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SUBJECTIVE INCOME RISK AND PRECAUTIONARY SAVING

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Abstract. Econometric studies have produced conflicting results on the relevance of *precautionary saving*. This ambiguity has been often ascribed to *i)* the difficulty of measuring key variables, like households' subjective risk in income and permanent income; *ii)* the occurrence of certain kinds of endogeneity bias associated to the unobservability of individual characteristics, like preferences and insurance possibilities. In the present work we investigate these estimation problems exploiting a particular wave of the Italian Survey of Household Income and Wealth which contains both type of information. Our results quantify the average precautionary saving as 4-5 percent of total net wealth. Moreover, excluding illiquid assets like the primary home and business equities, a figure of about 5 percent is statistically invariant to the alternative measures of wealth considered. This 'invariance' reveals a tendency of households to respond to a change in their perceived income risk by rescaling their (liquid) portfolio. We also discuss how the use of richer information on the household characteristics unveils how various kinds of 'bias' might affect estimates in opposite directions and with different intensities.

Keywords: Precautionary saving; wealth accumulation; preferences; liquidity constraints
JEL Classification Numbers: C21; D12; D91

Contents

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1. Introduction

The theory of precautionary saving is grounded on the permanent-income hypothesis of Friedman (1957) and on the life-cycle hypothesis of Brumberg and Modigliani (1954). On the one hand, if preferences exhibit a quadratic felicity (*i.e.* individuals have a linear marginal utility of income), consumption decisions of patient individuals depend on the present value of their permanent income. Any transitory, unexpected income shock is offset by saving decisions and delivers no consumption innovation. Instead, consumption innovations occur as a result of persistent income shocks which produce changes of permanent income. This descriptions conforms to Hall's (1978) certainty equivalence model. On the other hand, if preferences exhibit 'prudence' (*i.e.* individuals have a convex marginal utility of income), consumption decisions do also depend on the perceived consumption risk. A higher expected variance of consumption decreases the current consumption of prudent individuals below their certainty equivalence, for example, in Caballero (1990), Deaton (1991), Weil (1993) and Carroll (1997). This reduction of current consumption goes into 'precautionary saving.' Finally, consumption risk is positive and tied to income risk to the extent to which income shocks are uninsurable; something that ultimately depends on: *a)* the nature of income shocks (*e.g.* idiosyncratic or aggregate, temporary or persistent); *b)* the functioning of markets and institutions (*e.g.* labor and financial markets, social security system); *c)* the ability of the individuals to self-insure (*e.g.* using disposable wealth and transfers from informal networks of friends and relatives). All these three factors are usually captured through the individual budget constraint, for given profiles prices.

Although it seems natural to try to assess the relevance of precautionary saving by directly testing a model of individual consumption or saving, many empirical studies have focused on individual wealth accumulation. This is essentially motivated by the fact that one may find no apparent relation between current consumption and perceived income-risk, especially, when the analysis is based on longitudinal data. By converse, it is typically observed that individuals expecting greater uncertainty hold a larger stock of wealth, relative to their 'human wealth' (or permanent income). Such models of wealth accumulation are consistent with the buffer-stock version of a life cycle model (*e.g.* see Deaton, 1991, Carroll 1997, Carroll and Samwick, 1997), in which individuals have an optimal target of wealth corresponding to a certain perceived income-risk.[1] A log-linearized version of this popular, empirical model is,

$$\log \frac{W_j}{Y_j^P} = b_0 + X b_1 + \frac{\sigma_{y_j}^2}{Y_j^P}\, b_2 + \epsilon_j$$

Individual j's wealth W_j, divided by j's permanent income Y_j^P, is a function of subjective (or perceived) risk in income $\sigma_{y_j}^2$, as well as of personal/household characteristics and economic conditions/opportunities X.

[1] An empirical model of this kind was, first, proposed by King and Dicks-Mireaux (1982). Later it has been used in many studies on precautionary saving; for example, in Guiso, Jappelli and Terlizzese (1992), Lusardi (1997, 1998), Kazarosian (1997), Carroll and Samwick (1998), and more recently in Arrondel (2002) and Fuchs-Schündeln and Schündeln (2005).

Evaluating the relevance of precautionary saving through the estimation of this model is problematic, as estimates might suffer of (at least) two kinds of bias: one is due to measurement errors of key variables, such as subjective risk and permanent income; the other is an endogeneity bias due to the unobservablility of certain fundamental characteristic, like those identifying household preferences and insurance possibilities.

In the present work we investigate these estimation problems exploiting a particularly rich set of longitudinal data, the 2012 Italian Survey of Household Income and Wealth (SHIW), run by the Bank of Italy. This data set is the first one, after SHIW 1989, that contains a question eliciting the respondent's subjective distribution of income. We use this question to derive a measure of subjective risk in income, following the seminal contribution by Guiso, Jappelli and Terlizzese (1992).[2] In addition, SHIW 2012 contains some detailed and precious information that are absent in the 1989 survey; namely, information on: *(i)* the respondents' preferences (*i.e.* on impatience and risk aversion); *(ii)* households' saving/consumption and insurance opportunities (*e.g.* on their exposure to liquidity and credit constraints).

Theory predicts that preference characteristics affect household decisions on accumulation and precautionary saving in various, important ways. These predictions have been confirmed by a consolidated empirical evidence that, for example, shows the relevance of the rate of time preferences in explaining the cross sectional distribution of wealth and permanent income (*e.g.* see Carroll, Slacalek and Tokuoka, 2017). Other studies documented that precautionary accumulation depends both on risk and personal attitudes toward risk (*e.g.* see Caballero, 1990; Cagetti, 2003; Attanasio, Banks, Meghir and Weber, 1999). It is also well known that substituting preference characteristics with proxies such as occupational status, portfolio composition, and even education achievement, might lead to endogeneity and self-selection bias with regard to most measures of expected risk and of permanent income (*e.g.* see Lusardi, 1997; Fuchs-Schündeln and Schündeln, 2005; Arrondel 2002).

A second important determinant of consumption and accumulation decisions is households' insurance opportunities; the individual possibilities to access to trade through both market institutions and 'informal trade mechanisms (*e.g.* famly and friends network).[3] For example, failing to control for insurance opportunities in empirical studies on precautionary saving makes impossible to distinguish 'imprudent' individuals from, say, those who are 'prudent' but liquidity constrained. As a consequence, estimates of precautionary saving might be biased downwards.

Finally, it is important to use both information in *(i)* and *(ii)* to account for the fact that preferences interact with insurance possibilities. This occurs to the extent to which

[2]With similar purposes Arrondel (2002) exploits the French 'Patrimoine 97' survey on household wealth which contains very similar questions of those used by Guiso et al. cit.

[3]The importance of insurance possibilities has been discussed, for example, in Zeldes (1989), Deaton (1991) and, more recently, in Blundell, Pistaferri and Preston (2008); Heatcote, Storesletten and Violante (2009); Blundell, Low and Preston (2013); Carroll et al. (2017, 2021).

the latest are, at least partially, the consequence of past accumulation and consumption decisions (*e.g.* see Deaton, 1991).

It is worth pointing out that both types of information, *(i)* and *(ii)*, are rarely available in official data. 2012 SHIW is the first, and so far the only survey following the 1989, which contains both kinds of information and a question eliciting household heads' perceived risk in income. Furthermore, differently from the 1989 wave, this latest question refers to *total income* as opposed to *labor earning*. This has two relevant implications; one quantitative, another qualitative. The first is that our measure of subjective risk displays a sensibly higher cross-sectional variance than the one constructed on labor income from 1989 data; and this is expected to help in the identification of precautionary saving.[4,5] Qualitatively, our measure of risk is appropriate to evaluate the relevance of precautionary savings also on those respondents like business owners, senior citizens and pensioners, whose main source of income is capital (*e.g.* in the form of private equities, financial asses and real estate properties) and pension transfers. These are individuals who were often excluded from previous studies on precautionary saving. In extending our analysis to this class of respondents we take seriously some potential identification problems. First of all, when we include business-owners in our sample, we consider the fact that these individuals have been often considered to face a higher risk in income and to hold a larger stock of wealth, relative to their permanent income. Yet, their choice might be driven by motives different from the precautionary one (see Hurst, Lusardi, Kennickell and Torralba, 2010). A similar argument can be raised for senior citizens whose saving decisions might increasingly depend on life-cycle considerations (*e.g.* longevity risk, health risk).

Our results show that enriching the model specification with variables representing individual preferences and insurance possibilities, increases considerably its predictive power. However, we find that the effect of precautionary saving is typically small: on average, about 4-5 percent of household's wealth, when we restrict the sample to respondents younger than 65. These figures are essentially in line with an average elasticity of 2-4 percent found in Guiso et al. (1992) and Lusardi (1997), with respect to earning risk. They do also match the elasticities estimated by in Arrondel (2002) on French data, which refer to a similar measure of perceived risk on total income. Further, we find that, excluding 'illiquid' assets like the primary house and business equities from our measure of wealth, delivers an average elasticity of about 5 percent. This same figure is found if wealth corresponds to financial assets. Because this suggests that households tend to react to income risk by simply re-scaling their asset position, we complement the analysis with one that tests the hypothesis that households' wealth composition is not sensitive to subjective income risk. Finally, we complete our analysis with some extensions and robustness check. In particular, we estimate our model on a larger sample, including respondents as old as 80,

[4]According to Browning and Lusardi (1996), an appropriate measure of risk should be observable, exogenous, and vary significantly across the population. This represents a real challenge in empirical studies on precautionary saving.

[5]The higher cross-sectional variance of $\sigma^2_{y_j}$ is also due to the effects of the ongoing global economic and financial crisis, as well as on the Italian sovereign bond crisis.

and find that the average precautionary saving diminishes by about one percentage point on all measures of wealth. In addition, we evaluate the effects of including self-employed individuals and find it does significatively increase precautionary saving only when the more liquid measures of wealth are considered.

Although, the introduction of preference characteristics and indicators on households' insurance opportunities seems to have contributed little to the improvement of the evaluation of precautionary saving, if compared to earlier studies, such a conclusion is incorrect for at least two reasons. The first one is a marked improvement of the explanatory power of both models on wealth accumulation and permanent income. The second contribution is in the possibility to empirically assess the relevance of different kinds of bias, which have been often debated in the literature. In particular, our analysis highlights that the omission of preference characteristics and indicators on households' insurance opportunities from our baseline model, potentially biases estimates in opposite directions and that the intensity of precautionary saving depends on how these effects compose. Moreover, it also highlights that these effects may have very different empirical relevance; some, like liquidity constraints and other indicators of insurance opportunities are stronger than others, like the degree of patience or risk-aversion. Finally, we use indicators of preferences and insurance possibilities to analyze group-behavior; namely to study if and why some particular group has a precautionary saving that significatively differs from the sample mean.

The paper is organized as follows. **Section 2** briefly describes SHIW 2012 and our sample definitions. It then goes through the definition and measurement of the main variables of interest. **Section 3** presents estimation results on precautionary saving as a fraction of alternative measures of wealth, and discusses some possible sources of bias. Section **section 4** discusses the robustness of these results to sample changes by age (including or excluding respondents of age 66-80) and occupation (including or excluding business owners). Some final considerations are presented in **Section 5**. Four appendices collect additional material.

2. Data and measurement

2.1. **Data.** We used data from the 2012 Italian Surveys of Household Income and Wealth (SHIW) run by the Bank of Italy. The survey has been conducted on a sample of 8151 Italian households (approximately twenty thousand individuals) with interviews carried out between January and August 2013.[6] From the original sample (sample A), we later excluded households whose family head was older than 80, who registered a null or negative net income or total net wealth, or revealed an implausibly high degree of risk aversion. Further, we dropped from the sample those households who did not provide relevant information to the interviewer (*e.g.* with missing values on the questions used to elicit preference characteristics or subjective risk in income). Instead, we choose to keep in

[6]The survey is conducted every two years. Details on the 2012 wave, regarding the questionnaire, the sample design and the responses can be found in Bank of Italy (2014).

the sample entrepreneurs and retired citizens, who were excluded in some earlier studies.[7] The remaining sample is of 2,068 individuals (sample B). In Table 13 (see Appendix B) we compare the two samples A and B with a third one that excludes from B respondents older than 65 (sample C); the comparison is by individual characteristics. The definition of the filters used to obtain our samples B and C, explains why their respondents are slightly younger, better educated and with a relatively higher income and net wealth than those in A. Also with respect to A and B, sample C has a moderately higher fraction of males who are self-employed. Instead, it is balanced in terms of family characteristics (marital status, family size, number of children).

2.2. **Measurement.** In this section we focus on the key variables of our model and postpone to Appendix A their exact definition through the survey questions.

2.2.1. *Wealth.* In reality, households' wealth may be composed by a wide range of assets, with possibly very different degrees of liquidity. Which assets might better capture precautionary saving is unclear, both theoretically and empirically. Illiquid assets, such as real estate and pension funds, may be less useful to prevent the effects of bad income shocks, because of the extra time or cost required for cashing them out. Thus, in this respect, it would not be surprising to find that holdings of more liquid assets is associated to higher uncertainty. However, we cannot ignore that for Italian households home ownership and, more generally, real estates are typically the largest asset in their portfolios. For these reasons, beside total net wealth, we consider two progressively more liquid measures:[8] net wealth excluding the main home and business equities (labelled Adjusted Wealth), and financial assets (labelled Financial Wealth). Based sample statistics for the three measures are presented in Table 1 below.

	count	mean	median	sd
Total Net Wealth	2068	371,899	248,106	605,191
Adjusted Wealth	2068	130,576	32,025	393,838
Fininancial Wealth	2068	46,832	15,327	153,997

TABLE 1. Three measures of wealth. Statistics in 2012 Euro. Sample B.

This table confirms that the average (and median) composition of wealth is largely skewed in favor of real assets; something that, for most households, coincides with their primary house. Indeed, in our sample the median fraction of wealth held in real estate properties is above ninety percent (71% is the median fraction represented by the home value). This is true, quite uniformly, across households, with the exception of those in the bottom quintile of the wealth distribution, who are the only ones with a significative

[7]For example, see Guiso et al. (1992); Lusardi (1997); and a more specific study due to Hurst et al., 2010. Arrondel (2002) followed our same choice.

