Financial literacy, trust and retirement planning

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Abstract

We study the complex relationship between financial literacy, retirement planning and trust in financial institutions, using data from the 2010 Bank of Italy Survey on Household Income and Wealth. The impact of financial literacy on retirement planning is a well established issue in the existing empirical literature; our main contribution is proving that financial knowledge not only impacts retirement planning, but also the decisions of entering a private pension scheme (or devoting the severance pay to a private pension scheme). Adding the consideration of trust poses serious econometric concerns, since both financial literacy and trust in financial institutions are likely to be endogenous and the presence of two endogenous regressors renders the identification of causality very difficult. Our solution is to keep only financial literacy as endogenous and include in our models an exogenous regional indicator of social capital (similar to the one adopted by Guiso et al., 2004), as a proxy for the level of trust between the counterparts of a financial contract in each geographical area. Our main findings show that trust has a positive influence on both the decisions to enter a private pension scheme or to devote the severance pay to a private pension scheme.

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1. Introduction

This paper investigates the role of both financial literacy and trust in voluntary pension plan participation.

As outlined by the first edition of the OECD Pensions Outlook (2012), recent reforms in many developed countries will lead to lower public pensions for future generations of retirees, with a reduction of about 20-25% on average. As a consequence, future retirees will have to rely less on social security schemes and more on voluntary pension plans (Cappelletti et al., 2008). In this framework, a better understanding of what drives the demand of voluntary pension plans[1] is an absolute priority for both regulators and policy makers.

As outlined by Oehler and Werner (2008), this would not be a big issue in a neoclassical perspective, under which individuals are perceived as fully rational decision makers who dispose of all the relevant information. However, in the "real world" of individual financial decisions, two main problems arise: bounded rationality and information asymmetries in the contractual relationship. The authors recognize that policy makers are able to take some actions to increase the recourse to voluntary pension plans (i.e., providing fiscal incentives to encourage adhesions). Nevertheless, these instruments may fail to exert the desired effect in the absence of (at least basic) financial literacy. In addition to this, as remarked by Ring (2005), the role of trust as a mean to overcome the severe imbalance between the low level of consumers' knowledge and the increasing complexity of financial products and services, pensions in particular, is crucial. The author explains that "*this does not mean that the risks inherent in financial investment disappear; but rather that individuals able to place their trust in the financial services sector feel better able to 'manage' these risks, despite their own lack of knowledge and expertise*" (Ring, 2005, p. 60). In this framework, it appears logical from the standpoint of policy makers to invest both in the development of financial literacy among citizens and in controls over the diligence, fairness and transparency of financial providers. As far as these interventions may prove effective only in the medium-long term, a complementary solution may be to dispose automatic enrolment, i.e. a scheme of default options that kick in individuals if they do not take active retirement planning decisions.

At least two considerations make the overall picture even more complex. One problem is that governments are pushing individuals to defer consumer spending and put more savings in the hands of

[1] In the remainder of the paper, several expressions will be used as substitutes: voluntary/supplementary/private/funded pension schemes/plans, irrespective of the fact that the worker chooses to enter a collective fund or an individual contract. The intention is simply to identify each form of investment specifically designed to save for retirement and to add something to what is expected from the public pension system.

financial firms in a period in which trust in the financial services industry has dramatically shrunk down as an effect of the global financial crisis. Secondly, the role of trust is not so straight and easily predictable to be positive as it appears at first sight, especially if we consider trust in the government instead of trust in financial firms. In fact, there are some researchers (e.g., Taylor-Goodby, 2005) highlighting that a number of individuals may feel that they do not have real alternatives to the public pension system and (want to) believe that the government will not let them starve. This is a pretty passive type of behavior, but it is still trust in some way and would suggest a negative relationship with retirement planning, in the sense that people putting their confidence in the public pension system (even if forced to do it by the absence of alternatives) are less likely to enter voluntary pension schemes.

Surprisingly, there is a substantial lack of research (especially providing empirical evidence) on the simultaneous effect of financial literacy and trust in individuals' retirement planning decisions. The objective of this paper is to fill in this gap bringing together two existing strands of the academic literature that examine, respectively, the impact of financial literacy and the influence of trust on individual financial decisions. The remainder of the paper is organized as follows. Section 2 presents the literature review and develops testable hypotheses; Section 3 and 4 describe, respectively, the methodology used to test the hypotheses and the sample and variables definition. Section 5 presents the main results of the empirical investigation, while conclusions, limitations and directions for future research are discussed in Section 6.

2. Literature review and testable hypotheses

Consistently with our aims, the existing literature is analyzed as follows: a) studies dealing with the impact of financial literacy on individual financial decisions; b) studies dealing with the impact of trust on individual financial decisions.

a) ***Financial literacy***. The first strand of literature dealing with financial literacy is well-established and counts a very large number of contributions. Most of these papers are based on surveys conducted in the US. As outlined by Lusardi (2008, p.2), "*ignorance about basic financial concepts can be linked to lack of retirement planning, lack of participation in the stock market, and poor borrowing behavior*". Lusardi and Mitchell (2006) report very interesting results from a specific module of the US Health and Retirement Study (HRS) which was added to the 2004 edition of the survey in order to investigate how workers make

retirement saving decisions, how they collect the relevant information to make these decisions and their level of financial literacy. Findings show that financial illiteracy is widespread among older Americans (aged 50 years or more) and that financial knowledge is directly related to planning: those who display higher level of financial knowledge are more likely to plan and to succeed in their planning. Furthermore, planners are more likely to rely on formal methods to collect information, such as retirement calculators, retirement seminars, and financial experts, and less likely to rely on family/relatives or co-workers. Similar findings are shown in Lusardi and Mitchell (2007a) using the 2004 HRS study to investigate the relationship between planning, financial literacy and housing wealth. Results show that planning is strongly correlated with financial and political literacy (i.e., knowing the names of the US President and Vice President) and that the relationship between planning and wealth remains strong, even after checking for many socio-demographic factors. The authors also explore the possible endogeneity of wealth and find that the relationship runs from planning to wealth, and not the opposite way.

