Ask a question, get an answer. A study of the framing effect on financial literacy in Italy

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Abstract

This paper takes its cue from the relevance of the framing effect related to behavioural biases associated with economic decision-making. Most attempts to measure financial literacy rely on surveys that include standardized questions about the knowledge of three or four fundamental concepts. A survey conducted in October 2021 that involved 2500 individuals representative of the Italian population made it possible to evaluate whether questions with different wording created higher respondent engagement, determined other answers and improved performance in terms of financial literacy. The descriptive and regression analysis showed that the wording mattered in three out of four questions. More engaging wording mitigated the gender effect by reducing the probability of women choosing the 'I do not know' option. However, while there was evidence of an increase in the percentage of correct answers in single questions, the overall level of financial literacy showed no signs of improvement. The regression analysis found that the likelihood of being financially literate, independently of the type of question, depends on sociodemographic variables (gender, age, geographical area and level of education) and on self-evaluation of digital and economic skills. In addition, knowledge of basic maths plays a key role. Whoever knows how to compute a percentage correctly has a notably higher probability of being financially literate. This evidence has clear policy indications.

1. Introduction

The importance of financial education has grown over time, since several long-term decisions, which were previously addressed by generous public welfare programmes, are now up to individuals. We need to make complex decisions at a very early stage of our adult lives, often needing to choose amongst complicated options, products and services. Mastering a few personal finance concepts is of great help in making simple autonomous choices and particularly relevant to selecting whom to trust when our money is at stake.

Over the last decades, a series of financial crises have demonstrated the economic fragility of people with lower levels of financial education (see Klapper et al., 2012). Being familiar with the concepts of risk and diversification and knowing that human activities, including financial transactions, are affected by stochastic events are useful when exogenous shocks increase the probability of losses. Furthermore, a statistically significant correlation[1] between a higher level of financial education and a lower degree of social inequality provides grounds for inclusive and sustainable growth, which is also furthered by better personal money management skills.

Generally, measurement of the level of financial education is inferred by the answers to a standardized survey that was established by the pioneering research of Lusardi and Mitchell (2008, 2011a, 2011b) and distributed worldwide, which enabled comparison of the results. The 2014 Standard & Poor's and Gallup[2] survey provides an overview of the status quo. This survey shows that, on average, 67% of adults (48% in the EU and 63% in Italy) are financially illiterate, with differences according to country, gender, level of education and age. This evidence is backed up by the results of other empirical studies, including the study by Lusardi and Mitchell (2014). OECD surveys[3] conducted amongst adults (the most recent in June 2020) and youngsters (OECD-PISA) show a 'gap' for Italians that is related not only to knowledge but also to behaviour and attitudes and the permanence of a gender gap amongst the teenagers. The same qualitative evidence is provided by the Bank of Italy's IACOFI[4] survey. D'Alessio et al. (2020) confirm that Italy is still behind other countries despite a slight improvement in financial knowledge and the stability of behaviours and attitudes.

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[1] See Figure 4 in Batsaikhan (2018). According to Bianco et al. (2021), financial knowledge and the existence of financial capability/education strategies reduce the probability of a country being in the low financial inclusion segment. Higher financial inclusion, in turn, is usually associated with higher growth and lower inequality (ee Sethi and Acharya, 2018).

[2] Global Finlit Survey, S&P and Gallup 2014. The study tests the financial knowledge of 150,000 adults in 140 countries. https://gflec.org/initiatives/sp-global-finlit-survey/

[3] OECD survey reports are available at
https://www.oecd.org/finance/financial-education/measuringfinancialliteracy.htm. Italy is ranked last given Malta's exclusion due to partial completion of the questionnaire.

4 IACOFI surveys are available at:
https://www.bancaditalia.it/statistiche/tematiche/indagini-famiglie-imprese/alfabetizzazione/index.html

This study therefore aimed to understand whether the wording of a question affects the answer in the financial literacy questionnaire.

The pros of having a standardized survey are simplicity (i.e. involving basic concepts), relevance (i.e. related to daily life), brevity (i.e. more easily completed) and the capability to discriminate literacy levels. The contrasting side of standardization is that different cultural backgrounds may alter the perception of the question complexity. For example, the neutral wording of questions associated with the multiple-choice structure might be less familiar within a culture where school teaching methods rely on exams structured as a dialogue between teacher and student.

We know that decision-making may be influenced not only by knowledge - real or perceived - but also by emotional states of mind and the presence of behavioural biases. Behavioural economics acknowledges that the wording of a question might condition the chosen answer[5]. Much research has focused on how surveys are structured, suggesting that even a tiny change in the wording in the list of options and/or in the order of the questions may influence the chosen answers (De Bruin, 2011; Goldin et al., 2019).

A survey is always exposed to criticism related to its trustworthiness, use of self-assessment questions, possibility of random answers, misunderstanding of a question's meaning and, last but not least, sensitivity to the framing/wording of the question (Lusardi & Mitchell, 2009; Schmeiser & Seligman, 2013).

Empirical evidence shows that women and men, at an aggregate level, make decisions following different patterns. For example, in the case of a multiple-choice question, men seem better off than women also in domains apart from financial literacy. Women are more likely than men to be tempted to choose the 'I do not know' option (Baldiga, 2014) and, in general, are more sensitive to framing (amongst others, see Lusardi et al., 2014 and West et al., 2020).

In Italy, the teaching method has always favoured open written exams (essays) and oral exams (the so-called interrogations). The same teaching method was broadly adopted in universities until a decade ago, and many university courses continue to weigh the oral exam greatly in the final score. Multiple-choice questions may be unfamiliar to a large proportion of Italians, but the need to compare thousands of questionnaires prevents the use of open-question surveys. Likewise, neutral wording, which is preferable for simplicity, might be another obstacle, because it could heighten a respondent's observed lack of interest. An attempt was made in this study to reformulate the financial literacy questions to make them closer to actual problems and less abstract by favouring a sort of emotional involvement to trigger attention and increase willingness to provide a thoughtful answer, thus avoiding the 'I do not know' shortcut. According to Cassotti et al. (2012), positive emotional involvement can significantly mitigate the framing effect.

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[5] It is outside the scope of this paper to investigate these aspects in depth. The work of Tversky and Kahneman (1981) is considered the seminal reference that analyses the framing effect.

We find that the wording of financial literacy questions matters for a large proportion of the Italian population, namely women and Gen Z. At the single question level, alternative phrasing increased the number of correct answers. Unfortunately, this did not result in an improvement in the overall level of financial literacy, which remains low. Only around 37% and 30% of the Italian population are financially literate, depending on the wording.

This paper includes several econometric estimations, which explain the variability of financial literacy indexes as a function of various sociodemographic characteristics, self-assessment of digital and economic skills and maths knowledge. These factors explain a large share of the variance of the endogenous binary variable of 'literate' versus 'not literate' and the predicted probability of making mistakes.

The rest of the paper proceeds as follows. Section 2 describes the survey sample; section 3 highlights the characteristics of the so-called uncertain group (i.e. persons who either changed ideas, moving from being literate to being illiterate, depending on the wording, or chose the answer 'I am definitely not able to answer' in at least 20% of the questions). Section 4 analyses the 'best in class', namely, the individuals who answered the questions correctly independently of the wording used in the question. Section 5 offers a generational overview suggested by multiple findings on the impact of age on the level of financial literacy. In section 6, the heterogeneity of the relation amongst the literacy indexes, demographic groups and specific skills is explored. Section 7 is the conclusion.

2. Survey sample

In October 2021, an online survey[6] collected sociodemographic data and information on the knowledge of some basic financial concepts. A total of 2500 Italians aged between 18 and 74 were selected through a market research company to form a representative sample of the Italian population stratified by sex, age and geographical area.