[8]'Net wealth' is real assets (real estate, business equity, valuables) + financial assets (deposits, government securities, other securities) - financial liabilities (to banks, financial companies, other households).

fraction of bonds and securities. Figure 1 presents the average composition of wealth across its distribution by quintiles.[9]

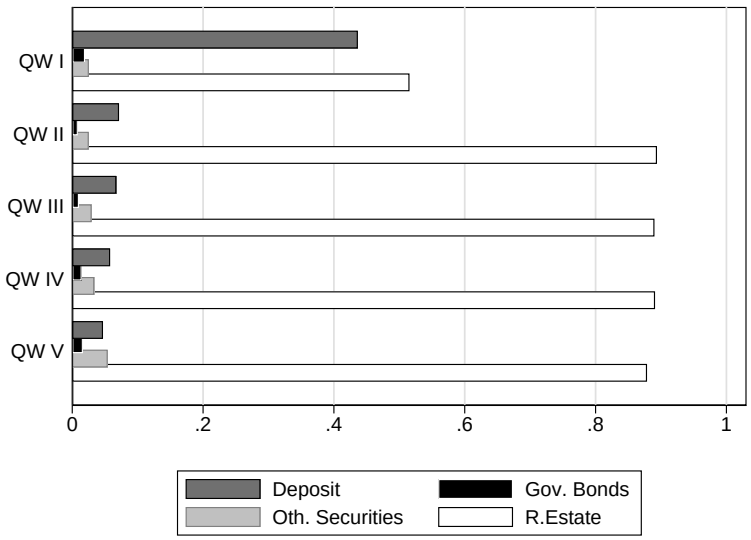

FIGURE 1. Wealth composition by quintiles of wealth (mean values). Sample B

To give a sharper idea of the composition of wealth in the original sample, observe that only 28.4 percent of Italian households did not hold a real estate property. 67.2 per cent of them owned their homes (21.8% tenants, 7.4% rent-free occupiers, 3.3% usufructuaries). This figure is higher than the Euro-area average, which was 60 per cent in 2010.[10] Home ownership is more frequent among respondents aged 55-64 (76.7%), university graduates (76.5%), and among three-member households (72.7%). It is also increasing in the number of income recipients and in total household income. In terms of occupation, some 71.7 percent of self-employed respondent own their homes, against 60.6 percent of households headed by employees. Finally, 16.4 percent of households own a second house and 6.8 other buildings.

Given the relevance of real estate properties, we introduce two binary indicators identifying households who own their primary residence (HomeOwner), or other houses which they used for holidays, for their profession or rented out (OtherHouses). Data on the first indicator confirms the relevance of acquiring home ownership for most Italian households, irrespectively of their demographic and socio-economic conditions. Yet, it also emerged that home ownership was more frequent among respondents aged 55-64 (86%), university graduates (82%), employed in the public sector (82%) and not part of the bottom quintile of the wealth distribution (94%). Concerning OtherHouses, the ownership of real estates is mostly associated to wealthy households, belonging to the top quintile of the wealth distribution (65%). The head of these households were more frequently middle-aged (31%),

[9]In this Figure we label as Other Securities the aggregate value of non-government bonds and equities, also held through ETF and managed funds.
[10]See Table E3 in Bank of Italy (2014).

highly specialized (41%), running her/his own business (45%) or working in the public sector (33%).

One of the reasons why purchasing the primary residence is an important plan for most households is its 'large' size compared with other typical plans. Being large, this plan is expected to change the household saving and consumption motives, especially, around the time when it is implemented. For this reason, we have also defined a third binary indicator that captures the 'ownership tenure' (NewHomeOwner). This is defined to identify those people who purchased or built their primary residence in 2012 or in the previous 4 years. New Home Owners is a group of 138 households, approximately 7 percent of the sample, mostly headed by an individual younger than 44, with a university degree (15%), employed as manager (15%) or working in the public sector.

Finally, households' financial wealth was mostly composed by bank or post office deposits. Participation rates in bonds and stocks were quite low compared to other European countries. Only 13 percent of respondents held Italian Government bonds while direct and indirect stock-holding occurred for no more than 27 percent of the sample. Analyzing financial wealth by area and occupation, data show a significant heterogeneity. Households living in the northern part of the country invested more frequently in bonds (17%) and equities (33%) than those in the central (13% and 28%) and southern (4% and 13%) regions. Families headed by managers and entrepreneurs exhibited a participation in Italian bonds four times higher than the one reported by workers (5%) and double when compared to employees (12%); participation in other securities offers even a more heterogeneous picture with managers prone to invest (47%) and workers who shy away (11%) from these assets.

2.2.2. *Subjective risk in income.* Subjective income risk is computed following the procedure in Guiso et al. (1992), with the major difference that we consider total income, as opposed to labor earnings. To summarize, each individual in our sample is asked to reveal her/his beliefs on the growth rate of nominal income one year ahead. This is achieved by inviting the respondent to place a probability weight on each indicated (intervals of) percentage change. A similar question concerns the expected growth rate of a price index. These data are then used to compute the empirical variance of real income σ_y^2. Later, the ratio of this variance over permanent income, σ_y^2/Y^P, is used to define our measure of 'subjective income risk' (see Appendix A for further details).

Two major problems emerged with the measure of risk computed on SHIW 1989: the high number of respondents declaring zero risk and the low variance of the indicator. For a rough comparison of the two measures, also with earlier studies, we exclude from our sample respondents older than 65 (*i.e.* consider sample C).[11] We found that our data reveal an even higher frequency of observations with a zero value; with 43 percent of the sample declaring zero risk, instead of 33.7 in SHIW 1989. However, we also found a much higher

[11]Even restricting to sample C, the comparison is rough because the questions in the two surveys differ. In SHIW 1989 beliefs on income variation are collected based on a 12 interval grid of positive increments and an alternative of some negative increment. Instead, the 2012 is based on 4 symmetric intervals placed around the central one $[-2, +2]$%. Moreover, the question on prices is posed with respect to a generic index of 'inflation' in the 1989 survey and on an index of (local) housing prices in the 2012.

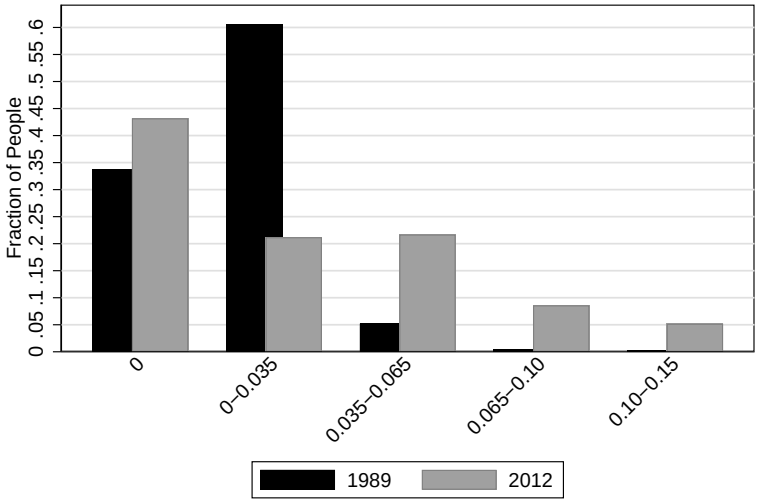

FIGURE 2. Empirical distributions of perceived income risk in 1989 and 2012 SHIW. Respondents younger than 65 (sample C).

variance in the group of respondents declaring a positive risk. This is shown in Figure 2 detailing the empirical distributions of the standard deviation σ_{y_j} over individuals j, grouped by different classes of risk. In the 1989 survey, only around 6 percent of people had an uncertainty higher than 3.5 percent and less than 1 percent of them perceive a significantly high risk in income, higher than 6.5 percent; the corresponding figures in the 2012 survey, respectively, are about 35 and 13 percent. This greater variability is particularly important as it reduces the threat of being unable to consistently identifying precautionary saving.

It is interesting to complement this analysis with one on perceived risk by sample characteristics; we do so referring to our larger sample B. First we divide this in Low- and High-risk, based on a 3.5 percent threshold.[12] Table 14 in Appendix B is structured similarly to Table 2 in Guiso et al. (1992). These groups are essentially homogeneous in terms of demographic characteristics, with a slight tendency of the high risk to be more numerous among single and divorced respondents. The high-risk group has a predominantly larger component of people with a high educational achievement (college graduate or more) or a very low one (elementary or none), who are self-employed, especially craftsman, who had experienced a period of unemployment in the past, and live in the South.[13] In terms of asset position, Low-risk tend to invest relatively less in real estates (OtherHouses) and in securities different from government bonds (OtherBonds), and relatively more in government bonds (GovBonds), life insurances (LifeIns) and retirement plans (PensIns). A closer look to households' wealth, income, and consumption, reveals that those in the Low-risk

[12]A simple analysis on the extreme values of risk in income reveals that there are 5 observations with values above 900. Of these, 4 are self-employed and one is a pensioner. All are wealthy individuals (belonging to the highest quintile of the wealth distribution) with a high education achievement.

[13]People in the group with no educational achievement is formed by 32 respondents only.

group have higher absolute indicators and a 24 percent higher average propensity to save ($1 - APC$). This is coherent with the evidence that Low-risk tend to be more patient.[14]

Comparing our findings with those related to earning risk in the 1989 wave (see Table 2 in Guiso et al., 1992), we observe many similarities and a few differences. In particular, concentrating on differences, contrary to the 1989 survey, we did not find that high-risk are more concentrated in the private service sector, nor we found that managers belong to the high-risk group.

Next, we concentrate on the group of people declaring zero subjective risk; 57.45 percent of sample B. It is important to notice that almost a half (48,6%) of this group are pensioner (*i.e.* 2.4% more frequent than in the whole sample B). Among the occupied respondents, zero risk is about 7 percent less frequent for self-employed (only 50% of entrepreneurs and craftsmen declared zero risk, against an average of 56.7% of the other occupied individuals). Also, there is no clear sign that those occupied in the public sector perceive zero risk relatively more frequently than those in the private sector.[15] Further, we have a mild evidence that those declaring zero risk are relatively less numerous in the South, among households living in larger cities and subject to economic distress (*i.e.* liquidity or credit constrained). Instead, there in no evidence that zero income risk be associated to a lower educational achievement or 'educational ability;'[16] something which can also be read as an indicator that a zero risk answer is not driven by a more limited ability to understand the survey question. Finally, in terms of preference characteristics, zero perceived risk is more frequently associate to more patient respondents (*i.e.* with a higher subjective discount factor).

2.2.3. *Permanent income.* We estimate permanent income from total net income which is the sum of payroll income, transfers, self-employed income, and property income (real and financial).[17] This is accomplished following the procedure suggested in King and Dicks-Mirraux (1984).[18] We depart from the latest study mostly in the model specification, which we tried to improve exploiting the additional information available in SHIW 2012.[19]

Summary statistics of this decomposition are reported in Table 2. Average income is 41,352 Euros, while permanent is slightly higher, 45,775. This result is reasonable considering that the survey refers to a year in which the Italian economy was still experiencing a severe economic and financial crisis.[20]

[14]These observations are confirmed by a simple linear regression analysis on $\sigma_y = Xb + \epsilon$ in which X represents sample characteristics (estimated coefficients b and t-statistics are in the last two columns of Table 14 in Appendix B).

[15]Although 64% of worker in the public sector declare zero risk against 54% of those in the private sector; the evidence is somewhat reversed for employees (55% and 61% respectively) and managers (54% and 57% resp.).

[16]We used as an indicator of 'educational ability' the final vote received by the respondent in the highest degree obtained, relative to its maximum. 66.3% of the zero risk respondents have an indicator above .9.

[17]This corresponds to the aggregate variable 'Net disposable income' y in the definition used in the SHIW data set. See Bank of Italy (2014).

[18]Since then, the procedure has been used in many studies on wealth composition based on longitudinal data (*e.g.* see Guiso et al. 1992; Lusardi, 1997; and Arrondel, 2002).

[19]See Appendix C for an explanation of the procedure and on the results from the estimation.

[20]The Italian sovereign debt crisis had its worst time in the first half of the 2012.

	mean	median	sd	min	max
Total Net Income	41,352	35,995	27,248	285	368,690
Permanent Income	45,775	44,808	20,165	2,820	136,755
Transitory Income	-4,424	-5,270	19,463	-58,942	234,056

TABLE 2. Permanent and transitory income. Values in 2012 Euros - Sample B, 2068 units.

As expected, data on income differ considerably across respondents' occupations (by individuals in the labor force and pensioners) and employment sectors (by employed in the private sector PS and public administration PA). In Figure 3, entrepreneurs and managers report the highest average permanent income, respectively around 74.4 and 63.7 thousands Euros. Employees, craftsmen and workers (operative and laborers), in the order,

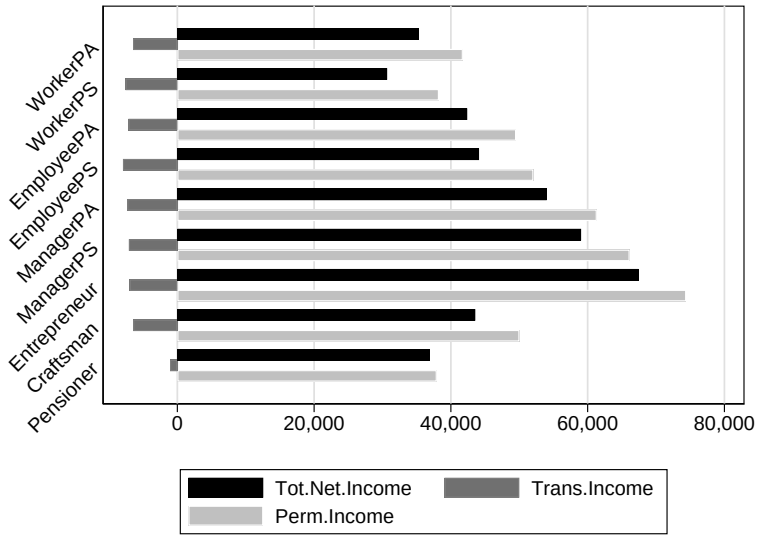

FIGURE 3. Income decomposition across occupations. Sample B.

have progressively lower figure, about 50.9, 50.4 and 38.6 thousands Euros. Transitory income is negative on average, but its dispersion is high, especially for people in certain occupations and for those in the low percentiles of the wealth distribution. In particular, workers and employees have the lowest average transitory income in the 2012, but entrepreneurs and craftsmen have the greatest standard deviation (their distribution is highly skewed toward the lowest value, with a median loss above 20 and 10 thousands Euro, respectively). Instead, if one considers permanent income, the dispersion by occupation is reversed. Geographically, household's income is higher for those who are resident in the North than in the South or in the Centre, but it is relatively more stable for those in the Centre. The eduction achievement has also a positive effect, increasing the average level of income and lowering its standard deviation. All this can be read as an evidence of the greater capabilities of individuals who are wealthier and/or better educated to insure their permanent income against temporary shocks. This is supported by the analysis in Figure 4, which specifically considers the transitory income component: managers of the

private sector and entrepreneurs, who typically have a high education level, have a negative transitory income that is smaller in comparison with employees and workers in the same sector (much smaller if expressed as a ratio of total income).

