Financial literacy and gender: does education fill the gap?

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Abstract

Financial literacy is an issue which has recently been widely debated among scholars, policy makers and other institutional actors. Within the academic literature, several aspects of the topic have been investigated, ranging from the identification of the main influencing factors to the assessment of the possible impacts on individual economic and financial decisions. By analysing a sample of Italian households, the present paper adds to the existing literature in several respects. First, it provides updated evidence on individual financial knowledge's determinants. Moreover, in focusing on the gender issue, it specifically investigates how the difference in the probability of being financially literate for men and women changes with education. In addition, by using Italian data, it provides useful evidence about one of the advanced countries with the lowest level of financial literacy. Corroborating the findings by the reference literature, panel estimates for Italy refer the existence of a gender gap in financial knowledge at the expense of women. However, the gap turns out to close for higher levels of education.

Keywords Financial literacy, gender, education
JEL classification D14, I22, J16

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1 Introduction

The extent to which individuals are economically and financially literate is an issue which has recently been widely debated among scholars, policy makers and other institutional actors. Increasing attention has been devoted to identify the main factors which could exert an influence on financial literacy as well as to the consequences that the latter may produce in terms of financial decisions.

Over the last decades, the supply of diversified financial products and services widened and so did their complexity and sophistication. In addition, social welfare systems have been reformed thereby determining a progressive shift of financial risk from governments and employers to individuals. Demographic and cultural changes also occurred, with many countries registering an increase in longevity, in women participation to the labor market, in people entering higher education (OECD, 2017b). Fostered by these trends, individuals direct participation to economic and financial decisions increased and financial knowledge turned out to be an important skill to properly manage individual and household resources as well as to enhance stability and development. In fact, weak financial literacy makes individuals unable to optimize their own welfare and causes financial mistakes, some with nontrivial economic and financial effects (Hastings et al., 2013), both at the individual as well as at the aggregate level. This is particularly true for young individuals, whose economic and financial decisions may have long lasting effects (Lusardi et al., 2010).

Yet, even in presence of significant differences across countries, the level of financial literacy is still quite low, and this became of great concern during the recent financial crisis (Bucher-Koenen and Ziegelmeyer, 2013). As a consequence, an upsurge in the development of international strategies and national programs to enhance financial knowledge has recently occurred, such as the definition of high-level international principles on financial education, the introduction of personal finance classes in schools, the organization of employer-provided seminars and workplace courses, the supply of personalised credit and mortgage counseling. In addition, in order to properly assess the level of financial knowledge based on reliable and comparable data, several national and international surveys include nowadays dedicated sections on economic and financial issues.

In the light of the above arguments, the present paper adds to the existing literature in several respects. It provides updated evidence on financial knowledge's determinants by focusing on gender differences and specifically investigating the relationship between gender and education. In addition, the use of Italian data allows to explore the situation in one of the advanced countries with the lowest level of financial literacy. To the best of our knowledge, this is the first paper that analyzes financial knowledge at individual level using the panel component of the Survey on Household Income and Wealth released by the Bank of Italy.

The remainder of the paper is organized as follows. Section 2 reviews the relevant literature whereas section 3 provides a description of both the data and the econometric approach. Section 4 discusses the findings obtained by estimating a model for the determinants of financial knowledge for a sample of Italian respondents. Section 5 presents some robustness checks.

2 Literature review

Over recent years, the literature on financial literacy has widened considerably, thanks to both theoretical and empirical contributions. Different aspects have been investigated, ranging from the identification of the main influencing factors to the assessment of the possibile impacts on economic and financial decisions. With reference to the latter, attention has been devoted to wealth accumulation (Ameriks et al., 2003), retirement plans (Lusardi and Mitchell, 2011), stock market participation (Van Rooij et al., 2011), portfolio diversification (Guiso and Jappelli, 2008; Disney and Gathergood, 2013), asset holding and trading (Graham et al., 2009; Guiso and Viviano, 2015) debt and mortgages (Lusardi and Tufano, 2015), the search for financial advice (Calcagno and Monticone, 2015; Stolper, 2018). In general, results show that higher literacy is associated to a more careful management of individual and households resources.

Concerning financial literacy determinants, some common findings have been detected by the literature. As for the age profile, a non-linear hump-shaped relationship seems to emerge in several countries, indicating that financial knowledge is lowest among the young and the old (Lusardi and Mitchell, 2014; Finke et al., 2016). When it comes to education, its correlation with financial literacy turns out to be positive (Atkinson and Messy, 2012), even if such relationship could be influenced or driven by cognitive ability (Christelis et al., 2010). Personal competences have been shown to be related also to the family background, especially in the case of young individuals (OECD, 2014; Longobardi et al., 2017).

In addition, a gender gap is documented, with female being usually less literate than men (Lusardi and Mitchell, 2008; Atkinson and Messy, 2012; Fonseca et al., 2012; Mottola, 2013; Agarwalla et al., 2015; Bucher-Koenen et al., 2017; Lusardi, 2019). This gap already exists among teenagers (Chen and Volpe, 2002; Lhrmann et al., 2015) being correlated also with the presence of gender stereotypes (Driva et al., 2016) and with the socio–cultural environment women and men grew up in (Filipiak and Walle, 2015)[1]. Other explanations of gender differences are related to the division of labour in terms of household decision making, with men specializing in financial decisions (thereby acquiring greater financial knowledge) and women mostly performing other household functions (Fonseca et al., 2012). However, since women are likely to outlive their husbands, they might need to take over financial responsibilities and manage their own wealth once their husbands pass away. In this respect, Bucher-Koenen et al. (2017) find that financial illiteracy is as widespread among single women and widows as it is among married women while Hsu (2016) shows that women start investing in their own financial knowledge as widowhood becomes more imminent. Low levels of financial literacy among women might also affect relevant outcomes such as retirement planning (Lusardi and Mitchell, 2008), financial risk taking (Bannier and Neubert, 2016) and credit card behaviours (Mottola, 2013).

In Italy, the level of financial knowledge is low compared with the most advanced economies (Jappelli, 2010; Di Salvatore et al., 2018). Monticone (2010) highlights some factors that could have historically contributed to such an evidence. First, the

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[1]In a quasi-experimental setting, Filipiak and Walle (2015) compare individuals who live in a matrilineal cultural environment with those living in a patriarchal environment in India and find that the gender gap in financial literacy is significant only in the patriarchal environment, with matrilineal women being more literate than women living in patriarchal regions.

public pension system, which has traditionally provided quite high replacement rates at retirement, did not encourage individuals to actively manage their retirement savings. Second, financial markets are less developed in Italy compared to Anglo-Saxon countries and the financial culture is generally less widespread.

Financial literacy among Italian teenagers has been assessed through the OECD-PISA programme since 2012. An overview of the main findings of the first survey is offered in Montanaro and Romagnoli (2016). Longobardi et al. (2017) ... Becchetti et al. (2013) conduct a randomized experiment on high school students aimed at studying the effects of attending a course in finance on investment attitudes. Thanks to the course, the level of financial literacy increases significantly in the treated group, with stronger effects for those who had ex ante poorer notions of financial literacy such as females or students with poorer mathematics and Italian grades. Concerning college students, Bongini et al. (2015, 2016) examine a sample of undergraduate students attending a bachelor's degree in business studies in a large Italian university. They provide evidence about the lack of a gender gap as for the level of financial literacy. However, gender differences exist in perceived financial literacy, with women showing a lower confidence in their own financial knowledge.