In more recent papers, Lusardi and Mitchell (2007b; 2010) present results from a new database, the Rand American Life Panel (ALP), an Internet-based survey of respondents aged 18 and older, recruited by the University of Michigan's Survey Research Center. Findings are absolutely consistent with the evidence from the HRS, providing evidence of a positive relationship between knowledge of financial matters and retirement planning. The authors also outline the problem of potential endogeneity: it is logical to assume that more knowledgeable people are more likely to be serious planners (i.e., that the relationship runs from financial literacy to planning), but it may also be that those who want to plan for retirement are willing to invest in acquiring financial knowledge (i.e., that the relationship runs from planning to financial literacy). Using information on individuals' past financial literacy, before they entered the job market, the study makes clear that financial literacy affects planning and not the other way around.

More recently, the issue of the relationship between financial literacy and retirement planning has been explored also in countries other than the US. Bucher-Koenen and Lusardi (2010) explore the case of Germany using information drawn from SAVE, a survey conducted by the Mannheim Research Institute for the Economics of Aging (MEA), finding that financial literacy has an important effect on individuals' retirement planning (even when possible endogeneity is taken into account). Similar conclusions are reached for Netherlands by van Rooij et al. (2011a) using information drawn from both the annual DNB Household

Survey and a special set of questions designed to measure basic and advanced financial literacy among members of the CentERpanel, which is run by CentERdata at Tilburg University. The authors confirm these findings in a later study (van Rooij et al., 2012) in which they also use information on smoking and heavy alcohol drinking as a proxy for time preferences and myopic behavior.

Consistent results have been found also in the study by Klapper and Panos (2011) dealing with the Russian case and using a dataset collected via face-to-face interviews to 1,400 individuals in June 2009.

The case of Italy is particularly relevant since the public pension system has gone through a long reform process which has strongly reduced social security, shifting from a Defined Benefit (DB) to a Defined Contribution (DC) formula. To address the resulting reduction in replacement rates, a second pillar of the pension system was established in 1993, based on voluntary and supplementary pension schemes. Enrolment in private pension schemes is voluntary, but has been strongly encouraged by provisions of the legislative decree 252/2005 which introduced high fiscal incentives and an automatic silence-as-assent for the transfer of the private severance pay ("*Trattamento di Fine Rapporto*", hereafter TFR). In case of refusal, the TFR is retained as a book reserve by the employer, annual flows are compounded by a return rate of 1.5% plus 75% of the inflation rate, and the resulting amount is received as a lump sum at retirement. Despite the provision of fiscal incentives and the design of the TFR default option, subscriptions of privately managed pension plans are growing quite slowly in Italy: the participation rate is very low especially for employees in the public sector, for which the 2005 reform does not apply, and for self-employed workers, for which there is no TFR and the income is more volatile and discontinuous. In two companion papers devoted to Italy, Fornero and Monticone (2011a, 2011b) confirm the existence of a positive relationship between retirement planning, measured as the participation in a privately managed pension scheme, and financial literacy, assessed with questions that are very similar to those included in the HRS. In this paper we aim at providing new evidence on the case of Italy by considering several indicators of retirement planning, measuring both intentions and effective behaviors of people and formulating the following hypotheses:

H1: Financial literacy has a positive impact on retirement planning (i.e., having thought about how to arrange for household support after retirement).

H2: Financial literacy has a positive impact on the decision to enter a supplementary pension scheme.

H3: Financial literacy has a positive impact on the decision to transfer the severance pay (TFR) to a supplementary pension scheme.

b) ***Trust***. The second strand of literature, dealing with trust, is less developed and counts a smaller number of contributions, focusing in particular on stock market participation (e.g., Guiso et al., 2008; Pasini and Georgarakos, 2009). Financial contracts are trust intensive contracts *par excellence* (Guiso et al., 2004) and the relationships between customers and financial service providers strongly depend on the level of confidence in the counterpart. Guiso et al. (2004) investigate the relationship between social capital and financial development using data from the Bank of Italy Survey on Household Income and Wealth (SHIW) over 1989-1995. Findings show that in Italian provinces with high levels of social capital, households are: less likely to hold cash and rely on informal credit; more likely to invest in the stock market, to use checks and to have access to institutional credit. Guiso et al. (2008) study the relationship between trust and participation in the stock market. The main database is drawn from the Dutch National Bank (DNB) Household Survey covering a sample of 1,943 households interviewed in 2003. Their generalized level of trust is measured on the basis of answers to the following question: "*Generally speaking, would you say that most people can be trusted or that you have to be very careful in dealing with people?*". Results show that generalized trust is positively related to direct stock market participation, to the share of wealth invested in stocks and also to the investment in all risky assets. Using an alternative database including 1,834 customers of an Italian retail bank interviewed in 2003, the authors investigate the role of specific trust (i.e., how much the respondent trusts his/her bank official or broker as a financial advisor). Results are consistent with those obtained for generalized trust, showing a positive relationship with the investment in risky assets. The existence of a direct link between trust and investment in stock is also confirmed by the cross-country study of Pasini and Georgarakos (2009), which uses information on ten European countries drawn from the Survey on Health, Ageing and Retirement in Europe (SHARE) and the World Values Survey (WVS), with reference to 2004. Evidence in the same direction is provided also by van Rooij et al. (2011b).

As far as we are aware, the role of trust in retirement planning has been substantially unexplored by the academic literature. One exception is the work of Taylor-Goodby (2005) which examines trust in both state and non-state pensions in the UK. The author uses two main sources of information: a series of questions on trust in state and private pensions included in the 2002 British Social Attitudes (BSA) survey, and a specially

commissioned 2004 focus group study on attitudes, expectations and ideas about retirement planning. Results from the analysis of the BSA data show that trust is quite low in both public and private pensions. Significant differences emerge depending on socio-demographic factors: lower levels of trust are particularly strong among the middle-class, better-educated people and women, while older, working-class, less well-educated groups are more likely to trust both forms of pension. The focus group provides discursive and more detailed information, revealing a significant difference between the working- and the middle-class groups. The former tend to place greater reliance on state pension, but in a quite passive way. They are not very trustful in the state, but they feel they have no alternatives and they hope that the government "won't let them starve". Conversely, middle-class groups tend to trust more private pensions. Their behavior appears as being more active with respect to working-class groups, they feel more confident in their ability to make informed decisions and dislike the public system because it limits control over their money.

