

# Financial Literacy and Pensions in Participation in Italy\*

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PRELIMINARY – PLEASE DO NOT QUOTE

Received: April 21, 2011

By requiring new users to complete a participation (newly established) pension fund, how much do contributions now to investment in pension funds vary across countries about the ability of households to afford financial services. Using the Bank of Italy's Survey on Household Income and Wealth, our empirical analysis shows that most new users are now going of basic concepts such as interest rates and inflation. Moreover, more educated respondents in Central-North possess greater literacy. As for the effects, financial literacy as a positive and significant impact on the probability of pension participation.

**Keywords:** Financial literacy, retirement planning, pension participation.

**JEL classification:** D91

## 1 Introduction

Since the early '90s the Italian pension system has gone through a long reform process aimed at improving its long-term sustainability and increasing its management efficiency. The reform also increased, partly in order to encourage young generations, new user responsibility in the accumulation of retirement wealth.

Two main features characterize the reform. The first consists in the shift of the PAYG system from a Defined Benefit (DB) to a Defined Contribution (DC) formula. The latter represents benefits according to “actuarial equivalence” – i.e. to the (capitalized worth of) payee tax contributions during the working career and to the worker's retirement age – and, on average, more uncertain retirement payments relative to the expected past and current

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\* With Annamaria Lusar, Tuomo Jappi, Luigi Guiso, Giovanni Mastrobuoni, Tabata Bucur-Koehn, participants to the “Financial Literacy around the World” conference in Turin, Italy (December 2010) and participants to the “Mathematical Statistics Methods for Actuarial Sciences and Finance” conference in Ravenna, Italy (April 2010) for helpful comments. Financial support from Ntspar's grant funding is gratefully acknowledged.

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benefits, termination on the basis of (an average of) the last earnings. This configuration consists in a grant retro for pension funds as a way to restore an adequate level of future pensions. Participation to (private management) pension plans is voluntary but encourages the rough financial investment and substitution of fault options; workers are to be able to contribute to the pension system, which in turn requires grant retro financial support to be able to save and invest in management. Workers more actively affected by the first pillar form a factor that is not sufficient to finance consumption during retirement, and this is many concerns workers (Cappitani and Guazzarotti 2010).

This situation appears at a time when the macroeconomic processes, financial innovations and increasing market integration are making financial products more complex. An empirical study about household preparedness, the level of retirement financing, the ability to afford financial decisions, and the impact of ignorance on savings. Several institutions (e.g. the Bank of Italy, the Authority for Italian Securities Market (Consob), the Supervising Authority on Pension Funds (Covip), etc.) express their concerns about the ability of citizens to face current economic and financial developments and to promote a responsible financial literacy, not only of the budget but also of financial education (Banca d'Italia 2009; Banca d'Italia 2010).

Our paper measures the current level and the structure of financial literacy among the Italian population, investigates the determinants and its effects on retirement planning behaviour. Specifically, we examine the financial literacy matters in connection to pension plans. The empirical analysis draws on the 2006 and 2008 waves of the Bank of Italy *Survey on Household Income and Wealth* (SHIW).

The results show that most individuals are aware of basic financial concepts, and that they are more familiar with inflation and stock and interest compounding. The structure of financial literacy among the population presents features similar to other countries' results (Lusarri and Motta 2006, 2007; Australian and New Zealand Banking Group 2008; Brumm 1998; van Rooij et al. 2011), with women and individuals with low education having the worst performance. As specific Italian features, the gender gap is visible between North-Central and South, which is confirmed in relation to financial literacy. As for retirement planning, financial literacy positively and significantly increases the probability of participating in a pension fund. Robustness checks confirm that financial literacy increases the probability of: a) participating in a retirement plan after controlling for financial literacy; b) a positive response to the change in the fault that occurred in 2007 as for voting in the *Trattamento di Fine Rapporto* (TFR) flows to a pension fund (at least for those who expect to do so).

The first of the papers is organized as follows. Section 2 describes the SHIW data. Section 3 reports the empirical findings, and the remaining sections discuss the population sub-groups, the latest and the effects of financial strategy on saving for retirement and pension participation. Section 4 concludes.

## 2 The data

Every two years, the Survey on Household Income and Wealth (SHIW), the Bank of Italy conducts the national household survey, consumption, income, and wealth for a representative sample of the Italian population. In 2006 the survey covered 7,768 households (sampling units) and 19,551 individuals; in 2008 the survey covered 7,977 households and 19,907 individuals.<sup>1</sup> The average age of household heads is about 57; 37% are females; 64% are married; 32% completed high school and only about 9% have a university degree (or more). The average household size is 2.5 people. Median (net) household income is about euro 26,000 in both years and 70% of households own their own house, with a net aggregate rate. About 45% of households are working full-time, 35% are working as employees and 7% are self-employed.

In the 2006 wave, in addition to the standard questionnaire, about a fifth of the sample (3,992 households) was asked a question about the person primarily responsible for the household budget, answered by the individual head of household (i.e., “the person primarily responsible for the household budget”). Even though the survey is a quarterly longitudinal component, financial strategy questions were included in the 2006 SHIW for the first time, with the exception of any impact of the survey structure on respondents' sensitivity to the topic. In the subsequent 2008 wave, a financial strategy module was again part of the survey, including new questions about the 2006 ones.

The interviews for the 2006 survey were conducted, by a special company, between March and October 2007; those for the 2008 wave were conducted between January and September 2009.<sup>2</sup> Data are mainly collected personally with the aid of computers, using the Computer-Assisted Personal Interviewing program (CAPI). This is a good option for the vast majority of the interviews (about 79% in

<sup>1</sup> Descriptive statistics about both samples are displayed in Table A1 in the appendix, showing that the sample structure across the main socio-demographic characteristics is very similar in the two waves.  
<sup>2</sup> Note that about 10-15% of the 2006 sample was interviewed after the outbreak of the financial crisis (August-September 2007). We consider two of the most important variables related to the crisis (August 9, 2007: main BCE and FOMC operations, stock market fall; and September 14, 2007: run to North America) and check whether the individuals interviewed before or after the start of the crisis are different from those interviewed after the crisis now that the same (or similar) situation has occurred for the whole country.

both 2006 and 2008). The remaining interviews are conducted using paper-based questionnaires (PAPI, Paper-An -p ne P rsona Int rv w ng), with the survey company subsequently transferring to a computer using the CAPI program as the input screen (Banca 'Italia 2010). Even though the methods are more effective in allowing the respondents to understand the financial literacy questions with respect to the population interviews, respondents are not always aware of the questions, so they do not read them. In various occasions they do not give answers.

### 3 Empirical evidence

#### 3.1 How financially literate are individuals in Italy?

##### 3.1.1 Measurement

For the sake of comparison, we will report on the results of the financial literacy tests conducted in the 2006 SHIW survey, comparing most similar to the ones used for the Health and Retirement Study (HRS) by Annamaria Lusar and Olivia Mitchell (Lusar and Mitchell, 2006). While the two questions on inflation and interest compounding use almost the same wording as the corresponding questions in the HRS, the 2006 SHIW does not contain a question on risk versus return, as stated in the HRS (i.e., based on the choice between a stock and a stock mutual fund). In this study, the question about risk was replaced with another one capturing stock market knowledge (question 1). The process wording of the three tests is reported below.

