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PRECAUTIONARY SAVING, FINANCIAL RISK AND PORTFOLIO CHOICE

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Precautionary saving, financial risk and portfolio choice

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Abstract

Relying on a direct question about the desired amount of precautionary wealth from the 2002 wave of the Italian Survey of Household Income and Wealth, I assess the main determinants of precautionary motive for saving. In particular, I focus on the role played by financial risk on households' saving decisions. Actually, households investing mainly in safe assets do not need to protect themselves against future and unexpected financial losses. Consequently, controlling for households' sources of risk beside financial ones, the amount of precautionary savings of a household who invest exclusively in safe assets should be lower compared to households who instead detain a non-negligible share of risky assets in their portfolio. Moreover, portfolio diversification, reducing households' total exposure to financial risk, should reduce the amount of wealth households need to save for precautionary reasons. In this paper, I provide an empirical assessment of the linkage existing between the composition of households' portfolio and the amount of wealth households wish to have to protect themselves against unexpected contingencies. As expected, a strong and negative correlation exists between the desired amount of precautionary wealth and the ownership of a portfolio made exclusively of safe assets. However, households do not seem to use portfolio diversification to reduce exposure to total risk. Finally, I address the issue of complementarity vs. substitution between formal and informal insurance schemes. Actually, trust in capital market would lower substantially the amount of wealth households wish to detain for precautionary reasons. However, there is no evidence in favour of a negative and strong linkage between precautionary saving and insurance.

Keywords: portfolio choice, precautionary saving.
Jel classification: G11, E21, C21

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1.Introduction

People save not only for expected rainy days, but also in prevision of unexpected contingencies (precautionary saving). As pointed out by Kimball (1991), households respond to risk by accumulating assets, especially liquid ones which can be easily sold in case an unexpected event occurs.

Moreover, households tend to reduce exposure to other risks when facing an additional and unavoidable risk, even if no significant statistical correlation exists among those risks. In this perspective, the path breaking contribution of Guiso, Jappelli and Terlizzese (1996), using a cross section of Italian households, shows that uncertainty about future earnings makes households less prone to invest in risky assets. They argue that when facing other types of risk, people will reduce their exposure to financial risk, investing less in risky assets and more in liquid ones.

Few other papers have tried to establish a connection between saving choices and portfolio allocation (i.e. Haliassos and Bertaut, 1995; Hochguertel, 2003). Actually, general consensus exists on the fact that income risk tends to lower the amount of risky assets held by households. In this perspective, if income risk is not perfectly insurable, saving choices cannot be disentangled from portfolio decisions (Dreze and Modigliani, 1972). Uncertainty affects consumption and saving decisions as well as portfolio allocation.

Actually, papers that investigate the importance of precautionary savings typically regress savings on a measure of earnings risk, implicitly assuming that the only risk that matters is that related to earnings. In practice, households face a multitude of risks, some insurable (such as fire or car theft) and some not (such as the risk of stock market losses).

In this paper, I examine if and how much the desired amount of precautionary wealth depends on financial market risk. Controlling for other risks beside the financial one, and for household's attitudes towards risk, I try to establish a link between portfolio composition and precautionary saving in a novel way. I exploit a question present in the 2002 wave of the Bank of Italy Survey of Household Income and Wealth (SHIW), which is patterned after a similar question in the Survey of Consumer Finances (SCF) (Kennikell and Lusardi, 2004). Italian households were asked to quantify the amount of wealth they would like to own in prevision of unexpected events. This piece of information represents a household-specific measure of

precautionary wealth. Moreover, it represents a step forward with respect to previous literature about precautionary behaviour relating to a unique source of risk - typically income risk- to households' wealth. Actually, considering income risk as the only source of risk might give rise to misleading results, thus providing a biased estimate of the precautionary motive for saving. Furthermore, using the *desired* amount of wealth instead of the *effective* one, allows to avoid those problems related to financial market imperfections, and past negative shocks, which might affect households' saving, resulting in no wealth held for precautionary reasons[1].

Following Kennikell and Lusardi (2001) I use the subjective measure of target wealth instead of effective wealth in order to bound the size of precautionary motive for saving. On this basis, I investigate to what extent uncertainty about future contingencies affects the amount of desired precautionary wealth. However, unlike Kennikell and Lusardi, I explicitly take into account the role of financial risk in shaping households' precautionary saving behavior. In other words, if precautionary saving is the response of current spending to future risk, we need to consider to what extent the probability to loose the capital invested in relatively risky assets affects households' precautionary behavior. In this sense, this paper is similar in intent to that of Grande and Ventura (2002), who empirically found a large and positive effect of risky asset holdings on consumption variability. It is also related the strand of literature (Guiso, Jappelli, Terlizzese, 1992 among others) investigating the effect of income risk on portfolio choices. However, I deviate from both strands of literature in several ways. On one hand, using the subjective measure of precautionary wealth rather than measures of effective consumption or wealth helps to disentangle the effect of precautionary behavior from the effect of other

[1]Since wealth may be invested in risky assets, analyzing the effect of risky asset ownership on wealth holdings is kind of tautological. Actually, assets accumulated for precautionary reasons should be characterized by high liquidity, so that they can be easily sold in case an unexpected event occurs. In this sense, using a desired measure of target wealth would help to overcome problems related to the choice of the most appropriate form of wealth to measure precautionary accumulation.

contingencies (i.e. negative past shocks) which may bias wealth accumulation towards zero. On the other hand, I rely on the findings of Guiso, Jappelli and Terlizzese (1996), who find a strong negative relation between the amount of wealth invested in risky assets and income risk. Keeping in mind the interaction existing between labor and income risk, I go one step further, investigating the impact of both sources of risk (financial and labor-income related) on precautionary accumulation.

From this perspective, I extend Kennikell and Lusardi's (2001) analysis in two main directions.

First, controlling for different sources of risk, I explicitly take into account the role played by portfolio choices in shaping households' precautionary wealth. To address the role of financial risk, I proceed in two ways. First of all, I empirically assess whether households whose wealth is exclusively invested in safe assets show a lower desired precautionary wealth than those who instead own a non-negligible share of risky assets in their portfolio. Actually, a household which invests exclusively in safe assets, does not need to protect itself against future and unexpected financial losses. Consequently, controlling for attitudes towards risk, the amount of savings of a household which invests exclusively in safe assets will be lower than that of a household whose portfolio contains some risky assets.

As well as ownership of risky assets, the share of risky assets in households' portfolio should affect households' precautionary behavior. The higher the share of wealth invested in risky assets, the higher the financial risk, and therefore the need for precautionary behavior against unexpected financial losses.

Furthermore, I check whether portfolio diversification affects the amount of wealth households wish to own for precautionary reasons. Unless a perfect correlation exists between all assets, a well diversified portfolio will indeed reduce the total riskiness associated to the ownership of financial assets. To test this prediction, I use two different indices of financial diversification. The first one is simply the number of assets the household detains in its portfolio. However, such an index does not take into account the possibility that households' wealth is unevenly invested in the portfolio. Therefore, I use an alternative index of portfolio diversification, the inverse of the Herfindhal index, which is derived as a weighted average of the wealth invested in every asset.

The empirical analysis strongly supports the hypothesis of a negative correlation between risky asset ownership and precautionary saving. Moreover, controlling for demographic and personal characteristics, I found evidence of a negative correlation between the amount of wealth invested in risky assets and the desired level of precautionary savings. However, Italian households do not seem to use portfolio diversification to reduce total exposure to risk.

Actually, variables regarding portfolio composition may be affected by endogeneity. In other words, there may be unobservables (related to household-specific plans for the future or attitudes towards risk) that may influence both the amount of desired precautionary saving and portfolio composition. However, previous results still hold when potential endogeneity of financial variables is considered.

Finally, I address the issue of formal versus informal insurance schemes. Actually, financial markets provide households with plenty of insurance schemes to face unexpected events, such as damage, illness or death. Guiso and Jappelli (1998), using Italian microdata, show that the probability of buying insurance is positively and significantly correlated with a subjective measure of earnings uncertainty. Actually, if agents' preferences are characterized by decreasing absolute prudence, the presence of uninsurable risk makes households more prone to buy further insurance against other risks that are insurable.

Depending on the degree of trust towards financial markets, households might indeed choose between formal (i.e. insurance schemes) or informal (saving, help from parents/friends) ways to protect themselves against unexpected events. In this perspective, previous literature (Starr-McCluer, 1996; Guariglia and Rossi, 2001) emphasized a substitutability between insurance and precautionary saving.

Using a subjective measure of desired precautionary saving, it is possible to re-investigate the linkage existing between formal and informal insurance schemes in a novel way. Actually, the self reported measure of desired wealth makes it possible to take into account forms of risks beyond income risk. On this basis, one can investigate whether substitutability between formal insurance schemes and precautionary accumulation for all kinds of unexpected events.

The linkage between desired precautionary savings and insurance is then

investigated empirically. There is a negative but not significant effect of insurance ownership on precautionary accumulation. There is no strong evidence indeed that the more a household relies on capital markets, using formal insurance schemes against unexpected events, the lower the amount of desired precautionary savings will be.

In the paper, I will proceed as follows. In the second section, a brief review of the literature about precautionary saving and households' portfolio choice is presented. In the third part, data used in the empirical analysis and some descriptive statistics are shown. In the fourth section, the description of the empirical analysis based on the subjective measure of precautionary wealth is presented, whereas section 5 presents empirical results. In section 6, the effect of the share of risky assets in households' portfolio and portfolio diversification are taken into account. In section 7, the complementarity/substitution issue between precautionary saving and formal insurance schemes is addressed. Finally, some conclusions are drawn.

2. Brief literature review

A large strand of literature has pointed out a strong linkage between precautionary saving and portfolio choice. If a country is characterized by a well developed financial market, households can not only diversify appropriately their portfolio -reducing its total riskiness- but also purchase more instruments against those risks which are insurable.