On the one hand, past literature shows that both generalized and specific trust (in financial institutions) have a direct relationship with some financial decisions, i.e., with the investment in the stock market. On the other hand, we have some evidence that savings for retirement may be motivated by mistrust in the public pension system. Consequently, in a retirement setting, it would be crucial to have a measure of trust in the government, and hence in the public pension system. Unfortunately, we only have a measure of generalized trust in other people, which cannot be interpreted as a proxy for trust in the government, nor used to infer it in some way[2]. As a consequence, we decide not to include specific hypotheses about its relationship with retirement planning and to concentrate on trust among the counterparts of a financial contract. First of all, we have a specific measure of trust in banks, that we believe usable as a proxy for trust in all financial institutions, since banks have a very central role in the Italian financial system. Second, we follow Guiso et al. (2004) using a measure of regional social capital to proxy the level of trust entering financial contracts stipulated in each geographical area. Linking trust to our different measures of retirement planning, we may have quite different situations: when we distinguish between planner and non-planners, we are merely studying if people have been thinking about their future, without measuring the amount of retirement savings

[2] As suggested by one referee, there is a possibility that generalized trust is a "weighted average" of trust towards various entities, including the state, financial institutions, and other people. Nevertheless, the exact wording of the questionnaire weakens this possibility, since the question about generalized trust refers generically to other people. "*In the following question, trust is investigated with reference to the following specific categories (not including the government or the public pension system): Your family, Your friends, Your neighbours, Another resident of your region, An Italian from a different region, A foreigner from another European country (e.g., a Frenchman or a German), A foreigner from outside the European Union (e.g. an Albanian or a North African), The banks*". There is no part of the module on trust referring to the government in some way.

or considering to whom the management of these resources is committed (e.g., to the employer or to a financial intermediary). As a consequence, we believe that the sentiment of trust towards financial institutions should not be a key determinant. At the opposite, when we deal with the decision to enter a supplementary pension scheme, we consider a specific financial contract and it is then easier to predict the existence of a positive relationship with trust in financial institutions. Similar considerations may be raised for the decision to transfer the TFR to a supplementary pension scheme managed by a financial intermediary (rather than leaving it to the employer). More specifically, we formulate the following hypotheses:

H4: Trust in financial institutions does not affect retirement planning in a significant way (i.e., having thought about how to arrange household support after retirement).

H5: Trust in financial institutions is positively related to the decision to enter a supplementary pension scheme.

H6: Trust in financial institutions is positively related to the transfer of the severance pay (TFR) to a supplementary pension scheme.

At our knowledge, our paper is the first investigating the role of both financial literacy and trust in retirement planning. The only existing paper covering this issue is the one by Agnew et al. (2012), analyzing the case of automatic and voluntary enrolment in 401(k) savings plan. Results show that plan knowledge is positively linked to plan participation for both the automatic and the voluntary enrolment cases. Quite unexpectedly, trust in financial institutions is positively linked to plan participation only in automatic enrolment. A possible explanation for this counterintuitive result is that average education and income are higher for voluntary enrolment with respect to the automatic case, while trust may be a larger issue for lower-educated and lower-salaried employees[3]. The main differences with our paper are: 1) Agnew et al. (2012) consider a specific measure of plan knowledge rather than a generic indicator of financial literacy; 2) they do not deal with the problem of both plan knowledge and trust potential endogeneity. We are fully aware of the econometric difficulties arising from regression models incorporating two potentially endogenous regressors. However, we believe fundamental to search for an identification strategy able to shed some light on this complex issue.

3. Methodology

[3] The idea that trust is more relevant for investors with less financial capability is also suggested by Georgarakos and Inderst (2011).

As a first step, following previous studies (e.g., Lusardi and Mitchell 2007b; Fornero and Monticone 2011a; van Rooij et al. 2012), we conduct a multivariate analysis in order to assess the impact of financial literacy on retirement decisions and test hypotheses 1-3. In this way, we assess if the positive relationship with financial literacy holds for all our measures of retirement behavior. Since our dependent variables related to retirement behavior have always a dichotomous nature, we estimate a set of probit models (for simplicity, we omit subscripts):

$$Pr(Y = 1|\, X, FL) = F\,(\alpha + \beta X + \gamma FL) \quad (1)$$

where Y is our interest variable (taking the value of one for: Planners; Having a private pension scheme; Devoting TFR to a private pension scheme, respectively); X is a vector of control variables describing the socio-demographic profile of the respondent; FL is our measure of financial literacy, and F is the Cumulative Distribution Function (CDF) of the standard normal distribution. We take into account the potential endogeneity of both financial literacy and trust. With reference to financial literacy, the possible endogeneity is a key issue outlined in several studies (see Section 2 for more references). The problem may have several origins: first of all, there could be some unobservable characteristics of individuals that impact both retirement planning and financial literacy. Secondly, our financial literacy score may be affected by some measurement errors. Most importantly, it could be that the relationship runs from retirement planning to financial literacy and not from financial literacy to retirement planning, as assumed in our hypotheses. In order to overcome this limitation, we implement an IV approach, following previous studies for the choice of both control and instrumental variables (see Section 4 for more details).