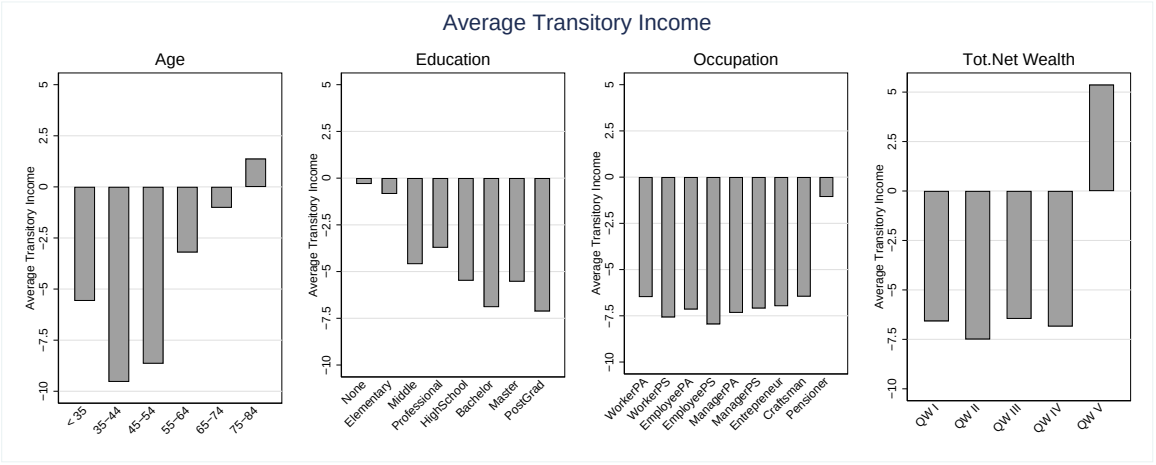

FIGURE 4. Average transitory income across sample characteristics. Sample B.

2.2.4. *Individual preferences: impatience and risk aversion.* One of the major advantages of the 2012 survey with respect to 1989 is that it contains some questions which can be used to measure respondents' patience and risk attitudes.

Patience. The survey contains a question that asks the respondent about his/her willingness-to-pay to anticipate (*i.e.* immediately obtain) the amount of a hypothetical inheritance which is due one year ahead. The payment proposed to respondent j is a percentage θ_j of the inheritance, which we interpret as a measure of the j's subjective, yearly *discount rate*. Coherently, we let j's subjective yearly *discount factor* be $\beta_j = 1 - \theta_j/100$.

Results indicate that 67 percent of individuals have a β above 0.85, and about 56 percent above 0.95 (see Table 3). Although, most individuals seem to be fairly patient,

β_j	Count	Freq	Cum
0.77	124	6.0	6.0
0.80	119	5.8	11.8
0.85	73	3.5	15.3
0.88	339	16.4	31.7
0.95	263	12.7	44.4
0.97	322	15.6	60.0
0.99	828	40.0	100
N	2068	100	

TABLE 3. Estimated average discount factor; sample distribution. Sample B.

the dispersion of the subjective discount factor is substantial.[21] Figure 5 shows that the

[21]'Substantial' does not mean implausible. For example, Carroll and Samwick (1997), calibrating a canonical buffer stock model, find that β is between .88 and .95. More generally, studies provide a very mixed

most patient respondents are among those between 35-54 years old, employed in the public administration or managers of private companies and entrepreneurs. Moreover, on average, β is increasing in the households' net wealth. In terms of geographical residence, there is a slight tendency of the most impatient (respectively patient) to be resident in the South (North); while the average rate is the highest in the Centre.

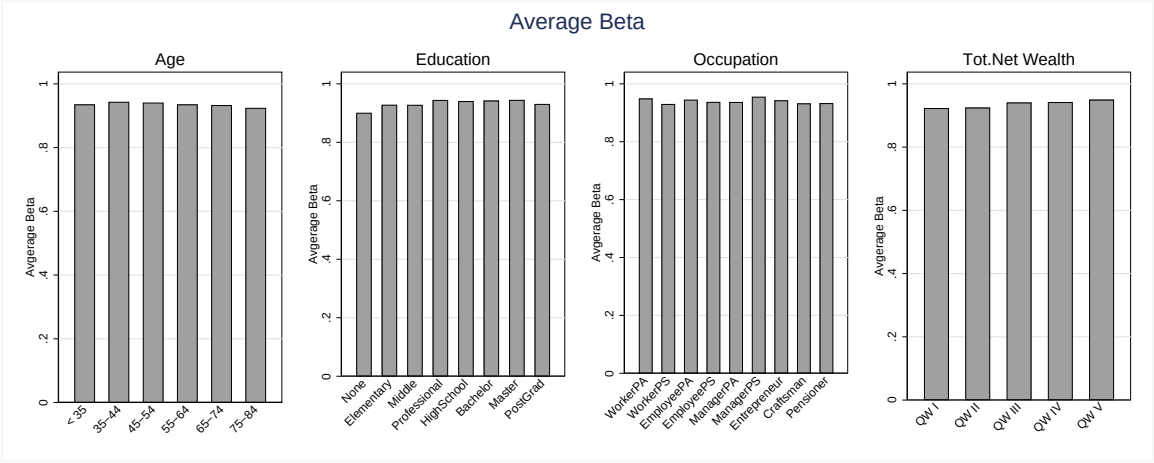

FIGURE 5. Subjective discount factor; empirical distribution by sample characteristics. Sample B.

Risk attitudes. A survey question put each respondent j in front of a risky gamble. It asks wether j would liquidate a fraction d_j of his/her financial assets L_j to purchase a security that either duplicates its value or looses half of it every month, with equal probabilities. Then, every month j can cash the reimbursement of the security or reinvest it.[22]

We derive an (approximate) measure of Arrow-Pratt *coefficient of relative risk aversion* (RRA) by interpreting d_j as the maximal willingness-to-pay for this security by j, out of L_j. Assuming that individuals have expected utilities, we obtain the *coefficient of absolute risk aversion* (ARA) as,

$$r_j \approx \frac{4}{5}(d_j L_j)^{-1}$$

and the coefficient of relative risk aversion (RRA) as, $r_j L_j = (4/5)d_j^{-1}$. We refer the interested reader to remark 2.1 below for the explanation of why SHIW 2012 data rationalizes this measure.[23]

The empirical distribution of the ARA coefficient is presented in Table 4. We point out that our analysis of risk attitudes is instrumental to properly quantify precautionary

evidence, also depending on the differences among data set ('field' as opposed to experimental) and measures (*e.g.* bases on money or health, involving different time horizons). For a critical review of the empirical literature see, for example, section 6 in Frederick, Loewenstein and O'donoghue (2002). In particular, their Figure 2 indicates some consensus of the latest empirical studies in placing β in between .8 and 1.

[22]The value of assets, L_j, is net of trade credit. See appendix A for a precise definition of d_j from the survey question.

[23]Guiso, Jappelli and Pistaferri (2002) and Guiso and Paiella (2008) derive the same measure of absolute risk aversion from a similar query in SHIW 1995. See also footnote 24 below.

saving. Thus, in filtering the original sample, we have excluded people who do not have savings (report a null L_j) or reveal an extremely unrealistic degree of risk aversion (ARA higher than 3). Concerning this last point, we observe that the lottery designed in this

r_j	Count	Freq	Cum
≤ 0.1	1,936	93.62	93.62
0.1-0.2	79	3.82	97.44
0.2-0.3	26	1.26	98.69
0.3-0.4	15	0.73	99.42
0.4-0.5	6	0.29	99.71
0.5-0.6	1	0.05	99.76
0.8-0.9	1	0.05	99.81
> 1	4	0.19	100
N	2068	100	

TABLE 4. Estimated ARA; sample distribution. Sample B.

survey question is quite appealing, with an expected return of 25 percent and a coefficient of variation of 3. Despite so, about 87 percent of the respondents answered to be willing to participate, paying a prize not exceeding 3.5 percent of their liquid assets L; and this reveals a high degree of risk aversion. In remark 2.1 we show that this attitude is approximately captured by a RRA coefficient above 6 for individuals with CRRA expected utilities.[24]

Finally, Figure 6 shows how the average ARA changes with the usual individual characteristics. In the first panel, risk aversion is first increasing up to age 35-44, then decreasing approximately until 65, about the age of retirement; the retirement age (65-74) sees an increase of risk aversion, which later decreases again. ARA is approximately decreasing in the level of education, in the second panel. This evidence is roughly consistent with the one in the third panel, where the most risk averse are workers, followed by craftsman and employees of the private sector. The right hand side panel of Figure 6 shows a pattern that can be interpreted as an evidence of preferences being of the class of decreasing ARA.

Remark 2.1 (Rationalizing the index of risk-aversion)**.** *For simplicity, we omit the respondent subscript and let $q \equiv dL$, to be the individual payment to the lottery considered. By definition, the maximal willingness-to-pay q^* for the lottery is the maximum value $q \leq L$ such that,*

$$(o) \qquad u(L) \leq \frac{1}{2}[u(L+q) + u(L-q/2)]$$

[24] We point out that the lottery proposed in SHIW 2012 has a different formulation and is less risky than the one corresponding to the 1995 survey. The latest is based on a question that asks how much one is willing to pay ($d_j L_j$) to enter a lottery that yields 10 (million lire) or the entire loss of the bet with equal probabilities. Thus, it has an expected value which is positive only for those who are willing to bet at least the winner prize of 10 (million lire) and it is negative for lower bets. Moreover, for the 'risk-lovers' who are willing to bet more than the winner prize, the expected value is lower than the one offered by the 2012 lottery.

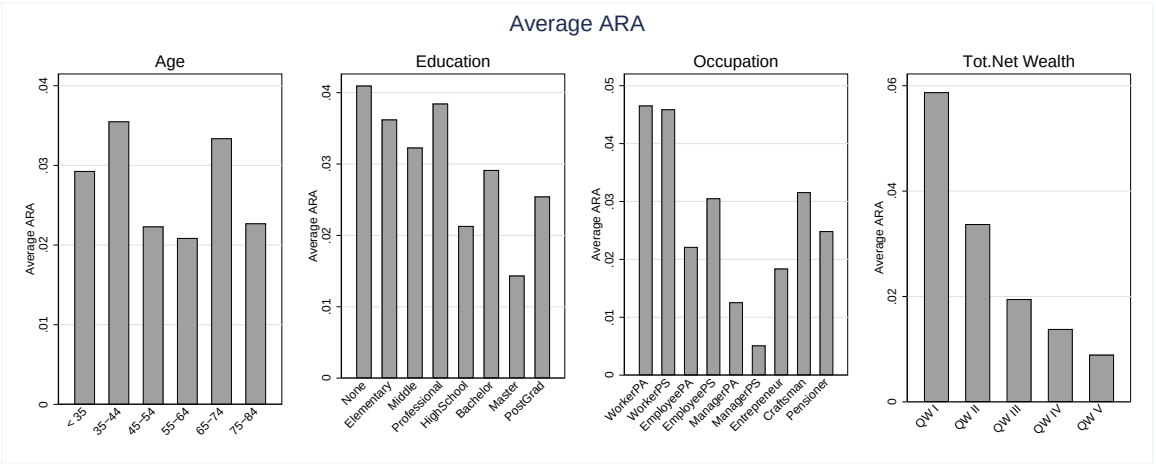

FIGURE 6. ARA empirical distribution by sample characteristics. Sample B.

q^* can either be a corner or an interior solution of this problem; namely, either i) $q^* = L$ or ii) $q^* < L$ is such that (o) holds with equality (and $u'(L+q^*) - u'(L-q^*/2)/2 < 0$).[25]

*Next, SHIW 2012 data point to $d \equiv q/L \leq 0.1$ for more than 87 percent of respondents, and have none choosing $d = 1$ (*i.e. *$q = L$). Therefore, for every individual j with assets L_j, we let q_j^* be such that (o) holds with equality. Approximating each term on the right hand side of (o) to the second order, $0 = \frac{1}{4}u'(L_j)q_j^* + \frac{5}{16}u''(L_j)(q_j^*)^2$; which translates into the above approximate ARA coefficient r_j. It is worth pointing out that this approximation is actually a lower-bound for prudent households (*i.e. *with $u''' > 0$).*

Finally, data highlight an extremely high degree of risk aversion. To illustrate this with an example, assume that u is a CRRA with elasticity $\gamma > 0$, possibly different across households. Use the fact that, at an interior solution q^*, $u'(L+q^*) - u'(L-q^*/2)/2 < 0$; or, equivalently, $(L-q^*/2)^{-\gamma} > 2(L+q^*)^{-\gamma}$. Taking logs and approximating around zero participation, the latest condition translates into,

$$\gamma > \frac{\log 2}{\log(L+q^*) - \log(L-q^*/2)} = \frac{\log 2}{\log(1+d^*) - \log(1-d^*/2)} \approx \frac{2\log 2}{d^*}$$

Hence, referring to the data, $d^* \leq 0.1$ for 92 percent of our sample, corresponds to a CRRA coefficient γ above 6 for almost all individuals.

2.2.5. *Liquidity and credit constraints.* SHIW 2012 contains very useful information on households' budget constraint and insurance possibilities. In particular, beside comprehensive data on respondents income, assets and liabilities, the survey presents some detailed information on the respondents' liquidity constraints, both actual and expected, and on credit constraints. There are important theoretical reasons to keep these information distinct, on which we shall return later.

[25]A maximum exists because the constrained set contains 0. Moreover at $q = 0$, (o) holds with equality. Assume u is twice continuously differentiable, strictly increasing and strictly concave. Then, the function $F(q) \equiv \frac{1}{2}[u(L+q) + u(L-q/2)] - u(L)$ has the same properties of u, with $F(0) = 0$ and $F'(0) > 0$. Also, $F'' < 0$. Finally, that $q^* < L$ is such $F'(q^*) < 0$ is easier to verify by forming the Lagrangian of the problem and showing that the multiplier associated to (o) is strictly positive at q^* iff $F'(q^*) < 0$ iff $u'(L+q^*) - u'(L-q^*/2)/2 < 0$.

Liquidity constraints. We define three binary indicators for *liquidity constrained* households, two 'actual' (or 'effective') and one 'expected.' The first is a subjective indicator (SubjLiqCon) and identifies as liquidity constrained respondents who declared to have a total disposable income that is insufficient to allow the household 'to live reasonably comfortably but not in luxury.' The second indicator is 'objective' (ObjLiqCon) and identifies as liquidity constrained those households who were more than three months late in the payment of their rent, utility bills or loans, during the 2012. A third indicator, of expected liquidity constraint (ExpLiqCon), identifies those households who think they are unable to save enough money to face future unexpected events.

To avoid confusion between 'expected' and 'actual' liquidity conditions, we drop from the latest group those who were currently spending in excess of their income. This last filtering sharpen our ability to effectively discriminate between households who save 'less' simply because they are unable to, from those who are 'optimistic' on their future finances.[26] Clearly, such a distinction becomes sharp once we control for individual preference, as it allows to tell apart patient liquidity constrained individuals from impatient/hand-to-mouth ones (*e.g.* see Deaton, 1991).

x	$Pr(oLC\|x=1)$	$Pr(sLC\|x=1)$	$Pr(eLC\|x=1)$	$Pr(x=1)$	count
oLC	1	0.55	0.1	.039	80
sLC	0.084	1	0.189	.253	523
eLC	0.011	.133	1	.359	742

TABLE 5. Liquidity constrain indicators, sample conditional probabilities. $oLC = ObjLiqCon$, $sLC = SubjLiqCon$, $eLC = ExpLiqCon$. Sample B.