Among the studies that investigated the link between financial literacy and outcomes based on Italian data, Guiso and Jappelli (2008) find a positive association between the level of financial knowledge and portfolio diversification. Calcagno and Monticone (2015) provide empirical evidence about the relationship between financial literacy and the demand for financial advice. Specifically, they show that financial knowledge and the quality of advice are complementary, that is having a high degree of financial literacy increases the probability of consulting an advisor while reducing the probability of delegating the portfolio choice. Paiella (2016) develops an analysis about the possible influence of financial literacy on the individual willingness to answer questions on expectations of future asset returns, pointing out a strong (positive) correlation between the two and offering a validation for a number of questions commonly used in surveys to assess financial competences.

3 Model specification and data

To analyse financial knowledge's determinants devoting specific attention to gender, we estimate the following model:

$$FL_{ijt} = \alpha + \beta \, gender_i + \gamma X_{ijt} + \delta_{ij} + \tau_t + \epsilon_{ijt} \tag{1}$$

where subscripts i, j and t denote individuals, regions and time respectively, FL_{ijt} is our measure for financial literacy, X_{ijt} is a matrix of socio-demographic characteristics, δ_{ij} are regional fixed effects, τ_t are time fixed effects and ϵ_{ijt} is the idiosyncratic error term.

As for the selection of the control variables, we follow the reference literature in order to get comparable results[2]. Specifically, we control for the age of respondents. In fact, since individuals' saving and decumulation choices can be viewed as a life cycle optimization process, it is reasonable to assume that financial literacy may change over the lifetime (Lusardi et al., 2011; Lusardi and Mitchell, 2014).

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[2]See Stolper and Walter (2017) for an update review of the contributions examining individual financial literacy's determinants.

Marital status is also included in the set of control variables because financial decisions and the management of household finances may be shared differently among family members, depending on the prevailing social norms or role models (Fonseca et al., 2012; Hsu, 2016). Furthermore, the presence of dependent family members within the household may affect financial decisions and behaviors (Mottola, 2013), and possibly also the level of financial knowledge. In our model, we control for the presence of children aged 14 or less within the household. Some studies find out that financial literacy may be influenced by racial and ethnic differences (Lusardi et al., 2010; Al-Bahrani et al., 2018). As a consequence, we include respondents' citizenship among the controls. Formal education is also expected to play a role in explaining the individual level of financial knowledge (among others, see Nicolini et al. (2013)). Actually, the association between these financial literacy and education could be driven by cognitive ability even though education has been shown to play a significant role even after controlling for cognitive ability, as highlighted in Lusardi and Mitchell (2014). The level of financial literacy may be also influenced by the professional occupation (Cupak et al., 2018; Di Salvatore et al., 2018). Accordingly, we include the professional status among the regressors to control for this possible source of heterogeneity among respondents. Finally, we include the Italian region of residence and the year of the survey as regional and time fixed effects respectively. Variable definitions and summary statistics are presented in Tables 2 and 3.

Our data source is the Survey on Household Income and Wealth by the Bank of Italy. Specifically, we use the most recent waves of the survey whose questionnaires include questions on financial knowledge, that is 2008, 2010 and 2016. In these years, financial knowledge is assessed through different sets of questions, which vary from one wave to the other. In 2016, respondents were asked to answer to three questions about: interest rate, inflation and risk diversification. These questions have been extensively used in the reference literature, starting from Lusardi and Mitchell (2008)[3]. In the other two waves, questions about financial knowledge still cover the concepts of inflation and risk diversification. However, a question about mortgages is considered instead of the one on the interest rate (which is not included in the questionnaire)[4].

Based on the referred questions, we defined our dependent variable for financial literacy as a dummy equal to 1 if all the considered answers are correct and equal to 0 otherwise. The variable is set to missing if at least one of the questions received no answer. Our sample is limited to household's heads and among them we focus on the panel component of the survey. Moreover, we restrict our analysis to individuals aged 20 to 85 years. The share of respondents who answered correctly to all the questions about financial knowledge is presented in Table 1. As data show, financial literacy is quite low in the sample thus confirming the general evidence previously provided with reference to Italy[5] and its incidence is significantly lower for women compared to men.

Concerning the estimation of model (1), since our dependent variable is defined as taking only two values, we use a binary response model, specifically a probit model. Moreover, given that we are interested in studying in particular the role of gender, which is a time-invariant variable, we use a random-effects probit model.

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[3]On the socalled *Big Three*-questions (Hastings et al., 2013) see also Lusardi and Mitchell (2014).
[4]For a complete list of financial literacy questions, see Appendix B.
[5]For a recent international comparison about financial literacy, see OECD (2017a)

Table 1: Financial literacy (% of respondents
who answer correctly to all the questions)

	All years	2008	2010	2016
All	31.57	26.19	40.37	28.14
Men	35.37	29.30	42.45	34.38
Women	25.89	21.55	37.28	18.83
*t-test p-value**	0.000	0.002	0.079	0.000

$^*H_0 : \text{diff} = mean(male) - mean(female) = 0; H_a: \text{diff} \neq 0.$

In this case, the error term of model (1) can be specified as $\epsilon_{ijt} = \eta_i + u_{ijt}$ with the unobserved individual effect η_i assumed to be independent from the included explanatory variables.

4   Empirical findings

To assess financial knowledge's determinants, we first estimated model (1) by adding one regressor at a time.

As shown in Table 4, a gender gap in financial knowledge emerges. The coefficient of the variable $female$ is always negative and statistically significant, showing that women are less likely to answer correctly to all the financial literacy questions. Such a result confirms an evidence which has been widely supported by the reference literature (OECD, 2017a; Stolper and Walter, 2017). Moreover, the coefficient maintains its sign and significance even if its size decreases as additional socio-demographic controls are included. This means that while the additional characteristics we control for can explain part of the gender gap in financial literacy, they do not fully cancel out gender disparities in this respect as Bucher-Koenen et al. (2017) show by using American, Dutch and German surveys. Specifically, when all the socio-demographic controls are included, the conditional marginal effects is equal to -0.042 (Table 5): the probability of being financial literate is approximately 4 percentage points lower for women than for men.

Concerning the age of respondents, one might expect financial literacy to be increasing with age, given the possibly increasing experience of individuals in terms of investment and saving decisions over the lifecycle. However, as highlighted by Atkinson and Messy (2012), two factors may oppose this trend: first, the difficulty for the oldest to keep up with the rapid changes affecting financial markets, including the introduction of new technologies, products and instruments; second, cognitive deterioration, which may reduce the extent to which elderly people can rely on and apply financial knowledge. In line with the arguments just referred, the distribution of financial literacy across age results to be hump-shaped in several studies (Cupak et al., 2018; Bucher-Koenen et al., 2017; Lusardi and Mitchell, 2011). As for our sample, a negative and significant association with financial knowledge is detected, meaning that the probability of answering correctly is lower for older household heads. Such a result could be driven by the specific composition of the analysed sample, where younger respondents account for a limited share of the total (slightly more than 8% are aged 40 years or less).

With regard to marital satus, a significant difference compared to the reference group (married) emerges only for widowed respondents, who turn out to be less likely to answer correctly to the analysed questions.