The sociodemographic data provide insights into the respondents' characteristics (see **Tables 1** and **2**). **Table 1** shows a slightly higher prevalence of women compared to men and of respondents aged 45–74, who were more than 60% of the sample. Most respondents had completed high school (56.9%), and 27.3% had a college education or more (due to the online method, this percentage is a little higher than the national average, which was 20% in 2020 according to ISTAT). As for the geographical distribution, a higher percentage of respondents lived in the area categorized as south and islands. Other areas followed in line with the number of inhabitants per region. About 27% of the respondents lived in centres with more than 100,000 inhabitants. The respondents' professions were grouped into 17 categories: about 27% of the respondents were employees, 20% were retirees, 10% were homemakers, 9% were workers, 7% were unemployed, 5% were self-employed, 3% were executives and 2% were entrepreneurs. The questionnaire included two questions to self-assess

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[6] The survey used the computer-assisted web interviewing (CAWI) method. The questionnaire included 21 multiple-choice questions.

respondents' digital skills and level of economic knowledge (see **Table 2**). In both cases, significant differences (Pearson's chi-squared test significant at the 1% level) related to sex and age. The women had lower self-esteem, as expressed in lower scores; similarly, the respondents aged 55 or more were less confident in their abilities than the younger respondents.

Table 3 shows the financial literacy questions. Section A presents the four questions with the standard wording. The results, displayed by gender and age, indicate a significant gap in the percentage of correct answers between men and women (10.2% on average across the questions) and a higher number of correct answers given by respondents aged 55 or more.

Section B reports the financial questions with the alternative wording. The comparison between sections A and B reveals an increase in correct answers for the question on simple interest. The percentage rises from 67% to 71%. The improvement is seen in the men, the women and the younger generations and is statistically significant (p=0.01)[7]. The question on diversification collected a lower number of correct answers in the alternative version (-5.8 percentage points[pp])[8]. In addition, there are signs of a profound misunderstanding, indicated by the number of respondents who associated investments in real estate and public bonds with a low-risk scenario. In favour of the alternative wording, it is notable that the number of respondents who chose to invest only in one stock decreased from 9.7% to 1.9%. The question about inflation did not show relevant differences due to the wording. However, only 38% of the respondents who chose the option 'no' in the alternative version answered subquestion 3 correctly, which is a clear sign of difficulties in computing simple maths operations quickly. Finally, question 4 recorded a higher percentage of correct answers in the alternative version than in the standard version (the difference is 2.6 pp, significant at the 6% probability level).

Overall, we can infer the following:

- In 75% of the questions, the framing effect changed the chosen answer;
- The question on inflation was the only one where the rephrasing had no impact;
- The alternative wording helped uncover a profound misunderstanding of the diversification concept;
- In all the rephrased questions, the percentage of women choosing the option 'I am definitely not able to answer'[9] was lower than in the standard version (see **Table 4**, where the denominator is the number of the respondents who chose that option);
- **Table 3** highlights a reduction by 3.4 pp in the gender gap from 10.2% to 6.8%, on average, across the four rephrased questions.

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[7] According to the z test for equality of two percentages.

[8] 1% significance level.

[9] This phrase is equivalent to the 'I do not know' option but is less soft. It recalls the idea of individual capacity/ability and was present in both versions of the questionnaire to push the respondent to evaluate the alternative options more thoroughly.

Table 5 summarises three additional questions. Question (Q) 5 is about interest expenses and helps measure the level of understanding of the simple interest concept. Surprisingly, only 45% of the respondents answered correctly, while 52% of those who chose the correct option for Q1, either in the standard or the alternative mode, answered Q5 well. Moreover, only 8% of the respondents who gave a wrong answer to Q1 selected the correct answer in the case of the interest expenses. This provides evidence that the concept of 'simple interest rate', despite being associated with the highest number of correct answers, seems to be associated with a superficial grasp of the concept.

The remaining two questions evaluated maths skills through percentages and conditional probability.

As expected, given the pandemic experience, the percentages were computed correctly by 70% of the respondents, with the usual caveats related to sex and age.

On the contrary, Q7, about conditional probability, showed deficiencies related to the specific concept with a high propensity to mix up unconditional probability with conditional probability. Education seemed to exert an impact: the respondents with a college or higher degree replied correctly 40% of the time, whereas for the group with the lowest educational level, this percentage dropped to 20%. Despite being wrong, 49.6% of the respondents chose the option 50%, which was a mistake made by around 50% of the highly educated respondents.

3. Uncertain

In this section, the focus is on the respondents who switched answers depending on the wording. They are the uncertain, the individuals who are likely not to have a perfect grasp of the meaning of the questions (see **Table 6**).

Regarding the simple interest rate question (Q1), 84.5% of those who answered the standard question correctly also chose the correct answer when the question used the alternative wording, which also attracted correct answers from the respondents who selected choice 2 or 3 in the standard version (the shift was 63% and 52% of the respondents, respectively). On the contrary, only a small group of respondents amongst those who chose the wrong options in the alternative wording, answered Q1 correctly in the standard version. At an aggregate level, the women were more undecided than the men. The respondents who declared that they were unable to answer were, instead, more static; they knew for sure that they do not know.

As for the question about diversification (Q2), 64% of the respondents who chose the right option in the standard wording also answered the question with the alternative wording correctly. The latter also attracted correct answers from those who made mistakes or chose the shortcut 'I am definitely not able to answer' in the standard version (70% of the switches overall). In the opposite direction, the number of shifts was much less relevant (only 34%); those who were wrong in the alternative wording did not change their mind. The women seemed more disposed to change their opinions than the men.

Regarding Q3, which was on inflation, 82% of the respondents who chose the right option in the standard wording also answered the alternative version correctly. Here too, the shift from a wrong answer in the standard version towards a correct answer in the alternative one is relevant but not vice versa. A total of 73% of the participants who were unable to answer the standard version chose the same option in the alternative wording. Also, in this case, the percentage of the women who changed opinions was higher than for the men. The same holds for the respondents aged 55 years or over versus the younger generation.

Finally, Q4, which was on compound interest, showed that 69% of the individuals who chose the correct answer did so in both versions. A total of 53% of respondents who made the wrong choice in the standard version chose the right option in the alternative formulation; the reverse happened only 20% of the time. Here too, the women changed opinion more frequently than the men, as well as the cohort of individuals aged 55 or over.

Overall, we can identify some shared features. For all the financial literacy questions, uncertainty was higher amongst the respondents who chose the wrong answer to a question phrased in the standard way: they were more willing to change ideas and select the correct answer in the alternative wording. The women were very undecided as were, in some cases, the respondents aged 55 years and over.

4. Best in class

This section focuses on the financially literate individuals who answered Q1, Q2, Q3 and Q4 correctly, independently of the type of wording.

Table 7 presents the correlation coefficients between the variables that represent those who answered each question correctly in both versions (Super_Q1, Super_Q2, Super_Q3, Super_Q4) and the binary variables (0, 1) related to questions Q5, Q6 and Q7, where 0 corresponds to a wrong answer or to 'I am definitely not able to answer' and 1 indicates the correct answer.

It is worth noting that the correlation between super experts is statistically significant but not higher than 36%, and the correlations with the additional questions show that knowing how to compute percentages matters more than knowing about conditional probability.

Table 8 presents the essential features of the super experts for each question and of the financial literates who answered three or four questions well in the standard or the alternative versions. Finlit3_STD contains those who, in the standard version, correctly answered the BIG3 (i.e. the first three questions in **Table 3**, section A), while Finlit4_STD includes those who correctly answered four questions (BIG4). Finlit3_ALT and Finlit4_ALT, similarly, define those who correctly answered three or four questions in the alternative wording, that is, the questions in **Table 3**, section B.

For completeness, **Table 8** shows the data related to the super literates, those who answered all the questions correctly, independently of the wording (Super_Finlit3, Super_Finlit4). It is a subsample of the Finlit group.

The matrix confirms that simple interest was the best-known concept[10]. The alternative wording was associated with a reduction in the number of literates. Super literates are a minority. The share of the Italian literate population went from a maximum of 37% for Finlit3_STD to a low of 10% for Super_Finlit4. All the literacy indicators showed a gender gap, with differences ranging from 14% (for Finlit3_STD) to 7% (for Finlit4_ALT) and a higher level of literacy of baby boomers compared to millennials, Gen X and Gen Y.