We summarize how these indicators interact with each other in Table 5, where it is illustrated in what proportions households enter different groups of liquidity constrained individuals. This is done computing the sample conditional probabilities to belonging to each group, in each of the first three columns. The last column of the table indicates the proportions of households who are liquidity constrained. It is immediately evident that, while only 3.9 percent of households is objectively liquidity constrained in 2012 ($ObjLiqCon = 1$), a much larger fraction declares either to be constrained ($SubjLiqCon = 1$) or to expect to be so in the next future ($ExpLiqCon = 1$) (respectively, about 25% and 36%). However, not all those falling in the group of objectively constrained are also part of the last two categories; only about 55 and 10 percent of the 'objectively' liquidity constrained, respectively, declared that the household's income is insufficient to 'live reasonably comfortably' ($SubjLiqCon = 1$) or to avoid liquidity constrains in the next future ($ExpLiqCon = 1$). To confirm that the three indicators capture sufficiently independent phenomena, we notice that there are only 8 households (0.4% of sample B) who is liquidity constrained according to all three indicators.

[26]The effect of expected liquidity constraints on precautionary saving is clearly explained in a recent theoretical paper by Carrol et al. (2021).

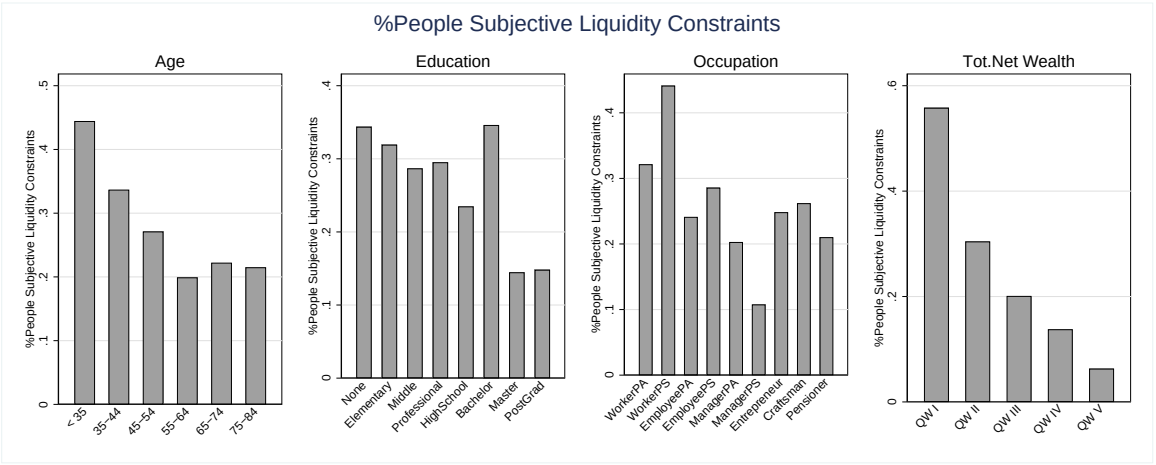

FIGURE 7. Subjectively liquidity constrained households. Sample B.

Finally, Figure 7 presents same evidence on the households who perceive themselves as liquidity constrained ($SubjLiqCon = 1$), by the usual sample characteristics. Summarizing, these households are more likely to be in the poorest part of the population (56% of those in the I quintile of the net-wealth distribution), among the workers (44 and 32% of those employed in the private sector and in the public administration respectively), and young people (44% among those younger than 35 and 34% of those in the interval 35-44). Following workers, liquidity constrains emerge for about 25 percent of employees and 21 percent of pensioner. As expected, these figures do not completely match those obtained considering the objective measure $ObjLiqCon$. In particular, most liquidity constrained households are now in between age 45-54, followed by 35-44, and are more numerous among craftsman than workers of the public sector. Turning to expected liquidity constrains $ExpLiqCon$, differences are more evident (see Figure 8). First of all, on average, there seems to be a much lower variation among classes of age, occupation, and wealth. Moreover, households falling in the $ExpLiqCon$ group are mostly among the elderly: more of 83 percent of respondents are older than 65 and more than 82 percent are retired; this group is closely followed by the respondents younger than 35. In terms of the occupation, now the $ExpLiqCon$ are numerous also among managers (more than 83% and 82%, respectively, of the private and public sector); instead, the craftsman seem to be the most 'optimistic,' followed by the workers of the public sector. The markedly diffused fear to be liquidity constraints of the elderly is probably associated to the specific indicator considered, and to their perception of a reduced possibility to 'save for rainy days.'

Credit constrains. A respondent is 'credit rejected' if the household applied for a loan or mortgage to a bank or a financial intermediary during the 2012 or in one of the previous two years was, and the request was (even if only partially) denied. Instead, we say that a household is 'credit discouraged' if in the same period, any of its members had considered to apply to a loan or a mortgage, but then did not because thought the request would be

refused.[27] These groups are formed by very few households: only 20 are credit rejected and 50 are discouraged (respectively, about 1% and 2.4% of sample B). Moreover, only three of them are simultaneously members of the two groups. Hereafter, we address as of 'credit constrained' (CreditCons) the households who belong to either one of the groups of credit rejected or discouraged.

Figure 9 examines credit constrained households by the usual characteristics. The evidence from the first and last panel are essentially in line with what we expected; households' credit mostly consist in mortgages to acquire home ownership or for its renovation (overall, around 12.3% of households), something occurring manly around age 35-54. The relatively low fraction of constrained respondents may be due to the fact that households, especially if applying for a mortgage, tend to do so only when they believe they are eligible for it. Besides this, credit constrains seem to arise for those households headed by a self-employed individual, who depends more strictly on business credit (*e.g.* craftsman and entrepreneur), or for those who might rely more on consumer credit, such as workers or, more generally, people in the lowest percentiles of the wealth distribution. The major difference between groups is that discouragement seems to drop more sharply with the level of wealth and with age, and seems to be more widespread than credit-rejection. However, considering the small number of respondents, and the absence of marked differences in their characteristics, in the rest of the analysis we shall group them as 'credit constrained;' something that was also pursued in Jappelli (1990).

3. Main results

To help comparisons with earlier studies, we start by estimating a model of total net wealth over a subsample of individuals younger than 65 (our sample C). We shall later comment how these results extend to the two other measures of wealth considered. Further extensions and robustness test are postponed to section 4, where we run our analysis on

[27] The distinction between 'credit constrained' and 'credit discouraged' has been first proposed in Jappelli (1990) using data from 1983 U.S. Survey of Consumer Finance.

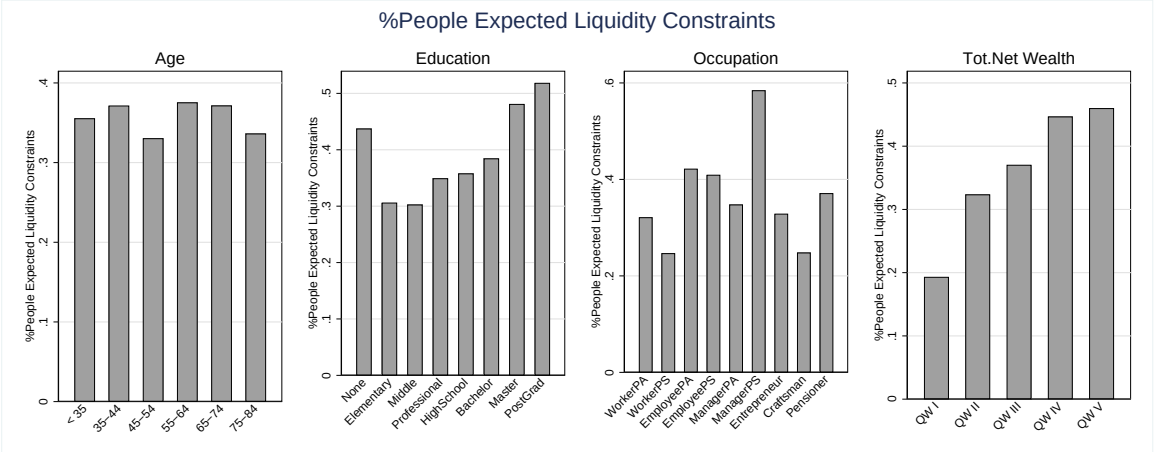

FIGURE 8. Households who are expected to be liquidity constrained. Sample B.

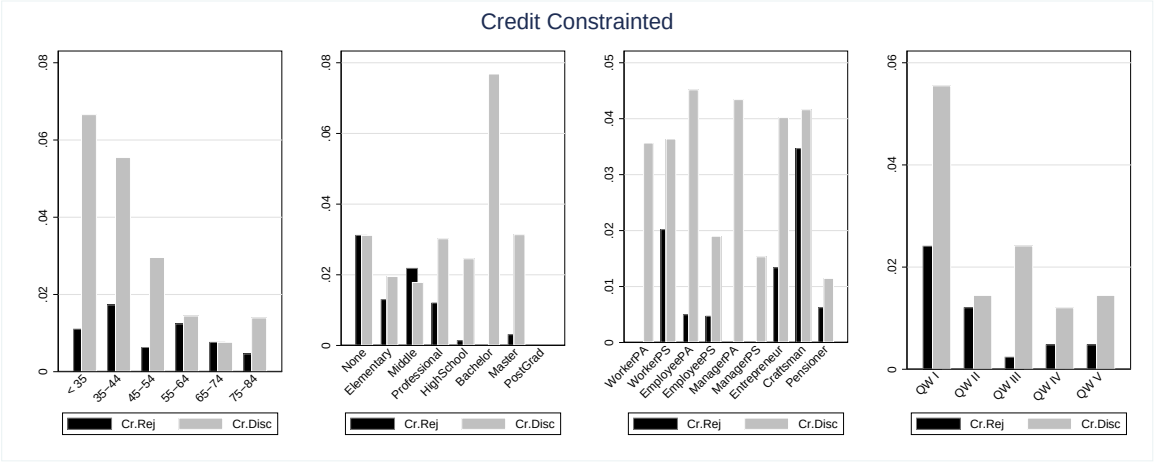

FIGURE 9. Credit constrained households, divided in groups of Credit Rejected and Credit Discouraged. Sample B.

the whole sample of individuals, up to age 80 (sample B), and explicitly address the effects of excluding business-owners from our samples.

3.1. **A model of total net wealth.** As for the general model presented in the Introduction, we regress the log-ratio of wealth to permanent income ($\ln(W/Y^P)$) on our measure of risk in income and on three types of household characteristics (see Table 6). The risk measure is the variance of total income in real terms, normalized by the permanent income (R Income Risk).[28] The household characteristics are: *i)* **demographic attributes**, such as gender (Male), age, martial status (Married or else), number of income recipients (NRecipients), and **geographic location** in terms of country area (Northern, Southern with respect to Centre) and of city size by inhabitants (Small City = 20,000-40,000, Mid Cities 40,000-500,000, Big City $>$ 500,000, with respect to Villages $\leq$ 20,000); *ii)* **occupation** conditions identified by the respondent occupation (with respect to Workers), labor and non-labor pensioner (LPensioner and NLPensioner); *iii)* **preferences**, the respondent's subjective discount factors (Beta) and degree of risk aversion (PatientEIS ad ImpatientEIS); *iv)* **economic conditions and opportunities**, like the household's exposition to liquidity constraints (ObjLiqCon, SubjLiqCon, ExpLiqCon) or credit constraints (CreditCon), and the status of real estate owner (HomeOwner, OtherHouses and NewHomeOwner).[29]

Estimation results in Table 6 are presented for four model specifications. These, enumerated from (1) to (4), contain the indicator of subjective risk in income and progressively richer specifications of households characteristics. In particular, (1) only includes some basic demographic and socio-economic characteristics, (2) introduces preferences, (3) adds liquidity and credit constraints, (4) includes three binary variables on the households' real estate properties.

[28]All the definitions of our measures are in section 2.2 above.

[29]NewHomeOwners, defined in Appendix A, is a binary indicator taking value 1 if the household has purchased or built the primary residence in 2012 or in the previous 4 years, and 0 otherwise.

	(1) $\ln(W/Y^P)$		(2) $\ln(W/Y^P)$		(3) $\ln(W/Y^P)$		(4) $\ln(W/Y^P)$	
	b	se	b	se	b	se	b	se
Demographic								
Male	0.023	0.077	0.017	0.078	0.010	0.074	-0.010	0.053
Age	0.026***	0.005	0.026***	0.005	0.021***	0.005	0.008**	0.004
Married	0.163*	0.090	0.160*	0.090	0.196**	0.086	-0.014	0.061
NRecipients	-0.010	0.050	-0.012	0.050	-0.127***	0.049	-0.231***	0.035
Geographic								
Northern	-0.339***	0.079	-0.337***	0.079	-0.315***	0.075	-0.285***	0.057
Southern	-0.216**	0.093	-0.181*	0.095	-0.035	0.090	-0.123*	0.068
SmallCity	-0.052	0.096	-0.052	0.097	-0.074	0.092	-0.109	0.070
MidCity	-0.174**	0.080	-0.175**	0.080	-0.177**	0.077	-0.159***	0.058
BigCity	-0.193	0.150	-0.191	0.149	-0.189	0.143	-0.149	0.099
Occupation								
Employee	0.434***	0.115	0.417***	0.115	0.218**	0.106	0.076	0.071
Manager	0.604***	0.126	0.585***	0.125	0.294**	0.115	0.140	0.088
Entrepreneur	0.814***	0.142	0.790***	0.142	0.655***	0.132	0.396***	0.110
Craftsman	0.843***	0.133	0.839***	0.133	0.726***	0.123	0.721***	0.097
LPensioner	0.600***	0.139	0.595***	0.139	0.404***	0.128	0.319***	0.090
NLPensioner	0.909***	0.245	0.914***	0.242	0.927***	0.268	0.552***	0.177
R Income Risk	0.077***	0.009	0.080***	0.009	0.068***	0.009	0.060***	0.007
Preferences								
PatientEIS			0.073	0.375	0.149	0.367	0.364*	0.209
ImpatientEIS			-0.351*	0.200	-0.195	0.186	-0.328**	0.157
Beta			0.012**	0.006	0.003	0.005	0.001	0.004
Econ. Cond.								
CreditCon					-0.263	0.171	-0.041	0.127
ObjLiqCon					-0.524**	0.226	-0.249	0.158
SubjLiqCon					-0.785***	0.088	-0.394***	0.061
ExpLiqCon2					0.255***	0.061	0.156***	0.045
HomeOwner							1.953***	0.083
OtherHouses							0.539***	0.051
NewHomeOwner							-0.225***	0.084
Constant	-0.264	0.272	-1.447**	0.598	0.120	0.580	-0.257	0.454
N	1332		1332		1332		1332	
R^2_{adj}	0.132		0.134		0.229		0.592	
aic	4305.3		4304.8		4154.5		3310.2	

$* \; p < 0.10, \; ** \; p < 0.05, \; *** \; p < 0.01$

TABLE 6. Regression outcome. Dependent variable: log of Total Net Wealth over permanent income. OLS with std errors robust to heteroskedasticity. Sample C. Reference categories: Singles, resident in the Centre of Italy, resident in Villages, Workers.