The coefficient on citizenship is always positive and statistically significant, denoting a higher probablity for Italian respondents to be financially literate compared to non-Italian citizens. If we consider the variable citizenship as a rough proxy for ethnicity, our findings confirm the evidence detected in other papers, according to which the level of financial literacy of ethnic minorities turns out to be lower (Fonseca et al., 2012; Lusardi and Mitchell, 2011; Al-Bahrani et al., 2018).

When it comes to education, the attainment of primary and lower secondary school does not translate into a higher likelihood of being financially literate in comparison with having no education at all; differently, the completion of at least vocational or high-school is associated with higher probability of answering correctly. Moreover, financial knowledge results to be increasing with the education level: respondents with vocational or high-school diploma are about 18 percentage points more likely to answer correctly to all the financial questions than those without education. The difference amounts to 25 percentage points for household heads having a university degree or more, as shown in Table 5. A similar evidence of positive and increasing association between formal education and financial knowledge is detected, among others, in Bucher-Koenen et al. (2017) and, for some of the analysed countries, also in Nicolini et al. (2013). Having financially dependent family members may increase the financial needs of a household and, together with this, it may influence the likelihood of being financially literate. Our estimates suggest however that having children aged 14 or less does not affect the probability of being financially literate. A similar result was found in Van Rooij et al. (2011) and Nicolini et al. (2013), where the presence of children turns out to be not significant in explaining financial literacy.

Finally, respondents who are retired or workers, independently on their job type, show a higher likelihood of answering correctly to all the questions compared to unemployed. Similar evidence, according to which employees and the selfemployed do better than the unemployed, is provided in Lusardi and Mitchell (2014). Also in Cupak et al. (2018), employed and self-employed respondents are more likely to be financially literate than not-working ones (in this case, however, retired people do not significantly differ from the reference category). In general, our findings show that current or past participation to the labor market contribute to/favours the knowledge of some basic economic and financial concepts.

To better investigate the role of gender, we estimate model (1) in the subsamples of men and women separately (Table 6, columns 2 and 3). The variable *age* maintains its significance only in the subsample of women, denoting for them a negative association with financial knowledge. In addition, once the sample is splitted in the two groups no significative difference is detected between being married and any other status. As for *citizenship*, the result obtained for the whole sample still holds when men and women are analysed separately.

The education variable shows a substantially different pattern among men and women. Its coefficient are never significant in the male subsample, whereas being always statistically significant for women, with higher probabilities of financial knowledge associated to increasing educational attainments. In this respect, our evidence departs from the findings in Fonseca et al. (2012), according to which men benefit more from education than women. Specifically, increasing education levels

are associated there with higher financial literacy for men, while among women only college graduates are more likely to be financially knowledgeable than women without a high-school degree.

When it comes to *children*, a significant and positive association with financial knolwedge emerges for women differently from Mahdavi and Horton (2014) who finds that in their sample of educated women having children exerts no influence on the probability of being financially literate.

Finally, while in the whole sample any professional status is associated with a higher probability of being financially literate compared to being unemployed, in the male subsample such a difference is significant only for managers and executives. Differently, among women, the difference with the reference category continues to be statistically significant for any occupational status except for blu-collar workers.

To get a closer look at the substantially different results concerning the education variable in the two subsamples, we estimate again model (1) for the whole sample by adding the interaction between *gender* and *education* (Table 6, column 4). Increasing levels of education for men do not exert any influence to the probability of being financially literate compared to the reference category (no education), confirming the result obtained for the men's subsample. Differently, the likelihood of being financially literate for women changes according to the educational level. Specifically, women who attained at least primary or lower secondary school show a higher probability of answering correctly compared to women without education. Margins shown in Table 7 can help assessing the size of the education premium. The probability of answering correctly for a woman with primary or lower secondary diploma is almost 9 percentage points higher compared to a woman without education. Assuming the same reference category, a vocational or a high school degree increases the difference to approximately 25 percentage points. The gap widens up to 30 percentage points with an academic degree.

Concerning the gender gap by education level, results show that it is significant only up to lower secondary school. According to the linear combination of the margins (Table 7), women with no education have a probability of being financially literate which is 21.4 percentage points lower than men with no education. Such a difference drops to slightly more than 6 percentage points when respondents has attained primary or lower secondary education. Differently, the gap between men and women is not significant for higher levels of education.

The latter evidence differs from the results obtained in other studies which assess financial literacy among educated people. Specifically, by focussing on a sample of college students in the United States, Chen and Volpe (2002) detect the presence of a statistically significant difference between men and women (in favor of the former) in the probability of being financially literate. Similarly, by looking at a sample of undergraduate business school students, Ford and Kent (2009) find statistically significant differences between men and women concerning attitudes and awareness about financial markets with women resulting more intimidated, less interested and less aware.

5 Robustness checks

In order to test the soundness of the findings discussed in the previous paragraphs, we carried out some robustness checks. Specifically, we used an alternative definition of the dependent variable. In addition, we controlled for a possible "learning effect".

Furthermore, we run the model for different subsamples, defined on the basis of the median age of the respondents. Finally, we show results obtained by estimating model (1) by means of a linear probability model. In what follows, we assume the estimates shown in Table 6, columns 1-3 as a reference for the model without interaction; differently, for the model including the gender-education interaction, the reference is Table 6, column 4.

Alternative dependent variable

As a first check of our results, we use an alternative definition of the dependent variable ($flit\_cat$). For each wave of the survey, it has been computed as the share of correct answers over the totalTo estimate model (1), we apply a random-effects linear panel estimator. Estimates are shown in Table 10 and they substantially confirm the baseline results. As for the main differences, once the sample is splitted between men and women, education is now significant also for males. The probability of being financially literate increases with the education level in both the subsamples; however, the estimated coefficients are higher for women than for men. When the variables *gender* and *education* are interacted, the gender gap turns out to be significant only for the first two education levels (Table 13, Panel A), as in the reference estimates.

Learning effect

To ask people questions about the same topic over time (or even exactly the same questions) may induce some sort of practice effects (Bae et al., 2019), according to which improvements in test results arise, in general, from practicing task items and/or memorizing the questionnaire answers. To control for this possible effect, we create a dummy ($flit\_learn$) which is equal to one in two cases: (i) when the dummy for financial literacy is equal to zero in the first wave (2008) and then equal to one in the following waves (2010 and 2016); (ii) when the dummy for financial literacy is equal to zero in the first two waves (2008 and 2010) and it turns equal to one in the third wave (2016). In all other cases, the dummy $flit\_learn$ is equal to zero, thereby denoting the absence of any "learning effect". As a first check, we include the dummy $flit\_learn$ in model (1) as a control variable (Table 11, columns 1-4). The results of the reference models are confirmed, providing evidence of a gender gap which is significant for the lower education levels (up to lower secondary school), as shown in Table 13, Panel B. As a further check, we exclude from the sample the respondents having the dummy $flit\_learn$ equal to 1 (Table 11, columns 5-8). In this case, the results for the model without interaction confirm the reference ones for all the control variables but $female$, which is not significant (Table 11, column 5). Yet, in the specification including the interacted variables, the reference results are generally confirmed, with the gender gap being significant only for low levels of education (Table 13, Panel C).