On the contrary, in countries characterized by a relatively low degree of financial development, households would rather save more to protect themselves against unexpected events (i.e. illness, theft, unemployment). As Guiso, Jappelli and Terlizzese (1992) point out, a relatively low level of financial market development is indeed a good candidate for explaining Italy's high saving rate.

However, when addressing the issue of the linkage between precautionary saving and portfolio choice, the existence of significant spillovers among different sources of risk needs to be taken into account.

The existence of idiosyncratic risks that are not fully insurable (background uncertainty) may induce indeed risk averse and prudent individuals to reduce the portfolio share of risky assets. This result can be drawn from Kimball's (1993) risk-taking theory with multiple sources of risk. Actually, Kimball's prediction is that bearing any one risk makes a risk-averse agent less willing

to bear another risk, even when the two risks are independent.
Weil (1992) theoretically investigates the linkage between asset allocation and precautionary saving, using a two period model economy with both uninsurable risk and rate of return risk. He shows that if the utility function exhibits Kimball (1993)'s property of standard risk aversion precautionary saving will be predominantly allocated on the risk-free asset[2].
Guiso, Jappelli and Terlizzese (1996), using a cross section of Italian households, provide an empirical assessment of the linkage existing between portfolio choice and background uncertainty. Using a subjective measure of earnings uncertainty , they estimate the share of risky assets in households' portfolio. They eventually found a negative and significant correlation between earnings uncertainty and ownership of risky assets. Moreover, expectation of future borrowing constraints induce households to reduce the amount of risky and non tradable assets in their portfolio. In this perspective, households who are already exposed to one source of risk (i.e. income risk) try to reduce the exposure to other sources of risk, even if no significant correlation exists between these risks.
Using the same subjective measure of income uncertainty, Guiso and Jappelli (1996) show that the presence of non-tradable labour risk increases the demand for insurance against insurable risks. Their result strongly support the existence of spillover effects across independent risks.
Grande and Ventura (2002) focus on the role played by capital market in trading away asset-specific risk on households' consumption and saving choices. Relying on Cochrane's (1991) empirical framework, they test whether consumption is fully insured against two different shocks: job loss and illness. They eventually found Italian households to react significantly to the first, but not to the latter source of risk. More importantly, Grande and Ventura (2002) take into account the role played by financial risk in affecting households' consumption and saving choices. They found the dispersion of consumption flows across households to be positively correlated with the holding of risky assets. In this sense, even though the availability of financial instruments allows households to reduce exposure to uninsurable financial

[2]Standard risk aversion implies two conditions. First of all, the absolute holding of risky assets rises as wealth rises. Secondly, the absolute level of precautionary savings should decline as wealth rises.

risk, asset-specific risk cannot indeed be fully traded away.

3. Data and descriptive statistics

Our data was taken from the 2002 wave of the Survey of Household Income and Wealth (SHIW) carried out biannually by the Bank of Italy. The sample includes about 8,000 households and 24,000 individuals[3] each year. The 2002 wave of SHIW includes 8011 observations. For robustness checks, pooled OLS and panel random effect analysis will be performed using the 2004 wave of SHIW[4].

For our purposes, the SHIW has several advantages. The survey is rich with information on household social, demographic and economic characteristics. Moreover, household portfolios are described in details, providing us with information about whether and how much of 22 financial instruments, and three types of insurance (property, life and health)[5] are owned by Italian families.

Furthermore, the 2004 survey contains a question that allows us to measure households' propensity towards risk based on a subjective question in which the respondent is asked to select their preferred financial investments among the following:

1 = high risk of losing part or all the capital, high returns;
2 = reasonable risk losing part of the capital, good returns;
3 = low risk of losing part of the capital, reasonable returns;
4 = no risk for the capital, low returns.

A household is considered risk averse if it chooses the fourth alternative[6].

This question was not asked in the 2002 survey. However, since we can assume risk aversion to be constant over the life cycle, we can impute the

[3]See Biancotti et al. (2004) for a detailed description of SHIW questionnaire, sample design, response rates, results and comparison of survey data with macroeconomic data.

[4]Actually, some of the explanatory variables (number of credit cards, variation of financial and real wealth with respect to previous year) are not included in both waves.

[5]See the appendix for a detailed description of financial variables.

[6]One of the advantages of this measure of risk aversion regards the fact that it does not rely on a particular functional form of the utility function. An alternative measure is the one used by Guiso and Paiella (2004).

coefficient of risk aversion to those households who were interviewed in 2002 and 2004[7].

Most importantly for the present study, the 2002 survey has a direct question on precautionary wealth:

People save in various ways (depositing money in a bank account, buying financial assets, property, or other assets) and for different reasons. A first reason is to prepare for a planned event, such as the purchase of a house, children's education, etc. Another reason is to protect against contingencies, such as uncertainty about future earnings or unexpected outlays (owing to health problems or other emergencies). About how much do you think you and your family need to have in savings to meet such unexpected events?

Using a similar question in the Survey of Consumer Finance, Kennikell and Lusardi (2004) described in detail the determinants of precautionary savings. Further, Jappelli, Padula and Pistaferri (2006) exploit the same information to directly test the buffer stock hypothesis on Italian data[8].

The reported amount of wealth can be considered as the target wealth desired by buffer-stock savers. Buffer-stock savers have indeed a target wealth-to-permanent-income ratio such that, if wealth is below the target, the precautionary saving motive will dominate impatience and consumers will save, while if wealth is above the target, impatience will dominate prudence and consumers will reduce savings (Carroll, 1997).

Using this measure of *desired* wealth instead of *effective* wealth, as done by previous literature, provides a better way to elicit the extent of precautionary

[7]See, at this regard, Paiella and Chiappori (2008) and Brunnermeier, and Nagel (2008). Using data from PSID and SHIW, respectively, they show that households' investment in risky assets show a very low (and statistically insignificant) elasticity to wealth fluctuations.In this sense, households' risk aversion cannot be considered as time varying.

[8] It is worth noticing that the desired amount of precautionary wealth held by Italian households is much higher than the correspondent measure for US households. As Jappelli, Padula and Pistaferri (2006) point out, that difference may be imputed to an higher degree of income risk and a lower degree of development of financial markets. The median ratio of target wealth to total wealth for Italian household is 0.31, and 3.32 if wealth includes only financial assets. Kennickell and Lusardi (2004) report instead 0.08 and 0.2 respectively.

accumulation. First of all, households in the past might have borne negative shocks, depleting the wealth they eventually held for precautionary reasons. As a consequence, households who exhibit very low levels of wealth are not necessarily those who do not have a precautionary motive for saving. It may simply be that these households have faced negative shocks in the past. Secondly, using a subjective and household - specific measure of desired precautionary saving is helpful in order to circumvent all these problems related to borrowing possibilities, unobservable preferences, formal and informal insurance schemes (Kennikell and Lusardi, 2004)[9]. Finally, this piece of information provides us with a comprehensive measure of risk, including not only income risk, but all possible sources of risk perceived by households. Actually, previous literature only deals with one specific source of risk, particularly income risk (see Guiso, Jappelli and Terlizzese, 1992; Lusardi, 1999). Some contributions (eg. Guiso, Jappelli and Pistaferri, 1996) show a relation existing between the two different sources of risk (i.e. income risk and financial risk), empirically showing that exposure to one source of risk reduces exposure to the other, even if the two risks are not correlated.

Using the subjective measure provided by the SHIW allows to go one step further than previous literature. On one hand, it enables to take into account different sources of risk beyond income risk. Actually, households reduce exposure to unavoidable risk by reducing exposure to other risks, even when the other risks are statistically independent of the first (Kimball, 1991). Using a household-specific measure of desired precautionary saving, it is indeed possible to control for different sources of risk, checking the relative weight of each source on households' precautionary behavior.

As far as the definition of risky asset is concerned, following Guiso, Jappelli and Pistaferri (1996), and Bertocchi, Brunetti and Torricelli (2009), I use two main definitions of risky assets. The narrow definition includes stocks, corporate bonds, foreign assets and shares in limited liabilities companies. According to the broad definition, long term government bonds and

[9]Actually, as Kennikell and Lusardi (2004) point out, using this subjective measure is not free from measurement errors. For example, it might be that households do not understand very well the question. However, they notice that this is a problem related to all literature which use subjective measures.

investment funds are also included among risky assets. However, as pointed out by Bertocchi, Brunetti and Torricelli (2009) long-term government bonds and investment funds can be considered fairly safe. Moreover, investment funds are a form of managed investment characterized by high diversification. As far as long-term government bonds are concerned, thanks to the post- 1996 fiscal stabilization, it is possible to attach a relatively low risk to these assets (Guiso and Jappelli, 2002).

In order to detect household portfolio composition we first need to take into account whether households owns any risky asset in their portfolio.

Two dummies are introduced, *port_safe1* and *port_safe2*. They take value 1 if the portfolio is exclusively made of safe assets, and value 0 if the household owns at least one of the securities classified as risky, according to the broad definition (port_safe1) or to the narrow one (port_safe2). The weight of risky assets in the portfolios, as well as their ownership, is of interest. The two variables *share_narrow* and *share_broad*, which are calculated as the share of risky asset (according to the broad and narrow definition, respectively) are introduced to take this into account.

Table 2 presents some descriptive statistics of the desired precautionary savings, as well as the ratio precautionary savings/permanent income, by demographical and financial variables.

The desired amount of precautionary savings tend to be higher for middle-aged households, and for those who live in the centre-north. As expected, married individuals - who care about unexpected events which may occur not only to themselves, but also to their spouse- show a higher precautionary motive for saving than single people. As far as job status is concerned, self-employed households- who take into account the possibility of losses in their business- show a higher amount of desired precautionary saving than wage earners.

When attitudes towards risk are taken into account, we can notice risk averse households exhibiting a higher ratio of precautionary savings/permanent income than risk lover ones[10].