Overall, estimation results indicate that the average contribution of precautionary saving is significative, but 'small;' around 4-5 percent of total net wealth, not much higher than 2-4% resulting from the OLS estimates on earning risk in Guiso et al. (1992) and in Lusardi (1997), based on SHIW 1989 (see Table 7). However, the inclusion of covariets representing households' preferences and economic characteristics has considerably improved the explanatory power of the model and, as we discuss later, it has also significantly affected the estimated elasticity of the precautionary component. Moreover, with

respect to traditional, more parsimonious specifications, our does not include among the regressors, variables such as the log of permanent income, normally used as a proxy of the respondent preferences; or a higher-order polynomial function of the respondent's age, typically used to capture life-cycle properties of the cross-sectional distribution of wealth that were otherwise unexplained.[30]

		$\varepsilon(1)$	$\varepsilon(2)$	$\varepsilon(3)$	$\varepsilon(4)$
R Income Risk	mean	.0508	.0520	.0454	.0406
	sd	.1000	.1018	.0915	.0837

TABLE 7. Precautionary saving: Estimated elasticities with respect to TotNetWealth; mean and standard deviation; models (1)-(4). Sample C.

The estimation of (1) highlights that the level of accumulated net wealth, relative to its 'target' Y^P, increases with age. It is relatively higher for households with married individuals, especially if living in small- and medium-size cities, located in the Centre of Italy and, subordinately, in the South. In terms of the respondent's occupation, employees tend to accumulate 43.4 percent more than workers; this figure raises to 60 percent for managers and to above 80 percent for self-employed (entrepreneurs and craftsmen). Labor pensioners have also a higher ratio W/Y^P, similar to managers, and this is in line with life-cycle theory, as the individuals considered in this sample are mostly in their earlier retirement (because younger than 65). Non-labor pensioner have an even higher ratio, which is mostly explained by a lower median permanent income. As for risk in income, its coefficient is positive and significative; although, its magnitude is more easily interpreted in terms of the elasticity of total net wealth, in Table 7, column (1).

In specification (2) preference characteristics are introduced. According to the theory, individuals with a higher discount factor Beta have a higher propensity to accumulate wealth.[31] As observed in section 2.2, the sample dispersion of our this variable is substantial, and this makes it an important determinant of the large cross-sectional variance characterizing households' wealth (*e.g.* see the discussion in Carroll et al., 2017). By converse, the overall effect of risk aversion is, in general, ambiguous. As theory predicts, in standard expected utility models, the coefficient of relative risk aversion has offsetting effects: accumulation is decreasing in the degree of risk aversion if consumers are 'impatient' and increasing if they are 'patient.'[32] This is the consequence of the fact that the

[30]The inclusion of permanent income has been justified to account for the possibility that preferences are non-homothetic. However, we notices that this variable tends to completely loose its statistical significance once we control for both preference characteristics and liquidity constraints in models (3) and (4); something that makes us suspicious of the effective role played in traditional specifications. Second-degree or higher-order polynomials of Age have been used since King and Dicks-Mireaux (1982) by all authors. We tested different polynomial structures of the second order, but could not reject the linear specification in Age.

[31]To easy the coefficient interpretation, we let $Beta = \beta \cdot 100$.

[32] A typical Euler equation model is of the form,

$$\mathbb{E}_t\left[\Delta \log(c_{t+1})\right] = \frac{1}{c_t r(c_t)}\left(\frac{i_{t+1}-\theta}{1+i_{t+1}}\right) + \frac{1}{2}p(c_t)\mathbb{E}_t\left[\left(\Delta \log(c_{t+1})\right)^2\right]$$

where $p(c_t) \equiv -c_t u'''(c_t)/u''(c_t)$ is Kimball's coefficient of relative prudence is subject to estimation. See, for example, Carroll (1987) for a discussion of this model.

RRA coefficient is in inverse relationship with the elasticity of intertemporal substitution (EIS).[33] Therefore, by regressing a measure of wealth accumulation on an index of risk aversion, the estimated coefficient may take either signs, or be non-significative. This is what we recurrently found in our preliminary analysis.[34] To try to disentangle the opposite effects associated to risk aversion and to EIS, for each typical respondent j, we define the variable,

$$(i - \theta_j) \cdot EIS(r_j)$$

where i is the economy real interest rate and $\theta = \beta^{-1} - 1$ is the subjective discount rate (see footnote 32). Then, individual j is 'patient' or 'impatient' depending on the term in parenthesis $(i - \theta_j)$ being, respectively, positive or negative. Data indicate that i is approximately 3 percent in the reference period.[35] Therefore, we identify as 'patient' those respondents with $\beta > .97$. Next, to capture the two opposite effects of the EIS, we separate 'patient' and 'inpatients' using a dummy variable d_p which takes value 1 for all individuals with $\beta > .97$ and 0 otherwise; then, we let,

$$PatientEIS_j = d_p \cdot EIS(r_j)$$
$$ImpatientEIS_j = -(1 - d_p) \cdot EIS(r_j)$$

and take $EIS_j \equiv 1/ARA_j$. As a result, one expects that accumulation increases in the 'patience' indicator and decreases in the 'impatience;' which is what we actually finds in model (2) and, more generally, in the rest of the analysis.

Model (3) introduces various indicators of liquidity and credit constraints, discussed in section 2 above. Liquidity constrains have very strong effects on households' saving decisions. In particular, following Deaton (1991), we differentiated 'actual' from 'expected' liquidity constraints. The underlying idea is that liquidity is normally used to smooth current consumption, especially, in its non-durable component. Therefore, liquidity constrained households tend to hold a level of net wealth below its target; by contrast, expected liquidity constrained tend to increase current asset accumulation. Results confirm this interpretation for all measures; the two 'actual' ones, based on a subjective and an objective indicator, show that a constrained individual reduces accumulation with respect to its target, respectively, by 78.5 and 52.4 percent; the 'expected' one reveals that a constrained individual raises accumulation by 25.5 percent. Moreover, the overall contribution of these components to explain the cross sectional variance of the dependent variable is substantial

[33]If preferences are standard additively separable vNM preferences with CRRA felicity the two coefficient are exactly one the reciprocal of the other. A more general class of utilities, preserving recursivity and stationarity, is Kreps and Porteus' (1978). Epstein and Zin (1989) showed that this class of preferences allows a separation of RRA from EIS, and that the relationship between these two is still of inverse proportionality in some of the most popular homogeneous utility representations.

[34]It is also consistent with Arrondel (2002), who used very similar measure of our RRA. In Arrondel's, the estimated coefficients associated to a categorial variable built for different classes of RRA values, alternate in sign and, in general, are non-significative.

[35]The interviews of the sample survey on the income and wealth of Italian households in 2012 were conducted between January and August 2013. The inflation rate equals 1.45%, when measured as the average rate of change of the consumer price index in the period of the interviews. In the same period, 4.35 is the nominal average interest rate of 10-year government bond (BTP).

and seems to absorb most of the effect of preference indicators. This is especially true for Beta and can be seen more clearly looking at model (4). We interpret the effect of liquidity constrained on the subjective discount rate mostly as the result of the fact that situations of financial distress are, at least partially, related to their habits and past decisions (*e.g.* concerning education, employment and saving).[36]

Finally, in (3) we also keep distinct situations in which households run into 'liquidity constrains' from 'credit constraints.' In reality, liquidity constraints are typically associated to circumstances in which an individual is short of cash or liquid assets. Thus, perhaps excluding individuals who run a personal business, most Italians find costly to finance daily payments (*e.g.* utility bills, house rent etc.) in debt, even in the form of overdraft facilities and credit card debt. By contrast, the use of credit is normally associated to purchases of durable consumption and housing. In fact, households' liabilities mostly consist in mortgages to acquire home ownership or to renovate it, and typically regard respondents around age 35-54. As discussed in section 2, it seems that households who plan to purchase a house do it in advance, and implement their decision only when they can actually accomplish it, drawing from their savings and taking out a mortgage. All this is coherent with the empirical evidence showing that those households who have recently purchased their main house experience a drop of their ratio of wealth to permanent income.[37] In model (4) this is captured by a particular binary variable (NewHomeOwner) which takes value 1 for those households who have purchased or built their primary residence in the last five years prior the interview, and 0 otherwise.[38] The estimated coefficient is negative and significative, signaling that the effect of this decision on the holding of other assets and on liabilities is to decrease net wealth-to-permanent income, relative to other households. A simple graphical illustration shows that this effect is especially evident for adjusted net wealth, which does not comprise the house, in Figure 10; indeed, the adjusted wealth of 'new home owners' would become negative if we exclude from NewHomeOwner respondents owning other houses.

3.2. **Omission variable bias and precautionary saving.** We now ask to what extent the use of information on household preferences and insurance possibilities might actually prevent the occurrence of bias in the estimation of the average magnitude of precautionary saving, given our baseline model and data.

Estimations highlighted how going from model (1) to (4), and introducing certain covariates, changes the average elasticity of precautionary saving. We now ask if these

[36]Statistically, we found that households' permanent income is increasing in patience and decreasing in risk aversion, after controlling for their current and past employment status. Moreover, households' problems of liquidity and access to credit are more evident among respondents with a lower permanent income.

[37]For an in deep, empirical analysis of the relevance of down payments on home ownership see Chiuri and Jappelli (2002).

[38]The choice of including households who have purchased their home in the years prior 2012 is motivated by the sample size/characteristics. In fact, first, we noticed that very few people in the sample have become home owners in 2012; second, the decision to purchase (or build) a house seems to have persistent effects on wealth, especially, excluding the home value (our measure of adjusted total net wealth). This is shown in Figure 10 below.

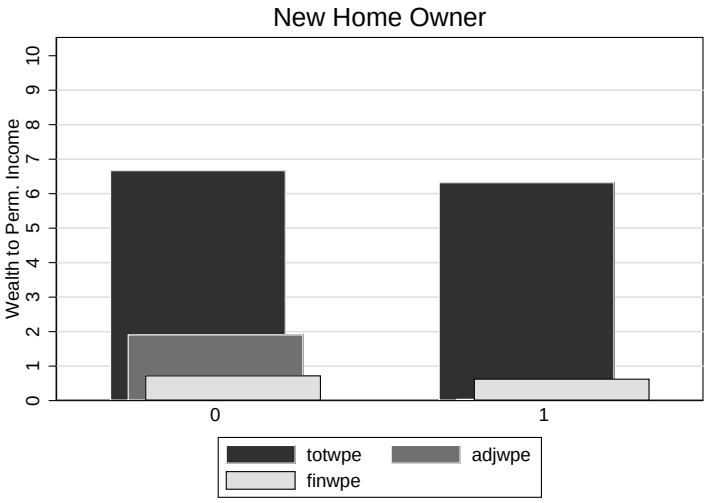

FIGURE 10. Ratios of wealth to permanent income for our three measures of wealth. Sample C.

changes are statistically significative. Moreover, given the empirical relevance of liquidity constraints and home-ownership, we try to better understand how these indicators interact with each other and with preferences. To this end, we start by summarizing what is the expected sign of each kind of bias.

The sign of an omission variable bias on ϵ, depends on two factors: the sign of the coefficient associated to the variable that could be omitted, and the sign of the covariance between that variable and the risk in income (R Income Risk). On the first sign we have conjectures, based on economic theory, which we have discussed above; while on the second sign, providing a theoretical explanation is more difficult, and we begin by letting the data speak. Table 8 summarizes these signs and the resulting directions of the bias.

	Correlation	Coefficient	Bias
Beta	−	+	−
PatientEIS	−	+	−
ImpatientEIS	−	−	+
CreditCon	+	−	−
SubjLiqCon	−	−	+
ObjLiqCon	−	−	+
ExpLiqCon	+	+	+
HomeOwner	+	+	+
OtherHouses	+	+	+
NewHomeOwner	−	−	+

TABLE 8. Correlations are w/r R Income Risk. Coefficient signs are estimated from our model. Bias results as the product of the former signs. Sample C.

Turning to our estimation results in Table 7 above, we notice that the introduction of preferences in (2) tends to rise the elasticity of precautionary saving. Qualitatively, this

is coherent with the commonly shared opinion of the existence of a (potentially serious) problem of selection bias associated to the measure of risk in income. However, quantitatively, this hypothesis is rejected by data; since this change of the estimated elasticity is statistically non-significative. Indeed, the estimated standard deviations associated to the risk coefficient are quite large, indicating a sensible cross-sectional variance of the precautionary component. We illustrate this in Figure 11, where we have graphed the confidence intervals of the average elasticities $\epsilon(\cdot)$ associated to models (1) to (4). In particular, comparing (1) and (2) does not reveal a significative bias associated to preferences. However, in general, one has to be careful on the fact that the sign of the potential bias associated to omitting the subjective discount factor may differ from the one associated to indicators of risk aversion. In our context, this is the case of ImpatientEIS; in Table 8 the sign of the bias of omitting this variable is different from the corresponding signs of Beta and of PatientEIS. Something can also be said on the covariance signs. For example, individuals who are more patient might achieve higher educational levels and this tends to reduce their exposure to unemployment risk. This would explain why the covariance between Beta and income-risk is negative. Moreover, a higher degree of risk aversion is typically used to explain why certain people sort to 'safer' occupations, like being employed in the public administration, and choose safer investments. This would explain why the covariance of EIS ($= 1/RRA$) and income-risk is negative.

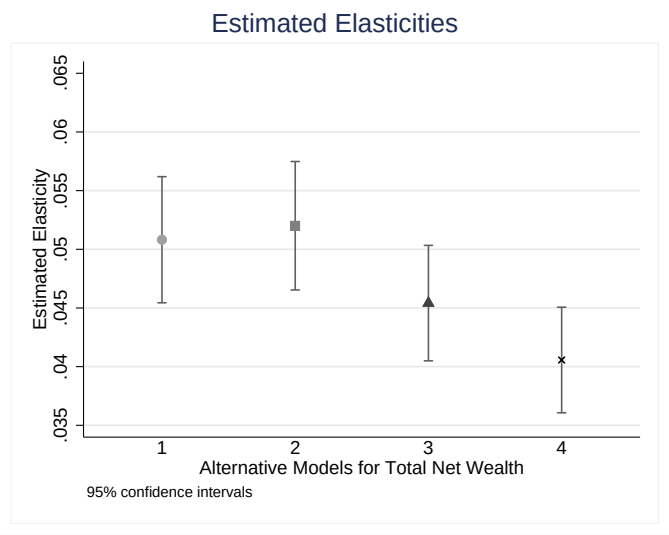

FIGURE 11. Confidence intervals for the sample means of $\epsilon(1) - \epsilon(4)$. Sample C.

