing contains both and element of consumption and of investment. However, when housing has been incorporated into the picture, rarely it has been considered as risky.

In this paper we want to concentrate on the share of housing out of total wealth, to understand whether more literate households do show a more balanced portfolio by being less imbalanced in favour of housing. If housing is rightly perceived as risky, it should be considered as such by households, whose wealth disproportionately is tided up to housing prices. In our empirical analysis we thus show whether more financially sophisticated households have a less pronounced share of their assets in housing.

As we mentioned in the introduction, we also want to provide a measure of the consequences of portfolio imbalance. Do the elderly bear heavy costs for their choices of not using their tied up into housing wealth? Does financial literacy help in smoothing shocks and bear less negative consequences of portfolio imbalance? In order to do so, in the empirical analysis we try to detect the role of financial literacy on another dimension of the optimal behaviour, measured by the optimal consumption path. The ideal empirical implementation would be to use total household consumption and look at the role of financial literacy on the consumption drop, assuming that in the optimal scenario consumption should be kept constant over the life-cycle, thus no consumption drop should occur.

5. Data

For our empirical analysis we use the SHARE dataset, a survey that in 2004 started to collect data on the individual life circumstances of a representative sample 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, 3 new countries joined the survey in wave 2, which was released between 2006 and 2007:[6] the Czech Republic, Poland, and Ireland. The survey covers 19,286 households and 32,022 individuals, and its main purpose is to collect comparable information about the health status, income, wealth, and household characteristics of elderly people in 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 that are present in both waves, thus excluding Israel, the Czech Republic, Poland, and Ireland; therefore we are left with the following 11 countries: Austria, Belgium, Denmark, France, Germany, Greece, Italy, the Netherlands, Spain, Sweden, and Switzerland. Our aim is to analyse 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, ideally we need to identify the individual who is responsible for them. The wealth-related survey questions refer to the household, whereas the other questions, such as all the questions related to cognitive abilities (and thus to financial literacy) are asked to each respondent. We need to match the household-related variables with the individual characteristics of one person per household, ideally with the person who is most in charge of the household finances. The survey is well suited to this purpose because at the beginning of the questionnaire individuals are asked 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 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 the 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 the asset questions in wave 2 refer to the household and not to individuals; therefore, the relevant variables are only available for wave 1.

We analyse household financial behaviour and its relationship with financial literacy from three different perspectives: housing wealth decumulation, portfolio imbalance, and consumption path. Accordingly, we thus consider the following main dependent variables: housing wealth decumulation and an indicator for housing downsizing, the ratio between housing wealth and total net worth (log), and a proxy for the optimal consumption path.

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

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 of the amount spent on food at home or outside the home plus the amount spent on telephones. Thus, we consider as a proxy for the optimal consumption path an indicator of the self-reported household ability to make ends meet. The relevant questions for the respondents in charge of answering household-related questions are: "Is the household able to make ends meet? Thinking of your household's total monthly income, would you say that your household is able to make ends meet?". From these questions we build 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 the observations with missing information regarding the variables of interest, we are left with a sample of 18,660 observations. A summary of the descriptive statistics is shown in Table 1. Following Jappelli and Padula (2011), we adopt the variable numeracy provided by the survey as a proxy for our measure of financial literacy. The variable numeracy is derived from four questions that are combined into a single indicator taking values from 1 to 5,[7] with 5 corresponding to the highest level of numeracy; this indicator is meant to measure the ability to perform basic numerical operations. Three questions test the ability to play with numbers, such as the ability to compute a percentage ("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?"), computing the final price of a discounted good from the original price ("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?"), and the price of a second-hand car sold at two-thirds of its original price ("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 fourth question is instead related to the interest rate compounding in a savings account ("Let's say you have 2,000 euro in a savings account. The account earns 10 per cent interest each year. How much would you have in the account at the end of two years?"). In the SHARE data set the original variable name is "numeracy"; for simplicity we instead use the term financial literacy. Using housing wealth we need to take into account two different model specifications for those with housing wealth equal to or different from zero, since the determinants of the two groups might differ; in addition, since we work with the log transformation of the variable, all the observations with a zero value are dropped from the sample; therefore, we end up with a censored sample. The original (uncensored) sample size would be cut by 25 per cent (18,660 instead of 24,336), thus as a robustness check for potential selection concerns we also estimate a Heckman selection model, in order to ensure that the estimates for the censored sample are not

[7] For the details on how the indicator is constructed see the Appendix.

biased due to the selection process.

Lack of decumulation is evident from the pattern of both real and housing wealth (Tables 2 and 3), which does not seem to follow an optimal path from a life-cycle perspective, since different cohorts do not decumulate as they age with the only exception of the oldest cohort (column 1).