Secondly, in order to test hypotheses 4-6, we need to include in our models a measure of trust in financial institutions. The issue of the potential endogeneity of trust in financial institutions has never been explored in past previous studies (see, for example, Guiso et al. 2008, using both a generalized and a specific measure of trust without dealing with their possible endogeneity). One notable exception is the paper of Georgarakos and Inderst (2011), using information about how frequently people make use of instructions on labels for household products as an instrumental variable for trust in financial advice. This paper deals with the quite different issue of the impact of financial advice on individual investment decisions in risky assets; furthermore, we do not dispose of such information on following label instructions. Nevertheless, there are several reasons to suspect that trust in financial institutions is endogenous also with respect to our interest

dependent variables: trust may be correlated to retirement planning outcomes through many unobservable variables, or there may be a reverse causality problem (i.e., trust in financial institutions may increase as a result of retirement planning decisions, favoring a more frequent contact with financial institutions). To overcome this problem, we decide to test for the endogeneity of both financial literacy and trust. As a first solution, we run a set of IV probit models, with two potentially endogenous regressors, using the two instrumental variables specified in Section 4. However, the presence of two potentially endogenous regressors poses quite serious concerns for a good identification strategy and for the interpretation of results; in addition, it is not possible to exclude that some unobservable variables influence both financial literacy and trust in financial institutions, making more difficult to disentangle their effects. In order to overcome this problem and shed some light on the potential role of trust, we decide to adopt a measure of trust similar to Guiso et al. (2004). Specifically, we define a regional-based measure of social capital that, with respect to an individual measure of trust towards financial institutions, is more likely to be exogenous and less related to financial literacy. In this way, once that the exogeneity of this measure is proven, we can rely on models including only one endogenous regressor (i.e., financial literacy).

4. Sample and variable description

Existing empirical analyses regarding Italy have already proven the relevance of financial literacy on retirement planning, using different definitions of the latter: in Cappelletti et al. (2011) savings decisions are analyzed in terms of preference for an annuity rather than a lump sum, while Fornero and Monticone (2011a, 2011b) explored the determinants to enter a privately managed pension plan and to put the TFR into a pension scheme. Their studies are based on the 2006 and 2008 editions of the Bank of Italy SHIW, while questions about trust were included only later, in the 2010 edition. The design of the 2010 edition of the SHIW allows us to collect more information to our aims and to advance the existing studies on retirement planning in Italy. First of all, a specific module of the questionnaire is devoted to supplementary pension plans with three central questions asked to heads of household[4]:

1) *Have you ever thought about how to arrange for your household's support when you retire*?

[4] In the SHIW the effective head of household is defined as the person primarily responsible for, or most knowledgeable about, the household budget.

The question is asked to the whole sample of respondents, excluding pensioners and people living on independent means without working. People answering yes are classified as "Planners".

2) *In 2010 did you pay into a personal retirement plan or supplementary pension fund? Bear in mind that personal pensions (pension funds or retirement plans) pay the holder an income only when he/she becomes eligible for a state pension.*

The question is asked to the whole sample. People answering yes are classified as "Having a private pension scheme".

3) *Was your severance pay transferred to a supplementary pension scheme (pension fund or individual pension plan)?*

The question is asked only to employees in the private sector for which the default option applies. People answering yes are classified as "Devoting TFR to a private pension". Answers to these three questions are used to construct our dependent variables for models explained in Equation (1). Our final sample considers about half of the people interviewed by the Bank of Italy, restricting the analyses to heads of household with an odd year of birth, i.e., the only ones answering also questions about trust. Furthermore, following past studies dealing with retirement planning in Italy (Fornero and Monticone 2011a and 2011b), we restrict our sample to people aged 25-65 and in the labor force. Table 1 shows retirement planning behavior in our final sample. With reference to the first question (*Have you ever thought about how to arrange for your household's support when you retire*?), it is quite surprising to show that Planners are less than a half of respondents (about 46% of the sample). Secondly, the percentage of people contributing to a supplementary pension scheme is quite small, a little more than 21%. The last question (*Was your severance pay transferred to a supplementary pension scheme?*) is asked only to employees in the private sector, being the only category that has right to the TFR and is also given the chance to devote TFR to supplementary pension schemes (employees in the public sector do not have this possibility and self-employed workers have no TFR). It is interesting to note that only a small portion of private employees has already chosen to devote his/her severance pay to a private pension scheme (a little more than 13%).

Furthermore, the 2010 SHIW includes three financial literacy quizzes for the whole sample of 7,977 heads of household. The quizzes are designed to determine the ability to calculate changes in purchasing power, evaluate the difference in the riskiness between different types of mortgage loans, and understand the

advisability of portfolio diversification. The limited number of questions might raise some doubts on the reliability of the obtainable indicator of financial literacy. As outlined in van Rooij et al. (2011b), the measures of financial literacy used in existing studies are generally quite crude. On the other hand, the surveys providing more extensive information about financial literacy have little or no data on wealth, saving and other important features of the respondents. As a consequence, it is necessary to rely on a small number of questions, as in the case of the Bank of Italy survey, in order to be able to examine a large sample with plenty of information on the respondents. A crucial issue is also the suitability of the SHIW questions to the aim of measuring financial literacy. A relevant term of comparison is the financial literacy module included in the Health and Retirement Study (HRS), which is the base survey for many of the US academic studies dealing with financial knowledge (e.g., Lusardi & Mitchell, 2008). This module counts three questions concerning interest compounding, inflation and risk diversification. The similarity with the SHIW is evident: for two of the three questions, those regarding inflation and risk diversification, even the exact wording is almost the same. In both cases, a third question investigates the ability to calculate interests on savings or loans, even if in a different way.

Tables 2 shows to what extent financial literacy is widespread in our sample. A small share (about 7%) of respondents was unable to provide any correct answer to the financial literacy quizzes. At the same time, over one third of the sample obtained the best possible score, reaching a total of 3 points. This does not mean that, on average, Italian households have a high level of knowledge of financial matters because the questions dealt with rather elementary notions.

In addition to this, half of the sample was asked a set of questions dealing with social capital. A first question to assess generalized trust is: "*Generally speaking, would you say that you can trust most people or that you can never be too careful in dealing with people? In answering, please give me a score from 1 to 10*". A quite similar question, with the same range of possible marks (1-10), was also asked with specific reference to some categories of subjects, including banks. On average (see Table 3), respondents show a discrete level of generalized trust (the mean of the overall sample is about 5.8 in a range between 1 and 10) while their feelings towards banks are a bit less positive (about 5.5). Looking at trust for all possible values of financial literacy there are no significant differences across several groups (running an F-test it returns p-values higher than 0.10). Finally, we consider a large set of control variables employed in the existing

literature, which proved to be significant in determining individual financial decisions (see Fornero and Monticone 2011a and 2011b for the specific case of Italy). First of all, we introduce some socio-demographic factors[5]: a second order polynomial in age; gender (a dummy variable taking the value of 1 for males and 0 for females); the geographical area of residence (North, Centre or South of Italy), the level of education (none, primary school, secondary school, tertiary school, college or more); marital status (distinguishing married or cohabiting couples, single, separated/divorced and widowed); the number of children in the household. Secondly, we include a set of dummies related to the professional status: we distinguish employees (in large and small firms) from self-employed workers, and we also take into account the economic wellbeing perceived by the respondents, considering his/her housing condition (home owner or not) and quartiles of household income.