Subsamples by age

As an additional check, we devote specific attention to the variable *age* . Specifically, we estimate model (1) with reference to different subsamples defined on the basis of the median age, which is 60; we apply such a threshold to the age of respondents in 2008. Results are shown in Table 12 and the main findings are described in what follows. In the model without the gender-education interaction (columns 1 and 2), the variable *female* is significant only among respondents older than 60 (with a negative coefficient). Education is not significant for the group of younger.

Differently, a positive and significant association between education and financial literacy emerges for household heads who are more than 60 years old and who have attained at least a vocational/high-school diploma. When we split the subsamples of men and women on the basis of the median age (columns 3-6), the education varibale is never significant for men and younger women. Differently, older women with a vocational/high-school or higher degree have a higher probability of being financially literate compared to women with no education.

The lack of significance of the citizenship variable for the older could be driven by the composition of the subsamples: in the group aged more than 60, only two respondents have non-Italian citizenship. The results about the presence of children aged 14 or less differ in the two subsamples (and also compared to the reference estimates): the estimated coefficient is positive and significant for the group of younger respondents, whereas it is negative (still significant) for the others. Also in this respect, subsample composition might exert a crucial role: only 28 out of 1451 respondents aged more than 60 have children< 14, 20 males and 8 females.

As for the model including the gender-education interaction (columns 7-8), increasing levels of education do not produce any effect on the likelihood of financial knowledge for men (no matter the age group they belong to). As for women (in both the age groups), education increases the likelihood of financial literacy only starting from vocational/high school level. Concerning the gender effect by education level, results show that the gap between women and men is never significant with reference to the group of younger respondents (Table 13, Panel D). Differently, the gap turns out to be significant for the lowest two levels of education (up to lower secondary) when older respondents are examined (Table 13, Panel E), as in the baseline results. For female respondents who are 60 or more in the years of the survey having attained an high-school diploma or a university degree represented in comparative terms an important source of knowledge, which could have contributed to close the gender gap for high levels of education.

Table 2: Variables and definitions

Variable (*label*)	Definition
Financial literacy (*flit*)	Dummy equal to one if the answers to all the financial literacy questions are correct
Gender (*female*)	Dummy equal to one if female
Age (*age*)	Age of the respondent
Italian citizenship (*cit_IT*)	Dummy equal to one if Italian citizenship
Marital status (*mstat*)	Marital status of the respondent
1*	married*
2	unmarried
3	divorced
4	widowed
Education (*edu*)	Level of education of the respondent
0*	none*
1	primary or secondary certificate
2	vocational or high-school diploma
3	university degree or more
Children (*kids*)	Dummy equal to one if there are children within the household aged 14 or less
Job (*job*)	Professional status of the respondent
0*	unemployed*
1	blue-collar worker
2	office worker
3	manager, executive
4	self-employed (business-owner, member of profession, other self-employed)
5	retired
Region of residence (*reg*)	Italian region of residence
Year of the survey (*year*)	Year when the survey is carried out
0*	2008*
1	2010
2	2016

* is the reference group in our estimates.

Table 3: Summary statistics

Variable	Obs	Mean	Std.Dev.	Min	Max
Financial literacy	3747	0.324	0.468	0	1
Female	3849	0.401	0.490	0	1
Age	3849	59.419	12.769	20	85
Italian citizenship	3849	0.970	0.171	0	1
Children	3849	0.175	0.380	0	1
Marital status					
married	3849	0.674	0.469	0	1
unmarried	3849	0.096	0.294	0	1
divorced	3849	0.079	0.270	0	1
widowed	3849	0.151	0.358	0	1
Education					
none	3849	0.028	0.164	0	1
primary or secondary certificate	3849	0.494	0.500	0	1
vocational or high-school diploma	3849	0.356	0.479	0	1
university degree or more	3849	0.123	0.328	0	1
Job					
unemployed	3849	0.121	0.326	0	1
blue-collar worker	3849	0.128	0.334	0	1
office worker	3849	0.140	0.347	0	1
manager, executive	3849	0.044	0.204	0	1
self-employed	3849	0.106	0.308	0	1
retired	3849	0.461	0.499	0	1
Year of the survey					
2008	3849	0.333	0.471	0	1
2010	3849	0.333	0.471	0	1
2016	3849	0.333	0.471	0	1

Table 4: Random-effects probit model

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Female	-0.292***	-0.305***	-0.250***	-0.257***	-0.236***	-0.236***	-0.131**
	(0.058)	(0.057)	(0.063)	(0.063)	(0.060)	(0.060)	(0.065)
Age		-0.012***	-0.011***	-0.013***	-0.007***	-0.006**	-0.008**
		(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)
Marital status							
unmarried			-0.074	-0.076	-0.124	-0.101	-0.132
			(0.092)	(0.092)	(0.088)	(0.091)	(0.092)
divorced			-0.026	-0.039	-0.057	-0.044	-0.079
			(0.100)	(0.099)	(0.096)	(0.097)	(0.098)
widowed			-0.201**	-0.189**	-0.104	-0.102	-0.190**
			(0.091)	(0.091)	(0.088)	(0.088)	(0.091)
Italian citizenship				0.587***	0.555***	0.556***	0.445***
				(0.168)	(0.162)	(0.162)	(0.169)
Education							
primary or secondary					0.201	0.201	0.224
					(0.189)	(0.189)	(0.189)
vocational or high-school					0.638***	0.639***	0.606***
					(0.193)	(0.193)	(0.194)
university or more					0.877***	0.875***	0.784***
					(0.202)	(0.202)	(0.203)
Children (<14)						0.075	0.072
						(0.077)	(0.077)
Job							
blue-collar worker							0.222*
							(0.116)
office worker							0.368***
							(0.110)
manager, executive							0.590***
							(0.148)
self-employed							0.512***
							(0.118)
retired							0.383***
							(0.108)
Year of the survey							
2010	0.512***	0.536***	0.533***	0.533***	0.519***	0.518***	0.527***
	(0.057)	(0.057)	(0.057)	(0.057)	(0.057)	(0.057)	(0.057)
2016	0.117**	0.214***	0.209***	0.220***	0.165***	0.162***	0.181***
	(0.058)	(0.060)	(0.060)	(0.060)	(0.061)	(0.061)	(0.061)
Constant	-1.343***	-0.611***	-0.693***	-1.146***	-1.801***	-1.893***	-2.070***
	(0.146)	(0.194)	(0.200)	(0.239)	(0.307)	(0.321)	(0.353)
Italian region of residence	x	x	x	x	x	x	x
LR test of $\rho = 0$	42.47	36.72	35.46	32.33	15.68	15.75	14.85
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Observations	3,747	3,747	3,747	3,747	3,747	3,747	3,747
Number of nquest	1,283	1,283	1,283	1,283	1,283	1,283	1,283

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 5: Random-effects probit model, *conditional marginal effects* (at means)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Female	-0.091***	-0.096***	-0.079***	-0.081***	-0.076***	-0.076***	-0.042**
	(0.018)	(0.017)	(0.019)	(0.019)	(0.019)	(0.019)	(0.021)
Education							
primary or lower secondary					0.053	0.053	0.060
					(0.046)	(0.046)	(0.047)
vocational or high-school					0.194***	0.194***	0.184***
					(0.048)	(0.048)	(0.049)
university or more					0.281***	0.280***	0.248***
					(0.053)	(0.053)	(0.054)
Other socio-demographic controls*	x	x	x	x	x	x	x
Italian region of residence	x	x	x	x	x	x	x
Observations	3,747	3,747	3,747	3,747	3,747	3,747	3,747