5. Financial literacy across four Italian generations

This section examines the level of financial literacy across four generations of the Italian population. Each generation covers different career and life stages and personal experiences in money management. Gen Z spans the age range from 18 to 23 years. Given the age range, 66% classified themselves as students, 10% as unemployed, 1.3% as homemakers and 23% as currently working. Gen Y covers the 24–39-year-old age group, of which 13% were unemployed, 9% were students, and 7% were homemakers. The other 70% were currently working. Gen X includes adults in the mid-life stage and spans ages 40 to 55 years. Of the respondents, 10.3% classified themselves as homemakers (the majority were women), 8% were unemployed[11], and the remaining 81% were currently working. Finally, the baby boomer generation ranges from ages 56 to 74 years. As expected, 49% considered themselves retired, 14% were homemakers, and 3% classified themselves as unemployed. The remaining 34% were currently working.

Overall, the sample correctly answered 2.35 questions in the standard version and 2.36 questions in the alternative formulation: they chose a correct answer 59% of the time. Differences across the generations were notable: the baby boomers answered 63% of the questions correctly, while this percentage reduced to 58% for Gen X, 53% for Gen Y and 50% for Gen Z. For the last group, the difference between the wording favoured the alternative one, with the percentage of correct answers equalling 53%. The Gen Z adults therefore showed a higher sensitivity to the framing effect.

Figure 1 illustrates the financial literacy levels and shows sharp differences across the generations. Those at the beginning of adulthood were worst off: 67% of Gen Z could not answer two out of four questions expressed in the standard way correctly (the figure declined to 54.5% in the alternative version). This percentage gradually reduced to 58.3% for Gen Y (55% in the alternative version) and to around 40% for the Baby Boomers, independently of the wording.

Figure 1 also highlights that the percentage of Baby Boomers who answered all four financial questions correctly was significantly higher than for the previous generations (a result likely due to

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[10] Doubts about the understanding arise, however, from the answers to Q5.
[11] Less than 1% were retired.

practical experience rather than to the level of education). Generations Z, Y and X recorded a higher percentage of correct answers in three out of four questions with the alternative formulation. Finally, Gen Z and Gen Y were more likely to give wrong answers to all questions in the standardized version.

6. Impact on financial literacy of sociodemographic factors, self-assessed digital skills and maths abilities

The analyses in the previous sections confirm the low level of financial literacy and detect some sensitivity to the question wording. The improvement related to the formulation applies to the number of correct answers but not to the ability to correctly answer all the questions. Hence, the level of financial literacy seems unaffected by the experiment.

In this section, we investigate the impact of the explicative variables on three financial literacy indicators: the literacy level, the number of correct answers and the level of sophistication.

First, we focus on the financially literate, so-called according to the number of correct answers given in the questionnaire. Finlit3 and Finlit4 are binary variables that take the value 1 when the individual correctly answered all the questions (three or four) and 0 otherwise. Considering the data displayed in **Table 8** and the evidence suggesting that Q4 was the most difficult question for people to answer (see Schmeiser & Seligman, 2013), we direct our attention to Finlit3, computed for both sets of questions.

The following model is estimated using a logit regression:

$$\Pr(Y = 1|X) = F(\alpha + \beta_1 EDU + \beta_2 GENDER + \beta_3 AGE + \beta_4 AREA + \beta_5 PROFESSION + \beta_6 DIGITAL \\ + \beta_7 ECOINFO + \beta_8 PERCENTAGE + \beta_9 PROBABILITY) \ (1)$$

Where F is the standard logistic distribution function.

Table 9 presents the results of the logit estimation[12] of equation (1), where Y_i is the binary dependent variable Finlit3 and the variables on the right-hand side are the explicative factors, i.e. the sociodemographic features, self-assessed digital skills and economic knowledge, and maths ability measured by the correct answers to Q6 and Q7.

Independently of the question wording (STD or ALT), the exogenous variables explain a large tranche of the variability of Finlit3, and the coefficient signs are in line with the ones in the literature and common sense.

As for the sociodemographic variables, it is worth noting that education was crucial[13] (a college degree or more GRAD+ counts), as was GENDER, since being a woman reduced the odds of being

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[12] The logit distribution appeared to be the proper one on the base of the Linktest. In any case, the results obtained using a probit estimation are qualitatively the same in terms of the level of significance of the coefficients and the size of the impact of the exogenous variables measured via margins.

[13] We used the binary variable GRAD+ instead of EDU because of multicollinearity issues among the exogenous variables. With GRAD+ [0,1], the VIF of the most complex specification was lower than 1.6.

financially literate. On the contrary, in line with the analyses across generations in section 5, AGE impacted positively: the older, the better. The geographical location (AREA) showed a net separation between north and central south. As for PROFESSION, the self-employed respondents performed worse than the employed respondents.[14] Digital skills (DIGITAL CLASS) counted, especially when the score was 6-7, and the same held for those who declared that they were informed about economic issues (ECOINFO CLASS) by choosing the options 'a lot' or 'enough' (see **Table 2**). Finally, maths ability (PERCENTAGE and PROBABLITY) increased the likelihood of being financially literate. All the specifications had a proper fit according to the tests included in the table. The models in columns 3 and 4 refer to the female population. The qualitative results for the subsample are equivalent to the full sample estimation.

The estimation of predicted probabilities and margins allows measurement of the impact of each exogenous covariate on the dependent variable. **Table 10** reports, for each explicative variable, the average marginal effect computed as the discrete change from the base level.

Having a college degree or more counted and increased the probability of being literate by 7% in the standard version and 5% in the alternative version. As for the women, in the alternative wording in column 4, having a college degree or more boosted the probability by almost 8%[15]. Being a woman had, however, a negative impact on the likelihood of ending up in the group of financial literates, independently of the wording (see columns 1 and 2), but with a higher value in the standard version (-7%) than in the alternative formulation (-4%). These results are consistent with several international studies, including Bucher-Koenen et al. (2017) and Driva et al. (2016). The coefficient of the variable AGE was also positive and highly significant for senior women (but the predicted probability for men was higher)[16]. However, being a woman living in the central south of Italy considerably reduced the likelihood of being literate, independently of the wording of the questions (only a slightly higher coefficient in model 3 than in model 4). The geographical location mattered more for the women than for the men (see models 1 and 2). Being self-employed was of no help, as it reduced the probability of belonging to Finlit3 by around one percentage point [0.054–0.091]. Digital skills and self-assessed economic knowledge were positively related to the status of being financially literate. In the case of the women, digital skills mattered more than economic knowledge

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[14] The self-employed category included entrepreneurs, self-employed professionals, retailers, artisans, other self-employed workers without a company and farmers. The employed included executives, directors, sales agents, employed farmers, employed blue-collar workers and teachers. Others included homemakers, unemployed workers, students and retired people.

[15] See Lusardi et al. (2014a), amongst others. They found a statistically significant linkage between the level of education and financial literacy.

[16] As for the impact of AGE, various studies have provided diverse evidence. Much of this variability depends on cultural background and the way the elderly are defined. In our case, bin 3 included baby boomers. Yu et al. (2021) found, in a sample of 1000 individuals aged on average in their 80s, that the decline in literacy was significant and independent from the starting level of literacy. This result, however, does not apply to everyone. Part of the sample may have avoided a decline and recovered the loss of ability. Lusardi and Mitchell (2021) showed, using 2018 data, that the degree of literacy increases and reaches a maximum at the age range of 70–74 years. Okamoto and Komamura (2021) found that in Japan the decline in financial literacy starts at the age of 60.

(see column 4). A possible effect of excess modesty or a lack of self-esteem that is typical of women. Finally, basic maths abilities, such as computing percentages, had a formidable impact. They boosted the probability by 30% for women and men in both question wordings.

The bottom of **Table 10** shows extra marginal effects for columns 3 and 4. Notably, a college degree or more had an even more powerful impact amongst senior women, especially in the alternative version (+8%). Indeed, women with a college degree living in the central south of Italy were more likely to be included amongst the literate group, especially when the literacy was computed using questions with alternative wording.