With reference to instruments for financial literacy, Fornero and Monticone (2011a, 2011b) used two dummies indicating the presence of at least one household member with a degree in Economics and the presence of at least one household member using a computer, respectively. Unfortunately, the question relative to the use of a computer is no longer included in the SHIW, probably as a response to the dramatic development in the use of ICT that may hinder the discriminating power of such a variable. In addition, we prefer to use at least one instrumental variable that is external to the household and its decisions/behaviors. We define two instruments: 1) *Mun_size*, that is the number of inhabitants in the municipality of residence (supposing that larger municipalities provide easier access to banking services, ICT and education) and 2) *Parent_edu*, that is an indicator of the general education for the parents of the respondent (specifically, it is the average of the highest education titles attained by the father and the mother of the respondent).

5. Results

5.1 Results for financial literacy

First of all, we consider a reduced form in which trust variables are not included in the model. The idea is to provide evidence of the positive impact of financial literacy on retirement planning, using several definitions of the dependent variable and catching different retirement behaviours. Table 4 reports results for each one

[5] For reasons of brevity, we do not introduce a table with summary statistics for control variables. These are available in the Bank of Italy documentation about the SHIW, whose sample is build to be representative of the entire Italian population.

of our three dependent variables of interest, both from the simple probit model shown in Equation 1 and from the IV probit estimation, considering the potential endogeneity of financial literacy and using the instrumental variables described in Section 4. Findings provide strong evidence in support of hypotheses 1-3[6]: controlling for several socio-economic factors, financial literacy shows a positive impact on each variable measuring retirement planning. This result is absolutely consistent with previous literature (for Italy, see, Fornero and Monticone 2011a, 2011b) and proves to be robust when the possible endogeneity of financial literacy is considered in the IV probit estimation. The coefficient for financial literacy remains always positive and statistically significant, and it also increases in size in a relevant way (see Table 4, Panel A). However, at our aims, the dimension of coefficients is not indicative and it is more important to consider the size of marginal effects, i.e., the effect of a change in financial literacy on the probability of success. Our interest variable, *FIN_LIT*, is a discrete indicator that assumes four different unique values, from 0 to 3. As a result, it is not useful to calculate the instantaneous rate of change, as it is usual for a continuous variable. We are rather interested in the predicted probabilities of success for hypothetical individuals with average values for all the other covariates and financial literacy assuming its different possible four values. Results are shown in Table 4, Panel B. For example, with reference to marginal effects from the IV probit model, we can see that an average individual with the lower level of financial literacy (FIN_LIT=0) has a probability of having a private pension scheme of about 1.73%, while the same average individual with the highest possible level of financial literacy (FIN_LIT=3) has a much higher probability (42.16%). It is also interesting to note how differences in probabilities are much larger when we look at the IV model rather than the simple probit in which the problem of endogeneity is not solved. Past studies are consistent in showing that IV models reveal a much more important role for financial literacy with respect to simple OLS or probit models (e.g., Fornero and Monticone, 2011a,b; Klapper and Panos, 2011).

In order to test the potential weakness of instruments, we prefer to rely on the Kleibergen-Paap (KP) F-test rather than on the Cragg-Donald (CD) one[7]. As outlined in Baum et al. (2007), the CD F-test requires the strong assumption of i.i.d. errors, while the KP test is a clearly superior choice when it is not possible to exclude the presence of heteroskedasticity, autocorrelation, or clustering. Baum et al. (2007) also outline that

[6] Results do not change including also a measure for risk aversion or eliminating all controls. We thank an anonymous referee for suggesting us to introduce risk aversion and another referee for asking to test also a baseline scenario without controls. Results are available from the authors upon request.

[7] Both these tests are performed with an instrumental variable linear regression.

users of the KP test should either apply with caution the critical values compiled by Stock and Yogo for the i.i.d. case or refer to the older "rule of thumb" that the F-statistic should be at least 10 for weak identification not to be considered a problem. In our first stage regressions, values of the F-test are acceptable (i.e., greater than 10, and larger than the critical values suggested by Stock and Yogo at the 15% level) in Models (4) and (5). However, the value for the F-test is quite lower in Model (6), i.e. for the decision to devote the severance pay to a private pension scheme. The choice of instrumental variables is also supported by results of the Hansen's J test (the p-value is quite high and we can accept the null hypothesis of instruments validity). In addition, very low p-values for the Wald test of exogeneity[8] confirm the importance of addressing the endogeneity of financial literacy. Since the results from both the Hansen and the Wald tests may be affected by the weakness of instruments, and this weakness cannot be excluded for Model (6), findings for the decision to devote the TFR to a private pension scheme should be interpreted with some caution. However, the positive influence of financial literacy on pension planning is something well-established in the existing empirical literature and we are consequently confident that this finding is confirmed also in this study, irrespective of the specific variable used to proxy retirement planning.

Results for the control variables, when statistically significant at the 10% level or less, are perfectly in line with other studies, outlining the positive impact of being male and having a higher level of disposable income. In addition, the results for the second order polynomial in age suggest that people in the middle age are the most likely to think about retirement (the relationship with age is positive, but the coefficient for the square term is negative). Finally, self-employed workers are found to be less likely to have a private pension scheme. This is a relevant and well-known issue, especially in Italy (see, for example, COVIP 2012): self-employed workers are probably those who will be more affected by the reforms of the public pension system in terms of expected replacement rate. However, they are often not able to save for retirement because of the high volatility (and discontinuity) of their income. In addition, they do not have a severance pay, which is the main source of funds for retirement savings in Italy.

[8] This test is performed with an instrumental variable probit model. Similar results are obtained performing an exogeneity test (the Wu-Hausman F-test) with an instrumental variable linear regression.