Instead, the introduction of liquidity constraints and of indicators of real estate ownerships have a significative impact on the estimated mean elasticity ϵ in models (3) and (4), respectively. In both cases the final effect is to reduce the ϵ's. Moreover, as Table 8 highlights, the sign of the bias associated to omitting any of these indicators is unambiguously positive. In other words, while people who are effective- and expected-liquidity constraints tend to have opposite behaviours in terms of wealth accumulation, they are always more inclined to cut on precautionary saving. Given the empirical relevance of

these indicators, it is worth trying to further explain their effects on precautionary saving. We have said above why the theory predicts that 'effective'- and 'expected'- liquidity constrains have opposite signs on wealth accumulation. In traditional buffer stock models, individuals respond to the foreseen liquidity/credit constraints by displaying an increased level of prudence.[39] Mapping this into our setting, people who are expected to be liquidity constrained, foresee a higher risk and decide to increase accumulation (*i.e.* increases precautionary saving). This essentially explains the two positive signs related to income risk σ_y^2 and *ExpLiqCon* in Table 8.

It is important to recall that, by definition, the set of households who are expected-liquidity constrained and those who are 'effectively' liquidity constrained have a negligible intersection (only very few respondents are in the two groups). Thus, when consider the behavior of people in the first group, we have to keep in mind that these households believe they will not be constrained in the future. Accordingly, the evidence that currently binding constraints reduce accumulation is coherent with consumption smoothing.

A further consideration concerns the effect of home-ownership. From the results in the previous section, it seems clear that acquiring the primary house of residence is (at least for its size) a major plan for most households. Around the time in which this plan is realized, households experience a reduction of their net wealth, with respect to all the other (these are the New Home Owners). Later on, being a home owner is associated to a higher ratio of wealth-to-permanent income. This latter phenomenon is reinforced by the ownership of other real estate properties (OtherHouses). We interpret the fact that households with real estate properties are typically associated with a lower perceived income risk, perhaps as a consequence of the sense of security that a sounder patrimonial condition provides them. But the question we wish to answer here is if and how the acquisition of home ownership alters households' attitude toward precautionary saving. A first qualitative answer to these questions is in Table 8, which points to the fact that omitting any of the housing indicators tends to bias the estimated elasticity of precautionary saving upwards. Quantitatively, an evidence of a significative bias is offered observing that the drop in the average elasticity, from $\varepsilon(3)$ to $\varepsilon(4)$ in Table 7, is statistically significative at the 95%. All this indicates that home ownership is associated to a lower estimated elasticity of precautionary saving.

A next step is to verify if different groups of households, defined based of our three indicators of home-ownership, have an elasticity of precautionary saving that is significatively different from the mean. The hypothesis that home-owner have a lower elasticity of precautionary saving was tested and accepted by Lusardi (1997), who excluded this group from her sample. Differently from Lusardi, we run our tests keeping all the individuals in the sample and introducing interaction terms. This is illustrated next, for all group-criteria defined based on our primary indicators.

[39]Prudence is higher in consumption functions which are more concave; and since consumption concavity enhances the concavity/prudence of the value function, precautionary saving is reinforced in the presence of binding constraints. A similar effect is obtained by an increase in expected income risk. See, for example, Carroll, Holm and Kimball (2021).

To test the presence of significative group-differences in precautionary saving, we add to the covariates of model (4) as many interaction terms as the dummy variables in table 8.[40] Each interaction term is defined as the product of a particular indicator with the variable of perceive income risk, *R Income Risk*. Results show that the only group whose precautionary motive is significatively different from the sample mean is the one of credit constrained households. This group has an estimated precautionary saving of the 16.5 percent of total net wealth, almost four time higher than the sample mean (4.3%); while the group of unconstrained households have an elasticity of 3.8 percent. The higher propensity to save to meet unexpected events by constrained households is a rational response to the fact that, if compared with the average household, they perceive a higher risk in income and hold a lower ratio of wealth-to-permanent income (see Table 8 above).

3.3. **More liquid measures of wealth.** Recall that our more liquid measures of wealth are Adjusted Wealth (W_a) and Financial Wealth (W_f). The first is obtained from total net wealth, by dropping business equities and home ownership. The second consists of financial assets. A part from the definition of the dependent variable, regression models (5) and (6) have the same exact specification of (4) above (see Table 6). Estimates are presented in Table 9, and the corresponding average elasticities of precautionary saving are compared with $\epsilon(4)$ in Table 10.

Eliminating the most illiquid components of wealth (the primary house of residence and business equities) significatively reduces the estimated elasticity of precautionary saving $\epsilon(4)$. Yet, contrary to what we expected, estimates show that the precautionary saving component does not significantly vary across the two more liquid definitions of wealth. This is documented in Figure 12, where the confidence intervals of the estimated mean elasticities are compared.

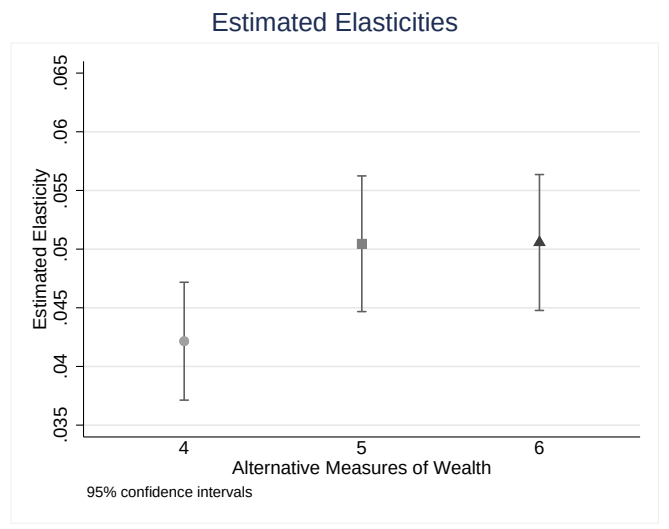

FIGURE 12. Confidence intervals for the sample means of $\epsilon(4), \epsilon(5), \epsilon(6)$. Sample C.

[40]We have also considered more parsimonious specifications, combining similar indicators (*e.g.* SubJLiqCon and ObjLiqCon), and nested models.

	(5) $\ln(W_a/Y_P)$		(6) $\ln(W_f/Y_P)$	
	b	se	b	se
Demographic				
Male	0.067	0.072	0.138*	0.074
Age	0.008*	0.004	0.011**	0.005
Married	-0.024	0.081	0.001	0.082
NRecipients	-0.188***	0.051	-0.236***	0.054
Geographic				
Northern	-0.285***	0.080	-0.131*	0.079
Southern	-0.229**	0.093	-0.255***	0.092
SmallCity	-0.280***	0.101	-0.246**	0.098
MidCity	-0.195**	0.078	-0.103	0.081
BigCity	-0.612***	0.133	-0.405***	0.135
Occupation				
Employee	0.198*	0.101	0.182*	0.096
Manager	0.420***	0.125	0.549***	0.120
Entrepreneur	0.478***	0.141	0.314**	0.137
Craftsman	0.892***	0.131	0.423***	0.132
LPensioner	0.453***	0.121	0.563***	0.121
NLPensioner	0.437	0.281	0.945***	0.291
R Income Risk	0.073***	0.014	0.074***	0.012
Preferences				
PatientEIS	0.641*	0.359	0.509*	0.282
ImpatientEIS	0.065	0.372	-0.137	0.246
Beta	0.009*	0.005	0.019***	0.005
Econ. Cond.				
CreditCon	0.197	0.156	-0.276	0.173
ObjLiqCon	-0.428**	0.186	-0.761***	0.173
SubjLiqCon	-0.528***	0.083	-0.432***	0.085
ExpLiqCon2	0.440***	0.067	0.741***	0.070
HomeOwner	0.023	0.083	0.030	0.087
OtherHouses	1.591***	0.069	0.180**	0.077
NewHomeOwner	-0.174	0.158	-0.264**	0.125
Constant	-1.595***	0.569	-3.388***	0.567
N	1160		1332	
R^2_{adj}	0.441		0.261	
aic	3517.9		4253.4	

$* \ p < 0.10, \ ** \ p < 0.05, \ *** \ p < 0.01$

TABLE 9. Regression outcome. Adjusted Wealth and Financial Wealth. Sample C.

		$\varepsilon(4)$	$\varepsilon(5)$	$\varepsilon(6)$
R Income Risk	mean	.0406	.0505	.0487
	sd	.0837	.1004	.0967

TABLE 10. Precautionary saving: Estimated elasticities with respect to the three measures of wealth; models (4),(5),(6). Sample C.

In general, the small variability of precautionary saving across different measures of wealth is positive, if interpreted as a robustness check of our results. Thus, for example, it

may be used to reject the hypothesis that there may be a measurement error of precautionary saving due to the choice of any of the two more liquid measures of wealth W_a and W_f. However, in an economic perspective, this result is puzzling, as it suggests that households react to a change of income risk by simply re-scaling their 'liquid' portfolios. This may still be plausible if the main motivation for holding precautionary assets is to self-insure against rare but large shocks to income, such as severe health problems or long spells of unemployment. In fact, in this case, liquidation costs would probably not be a concern for prudent individuals, and any change in risk would essentially lead households to adjust all their 'liquid' assets proportionally. To verify the soundness of this argument, we exploit disaggregate data on wealth and check whether the proportions of different asset holding, relative to total wealth, are sensitive to income risk. Precisely, we divide assets in four aggregates: *deposits*, including both bank and postal accounts; *government bonds*, including all types of bonds issued by the Italian government on the market; *non-government bonds and equities*; *real assets*, mostly consisting in real estate properties. Then, we define portfolio shares as the ratio of each of these aggregates with respect to household total wealth. Finally, we test the hypothesis that any of these portfolio shares is sensitive to income risk, based on a Tobit model with a specification similar to models (4)-(6) above. Results, which are detailed in Appendix D, robustly reject this hypothesis, supporting our explanation.[41]

4. Extensions: The relevance of senior citizens and business owners

In the previous section we estimated the relevance of precautionary saving over a sample of households whose head is younger than 65 (sample C), and found that it amounts to an average of 4-5 percent of total net-wealth. In this section, we analyze if these results are sensitive to a sample revision that includes respondents older than 65, and one that excludes business owners.

4.1. **Senior citizens.** In this section we repeat our analysis and estimate precautionary saving on sample B, which covers respondents as old as 80. Qualitatively, the analysis confirms all the results obtained above. Instead, quantitatively, we found that including senior citizens reduces the estimated elasticity of precautionary saving by about one percentage point for the two measures of net wealth and by about two percentage points for financial assets (see Table 11). All these differences are statistically significative.

		$\varepsilon(1)$	$\varepsilon(2)$	$\varepsilon(3)$	$\varepsilon(4)$	$\varepsilon(5)$	$\varepsilon(6)$
R Income Risk	mean	.043	.043	.039	.033	.039	.027
	sd	.087	.088	.081	.072	.082	.061

Table 11. Precautionary saving: Estimated elasticities models (1)-(6). Sample B

One possible interpretation of this phenomenon is that, as people become older and approach, or enter, the retirement age, the relative importance of income-risk diminishes

[41] A somewhat different conclusion is found in Guiso, Jappelli and Terlizzese (1996) using a different model and data from SHIW 1989.

with respect to other risks, such as longevity- and health-risk. Moreover, it is possible that perceived income risk itself drops, especially, for those households whose main source of income are pension transfers, which can be regarded as riskless. Although we are unable to test the first conjecture on our data, we found evidence that essentially reject the second one. In fact, data show that the income risk perceived by retired workers depends more on the level of household's wealth than on the relative importance of pension transfers with respect to capital income (*i.e.* income from financial and real assets). To illustrate this point, we divide pensioners into three groups, based on the fraction f of their capital income with respect to total. Then, we notice that the group with the smallest f has an average perceived risk in income higher than the one with the highest f. This is shown in the left panel of Figure 13, where the three groups are labelled "Low", "Mid" and "High," for increasingly higher fractions f.[42] The right panel in the figure shows that perceived income risk is decreasing in total net wealth. Both patterns in the figure hold irrespectively of the sample considered.

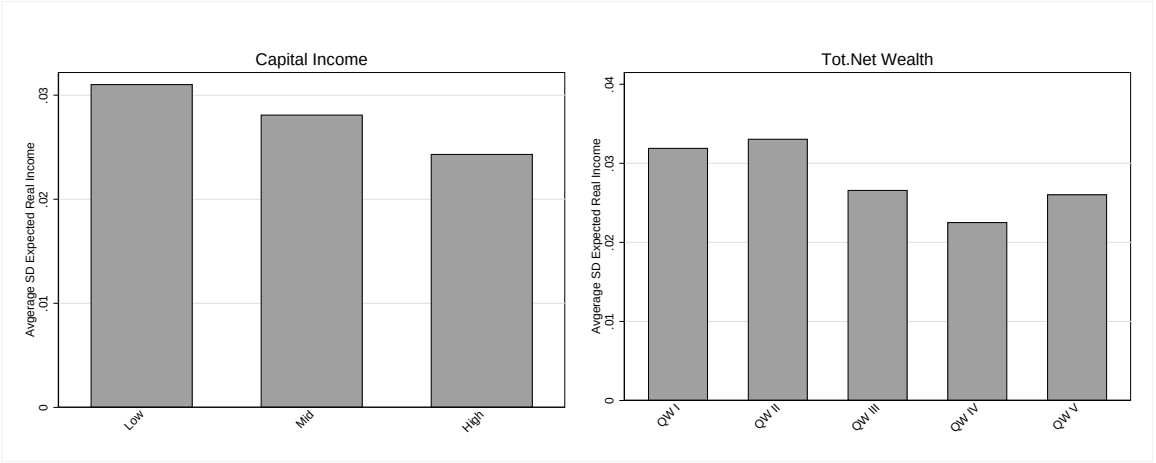

FIGURE 13. Pensioners' perceived risk in income by the fraction of capital income (first panel) and by the distribution of total net wealth (second panel). Sample B.

4.2. **Business owners.** A potentially relevant source of bias relates to disparities in saving motives, not immediately imputable to preferences or to economic possibilities. In particular, Hurst et al. (2010) presented some empirical evidence in support of the hypothesis that failing to properly accounting for differences between entrepreneurs and non-business owners, can lead to an upward bias in the estimates of precautionary saving in studies on household wealth. More precisely, the fact that business owners tend to hold a relatively larger stock of wealth and face high income risk leads to a correlation between risk in income and wealth that has little to do with precautionary motives. By contrast, this correlation is imputable to the specific nature of risk and, perhaps, to the absence of

[42]The group thresholds of f are defined as follows. Given the average fraction of capital income $\mu = .253$ and a standard deviation $s = .138$ for the labor pensioner, the "High" group is the one with $f > \mu + s$, and the "Low" is the one with $f \leq \mu - s$. These are respectively formed by 133 and 106 individuals. The remaining 667 form the "Mid" group.

specific insurance mechanisms (*e.g.* 'business risk' may be more difficult to diversify). To account for this, in our previous analysis we have considered wealth net of business equity and financial wealth, as alternative measures of saving accumulation, but kept business owners. Instead, in this section, we drop business owners from both samples, B and C.