- . *Interest*: Imagine having €1,000 in a current account that pays 2% annual interest as no charges. What sum of money will be available at the end of 2 years? Less than 1,020 euros | Exactly 1,020 euros | More than 1,020 euros | Don't know
- . *Inflation*: Imagine having 1,000 euros in a current account that pays 1% interest as no charges. Imagine a store that is running at 2%. Do you think that if you wait a raw month next year's time you will be able to buy the same amount of goods as if you spent the 1,000 euros today? Yes | No, I will be able to buy less | No, I will be able to buy more | Don't know
- . *Stocks*: Imagine you are on a quantity function in the stock market process. Are you...? (Really) Better off | Worse off | As well off as before | Don't know

The 2008 does not contain exactly the same set of questions as in 2006, but allows to cover a test on risk versus return that is very similar to the HRS one (question 1), that was missing in the previous survey. The three tests are again reported below.

- . *Inflation*: same as in the 2006 survey

- *Risk HRS*: Would you follow the investment strategies you currently use to invest your capital? Investing in the shares of a single company | Investing in the shares of more than one company | Don't know
- *Risk 2*: A company can be financed by issuing debt (equity securities) or bonds (debt securities). Would you invest most of your money for the investment? Shares | Bonds | They are equally risky | I don't know the difference between shares and bonds | Don't know

Not that “Don't know” (DK) is always a response option. These missing responses are not forced to give a (random) answer and should therefore be minimized. Among the correct answers there is no expected category for “risky”. Since only two observations in the 2006 wave (out of 3,992) report missing answers for the financial literacy test, these can be interpreted as risky answers and thus report corresponding observations from the analysis. There are no missing values for the financial literacy test in the 2008 survey.

### 3.1.2 Descriptive statistics

Table 1 presents the ‘raw’ answers to the test. Panel A of Table 1 reports the answers to the first compound question, showing that 40% give a correct answer, while about 28% do not know. Among those giving a wrong answer (32%), 25% answer “exactly €102” while 7% answer “less than €102” (7%). The answers to the final question are shown in Panel B, where a most 60% give the correct answer, 30% do not know and 10% provide an incorrect answer (10%). Finally, the question about stock stability more than a half sample (52%) give the correct answer (Panel C). Overall, about one fourth of the 2006 sample give the correct answers, one fourth give no correct answer, and almost one fifth do not know the answer to a test (Panel D). Comparing the answers on the test, Italian immigrants more familiar with the final question on stock stability compound. This may be due, among other factors, to the personal memory of an inflationary environment, as a characteristic of the sample period at the beginning of the 1970s and 1980s. On the contrary, now given the propensity to rely on financial assets is quite low: as of 2008 only 9.2% of households own government securities, 6.1% shares (retail), and 19.2% rely on assets, including private bonds, stocks, funds, etc. (Banca d'Italia 2010).

[Table 1 r]

The only test question that is included in both the 2006 and 2008 waves is the question about inflation. By comparing Panel B in Table 1 and Panel A in Table 2, it is possible to state that

s are of correct answers increased than DK correct answers, although remaining quite low. This improvement is not significant to a "marginally significant" (i.e. respondents are more likely to write the correct answer than the incorrect answer) but could be attributed to more exposure during the financial crisis. By comparing – among the 2008 respondents who returned via a survey in 2006 – the two subsamples of those who were (randomly) chosen for the financial literacy tests in 2006 and those who were not (and thus received FL modules in 2008 for the first time), we conducted the answers to the financial literacy test are not statistically different between the two groups (not reported).

As for the remaining questions in the 2008 survey, about 45% of the whole sample can correctly identify at least one of the following company exposures to agricultural products and one of the following services (Panel B). Moreover, 34% correctly identified services as an investment in (private) bonds (7%), with almost 13% claiming that they do not now fully understand an additional 18% do not now answer at all (Panel C). About 26% identified bonds as stocks or, possibly because they are aware that corporate bonds are usually sold to government bonds. Observing Tables 1 and 2, the not correct answers of DK surveying (around 30% of the 2006 sample on average; between 19% and 28% in 2008 on), we compare the former with the latter.

[Table 2]

Again, the results are consistent with a low stock market participation rate and scarce familiarity with the assets. Moreover, the topics covered by the five questions are not taught in standard secondary programs nor are they commonly known in some types of general education, so respondents can rely upon previous knowledge acquired in school.

### 3.2 Who knows the least?

Tables 3 and 4 show financial literacy performance by socio-demographic characteristics in the 2006 and 2008 samples respectively. Financial literacy among professionals is high, with a particularly high performance in the age class 36-50 (not, however, in the 2008 sample). Performance of the age groups 36-50 and 51-65 are significantly different. As expected, the age class with the highest scores of correct answers is also the lowest proportion of DK. This pattern is similar across all questions. Men are more knowledgeable than women in all questions and in both waves, and the differences are always statistically significant at 1% level. As in other countries, women have a lower proportion of DK. On the other hand, the fact that a larger proportion of respondents are older is also a source of greater differences, because the samples are stratified by more homogeneous than a sample of the general population. On the other hand, the gender gap can vary

to own a mortgage status, as a large share of former respondents are young women (38% in both waves, while women are only about 5% among male respondents). Financial literacy is strongly monotonically increasing with the level of education. This is true when looking at both correct and DK answers. For instance, in the 2008 SHIW only 12% of those with at most primary education (representing 26% of the household) could answer a set of questions correctly, compared to 47% among those with a university degree.

The self-employed (including small business owners, owners or members of a family business, and members of 'business professions' such as lawyers, architects, and so forth) display better knowledge than employees, as they are what remain most likely to manage their personal/business finances (however, in the 2006 sample the difference in financial literacy between employees and self-employed is a most interesting statistical finding, which is always significant in the 2008 sample, probably due to the larger sample size). The fact that employees perform better than the retired might suggest differences in cognitive abilities. The non-employed (including unemployed, mothers, students and so on) are the worst performing in all measures.

[Tables 3 and 4 about here]

Home ownership is also related to financial literacy (not reported). Home ownership is particularly high (around 71% according to the 2001 census, Istat 2004, and 70% in the SHIW sample for the analyses), and housing quality constraints – not considering social security – are the largest fraction of households' wealth. Home ownership is particularly high for financial literacy in renters, consistently with the fact that financial knowledge is usually associated with higher education (van Rooij et al. 2008). Moreover, among homeowners, households currently paying a mortgage demonstrate higher knowledge than those who do not, which suggests that contracting households are taking advantage of opportunities.<sup>3</sup>

### 3.2.1 Regional disparities

A peculiarity of Italy is the stark disparity between northern and southern regions as captured by important economic and social indicators, such as employment rates, per capita income and average education. Financial literacy is no exception.

Figures 1 and 2 depict the financial literacy structure across Italian regions according to the 2006 and 2008 tests respectively. Figures in the left panel report the 'raw' structure of

<sup>3</sup> The category of households not paying a mortgage at the time of interview includes both those who are a year past the last time they took out a mortgage. This may be due to the fact that, according to the difference in financial literacy between those with and without a mortgage; the use of mortgage is strongly related to the variable.

financial literacy (number of correct answers and proportion of total correct answers) as measured by the SHIW. The four categories represent quartiles of each variable. As expected, the usual North-South disparity emerges: broadly speaking, households living in southern regions (and especially Sicily and Sardinia) tend to perform worse in a questionnaire than those living in the Centre and the North-East. However, there is some variation across regions beyond the simple North-South divide: for instance, in 2008 north-western regions fall into the lowest literacy quartile for both measures.

Figures on the right panel, instead, show the level of financial literacy that is predicted by an econometric model with demographic and regional dummies as explanatory variables.<sup>4</sup> As before, the four categories represent quartiles of the corresponding variable. These figures suggest that the regional gap is not simply explained by a different population composition; in fact, after controlling for socio-demographic characteristics (including household income), southern regions are lower in financial literacy.