Actually, households whose portfolio is made exclusively of safe assets

[10]Actually, this is in line with Kimball and Weil (1992) who analytically show that greater risk aversion tends to increase the strength of the precautionary saving motive.

report a lower desired precautionary wealth than households who own risky assets. Ownership of risky assets implies a non-negligible financial risk. Therefore, households might perceive a higher risk, reporting a higher amount of wealth to face unexpected contingencies.

Last but not least, the role played by liquidity constraints is taken into account, by taking into consideration two different definitions of constraints. The first one relies on a specific question present in the SHIW. According to the first definition, a household is constrained if its request for a loan was rejected, or if it is discouraged from asking for a loan but wished to apply for one. The second definition is the traditional and widespread definition proposed by Hayashi (1985). According to that, a household is constrained if its wealth is greater than 6 months' income[11]. Actually, insignificant differences in the ratio of precautionary saving/permanent income are found when the first definition is taken into account. Households who are constrained according to Hayashi's definition, are found instead to have higher precautionary saving compared to unconstrained ones.

This is in line with Carroll and Kimball (2001) who show analytically that the introduction of a liquidity constraint increases the precautionary saving motive around those levels of wealth where the constraint becomes binding.

Table 3 presents some descriptive statistics regarding the index of portfolio diversification. In the empirical analysis, two different financial diversification indexes will be used.

The first one is simply the inverse of the Herfindhal index, and it is calculated as:

$$div\_index = 1 - \sum_{i=1}^{N} (w_i)^2$$

where N is the total number of assets in the portfolio, whereas w_i is the weight of asset i in household's portfolio. An index of portfolio diversification close to one means high diversification, whereas an index close to zero means a portfolio concentrated in one or few assets. As explained in the appendix, ***div_index1*** is calculated including all 22

[11]Actually, as Jappelli et al point out, there is not a monotonic relation between net wealth and the probability to be constrained. However, Hayashi's definition gives a good approximation of those who are going to be constrained.

financial assets. ***Div_index2*** and ***div_index3*** are instead calculated when only risky assets - defined in a narrow and in a broad sense respectively- are included.
The second index, ***ndiv_index*** is instead simply the number of assets households own in their portfolio. Actually, using this measure does not allow taking into account assets distributed unevenly in the portfolio. Therefore, in the empirical analysis I rely mostly on ***div_index***, using ***ndiv_index*** as further robustness checks.
As table 3 shows, Italian households seem to hold quite undiversified portfolios. When ***div_index*** is taken into account, the value of the diversification index averages around 15%. When ***ndiv_index*** is used, previous results are confirmed. On average, Italian households own less than two financial assets in their portfolio.
Table 4.1, 4.2 and 4.3 show the number of assets owned by Italian households, considering all assets, risky assets in a broad sense and risky assets in a narrow sense, respectively. In fact, only a small percentage of households own more than 3 assets in their portfolio.
Results from descriptive statistics are in line with the strand of literature about the non-participation puzzle (Mankiw and Zeldes, 1991; Haliassos and Bertaut, 1995; Guiso and Jappelli, 2005), according to which transaction and information costs severely limit stockholding.

4. Empirical estimation

Following Kennikell and Lusardi (2004), I estimate the determinants of desired precautionary savings taking into account different possible reasons that may lead households to save for precautionary reasons. However, I go one step further by explicitly taking into account the effect of portfolio composition on precautionary wealth.
On one hand, I argue that ownership of risky assets would represent an additional reason for saving. Therefore, households whose portfolio is made exclusively of safe assets should have a lower desired precautionary wealth with respect to those households who instead own some risky assets in their portfolio. On the other hand, I take explicitly into account the role of portfolio diversification in reducing households' total exposure to financial risk. In this perspective, assuming no correlation between asset returns, a well diversified financial portfolio should reduce desired precautionary

saving.
In order to assess these two claims, I follow closely Kennikell and Lusardi (2004) and Guariglia (2001) as far as the empirical specification is concerned. The log of desired precautionary saving scaled by permanent income is used as a dependent variable, $(\ln(precaut\_y)_i$. The logarithm of permanent income is included in the right hand side[12]. Actually, there is evidence that saving varies across levels of permanent income (Carroll and Samwick, 1998; Guariglia, 2001). Including permanent income as an explanatory variable we allow preferences to be non homothetic.
The following regression is therefore estimated:

$$\ln(precaut\_y)_i = \alpha + \beta \ln(perm.income)_i + port\_safe_i + \mathrm{var}_i + \delta DEM_i + \gamma FIN_i + \varepsilon_i$$

where $port\_safe_i$ is a dummy which takes value 1 if the households own exclusively safe asset in their portfolio, and 0 if he owns at least one risky asset. var_i represents the logarithm of labour income variance, calculated over 6 waves of the SHIW. It is included in the estimation in order to control for earnings variability[13].
DEM and FIN are respectively a set of and financial variables that may affect the desired amount of precautionary savings. The set of demographic indicators includes age, age squared, education, education squared, 21 geographical dummies, a dummy for civil status and occupational dummies. As far as financial variables are concerned, 2 dummies indicating whether the household exhibit a positive variation in their financial and real wealth with respect to the previous year are included. This helps to control for previous shocks in wealth which may affect the declared amount of desired precautionary wealth. Moreover, a dummy for house ownership is included.

[12]Permanent earnings are calculated following the procedure proposed by Guiso, Jappelli and Terlizzese (1992). See the appendix for further details.
[13]Following Guariglia (2001) three panel measures of earnings variability are calculated (see the appendix for further details). In the empirical estimation I use $\mathrm{var}3$, because it drops a smaller number of observations. However, using alternative measures of earnings variability does not change the results.

House ownership may indeed represent a good "safety net" in case of unexpected events, affecting therefore the amount of wealth households would need to detain to face sudden drops in their income. Furthermore, credit card ownership is also included in the estimation. Actually, ownership of one or more credit cards, allowing households to postpone expenses to the future, might indeed represent a good indicator of households' spending target. Finally, a dummy which indicates whether the household received help from parents or friends is included in the regression. As pointed out by Guiso and Jappelli (1991) such informal networks might indeed help households to overcome borrowing constraints. In this perspective, help from relatives represents an alternative to insurance schemes or savings to protect themselves against uninsurable risks. Finally, the length of relationship with the bank is included in the estimation as a proxy for financial education. Having a long term relationship with a bank might indeed increase the possibility that the household prefers to insure against unexpected losses using formal insurance schemes, or to diversify its portfolio in order to reduce exposure to financial risk. Finally, wealth quartile dummies are included, in order to control for the level of wealth [14].

5. Results

Table 5.1 and 5.2 present the estimation results using *port_safe1* and *port_safe2* , respectively. Precautionary saving is significantly higher for those aged between 40 and 50, and for households belonging to the highest wealth quartile. Looking at *port_safe1* and *port_safe2* , we notice that they are both negative and significant at 1% level. As expected, having a portfolio made exclusively of safe assets significantly reduces households' desired precautionary wealth. In this perspective, asset related risk represents a non negligible determinant of precautionary saving.

As well as financial risk, earnings risk represents a non negligible source of precautionary accumulation. Actually, earning risk is positive and significant at 10% level.

In order to control for households' attitudes towards risk, a dummy which takes value 1 if the household is risk averse is included in the estimation

[14]See the appendix for a complete description of all variables used in the empirical analysis.

(specification 3). Actually, the dummy is derived by a specific question present in 2004 wave of SHIW (see Bertocchi, Brunetti and Torricelli, 2009). Since only households who were interviewed in 2004 and 2002 wave of SHIW were included, the sample size shrinks to 1006 observations. Even controlling for risk aversion, previous results do not change.

In order to control for the regional level of financial development, the number of bank counters in a region is included in specification (4) instead of regional dummies. Intuitively, the higher the financial development of a certain region, the more households would rely on market-based instruments (i.e. insurance, portfolio diversification) - instead of precautionary savings- to insure themselves against unexpected losses. Furthermore, it might be that not only the number, but also the diversification of financial intermediaries could affect households' demand for financial services. In order to control for the latter effect, an interaction term between the number of bank counters and four dummies for town size are included[15]. Actually, the total effect of the number of bank counters is positive and significant. However, it turns out to be negative for those households living in a municipality with more than 500,000 inhabitants.

As expected, when the working sub-sample is taken into account (specification 2) earnings variability becomes greater and more significant[16]. Moreover, in order to control for health risk, in specification 4 a variable indicating the number of illness days is introduced as explanatory variable. As expected, it is found to positively affect households' precautionary saving, though it is not significantly different from zero. From this perspective, the Italian public health system makes the need to save for future illness less preponderant .

Finally, in specification (5) of tables 5.1 and 5.2, a random effect panel

[15]Data comes from the Bank of Italy "Base Informativa Pubblica".

[16]The fact that income risk is not significant in the whole sample does not contradict the strand of literature which found evidence in favor of precautionary saving using effective or subjective measures of income variance. It is straightforward noticing that labor income risk is not likely to affect the behavior of retired and unemployed households.

estimation is performed using the 2002 and 2004 waves of the SHIW. Previous results regarding financial risk significance remains basically unaffected. Moreover, earnings risk is significant at 10% level.

5.1 Endogeneity issues

In the previous section, ownership of risky assets has been found strongly correlated with desired precautionary saving. However, OLS regression might be plagued by an endogeneity problem. First of all, risky asset ownership is correlated with unobserved factors, possibly related to household-specific plans for the future and attitudes towards risk, which also affect the reported amount of precautionary saving. Intuitively, a household with a relatively high level of knowledge of financial market would probably use insurance schemes to protect himself against insurable risks (i.e. death, illness, damage to property). Further, he would adequately diversify his portfolio, so that overall financial risk is reduced.

Secondly, the decision to own risky asset strongly depend on households' perception of future unexpected events. In this sense, a household might not invest in risky asset because he need an higher amount of wealth to face unexpected events. Similarly, a household may diversify his portfolio because he already needs an high amount of wealth to face other risks.