The second step of the econometric analysis focused on the so-called uncertain group and investigated the impact of the exogenous covariates on their behaviour. The uncertain respondents were financially literate in only one of the two formulations (see **Table 11**). Uncertain-A identifies the literates who correctly answered the BIG3 in the alternative wording but made mistakes in the standard version. As for Uncertain-B, the binary variable associates 1 with the BIG3 literates in the standard version who made mistakes in the alternative formulation. In line with the evidence in **Table 10**, being a woman increased the probability by 11% of being Uncertain-A. This is likely a sign of the framing effect on women. Equally, in the case of Uncertain-A, age counts, as it reduced the probability of being uncertain for the baby boomer (-12%). People living in the central south of Italy were more likely to be uncertain of either type A or type B (14% and 12%, respectively). One would expect that economic information impacted negatively (-19.1% and -7.5% for A and B, respectively). The respondents who were excellent in maths, namely those who correctly answered Q6 and Q7, were less likely to be associated with the uncertain category. The probability decreased by 33.4% and 36.4% (in types A and B, respectively) with respect to those who answered Q6 and Q7 by selecting the wrong option. Column 3 identifies the individuals who chose the option 'I am definitely not able to answer' 20% of the time (i.e. 2 out of 8 questions). In this case, there was a smoother effect of gender, geographical location (living in the central south of Italy) and age compared to the coefficients in column 1. Notably, the respondents who considered themselves knowledgeable in economics and had maths skills were less likely to be associated with the group 'I do not know' (i.e. 'I am definitely not able to answer'), a 70% reduction in probability, which doubles the figure in columns 1 and 2.

Overall, uncertainty seemed to affect more women, young people and those living in the central south of Italy than those who thought that they were knowledgeable in economics and good at maths. The interaction effects[17] confirm that women living in the south were more likely to be classified as uncertain or in the 'I do not know' group.

We proceed by analysing the number of correct answers in both formulations. The computation used the two sets of four questions (BIG4) and three questions (BIG 3). **Table 12** shows that the correlation

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[17] Not present due to lack of space, but available upon application to the author.

between the two indicators (Num_answer3 and Num_answer4) for each type of question was very high (93%–94%), whereas the correlation across the wording decreased to 63%–68%. To increase the number of potentially correct answers, given the very high correlation, the selected dependent variable was num_answer4.[18]

Table 13 reports the change in the marginal effect for outcome 0 (zero correct answers) and outcome 4 (four correct answers) based on an ordered logit regression. The coefficient significance highlights that the selected exogenous variables, whose signs were coherent with the impact predicted by the margins, influenced the number of correct answers.

Specifically, a college or higher degree increased the probability of correctly answering the highest number of questions in the standard formulation, less intensely in the alternative wording. The likelihood of always choosing the wrong options when the respondents had a college degree decreased by 2.5% and 1.4%, depending on the question wording. In contrast, the probability of answering all questions well when the respondents had a college degree increased by 4.1% and 2.3% in the standard and alternative wording, respectively.

Gender mattered in the standard formulation. It did not influence answers in the alternative wording. The latter corroborates the evidence of a possible reduction of the gender gap, as pointed out in the descriptive analysis. When the gender coefficients were statistically significant (columns 1 and 2), their impact was positive on outcome 0, whereas it reduced by 3.6% the probability of answering all the questions well.

Age, consistent with the results in the previous tables, increased the probability of being amongst those who answered a high number of questions well. The rise in probability for the baby boomers was notable: 11% and 8 % for the standard and alternative versions, respectively.

The central south of Italy was associated with the poorest literacy performances. Living there reduced the likelihood of answering the BIG4 correctly, with a probability change in the range of 6–8 percentage points.

Digital self-assessment was consistent with the number of correct answers. However, differences between the respondents with an average score (in class 2) and those who thought that they were are very good (in class 3) with respect to those with a poor score (in class 1) were not so neat in terms of percentage points, as can be inferred from outcome 4. On the linkages between digital skills and financial literacy, updated evidence has been provided by the OECD report (2020) and Bianco et al. (2021).

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[18] The results were qualitatively the same if the selected variable was num_answer3 and are available upon request.

Equally, the impact of self-assessment related to economic knowledge (ECOINFO CLASS) was as expected. For the respondents who were informed ('a lot' or 'enough') about economics, the likelihood of outcome 4 increased by 12% and 8% in the standard and the alternative wordings, respectively. Finally, maths ability continued to be a determining factor of financial literacy. Summing up the percentages associated with PERCENTAGE and PROBABILITY, the increase in the probability of the outcome 4 was 40% and 38% in columns 2 and 4, respectively.

In short, the results confirm that the exogenous variables, except GENDER in the ALT version, kept their predictive power in explaining the number of correct answers.

To complete this part of the analysis, we computed the difference between the number of correct answers to the questions expressed as STD and ALT. In **Table 14**, the dependent variable is the absolute value of the difference between the number of correct answers to BIG4 in the standard formulation and in the alternative one. The variable takes five values [0,1,2,3,4], where 0 indicates that the number of correct answers in the two versions is the same, and 4 specifies the case in which all the answers were wrong in one version and right in the other one, which is a potential sign of uncertainty in the decision-making process of the respondents.

Only GENDER and GRAD+ had significant marginal effects. GRAD+ increased the probability of outcome 0, which could signal a stability of opinion; GENDER reduced the probability of outcome 0 and increased the likelihood of switches amongst the answers according to the wording, that is, outcome 4 was associated with higher uncertainty.[19]

The 'I do not know' variable represents the uncertainty by construction and did not exert any significant effect on the dependent variable. This result held even when the option 'I am definitely not able to answer' was chosen 30% of the time.

Finally, **Table 15** presents the results of a multivariate regression where the dependent variable is the degree of financial sophistication[20] (Sof3 and Sof4). It is the deviation from the mean of the sum of correct answers to 6 or 8 questions divided by the number of questions (6 or 8). The results reveal a negative impact on sophistication of GENDER, as in Lusardi et al. (2014 a), and in our case of AREA; AGE, instead, counted positively as well as GRAD+. The self-assessment of economic knowledge was critical, and, once more, maths ability was strikingly relevant. The latter may mitigate the framing effect related to financial education, as shown by Costa et al. (2020).

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[19] Case 4 is not present here because the related observations are few, and the margins are not significant.
[20] Taking the definition provided by Lusardi et al. (2014a), in Table 15 the dependent variable is the simple average deviation from the mean of the number of correct answers. The weighted index - via principal component analysis to account for the degree of complexity of the questions – is not presented here because it is substantially equivalent to the simple one from an informational point of view. The correlation between the simple index and the weighted one was higher than 94%.

7. Conclusions

Analysis of the data collected through a survey conducted in October 2021 with 2500 individuals stratified to represent the Italian population allowed an update of the measure of the level of financial literacy of Italians and a study of the impact of the question wording on the answers to the financial literacy questionnaire.

The descriptive and econometric analyses show that the framing exerted an effect on the correctness of the chosen answers. The wording of the question also affected the impact size of the variables that explain the level of financial literacy.

In two of the four questions, the alternative wording determined a higher percentage of correct answers. As for the question on inflation, it did not display any sensitivity to the formulation. The answer about diversification seemed to favour the standard formulation but highlighted much confusion, mainly amongst the men, and indicated a notable lack of understanding of the concept.

A positive effect of the alternative formulation was shrinkage of the gap between the genders. At the single question level, not only was the percentage of women who answered correctly in the alternative version equal to or higher than the one with the standard wording, but a reduction in the percentage of women who chose 'I am definitely not able to answer' was also evident.

Despite the mitigating effect on the gender gap, the alternative wording did not trigger a closing of the gap; the difference remains worrisome. Being a woman living in the central south of Italy without a college or higher education reduced the probability of being literate or sophisticated, independently of the wording. As suggested by several switches amongst answers in the two versions, the women were more uncertain than the men.

A college or higher degree (more in the standard wording than in the alternative one) as well as the self-assessment of digital skills and economic knowledge counted in explaining the number of correct answers. However, maths ability was what made the difference. Knowing basic maths (i.e. computing percentages) impressively boosted the probability of being financially literate and sophisticated. Knowing conditional probability was relevant, but to a lesser extent.