[Figure 1 and 2 are here]

### 3.3 Does financial literacy matter?

Recent literature has shown that financial literacy is associated with a wider range of financial decisions, such as stock market participation, portfolio diversification, and the tendency to avoid over-indebtedness (Guiso and Jappelli 2008; Kimball and Sufi 2007; Lusarri and Tufano 2008; van Rooij et al. 2011). Moreover, Lusarri and Miettinen (2007) have shown that financial literacy is positively related to planning for retirement and that planners advise significantly greater wealth at retirement than non-planners (with a significant effect on accumulation, and not vice versa). These views are corroborated by other studies pointing out the role of the propensity to plan for wealth accumulation (Amrath et al. 2003), and accumulating a positive significant effect of financial literacy on the net worth of Dutch households (van Rooij et al. 2008).

An aspect of planning and saving for retirement that deserves attention is pension participation. For instance, Agnew et al. (2007) study pension participation in the US, finding that a non-voluntary enrolment 401(k) plan, the effect of financial literacy on savings is substantial, and that an automatic enrolment, however, is of a stronger influence on employees' decisions to quit their employer's savings plan.

<sup>4</sup> While the panel variable is the number of correct answers and is estimated by OLS, we write the panel variable as a dummy for getting the correct answer as a probit model is used. Covariates include age, age squared, gender, years of education, marital status, number of children, household income, household total income, a dummy for self-employment, a dummy for homeownership, and regional dummies. The inclusion of interactions terms between regional dummies and age, years of education and income is not changing the results. The cut-off points for the four categories are the same as in the maps based on the quartiles of each variable.



In this section we investigate the role of financial literacy on pension participation. Italy, an issue we cut, argues that public pensions on benefits up to pensions on reforms as brought to the forefront.

Despite a rather generous tax treatment, pension participation on pension funds is still quite low (Covatta 2008). This is due to the low tax rate on mandatory pension tax rates (33% for employees; 20% for self-employed), generous pension benefits and a general mistrust towards financial markets (Castellano and Fornaro 2001, 2008).

To counteract a rather disappointing performance, in 2007 a new reform of the system of survivor payments (*Trattamento di Fine Rapporto*, TFR) was introduced, aimed at encouraging a higher take-up. The TFR consists in a fraction of the worker's wage (approximately equal to one month's pay) that is retained as a bonus reserved by the employer, and paid back to the worker upon leaving the firm, whether voluntarily or not. The annual flows are compounded by using a real return rate established by the law and partly indexed to inflation.<sup>5</sup> The reform allows employees to choose, in the period January-June 2007, whether to maintain the future flows of TFR with the firm or to convert them to pension funds, to be invested in the financial market.<sup>6</sup>

Moreover, the reform introduced a fault option. For new entrants the choice as to be made within six months from entering, and in case no choice is expressed within the stipulated period, pension participation on pension funds consists in the fault option and the TFR flows are automatically transferred to an occupational fund (choice according to specific and rather complex rules).

Pension participation rates increased after the reform, but not as much as expected. Apart from a possible nationwide communication campaign, the irreversibility of the choice was one of the main reasons that at most may have affected the conversion of the reform: a worker paying the TFR with the firm can at any time opt for pension funds, but when the choice is made cannot reverse the choice.<sup>7</sup> Pension participation was about 3.2 million (of which 2.1 private sector employees) in 2006 and grew to 4.8 million in 2008 (3.6 private sector employees). This represents that pension participation

<sup>5</sup> The TFR is capitalized annually at 1.5% plus 3/4 of the inflation rate measured by the Italian Statistics Institute (Istat).

<sup>6</sup> The reform treated differently workers in firms with more or less than 50 employees. With small-firm employees face the choice between leaving the future TFR flows with the firm or transferring them to pension funds, employees in large firms can opt for pension funds or for leaving the TFR amount reserved by the National Institute for Social Security (INPS), instead of the firm, at the same conditions as for the main part of the firm's employees. The difference in treatment is due to the fact that pension participation rates are split into two groups, with small firms' employees being more likely to leave the TFR with the firm and large firms' employees being more likely to transfer them to pension funds. Survival reasons may account for this difference in behaviour, including mistrust towards financial institutions and INPS (Borran and Zingales 2008) and fears of negative future asset returns (and therefore on their own future employment prospects) (Corsani et al. 2010).

<sup>7</sup> See Rinaldi (2011) for a review of the factors that contribute to the partial success of the reform.

rate over the total employed population went approximately from 14% in 2006 to 21% in 2008.<sup>8</sup> An increasing participation rate emerges also from the SHIW data, where participation rates among workers are about 11% and 13.5%, in the 2006 and 2008 sample surveys.<sup>9</sup> Given the increase of private pensions take-up in Italy, the rest of the papers devoted to examine the relationship between financial literacy and pension participation, as an important example of the effects of literacy on retirement planning.<sup>10</sup>

### 3.3.1 Pension plan participation

To investigate the effect of financial literacy on pension participation we use both pre- and post-reform data from the 2006 and 2008 SHIW. The analysis is restricted to the sample of employed and self-employed aged 25-65, excluding unemployed and other respondents out of the labor force (retirees, students, immigrants, etc.). Simple univariate statistics reported in Tables 5 and 6 show that financial literacy is generally for respondents with a supplementary pension in the first two waves, and the difference between the two groups is generally statistically significant for most measures in both samples.

[Tables 5 and 6 refer]

A multivariate analysis of the impact of financial literacy on pension participation is conducted estimating a linear probability model by ordinary least squares (OLS) of the following specification

$$P = X_i \beta_i + FL\gamma + u_i \quad (1)$$

where  $P$  takes the value of one if the respondent (household) participates in a private pension scheme at the moment of interview. Financial literacy  $FL$  is measured in two ways: first, we use a dummy variable of one if the respondent is able to answer a set of questions correctly; second, we use a variable counting the number of correct answers to the set of questions (taking values from 0 to 3).  $X_i$  is a vector of covariates, including a set of control variables, a gender dummy for females, four dummies in categorical gender of education by the respondent, marital status dummies, the number of children living in the household, household income quartiles dummies, a dummy taking the value of one for homeowners (as a proxy for household wealth), a dummy for being self-employed, and regional dummies.

<sup>8</sup> Own computations based on a multinomial logit model estimated by the Autority for Pension Funds Supervision (Commission on Vigilanza sui Fondi Pensione, Covip). See for further details Covip (2008, 2009, 2010) and Istat (2010).

<sup>9</sup> The first estimation of participation rates in the SHIW with respect to aggregated data may be due to several reasons, including respondents' tendency to under-report or not report information about their wealth, and low sampling of workers in sectors with above average participation rates, such as agriculture (Cappitani and Guazzarotti 2010).

<sup>10</sup> Unfortunately, explicit information on pensioning behavior is not available in the SHIW, except as far as pension participation is concerned.

Table 7 reports the OLS estimates for 2006. The first and third columns show that giving an additional correct answer raises the probability by 2 percentage points, while being able to answer a third question correctly increases the chances of participation by 3 percentage points (but its effects are significant only at 10% level). Moreover, participation is associated with being male and taking professional services, and higher income is positively associated with the probability of answering questions on pain, while home-owning and self-employment are negatively associated.

[Table 7]

In a separate regression (not reported) we use different measures of financial literacy, including dummies for answering correctly on questions (acting as a separate), dummies for answering correctly on two questions (acting as a separate), the number of DK answers for answering at least one DK. All these measures are significantly affected, except the dummy on non-attendance. The dummy for answering correctly on the first question seems to be the most affected (it increases the probability of participation by 4.9 percentage points).