Moreover, within each cohort, a higher level of financial literacy corresponds to a higher level of housing wealth (Table 4), and this can be easily interpreted as being due to both variables being correlated with third common factors. Households endowed with a higher level of wealth can also have higher incentives to invest in financial literacy and both factors can in turn be positively correlated with education and/or income. On the contrary, with respect to our priors, from the raw descriptive statistics it is also clear that households with a higher endowment of financial literacy do not decumulate their illiquid assets to a greater extent than those with a lower level; in fact, by splitting the sample according to having a level of financial literacy higher than the mean sample value, there is no difference in the respective decumulation behaviour and no evidence that more literate individuals decumulate at a faster rate as they age. However, this evidence is only indicative of a pure correlation and in order to obtain a better picture of the causal relationship between financial literacy and wealth decumulation we need to rely on model estimation.

At the same time, there is no clear-cut relationship between household portfolio imbalance and the stock of financial literacy (Table 5), since having a higher stock of financial literacy is neither positively nor negatively correlated with having a higher portfolio imbalance. On the contrary, there is a strong positive correlation between increasing financial literacy and optimal consumption behaviour, which is proxied by our indicator of the ability to make ends meet (Table 6) and this correlation is not driven by income effects since the pattern also remains if we control for income replicating the cross-tabulation by quintiles of income.

6. Empirical strategy

In order to estimate the impact of financial literacy on different dimensions of wealth and savings decisions, we use the 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 that are able to make ends meet, which is our proxy for optimal consumption, and the dependent variables representing housing wealth decumulation, such as housing wealth decumulation and an indicator set equal to one if the household downsizes the housing wealth by moving to a smaller unit (the survey provides with the information about the number of rooms in the residence house, accordingly we build and indicator set equal to one if the number of reported rooms between waves

decreases). 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 with both investments in financial literacy and 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 literacy is an indicator showing the last job or occupation held by the father; we set this indicator equal to one if the father was employed in a highly skilled occupation, which we define as a manager, professional, or technician and associate. The intuition driving this choice is the fact that first of all, within the family, it is often the father who is in charge of dealing with finances and is thus more aware of the role played by financial literacy than the mother. In addition, being employed in a highly skilled occupation is certainly positively correlated with investing in children's financial literacy because of the awareness that higher financial literacy can have a positive and important impact on children's subsequent planning for retirement as well as on dealing with household finances. As a consequence, fathers employed in higher-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, the past father's occupation should not be related to the current (un)observed characteristics affecting the 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 to this instrument is that it is time-invariant by nature, since it is derived from a question ("What is or was the last job your father had?") that was 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 to the second wave as well, assuming that given the old age of the sample (50+) the last parental job would probably not have changed by the second wave, as the large majority of parents would already be retired and the very few not yet retired would probably 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 OLS and IV regressions first on the pooled sample, then to compare the endogenous estimates obtained 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 this would mean that the potential endogeneity is not due to individual unobserved factors which are constant over time, and we can consider the pooled cross-sectional IV estimates as the benchmark since the latter would be unbiased for any other potential time variant

source of endogeneity.

We use a set of dependent variables of different types; therefore, ideally we need to use different model specifications. The measure of portfolio imbalance is a continuous variable that we model using OLS regressions and the relevant IV regressions. 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 that 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 (Table 7-various columns).

The second dependent variable of interest is a dichotomous variable representing an indicator for being in a (self-reported) good financial situation. Due to the well established evidence (Angrist, 2001, and Angrist and Evans, 1998) that linear and non linear models provide equivalent results and are both consistent, we prefer to adopt a linear probability model which, as opposed to the non linear fixed effect specification such as the conditional logit model, allows us to gain efficiency.

The third set of dependent variables consists in: housing (and financial) wealth decumulation and the indicator for housing downsizing, two continuous variables and a binary indicator that we treat with OLS and IV specifications. In addition we have only two waves and the dependent variables are obtained as the change over time in the number of rooms in the residence house and in the log value of wealth, thus we are left with a single cross-section and we cannot exploit any longitudinal dimension (Table 9, various columns). For all three dependent variables we use the same vector of individual variables given that the determinants underlying each of them are similar and are all related to savings decisions. The individual regressors consist of the following: the proxy for financial literacy and three categorical indicators corresponding to being in the following age brackets:[8] 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 in which they should start to decumulate due to the less than unitary pension benefit replacement rate. Since the data set only involves individuals aged 50 and older, we divide the two remaining conventional phases into three in order to account for the additional variability due to the oldest age phase (85-100). In addition, we include the self-reported probability of being alive, which we use as a proxy for self-reported life expectancy assuming that the perceived longevity should have an impact on savings behaviour. Individuals are asked the following question: "What are the chances that you will live to be age (75, 80, 85, 90,

[8]The excluded category being the 50-64 age bracket.

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 two indicators for secondary and tertiary education, respectively (where the reference excluded category is primary education). We also control for household income per capita (in logs) and its squared value.[9] Additional information is included in order to account for potential determinants or shocks to savings decisions: an indicator for being retired, unemployed, disable, home-makers or in other categories, an indicator for being a widow/er, and for good health status.[10] We also control for potential bequest motives by including the number of children.[11] Additional information included consists of country fixed effects and time fixed effects in the case of the FE specifications. Whereas only for the regressions modelling consumption path we also include the measure of portfolio imbalance as a proxy for excess of illiquid assets.