*Control variables are included in the same order as in Table 4. Delta-method standard errors in parentheses.
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 6: Random-effects probit model (*gender-education interaction*)

VARIABLES	All (1)	Men (2)	Women (3)	All_interact (4)
Female	-0.131**	-	-	-0.810**
	(0.065)			(0.394)
Age	-0.008**	-0.006	-0.009*	-0.007**
	(0.003)	(0.005)	(0.005)	(0.003)
Marital status				
unmarried	-0.132	-0.201	-0.062	-0.137
	(0.092)	(0.125)	(0.142)	(0.092)
divorced	-0.079	-0.131	-0.041	-0.078
	(0.098)	(0.153)	(0.132)	(0.098)
widowed	-0.190**	-0.199	-0.076	-0.160*
	(0.091)	(0.167)	(0.122)	(0.092)
Italian citizenship	0.445***	0.404**	0.626**	0.439***
	(0.169)	(0.202)	(0.316)	(0.169)
Education				
primary or lower secondary	0.224	-0.227	0.396*	-0.192
	(0.189)	(0.326)	(0.240)	(0.319)
vocational or high-school	0.606***	0.109	0.880***	0.123
	(0.194)	(0.329)	(0.252)	(0.322)
university or more	0.784***	0.286	1.020***	0.315
	(0.203)	(0.338)	(0.274)	(0.330)
Female × Education				
female × primary or secondary				0.588
				(0.398)
female × vocational or high-school				0.780*
				(0.401)
female × university or more				0.738*
				(0.419)
Children	0.072	-0.075	0.303**	0.076
	(0.077)	(0.099)	(0.125)	(0.077)
Job				
blue-collar worker	0.222*	0.073	0.236	0.213*
	(0.116)	(0.202)	(0.166)	(0.116)
office worker	0.368***	0.123	0.503***	0.352***
	(0.110)	(0.201)	(0.144)	(0.111)
manager, executive	0.590***	0.435*	0.655**	0.593***
	(0.148)	(0.225)	(0.287)	(0.148)
self-employed	0.512***	0.320	0.614***	0.511***
	(0.118)	(0.201)	(0.190)	(0.118)
retired	0.383***	0.138	0.448***	0.367***
	(0.108)	(0.196)	(0.149)	(0.109)
Year of the survey				
2010	0.527***	0.466***	0.611***	0.526***
	(0.057)	(0.073)	(0.094)	(0.057)
2016	0.181***	0.257***	0.035	0.179***
	(0.061)	(0.078)	(0.102)	(0.061)
Constant	-2.070***	-1.387***	-2.716***	-1.648***
	(0.353)	(0.506)	(0.547)	(0.427)
Italian region of residence	x	x	x	x
LR test of $\rho = 0$	14.85	10.64	1.199	14.18
p-value	0.000	0.001	0.137	0.000
Observations	3,747	2,251	1,496	3,747
Number of nquest	1,283	768	515	1,283

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 7: Gender effect by education level **and education effect by gender** (margins of interactions and linear combinations)

$gender \times education$	**Margins**	**Std.Err.(*)**	**P> $|z|$**
$male \times edu_0$	0.327	0.107	0.002
$male \times edu_1$	0.265	0.016	0.000
$male \times edu_2$	0.370	0.019	0.000
$male \times edu_3$	0.440	0.033	0.000
$female \times edu_0$	0.113	0.043	0.008
$female \times edu_1$	0.202	0.018	0.000
$female \times edu_2$	0.360	0.025	0.000
$female \times edu_3$	0.414	0.044	0.000

(*) Delta-method standard errors.

Linear combination of margins	**Coef.**	**Std.Err.**	**P> $|z|$**
$(male \times edu_1) - (male \times edu_0)$	-0.062	0.108	0.565
$(male \times edu_2) - (male \times edu_0)$	0.043	0.109	0.696
$(male \times edu_3) - (male \times edu_0)$	0.113	0.113	0.318
$(female \times edu_1) - (female \times edu_0)$	0.088	0.045	0.050
$(female \times edu_2) - (female \times edu_0)$	0.246	0.050	0.000
$(female \times edu_3) - (female \times edu_0)$	0.300	0.062	0.000
$(female \times edu_0) - (male \times edu_0)$	-0.214	0.115	0.064
$(female \times edu_1) - (male \times edu_1)$	-0.063	0.025	0.012
$(female \times edu_2) - (male \times edu_2)$	-0.010	0.032	0.750
$(female \times edu_3) - (male \times edu_3)$	-0.026	0.054	0.628

Table 8: Random-effects linear probability model

VARIABLES	All sample							Men	Women	All_interact
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Female	-0.086***	-0.089***	-0.073***	-0.075***	-0.068***	-0.068***	-0.037*	-	-	-0.177*
	(0.017)	(0.017)	(0.019)	(0.019)	(0.018)	(0.018)	(0.019)			(0.108)
Age		-0.004***	-0.003***	-0.004***	-0.002***	-0.002**	-0.002**	-0.002	-0.002	-0.002*
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Marital status										
unmarried			-0.024	-0.024	-0.038	-0.031	-0.041	-0.064	-0.019	-0.042
			(0.028)	(0.028)	(0.027)	(0.028)	(0.028)	(0.039)	(0.040)	(0.028)
divorced			-0.013	-0.017	-0.022	-0.018	-0.027	-0.049	-0.009	-0.027
			(0.030)	(0.030)	(0.029)	(0.030)	(0.030)	(0.049)	(0.037)	(0.030)
widowed			-0.052**	-0.048*	-0.025	-0.025	-0.050*	-0.058	-0.019	-0.045*
			(0.026)	(0.026)	(0.025)	(0.025)	(0.026)	(0.051)	(0.033)	(0.027)
Italian citizenship				0.186***	0.177***	0.177***	0.140***	0.134**	0.173**	0.138***
				(0.050)	(0.048)	(0.048)	(0.050)	(0.063)	(0.084)	(0.050)
Education										
primary or secondary					0.033	0.033	0.040	-0.073	0.066	-0.057
					(0.049)	(0.049)	(0.049)	(0.098)	(0.053)	(0.094)
vocational or high-school					0.167***	0.168***	0.156***	0.035	0.198***	0.046
					(0.050)	(0.050)	(0.050)	(0.100)	(0.058)	(0.094)
university or more					0.251***	0.250***	0.219***	0.098	0.254***	0.112
					(0.054)	(0.054)	(0.054)	(0.103)	(0.066)	(0.097)
Female × Education										
fem. × prim. or sec.										0.126
										(0.109)
fem. × vocat. or high-sc.										0.162
										(0.110)
fem. × univ. or more										0.153
										(0.117)
Children						0.025	0.023	-0.025	0.094***	0.024
						(0.023)	(0.023)	(0.031)	(0.036)	(0.023)
Job										
blue-collar worker							0.055*	0.017	0.061	0.054
							(0.033)	(0.061)	(0.045)	(0.033)
office worker							0.101***	0.031	0.150***	0.098***
							(0.032)	(0.061)	(0.041)	(0.032)
manager, executive							0.185***	0.142**	0.210**	0.186***
							(0.045)	(0.069)	(0.087)	(0.045)
self-employed							0.151***	0.099	0.182***	0.151***
							(0.035)	(0.061)	(0.055)	(0.035)
retired							0.101***	0.040	0.108***	0.098***
							(0.031)	(0.060)	(0.039)	(0.031)
Year of the survey										
2010	0.155***	0.162***	0.161***	0.162***	0.158***	0.157***	0.159***	0.147***	0.174***	0.158***
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.023)	(0.025)	(0.017)
2016	0.029*	0.058***	0.056***	0.060***	0.044**	0.043**	0.048***	0.077***	0.003	0.047***
	(0.017)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.024)	(0.027)	(0.018)
Constant	0.108***	0.322***	0.301***	0.156**	-0.019	-0.049	-0.092	0.072	-0.223	0.005
	(0.038)	(0.055)	(0.057)	(0.068)	(0.085)	(0.089)	(0.098)	(0.153)	(0.138)	(0.124)
Italian region of residence	x	x	x	x	x	x	x	x	x	x
Observations	3,747	3,747	3,747	3,747	3,747	3,747	3,747	2,251	1,496	3,747
Number of nquest	1,283	1,283	1,283	1,283	1,283	1,283	1,283	768	515	1,283