5.2 Results for trust

We now turn the attention to models including a measure of trust, considering its potential endogeneity. First of all, we consider an IV model in which both financial literacy and trust in banks are considered as potentially endogenous. Nevertheless, we decide to not report results, since values for the KP test signal a serious problem of instruments' weakness and then the impossibility to run reliable tests about the exogeneity of the interest variables. The same problem arises using a measure of generalized instead of specific trust. To overcome the difficulties of the IV model with two potentially endogenous regressors, we follow Guiso et al. (2004) and proxy the level of trust between the counterparts of a financial contract using a regional indicator of social capital. More in details our measure, *Social capital*, is given by the number of people aged 14 and over who have done volunteering (as a percentage of the total population aged 14 and over, for each Italian region[9]). With respect to a direct individual measure of trust in banks, as the one provided by the Bank of Italy, an indicator of social capital at the regional level is undoubtedly less specific and consistent with our aims, but presents some advantages. First of all, a regional-based indicator of social capital is more likely to be exogenous with respect to an individual measure of trust (either generalized or specifically referred to banks), since the former is independent from the behaviour and the decisions of each household. Second, an individual measure of trust is more likely to be influenced by other unobservable variables that may strongly impact the phenomenon under study and also the level of financial literacy (e.g., optimism, expected longevity, relationships with banks). Differently from the cases of trust in banks and generalized trust, using this indicator, the IV model with two potentially endogenous regressors (both financial literacy and social capital) show acceptable values for the KP F-tests (reported at the bottom of Table 5), higher than the Stock and Yogo critical values at the 10% level (15% level for Model 3). This allows us to: 1) exclude a serious problem of instruments weakness, 2) have more confidence in results about the exogeneity test of social capital, and 3) rely on a final model in which only financial literacy is treated as endogenous. As we can see in Table 5[10], using a regional measure of social capital, trust does not result to impact in a significant way our first retirement planning dependent variable (i.e., being a planner). This is perfectly in line with our expectations (*H_4: Trust in financial institutions does not affect retirement planning in a significant way*). This is not surprising, since in this case we are merely considering whether respondents

[9] The source of data is the Italian National Institute of Statistics (ISTAT).
[10] Findings are the same using a baseline model without controls. Results are available from the authors upon request.

are worried or not about their future, while we are not considering the effective amount of savings nor to whom it is committed the management of these savings. Moving to the other dependent variables, we can see that social capital positively impact both entering a private pension scheme and devoting the TFR to a private pension scheme. Both coefficients are statistically significant at the 1% confidence level providing support to both H_5 (*Trust in financial institutions is positively related to the decision to enter a supplementary pension scheme*), and H_6 (*Trust in financial institutions is positively related to the transfer of the severance pay to a supplementary pension scheme*). In order to better appreciate the economic significance of these results, we also report marginal effects. As for financial literacy, we consider predicted probabilities of success for hypothetical individuals with average values for all the other covariates and three possible values of social capital (25, 50, and 75 percentile). Results are shown in Table 5, Panel B. As expected, the effect of trust is more meaningful for having a private pension scheme or devoting the TFR, rather than for being a planner. For example, an average individual with a low level of social capital (i.e., 25 percentile) has a probability of having a private pension scheme of 15.61%, while the same average individual with an higher possible level of social capital (i.e., 75 percentile) has a probability of 26.47%. Similarly, an average individual with a low level of social capital (i.e., 25 percentile) has a probability of devoting the TFR to a private pension scheme of 15.49%, while the same average individual with an higher possible level of social capital (i.e., 75 percentile) has a probability of 25.91%.

6. Conclusions

Recent reforms of the public pension systems have strongly reduced expected replacement rates for future pensioners. As a consequence, workers have now a stronger individual responsibility regarding the amount of money to be saved and the choice of who is going to manage these funds. At the same time, financial services and products are becoming more and more complex, requiring investors to have an adequate level of technical knowledge in order to take conscious decisions. This paper, based on information drawn from the 2010 edition of the Bank of Italy Survey on Households Income and Wealth (SHIW), has two main objectives: first of all, using the most recent available data for Italy, we aim at providing further evidence on the crucial role of financial literacy on both the consciousness of investors and their active behaviour in

retirement planning. Secondly, our aim is to analyze the role of trust, in order to understand whether the level of confidence in financial institutions may impact investors' choices.

The first relevant result is that the positive relationship between financial literacy and retirement planning, (found in all previous studies on the issue) is confirmed irrespective of the investigated dependent variable: being a planner, i.e., someone that has thought about how to arrange after retirement; having a private pension scheme or having devoted the severance pay to a private pension scheme. This finding appears also to be robust to different econometric specifications: it is evident in both the simple probit models and in the IV probit estimations which also considers the potential endogeneity of financial literacy.

With reference to the role of trust, all models including both financial literacy and trust in banks as two potentially endogenous regressors show a serious problem of instrument weakness, which renders unreliable any test on the exogeneity of interest variables. To overcome this problem, we follow Guiso et al. (2004) and use an alternative measure of trust, based on social capital at the regional level, more likely to be exogenous and less related to financial literacy. Using this measure, results are consistent with theoretical expectations, with social capital positively influencing both the decision to enter a private pension scheme and to devote the TFR to a private pension scheme, and not impacting being a planner.

In terms of implications, results show that financial knowledge and trust are key drivers of retirement planning, suggesting that policy makers should take as many initiatives as possible to increase both of them among citizens. This is important not only from an individual point of view, but also from a social perspective: people who do not care about their standard of living after retirement will probably need government assistance, generating an increase in public expenditure and hence in tax burdens.

The main limitation of this work is related to the use of secondary data, that do not allow to deeply investigate all the mechanisms that affect the decision process about retirement planning. The impact of trust undoubtedly deserves further investigation, possibly using *ad hoc* questionnaires to collect more information on the individual choices and to have direct measures for both trust in the public pension system and trust in financial intermediaries managing voluntary pension schemes. We hope that this study will be a first step in this direction, giving important indications to policy makers in order to better understand how to spread awareness of the importance of retirement planning and encourage responsible and conscious saving and investment decisions.