We start by commenting on the results relating to financial literacy and portfolio imbalance (Table 7). The first and second columns report the results obtained for both OLS and IV estimations. Concentrating on the impact of financial literacy, both the OLS and the IV results show that having a higher endowment of financial literacy causes a reduction in the household portfolio imbalance: a lower proportion of household wealth consists of housing wealth. We also replicate the analysis by controlling for potential selection bias, since 25 per cent of the uncensored sample has zero housing wealth, so it is dropped 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 and 4 in Table 7). The coefficients relevant to financial literacy are substantially unchanged with respect to the ones obtained for the censored sample, in fact the LR test for independent equations shows that the selection mechanism is ignorable because we cannot reject the null hypothesis of independent equations (p-values: 0.337, and 0.361). As a consequence we can consider the IV results reported in column 2 as our benchmark estimate; according to these results, increasing the stock of financial literacy by one point brings about a significant reduction in household portfolio imbalance equal to 27 percent, which is a substantial effect given that the average value of the dependent variable is about .80. We then compare

[9] All monetary values have been transformed into real ones, denominated in prices obtaining in Germany in year 2005.

[10] The indicator for good health is derived from the question "Has a doctor ever told you that you had any of the conditions on this card?" and set equal to one if the respondent's state that no conditions were diagnosed among those indicated in the list.

[11] The data set also provides information about the intention to leave an 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 to use a more exogenous proxy given by the number of living children.

the results obtained from the IV specification with those of the FE linear model, since this allows us to control for time-invariant unobserved factors affecting saving decisions and also correlated with the stock of financial literacy. The results, shown in column 5, are consistent and of the same order of magnitude of those found for both the OLS and the 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 that we control for in the IV specification. Unfortunately we cannot compare the IV-FE estimator with the cross-sectional 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, being a widow/er or the health status, as well as the number of children, do not seem to have an impact on savings decisions, as is clear from column 2 in Table 7, with the only exception for being retired, which increases the portfolio imbalance, whereas the latter is lower for women and for older people. From the selection equation (columns 4 and 6, Table 7), which we identify by functional form instead of by using any exclusion restriction, we can argue which individual factors mostly increase the probability of having housing wealth. Immigrants, unemployed people or disable are much less likely to own housing wealth, whereas the opposite is true for housewives, and widows/ers, which can be interpreted as being due to the fact that the widow/er inherits the spouse's housing wealth. In addition a self-perceived longer life is correlated to higher probability of holding housing wealth which can be interpreted as wealth effects or signalling a strategy whereby individuals accumulate housing wealth as a buffer-stock. The chosen instrument seems not to suffer from any weakness almost in all the specifications, when we consider either the IV estimates or the control function approach (see the bottom panel of Tables 7, 8, and 9); both the first-stage F statistics and the t-test in the first stage - in case of the control function specifications - are almost all above any standard critical values.

The results for the impact of financial literacy on consumption patterns, proxied by the likelihood of making ends meet, are shown in Table 8, which reports the linear model in the cross-sectional version (column 1) with the IV counterpart in column 2 and the FE results reported in column 3. Throughout all specifications a positive coefficient for financial literacy is reported, thus suggesting the positive impact of the latter on the probability of making ends meet: having a higher endowment of financial literacy increases the likelihood of optimal consumption behaviour. This pattern remains stable and significant (even if with a lower magnitude) when also controlling for unobserved individual heterogeneity in the FE estimation. As for the impact of individual factors in affecting the probability of an optimal consumption pattern, once we control for individual fixed effects, we observe a significant positive impact of self-perceived life expectancy and a negative impact of suffering from a too illiquid portfolio, or being retired, disable or a widow/widower. Commenting on the IV specification, our estimates show that increas-

ing the numeracy score by one point increases the probability of following an optimal consumption pattern by 23 and 28 percentage points. Once we control for unobserved individual heterogeneity, this impact is lower in magnitude, corresponding to a 1 percentage point increase, and loses a little significance (10 per cent level) but still maintains the same (positive) sign. As for the role played by financial literacy, since the FE estimates are substantially similar to the OLS cross-sectional one, we argue that individual time-invariant unobserved heterogeneity plays a minor role, hence, since the endogeneity can certainly represent a source of bias, the IV results represent our benchmark.