Previous estimation results should be therefore estimated using instrumental variables. However, the choice of plausible instruments for the endogenous variable is somewhat tricky. Actually, we can assume the decision to invest in risky assets to be correlated with the knowledge of such instruments. As showed by Guiso and Jappelli (2005) financial instruments awareness is strongly and positively correlated with education, household resources, long-term bank relations and proxies for social interaction.

In table 6.1, education and the length of relationship with the bank are used to instrument $port\_safe1$ and $port\_safe2$ [17]. Actually, $port\_safe1$ and $port\_safe2$ are found negative and significant at 1% level even when the endogeneity issue is taken into account.

Moreover, $dummy\_help$ is negative and significant at 5% level. This is in favor of the strength of "informal networks" among Italian households.

[17]Actually, we tried to include parental level of education as an additional instrument. Results are basically unchanged.

Receiving help from relatives represents a "safety net" against unexpected events, significantly reducing households' need to save for precautionary reasons.
These results still hold when random effect panel estimation is performed (table 6.2).
In table 6.3, *port_safe1* and *port_safe2* are instrumented using years of education, the length of the relationship with the bank and risk aversion indicator, which turns out to be strongly correlated with ownership of risky asset[18]. Even in this case, portfolio ownership dummies are found to be negative and strongly significant.

6. Precautionary saving and portfolio diversification

So far we have addressed the linkage between precautionary savings and portfolio diversification in the simplest possible way, analyzing whether ownership of relatively risky assets affects households' saving for unexpected contingencies. However, taking into account only the ownership of risky assets is only one side of the coin.
On one hand, what matters is not just the fact of holding risky assets, but their weight compared to the overall wealth held. On the other hand, households might indeed exploit portfolio diversification in order to reduce portfolio's total riskiness. As Mauro (1995) pointed out, the introduction of a well developed stock market allows households to pool risks, with a consequent reduction of precautionary saving. From this perspective, the influence of portfolio diversification on households' desired precautionary saving is twofold. On one hand, financial instruments should help to smooth consumption over time and across contingencies. On the other hand, they seem to convey sector-specific shocks that the holder might not diversify as fully as desired (Grande and Ventura, 2002).
Tables 7.1 and 7.2 show the results of the instrumental variable estimation. As well as ownership of risky assets, the share of risky assets, and portfolio diversification indexes should be treated as endogenous variables. A simultaneity issue indeed exist. Households might detain a relatively low share of risky assets as well as a highly diversified portfolio in order to

[18]Look at the appendix for the result of first stage regression.

reduce the amount of desired precautionary wealth.
Since households' propensity to diversify their portfolio is not only related to their attitudes towards risk, but it is also correlated to the level of education and financial literacy, the level of education and years of relationship with a bank seem plausible instruments for a diversification index. Table 7.1 shows results of IV regression using years of education and the length of the relationship with a bank as instruments, whereas in table 7.2 risk aversion is used as additional instrument.
Results show that a relatively larger share of risky assets in one's portfolio increases the precautionary motive for saving.
However, Italian households do not seem to use portfolio diversification to protect themselves against financial risk. Using both indexes, the sign of the coefficient associated to the diversification index is positive and significant. A higher level of diversification increases households' desired precautionary saving. This result is in line with Grande and Ventura (2002): although a higher diversification helps to reduce portfolio's total riskiness, risky assets convey sector specific shocks, giving rise to higher precautionary savings.

7. Formal and informal insurance schemes

Finally, I test whether ownership of health or property insurance affects the desired amount of wealth households would like to save for precautionary reasons.
In the literature several contributions have analyzed the linkage between private saving and insurance decisions. Starr-McCluer (1996) evaluates the impact of private health insurance on American households' saving habits to verify the existence of substitutability between private insurance and self insurance. The author concludes that, in general, precautionary savings does not offset private insurance. A similar conclusion is reached by Guariglia and Rossi (2001) using British household data. As far as the Italian case is concerned, Jappelli, Pistaferri and Weber (2004), focus on the impact of health risk on precautionary saving. They eventually found a higher degree of precautionary saving in areas with poor quality health services.
In order to see whether substitutability exists between formal and informal insurance schemes, the dummy ***insurance*** is introduced. It takes value 1 if the households owns a property insurance or health insurance, zero otherwise. Since insurance ownership is a choice variable, its endogeneity

needs to be tackled.
Table 8.1 reports the results of IV estimates, where port_safe1, port_safe2 and insurance are instrumented using years of education, risk aversion, the length of the relationship with the bank and the number of bank counters per capita. Table 8.2 instead shows IV estimates using ***share_narrow***, ***share_broad***, ***dindex1*** and ***ndindex1***, instrumented with the same set of instruments used in table 8.1.
As tables 8.1 and 8.2 show, the decision to buy an insurance is negatively correlated to the desired amount of precautionary savings. Therefore, substitutability exists between self-insurance (precautionary saving) and formal insurance schemes. Households who trust financial markets prefer to insure against unexpected contingencies through financial instruments (i.e. buying an insurance) instead of saving[19]. However, ***insurance*** is not significant. In this perspective, although Italian households use insurance instruments in order to face unexpected and future losses, they do not significantly reduce the amount of wealth they wish to detain for precautionary reasons. Actually, this may be due to the fact that losses that can be insured (i.e. illness, damage) are not perceived to be as important as those who do not (i.e unemployment, financial market related losses). On the other hand, the explanation of the weak substitutability between formal and informal insurance markets may be also founded on Italian households' relatively little trust on capital markets.

8. Conclusion

In this paper I have explored how saving decisions of Italian households respond to asset-related risk. Unlike previous works about precautionary saving, a household specific measure of desired precautionary wealth is used in the empirical analysis. The advantage in using a self-reported measure of precautionary wealth is twofold. First of all, it is a comprehensive measure, which includes all possible sources of risk. Secondly, using such a measure helps to avoid problems related to past shocks in household wealth, which

[19]However, the over identification test is not rejected in specifications (3) and (4). Thus, the estimates should be taken with care.

might shrink households' effective resources, giving rise to a low or null amount of wealth detained for precautionary reasons.

The empirical results show that Italian households appear to use precautionary saving to protect themselves against financial risk. Estimates show that owning a portfolio made exclusively of safe assets strongly and significantly reduces the amount of precautionary saving households wish to detain to face unexpected contingencies. In this perspective, risky asset ownership is perceived as a non-negligible source of risk. This result is robust to alternative specifications (i.e. self employed, and older households). However, significance of asset-ownership might be related to the fact that endogeneity is not adequately taken into account. Even using IV estimation, previous results are confirmed.

Once the importance of financial risk on households' precautionary saving is established, the role of portfolio diversification is taken into account. Albeit financial instruments convey sector-specific shocks, provided that assets' return are not perfectly correlated, an adequately diversified portfolio should help reducing total riskiness of portfolio. Consequently, a greater diversification of financial portfolios should give rise to a lower desired amount of precautionary saving. The empirical results show that portfolio diversification is not used by Italian households as a device to reduce total exposure to risk. This result is robust to the inclusion of different assets in the of households' financial diversification index (i.e. all assets, risky assets in a broad and narrow definition), and to different computations of this index.

Finally, a substitution effect does not seem to exist between formal insurance schemes and precautionary saving. Using formal insurance schemes to insure themselves against specific kinds of risk (i.e. health, damage and death) does not reduces the amount of desired precautionary savings.

The role played by financial risk on precautionary savings has important policy implications. As Levine (1991) pointed out, a well developed stock market allows households to diversify their portfolios, enabling them to hedge against idiosyncratic risks. It is straightforward noticing that a higher degree of development of financial markets would allow households to better insure against unexpected events. On one hand, a well diversified portfolio would allow them to better hedge against idiosyncratic risks. On the other hand, adequate insurance schemes would potentially help individuals to deal with specific kinds of risk.

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APPENDIX

(A) VARIABLES DEFINITION

precaut: desired amount of precautionary saving.
YP: permanent income
ln (precaut): logarithm of households' reported desired precautionary wealth.
ln(precaut_y): ln(precaut/permanent income).
ln(YP): logarithm of permanent income
age: age of the household head

age5: age classes. Coded as: (1) age 30; (2) 31 age 40; (3) 41 age 50; (4) 51 age 65; (5) age 65.
south: dummy variable, takes value 1 if the household live in the south, 0 otherwise.
acom5: dummy variable, takes value 1 if the household lives in a city where the number of inhabitants is greater than 50000, 0 otherwise.
farmer: dummy variable which takes value 1 if the household is a farmer, 0 otherwise.
self-employed: dummy variable which takes value 1 if the household is self employed, 0 otherwise.
abit: dummy variable, takes value 1 if the household own a house, 0 otherwise.
carcre: dummy variable, takes value 1 if the household owns at least 1 credit card.
dassan: dummy taking value 1 if the household owns health insurance.
dassvita: dummy taking value 1 if the household owns life insurance.
*dassdanni:*dummy taking value 1 if the household owns property insurance.
insurance: dummy taking value 1 if the household owns property insurance or health insurance.

Definition of assets

The SHIW provides detailed information about real and financial assets and

financial liabilities. In particular, in the SHIW we can identify:
AF total financial assets
PF total financial liabilities
AR real assets

Among real assets, we can distinguish between:
AR1 real estate
AR2 business
AR3 other valuable assets

The SHIW provides detailed information about ownership and amount of wealth detained in the following classes of financial assets.
(1) CONTAN cash
(2) LDBCC checking accounts
(3) LDBRI savings accounts
(4) LCD certificates of deposit
(5) LPCT reverse repurchase agreements
(6) LDP postal deposits
(7) LBFP postal bonds
(8) BOT short-term government bonds
(9) CCT long-term government bonds
(10) BTP long-term government bonds
(11) CTZ short-term government bonds
(12) LATS other government bonds
(13) LOBB corporate bonds
(14) LQFC investment funds
(15) LAZI equities
(16) LSRL shares in limited liabilities companies
(17) LPER shares in limited liabilities companies
(18)LGP investment funds
(19) LTE foreign bonds
(20) LCOOP co-op loans

I consider 2 defintions of risky assets.

a) **Broad definition**, includes: *BTP*,LSRL, LPER, LOBB, LAZI, LTE, *CCT, LATS*
b) **Narrow definition**, includes: LSRL, LPER, LOBB, LAZI, LTE

Portfolio-related variables can be defined as follows:

port_safe1, port_safe2: takes value if the household does not own any of the risky assets listed above (according to the broad and narrow definition, respectively)
share_narrow, **share_broad:** risky asset (according to the broad and narrow definition , respectively) over total financial assets.