We conclude that framing effects affect women more than men and young people more than elderly people. Despite the positive impact of the wording on single questions, however, there were no signs of improvement in the level of financial literacy, which requires a thorough knowledge of three or four financial concepts and is influenced mainly by maths skills.

Variables List

Name	Description	Mean	Source	Note: variable range
Exogenous Variables				
GENDER	Sex of the interviewed	1.51	Survey	Variable [1,2]
YEAR	Age of the interviewed	49.29	Survey	Variable [18.....74]
AGE	Age grouping	2.20	Author's Computation	Variable [1.3] 1=18-34; 2=35-54;3=55-74
EDU	Level of education	1.89	Survey	Variable [1,4] 1= Bachelor's Degree or more; 2=High School Diploma; 3=Middle School Diploma; 4= Sixth grade
GRAD+	Bachelor's degree or more	0.27	Author's Computation	Variable [0,1]
DIGITAL	Digital skills self-assessment	6.99	Survey	Variable [0,10]
DIGITAL CLASS	Digital skills grouping	2.26	Author's Computation	Variable [1,3] 1=1-5; 2=6-7; 3=8-10
ECOINFO	Level of economic information	2.65	Survey	Variable [1,4] 1=a great deal; 2=enough; 3 =a little; 4=at all
ECOINFO CLASS	Ecoinfo grouping	0.46	Author's Computation	Variable [0,1] 0=a little+ at all; 1=a great deal + enough
PROFESSION	17 type of professions in grouping	1.65	Author's Computation	Variable [1,3] 1=other, 2= employee, 3=self-employed
AREA	Geographic area	2.61	Author's Computation	Variable [1,4] 1=North West; 2=North East ;3=Centre; 4=South and Islands
PERCENTAGE	Question D6 about percentage	0.69	Author's Computation	Variable [0,1] 0= wrong answer; 1 =correct answer
PROBABILITY	Question D7 about conditional probability	0.21	Author's Computation	Variable [0,1] 0= wrong answer; 1 =correct answer
Survey Questions				
Q1_STD	Standard question on simple interest	1.62	Survey	Variable [1,4]
Q1_ALT	Alternative question on simple interest	1.42	Survey	Variable [1,3]
Q2 STD	Standard question on diversification	2.23	Survey	Variable [1,3]
Q2_ALT	Alternative question on diversification	3,67	Survey	Variable [1,5]
Q3_STD	Standard question on inflation	2.97	Survey	Variable [1,4]
Q3_ALT	Alternative question on inflation	2.04	Survey	Variable [1,3]
Q4_STD	Standard question on compound interest	1,78	Survey	Variable [1,3]
Q4_ALT	Alternative question on compound interest	2.07	Survey	Variable [1,4]
Indexes of financial literacy and sophistication				
FINLIT3_STD	Individual who answers correctly to the BIG 3 STD wording	0.42	Author's Computation	Variable [0,1]
FINLIT3_ALT	Individual who answers correctly to the BIG 3 ALT wording	0.31	Author's Computation	Variable [0,1]
FINLI4_STD	Individual who answers correctly to the BIG 4 STD wording	0.23	Author's Computation	Variable [0,1]
FINLIT4_ALT	Individual who answers correctly to the BIG 4 ALT wording	0.24	Author's Computation	Variable [0,1]
SUPER_FINLIT3	Individual who answer correctly to the BIG 3 in ALT and STD wording	0.21	Author's Computation	Variable [0,1]

SUPER_FINLIT4	Individual who answer correctly to the BIG 4 in ALT and STD wording	0.11	Author's Computation	Variable [0,1]
UNCERTAIN-A	Individual who is financially literate according to the ALT wording but not according to the STD one	0.42	Author's Computation	Variable [0,1] 0 = when both Finlit3_STD and Finlit3_ALT are 1; 1= when Finlit3_STD is 0 but Finlit3_ALT is 1
UNCERTAIN-B	Individual who is financially literate according to the STD wording but not according to the ALT one	0.51	Author's Computation	Variable [0,1] 0 = when both Finlit3_STD and Finlit3_ALT are 1; 1 when Finlit3_ALT is 0 but Finlit3_STD is 1
I DON'T KNOW	Individual who chooses the "I am definitely not able to answer" in 2 out of 8 questions	0.33	Author's Computation	Variable [0,1]
NUM_ANSWER3_STD	Number of correct answers among the BIG 3 STD wording	1.86	Author's Computation	Variable [0,1,2,3]
]NUM_ANSWER3_ALT	Number of correct answers among the BIG 3 ALT wording	1.84	Author's Computation	Variable [0,1,2,3]
NUM_ANSWER4_STD	Number of correct answers among the BIG 4 STD wording	2.35	Author's Computation	Variable [0,1,2,3,4]
NUM_ANSWER4_ALT	Number of correct answers among the BIG 4 ALT wording	2.35	Author's Computation	Variable [0,1,2,3,4]
SOF 3	Level of sophistication computed as the deviation from the mean of the number of correct answers among the BIG 3 divided by 6	0.00	Author's Computation	Variable in the range [-0.03 ..0.14]
SOF 4	Level of sophistication computed as the deviation from the mean of the number of correct answers among the BIG 4 divided by 8	0.00	Author's Computation	Variable in the range [-0.01…0.11]

Table 1. Demographic description of the sample (2500 Italians in the age range 18 - 74)

Percentage values

	Gender	Education			
		Bachelor's degree or more.	High School Diploma	Middle School Diploma	Sixth Grade
Men	49.8	25.6	57.7	15.9	0.8
Women	50.2	29.0	56.0	13.4	1.5

Age		Area		Number of Inhabitants	
< 24	9.7	NW	26.7	Up to 10k	22.3
25-34	11.6	NE	19.3	10 -30k	26.2
35-44	15.8	CE	20.0	30 -100k	24.7
45-54	20.0	SI	34.0	>100k	26.7
55-64	21.0				
65+	21.9				

NW=North West; NE= North Est; CE=Centre; SI =South and Islands

Table 2. Self-assessment of digital and economic skills

Percentage of column total

Digital skills score (1-10)	TOT	Men	Women	18-34	35-54	55-74
not enough (1-5)	16.3	13.5	19.0	0.9	11.7	23.4
enough (6-7)	40.9	40.0	41.7	32.2	39.6	46.2
well (8-10)	**42.9**	46.5	39.3	58.4	48.7	30.3
Average score	7.0	7.2	6.8	7.6	7.3	6.5
Informed on economic themes	TOT	Men	Women	18-34	35-54	55-74
a great deal	5.5	8.3	2.7	7.1	7.0	3.5
enough	**40.3**	45.3	35.4	39.3	41.3	39.9
a little	37.6	34.4	40.7	33.7	37.0	40.0
at all	16.6	12.0	21.2	19.9	14.6	16.6
a great deal + enough	45.8	53.6	38.1	46.4	48.3	43.4

Table 3. Level of financial literacy measured with four multiple-choice questions

Section A. Standard Literacy Questions (Lusardi-Mitchell)
Percentage of column total

Question 1: Suppose you had 100,000 € in a savings account and the interest rate was 2% per year. There are neither taxes nor fee. After 5 years, how much do you think you would have in the account if you left the money to grow? (1 answer only)

	TOT	Men	Women	18-34	35-54	55-74
* More than 102,000 €	**67.0**	71.5	62.5	63.1	63.5	71.8
Exactly 102,000 €	15.4	15.0	15.7	15.2	19.4	12.0
Less than102,000 €	6.6	4.9	8.2	7.9	5.7	6.6
I am definitely not able to answer	11.1	8.6	13.6	13.8	11.3	9.5

Question 2: Buying a single company's stock usually provides a safer return than a stock mutual fund. (1 answer only)

	TOT	Men	Women	18-34	35-54	55-74
True	9.7	10.2	9.2	14.5	9.7	7.4
* False	**57.2**	62.8	51.5	49.2	57	61.2
I am definitely not able to answer	33.1	27.0	39.3	36.4	33.3	31.4

Question 3: Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much do you think you would be able to buy with the money in this account? (1answer only)