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 the OLS estimates, assuming that they are positively correlated with both the stock of financial literacy and the optimal consumption behaviour. However, the OLS estimates can also be downward biased in the presence of measurement errors in the financial literacy indicator as it is well known from the literature on return to schooling (Card, 2001). Therefore, the direction of the bias turns out to be an empirical question. Underestimation of the OLS coefficient has also been found by Jappelli and Padula (2011), who use the same SHARE data set to estimate the impact of financial literacy on the savings rate. Taking the maths 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 estimates are related to the impact of financial literacy on housing wealth decumulation, and the relevant OLS and IV results are shown in Table 9. First we consider the raw measure of housing wealth decumulation (columns 1-3), in addition we consider, as a proxy for the latter, an alternative measure given by an indicator set equal to one if the number of reported rooms in the residence house between waves decreases (columns 4-5), and we also control for the potential impact of financial literacy on financial wealth decumulation in columns 6-8. In this regression we follow our theoretical sketch and we introduce the constant k factor and its interaction with financial literacy in order to evaluate whether financial literacy helps individuals to get closer to the optimal consumption path. In the optimal scenario we would expect to find a coefficient equal to one for k, whereas for any deviations from the optimal scenario we would expect to find the interaction coefficient plus the k coefficient to sum up to one.[12] Starting with the impact on housing wealth, there is no evidence that financial literacy affects housing wealth accumulation (columns 1-3). Similar results are confirmed as for the impact on financial wealth (columns 6-8). These findings are also robust to potential capital-gain effects (column 3 and 8), which we control for by including the interaction between the

[12]The k factor is derived from the theoretical framework in the above section and computed as an inverse function of life expectancy using as measure of the latter the same regressor also included in the rest of the empirical analysis.

month of the interview and country fixed effects. Despite the growth rate representing real values purchasing parity adjusted, housing prices or the value of financial holdings might increase only due to the pure capital-gain. As a consequence individuals could adjust their financial literacy accordingly; therefore, not accounting for these confounding effects, we would end up with biased estimates. Moving to our alternative proxy for housing decumulation, despite in the OLS financial literacy does not play any role in wealth decumulation (column 4), in the IV specification the former turns out to be significant and of the expected negative sign (column 5). According to these estimates by increasing the numeracy indicator by one point increases the probability of downsizing the residence house - by moving to smaller units - by 9 percentage points.

7. Discussion and conclusions

This paper analyses the role played by financial literacy in optimal savings decisions and potential household portfolio imbalance. From a life-cycle perspective, having a large share of wealth invested in illiquid assets, in particular in the late stage of the life cycle, is highly sup-optimal, since illiquid assets such as housing wealth are difficult to use in order to face unexpected shocks or to keep consumption levels smooth during the retirement period when the income from the pension benefit is substantially lower. Despite the theoretical guidance, the empirical evidence largely shows that households do not decumulate as they age and also have a large part of their wealth invested in housing wealth, despite not having strong bequest intentions that could motivate and justify the nature of an unbalanced portfolio. Motivated by this puzzle, we analyse whether individuals endowed with a larger stock of financial literacy may behave in a way that is more consistent with an optimal savings pattern, assuming that higher financial literacy also helps in dealing with more complex financial instruments, thus it should increase the share of the portfolio devoted to financial assets. Using the SHARE survey on individuals aged 50+, we empirically investigate the role played by financial literacy in the following dimensions of savings decisions: unbalanced portfolio, optimal consumption pattern, and housing wealth decumulation.

Our results are robust to the endogeneity of financial literacy through the adoption of an IV strategy, based on father's past occupation. According to our findings, we show that financial literacy helps households to have a more balanced portfolio, characterized by a lower weight assigned to illiquid assets (such as housing wealth); at the same time, a higher stock of financial literacy helps individuals to follow a more optimal consumption path, which is proxied by the likelihood of making ends meet. In addition, we do also find that financial literacy plays a substantial role in another dimension of optimal savings behaviour, represented by housing wealth decumulation, which is reduced for individuals endowed with a bigger stock of financial literacy.

Appendix

A.1. Theoretical framework

The sum of lifetime resources at time t with constant pension benefit, P, and consumption, C can be expressed as

$$A_t + P\sum_{x=t}^{T}\frac{1}{(1+r)^{x-t}} = c\sum_{x=t}^{T}\frac{1}{(1+r)^{x-t}} \tag{4}$$

which simplifies to

$$A_t + P\frac{1-(1+r)^{T-t}}{1-(1+r)} = c\frac{1-(1+r)^{T-t}}{1-(1+r)} \tag{5}$$

Dividing equation (5) computed at *t+1* by equation (5) computed at t and simplifying, we obtain

$$\frac{A_{t+1}}{A_t} = 1 + \frac{r}{1-(1+r)^{T-t}} \tag{6}$$

Taking logs and simplifying further yields result (3)

$$\log\left(\frac{A_{t+1}}{A_t}\right) \simeq \frac{r}{1-(1+r)^{T-t}} \simeq -\frac{1}{T-t} \tag{7}$$

A.2. Numeracy

The four questions relevant to the variable numeracy are the following. The possible answers are shown on 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 follows. 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 receives a score of 2, while if she answers (2) incorrectly she gets a score of 1. On the basis of these four questions, Dewey and Prince (2005) construct a numeracy indicator, which ranges from 1 to 5.