Table 1 Retirement planning behavior in the 2010 Bank of Italy Survey on Household Income and Wealth

Question about retirement behaviour	Obs.	in %
1) Have you ever thought about how to arrange for your household's support when you retire?		
Yes – PLANNERS	737	46.38%
No – NON PLANNERS	850	53.49%
Do not answering	2	0.13%
Total	1,589	100.00%
2) In 2010 did you pay into a personal retirement plan or supplementary pension fund?		
Yes - HAVING A PRIVATE PENSION SCHEME	341	21.46%
No - NOT HAVING A PRIVATE PENSION SCHEME	1,248	78.54%
Total	1,589	100.00%
3) Was your severance pay transferred to a supplementary pension scheme?		
Yes - DEVOTING TFR TO PENSION SCHEMES	143	13.38%
No - NOT DEVOTING	823	76.99%
Do not know	103	9.63%
Total	1,069	100.00%

Source: SHIW (2010). In this study we only consider half of the respondents (those with odd year of birth, answering to questions about trust). In addition, we restrict the sample to people aged 25-65 in the labour force (Question 3 was asked only to private sector employees).

Table 2 Financial literacy in the 2010 Bank of Italy Survey on Household Income and Wealth

	Obs.	in %
People answering incorrectly to all questions	113	7.11%
People answering correctly to 1 question	263	16.55%
People answering correctly to 2 questions	563	35.43%
People answering correctly to 3 questions	650	40.91%
Total	1,589	100.00%

Source: SHIW (2010). In this study we only consider half of the respondents (those with odd year of birth, answering to questions about trust). In addition, we restrict the sample to people aged 25-65 in the labour force.

Table 3 Trust in the 2010 Bank of Italy Survey on Household Income and Wealth

	Generalized Trust	Specific trust
People answering incorrectly to all questions	5.7080	5.5044
People answering correctly to 1 question	5.5817	5.8707
People answering correctly to 2 questions	6.0018	5.5719
People answering correctly to 3 questions	5.8031	5.3292
Total	5.8301	5.5173

Source: SHIW (2010). In this study we only consider half of the respondents (those with odd year of birth, answering to questions about trust). In addition, we restrict the sample to people aged 25-65 in the labour force.

Table 4 - The relationship between financial literacy and retirement planning

Panel A – Probit and IV probit estimates

	PROBIT (1)	PROBIT (2)	PROBIT (3)	IVPROB(4)	IVPROB(5)	IVPROB(6)
	Y= Planner	Y= Having a private pension	Y= Devoting TFR to private pension	Y= Planner	Y= Having a private pension	Y= Devoting TFR to private pension
Financial literacy	***0.11157****	***0.09103****	***0.16572****	***0.90075****	***0.63835****	***0.97074****
	(3.01374)	***(2.10656)***	***(2.35177)***	***(8.48308)***	***(2.90585)***	***(6.83776)***
Age	0.04542	0.20252***	0.22803***	0.03437	0.18083***	0.13439*
	(1.33185)	(4.86673)	(2.80933)	(1.08534)	(4.23086)	(1.74444)
Age2	-0.00044	-0.00224***	-0.00259***	-0.00033	-0.00200***	-0.00153*
	(-1.17576)	(-4.95542)	(-2.89235)	(-0.95912)	(-4.27543)	(-1.76994)
Male	0.04456	0.20384**	0.33546**	-0.01423	0.14814*	0.18236
	(0.62586)	(2.47443)	(2.37700)	(-0.22812)	(1.75822)	(1.47421)
Income quart 2	0.31696***	0.00413	-0.03910	-0.06001	-0.18265	-0.21890
	(2.70034)	(0.02730)	(-0.15590)	(-0.46339)	(-1.13234)	(-1.14562)
Income quart 3	0.33666***	0.49412***	0.38292	-0.15578	0.17107	-0.06206
	(2.81421)	(3.30155)	(1.58776)	(-1.12158)	(0.78451)	(-0.27535)
Income quart 4	0.49142***	0.41426**	0.46388*	0.04691	0.16566	0.01553
	(3.78729)	(2.51145)	(1.71902)	(0.31316)	(0.82295)	(0.06166)
Self employed	-0.01683	-0.32936***	-	-0.08116	-0.33330***	-
	(-0.20778)	(-3.35300)	-	(-1.11815)	(-3.57886)	-
Large firms (>50)	-	-	0.48614***	-	-	0.18713
	-	-	(3.97792)	-	-	(1.29094)
Other control variables[+]	YES	YES	YES	YES	YES	YES
Constant	-2.48285**	-5.79976***	-6.41211***	-2.85587***	-5.85033***	-5.37614***
	(-2.44666)	(-5.13824)	(-3.24258)	(-3.17681)	(-5.52685)	(-3.03853)
Observations	1,587	1,589	787	1,587	1,589	787
Pseudo R-squared	0.0455	0.0810	0.1795	-	-	-
Wald test of exogeneity p-value	-	-	-	0.0000	0.0419	0.0038
KP rk Wald F stat*	-	-	-	12.327	12.299	5.136
Hansen's J p-value*	-	-	-	0.3362	0.2071	0.5518

+ Other control variables include main socio-demographic factors (i.e., general level of education, marital status, number of children, residence and housing conditions).
*Values derive from an IV linear regression. Critical values for the Stock-Yogo weak ID test are 19.93 (10% maximal IV size), 11.59 (15% maximal IV size), 8.75 (20% maximal IV size) and 7.25 (25% maximal IV size). Instruments for financial literacy are: 1) the number of inhabitants in the municipality of residence, and 2) the general educational level for parents of the respondent.

Source: SHIW 2010. Robust Z-statistics are in parentheses, *** p<0.01, ** p<0.05, * p<0.1. Sample: household heads of age 25-65, employees or self-employed (only employees for Models 3 and 6), without missing answers.