	TOT	Men	Women	18-34	35-54	55-74
More than today	4.8	6.0	3.6	9.9	4.5	2.6
Exactly the same	13.0	10.2	15.9	17.6	14.9	9.2
* Less than today	**61.7**	67.6	56.0	45.4	58.9	72.2
I am definitely not able to answer	20.4	16.2	24.5	27.1	21.7	16.0

Question 4: A 15-year mortgage typically requires higher monthly payments than a 30-year mortgage, but the total interest paid over the life of the loan will be lower.
(1 answer only)

	TOT	Men	Women	18-34	35-54	55-74
* True	**48.7**	53.1	44.4	45.3	48.5	50.5
False	24.1	24.0	24.2	23.3	25.2	23.7
I am definitely not able to answer	27.2	22.9	31.4	31.4	26.3	25.8

Section B. Alternative Wording
Percentage of column total

Question 1: Suppose you inherited 1000 €. You decide to put them in a saving account with an interest rate of 2% per year. You forgot this investment but after 4 years you decide that it's time to buy an electric bike to move around cheaply. The bike costs 1080 €. Do you think you would have enough money in the account? (1 answer only)

	TOT	Men	Women	18-34	35-54	55-74
* Yes	**71.0**	74.2	67.9	70.3	71.0	71.4
No	15.6	14.5	16.8	13.1	14.2	18.1
I am definitely not able to answer	13.3	11.3	15.3	16.6	14.8	10.5
If the answer is No, please answer also to sub Q 1.						

Question 2: Suppose you inherited a huge amount of money. You decide to put it aside with the aim to reduce the risk of losses because later in time you want to use your savings to buy a car and/or to pay the school fees for your children. What do you do? (1 answer only)

	TOT	Men	Women	18-34	35-54	55-74
I invest all on a single stock	1.9	2.5	1.3	2.2	2.5	1.2
I invest all on Government bonds	13.7	16.6	10.8	11.9	15.4	13.1
I invest all to buy a house	16.3	14.2	18.3	15.4	16.9	16.2
* I save part of it on a current/saving account and invest the rest in a mutual fund (which includes stocks and bonds)	**51.5**	52.4	50.6	50.4	49.1	54.1
I am definitely not able to answer	16.6	14.3	19.0	20.1	16.1	15.3

Question 3: You live in a country where the average price of goods increases by 5% per year. You keep 100€ in a saving account with an interest rate of 2% per year. You wish is to buy a new vacuum cleaner. After a year, given the inflation rate, the vacuum costs 105 €. Do you think you would have enough money in your account? (1answer only)

	TOT	Men	Women	18-34	35-54	55-74
yes	16.8	15.2	18.4	25.0	17.4	12.3
*No	**61.6**	67.3	56.0	50.9	58.5	69.6
I am definitely not able to answer	21.5	17.5	25.6	24.1	24.2	18.1
If the answer is No, please answer also to sub Q 3						

Question 4: Imagine you must choose the duration of a mortgage of 100,000 € with a fixed interest rate of 1.2%. The available options are 15 and 30 years. The monthly payment for the 15 years amounts to 607€; for 30 years amounts to 331€. In which case the total amount of interests paid is lower? (1 answer only)

	TOT	Men	Women	18-34	35-54	55-74
* In the case of a 15-year mortgage	**51.3**	55.1	47.5	41.4	50.6	56.8
In the case of a 30-year mortgage	14.4	14.2	14.6	18.3	15.0	12.1
The amount is the same in both cases	10.2	9.8	10.5	12.9	9.7	9.2
I am definitely not able to answer	24.1	20.9	27.4	27.4	24.8	22.0

Sub Question 1: How much money you need to buy the bicycle? (1answer only)

	TOT	Men	Women	18-34	35-54	55-74
40 €	22.4	21.6	23.1	19.4	25.3	21.6
60 €	27.1	23.3	30.3	44.7	29.0	19.5
72 €	**35.4**	37.8	33.4	27.0	30.5	41.7
I am definitely not able to answer	15.1	17.3	13.2	8.9	15.2	17.2

Continue table 3.B

Sub Question 3: How much money do you need to buy the vacuum cleaner? (1 answer only)						
	TOT	Men	Women	18-34	35-54	55-74
1 €	1.6	1.9	1.3	1.6	1.3	1.8
2 €	1.5	1.5	1.6	1.7	1.0	1.8
* 3 €	**62.9**	65.5	59.7	60.9	62.9	63.6
4 €	1.5	1.5	1.4	2.5	1.6	1.0
5 €	4.1	2.7	5.7	3.9	5.2	3.3
6 €	1.3	1.2	1.4	1.2	2.1	0.8
7 €	1.3	1.0	1.6	1.2	2.0	0.8
8 €	1.6	1.4	1.7	2.0	2.3	0.9
9 €	0.5	0.5	0.5	1.1	0.3	0.4
10 €	2.9	3.5	2.1	3.8	2.2	3.0
More than10€	11.7	11.3	12.1	10.4	10.5	13.0
I am definitely not able to answer	9.3	7.9	11.0	9.8	8.6	9.6

Table 4. I am definitely not able to answer. Percentage of row total

	Men	Women	of which Women 18-34	of which Women 35-54	of which Women 55-74
Q1_STD	38.5	61.5	15.3	23.0	23.2
Q1_ALT	42.3	57.7	14.8	22.7	20.5
Q2_STD	40.6	59.4	14.8	21.8	22.9
Q2_ALT	42.8	57.2	14.1	20.5	22.8
Q3_STD	39.6	60.4	18.8	22.6	19.1
Q3_ALT	40.4	59.6	14.5	24.5	20.6
Q4_STD	42.0	58.0	14.4	19.8	23.7
Q4_ALT	43.1	56.9	13.5	21.9	21.5

Note: Percentage differences between men and women are statistically significant according to Chi-squared test at p value =0.01

Source: Author's computation, see the text

Table 5. Additional questions
Percentage of column total

D5-Interest expenses: Imagine you have obtained a loan of 100,000 € from your bank with an interest rate of 5% per year. If you do not use this amount how much money will be available on your current account after a year? (1 answer only)						
	TOT	*Men*	*Women*	*18-34*	*35-54*	*55-74*
Between 100,000 and 105,000 €	28.2	26.8	29.5	30.1	28.6	27.0
* Less than 100,000 €	**45.1**	51.2	39.1	38.4	43.7	49.7
More than 105,000 €	7.9	6.8	9.0	9.8	7.0	7.7
I am definitely not able to answer	18.8	15.2	22.4	21.8	20.7	15.7

D6-Percentage: If the probability of getting a rare disease is 5%, how many people out of 1.000 will get sick? (1 answer only)						
	TOT	*Men*	*Women*	*18-34*	*35-54*	*55-74*
Five	10.2	9.3	11.2	8.2	11.9	9.9
One hundred	5.2	4.9	5.5	9.3	6.0	2.5
* Fifty	**69.9**	74.1	65.8	64.9	65.9	75.8
I am definitely not able to answer	14.6	11.7	17.5	17.5	16.2	11.9

D7-Conditional probability: What is the probability that flipping a coin twice it will come out 'tails' twice? (1 answer only)						
	TOT	*Men*	*Women*	*18-34*	*35-54*	*55-74*
* 25%	30.0	32.1	27.9	35.7	33.2	24.5
50%	**49.6**	50.5	48.7	43.9	48.1	53.8
75%	3.2	3.5	2.8	3.0	2.7	3.6
I am definitely not able to answer	17.2	13.9	20.5	17.4	16.0	18.1

Table 6. Uncertain
Percentage of cell total

	I know it (a)	Change of opinion (b) *wrong STD, correct ALT*	Change of opinion (c) *wrong ALT, correct STD*	Change of opinion (d) *I don't know STD, correct ALT*	Change of opinion (e) *I don't know ALT, correct STD*	I don't know (f)
Q1	84.5	57.3	12.5	12.0	2.8	78.4
Q2	64.1	36.0	4.9	34.0	4.9	40.1
Q3	82.0	37.0	10.8	18.6	7.2	73.7
Q4	69.2	53.1	12.3	9.2	6.1	68.1

(a) who answered the standard question and the alternative one correctly;
(b) who did not answer the standard question correctly while chose the correct answer of the alternative one;
(c) who did not answer the alternative question correctly while chose the correct answer in the standard version;
(d) who answered "I am definitely not able to answer" in the standard version and answered the question in the alternative wording correctly;
(e) who answered "I am definitely not able to answer" in the alternative version and answered the question in standard wording correctly;
(f) who chose "I am definitely not able to answer" in both versions.