Some other factors might affect the propensity to answer questions on pain, such as risk preferences, and expectations about longevity, retirement age and public pension system replacement rate (Gustavsson, 2009). In a separate regression (not reported) we add a dummy for being very risk averse, the expected replacement rate and the expected retirement age controlled by the SHIW. Moreover, since the SHIW does not report subjective estimates of expected longevity, we add two dummy variables indicating whether the respondent's parents are alive, and the interactions with parents' age, as proxies for longevity. According to the lifecycle model, individuals expect to live longer to retire, or to save more for retirement, or a combination of the two. Respondents who are very risk averse show a higher probability of answering questions on pain, while those expecting to retire earlier are less likely to do so. The expected replacement rate is a proxy for longevity and negatively affected. After controlling for the additional variables, the effect of financial literacy measures by the number of correct answers is substantially unchanged, while the dummy for the correct answers becomes not significant.

As a consequence, we allow for the possibility that financial literacy is endogenous to retirement. Jappelli and Pappa (2011) illustrate the endogeneity of financial literacy with respect to saving decisions, showing how literacy and wealth are accumulated jointly. In our case, financial literacy endogeneity may arise from experience (i.e. experience of opening an account on a bank), from individuals' effort to learn to better manage their investments, or from an unobserved factor simultaneously affecting both decisions to answer questions on pain and the amount of accumulated wealth (e.g. an unobserved taste for financial issues). Moreover,

financially sufficient to measure and thereby measure with error, possibly leading to a downward biased OLS estimate of financial literacy.

Building on (1) we estimate the following linear probability model using the generalized method of moments (GMM), controlling for the (possible) nonlinearity of financial literacy:

$$P = X_1 \beta_1 + FL\gamma + u_1 \tag{2}$$

$$FL = X_1 \beta_1 + X_2 \beta_2 + v_2$$

where  $X_1$  is a vector of controls as before and  $X_2$  is a vector of financial literacy instruments.

Despite the greater efficiency in finding instruments for financial literacy, we propose two variables related to the cost of earning and acquiring financial know-how as an instrument.<sup>11</sup> The instruments for financial literacy include a dummy taking the value of one if (at least) one of the respondent's age group in economics,<sup>12</sup> and a dummy taking the value of one if (at least) one of the respondent's assets is a computer (tablet, smartphone, or laptop). The validity of these instruments rests on the hypothesis that the presence of an economist and/or a computer user in the household is a strong predictor of the respondent's acquisition of financial literacy. However, we note that the respondent's response to acquiring financial literacy, while not being determined by respondents' access to online financial literacy support by the results of the Hansen's test, that do not reject the null of instrument validity (p-value 0.384 and 0.165 for the two financial literacy measures). Moreover, the F-test is relatively high (> 10), suggesting that instruments are not weak. First stage estimates are reported in column I of Table A2 in the appendix. Table 7 (second and fourth columns) reports the GMM estimates for 2006. Given an additional correct answer raises the participation probability by 13 percentage points.

In spite of these tests, it may be hard to argue that these instruments are completely exogenous. For instance, the presence of an economist graduate may correlate with an unobserved taste for economics/finance within the household, or it may affect participation directly, and not through financial literacy. To support the robustness of our IV results, we report in Table A2 (columns II to IV) in the appendix the estimates obtained using other sets of instruments. These alternative instruments may provide a more exogenous variation in literacy, but tend to be

<sup>11</sup> Given the efficiency in finding instruments for financial literacy, several potential instruments were turned down because they were not correlated with financial literacy, or they violated the hypothesis of instruments validity (Hansen's test). These include education related variables at the regional level (e.g. college graduates), the response of financial newspapers at the regional level, various measures of adult literacy at the regional level in 2005 from the "Adult literacy and skills" survey conducted by the OECD, an unemployment rate in 50+ population at the regional level from the SHARE survey.

<sup>12</sup> Results are unadjusted for the substitution of economics graduate dummy with a dummy for having a graduate in economics, politics or law (graduate in politics and law in Italy include at least one course in economics).

where. Nevertheless, the IV financial literacy coefficients are quite robust. These instruments include a dummy taking value on the first factor of the respondent's last upper secondary education (e.g. school), a dummy indicating whether the family is a mortgagee to buy or restructure houses or flats (at the moment of the survey), and the size of mortgagee's working firms (up to 50 employees) at the regional level (Istat 2002). Parents' education can be transmitted to children's education and affect the financial literacy (Lusarri, Motta and Curto 2010). As for the mortgage dummy, section 3.2 will not treat mortgagees as a separate financial literacy, probably because taking out a mortgage offers an opportunity for learning about interest rates and inflation. Moreover, mortgagees are typically taken out by pensioners. Finally, the size of mortgagee's working firms will not be a strong covariate for financial literacy in the regression, as Table 3 and 4 suggest that the size of mortgagee's working firms (anonymous results are obtained with the size of mortgagee's firms). Overall, the results obtained by using (various combinations of) the instruments suggest that financial literacy increases the probability of pensioners participating in a pension plan.

As a robustness check to the previous analysis, the regressions (1) and (2) are estimated again using the 2008 SHIW data. The overall results displayed in Table 8 broadly confirm 2006 results, as the instruments of magnitude, despite the fact that the financial literacy measures are partly affected in the two waves. The coefficient estimates of OLS estimates using the financial literacy (i.e., dummies for going on /two correct answers, the number of DKs and a dummy for at least one 'do not know') are also of the same significance, with very little difference in magnitude across quarters. While the total number of regressors are used (including, as before, the average, expected return, expected repayment rate and longevity), the effect of financial literacy increases by about one percentage point with respect to the baseline of Table 8 but it remains highly significant. Finally, we perform IV regressions with the same instruments used for the 2006 sample. Despite the potential shortcomings of the instrument variables and the financial literacy measures for 2008 are remarkably similar to the 2006 ones. Again, the first stage regressions for various instruments are reported to the appendix in Table A3.

[Table 8 continues]

### 3.3.3 The choice about the TFR destination

As was previously mentioned, a considerable proportion of pensioners participating in mortgagees' decisions about the destination of their TFR after January 2007. The recent 2008 wave of

the SHIW allows to investigate the issue, as the choice about the TFR is not automatically captured by the following question:

“(If the household member is an employed person at the moment of interview) Has (the household member's name)'s survival pay been transferred to some form of supplementary pension scheme (pension fund or private retirement plan)? Yes | No | Do not know”.

where about 82% of employed persons in the sample left the TFR at private form contracts,<sup>13</sup> 10% transferred to a pension fund and 8% reported that they don't know. While it is possible that respondents misreport their TFR choices (Gustman et al., 2008), this allocation is consistent with the information from an *ad hoc* survey conducted soon after the reform on a sample of private sector employees (Borjas and Zengales 2008), where the share of workers expected to maintain their TFR at the same conditions as before the reform is about 65%.

It is not entirely clear how to interpret the behavior of the 8% who answer “do not know” to the above question. Given the fault option membership in the reform (i.e., the TFR of workers not making any expected choice to be transferred to an occupational fund) it is legitimate to assume that their TFR was transferred to a pension plan. Alternatively, they may have answered this way because they truly do not remember. We will allow for both interpretations in the empirical analysis that follows.

As in the previous section, the expected results state that more than half of the workers moving to transfer their TFR flows to a pension fund, not only to benefit from higher expected returns (at least before the reform, where too high a benefit for the workers), but also to take advantage of generous fiscal incentives.

Behavioral statistics in Table 9 confirm the hypothesis. The analysis is restricted to the sample of (household head) employed persons aged 25-65.<sup>14</sup> The table reports the average number of correct “do not know” answers in the two groups of workers who moved their TFR to a pension fund (PF), who expected to maintain their previous form (FIRM), and who do not know

<sup>13</sup> Note that – as was mentioned before in section 3.3 – workers in firms with more than 50 employees cannot actually maintain their TFR with the firm, but can only choose between transferring it to a pension fund or averaging it among the rest of the National Institute for Social Security (INPS), at the same conditions as for the firm's spouse. For the sake of exposition, the following analysis will refer to the latter option as “firm” regardless of firm size.