Panel B – Marginal effects of financial literacy

MEMs for probit models (Models 1,2,3)

	Y=Planner	P>z	Y= Having a private pension scheme	P>z	Y= Devoting TFR to a pension scheme	P>z
FIN_LIT= 0	0.3701	0.000	0.1411	0.000	0.0592	0.005
FIN_LIT =1	0.4129	0.000	0.1625	0.000	0.0814	0.000
FIN_LIT =2	0.4568	0.000	0.1859	0.000	0.1093	0.000
FIN_LIT =3	0.5013	0.000	0.2112	0.000	0.1436	0.000

MEMs for IV probit models (Models 4,5,6)

At	Y=Planner	P>z	Y= Having a private pension scheme	P>z	Y= Devoting TFR to a pension scheme	P>z
FIN_LIT = 0	0.0250	0.047	0.0173	0.270	0.0026	0.024
FIN_LIT =1	0.1447	0.000	0.0702	0.001	0.0337	0.000
FIN_LIT =2	0.4370	0.000	0.2016	0.000	0.1954	0.001
FIN_LIT =3	0.7710	0.000	0.4216	0.000	0.5448	0.000

Marginal effects at means (MEMs) for each possible value of financial literacy. Marginal effects are expressed in terms of probability of success, Pr(Y=1), at all possible values of financial literacy for an average individual (i.e., setting all regressors different form financial literacy at their mean).

Source: SHIW 2010. *** p<0.01, ** p<0.05, * p<0.1. Sample: household heads of age 25-65, employees or self-employed (only employees for Models 3 and 6), without missing answers.

Table 5 – The relationship between financial literacy, trust, and retirement planning

	IVPROB(1)	IVPROB(2)	IVPROB(3)
	Y= Planner	Y= Having a private pension	Y= Devoting TFR to private pension
Financial literacy	***0.89330****	***0.51354****	***0.97132****
	(8.01816)	***(2.08678)***	***(7.16137)***
Social capital	***1.52277***	***5.76145****	***5.81194****
	(1.32151)	***(3.74715)***	***(2.97748)***
Age	0.03359	0.18982***	0.13333*
	(1.05682)	(4.47324)	(1.74038)
Age2	-0.00032	-0.00211***	-0.00152*
	(-0.92884)	(-4.54552)	(-1.77464)
Male	-0.01188	0.17472**	0.18842
	(-0.18962)	(2.04351)	(1.54636)
Income quart 2	-0.05320	-0.12304	-0.21292
	(-0.40411)	(-0.71431)	(-1.08183)
Income quart 3	-0.15020	0.26446	-0.08288
	(-1.05894)	(1.18461)	(-0.37373)
Income quart 4	0.05525	0.24855	0.02502
	(0.36178)	(1.20268)	(0.10021)
Self employed	-0.07957	-0.33847***	-
	(-1.09095)	(-3.52080)	-
Large firms (>50)	-	-	0.20395
	-	-	(1.48411)
Other control variables+	YES	YES	YES
Constant	-2.93781***	-6.34162***	-5.79671***
	(-3.24046)	(-5.82699)	(-3.21681)
Observations	1,587	1,589	787
Wald test of exogeneity p-value	0.0000	0.1251	0.0020
KP rk Wald F statistic*	12.318	12.294	5.232
Hansen's J p-value*	0.2081	0.6005	0.9090
Wu-Hausman F test p-value** (H_0: Social capital is exogenous)	0.22409	0.59070	0.90859
Wu-Hausman F test p-value** (H_0:Financial literacy and social capital are exogenous)	0.00004	0.32982	0.15390

+ Other control variables include main socio-demographic factors (i.e., general level of education, marital status, number of children, residence and housing conditions)

* Kleibergen-Paap Wald F-statistics and for the Hansen's J p-value derive from an IV linear regression in which only financial literacy is treated as endogenous. When both financial literacy and social capital are considered as endogenous, the KP F-statistics is equal to 8.867 when Y = Planner, 8.800 when Y= Having a private pension scheme, and 5.176 when Y= Devoting TFR to a pension scheme. Critical values for the Stock-Yogo weak ID test with two endogenous regressors are 7.03 (10% maximal IV size), 4.58 (15% maximal IV size), 3.95 (20% maximal IV size) and 3.63 (25% maximal IV size).

**Values for the Wu-Hausman F-statistics derive from an IV linear regression in which financial literacy and social capital are both considered as potentially endogenous and instrumented.

Instrumental variables are: 1) the number of inhabitants in the municipality of residence, and 2) the general educational level for parents of the respondent.

Source: SHIW 2010. Robust Z-statistics are in parentheses, *** p<0.01, ** p<0.05, * p<0.1. Sample: household heads of age 25-65, employees or self-employed (only employees for Models 3 and 6), without missing answers.

Panel B – 1) Marginal effects of financial literacy

MEMs for IVprobit models (Models 1,2,3)

	Y=Planner	P>z	Y= Having a private pension scheme	P>z	Y= Devoting TFR to a pension scheme	P>z
FIN_LIT =0	0.0259	0.056	0.0280	0.321	0.0023	0.036
FIN_LIT =1	0.1464	0.000	0.0812	0.006	0.0308	0.000
FIN_LIT =2	0.4370	0.000	0.1886	0.000	0.1846	0.000
FIN_LIT =3	0.7688	0.000	0.3558	0.001	0.5293	0.000

2) Marginal effects of social capital

MEMs for IVprobit models (Models 1,2,3)

	Y=Planner	P>z	Y= Having a private pension scheme	P>z	Y= Devoting TFR to a pension scheme	P>z
SOC_CAP at 25 percentile	0.4537	0.000	0.1561	0.000	0.1549	0.006
SOC_CAP at 50 percentile	0.4767	0.000	0.2145	0.000	0.2090	0.000
SOC_CAP at 75 percentile	0.4938	0.000	0.2647	0.000	0.2591	0.000

Marginal effects at means (MEMs) for each possible value of financial literacy. Marginal effects are expressed in terms of probability of success, Pr(Y=1), at all possible values of financial literacy for an average individual (i.e., setting all regressors different form financial literacy at their mean).

Marginal effects at means (MEMs) for some possible values of social capital. Marginal effects are expressed in terms of probability of success, Pr(Y=1), at 25, 50 and 75 percentiles of social capital for an average individual (i.e., setting all regressors different form social capital at their mean).

Source: SHIW 2010. *** p<0.01, ** p<0.05, * p<0.1. Sample: household heads of age 25-65, employees or self-employed (only employees for models 3 and 6), without missing answers.

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