The estimated average elasticities from our six models, are reported in Table 12, both with regard to sample B and C, without business owners.[43] Next, we compare the results obtained regressing the models of different measures of wealth, (4)-(6), with those found in the corresponding sample C in Table 10 and B in Table 11. This comparison reveals that the change of coefficients is sensible; though, it is statistically significative only for the measures of total net wealth and financial wealth. Therefore, when adjusted wealth is considered, and business equities are dropped from the measure of wealth, including or excluding business owners does not change the magnitude of the average precautionary saving.

R Income Risk		$\varepsilon(1)$	$\varepsilon(2)$	$\varepsilon(3)$	$\varepsilon(4)$	$\varepsilon(5)$	$\varepsilon(6)$
Sample B	mean	.042	.043	.040	.031	.033	.010
	sd	.080	.088	.078	.063	.065	.023
Sample C	mean	.051	.054	.050	.038	.040	.031
	sd	.094	.098	.092	.072	.076	.060

TABLE 12. Precautionary saving: Estimated elasticities models (1)-(6), sample B and C, without self-employed individuals ($N_B = 1773$, $N_C = 1069$).

We explain why financial wealth is not a good measure to use in the estimate of precautionary saving, based on the fact that data suggests that entrepreneurs privilege real wealth to financial wealth in their accumulation decisions. Indeed, we found that entrepreneurs tend to have a ratio of adjusted-wealth to permanent income that is (at least) 4 times higher than the average one of any other category of employed individuals; for craftsmen it is about 2.8, slightly above the third highest one, corresponding to the managers of the private sector. Instead, the ratio of financial wealth to permanent income does not reveal such differences. Moreover, if compared to total wealth, the amount of financial assets held by entrepreneurs and craftsmen is small: about 14 percent of total wealth for the entrepreneurs and 10 for the craftsmen; as opposed to 20 percent of the employed and 19 of the pensioner. By contrast, the fraction of total real assets is in line with the one found for respondents with other working positions.

5. Conclusions

Empirical studies of precautionary saving have produced somewhat mixed conclusions, with a large variety of econometric estimates ranging from about 50 to 1 percent of total wealth.[44] Differences persist even if one restricts the attention to studies using a similar

[43]Model specifications are identical to those detailed above, (1) to (4), except that we dropped from the correlates the controls for Entrepreneurs and Craftsmen.

[44]See, for example, Browning and Lusardi (1996) and Carroll and Samwick (1997) for early references. For more recent results, see Hurst et al (2010).

methodology and data source. In particular, in studies of wealth accumulation exploiting longitudinal data, this ambiguity has often been attributed to two main sources of *bias*: a measurement bias and an endogeneity bias. The first is mainly associated to the unobservability of two key variables: (subjective) risk in income and permanent income. The endogeneity bias is mostly the consequence of the unavailability of data on individual preference characteristics and on information of households' saving/consumption and insurance opportunities.

In the present work we addressed these estimation problems exploiting a unique data set from SHIW 2012. The peculiarity of this survey is to simultaneously contain a particular question which elicits the respondent subjective risk in total income, and some detailed information on individual preferences and on households' insurance possibilities.

The results presented quantify precautionary saving as 4-5 percent of total net income. Since our measure of risk is based on total income, as opposed to just earning risk, these figures are roughly in line with those found in Guiso, Jappelli e Terlizzese (1992) and in Lusardi (1997), based on SHIW 1989. However, the introduction of preference characteristics and indicators of the households' insurance opportunities, highlighted two relevant aspects. The first one is a marked improvement of the explanatory power of both models on wealth accumulation and permanent income. This improvement is achieved directly, in the most obvious way, by adding a larger set of explanatory variables; and, indirectly, to the extent to which controlling for preferences and insurance possibilities allows to account for various kinds of endogeneity bias, affecting precautionary saving. The possibility to avoid endogeneity bias, in turn, is also relevant for the choice of the estimation method; namely, it legitimates the use of OLS as opposes to hit the slippery road of Instrumental Variables.[45]

The second improvement from considering data on individual preference characteristics and insurance opportunities is to be able to actually assess the relevance of some potential sources of bias. We argue in the paper that the omission of these variables might bias estimates in opposite directions and that the intensity of precautionary saving depends on how these effects compose. If the omission of the subjective discount rate and risk aversion have opposite effects on precautionary saving, failing to control for liquidity constraints might unambiguously bias its estimates upwards. Interestingly, the latest is true also when we both include indicators of current- and expected-liquidity constraints, which are known to have opposite effects on aggregate wealth accumulation. Another potentially relevant source of bias comes from the inability to control if a family owns their home and if the acquisition is recent. Home ownership has two effects on precautionary saving. Around the time in which the property is purchased, it becomes a priority over other saving motives, the precautionary one included. Later on, it reduces the household's risk perceptions and their attitude to save for 'rainy days.'

[45]Lusardi (1997) estimated precautionary saving using instrumental variables and found elasticities that are up to five times higher than those obtained using OLS. However, she questioned the reliability these results, based on the difficulty to find an adequate set of instruments. Using French data Arrondel (2002) had a similar experience and opted to present OLS estimates only.

Of all these potential sources of bias, data reveal that the only significative ones are those associated to the omission of the indicators of liquidity and credit constraints, and of the indicators of home-ownership and real estate properties. Instead, we rejected the hypothesis that omitting any of the preference indicators would significatively bias precautionary saving. Moreover, dividing the sample in groups, based on all our indicators of preferences and insurance opportunities, allowed us to conclude that the only group whose behavior is significatively different from the average is that of credit constrained, who displays a precautionary saving that is about four times higher than the sample mean. Finally, to the extent to which perceive income risk and credit constraints are both countercyclical, this particular result supports the idea that precautionary saving is countercyclical (*e.g.* in Parker and Preston, 2005).

Our estimation results are robust to the use of alternative measures of wealth, with some caveats. If we consider the sample of people younger than 65, we found that precautionary saving varies little, provided we exclude from total wealth the most 'illiquid' assets; namely, the primary house of residence and business equities. As a matter of fact, we documented that households tend to react to income risk by simply re-scaling their asset position, and that their portfolio composition is insensitive to subjective income risk. Moreover, the estimates obtained with adjusted wealth or with financial wealth are also robust to the inclusion of business owners; who have a tendency to accumulate their non-business wealth in real asset, as opposed to financial assets. Instead, including respondents as old as 80, has the effect to reduce the average precautionary saving by about one percentage point on all measures of wealth.

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Appendix A. Queries and further measurement issues

The complete questionnaire of SHIW 2012 is in Bank of Italy (2014), p. 82.

Financial wealth. [Various queries] This is measured with financial assets = deposits [C.28(A,B)] + Governement securities [C.28(C)] + other securities [C.28(D,..,I)] + trade credit or credit due from other households [B2.12(2)+B3.10(2)+D.43(1)].

Real assets. [Various queries] = $[D1.2 \cdot D1.9 + D.23 \cdot D.4 + D.26]$, includes the principal residence and up to three other properties owned by the household; it does also include expenses made for these properties in the reference period.

Financial liabilities. [Various queries] = liabilities to bank and financial companies [D2_RES.3+D2_AIMM.3+D2_FAM.2+D2_PROF.2] + trade debt [B2.12(1)+B3.10(1)] + liabilities to other households [D.43(2)].

Total net wealth. [Various queries]

$$W = \textit{Real assets + Business equities [B2.15+B3.13+B4.9] + Valuables [E.5(1)] +}$$
$$\textit{+ Financial assets - Financial liabilities}$$

Business equities is the value of the respondent's business, estimated in terms of its net worth or measured at its market value. Valuables include the estimated value of jewellery, ancient or gold coins, works of art; it does not include other durables such as transportation equipment (cars etc.) and (non-antique) furniture.

Subjective income risk [Various queries] A subsample of respondents who are born in even years is asked to reveal their beliefs over the one-year growth rate of their household's, nominal income z (C.47) and of a price index π (C.48). Precisely, for each variable $v \in \{z, \pi\}$ they are given five possible intervals of changes to which assign probabilities $(\alpha_j^v)_{j=1}^5$: a central interval $-2 \leq v \leq 2$ and four other intervals, $10 < |v|$ and $2 < |v| \leq 10$, all expressed in percentage points. Precisely, for each variable $v \in \{z, \pi\}$ they are given five possible intervals of changes to which assign probabilities $(\alpha)_{j=1}^5$: a central interval $-2 \leq v \leq 2$ and four other intervals, $10 < |v|$ and $2 < |v| \leq 10$, all expressed in percentage points. Then, perceived income risk in the year t is measured by the variance of real income at $t+1$ out of these empirical distributions. Letting, $Y_{i,t}$ denote the income of respondent i at the time of the survey, $t = 2012$, and $y_{i,t} \equiv z_{i,t} - \pi_{i,t}$ her income growth in real terms, the predicted level of i's real labor income one year ahead is $Y_{i,t+1} = Y_{i,t}(1 + y_{i,t})$. $Y_{i,t+1}$ is a random variable with variance $\sigma^2_{Y_{i,t+1}} = Y^2_{i,t}\sigma^2_{i,y}$. $\sigma^2_{i,y}$ is a sample variance, computed as in Guiso et al. (1992), except that we admit the case in which (z, π) have a subjective correlation coefficient $\rho_j > -1$: $\sigma^2_{i,y} \equiv \sigma^2_{i,z} + \sigma^2_{i,\pi} - \rho_j \sigma_{i,z}\sigma_{i,\pi}$ $(\leq \sigma^2_{i,z} + \sigma^2_{i,\pi})$. As in that study, sample moments are computed using interval mid points, implying that the intra-intervals variance is disregarded and the resulting sample measure of risk is the most conservative.[46]

[46]The sample mean of each $v \in \{z, \pi\}$ is $\mathbb{E}_i[v] \equiv \sum_{j=1}^5 \alpha^v_{i,j}\widehat{v}_j$, where $\alpha^v_{i,j}$ is the probability weight given by respondent i to interval j of v, and $\widehat{v}_j$ is the mid point of interval j. The second moments are computed accordingly.

Impatience. [C.32] The interviewer asks each respondent i to imagine to receive an unexpected inheritance after a year from now. Then, the interviewer asks the respondent whether i would give up a percentage θ_j of the inheritance in order to keep the remaining $100(1-\theta_j)$ right away. Then, seven possible values of θ_j are, successively, proposed to the respondent: 10, 20, 4, 30, 15, 7, 2. The measure of impatience is described in the main text.

Risk aversion. [E.19] "Please think about how your savings are invested (cash, bank deposits, securities). Imagine you can reinvest them, in part in a new security that doubles in value or loses half its value every month, with equal probability (50/50). That is, every 100 euros invested in this way, the next month could be 200 euros or 50. Every month you can liquidate this holding or reinvest, on the same terms." The interviewer successively proposes to the respondent 8 possible intervals of percentage values of investment: $[0,1]$, $(1,2]$, $(2,5]$, $(5,10]$, $(10,20]$, $(20,50]$, $(50,90]$, $(90,100]$. The interviewer progressively proposed these intervals to the respondent (not exactly in this order) and stopped when the respondent accepted one. The measure of risk aversion is described in the main text. For every respondent j, we define d_j to be the mid point of the interval chosen by j.

Liquidity constrains. [Various queries]

(sLC) Actual, subjective. [E.15] "In your opinion, how much does a household like yours need per month in order to live reasonably comfortably but not in luxury? Euro Y^* per month." The indicator is $SubjLiqCon = 0$ if the household total net income $Y \geq Y^*$ and equals zero otherwise.

(oLC) Actual objective, $ObjLiqCon = 1$ if the respondent answered yes to any of the questions asking if the household were,

a) [D.42(1)] late in paying loans since at least 90 days,

b) [E.17(1)] late in paying utility bills since at least 90 days,

c) [D.17] late in paying the rent since at least 90 days.

and $ObjLiqCon = 0$ otherwise.

(eLC) Expected. First, we let z measure the difference between the amount the respondent believes the household needs to face unexpected events or expenses (C.35) and the yearly savings (C.43). Second, we take $z^+ = 1$ if $z > 0$ and $z^+ = 0$ otherwise.[47] Finally, the indicator of 'Expected liquidity constraint' is:

$$ExpLiqCon \equiv z^+ \times (1 - d_3)$$

where $d_3 = 1$ if during the 2012 the household's expenditure was in excess of its income (according to C.42(3) & C.44), and 0 otherwise.

Credit constrains. [Various queries] The first indicator is of *credit-rejection*: The household applied for a loan or mortgage contacted a bank or financial company in 2012 (D.44(1)) and the request was granted in part or refused (D.46(2,3) + D.48(2)); or the

[47] The households with negative values of z are eliminated because these have already current saving which cover the need for unexpected expenditure.

household did not apply in the 2012, but did it in 2010 or 2011 with the same outcome (D.49(1)+D.50(2,3)). A second indicator is of *credit-discouragement*: The household did not contact a bank or financial company to obtain a loan or mortgage in 2012 (D.44(2)), or in the previous two years (D.49(2)). However, some household's member had considered to do so but later changed her/his mind because thought the request would be refused, either in 2012 (D.51(1)) or in the previous two years (D.52(1)). We define an indicator of credit constrained households, CreditCon, as a binary variable that assumes value 1 if the household has been in a state of either credit-rejection or credit-discouragement, as previously defined, and 0 otherwise.

Real estate properties.[Various queries] We define three binary variables: HomeOwnership (D.02); OtherHouses (D.24) own real estate properties different from the main house; NewHomeOwner capturing households who have purchased their primary residence in 2012 or in the previous five years. The last uses the variable *anposs* in annex D1 to compute the years since the households had acquired the ownership of their dwelling ($2012 - anposs$); it also uses D.02(1) to identify those households who own their home, and D.07(1,2,3,7) to keep only those who had effectively acquired their property by purchasing or building it.

Appendix B. Tables

	Sample A		Sample B		Sample C	
	mean	sd	mean	sd	mean	sd
Male	0.547	0.498	0.664	0.472	0.640	0.480
Age	59.283	15.710	58.209	13.204	50.498	9.575
Diploma	0.383	0.486	0.514	0.500	0.618	0.486
Degree	0.119	0.323	0.180	0.384	0.220	0.414
Married	0.611	0.488	0.680	0.467	0.694	0.461
Divorced	0.080	0.272	0.084	0.277	0.110	0.313
Widowed	0.182	0.386	0.099	0.299	0.035	0.183
Employed	0.317	0.465	0.396	0.489	0.604	0.489
SelfEmployed	0.090	0.287	0.142	0.349	0.197	0.398
Pensioner	0.452	0.498	0.462	0.499	0.198	0.399
Outofwork	0.141	0.349	0.000	0.000	0.000	0.000
FamilySize	2.456	1.266	2.497	1.175	2.815	1.236
NChildren	0.718	0.946	0.702	0.906	0.972	0.968
TotNetWealth$_{(1)}$	261.190	441.565	371.899	605.191	354.866	501.140
TotNetIncome$_{(1)}$	31.768	23.795	41.352	27.248	43.668	25.476
TotConsuption$_{(1)}$	25.402	14.908	29.379	15.622	30.961	15.593
N	8151		2066		1332	

Table 13. Selected sample characteristics. (1) thousands of Euro. Samples A,B,C.