<sup>14</sup> Even though the 2007 reform is restricted to private sector employees, as a public sector employee is not included in the analysis, since some of the reported that they transferred their TFR to a pension fund. This may not necessarily be a mistaken answer. For instance, it is not easy to distinguish between employees in the public or private at an occupational sector. Moreover, (public) sector employees after 2000 are also possibly able to transfer their TFR to an occupational fund, a private employee.

(DK). Respondents who transferred their TFR to a pension fund averaged a greater amount of their two groups, and the FIRM group averaged a greater amount of DKs. When testing the differences in the amount of money between the two groups, we obtained a significant difference between the PF and FIRM groups in a series of statistical tests significant at 1%, and the difference between FIRM and DK is significant at 1% in most cases. Moreover, a significant difference in the amount of money between the 'active consumers' (PF and FIRM) versus the DKs is significant, with the difference between FIRM and DK is not significant (i.e. those who do not have a pension fund (active or passive) is not). This indicates that financial ignorance is to some extent correlated with a bad behaviour (since the DKs are the lowest now). However, it is not easy to correlate the behaviour of the DKs with the fact that more than 80% of the workers actively do not have a pension fund. This is to be investigated more thoroughly.

[Table 9 here]

We analyze workers' choices in a multivariate analysis, with the following linear probability model estimated by OLS:

$$TFR = X_i \beta_i + FL\gamma + u_i \tag{3}$$

where  $TFR$  equals the amount of TFR transferred to a pension fund. As before, financial literacy  $FL$  is measured by the number of correct answers and by a dummy indicating whether the respondent is able to answer a set of questions correctly.  $X_i$  is a vector of covariates, including a set of orthogonal polynomials, a gender dummy for females, four dummies indicating the highest level of education attained by the respondent, marital status dummies, the number of children living in the household, household income quartiles dummies, a dummy taking the value of one for homeowners (as a proxy for household wealth), a dummy for being self-employed, and regional dummies.

The results are displayed in Table 10 and confirm the script findings of Table 9. First, financial literacy increases the probability of putting the TFR in a pension scheme when DK respondents are excluded from the regression (i.e. comparing PF to FIRM). Second, financial literacy is not significant when DK respondents are considered to avoid (unconsciously) a pension plan (i.e. comparing the active and passive PF to FIRM). This suggests that the group of DK respondents is much more irrationally than the rest of the sample (see Table 9). Third, financial literacy (number of correct answers) increases the probability of expressing an active choice on (either for PF or FIRM) with respect to not making any explicit choice (DK). This finding indicates that financial literacy is a driver of the choice to voluntarily transfer one's own TFR to a

plans on fun but ts (obviously) n ff ct v on t os wo cannot t t r TFR st nat on. T s s exact y t spr t b n t fau t opt on mb n t r form, t at s of ncourag ng p ns on p an part c pat on among t un c . At t sam t m , financ a t racy s mor strong y assoc at w t an act v c s on-ma ng n favour of p ns on fun s rat r t an n favour of t frm.

[Tab 10 r ]

W p rform a furt r robustn ss c c , nc u ng a t ona contro s n t r gr ss on. T xp anatory pow r of financ a t racy s ar y aff ct w n r s av rs on an xp ctat ons about pub c p ns ons (r p ac m nt rat an r t r m nt ag ) ar contro for. How v r, as was m nt on pr v ous y, t c s on about TFR st nat on may b r at not on y to t rm nants of p ns on p an part c pat on (suc as r s pr f r nc s an xp ctat ons about pub c p ns ons), but a so to t sz of t frm. T s s b caus of t ‘ scont nu ty’ n uc by t r form ts f, tr at ng ff r nt y wor rs n frms w t mor or ss t an 50 mp oy s. W n w a frm sz umm s as r gr ssors w obta n t at wor rs n arg r frms (mor t an 100 mp oy s) ar mor y to on p ns on fun s, cons st nt y w t t v nc of Bo r an Z nga s (2008) an Cors n t a . (2010). At t sam t m , w n frm sz umm s ar nc u t ff ct of financ a t racy on t probab ty of transf rring on ’s own TFR to a p ns on fun ( xc u ng t DKs) s r uc an b com s non-s gn f cant w n m asur by t t r -corr ct ummy. Ov ra , t s v nc sugg sts t at t c s on about TFR st nat on s a comp x on an t at t ff ct of financ a t racy, w non-n g gb , s not fu y robust.

#### 4 Discussion and Conclusions

T Ita an p ns on r forms w n anc n v ua r spons b ty n t accumu at on of r t r m nt w a t an conf r a gr at r ro to pr vat p ns ons n nsur ng o ag ncom . Bot t numb r an t comp x ty of p rsona c o c s w ncr as , part cu ar y for young r wor rs, at a t m w n financ a nno vat on an ncr as ng mar ts nt grat on ar ma ng t tas of sav ng for r t r m nt mor ff cu t.

T s vo v ng cont xt man s mor financ a sop st cat on on t part of Ita an ct z ns to manag t r sav ngs, an prompts conc rns about t v of t r now g an ab ty to a w t comp x financ a c s ons. T s pap r xp o ts n w qu st ons about financ a t racy r c nt y ntro uc n t Surv y on Hous o Incom an W a t to nv st gat financ a t racy str but on n t Ita an popu at on an ts mpact on r t r m nt p ann ng. In part cu ar, w conc ntrat on p ns on p an part c pat on, a so by cons r ng wor rs’ r spons to t 2007 s v ranc pay (TFR) r form.



Empirical results show that most new users are now going to basic financial concepts, virtually all more familiar with inflation and stock market returns. Summary of other countries' findings, women are less educated new users spend worst performance. A strong gap exists between Central-North and South as shown by the data.

As for the effects, financial literacy has a positive and significant impact on the propensity to save for retirement through private pensions. Robustness checks corroborate the results. First, financial literacy increases the probability of participating to a pension fund even after controlling for financial literacy education. Second, women are more likely to respond to the 2007 reform, financial literacy increases workers' probability of transferring TFR flows to a pension fund (at least for those who are working).

These findings confirm and reinforce previous results about the positive impact of financial literacy on financial behaviour (on planning, saving, wealth diversification etc.), and provide a further rationale for public intervention to improve the level of financial literacy in the Italian population. At the same time, results indicate that some population sub-groups face greater risks of not possessing sufficient financial knowledge and access to a quality financial services by the reform pension system. We can improve the level of financial knowledge would be beneficial for the public policies on financial education especially for these groups.

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Source: SHIW 2006 - Weighted data.

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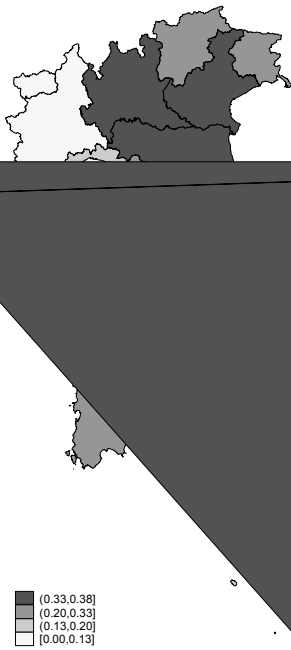


Source: SHIW 2008 - Weighted data.

### Three correct answers - 2008



Source: SHIW 2008 - Weighted data.



Source: SHIW 2008 - Weighted data.