Table 7. Correlations between super literates on single questions and who is answering correctly to questions Q5 Q6 and Q7

	Super_Q1	Super_Q2	Super_Q3	Super_Q4	Q5	Q6	Q7
Super_Q1	1						
Super_Q2	0.2329*	1					
Super_Q3	0.3625*	0.2528*	1				
Super_Q4	0.2754*	0.2049*	0.3494*	1			
Q5	0.1817*	0.1838*	0.2960*	0.1810*	1		
Q6	0.3874*	0.2774*	0.3793*	0.2841*	0.2711*	1	
Q7	0.1576*	0.1209*	0.1455*	0.1364*	0.0805*	0.1300*	1

Note: *5% significance level
Source: Author's computation, see the text

Table 8. Best in class
Percentage of column total

Indicator	Tot	Men	Women	18-34	35-54	55-74
Super_Q1	56.7	60.9	52.4	55.3	54.7	59.0
Super_Q2	36.6	41.3	32.0	32.8	35.6	39.4
Super_Q3	34.7	40.7	28.7	23.9	33.0	41.5
Super_Q4	33.7	37.5	30.0	27.8	33.4	36.9
Finlit3_STD	36.7	43.7	29.6	25.0	35.5	43.4
Finlit3_ALT	30.6	34.8	26.4	24.2	28.8	35.2
Finlit4_STD	24.3	29.9	18.7	17.9	24.0	27.7
Finlit4_ALT	21.7	24.5	17.9	15.1	20.2	26.1
Super_Finlit3	15.6	20.0	11.2	11.0	14.6	18.6
Super_Finlit4	10.0	13.7	6.4	7.1	10.1	11.5

Source: Author's computation, see the text

Table 9. The financially literates - BIG 3

Dependent variables: Finli3_STD Finlit3 ALT

Model Type of wording		(1) Standard		(2) Alternative		(3) Standard (Women)		(4) Alternative (Women)	
Edu (Grad+)	1	0.386	***	0.265	**	0.283	*	0.445	***
		(0.111)		(0.111)		(0.154)		(0.157)	
Gender	2	-0.373	***	-0.202	**				
		(0.098)		(0.099)					
Age									
	2	0.463	***	0.229	*	0.401	**	0.316	*
		(0.146)		(0.142)		(0.188)		(0.192)	
	3	0.898	***	0.495	***	0.812	***	0.511	**
		(0.148)		(0.143)		(0.196)		(0.200)	
Area									
	2	-0.238	*	-0.107		-0.186		0.019	
		(0.139)		(0.140)		(0.192)		(0.196)	
	3	-0.627	***	-0.389	**	-0.750	***	-0.691	***
		(0.143)		(0.142)		(0.204)		(0.206)	
	4	-0.694	***	-0.647	***	-0.757	***	-0.746	***
		(0.122)		(0.124)		(0.175)		(0.183)	
Profession									
	2	0.119		-0.111		0.052		-0.159	
		(0.115)		(0.114)		(0.158)		(0.160)	
	3	-0.305	*	-0.525	***	-0.504	**	-0.567	**
		(0.169)		(0.174)		(0.257)		(0.255)	
Digital class									
	2	0.325	**	0.404	**	0.677	***	0.686	***
		(0.152)		(0.158)		(0.221)		(0.221)	
	3	0.098		0.269	*	0.427	*	0.551	**
		(0.162)		(0.168)		(0.245)		(0.248)	
Ecoinfo class									
	1	0.939	***	0.544	***	0.789	***	0.416	***
		(0.105)		(0.107)		(0.153)		(0.157)	
Percentage									
	1	1.739	***	1.755	***	1.709	***	1.860	***
		(0.130)		(0.145)		(0.182)		(0.204)	
Probability									
	1	0.404	***	0.371	***	0.406	***	0.224	***
		(0.104)		(0.103)		(0.148)		(0.151)	
cons		-2.401	***	-2.548	***	-3.177	***	-3.196	***
		(0.288)		(0.299)		(0.321)		(0.331)	
Other controls		YES		YES		YES		YES	
Obs		2500		2500		1255		1255	
F (14,2486)		28.48	***	20.04	***				
F (13, 2487)						12.59	***	11.16	***
Linktest		ok		ok		ok		ok	
Pseudo R2		0.18		0.14		0.15		0.14	

Note: Coefficients of a logit regression; Grad+ is the dummy variable that is used to avoid multicollinearity instead of the variable Edu; *, **, *** coefficient significant at 10%,5% and1% level, respectively.
Source: Author's computation, see the text

Table 10. Predicted probability of being financially literate - BIG3

Dependent variables: Finlit3_STD Finlit3_ALT

Δ margins

Model Type of wording		(1) Standard	(2) Alternative	(3) Standard (Women)	(4) Alternative (Women)
Edu (Grad +)					
	1	0.072 ***	0.048 **	0.051 *	0.077 ***
Gender					
	2	-0.069 ***	-0.037 **		
Age					
	2	0.080 ***	0.039 *	0.067 **	0.052 **
	3	0.163 ***	0.089 ***	0.144 ***	0.086 ***
Area					
	2	-0.046 *	-0.021	-0.036	0.004
	3	-0.117 ***	-0.073 ***	-0.138 ***	-0.122 ***
	4	-0.129 ***	-0.117 ***	-0.139 ***	-0.131 ***
Profession					
	2	-0.022	-0.020	0.009	-0.028
	3	-0.054 *	-0.091 ***	-0.085 **	-0.093 **
Digital class					
	2	0.059 **	0.072 ***	0.119 ***	0.112 ***
	3	0.018	0.047 *	0.073 *	0.088 **
Ecoinfo class					
	1	0.179 ***	0.100 ***	0.142 ***	0.072 ***
Percentage					
	1	0.304 ***	0.278 ***	0.308 ***	0.321 ***
Probability					
	1	0.075 ***	0.069 ***	0.073 ***	0.039 ***

Specific marginal effects

Sub Pop Women

Grad+ & Age = 1				0.046 *	0.068 ***
Grad+ & Age = 2				0.051 *	0.076 ***
Grad+& Age = 3				0.055 *	0.080 ***
Grad+ & Area=3				0.049 *	0.069 ***
Grad+ & Area=4				0.049 *	0.067 ***

Note: Average marginal effects of a logit regression, delta method; *, **, *** coefficient significant at 10%,5% and 1% level, respectively;

Source: Author's computation, see the text

Table 11. Predicted probabilities of being uncertain

Dependent variables: Uncertain-A; Uncertain-B; I do not know

Model		(1) Uncertain A Δ margins		(2) Uncertain B Δ margins		(3) I do not know Δ margins	
Gender							
	2	0.109	***	0.051		0.026	*
Age							
	2	-0.039		0.028		-0.023	
	3	-0.119	**	-0.036		-0.051	**
Area							
	2	0.558		0.026		0.026	
	3	0.153	***	0.084	**	0.046	
	4	0.136	***	0.123	***	0.065	***
Ecoinfo class							
	1	-0.191	***	-0.075	**	-0.319	***
Percentage							
	1	-0.259	***	-0.282	***	-0.301	***
Probability							
	1	-0.075	**	-0.082	**	-0.105	***
Other controls		YES		YES		YES	
Obs		757		908		2500	
F(ev,dof)		8.53	***	23.47	***	36.69	***
Pseudo R2		0.10		0.04		0.22	

Note: Average marginal effects of a logit regression, delta method; *, **, *** coefficient significant at 10%,5% and1% level, respectively; ev= number of explicative variables; dof =degree of freedom
Source: Author's computation, see the text