Variables	Sample B	σ_y^2			
X		Low	High	b	t-stat
Preferences					
Beta	0.936	0.943	0.922	-0.0691	-5.784
ARA	0.025	0.025	0.026	-0.0018	-0.178
Demographic					
Male	0.664	0.665	0.661	0.0016	0.970
Age	58.209	58.729	57.201	-0.0001	-0.944
None	0.015	0.015	0.016		
Married	0.680	0.688	0.663	0.0014	0.571
Single	0.137	0.133	0.147		
Divorced	0.084	0.079	0.092	0.0014	0.465
Widowed	0.099	0.100	0.098	0.0029	0.860
NChildren	0.702	0.698	0.711	-0.0006	-0.602
NRecipients	1.758	1.777	1.721	-0.0008	-0.673
Geographic					
Northern	0.510	0.519	0.492	0.0062	3.646
Centre	0.232	0.261	0.175		
Southern	0.258	0.219	0.333	0.0113	5.128
Education					
Elementary	0.148	0.147	0.149	0.0028	0.407
Middle	0.323	0.327	0.314	0.0011	0.159
HighSchool	0.334	0.331	0.340	0.0017	0.248
Bachelor	0.013	0.011	0.016	0.0106	0.993
Master	0.154	0.158	0.147	0.0007	0.096
PhD	0.013	0.010	0.018	0.0142	1.310
Praise	0.031	0.030	0.034	-0.0010	-0.237
Occupation					
Worker	0.133	0.134	0.132		
Employee	0.198	0.193	0.208	0.0017	0.580
Manager	0.065	0.065	0.064	0.0004	0.093
Entrepreneur	0.072	0.070	0.077	0.0063	1.782
Craftsman	0.070	0.066	0.077	0.0041	1.285
Pensioner	0.462	0.472	0.442	0.0045	1.455
PA	0.149	0.145	0.156	0.0024	0.918
Was Unemployed	0.139	0.117	0.182	0.0061	2.787
Econ. Res.					
HomeOwner	0.798	0.798	0.798	0.0019	1.062
OtherHouses	0.264	0.289	0.216	-0.0049	-3.157
GovBonds	0.130	0.133	0.125	0.0025	1.215
OtherBonds	0.297	0.311	0.270	-0.0034	-2.115
Insur. Opportun.					
LifeIns	0.145	0.146	0.144	0.0015	0.760
PensIns	0.207	0.191	0.238	0.0064	3.173
HealthIns	0.348	0.360	0.326	-0.0015	-0.922
Tot. Net Wealth$_{(1)}$	371.899	376.038	363.874		
Tot. Net Income$_{(1)}$	41.352	42.348	39.420		
Permanent Income $_{(1)}$	45.776	46.604	44.170		
ND Consumption$_{(1)}$	27.940	28.630	26.600		
APC	0.826	0.765	0.946		

TABLE 14. Selected characteristics X for sample B and for the subsamples of High- and Low-risk. Estimated coefficients b of $\sigma_y^2 = Xb + u$ in the penultimate column. (1) thousands of Euro.

APPENDIX C. INCOME DECOMPOSITION

To briefly illustrate the procedure, notice that the goal is to achieve a decomposition of income in a 'permanent' (P) and a 'transitory' (T) component. Thus, for a typical

respondent j of age t, current disposable income is $Y_{j,t} \equiv Y^P_{j,t} + Y^T_{j,t}$. The procedure assumes that current disposable income of a respondent of age t behaves according to the model,

$$(*) \qquad Y_t = Z\ b + f_t + u_t$$

where Z is a vector of observable household's characteristics, b are coefficients, f_t is polynomial function of the age, eventually needed to capture the typical hump shaped age-income profile observed in a life-cycle model, and u is a stochastic term assumed to be white noise.[48] Using data on households' disposable income and characteristics, we obtain estimated coefficients $\widehat{f}_t$ and $\widehat{b}$. Then, assuming that each respondent j born in t has a sure life span of $80 - t$ years, and time invariant characteristics $Z_{j,t}$, we compute the *estimated permanent income* as,

$$\widehat{Y}^P_{j,t} = Z_{j,t}\ \widehat{b} + \frac{1}{80 - t + 1} \sum_{s=0}^{80-t} \widehat{f}_{t+s}$$

and, residually, obtain the *estimated transitory income*, $\widehat{Y}^T_{j,t} = Y_{j,t} - \widehat{Y}^P_{j,t}$.

We estimate model $(*)$ on our sample B of 2068 individuals. The set of covariates in Z includes observable attributes of the respondent (*e.g.* preference characteristics, gender, education, martial status), household's characteristics (*e.g.* family size, number of children, number of income earners in the household), the respondent's working condition (e.g. employment status and current occupation), her/his employment history (e.g. having ever been unemployed) and asset position (e.g. being a homeowner, having invested in Government bonds or other financial assets). It also includes indicators of the household ability to access to insurance schemes (e.g. having a life, pension and/or health insurances). Table 15 reports the estimated OLS coefficients of this model. The overall goodness of fit is satisfactory with an adjusted R^2 equal to 50%.

Examining Table 15, the preference parameters have opposite effects on the dependent variable. The higher the degree of patience, the greater the income while the higher the (absolute) risk aversion, the lower the income. For a 1 percentage point increase in β total net income increases by about 132 Euro;[49] while the same change of ARA makes Y falls by about 12 thousand Euro. The third-order polynomial in the age of the respondent captures the hump-shaped age-income dynamic, and all its terms are highly significant. Every thing else equal, an additional year in the age of the head makes income vary by 322 euros. A married couple (or a widow) earns approximately 3.5 (5) thousand euros more than a single person. The number of income earners in the household (NRecipiens) significantly affects the household's total net income while the number of children (NChildren) does not. The area of residence is another source of heterogeneity. The central area is the omitted reference category. People living in the southern part of Italy report a negative but not

[48] The empirical literature often assumes these polynomials to be piece-wise linear or of higher order (*e.g.* a mixed of linear and quadratic King and Dicks-Mirraux, 1984 and in Arrondel, 2002; quadratic in Guiso et al., 1992; of the third order in Lusardi, 1997).

[49] We let $Beta = \beta \cdot 100$.

	Y	
Z	b	t-stat
Preferences		
Beta	131.7**	2.49
ARA	-12018.3***	-3.99
Demographic		
Age	-5667.4***	-3.32
Age^2	113.4***	3.54
Age^3	-0.675***	-3.60
Male	990.4	1.02
Married	3538.7**	2.45
Divorced	408.7	0.27
Widowed	5044.4***	3.28
NRecipients	13136.7***	13.48
NChildren	778.7	1.20
Northern	2575.5***	2.71
Southern	-742.5	-0.65
Education		
Elementary	-610.1	-0.35
Middle	4605.7**	2.54
HighSchool	11256.4***	5.81
Bachelor	10520.3***	3.45
Master	20222.3***	8.24
PhD	24497.0***	5.25
Praise	9357.9**	2.27
Occupation		
Employee	1913.0	1.62
Manager	7893.9***	4.19
Entrepreneur	16691.1***	5.11
Craftsman	3365.9	1.49
LPensioner	-8665.1***	-3.51
NLPensioner	-9560.1***	-3.65
PA	-5912.4***	-4.58
WasUnemployed	-4007.7***	-4.46
Econ. Res.		
HomeOwner	4201.7***	3.48
OtherHouses	10342.1***	9.33
GovBonds	5018.1***	2.94
OtherBonds	7073.2***	6.99
Insur. Opportun.		
Life Insurance	3861.5**	2.27
Pension Insurance	1704.9	1.41
Health Insurance	2457.5**	2.09
Constant	63629.6**	2.25
N	2068	
R^2_{Adj}	0.501	

$* \ p < 0.10, \ ** \ p < 0.05, \ *** \ p < 0.01$

TABLE 15. Estimating Permanent Income. Estimation: OLS with standard errors robust to heteroskedasticity. Dependent variable: Total Net Income. The reference categories are: non-Married, resident in the Centre of Italy, Illiterate and Workers.

significant coefficient. On the contrary, families who live in the North earn approximately 2.6 thousand Euro more than those in the central regions.

Total net income is essentially increasing in the level of education. People with a middle school diploma have an income higher by 4.6 thousand Euro than the average illiterate

and the gap gets wider for people with degrees from high school, masters and PhD (e.g. respectively equal to 11, 20 and 24 thousand euros more). Yet, there is some evidence that getting a college degree does not improve income above those who finished high-school. As a proxy for ability, we use a binary indicator that highlights individuals who achieved the highest level of education with honor (Praise). This has a strong impact on income: brilliant school results are followed by an income higher by about 9.4 thousand Euro.

The type of employment and the sector of occupation capture the labour income heterogeneity. Workers are the (omitted) category with the lowest income. The difference is particularly significant with respect to managers and entrepreneurs, who respectively earn almost 7.9 and 17 thousand Euro more than blue collars. Pensioners have an income lower than workers by 8.7-9.6, respectively for labour pensioner (LPensioner) and survivors ones (NLPensioner). All else equal, people working in the public administration (PA) have 6 thousand Euro less than those employed in the private sector. Having experienced periods of unemployment (WasUnemployed) significantly affects the dependent variable, decreasing it by 4 thousand Euro.

To capture the household's economic condition and capture the relevance of capital as a source of income, we include binary indicators on the ownership of real and financial assets. Being the owner of the main residence (HomeOwner) increases the income by 4 thousand and other housing (OtherHouses) has an even more pronounced effect. Investing in (short term or long term) Government bonds (GovBonds) or in other bonds and equities (OtherBonds) makes the outcome vary by about 5.2 and 7.1 thousands Euro respectively.

Indicators on insurance opportunities are also significant. Having a life insurance (Life Insurance) and/or a health policy (Health Insurance) positively affects income by 3.9 and 2.5 thousand Euro respectively.

Appendix D. Tobit regression analysis

In this appendix we present the result of a regression analysis on the average shares of households' portfolio composition. The final goal is to test whether these shares are significantly affected by subjective income risk. To this end, we divide assets into four aggregates, total deposits (bank plus postal accounts), government bonds, all other financial securities (also including non-business equities), real wealth (mainly composed by houses). Portfolio shares are defined as the ratio of these three aggregates and total household wealth. Each of the four regression models includes covariates representing respondent/household characteristics and economic conditions; variables which have been used above, in our models of permanent income and wealth accumulation. The only new covariate are: *DEconomics*, a binary indicator taking value 1 if the respondent has a college degree in economics or statistics, which aims at capturing 'financial literacy;' *Praise* a binary indicator on wether individuals with a college degree have obtained the highest grade, a generic indicator of the respondent's 'ability;' $q5W(\cdot)$ the distribution of total net wealth by quintiles. The age specification, a polynomial of order 2 or 3, captures the hump-shaped profile of the dependent variables, with securities shares rising up until about age 65, then declining.

However, this typical life-cycle pattern is non perfectly homogeneous across the three models, perhaps capturing different motives for holding each class of assets.

Results reject the hypothesis that subjective income risk, on average, affects households' portfolio allocations; the associated coefficient is statistically non-significative. We checked that this result is robust to a change of the sample definition, from our sample B to C. It is interesting to notice that the demand of financial assets decreases in risk aversion, while that of real assets is increasing. This seems very plausible at the time of a sovereign debt crisis, and is confirmed by the additional fact that the first effect is particularly evident for government bonds.

	(1) D/W		(2) GB/W		(3) OS/W		(4) R/W	
	b	se	b	se	b	se	b	se
Beta	-0.004	0.006	0.003**	0.001	0.003***	0.001	-0.001	0.001
ARA	-0.431***	0.062	-8.631***	1.239	-0.377***	0.102	0.517***	0.064
Age	0.007	0.014	0.000	0.006	0.010**	0.004	-0.006	0.016
Age2	-0.000	0.000	0.000	0.000	-0.000**	0.000	0.000	0.000
Age3	0.000	0.000					-0.000	0.000
Diploma	-0.016	0.010	0.022	0.023	0.064***	0.015	-0.010	0.011
Degree	0.026**	0.013	-0.007	0.027	-0.020	0.018	-0.020	0.015
Praise	-0.024	0.024	0.012	0.048	0.006	0.032	0.012	0.027
Male	0.002	0.009	-0.040**	0.019	0.042***	0.013	-0.014	0.010
NRecipients	0.005	0.006	-0.002	0.013	-0.013	0.009	0.002	0.007
NChildren	-0.017***	0.005	-0.001	0.013	0.010	0.008	0.014**	0.006
Northern	0.005	0.010	0.063***	0.022	0.034**	0.014	-0.032***	0.011
Southern	-0.014	0.012	-0.086***	0.031	-0.099***	0.018	0.033**	0.013
Employee	-0.012	0.015	0.017	0.040	0.032	0.024	0.004	0.017
Manager	-0.023	0.020	0.043	0.047	0.069**	0.029	-0.002	0.023
Entrepreneur	-0.030	0.019	-0.008	0.049	0.054*	0.029	0.006	0.022
Craftsman	-0.039**	0.019	-0.025	0.049	-0.006	0.030	0.024	0.021
Pensioner	-0.025	0.017	0.040	0.043	0.031	0.026	0.012	0.020
DEconomics	-0.003	0.027	0.014	0.051	0.055*	0.033	-0.005	0.030
2.q5W	-0.374***	0.013	-0.027	0.035	0.027	0.021	0.399***	0.014
3.q5W	-0.383***	0.013	-0.044	0.034	0.022	0.021	0.411***	0.015
4.q5W	-0.396***	0.014	-0.003	0.033	0.043**	0.022	0.422***	0.015
5.q5W	-0.405***	0.015	-0.003	0.035	0.092***	0.022	0.417***	0.016
CreditCon	0.003	0.022	-0.022	0.063	0.028	0.036	-0.004	0.025
ObjLiqCon	-0.027	0.021	-0.020	0.079	-0.086*	0.047	0.027	0.024
SubjLiqCon	0.025**	0.010	-0.058**	0.027	-0.040**	0.016	-0.009	0.011
ExpLiqCon2	0.034***	0.009	-0.003	0.018	0.073***	0.012	-0.055***	0.010
R Income Risk	-0.001	0.002	0.001	0.003	-0.003	0.002	0.001	0.002
N	2066		2066		2066		2066	
R_p^2	21.61		0.248		0.334		3.003	
$N_{left\ cens.}$	28		1797		1452		33	
$N_{right\ cens.}$	25		1		0		0	

TABLE 16. Tobit analysis. Dependent variables: share of the value of asset class x in portfolio over total wealth W; x are bank and postal deposit (D), government bonds (GB), all remaining financial securities (OS), real assets (R). The reference categories are: non-Married, resident in the Centre of Italy, Illiterate, Workers, I quintile of the wealth distribution ($q5W(I)$). Sample B.