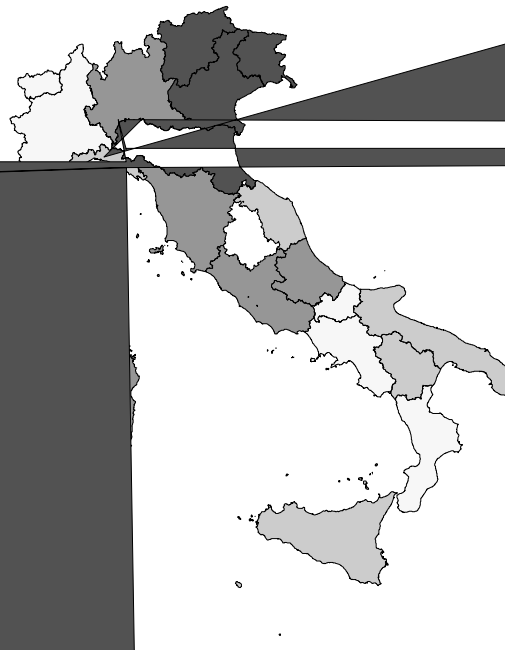


Table 1: Answers to the 2006 financial literacy questions (percentage)

	All household heads	Household heads 25-65
<i>Panel A -- Interest</i>		
Less than 1,020 euros	6.76	7.39
Exactly 1,020 euros	25.03	28.12
More than 1,020 euros (correct)	40.02	44.57
Don't know	28.19	19.92
<i>Panel B -- Inflation</i>		
Exactly same amount	3.83	4.33
Less (correct)	59.3	65.44
More	6.18	6.7
Don't know	30.7	23.53
<i>Panel C -- Stocks</i>		
Better off	1.65	1.86
Worse off (correct)	52.17	59.23
As before	12.52	12.7
Don't know	33.66	26.21
<i>Panel D -- Overall performance</i>		
Correct answers to interest and inflation	31.51	35.69
All answers correct	24.88	28.33
No correct answer	26.43	19.76
At least one "do not know"	44.88	36.95
All "do not know"	19.93	12.91
N obs	3992	2594

Source: SHIW 2006 – Weighted data. Text of questions set following:

- Interest: Imagine having €1,000 in a current account that pays 2% annual interest and as no charges. What sum do you think will be available at the end of 2 years?
- Inflation: Imagine having 1,000 euros in a current account that pays 1% interest and as no charges. Imagine a shop that inflation is running at 2%. Do you think that if you wait a year the money in your account will be able to buy the same amount of goods as if you spent the 1,000 euros today?
- Stocks: Imagine you have bought a quantity of shares in a stock market price. Are you...?

Tab 2: Answers to t 2008 financ a t racy qu st ons (p rc ntag )

	All household heads	Household heads 25-65
<i>Panel A -- Inflation</i>		
Exactly same amount	4.2	5.05
Less (correct)	72.99	77.83
More	2.75	2.7
Don't know	20.05	14.42
<i>Panel B -- Risk HRS</i>		
One company shares (correct)	45.13	50.13
Shares of several companies	26.43	28.5
Do not know	28.45	21.37
<i>Panel C -- Risk 2</i>		
Shares (correct)	34.04	38.77
Bonds	7.45	8.03
Equally risky	26.88	28.45
I don't know the difference	12.85	11.23
Don't know	18.78	13.52
<i>Panel D -- Overall performance</i>		
All answers correct	24.33	28.3
No correct answer	21.09	16.08
At least one "do not know"	42.27	34.62
All "do not know"	13.05	8.16
N obs	7977	5063

Source: SHIW 2008 – Weighted data. Text of questions set following:

- Inflation: Imagine having 1,000 euros in a current account that pays 1% interest and as no charges. Imagine that inflation is running at 2%. Do you think that if you withdraw the money in a year's time you would be able to buy the same amount of goods as if you spent the 1,000 euros today?
- Risk HRS: Which of the following investment strategies do you think is the best for increasing your capital?
- Risk 2: A company can be financed by issuing shares (equity securities) or bonds (debt securities). Which do you think is most risky for the investor?

Tab 3: Performance by socio-demographic characteristics (2006)

	Interest		Inflation		Stocks		Overall	
	Correct	DK	Correct	DK	Correct	DK	Three Correct	At least 1 DK
<i>Age</i>								
Age <=35	39.25	27.24	57.85	28.79	49.69	32.07	22.9	42.35
Age 36-50	45.64	16.24	68.58	19.88	62.09	23.1	30.29	32.59
Age 51-65	44.75	22.59	64.04	26.66	58.88	28.36	27.51	41.24
Age 65+	30.32	46.13	45.73	46.47	36.66	50.04	17.44	62.15
<i>Gender</i>								
Men	45.47	21.28	65.77	24.18	58.08	28.23	29.51	37.85
Women	30.78	39.9	48.34	41.74	42.14	42.87	17.04	56.78
<i>Education</i>								
No education	13.67	72.21	23.22	72.72	18.36	75.21	7.17	87.07
Primary (Isced 1)	27.87	47.8	44.75	47.51	33.96	52.62	12.96	67.37
Lower sec (Isced 2)	38.49	24.69	59.32	29.82	53.71	32.52	22.24	44.97
Upper sec (Isced 3)	50.91	14.69	71.11	17.48	64.02	18.8	35.03	27.79
Degree + (Isced 5+)	54.3	8.72	77.7	10.38	73.42	14.78	39.12	20.55
<i>Occupational status</i>								
Self-employed	49.98	9.4	71.2	15.07	67.19	15.74	28.92	24.72
Employees	45.33	17.27	66.79	22.07	60.11	24.6	28.74	35.11
Non-employed	31.76	38.07	49.66	40.08	47.14	40.04	20.3	55.77
Retired	34.52	41.68	50.59	41.3	41.39	46.01	20.65	57.41

Source : SHIW 2006 – Weighted data. Sample : a ous o a s (N = 3992)

Tab 4: Performance by socio-demographic characteristics (2008)

	Inflation		Risk (HRS)		Risk 2		Overall	
	Correct	DK	Correct	DK	Correct	DK	Three Correct	At least 1 DK
<i>Age</i>								
Age <=35	73.91	16.02	47.72	21.16	32.41	29.89	24.38	39.86
Age 36-50	78.36	14.28	50.91	20.61	40.75	23.71	29.55	33.05
Age 51-65	78.88	13.85	49.81	22.58	38.46	24.03	28.01	34.66
Age 65+	62.32	32.5	34.44	43.87	24.16	46.6	15.95	58.82
<i>Gender</i>								
Men	77.51	15.86	50.18	23.86	38.87	25.62	28.22	36.07
Women	65.36	27.13	36.59	36.2	25.88	41.79	17.76	52.76
<i>Education</i>								
No education	37.32	57.09	15.52	72.15	5.743	80.23	3.607	87.65
Primary (Isced 1)	59.09	35.17	31.28	45.84	19.86	51.78	11.96	64.75
Lower sec (Isced 2)	74.77	17.4	42.38	27.77	32.67	31.37	22.24	43.05
Upper sec (Isced 3)	82.51	10.04	54.94	16.25	42.13	16.34	31.13	26.54
Degree + (Isced 5+)	86.41	7.307	67.69	8.524	58.51	11.94	47.15	17.18
<i>Occupational status</i>								
Self-employed	83.83	7.955	60.23	10.96	49.86	16.55	38.26	23.99
Employees	78.86	13.47	51.28	20.22	38.95	23.77	28.8	33.51
Non-employed	59.98	29.35	34.17	36.28	22.86	44.5	12.52	57.76
Retired	66.8	27.92	37.34	39.48	27.53	40.76	18.71	52.78

Source : SHIW 2008 – Weighted data. Sample : a ous o a s (N = 7977)



Tab 5: Financial literacy by pension participation (2006)