(B) INDEX OF PORTFOLIO DIVERSIFICATION

In the empirical analysis, two different index of portfolio diversification have been used.

1) Inverse of the Herfindhal index

$$div\_index = 1 - \sum_{i=1}^{N} (w_i)^2$$

Depending on the number of assets included in the calculation, we can identify 3 indices of diversification:
div_index1: calculated including all financial assets;
div_index2: calculated including only risky assets (narrow definition)
div_index3: calculated including only risky assets (broad definition)

2) Number of assets detained in households' portfolio

Depending on the number of assets included in the calculation, we can identify 3 indices of diversification:

ndiv_index1: calculated including all financial assets;
ndiv_index2: calculated including only risky assets (narrow definition)
ndiv_index3: calculated including only risky assets (broad definition)

(C) PERMANENT INCOME

For the computation of permanent income I closely followed the methodology proposed by Guiso et al. (1992). They assume that permanent earnings of each household at time t can be expressed as:

$$Y_i^P(t) = Z_i\beta + \phi(\tau_i)$$

where Z is a vector of household and head of household characteristics and $\varphi(.)$ is a quadratic function of household's head age. Assuming that the maximum age at which people work is 65 years, and that the rate of productivity growth is equal to the interest rate, estimated permanent earnings at age/time τ_0 is given by:

$$Y_i^P(\tau_0) = Z_i b + (65 - \tau_{0i} + 1)^{-1} \sum_{\tau i=\tau_{0i}}^{65} f(\tau_i)$$

where b and f indicate, respectively, the estimated coefficients of β and φ

(D) INCOME VARIANCE

In order to calculate measures of earning variability, 6 waves of SHIW are

considered (from 1991 to 2002). Unemployed households, and households whose earnings were less than 20% of the average over the period were excluded.

Following Guariglia (2001) three measures of earnings variability are calculated.

The first one ($\mathrm{var}1$) is obtained for each households by taking the square of detrended household earnings in 2002 and 1991, divided by 6 to have an an annual rate .

The second one ($\mathrm{var}2$) is simply the variance of Y_t , over the 6 available waves. This measure considers all income shocks to be permanent.

Finally, the third measure of earning variability ($\mathrm{var}3$) is the variance of $(Y_t - Y_{t-1})$, calculated over waves 2 to 6. This measure considers all income shocks to be transitory.

Detrended household earnings (Y) is calculated by taking the residuals from a random-effect regression of household characteristics, such as age, age squared, educational and occupational dummies, and interaction terms between educational and occupational dummies with age and age squared.

(E) FIRST STAGE REGRESSION ESTIMATES

	(1) port_safe1	(2) port_safe2	(3) share_narrow	(4) share_broad	(5) dindex1	(6) ndindex1
ln (perm. income)	0.0316	0.0268	-0.0227**	-0.0223*	-0.0357***	-0.1293**
	(0.0206)	(0.0204)	(0.0114)	(0.0121)	(0.0082)	(0.0555)
income variance	-0.0114	-0.0226	0.0135	0.0107	0.0088	0.1366*
*1000	(0.0167)	(0.0167)	(0.0086)	(0.0106)	(0.0089)	(0.0731)
Age	-0.0229*	-0.02014*	0.0134**	0.0180***	0.0040	0.0709**
	(0.0121)	(0.0115)	(0.0054)	(0.0063)	(0.0061)	(0.0320)
age^2	0.0002	0.0002	-0.0001**	-0.0001**	-0.00003	-0.0006**
	(0.0002)	(0.0001)	(0.00005)	(0.00006)	(0.00005)	(0.0003)
family size	-0.0189	-0.0324*	0.0121	0.0050	0.0197**	0.1068*
	(0.0193)	(0.0191)	(0.0106)	(0.0115)	(0.0097)	(0.0551)
n.income recip.>1	-0.0630	-0.0727*	0.0280	0.0276	-0.0316	-0.1861
(dummy)	(0.0411)	(0.0408)	(0.0245)	(0.0264)	(0.0212)	(0.1210)
Farmer	0.2375	0.1401	-0.0670	-0.1255**	-0.2517***	-1.1748***
(dummy)	(0.1498)	(0.1549)	(0.0527)	(0.0593)	(0.0971)	(0.4387)
self employed	-0.0131	-0.0029	-0.0261	-0.0261	-0.0056	-0.0266
(dummy)	(0.0630)	(0.0645)	(0.0332)	(0.0348)	(0.0324)	(0.2150)
II wealth quartile	-0.1011	-0.1409**	0.0326	0.0202	0.0448	0.2868
	(0.0694)	(0.0640)	(0.0346)	(0.0401)	(0.0407)	(0.2131)
III wealth quartile	-0.2099***	-0.2125***	0.0448	0.0676	0.1363***	0.8508***
	(0.0771)	(0.0728)	(0.0383)	(0.0443)	(0.0449)	(0.2431)
IV wealth quartile	-0.3439	-0.3394***	0.1047**	0.1298***	0.1735***	1.1263***
	(0.0805)	(0.0769)	(0.0413)	(0.0469)	(0.0458)	(0.2420)
owns house	0.0530	0.0493	0.0151	0.0039	-0.0358	-0.2352
(dummy)	(0.062)	(0.0617)	(0.0320)	(0.0360)	(0.0323)	(0.1793)
help from parents	-0.0720	-0.1320	0.0055	-0.0258	0.0354	0.1644
(dummy)	(0.1095)	(0.1121)	(0.0468)	(0.0490)	(0.0417)	(0.3679)
Education	-0.0229***	-0.0168***	0.0083***	0.0144***	0.0045**	0.0273**
	(0.0047)	(0.0046)	(0.0025)	(0.0028)	(0.0023)	(0.0138)
risk averse	0.0946***	0.1070***	-0.0345*	-0.0256	-0.0512***	-0.3480***
(dummy)	(0.0359)	(0.0356)	(0.0197)	(0.0215)	(0.0177)	(0.1029)
years relat. Bank	-0.0476**	-0.0396***	0.0194**	0.0273**	0.0125	-0.0355
	(0.0193)	(0.0185)	(0.0098)	(0.0109)	(0.0106)	(0.0612)
Constant	1.8292***	1.7382	-0.3851**	-0.5984***	0.1602	0.5976
	(0.3452)	(0.3348)	(0.1570)	(0.1797)	(0.1759)	(0.9278)
Adj. R^2	0.1709	0.1451	0.1341	0.2162	0.1472	0.2006

Notes: this table shows first -stage regression results for dicotomic variables of risky asset ownership (*port_safe1* and *port_safe2*), share of risky asset over total financial wealth (*share_narrow* and *share_broad*) and indexes of portfolio diversification (*dindex1* and *ndindex1*)

TABLE 1 Descriptive statistics-main variables (all sample)

	mean	s.d.	median
Precaut	44345.8	79381.55	20000
precaut/permanent income	4.164435	64.52974	1.813623
precaut/labor income	4.071288	45.56373	1.190476
age	54.97169	16.11782	54
years of education	8.740205	4.662393	8
Wealth	177598.7	307368.9	102500
real assets	158707	274698.7	100000
financial assets	23092.36	86840.2	6500
labor income	15221.33	18296.62	12600

Notes: sample statistics are estimated using SHIW population weights.

TABLE 2 Desired precautionary saving-descriptive statistics (average values)

	PRECAUT.	*PRECAUT/ YP*
age class		
< 30	35212.14	5.288539
31 – 40	51221.94	10.07616
41 – 50	52002.71	3.712609
51 – 65	49883.18	2.24675
>65	30855.11	3.861782
North	53575.33	4.048967
Centre	54120.9	5.126186
South	25725.69	3.754108
Married	49580.18873	5.178626
Single	34209.43	2.200459
Education		
Primary School	28750.46	2.020019
High School	50406.17	5.623866
Undergraduate or more	73129.48	3.584275
Job status		
Unemployed	36793.82	4.44081
self – employed	64039.2	4.723714
dependent job	48484.04	4.723714
1^wealth quartile	32982.82	5.760568
2^wealth quartile	30483.16	2.719051
3^wealth quartile	46915.17	2.746094
4^wealth quartile	75222.63	5.625952
Risk averse	42237.83	4.06405
Risk lover-neutral	56163.8	3.684384
Liquidity constraints (1^def)		
Constrained	35937.74	5.061201
Unconstrained	53088.85	5.287624
Liquidity constraints (2^def)		
Constrained	31978.05	7.6921119
Unconstrained	45863.57	3.731517
Home ownership		
own home	46653	3.267529
do not own home	39334.48	6.11254
Portfolio composition - narrow def.		
only safe assets	39838.71128	3.980443
risky asset ownership	83716.5809	6.130957
Risky asset ownership - broad def		
only safe assets	81558.29569	5.963333
risky asset ownership	39279.32357	3.964644
whole sample	44345.8	4.071289

Notes: This table shows average values of the desired amount of precautionary saving (*precaut*) and precautionary saving scaled by permanent income (*precaut_y*), by several population groups. Sample statistics are estimated using SHIW population weights.