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Table 1: Summary statistics

Variable	Mean	Std. Dev.	Min.	Max.	N
Age	65.807	9.942	50	100	24,336
Prob of living extra 10 yrs	60.612	29.065	0	100	24,336
Financial literacy	3.427	1.113	1	5	24,336
Women	0.517	0.5	0	1	24,336
Immigrant	0.069	0.253	0	1	24,336
Primary edu	0.504	0.5	0	1	24,336
Secondary edu	0.274	0.446	0	1	24,336
Tertiary edu	0.222	0.415	0	1	24,336
Housing w over net w (log)	-0.175	0.483	-4.727	5.469	18,660
Housing w over net w	0.802	3.15	0	237.245	24,336
Prob making ends meet	0.639	0.48	0	1	24,336
HH net worth	229938.192	284914.199	-88297.815	2754292.902	24,336
HH Housing w	176790.438	216603.687	0	2032082.25	24,336
HH income pc	6.07	2.59	0	12.18	24,336
Objective Health	0.256	0.436	0	1	24,336
Employed	0.262	0.44	0	1	24,336
Retired	0.535	0.499	0	1	24,336
Unemployed	0.029	0.169	0	1	24,336
Disabled	0.031	0.173	0	1	24,336
Housemaker	0.135	0.342	0	1	24,336
Other	0.007	0.085	0	1	24,336
Widow/er	0.206	0.405	0	1	24,336
Numb children	1.999	1.172	0	4	24,336

Table 2: Household Net Real wealth

	Cohort				
Age	1904-1925	1926-1935	1936-1945	1946-1957	Total
50-54				203,260.11	203,260.11
55-59			174,085.08	214,298.13	211,421.91
60-64			197,614.51	220,312.80	201,286.13
65-69		166,909.48	184,603.90		183,063.69
70-74		162,307.26	193,905.84		167,313.86
75-79	129,793.39	151,184.84			149,191.79
80-84	123,659.65	176,738.70			133,345.14
85-100	104,613.08				104,613.08
Total	117,019.30	158,814.95	190,536.13	210,325.74	182,054.72

Table 3: Household housing wealth

	Cohort				
Age	1904-1925	1926-1935	1936-1945	1946-1957	Total
50-54				187,573.33	187,573.33
55-59			172,686.71	199,260.19	197,361.24
60-64			192,319.86	214,846.70	195,961.64
65-69		163,503.22	183,121.29		181,405.70
70-74		164,800.17	193,350.02		169,328.45
75-79	134,945.26	152,386.96			150,763.84
80-84	124,953.72	182,187.69			135,391.11
85-100	105,837.36				105,837.36
Total	118,643.69	160,575.98	187,427.72	195,836.28	176,783.70

Table 4: Housing wealth and Financial Literacy by cohort-age

Cohort	1904-1925		1926-1935		1936-1945		1946-1957	
Fin Lit	No	Yes	No	Yes	No	Yes	No	Yes
50-54							176,042.84	194,679.00
55-59					156,658.54	186,058.78	181,720.92	211,374.86
60-64					164,782.92	215,496.07	193,872.75	229,471.21
65-69			147,135.70	188,896.96	159,940.24	206,833.30		
70-74			149,097.97	185,939.34	175,161.90	213,525.07		
75-70	129,165.03	144,844.74	136,259.46	178,172.74				
80-84	112,849.18	151,307.20	149,596.73	250,695.23				
85-100	104,308.11	110,425.12						

Table 5: Share of housing wealth over net worth by Financial Literacy

Financial literacy	
1	0.71
2	0.75
3	0.83
4	0.82
5	0.79
Total	0.80

Table 6: Making ends meet and Financial Literacy

	5 quintiles of HH income					
Financial literacy	1	2	3	4	5	Total
1	0.30	0.44	0.50	0.63	0.52	0.41
2	0.31	0.50	0.54	0.64	0.70	0.48
3	0.37	0.56	0.66	0.72	0.76	0.60
4	0.47	0.61	0.72	0.78	0.86	0.71
5	0.48	0.63	0.75	0.82	0.89	0.77
Total	0.38	0.56	0.68	0.76	0.82	0.64