	Household head has pension plan	Household head has no pension plan	t-test
<i>Inflation</i>			
Correct	65.24	44.03	***
Do not know	5.74	16.71	***
<i>Interest</i>			
Correct	74.92	67.20	*
Do not know	11.43	21.57	***
<i>Stocks</i>			
Correct	77.08	60.08	***
Do not know	15.17	23.51	**
<i>Overall performance</i>			
Correct on interest and inflation	51.48	35.26	***
Number correct	2.17	1.71	***
3 correct	42.92	27.62	***
At least one DK	21.85	34.09	***
N obs	188	1588	

Source: SHIW 2006 – Weighted data. Significance: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.  
 Sample: ous o a n t about mar t n t ag c ass 25-65 (N = 1776). T tab  
 r ports t p r c ntag of corr ct / DK ans w rs n any qu st on, by p ns on p an  
 part c pat on

Tab 6: Financial literacy by pension participation (2008)

	Household head has pension plan	Household head has no pension plan	t-test
<i>Inflation</i>			
Correct	77.85	93.18	***
Do not know	13.85	2.32	***
<i>Risk (HRS)</i>			
Correct	50.79	68.38	***
Do not know	19.51	10.91	***
<i>Risk 2</i>			
Correct	38.73	57.74	***
Do not know	23.89	10.93	***
<i>Overall performance</i>			
Number correct	1.67	2.19	***
3 correct	28.40	46.81	***
At least one DK	33.11	19.04	***
N obs	471	2948	

Source: SHIW 2008 – Weighted data. Significance: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.  
 Sample: ous o a n t about mar t n t ag c ass 25-65 (N = 3419). T tab  
 r ports t p r c ntag of corr ct / DK ans w rs n any qu st on, by p ns on p an  
 part c pat on

Tab 7: Multivariate analysis of participation in 2006

	OLS	IV	OLS	IV
Number correct	0.023*** (0.01)	0.137*** (0.04)		
Three correct			0.034* (0.02)	0.372*** (0.13)
Age	0.027*** (0.01)	0.020** (0.01)	0.028*** (0.01)	0.022*** (0.01)
Age squared	-0.000*** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)
Female	-0.071*** (0.02)	-0.050** (0.02)	-0.072*** (0.02)	-0.042* (0.02)
Primary	-0.073** (0.03)	-0.106* (0.06)	-0.063* (0.03)	-0.019 (0.06)
Secondary	-0.060* (0.03)	-0.125* (0.07)	-0.046 (0.03)	-0.040 (0.06)
Tertiary	-0.013 (0.04)	-0.101 (0.07)	0.002 (0.03)	-0.021 (0.06)
College	0.004 (0.04)	-0.096 (0.08)	0.021 (0.04)	-0.010 (0.06)
Single	0.003 (0.02)	-0.003 (0.02)	0.004 (0.02)	-0.000 (0.03)
Divorced	0.065** (0.03)	0.048* (0.03)	0.066** (0.03)	0.041 (0.03)
Widow(er)	0.114** (0.05)	0.117** (0.06)	0.113** (0.05)	0.113** (0.06)
N children in house	-0.004 (0.01)	-0.007 (0.01)	-0.004 (0.01)	-0.006 (0.01)
H income quartile 2	0.052*** (0.02)	0.029 (0.02)	0.055*** (0.02)	0.040* (0.02)
H income quartile 3	0.050*** (0.02)	0.019 (0.02)	0.055*** (0.02)	0.044** (0.02)
H income quartile 4	0.102*** (0.02)	0.059** (0.03)	0.107*** (0.02)	0.066** (0.03)
Home-owner	0.016 (0.02)	-0.004 (0.02)	0.019 (0.02)	-0.000 (0.02)
Self-employed	0.015 (0.02)	0.004 (0.02)	0.018 (0.02)	0.024 (0.02)
Constant	-0.555*** (0.16)	-0.474*** (0.18)	-0.561*** (0.16)	-0.466*** (0.18)
N obs	1776	1776	1776	1776
Adj. R-Squared	0.105		0.102	
F of instruments		17.67		11.92
Hansen J		0.759		1.926
Hansen J p-value		0.384		0.165

Source: SHIW 2006. Linear probability model estimated by OLS/GMM. Robust standard errors are reported in parentheses. Significance: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Sample: 1500-1999. About marriage and class 25-65.

Tab 8: Multivariate analysis of participation in 2008

	OLS	IV	OLS	IV
Number correct	0.033*** (0.01)	0.121*** (0.04)		
Three correct			0.058*** (0.01)	0.334*** (0.10)
Age	0.018*** (0.01)	0.017*** (0.01)	0.019*** (0.01)	0.018*** (0.01)
Age squared	-0.000*** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)
Female	-0.041*** (0.01)	-0.032** (0.02)	-0.043*** (0.01)	-0.034** (0.02)
Primary	-0.047* (0.03)	-0.092** (0.04)	-0.034 (0.03)	-0.046 (0.04)
Lower Secondary	-0.024 (0.03)	-0.082* (0.04)	-0.007 (0.03)	-0.026 (0.04)
Upper Secondary	-0.001 (0.03)	-0.079 (0.05)	0.019 (0.03)	-0.019 (0.04)
College	0.027 (0.03)	-0.065 (0.06)	0.047 (0.03)	-0.017 (0.05)
Single	0.023 (0.02)	0.017 (0.02)	0.023 (0.02)	0.016 (0.02)
Divorced	0.021 (0.02)	0.013 (0.02)	0.022 (0.02)	0.016 (0.02)
Widow(er)	-0.000 (0.03)	0.016 (0.03)	-0.002 (0.03)	0.019 (0.03)
N children in house	-0.002 (0.01)	-0.004 (0.01)	-0.002 (0.01)	-0.005 (0.01)
H income quartile 2	0.062*** (0.02)	0.049*** (0.02)	0.066*** (0.02)	0.060*** (0.02)
H income quartile 3	0.071*** (0.02)	0.046** (0.02)	0.075*** (0.02)	0.055*** (0.02)
H income quartile 4	0.105*** (0.02)	0.063** (0.03)	0.111*** (0.02)	0.066** (0.03)
Home-owner	0.028** (0.01)	0.023* (0.01)	0.028** (0.01)	0.014 (0.01)
Self-employed	-0.051*** (0.01)	-0.055*** (0.02)	-0.051*** (0.01)	-0.059*** (0.02)
Constant	-0.386*** (0.12)	-0.366*** (0.13)	-0.384*** (0.12)	-0.341** (0.14)
N obs	3419	3419	3419	3419
Adj. R-Squared	0.087		0.085	
F of instruments		33.88		26.21
Hansen J		0.705		0.315
Hansen J p-value		0.401		0.575

Source: SHIW 2008. Linear probability model estimated by OLS/GMM. Robust standard errors are reported in parentheses. Significance: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Sample: 1500-1999 about marriage class 25-65.

Tab 9: Financial literacy by TFR status

	TFR in PF	TFR in firm	TFR: DK
<i>Inflation</i>			
Correct	90.76	79.39	55.37
Do not know	3.24	13.46	29.04
<i>Risk (HRS)</i>			
Correct	66.04	50.45	41.98
Do not know	11.51	19.92	33.79
<i>Risk 2</i>			
Correct	53.73	38.10	27.91
Do not know	11.05	23.55	46.75
<i>Overall performance</i>			
Number correct	2.11	1.68	1.25
3 correct	43.04	28.17	16.28
At least one DK	20.80	33.00	56.30
N obs	289	2,178	164

Source: SHIW 2008 – Weighted data. Sample: 1000 respondents aged 25-65.