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 9: Random-effects linear probability model (robust)

	All sample							Men	Women	All_interact
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Female	-0.086***	-0.089***	-0.073***	-0.075***	-0.068***	-0.068***	-0.037*	-	-	-0.177
	(0.017)	(0.017)	(0.019)	(0.018)	(0.018)	(0.018)	(0.020)			(0.122)
Age		-0.004***	-0.003***	-0.004***	-0.002***	-0.002**	-0.002**	-0.002	-0.002	-0.002**
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Marital status										
unmarried			-0.024	-0.024	-0.038	-0.031	-0.041	-0.064	-0.019	-0.042
			(0.030)	(0.030)	(0.028)	(0.029)	(0.029)	(0.041)	(0.043)	(0.029)
divorced			-0.013	-0.017	-0.022	-0.018	-0.027	-0.049	-0.009	-0.027
			(0.033)	(0.033)	(0.031)	(0.031)	(0.031)	(0.050)	(0.040)	(0.031)
widowed			-0.052**	-0.048**	-0.025	-0.025	-0.050**	-0.058	-0.019	-0.045*
			(0.023)	(0.024)	(0.022)	(0.022)	(0.023)	(0.042)	(0.032)	(0.024)
Italian citizenship				0.186***	0.177***	0.177***	0.140***	0.134**	0.173***	0.138***
				(0.046)	(0.044)	(0.044)	(0.045)	(0.058)	(0.064)	(0.045)
Education										
primary or secondary					0.033	0.033	0.040	-0.073	0.066*	-0.057
					(0.041)	(0.042)	(0.042)	(0.116)	(0.034)	(0.118)
vocational or high-school					0.167***	0.168***	0.156***	0.035	0.198***	0.046
					(0.044)	(0.044)	(0.044)	(0.117)	(0.042)	(0.119)
university or more					0.251***	0.250***	0.219***	0.098	0.254***	0.112
					(0.049)	(0.049)	(0.049)	(0.120)	(0.057)	(0.122)
Female × Education										
fem. × prim. or sec.										0.126
										(0.123)
fem. × vocat. or high-sc.										0.162
										(0.125)
fem. × univ. or more										0.153
										(0.133)
Children						0.025	0.023	-0.025	0.094**	0.024
						(0.025)	(0.025)	(0.032)	(0.038)	(0.025)
Job										
blue-collar worker							0.055*	0.017	0.061	0.054*
							(0.032)	(0.059)	(0.044)	(0.032)
office worker							0.101***	0.031	0.150***	0.098***
							(0.031)	(0.060)	(0.043)	(0.031)
manager, executive							0.185***	0.142**	0.210*	0.186***
							(0.046)	(0.067)	(0.126)	(0.046)
self-employed							0.151***	0.099*	0.182***	0.151***
							(0.033)	(0.060)	(0.058)	(0.033)
retired							0.101***	0.040	0.108***	0.098***
							(0.027)	(0.059)	(0.034)	(0.028)
Year of the survey										
2010	0.155***	0.162***	0.161***	0.162***	0.158***	0.157***	0.159***	0.147***	0.174***	0.158***
	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.021)	(0.025)	(0.016)
2016	0.029*	0.058***	0.056***	0.060***	0.044**	0.043**	0.048***	0.077***	0.003	0.047***
	(0.017)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.025)	(0.025)	(0.018)
Constant	0.108***	0.322***	0.301***	0.156***	-0.019	-0.049	-0.092	0.072	-0.223**	0.005
	(0.025)	(0.046)	(0.048)	(0.059)	(0.073)	(0.079)	(0.089)	(0.157)	(0.109)	(0.137)
Italian region of residence	x	x	x	x	x	x	x	x	x	x
Observations	3,747	3,747	3,747	3,747	3,747	3,747	3,747	2,251	1,496	3,747
Number of nquest	1,283	1,283	1,283	1,283	1,283	1,283	1,283	768	515	1,283

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 10: Random-effects linear model (*alternative dependent variable: flit_cat*)

VARIABLES	All	Men	Women	All_interact
	(1)	(2)	(3)	(4)
Female	-0.064***	-	-	-0.202***
	(0.014)			(0.075)
Age	-0.003***	-0.002**	-0.003***	-0.003***
	(0.001)	(0.001)	(0.001)	(0.001)
Marital status				
unmarried	-0.048**	-0.050*	-0.040	-0.050**
	(0.020)	(0.026)	(0.032)	(0.020)
divorced	-0.013	0.015	-0.033	-0.012
	(0.021)	(0.032)	(0.029)	(0.021)
widowed	-0.058***	-0.050	-0.036	-0.046**
	(0.018)	(0.033)	(0.026)	(0.019)
Italian citizenship	0.147***	0.141***	0.155**	0.144***
	(0.035)	(0.041)	(0.065)	(0.035)
Education				
primary or secondary	0.143***	0.055	0.159***	0.063
	(0.034)	(0.064)	(0.042)	(0.065)
vocational or high-school	0.248***	0.134**	0.305***	0.139**
	(0.035)	(0.064)	(0.045)	(0.066)
university or more	0.300***	0.167**	0.375***	0.184***
	(0.038)	(0.067)	(0.052)	(0.068)
Female × Education				
female × primary or secondary				0.097
				(0.076)
female × vocational or high-school				0.175**
				(0.077)
female × university or more				0.197**
				(0.082)
Children (<14)	0.007	-0.014	0.037	0.008
	(0.016)	(0.020)	(0.027)	(0.016)
Job				
blue-collar worker	0.034	0.016	0.057*	0.029
	(0.023)	(0.038)	(0.034)	(0.023)
office worker	0.059***	0.035	0.073**	0.049**
	(0.022)	(0.039)	(0.032)	(0.022)
manager, executive	0.087***	0.087**	0.095	0.089***
	(0.031)	(0.044)	(0.066)	(0.031)
self-employed	0.079***	0.075*	0.067	0.078***
	(0.024)	(0.039)	(0.042)	(0.024)
retired	0.059***	0.038	0.053*	0.050**
	(0.021)	(0.038)	(0.029)	(0.021)
Year of the survey				
2010	0.091***	0.074***	0.115***	0.090***
	(0.011)	(0.014)	(0.018)	(0.011)
2016	-0.012	-0.007	-0.023	-0.013
	(0.012)	(0.015)	(0.019)	(0.012)
Constant	0.337***	0.432***	0.225**	0.425***
	(0.069)	(0.099)	(0.108)	(0.086)
Italian region of residence	x	x	x	x
Observations	3,747	2,251	1,496	3,747
Number of nquest	1,283	768	515	1,283