Table 7: Portfolio Imbalance

	OLS	IV	Heck-ll	Sel eqn	Heck-ll-IV	Sel eqn	FE
Financial lit	−0.023***	−0.274***	−0.023***	0.088***	−0.241***	0.623***	−0.019***
	(0.004)	(0.088)	(0.004)	(0.010)	(0.083)	(0.207)	(0.007)
Age 65-79	0.011	−0.036*	0.011	0.001	−0.027	0.093**	0.018
	(0.009)	(0.019)	(0.009)	(0.028)	(0.017)	(0.045)	(0.025)
Age 80-100	−0.036***	−0.165***	−0.037***	−0.181***	−0.151***	0.076	−0.018
	(0.013)	(0.048)	(0.014)	(0.039)	(0.040)	(0.107)	(0.039)
Life exp	−0.000	0.000	−0.000	0.002***	0.000	0.001***	−0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Women	0.025***	−0.056*	0.024***	−0.075***	−0.050*	0.098	
	(0.008)	(0.030)	(0.008)	(0.021)	(0.027)	(0.070)	
Immigrant	0.040**	0.010	0.036**	−0.397***	−0.021	−0.301***	
	(0.016)	(0.021)	(0.016)	(0.035)	(0.029)	(0.051)	
Secondary edu	−0.031***	0.085**	−0.030***	0.162***	0.080**	−0.087	
	(0.009)	(0.042)	(0.009)	(0.025)	(0.037)	(0.100)	
Tertiary edu	−0.074***	0.099	−0.071***	0.425***	0.106*	0.041	
	(0.011)	(0.061)	(0.012)	(0.029)	(0.058)	(0.151)	
HH income pc (log)	−0.014**	−0.016**	−0.013**	0.084***	−0.006	0.080***	−0.028***
	(0.007)	(0.008)	(0.007)	(0.023)	(0.009)	(0.023)	(0.011)
HH income pc_sq	0.001	0.001*	0.001	−0.013***	−0.000	−0.013***	0.002*
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)
Health	−0.009	0.007	−0.009	0.051**	0.010	0.010	0.013
	(0.009)	(0.011)	(0.009)	(0.023)	(0.011)	(0.029)	(0.016)
Retired	0.058***	0.035**	0.058***	0.009	0.038***	0.050	−0.001
	(0.011)	(0.014)	(0.011)	(0.031)	(0.013)	(0.038)	(0.028)
Unemployed	0.099***	0.055	0.095***	−0.421***	0.035	−0.317***	0.024
	(0.029)	(0.035)	(0.029)	(0.054)	(0.036)	(0.067)	(0.046)
Disabled	0.102***	0.022	0.100***	−0.271***	0.016	−0.101	−0.011
	(0.026)	(0.040)	(0.026)	(0.054)	(0.038)	(0.085)	(0.046)
Housemaker	0.044***	−0.010	0.045***	0.168***	0.006	0.270***	0.009
	(0.012)	(0.023)	(0.012)	(0.040)	(0.024)	(0.059)	(0.030)
Other	−0.004	−0.053	−0.003	0.068	−0.047	0.171	−0.034
	(0.036)	(0.043)	(0.036)	(0.113)	(0.041)	(0.120)	(0.063)
Widow/er	0.022**	−0.016	0.023**	0.101***	0.001	0.166***	0.078
	(0.011)	(0.018)	(0.011)	(0.031)	(0.016)	(0.040)	(0.061)
Numb children	0.009**	0.005	0.008**	−0.012	0.005	−0.004	0.008
	(0.003)	(0.004)	(0.003)	(0.009)	(0.004)	(0.009)	(0.020)
lambda			0.020		0.119		
se(lambda)			0.021		0.129		
LR ($\rho = 0$) p-value:			0.337		0.361		
First stage							
IV		0.115***			0.122***		
		(0.017)			(0.015)		
F-stats		49.897					
Obs	18,660	18,660	24,336	24,336	24,336	24,336	18,660

Robust standard errors in parentheses

* p<0.10, ** p<0.05, *** p<0.01

Additional regressors: country, and year fixed effects

Table 8: HH making ends meet

	OLS	IV	FE
Financial lit	0.038***	0.229***	0.011*
	(0.003)	(0.068)	(0.006)
Life exp	0.001***	0.001***	0.001**
	(0.000)	(0.000)	(0.000)
Housing w over net w	−0.001	−0.001	−0.000
	(0.001)	(0.001)	(0.000)
Age 65-79	0.019**	0.055***	0.001
	(0.009)	(0.016)	(0.020)
Age 80-100	0.069***	0.167***	0.022
	(0.014)	(0.038)	(0.035)
Women	−0.031***	0.031	
	(0.007)	(0.023)	
Immigrant	−0.036***	−0.013	
	(0.014)	(0.017)	
Secondary edu	0.103***	0.014	
	(0.008)	(0.033)	
Tertiary edu	0.130***	−0.002	
	(0.008)	(0.048)	
HH income pc	0.063***	0.065***	−0.012
	(0.006)	(0.007)	(0.011)
HH income pc_sq	−0.004***	−0.005***	0.001
	(0.000)	(0.001)	(0.001)
Health	0.040***	0.027***	0.009
	(0.007)	(0.009)	(0.014)
Retired	−0.018**	−0.001	−0.043*
	(0.009)	(0.012)	(0.022)
Unemployed	−0.206***	−0.173***	−0.048
	(0.022)	(0.027)	(0.046)
Disabled	−0.169***	−0.107***	−0.094**
	(0.022)	(0.032)	(0.044)
Housemaker	−0.016	0.025	−0.019
	(0.012)	(0.020)	(0.031)
Other	−0.041	−0.003	−0.012
	(0.040)	(0.044)	(0.055)
Widow/er	−0.023**	0.006	−0.111**
	(0.011)	(0.016)	(0.049)
Numb children	−0.013***	−0.010***	0.002
	(0.003)	(0.003)	(0.018)
First stage			
IV		0.118***	
		(0.017)	
F-stats		49.780	
Obs	18,660	18,660	18,660