Tab 10: Probability of transferring TFR into a pension fund

	Dependent var: TFR in PF (vs. firm, excluding DKs)		Dependent var: TFR in PF (including DKs) vs. firm		Dependent var: Explicit decision (PF or firm) vs. DK	
Number correct	0.021***		0.004		0.018***	
	(0.01)		(0.01)		(0.01)	
Three correct		0.035**		0.019		0.017*
		(0.02)		(0.02)		(0.01)
Age	0.007	0.007	-0.004	-0.004	0.012**	0.013**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Age squared	-0.000	-0.000	0.000	0.000	-0.000**	-0.000**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Female	-0.030*	-0.030*	-0.026	-0.026	-0.003	-0.004
	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)
Primary	-0.043	-0.044	-0.162	-0.162	0.108	0.112
	(0.03)	(0.03)	(0.13)	(0.13)	(0.12)	(0.12)
Lower Secondary	0.003	0.006	-0.152	-0.151	0.140	0.146
	(0.03)	(0.03)	(0.13)	(0.13)	(0.12)	(0.12)
Upper Secondary	0.010	0.015	-0.154	-0.154	0.149	0.158
	(0.03)	(0.03)	(0.13)	(0.13)	(0.12)	(0.12)
College	-0.006	-0.001	-0.159	-0.160	0.137	0.147
	(0.04)	(0.04)	(0.13)	(0.13)	(0.12)	(0.12)
Single	-0.002	-0.001	-0.031	-0.031	0.032*	0.033**
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Divorced	0.017	0.018	-0.018	-0.019	0.035**	0.036**
	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)	(0.02)
Widow(er)	-0.017	-0.020	-0.009	-0.008	-0.009	-0.012
	(0.03)	(0.03)	(0.04)	(0.04)	(0.04)	(0.04)
N children in house	0.009	0.009	0.006	0.005	0.003	0.003
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
H income quartile 2	0.065***	0.067***	0.052**	0.052**	0.006	0.008
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
H income quartile 3	0.078***	0.082***	0.047*	0.047*	0.028	0.032*
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
H income quartile 4	0.065***	0.070***	0.040	0.038	0.021	0.027
	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)	(0.02)
Home-owner	0.047***	0.047***	0.007	0.006	0.041***	0.041***
	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)
Constant	-0.159	-0.152	0.392*	0.395*	0.432**	0.430**
	(0.14)	(0.14)	(0.21)	(0.21)	(0.17)	(0.17)
N obs	2467	2467	2631	2631	2631	2631
Adj. R-Squared	0.069	0.068	0.035	0.036	0.030	0.026

Source: SHIW 2008. Standard errors robust to heteroscedasticity are reported in parentheses. Significance: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Sample: 1990-2005.

Appendix

Table A1: Socio-demographic characteristics

	2006			2008		
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.
Age (years)	57.646	58	15.613	58.240	58	15.828
Age <=35	0.078	0	0.268	0.078	0	0.268
Age 36-50	0.276	0	0.447	0.268	0	0.443
Age 51-65	0.301	0	0.459	0.296	0	0.457
Age 65+	0.344	0	0.475	0.358	0	0.479
Female	0.370	0	0.483	0.381	0	0.486
No edu	0.055	0	0.228	0.053	0	0.223
Primary	0.265	0	0.441	0.258	0	0.437
Lower secondary	0.282	0	0.450	0.287	0	0.452
Upper secondary	0.309	0	0.462	0.308	0	0.462
College+	0.089	0	0.285	0.094	0	0.292
Single	0.116	0	0.320	0.113	0	0.317
Married	0.632	1	0.482	0.633	1	0.482
Divorced	0.071	0	0.257	0.073	0	0.261
Widow(er)	0.182	0	0.385	0.181	0	0.385
Num H components	2.517	2	1.265	2.496	2	1.256
N children in house	0.771	0	0.965	0.757	0	0.968
Household total net income (th)	31.893	26.217	27.276	32.344	26.702	24.357
Home-owner	0.700	1	0.458	0.707	1	0.455
Employees	0.348	0	0.477	0.345	0	0.475
Self-employed	0.076	0	0.266	0.073	0	0.260
Retired	0.454	0	0.498	0.465	0	0.499
Not employed	0.095	0	0.293	0.096	0	0.294
North-west	0.256	0	0.436	0.250	0	0.433
North-east	0.222	0	0.415	0.219	0	0.414
Center	0.203	0	0.402	0.206	0	0.404
South	0.209	0	0.406	0.218	0	0.413
Isles	0.111	0	0.314	0.108	0	0.310
Household head has private pension plan	0.061	0	0.239	0.061	0	0.240
Economist in house	0.024	0	0.153	0.023	0	0.150
A household member uses a computer	0.414	0	0.493	0.473	0	0.499
Mortgage for house of residence	0.100	0	0.300	0.092	0	0.289
Father's education: upper secondary+	0.088	0	0.284	0.088	0	0.283
% employees in firms <50 at regional level	67.97	68.18	4.147	67.86	67.97	4.255

Source: SHIW 2006, 2008. Sample: a ous o a s

Tab A2: First stage regressions and alternative instruments (2006)

	I		II		III		IV	
<i>FIRST STAGE – Dependent variable: financial literacy</i>								
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
A household member uses a computer	0.348*** (0.06)	0.115*** (0.03)			0.410*** (0.06)	0.139*** (0.02)		
Economist in house	0.065 (0.14)	0.095 (0.06)	0.069 (0.13)	0.098 (0.06)			0.128 (0.14)	0.117* (0.06)
Father's education: upper sec+			0.020 (0.07)	0.039 (0.04)			0.061 (0.08)	0.055 (0.04)
Mortgage for house of residence			0.234*** (0.06)	0.055* (0.03)				
% employees in firms <50 at regional level					0.020* (0.01)	0.011** (0.00)	0.021* (0.01)	0.011** (0.00)
N obs	1776	1776	1776	1776	1776	1776	1776	1776
Adj. R-Squared	0.172	0.125	0.160	0.117	0.085	0.058	0.059	0.045
<i>IV regression – Dependent variable: pension plan participation</i>								
Number correct	0.137*** (0.04)		0.237** (0.12)		0.154*** (0.03)		0.276*** (0.10)	
Three correct		0.372*** (0.13)		0.598* (0.36)		0.390*** (0.08)		0.435*** (0.11)
N obs	1776	1776	1776	1776	1776	1776	1776	1776
F of instruments	17.67	11.92	5.06	2.37	29.74	19.54	3.74	4.65
Hansen J	0.759	1.926	3.947	4.002	0.016	0.256	3.391	2.636
Hansen J p-value	0.384	0.165	0.139	0.135	0.899	0.613	0.184	0.268

Source: SHIW 2006. Robust standard errors are reported in parentheses. In panels III and IV standard errors are robust to clustering on regions. In columns (a) the dependent variable is the first stage test number of correct answers; in columns (b) the dependent variable is the first stage dummy variable for correct answers. Significance: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Sample is a subsample of about 25-65 year olds. The usual regressors are included in regressions but not reported in the table.

Tab A3: First stage regressions and alternative instruments (2008)

	I		II		III		IV	
<i>FIRST STAGE – Dependent variable: financial literacy</i>								
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
A household member uses a computer	0.334*** (0.04)	0.121*** (0.02)			0.348*** (0.06)	0.125*** (0.02)		
Economist in house	0.211** (0.09)	0.108** (0.05)	0.228*** (0.08)	0.114** (0.05)			0.211** (0.10)	0.112* (0.06)
Father's education: upper sec+			0.139*** (0.05)	0.065** (0.03)			0.188*** (0.06)	0.078*** (0.03)
Mortgage for house of residence			0.210*** (0.04)	0.059** (0.02)				
% employees in firms <50 at regional level					0.021 (0.02)	0.007 (0.01)	0.022 (0.02)	0.007 (0.01)
		(				)	1	2