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 11: Random-effects probit model (*learning effect*)

					No learning effect ($flit\_learn == 0$)			
	All	Men	Women	All_interact	All	Men	Women	All_interact
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Female	-0.112*	-	-	-0.969**	-0.175	-	-	-1.065*
	(0.066)			(0.409)	(0.108)			(0.613)
Age	-0.007**	-0.007	-0.005	-0.007*	-0.016***	-0.014*	-0.015*	-0.015***
	(0.004)	(0.005)	(0.005)	(0.004)	(0.006)	(0.008)	(0.008)	(0.006)
Marital status								
unmarried	-0.133	-0.165	-0.124	-0.142	-0.118	-0.138	-0.105	-0.126
	(0.093)	(0.127)	(0.144)	(0.093)	(0.156)	(0.222)	(0.227)	(0.155)
divorced	-0.083	-0.120	-0.062	-0.081	-0.169	-0.336	-0.034	-0.163
	(0.099)	(0.153)	(0.134)	(0.099)	(0.160)	(0.256)	(0.205)	(0.160)
widowed	-0.189**	-0.196	-0.111	-0.159*	-0.287*	-0.382	-0.118	-0.257*
	(0.093)	(0.170)	(0.125)	(0.094)	(0.148)	(0.297)	(0.186)	(0.150)
Italian citizenship	0.323*	0.285	0.524	0.314*	0.531**	0.508	0.740	0.518*
	(0.172)	(0.204)	(0.328)	(0.172)	(0.265)	(0.322)	(0.501)	(0.265)
Education								
primary or secondary	0.252	-0.268	0.489*	-0.259	0.325	-0.274	0.527	-0.253
	(0.197)	(0.328)	(0.262)	(0.322)	(0.289)	(0.529)	(0.347)	(0.507)
vocational or high-school	0.607***	0.039	0.962***	0.020	0.918***	0.232	1.271***	0.232
	(0.201)	(0.331)	(0.273)	(0.324)	(0.298)	(0.536)	(0.368)	(0.512)
university or more	0.784***	0.237	1.041***	0.228	1.224***	0.639	1.431***	0.646
	(0.211)	(0.340)	(0.294)	(0.332)	(0.320)	(0.557)	(0.411)	(0.530)
Female × Education								
female × primary or secondary				0.760*				0.794
				(0.413)				(0.619)
female × vocational or high-school				0.979**				1.075*
				(0.416)				(0.626)
female × university or more				0.888**				0.789
				(0.434)				(0.663)
Children (<14)	0.073	-0.082	0.354***	0.078	0.025	-0.146	0.300	0.035
	(0.078)	(0.099)	(0.126)	(0.078)	(0.122)	(0.162)	(0.185)	(0.122)
Job								
blue-collar worker	0.185	0.026	0.221	0.178	0.143	-0.221	0.233	0.145
	(0.117)	(0.202)	(0.168)	(0.117)	(0.183)	(0.319)	(0.253)	(0.183)
office worker	0.339***	0.067	0.523***	0.324***	0.496***	0.034	0.718***	0.488***
	(0.110)	(0.202)	(0.145)	(0.111)	(0.177)	(0.330)	(0.220)	(0.178)
manager, executive	0.569***	0.386*	0.762***	0.574***	0.800***	0.307	1.265***	0.804***
	(0.148)	(0.225)	(0.288)	(0.148)	(0.235)	(0.367)	(0.410)	(0.235)
self-employed	0.467***	0.241	0.659***	0.469***	0.625***	0.214	0.737***	0.631***
	(0.119)	(0.202)	(0.193)	(0.119)	(0.189)	(0.327)	(0.282)	(0.189)
retired	0.376***	0.132	0.415***	0.361***	0.549***	0.110	0.612***	0.542***
	(0.109)	(0.198)	(0.152)	(0.110)	(0.169)	(0.318)	(0.222)	(0.171)
Learning effect	0.399***	0.347***	0.505***	0.398***	-	-	-	-
	(0.065)	(0.078)	(0.116)	(0.064)				
Year of the survey								
2010	0.499***	0.456***	0.555***	0.499***	0.392***	0.235**	0.594***	0.391***
	(0.058)	(0.073)	(0.096)	(0.058)	(0.073)	(0.095)	(0.115)	(0.073)
2016	0.137**	0.232***	-0.067	0.134**	-1.045***	-1.080***	-1.057***	-1.045***
	(0.063)	(0.079)	(0.106)	(0.063)	(0.098)	(0.127)	(0.160)	(0.098)
Constant	-2.063***	-1.191**	-3.098***	-1.550***	-2.511***	-1.313	-3.545***	-1.907***
	(0.362)	(0.509)	(0.579)	(0.431)	(0.596)	(0.870)	(0.896)	(0.712)
Italian region of residence	x	x	x	x	x	x	x	x
LR test of $\rho = 0$	10.54	7.390	0.516	9.847	113.9	80.11	21.17	111.6
p-value	0.001	0.003	0.230	0.001	0.000	0.000	0.000	0.000
Observations	3,561	2,154	1,407	3,561	2,862	1,641	1,221	2,862
Number of nquest	1,187	718	469	1,187	954	547	407	954

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 12: Random-effects probit model (*subsamples by age*)