TABLE 3 Diversification Index - descriptive statistics

	mean	min	max	n. obs
div_index1	0.20520	0	0.85459	6548
div_index2	0.16223	0	0.78402	1581
div_index3	0.15633	0	0.83341	2778
ndiv_index1	2.034264	1	11	6548
ndiv_index2	1.475179	1	6	1581
ndiv_index3	1.53697	1	8	2778

Notes: $\mathrm{div}\_index1, \mathrm{div}\_index2, \mathrm{div}\_index3$ are index of portfolio diversification, calculated as the inverse of the Herfindhal index, whereas $n\,\mathrm{div}\_index1, n\,\mathrm{div}\_index2, n\,\mathrm{div}\_index3$ are calculated as the number of asset the household hold in his portfolio. Subscript 1, 2, 3, refer to the cathegory of asset used to calculate the index: all asset (1), risky asset in a narrow sense (2) and risky asset in a broad sense (3). Sample statistics are calculated using SHIW population weights.

TABLE 4.1 Number of assets (*ndindex1*)

NUMBER OF ASSET IN THE PORTFOLIO	frequency	
1	2999	45.80%
2	1750	26.73%
3	979	14.95%
4	447	6.83%
5	220	3.36%
6	101	1.54%
7	26	0.4%
8	18	0.27%
9	4	0.06%
10	3	0.05%
11	1	0.02%
TOT	6548	

Notes: sample statistics are estimated using SHIW population weights.

TABLE 4.2 Number of assets (*ndindex2*)

NUMBER OF ASSET IN THE PORTFOLIO	frequency	
1	1030	65.15%
2	381	24.10%
3	130	8.22%
4	34	2.15%
5	5	0.32%
6	1	0.06%
TOT	1581	

Notes: sample statistics are estimated using SHIW population weights.

TABLE 4.3 Number of assets (*ndindex3*)

NUMBER OF ASSET IN THE PORTFOLIO	frequency	
1	1793	64.54%
2	625	22.50%
3	226	8.14%
4	92	3.31%
5	33	1.19%
6	7	0.25%
7	1	0.04%
8	1	0.04%
TOT	2778	

Notes: sample statistics are estimated using SHIW population weights.

TABLE 5.1 OLS ESTIMATION USING PORT_SAFE1

Dependent variable: ln(precaut_y)

	(1)	(2)	(3)	(4)	(5)
ln(perm. income)	-0.948***	-1.022***	-0.789***	-0.873***	-0.959***
	(0.119)	(0.139)	(0.123)	(0.189)	(0.0310)
port_safe1	**-0.321*** **	**-0.244** **	**-0.415*** **	**-0.245*** **	**-0.253*** **
	(0.0923)	(0.117)	(0.0944)	(0.0899)	(0.0536)
income variance *1000	0.0691*	0.0704	0.0870*	0.0678*	-0.00305
	(0.0417)	(0.0487)	(0.0449)	(0.0357)	(0.0395)
Age	0.0327	0.104***	0.0353	0.0557	0.0457***
	(0.0223)	(0.0334)	(0.0231)	(0.0364)	(0.0143)
age^2	-0.000307	-0.00100***	-0.000340	-0.000528	-0.000420***
	(0.000199)	(0.000315)	(0.000207)	(0.000373)	(0.000126)
Education	0.0703**	0.0432	0.0992***	0.00614	0.0426**
	(0.0328)	(0.0495)	(0.0348)	(0.0480)	(0.0190)
education^2	-0.00180	-0.00118	-0.00348**	0.000242	-0.000591
	(0.00148)	(0.00222)	(0.00158)	(0.00200)	(0.000886)
n. income recip.>1 (dummy)	-0.0870	0.0295	-0.0487	-0.142	-0.0812
	(0.0996)	(0.129)	(0.103)	(0.102)	(0.0550)
Farmer (dummy)	-0.0631	-0.0519	-0.240	-0.141	-0.0644
	(0.186)	(0.290)	(0.213)	(0.176)	(0.151)
self employed (dummy)	0.141	0.166	0.0480	0.0627	0.0836
	(0.0993)	(0.156)	(0.108)	(0.0867)	(0.0742)
family size	0.0817**	0.0740	0.0108	0.0941**	0.0741***
	(0.0403)	(0.0581)	(0.0407)	(0.0445)	(0.0249)
II wealth quartile	0.471***	0.401	0.529***	0.421***	0.412***
	(0.137)	(0.250)	(0.148)	(0.142)	(0.0857)
III wealth quartile	0.600***	0.454*	0.663***	0.161	0.551***
	(0.158)	(0.265)	(0.169)	(0.165)	(0.0971)
IV wealth quartile	0.778***	0.700**	0.871***	0.464***	0.698***
	(0.173)	(0.284)	(0.183)	(0.173)	(0.103)
owns house	-0.230*	0.0223	-0.316**	-0.0849	-0.145*
	(0.125)	(0.226)	(0.132)	(0.124)	(0.0781)
help from parents (dummy)	0.201	0.314	0.136	-0.0173	0.0461
	(0.292)	(0.335)	(0.339)	(0.239)	(0.150)
credit card>1 (dummy)	0.129	0.239**	0.172**	0.162**	
	(0.0820)	(0.120)	(0.0849)	(0.0788)	

real wealth variation>0 (dummy)	0.719 (0.649)	-0.243 (0.277)	0.310 (0.559)	-0.133 (0.643)	
Fin. wealth variation>0 (dummy)	-0.591 (0.467)	0.322* (0.173)	-1.039** (0.507)	0.454* (0.250)	
bank counters			4.468 (2.729)		
bank counters* 20,000< inhab.<40,000			4.069*** (1.439)		
bank counters* 40,000< inhab.<500,000			0.540 (1.452)		
bank counters* inhab>500,000			-5.802** (2.487)		
risk averse (dummy)		0.0632 (0.106)			
n. days ill				0.00185 (0.00179)	
year=2004					0.351*** (0.0528)
Constant	1.472** (0.683)	-0.0374 (0.921)	0.684 (0.711)	1.059 (0.892)	1.347*** (0.430)
Observations	2984	1006	2984	1367	4500
	0.206	0.259	0.124	0.174	
Number of nquest					2999

Robust standard errors in parentheses

***** p 0.01, ** p 0.05, * p 0.1**

Notes: this table shows OLS regression. The dependent variable is the logarithm of desired precautionary saving, scaled for permanent income. Each regression includes 21 regional dummies (not reported for brevity). Households' portfolio composition is proxied using **port_safe1,** a dummy which takes value 1 if the household does not own any risky asset (in a broad definition). In specification (2) a dummy which takes value 1 if the household is risk averse is included in the estimation. In specification (3) the number of bank counters per person, interacted with 4 town size dummies are included instead of 21 regional dummies. In specification (4) only working households' heads. Are considered and a variable indicating the number of days the household head was ill during the period is introduced. Finally, in specification (5) panel random-effect estimation is performed, using 2002 and 2004 waves of SHIW. Each regression is weighted using SHIW sampling weights.

TABLE 5.2 OLS ESTIMATION USING PORT_SAFE2

Dependent variable: ln(precaut_y)

	(1)	(2)	(3)	(4)	(5)
ln(perm. income)	-0.949***	-1.022***	-0.790***	-0.802***	-1.020***
	(0.120)	(0.139)	(0.123)	(0.228)	(0.0592)
port_safe2	**-0.306*** **	**-0.277** **	**-0.411*** **	**-0.341*** **	**-0.262*** **
	(0.0937)	(0.120)	(0.0968)	(0.114)	(0.0782)
income variance*1000	0.0680	0.0686	0.0853*	0.0964**	0.0674*
	(0.0419)	(0.0489)	(0.0451)	(0.0436)	(0.0376)
age	0.0339	0.107***	0.0369	0.0782*	0.0547
	(0.0223)	(0.0333)	(0.0231)	(0.0448)	(0.0341)
age^2	-0.000315	-0.00103***	-0.000352*	-0.000824*	-0.000513
	(0.000199)	(0.000314)	(0.000207)	(0.000456)	(0.000355)
education	0.0709**	0.0445	0.100***	-0.00166	0.00161
	(0.0329)	(0.0496)	(0.0349)	(0.0676)	(0.0448)
education^2	-0.00178	-0.00122	-0.00347**	0.000205	0.000892
	(0.00148)	(0.00223)	(0.00159)	(0.00283)	(0.00185)
n. income recip.>1 (dummy)	-0.0863	0.0317	-0.0473	-0.169	-0.180**
	(0.0997)	(0.130)	(0.103)	(0.137)	(0.0869)
farmer (dummy)	-0.0653	-0.0480	-0.242	-0.156	-0.222
	(0.186)	(0.289)	(0.213)	(0.212)	(0.160)
self employed (dummy)	0.136	0.161	0.0408	0.192*	0.0845
	(0.0992)	(0.156)	(0.108)	(0.112)	(0.0801)
family size	0.0806**	0.0700	0.00909	0.0794	0.0981***
	(0.0403)	(0.0582)	(0.0408)	(0.0587)	(0.0345)
II wealth quartile	0.472***	0.396	0.528***	0.359**	0.415***
	(0.137)	(0.251)	(0.149)	(0.162)	(0.131)
III wealth quartile	0.605***	0.451*	0.667***	0.183	0.293**
	(0.158)	(0.266)	(0.169)	(0.202)	(0.149)
IV wealth quartile	0.791***	0.696**	0.882***	0.393*	0.530***
	(0.173)	(0.285)	(0.183)	(0.219)	(0.156)
owns house	-0.228*	0.0283	-0.311**	-0.0936	-0.111
	(0.126)	(0.227)	(0.133)	(0.137)	(0.113)
help from parents (dummy)	0.205	0.325	0.142	0.0677	0.00259
	(0.292)	(0.337)	(0.340)	(0.293)	(0.214)
credit card>1 (dummy)	0.135	0.236*	0.178**	0.171*	
	(0.0825)	(0.122)	(0.0852)	(0.0980)	

real wealth variation>0 (dummy)	0.769	-0.234	0.376	0.532	
	(0.627)	(0.276)	(0.548)	(0.547)	
financial wealth variation>0 (dummy)	-0.618	0.307*	-1.075**	0.157	
	(0.463)	(0.172)	(0.512)	(0.448)	
bank counters			4.550*		
			(2.738)		
bank counters* 20,000< inhab.<40,000			4.092***		
			(1.443)		
bank counters* 40,000< inhab.<500,000			0.525		
			(1.454)		
bank counters* inhab>500,000			-5.934**		
			(2.487)		
risk averse (dummy)		0.0628			
		(0.107)			
n. days ill				0.000271	
				(0.00222)	
year=2004					0.195
					(0.125)
Constant	1.428**	-0.0680	0.630	0.704	1.543*
	(0.677)	(0.894)	(0.704)	(1.112)	(0.858)
Observations	2984	1006	2984	1367	1780
	0.206	0.260	0.119	0.170	
Number of nquest					1385