Table12. Correlation between the number of correct answers BIG3 and BIG4 (weighted for the sample design)

	Num_answer4_STD	Num_answer4_ALT	Num_answer3_STD	Num_answer3_ALT
Num_answer4_STD	1			
Num_answer4_ALT	0.6820*	1		
Num_answer3_STD	0.9346*	0.6596*	1	
Num_answer3_ALT	0.6346*	0.9361*	0.6300*	1

Note: * 5% significance level
Source: Author's computation, see the text

Table13. Number of correct answers BIG-4

Dependent variable: number of correct answers out of 4 questions

Model Type of wording		(1) Standard Outcome(0)		(2) Standard Outcome(4)		(3) Alternative Outcome(0)		(4) Alternative Outcome(4)	
Edu(Grad+)									
	1	-0.025	***	0.041	***	-0.014	*	0.023	*
Gender									
	2	0.021	***	-0.036	***	0.005		-0.007	
Age									
	2	-0.036	***	0.048	***	-0.023	**	0.032	**
	3	-0.070	***	0.113	***	-0.050	***	0.079	***
Area									
	2	0.019	**	-0.036	**	0.013		-0.026	
	3	0.030	***	-0.056	***	0.034	***	-0.059	***
	4	0.044	***	-0.077	***	0.038	***	-0.065	***
Digital class									
	2	-0.035	***	0.054	***	-0.043	***	0.061	***
	3	-0.035	***	0.054	***	-0.047	***	0.069	***
Ecoinfo class									
	1	-0.069	***	0.118	***	-0.046	***	0.077	***
Percentage									
	1	-0.176	***	0.298	***	-0.176	***	0.292	***
Probability									
	1	-0.061	***	0.103	***	-0.053	***	0.088	***
Other controls		Yes				Yes			
Obs		2500				2500			
F(ev,dof)		72.07	***			67.99	***		
Pseudo R2		0.15				0.14			

Note: Average marginal effects of an ordered logit regression, delta method; *, **, *** coefficient significant at 10%, 5% and 1% level, respectively; ev= number of explicative variables; dof =ndegree of freedom
Source: Author's computation, see the text

Table14. Study of the difference in the number of correct answers across wordings

Dependent variable: abs (Num_answer4_STD- Num_answer4_ALT)

Model		(1) Outcome (0)		(2) Outcome (1)		(3) Outcome (2)		(4) Outcome (3)	
Edu (Grad+)	1	0.035	*	-0.018	*	-0.014	*	-0.003	*
Gender	2	-0.062	***	0.031	***	0.025	***	0.005	***
Ecoinfo class	1	-0.003		0.002		0.001		0.000	
I don't know	1	0.028		-0.014		0.012		-0.002	
Other controls		Yes							
Obs		2500							
F(4,2496)		3.26	***						
Linktest		ok							

Note: Average marginal effects of an ordered logit regression, delta method; *, **, *** coefficient significant at 10%, 5% and1% level, respectively
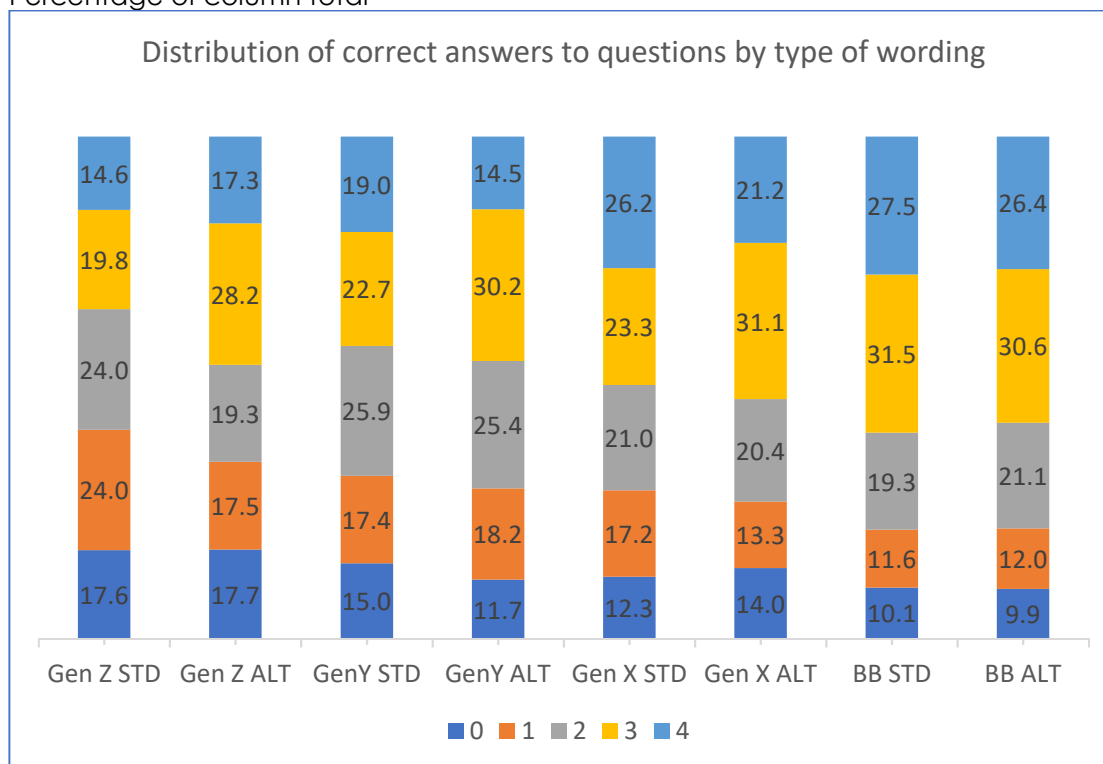Source: Author's computation, see the text

Table 15. The sophisticated

Dependent variable: level of sophistication Survey multivariate regression		SOF3		SOF3		SOF3		SOF3		SOF4	
Model		(1)		(2)		(3)		(4)		(5)	
Gender											
	2	-0.015	***	-0.014	***	-0.014	***	-0.010	***	-0.007	***
		(0.002)		(0.002)		(0.002)		(0.002)		(0.001)	
Age											
	2			0.003		0.003		0.004		0.002	
				(0.003)		(0.003)		(0.003)		(0.002)	
	3			0.010	***	0.012	***	0.010	***	0.004	**
				(0.003)		(0.003)		(0.003)		(0.002)	
Area											
	2			-0.008	*	-0.007	*	-0.009	**	-0.006	**
				(0.004)		(0.004)		(0.004)		(0.002)	
	3			-0.013	***	-0.013	***	-0.013	***	-0.007	***
				(0.004)		(0.004)		(0.004)		(0.002)	
	4			-0.020	***	-0.019	***	-0.018	***	-0.008	***
				(0.003)		(0.003)		(0.003)		(0.002)	
Edu (Grad.+)											
	1					0.013	***	0.006	**	0.004	**
						(0.003)		(0.003)		(0.002)	
Profession											
	2					0.001		-0.001		0.001	
						(0.003)		(0.003)		(0.002)	
	3					-0.006		-0.009	**	-0.006	***
						(0.004)		(0.004)		(0.002)	
Digital class											
	2							0.006	*	0.002	
								(0.003)		(0.002)	
	3							0.002		0.000	
								(0.003)		(0.002)	
Ecoinfo class											
	1							0.013	***	0.007	***
								(0.003)		(0.002)	
Percentage											
	1							0.026	***	0.013	***
								(0.002)		(0.001)	
Probability											
	1							0.011	***	0.008	***
								(0.003)		(0.002)	
cons											
		0.007	***	0.012	***	0.008	*	-0.022	***	-0.011	***
		(0.002)		(0.004)		(0.004)		(0.005)		(0.003)	
Obs		2500		2500		2500		2500		2500	
R2		0.01		0.04		0.04		0.11		0.08	
Vif				1.52		1.45		1.54		1.54	

Note: *, **, *** coefficient significant at 10%, 5% and1% level, respectively
Source: Author's computation, see the text

Distribution of correct answers to questions by type of wording

Source: Author's computation, see the text

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