VARIABLES	All		Men		Women		All_interact	
	age<=60	age>60	age<=60	age>60	age<=60	age>60	age<=60	age>60
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Female	-0.045	-0.219*	-	-	-	-	-0.821	-0.778*
	(0.081)	(0.116)					(0.854)	(0.446)
Age	0.003	0.001	0.005	0.009	0.002	-0.006	0.003	0.002
	(0.005)	(0.009)	(0.007)	(0.012)	(0.007)	(0.016)	(0.005)	(0.009)
Marital status								
unmarried	-0.046	-0.098	-0.111	-0.259	0.022	-0.034	-0.050	-0.141
	(0.118)	(0.162)	(0.160)	(0.222)	(0.179)	(0.257)	(0.118)	(0.163)
divorced	-0.152	0.118	-0.357*	0.248	0.002	0.008	-0.150	0.114
	(0.119)	(0.181)	(0.197)	(0.247)	(0.149)	(0.283)	(0.119)	(0.180)
widowed	-0.230	-0.113	-0.531	-0.069	-0.070	-0.021	-0.218	-0.111
	(0.149)	(0.125)	(0.379)	(0.185)	(0.173)	(0.194)	(0.151)	(0.125)
Italian citizenship	0.424**	-0.233	0.357	-0.218	0.559*		0.421**	-0.325
	(0.180)	(0.930)	(0.218)	(0.933)	(0.317)		(0.180)	(0.930)
Education								
prim. or lower secondary	0.137	0.195	-0.249	-0.159	0.367	0.389	-0.215	-0.179
	(0.412)	(0.213)	(0.589)	(0.384)	(0.638)	(0.279)	(0.579)	(0.375)
vocational or high-school	0.470	0.603***	0.058	0.211	0.778	1.083***	0.068	0.168
	(0.413)	(0.227)	(0.590)	(0.393)	(0.641)	(0.322)	(0.580)	(0.383)
university or more	0.630	0.812***	0.274	0.298	0.840	1.267***	0.286	0.291
	(0.420)	(0.252)	(0.598)	(0.418)	(0.653)	(0.386)	(0.587)	(0.406)
Female × Education								
fem. × prim. or lower sec.							0.718	0.491
							(0.858)	(0.453)
fem. × vocat. or high-sc.							0.853	0.689
							(0.857)	(0.480)
fem. × univ. or more							0.702	0.968*
							(0.870)	(0.535)
Children	0.166*	-0.658*	-0.019	-0.496	0.418***		0.169*	-0.628*
	(0.086)	(0.355)	(0.111)	(0.381)	(0.135)		(0.086)	(0.355)
Job								
blue-collar worker	0.252**		0.091		0.203		0.248**	
	(0.125)		(0.216)		(0.172)		(0.127)	
office worker	0.388***	0.947**	0.095	0.398	0.548***		0.384***	0.927**
	(0.121)	(0.403)	(0.216)	(0.773)	(0.155)		(0.123)	(0.405)
manager, executive	0.632***	1.227**	0.381	1.045	0.754**		0.628***	1.261**
	(0.163)	(0.540)	(0.244)	(0.844)	(0.293)		(0.163)	(0.538)
self-employed	0.617***	0.303	0.366*	0.160	0.716***	0.074	0.614***	0.293
	(0.134)	(0.319)	(0.219)	(0.717)	(0.205)	(0.640)	(0.134)	(0.319)
retired	0.434***	0.575**	0.152	0.375	0.552***	0.569**	0.431***	0.537**
	(0.132)	(0.245)	(0.219)	(0.684)	(0.191)	(0.282)	(0.134)	(0.246)
Year of the survey								
2010	0.493***	0.560***	0.438***	0.472***	0.565***	0.699***	0.494***	0.558***
	(0.072)	(0.098)	(0.092)	(0.122)	(0.116)	(0.163)	(0.072)	(0.098)
2016	0.106	0.121	0.153	0.167	0.010	-0.108	0.109	0.113
	(0.079)	(0.121)	(0.102)	(0.150)	(0.127)	(0.216)	(0.079)	(0.122)
Constant	-2.518***	-2.237*	-1.836**	-2.169	-3.066***	-2.902**	-2.135***	-1.817
	(0.557)	(1.164)	(0.780)	(1.413)	(0.844)	(1.277)	(0.688)	(1.194)
Italian region of residence	x	x	x	x	x	x	x	x
LR test of rho=0	12.360	1.482	8.656	0.550	0.285	0.000	12.28	1.294
p-value	0.000	0.112	0.002	0.229	0.297	0.498	0.000	0.128
Observations	2,293	1,451	1,391	857	902	573	2,293	1,451
Number of nquest	781	502	473	295	308	204	781	502

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 13: The gender effect by education level
(linear combination of the estimated coefficients)

		Coef.	Std.Err.	P$> |z|$
Panel A	$female + edu_0$	-0.202	0.075	0.007
	$female + edu_1$	-0.105	0.018	0.000
	$female + edu_2$	-0.026	0.020	0.192
	$female + edu_2$	-0.005	0.033	0.875
Panel B	$female + edu_0$	-0.969	0.409	0.018
	$female + edu_1$	-0.209	0.092	0.023
	$female + edu_2$	0.010	0.093	0.910
	$female + edu_3$	-0.081	0.149	0.588
Panel C	$female + edu_0$	-1.064	0.613	0.083
	$female + edu_1$	-0.270	0.147	0.065
	$female + edu_2$	0.011	0.153	0.945
	$female + edu_3$	-0.276	0.259	0.288
Panel D	$female + edu_0$	-0.821	0.854	0.336
	$female + edu_1$	-0.103	0.126	0.412
	$female + edu_2$	0.031	0.107	0.771
	$female + edu_2$	-0.119	0.174	0.494
Panel E	$female + edu_0$	-0.778	0.446	0.081
	$female + edu_1$	-0.287	0.134	0.032
	$female + edu_2$	-0.090	0.199	0.653
	$female + edu_2$	0.190	0.303	0.531

Appendices

Appendix A

Questions on financial knowledge from 2016 SHIW questionnaire:

- **Interest rate**

  C33 (QTASSO). Suppose you put 100 euros into a <no fee, tax free> savings account with a guaranteed interest rate of 2% per year. You don't make any further payments into this account and you don't withdraw any money. How much would be in the account at the end of 5 years, once the interest payment is made?

  - Less than 102 euros
  - Exactly 102 euros
  - More than 102 euros
  - Don't know
  - No answer

- **Inflation**

  C34 (QINT). Suppose you put 1,000 euros into a <no fee, tax free> savings account with a guaranteed interest rate of 1% per year. Suppose furthermore inflation stays at 2 per cent. In one year's time will you be able to buy the same amount of goods that you could buy by spending today 1,000 euros?

  - Yes
  - No, less than I could buy today
  - No, more than I could buy today
  - Don't know
  - No answer

- **Risk diversification**

  C35 (QRISK1). In your opinion, the purchase of shares of one company usually provides a safer return than buying shares of a wide range of companies through a mutual fund?

  - True
  - False
  - Don't know
  - No answer

Questions on financial knowledge from 2010 SHIW questionnaire:

- **Mortgage**

  C35 (QMUTUO). Which of the following types of mortgage do you think would allow you from the very start to fix the maximum amount and number of instalments to be paid before the debt is extinguished?

  - Floating-rate mortgage
  - Fixed-rate mortgage
  - Floating-rate mortgage with fixed instalments

- Don't know
- No answer

- **Inflation**

  C36 (QINT). Imagine leaving 1,000 euros in a current account that pays 1% interest and has no charges. Imagine that inflation is running at 2%. Do you think that if you withdraw the money in a 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
  - No answer

- **Risk diversification**

  C37 (QRISK1). Which of the following investment strategies do you think entails the greatest risk of losing your capital?

  - Investing in the shares of a single company
  - Investing in the shares of more than one company
  - Don't know
  - No answer

Questions on financial knowledge from 2008 SHIW questionnaire:

- **Mortgage**

  C44 (QMUTUO). Which of the following types of mortgage do you think would allow you from the very start to fix the maximum amount and number of instalments to be paid before the debt is extinguished?

  - Foating-rate mortgage
  - Fixed-rate mortgage
  - Floating-rate mortgage with fixed instalments
  - Don't know

- **Inflation**

  C46 (QINT). Imagine leaving 1,000 euros in a current account that pays 1% interest and has no charges. Imagine that inflation is running at 2%. Do you think that if you withdraw the money in a 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

- **Risk diversification 1**

  C47 (QRISK1). Which of the following investment strategies do you think entails the greatest risk of losing your capital?

  - Investing in the shares of a single company

- Investing in the shares of more than one company
- Don't know

- **Risk diversification 2**

  C48 (QRISK2). A company can be financed by issuing either shares (equity securities) or bonds (debt securities). Which do you think is most risky for the investor?

  - Shares
  - Bonds
  - They are equally risky
  - I don't know the difference between shares and bonds
  - Don't know

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