Robust standard errors in parentheses

* p<0.10, ** p<0.05, *** p<0.01

Additional regressors: country and year fixed effects

Table 9: Wealth decumulation

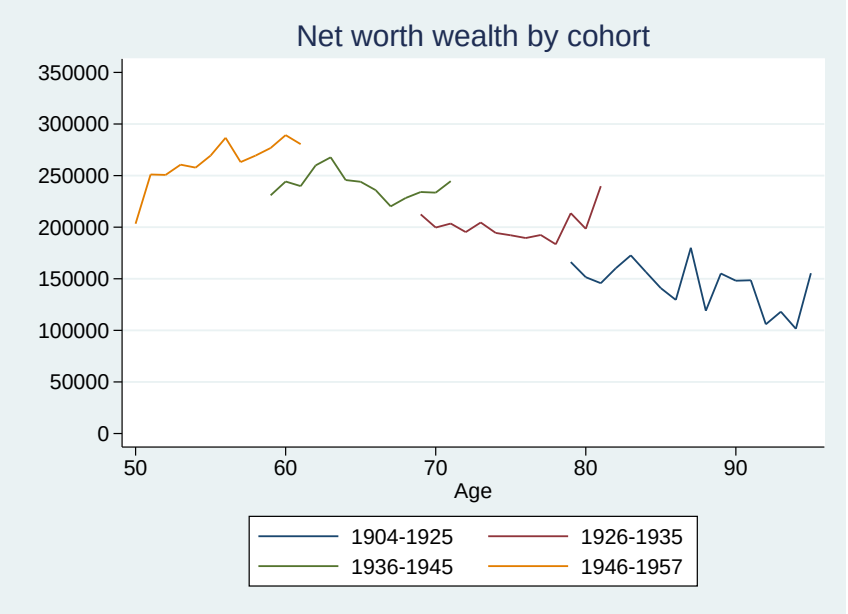
	Housing wealth			Downsizing		Financial wealth		
	OLS	IV	IV	OLS	IV	OLS	IV	IV
Financial lit	0.009	0.011	0.021	0.001	0.094**	0.002	0.599	0.645
	(0.010)	(0.199)	(0.204)	(0.002)	(0.045)	(0.024)	(0.451)	(0.490)
k	−0.260**	0.167	0.164			−0.357	0.176	0.248
	(0.124)	(0.626)	(0.631)			(0.312)	(2.357)	(2.439)
kxFin_lit	0.060*	−0.087	−0.084			0.131	−0.078	−0.104
	(0.035)	(0.209)	(0.211)			(0.084)	(0.763)	(0.790)
Life exp	0.001*	0.001*	0.001	0.000	−0.000	0.000	−0.000	−0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)
Age 65-79	−0.004	−0.003	0.001	−0.012***	0.006	−0.101*	0.035	0.051
	(0.024)	(0.046)	(0.045)	(0.004)	(0.010)	(0.058)	(0.119)	(0.126)
Age 80-100	0.002	0.008	0.014	−0.018***	0.029	−0.108	0.185	0.216
	(0.039)	(0.102)	(0.102)	(0.006)	(0.023)	(0.093)	(0.234)	(0.252)
Women	0.026	0.029	0.031	0.001	0.032**	0.033	0.243	0.263
	(0.020)	(0.068)	(0.069)	(0.004)	(0.015)	(0.046)	(0.164)	(0.176)
Immigrant	0.023	0.019	0.020	0.021**	0.030**	0.222**	0.258**	0.280**
	(0.043)	(0.045)	(0.045)	(0.010)	(0.012)	(0.096)	(0.107)	(0.110)
Secondary edu	−0.002	−0.007	−0.006	0.009**	−0.032	0.041	−0.184	−0.207
	(0.023)	(0.091)	(0.095)	(0.004)	(0.020)	(0.055)	(0.176)	(0.195)
Tertiary edu	0.044*	0.035	0.031	0.011**	−0.051*	0.004	−0.386	−0.422
	(0.024)	(0.135)	(0.140)	(0.005)	(0.031)	(0.057)	(0.295)	(0.323)
HH income pc(log)	0.053***	0.053***	0.048**	0.000	0.001	0.046	0.073	0.067
	(0.019)	(0.019)	(0.019)	(0.003)	(0.004)	(0.061)	(0.065)	(0.065)
HH income pc_sq	−0.003**	−0.003**	−0.003**	0.000	−0.000	−0.002	−0.004	−0.004
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.004)	(0.005)	(0.005)
Retired	−0.022	−0.024	−0.024	0.006	0.012*	−0.128**	−0.112	−0.117
	(0.026)	(0.030)	(0.031)	(0.005)	(0.007)	(0.064)	(0.071)	(0.072)
Unemployed	0.066	0.063	0.087	0.022	0.040*	0.098	0.224	0.189
	(0.053)	(0.059)	(0.058)	(0.016)	(0.021)	(0.155)	(0.191)	(0.197)
Disabled	0.088	0.095	0.102	0.007	0.032	−0.115	−0.014	0.001
	(0.059)	(0.076)	(0.079)	(0.013)	(0.020)	(0.154)	(0.184)	(0.185)
Housemaker	0.052	0.054	0.053	0.003	0.018*	−0.238***	−0.156	−0.157
	(0.035)	(0.048)	(0.049)	(0.006)	(0.010)	(0.086)	(0.111)	(0.113)
Other	−0.096	−0.093	−0.090	0.024	0.041*	−0.114	0.018	−0.007
	(0.080)	(0.087)	(0.090)	(0.019)	(0.022)	(0.207)	(0.237)	(0.237)
Widow/er	0.008	0.015	0.007	0.005	0.020**	−0.028	0.054	0.080
	(0.031)	(0.046)	(0.047)	(0.005)	(0.010)	(0.077)	(0.104)	(0.110)
Numb children	−0.003	−0.003	−0.002	0.003**	0.003*	0.018	0.019	0.011
	(0.009)	(0.009)	(0.009)	(0.001)	(0.002)	(0.020)	(0.022)	(0.022)
Health	−0.001	−0.002	−0.001	−0.002	−0.010*	0.008	−0.038	−0.034
	(0.020)	(0.027)	(0.028)	(0.004)	(0.006)	(0.047)	(0.060)	(0.062)
Add controls								
Months FE*Country FE			Yes					Yes
F-stat		8.757	8.195		20.190		7.372	6.216
Obs	7,315	7,315	7,315	7,832	7,832	5,465	5,465	5,465