Robust standard errors in parentheses

***** p 0.01, ** p 0.05, * p 0.1**

Notes: this table shows OLS regression. The dependent variable is the logarithm of desired precautionary saving, scaled for permanent income. Each regression includes 21 regional dummies (not reported for brevity). Households' portfolio composition is proxied using **port_safe2,** a dummy which takes value 1 if the household does not own any risky asset (in a broad definition). In specification (2) a dummy which takes value 1 if the household is risk averse is included in the estimation. In specification (3) the number of bank counters per person, interacted with 4 town size dummies are included instead of 21 regional dummies. In specification (4) only working households' heads. Are considered and a variable indicating the number of days the household head was ill during the period is introduced. Finally, in specification (5) panel random-effect estimation is performed, using 2002 and 2004 waves of SHIW. Each regression is weighted using SHIW sampling weights.

TABLE 6.1 IV ESTIMATION

Dependent variable: ln(precaut_y)

	(1)	(2)
port_safe1	**-1.888*** **	
	(0.635)	
port_safe2		**-2.036*** **
		(0.694)
permanent income	-0.785***	-0.781***
	(0.129)	(0.130)
Income variance*1000	0.000429	-0.00781
	(0.0735)	(0.0790)
age	0.0442	0.0437
	(0.0335)	(0.0334)
age^2	-0.000427	-0.000413
	(0.000311)	(0.000310)
family size	0.0724	0.0594
	(0.0537)	(0.0543)
n. income recip>1	0.0731	0.0915
(dummy)	(0.144)	(0.145)
farmer	0.142	0.155
(dummy)	(0.343)	(0.348)
self employed	-0.0387	-0.0503
(dummy)	(0.153)	(0.154)
II wealth quartile	-0.150	-0.186
	(0.199)	(0.206)
III wealth quartile	-0.0499	-0.0691
	(0.261)	(0.264)
IV wealth quartile	-0.124	-0.141
	(0.352)	(0.360)
owns credit card	-0.163	-0.113
(dummy)	(0.165)	(0.153)
real wealth variation>0	-0.458	0.754**
(dummy)	(0.580)	(0.353)
financial wealth variation>0	0.469	-0.0443
(dummy)	(0.415)	(0.192)
owns house	0.243	0.271
(dummy)	(0.167)	(0.170)

help from parents/friends	-0.743***	-0.775***
	(0.284)	(0.296)
Constant	3.086***	3.305***
	(1.080)	(1.139)
Instruments:		
years of education, lenght of the relationship with the bank		
Test of overidentifying restrictions (p-value):		
	0.9633	0.9859
Weak identification test (Kleibergen-Paap rk Wald F statistic)		
	14.664	12.727
Observations	1324	1324
	0.046	0.077
Robust standard errors in parentheses		
***** p 0.01, ** p 0.05, * p 0.1**		

Notes: this table shows IV regression. The dependent variable is the logarithm of desired precautionary saving, scaled for permanent income. Each regression includes 21 regional dummies (not reported for brevity). **port safe1** and **port_safe2** are instrumented using household head's years of education and the lenght of relationship with a bank. Each regression is weighted using SHIW sampling weights.

TABLE 6.2 IV ESTIMATION- PANEL

Dependent variable: ln(precaut_y)

	(1)	(2)
port_safe1	**-1.602*** **	
	(0.438)	
port_safe2		**-1.845*** **
		(0.515)
ln (permanent income)	-0.977***	-0.968***
	(0.0487)	(0.0491)
income variance *1000	-0.0228	-0.0367
	(0.0419)	(0.0438)
age	0.0511**	0.0522**
	(0.0207)	(0.0211)
age^2	-0.000457**	-0.000463**
	(0.000184)	(0.000188)
family size	0.0949***	0.0780**
	(0.0346)	(0.0354)
n. income recipients>1 (dummy)	-0.00374	-0.00756
	(0.0775)	(0.0791)
farmer (dummy)	-0.221	-0.251
	(0.270)	(0.275)
self employed (dummy)	-0.0320	-0.0387
	(0.114)	(0.116)
II wealth quartile	0.135	0.104
	(0.147)	(0.154)
III wealth quartile	0.225	0.213
	(0.176)	(0.181)
IV wealth quartile	0.153	0.117
	(0.235)	(0.248)
owns house (dummy)	0.102	0.119
	(0.125)	(0.129)
help from parents/friends (dummy)	-0.229	-0.223
	(0.221)	(0.225)
year=2004	0.223**	0.257***
	(0.0898)	(0.0909)
Constant	2.768***	3.003***
	(0.734)	(0.789)
Observations	2002	2002
Number of nquest	1403	1403

Standard errors in parentheses

***** p 0.01, ** p 0.05, * p 0.1**

Notes: this table shows random effect panel IV regression, 2002 and 2004 waves of SHIW are used. The dependent variable is the logarithm of desired precautionary saving, scaled for permanent income. Each regression includes 21 regional dummies, and 4 city size dummies (not reported for brevity). **port safe1** and **port_safe2** are instrumented using household head's years of education and the lenght of relationship with a bank.

TABLE 6.3 IV REGRESSION USING ALTERNATIVE INSTRUMENTS

Dependent variable: ln(precaut_y)

	(1)	(2)
port_safe1	**-1.345*** **	
	(0.410)	
port_safe2		**-1.549*** **
		(0.500)
permanent income	-1.043***	-1.043***
	(0.0502)	(0.0522)
Income variance*1000	0.0285	0.00758
	(0.0628)	(0.0656)
age	0.0627*	0.0621*
	(0.0324)	(0.0329)
age^2	-0.000543*	-0.000526*
	(0.000290)	(0.000296)
family size	0.114**	0.0896
	(0.0553)	(0.0578)
n. income recipients>0 (dummy)	-0.0600	-0.0858
	(0.120)	(0.128)
farmer (dummy)	0.673	0.579
	(0.555)	(0.558)
self employed (dummy)	-0.187	-0.177
	(0.176)	(0.179)
II wealth quartile	0.0521	-0.0309
	(0.238)	(0.250)
III wealth quartile	0.0511	0.00708
	(0.271)	(0.280)
IV wealth quartile	0.111	0.0543
	(0.320)	(0.340)
owns house (dummy)	0.361*	0.362*
	(0.206)	(0.204)
help from parents/friends	0.0423	-0.0609
	(0.326)	(0.347)
Constant	2.216**	2.539**
	(1.063)	(1.156)

Instruments:		
education, lenght of relationship with the bank, risk aversion		
Test of overidentifying restrictions (p-value):		
	0.2073	0.1687
Weak identification test (Kleibergen-Paap rk Wald F statistic)		
	15.1013.	10.9898
Observations	868	868
	0.429	0.354

Robust standard errors in parentheses

***** p 0.01, ** p 0.05, * p 0.1**

Notes: this table shows IV regression. The dependent variable is the logarithm of desired precautionary saving, scaled for permanent income. Each regression includes 21 regional dummies (not reported for brevity). **port safe1** and **port_safe2** are instrumented using household head's years of education, a dummy which takes value 1 if the household head reports being risk averse and the lenght of relationship with a bank. Each regression is weighted using SHIW sampling weights.

TABLE 7.1 IV ESTIMATION - PORTFOLIO DIVERSIFICATION

Dependent variable: ln(precaut_y)				
	(1)	(2)	(3)	(4)
share_broad	**4.361*** ** (1.415)			
share_narrow		**5.846*** ** (2.079)		
dindex1			**4.606*** ** (1.593)	
ndindex1				**0.910*** ** (0.352)
ln (permanent income)	-0.852*** (0.135)	-0.824*** (0.140)	-0.817*** (0.131)	-0.731*** (0.132)
Income variance*1000	-0.00377 (0.102)	-0.0468 (0.115)	0.0345 (0.0937)	-0.0189 (0.115)
age	0.0267 (0.0358)	0.0266 (0.0370)	0.0636 (0.0419)	0.0194 (0.0375)
age^2	-0.000254 (0.000329)	-0.000228 (0.000339)	-0.000543 (0.000372)	-0.000175 (0.000345)
family size	0.0834 (0.0603)	0.0638 (0.0674)	0.0367 (0.0619)	0.0335 (0.0613)
n. income recipients>1 (dummy)	0.0534 (0.156)	0.0827 (0.166)	0.305* (0.160)	0.307* (0.167)
farmer (dummy)	0.209 (0.405)	0.261 (0.443)	0.500 (0.320)	0.323 (0.401)
self employed (dummy)	0.00293 (0.172)	-0.0613 (0.201)	0.0726 (0.175)	0.115 (0.184)
II wealth quartile	-0.0852 (0.211)	-0.140 (0.235)	0.123 (0.192)	0.0608 (0.198)
III wealth quartile	-0.00746 (0.260)	-0.0643 (0.281)	-0.145 (0.300)	-0.162 (0.338)
IV wealth quartile	-0.0723 (0.336)	-0.129 (0.378)	-0.231 (0.387)	-0.297 (0.448)
credit card	-0.111 (0.180)	-0.0743 (0.188)	-0.111 (0.181)	-0.0465 (0.174)
real wealth variation>0 (dummy)	-0.152 (0.509)	0.970** (0.472)	0.0183 (0.717)	0.115 (0.374)

financial wealth variation>0 (dummy)	0.481 (0.350)	0.0307 (0.237)	0.740 (0.570)	0.602* (0.351)
house ownership	0.0950 (0.179)	0.119 (0.197)	0.137 (0.170)	0.209 (0.183)
help from parents/friends	-0.657** (0.322)	-0.614 (0.445)	-0.808*** (0.295)	-0.842** (0.344)
Constant	1.752* (0.971)	1.620 (1.013)	-0.00523 (1.225)	0.193 (1.157)
Instruments				
education, lenght of relationship with the bank				
Test of overidentifying restrictions (p-value):				
	0.5467	0.4343	0.9439	0.3900
Weak identification test (Kleibergen-Paap rk Wald F statistic)				
	11.4516	7.62495	7.36402	7.312
Observations	1266	1266	1266	1266