Robust standard errors in parentheses

* p<0.10, ** p<0.05, *** p<0.01

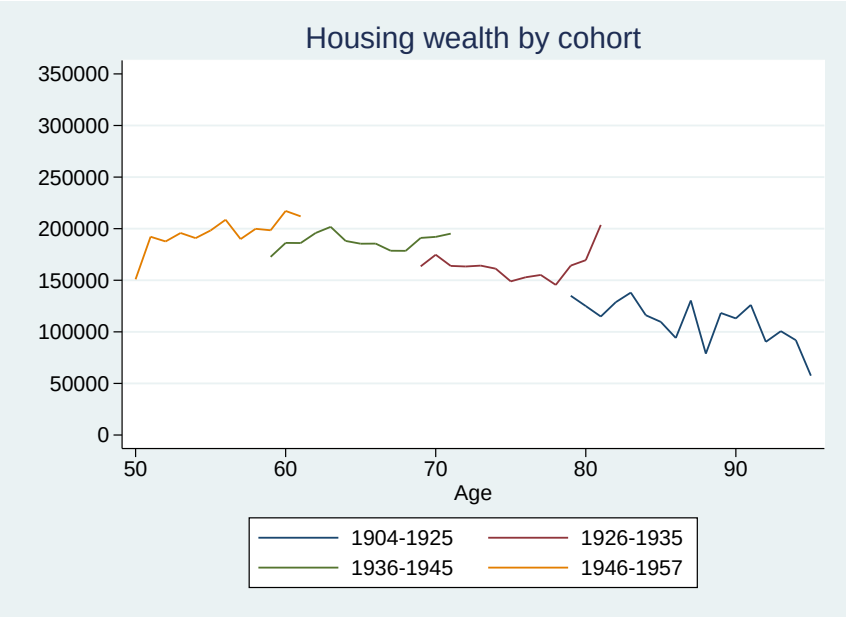
Additional regressors: country fixed effects

Figure 1:



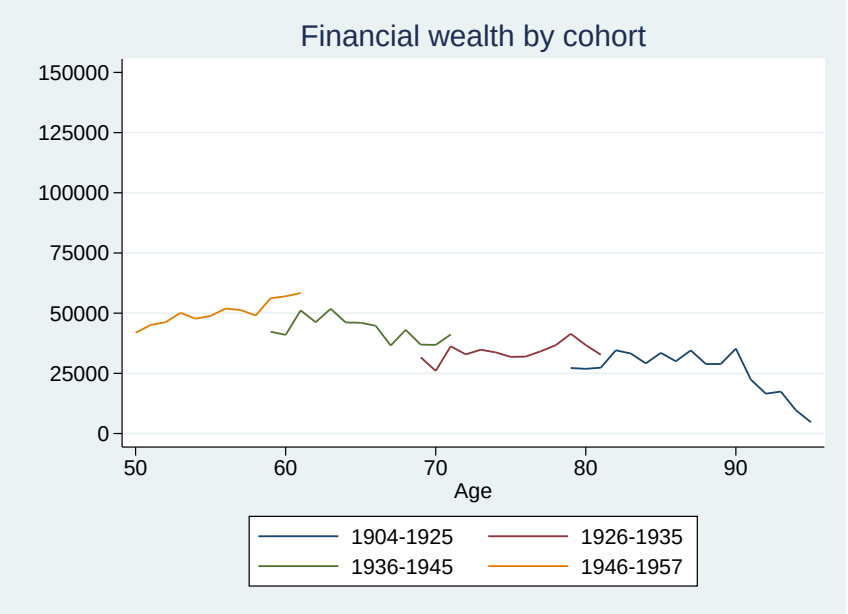
Source: SHARE, waves 1 and 2.

Figure 2:



Source: SHARE, waves 1 and 2.

Figure 3:



Source: SHARE, waves 1 and 2.