Robust standard errors in parentheses

***** p 0.01, ** p 0.05, * p 0.1**

Notes: this table shows IV regression. The dependent variable is the logarithm of desired precautionary saving, scaled for permanent income. Each regression includes 21 regional dummies (not reported for brevity). **share_broad** is the share of risky assets (defined in a broad sense) over financial wealth, whereas **share_narrow** is the share of risky assets (defined in a narrow sense) over financial wealth. **dindex1** and **ndindex1** represent indexes of financial diversification calculated respectively as the inverse of Herfindhal index and as the number of asset in household head's portfolio. s**hare_broad, share_narrow, dindex1** and **ndindex2** are instrumented using the length of the relationship with the bank and years of education. Each regression is weighted using SHIW sampling weights.

TABLE 7.2 IV ESTIMATION - PORTFOLIO DIVERSIFICATION USING ALTERNATIVE INSTRUMENTS

Dependent variable: ln(precaut_y)				
	(1)	(2)	(3)	(4)
share_broad	**2.368*** (0.759)**			
share_narrow		**3.529*** (1.254)**		
dindex1			**3.887*** (1.442)**	
ndindex1				**0.707*** (0.236)**
permanent income	-1.028*** (0.0517)	-1.000*** (0.0624)	-0.938*** (0.0680)	-0.987*** (0.0595)
Income variance*1000	0.0196 (0.0660)	-0.00446 (0.0684)	0.00588 (0.0611)	-0.0617 (0.0719)
age	0.0473 (0.0341)	0.0423 (0.0378)	0.0735** (0.0346)	0.0433 (0.0349)
age^2	-0.000409 (0.000305)	-0.000349 (0.000342)	-0.000616** (0.000306)	-0.000332 (0.000312)
family size	0.122** (0.0542)	0.0912 (0.0612)	0.0581 (0.0694)	0.0585 (0.0660)
n. income recipients>1 (dummy)	-0.0372 (0.126)	-0.0694 (0.144)	0.156 (0.128)	0.153 (0.129)
farmer (dummy)	0.633 (0.539)	0.595 (0.549)	1.349* (0.765)	1.239* (0.674)
self employed (dummy)	-0.101 (0.185)	-0.0756 (0.198)	-0.151 (0.190)	-0.149 (0.199)
II wealth quartile	0.0824 (0.233)	0.0116 (0.254)	-0.0448 (0.248)	-0.0819 (0.245)
III wealth quartile	0.0905 (0.259)	0.0912 (0.270)	-0.268 (0.347)	-0.347 (0.347)
IV wealth quartile	0.190 (0.296)	0.128 (0.328)	-0.153 (0.401)	-0.289 (0.413)
owns house (dummy)	0.303 (0.208)	0.256 (0.212)	0.439** (0.214)	0.478** (0.222)
help from parents/friends (dummy)	0.192 (0.287)	0.118 (0.315)	0.00962 (0.299)	0.0318 (0.343)

Constant	1.300	1.324	-0.418	-0.0606
	(0.927)	(1.006)	(1.028)	(0.961)
Instruments				
education, lenght of the relationship with the bank, risk aversion				
Test of overidentifying restrictions (p-value):				
	0.1714	0.2103	0.1122	0.1993
Weak identification test (Kleibergen-Paap rk Wald F statistic)				
	13.9893	7.26891	5.37777	5.84767
Observations	862	862	862	862
	0.431	0.224	0.315	0.289

Robust standard errors in parentheses

***** p 0.01, ** p 0.05, * p 0.1**

This table shows IV regression. The dependent variable is the logarithm of desired precautionary saving, scaled for permanent income. Each regression includes 21 regional dummies, and 4 city size dummies (not reported for brevity). **share_broad** is the share of risky assets (defined in a broad sense) over financial wealth, whereas **share_narrow** is the share of risky assets (defined in a narrow sense) over financial wealth. **dindex1** and **ndindex1** represent indexes of financial diversification calculated respectively as the inverse of Herfindhal index and as the number of asset in household head's portfolio. s**hare_broad, share_narrow, dindex1** and **ndindex2** are instrumented using the length of the relationship with the bank, risk aversion and years of education. Each regression is weighted using SHIW sampling weights.

TABLE 8.1 IV ESTIMATION FORMAL AND INFORMAL INSURANCE SCHEMES
Dependent variable: ln(precaut_y)

	(1)	(2)
port_safe1	**-1.982*** **	
	(0.560)	
port_safe2		**-2.409*** **
		(0.734)
insurance	**-0.663**	**-0.800**
	(0.616)	(0.685)
ln (permanent income)	-1.077***	-1.045***
	(0.0792)	(0.0888)
income variance*1000	0.0365	0.00799
	(0.0509)	(0.0579)
age	0.0945**	0.0945**
	(0.0441)	(0.0466)
age^2	-0.000916**	-0.000880**
	(0.000406)	(0.000432)
family size	-0.0463	-0.0855
	(0.0744)	(0.0805)
n. income recipients>1	-0.102	-0.148
	(0.173)	(0.192)
farmer	0.836	1.014
	(0.736)	(0.799)
self employed	-0.0725	-0.143
	(0.221)	(0.242)
II wealth quartile	-0.151	-0.286
	(0.339)	(0.376)
III wealth quartile	-0.128	-0.276
	(0.389)	(0.431)
IV wealth quartile	-0.0611	-0.162
	(0.427)	(0.475)
owns house	0.628**	0.706**
	(0.267)	(0.294)
help from parents/friends	0.217	0.103
	(0.510)	(0.589)

Constant	2.320*	2.753**
	(1.279)	(1.400)
Observations	868	868
	0.201	0.108

Instruments:
education, lenght of the relationship with the bank,
risk aversion, bank counters/person

Robust standard errors in parentheses

***** p 0.01, ** p 0.05, * p 0.1**

Notes. This table shows IV regression. The dummy *insurance* takes value 1 if the household head owns property or health insurance. The dependent variable is the logarithm of desired precautionary saving, scaled for permanent income. Each regression includes 21 regional dummies (not reported for brevity). Household head's years of education, risk aversion, the length of relationship with a bank and the number of bank counters per person are used as instruments for *insurance, port_safe1* and *port_safe2*. Each regression is weighted using SHIW sampling weights.

TABLE 8.2 IV ESTIMATION
FORMAL AND INFORMAL INSURANCE SCHEMES

Dependent variable: ln(precaut_y)

	(1)	(2)	(3)	(4)
share_broad	**5.241***** (1.721)			
share_narrow		**3.541***** (1.010)		
Dindex1			**6.129*** (3.237)	
ndindex1				**0.903**** (0.356)
insurance	**-0.948** (0.702)	**-0.722** (0.590)	**-1.015** (1.047)	**-0.731** (0.753)
ln (permanent income)	-1.013*** (0.0991)	-1.040*** (0.0811)	-0.811*** (0.184)	-0.884*** (0.122)
income variance*1000	-0.0279 (0.0666)	0.0144 (0.0531)	-0.0314 (0.0853)	-0.0893 (0.0787)
Age	0.0583 (0.0494)	0.0591 (0.0444)	0.171** (0.0775)	0.107** (0.0499)
age^2	-0.000541 (0.000456)	-0.000585 (0.000404)	-0.00160** (0.000707)	-0.000976** (0.000452)
family size	-0.0460 (0.0860)	-0.0167 (0.0733)	-0.197 (0.141)	-0.148 (0.106)
n. income recip.>1	-0.108 (0.222)	-0.0586 (0.183)	0.275 (0.236)	0.228 (0.190)
Farmer	0.812 (0.776)	0.512 (0.675)	2.090 (1.668)	1.569 (1.067)
self employed	0.0786 (0.263)	0.112 (0.224)	-0.0841 (0.263)	-0.0964 (0.227)
II wealth quartile	-0.176 (0.359)	-0.136 (0.319)	0.0593 (0.387)	-0.210 (0.331)
III wealth quartile	-0.0284 (0.401)	0.0126 (0.361)	-0.363 (0.539)	-0.539 (0.450)
IV wealth quartile	0.0431 (0.457)	0.111 (0.394)	-0.0573 (0.540)	-0.331 (0.487)
own house	0.467 (0.287)	0.463* (0.261)	0.504 (0.312)	0.685** (0.282)
help from parents/friends	0.283 (0.594)	0.442 (0.479)	0.181 (0.441)	0.612 (0.504)

Constant	1.219	1.265	-3.126	-1.835
	(1.245)	(1.146)	(2.591)	(1.580)
Observations	862	862	862	862
		0.144		0.048
Test of overidentifying restrictions:				
(p-value)	0.5571	0.3901	0.0602	0.0591

Robust standard errors in parentheses

***** p 0.01, ** p 0.05, * p 0.1**

Notes. This table shows IV regression. The dummy *insurance* takes value 1 if the household head owns property or health insurance. The dependent variable is the logarithm of desired precautionary saving, scaled for permanent income. Each regression includes 21 regional dummies (not reported for brevity). Household head's years of education, risk aversion, the lenght of relationship with a bank and the number of bank counters per person are used as instruments for *insurance, share_broad* , *share_narrow*, *dindex1* and *ndindex1*. Each regression is weighted using SHIW sampling weights.

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