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FINANCIAL LITERACY IN ITALY: THE RESULTS OF THE BANK OF ITALY'S 2020 SURVEY

by Giovanni D'Alessio*, Riccardo De Bonis**, Andrea Neri* and Cristiana Rampazzi**

Abstract

The paper analyses the results of the Survey on the Financial Literacy of Italian Adults, conducted by the Bank of Italy in early 2020. In line with the OECD's methodology, the financial literacy indicator is the sum of the scores calculated for three factors: knowledge, behaviour and attitudes. The survey confirms that Italy lags behind by international standards, as already noted in the 2017 survey. Compared with 2017, the new survey shows that Italian people's financial knowledge has improved, while their behaviour and attitudes have essentially remained stable. Financial literacy varies among the population according to the education levels – the most significant variable – gender, age and geographical location of those interviewed. An econometric analysis focused on knowledge – the most reliable component – shows that Italians can be divided into four groups, characterized by increasingly high levels of financial knowledge: excluded, incompetent, competent and expert. Between 2017 and 2020, the number of excluded and incompetent individuals in the population has decreased, whereas that of competent, and to a lesser extent, of expert individuals has increased.

JEL Classification: G53; A20; I20.

Keywords: financial literacy; knowledge, behaviour and attitudes; Survey on Household Income and Wealth (SHIW).

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* Bank of Italy, Statistical Analysis Directorate.

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1. Introduction ¹

At the beginning of 2020, the Bank of Italy conducted the second Survey on Financial Literacy of Italians (IACOFI). The first survey was conducted in 2017 (see di Salvatore et al., 2018). The survey is part of the activities of the International Network for Financial Education (INFE), active within the Organization for Economic Cooperation and Development (OECD), which has drawn up a harmonized questionnaire used by 26 countries (see OECD / INFE, 2020).

The goal of the paper is to discuss the financial literacy of Italian people. Section 2 illustrates the method for measuring literacy and the survey. Section 3 analyses how the financial education of Italians has changed in recent years and how it compares with that observed in other countries. Section 4 presents an econometric exercise that groups Italians into four categories based on their financial knowledge. Section 5 summarizes the financial education framework according to the Survey on Household Income and Wealth (SHIW) conducted by the Bank of Italy. The main conclusions are reported in Section 6. The appendices present in detail the structure of the OECD indicators, the survey questionnaire, the statistical tables and the indicators collected in the SHIW.

2. The financial literacy score and the survey

In this paper, the measurement of financial literacy follows the OECD methodology, deriving the overall financial literacy score as the sum of the scores obtained for three components: knowledge, behaviour and attitude.²

- (i) *Knowledge*. The questions concern the understanding of the basic relationships useful for making financial choices: inflation, interest rates, difference between simple and compound interest rates and risk diversification.
- (ii) *Behaviour*. The questions refer to the management of financial resources in the short and long term: setting financial objectives, planning of resources to be used for consumption, bill payments and savings in recent months.
- (iii) *Attitude*. The questions reveal the orientation of individuals towards saving, especially precautionary saving, in a long-term perspective.³

Financial knowledge has a score ranging from zero to 7, financial behaviour has a score between zero and 9 and financial attitude has a score ranging from 1 to 5. Financial literacy is computed as the sum of previous scores and therefore assumes values between a minimum of 1 and a maximum of 21. Based on the Cronbach coefficient - which measures the reliability of indicators that aggregate answers to different questions - knowledge is the most reliable profile of the survey (see Appendix A).

In Italy, the survey was conducted by a specialized company between January and February 2020, before the outbreak of the COVID-19 pandemic. The interviews were conducted by professional interviewers on a sample independent of the one interviewed in 2017, consisting of about 2,000 adults, aged between 18 and 79. The answers provided by the survey participants were recorded

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² The debate on the measurement of financial literacy is vast and characterized by different points of view. See for example, Romagnoli and Trifilidis (2013), Montanaro and Romagnoli (2016), Kaiser et al. (2020).

³ These are attitudes expressed towards the following questions: (i) I tend to live for today and let tomorrow take care of itself, (ii) I find it more satisfying to spend money than to save it for the long-term; and (iii) Money is there to be spent.

by the interviewers on their computer following a CAPI methodology (Computer Assisted Personal Interview).

In the 2017 survey, about 2,500 individuals were interviewed. About 1,500 had answered the questions independently using a tablet provided to them by the survey company, while the remaining 1,000 interviews were conducted in the same CAPI mode used in this edition. Since, as noted in di Salvatore et al. (2018), the mode in which a questionnaire is administered can sometimes have effects on the answers provided by respondents, some analyses have been carried out in this regard. The observed effects appear almost nil for knowledge and modest for the other two dimensions. In the following, we will mention the cases in which the estimated gaps between 2017 and 2020 could be influenced by the partially different collection procedures adopted in the two surveys.

In the present survey, the sampling weights were subjected to the same post-stratification procedure as in 2017; the design weights are modified so that the composition of the sample coincides with that of the population, according to some socio-demographic characteristics (gender, age, geographical area).

3. Financial literacy: Italy in comparison with other countries

3.1 Italy: the financial literacy score and its components

The average level of financial literacy of Italians in 2020 is 11.2, on a scale ranging from 1 to 21, essentially in line with the value observed in 2017 (Table B1 of Appendix B). The stability of the overall index hides variations in the three sub-indices. Financial knowledge recorded a growth of 0.4 points, while the behaviour and aptitude indices fell slightly, by 0.2 and 0.1 respectively:⁴ only the first decline is statistically significant (Figure 1).⁵

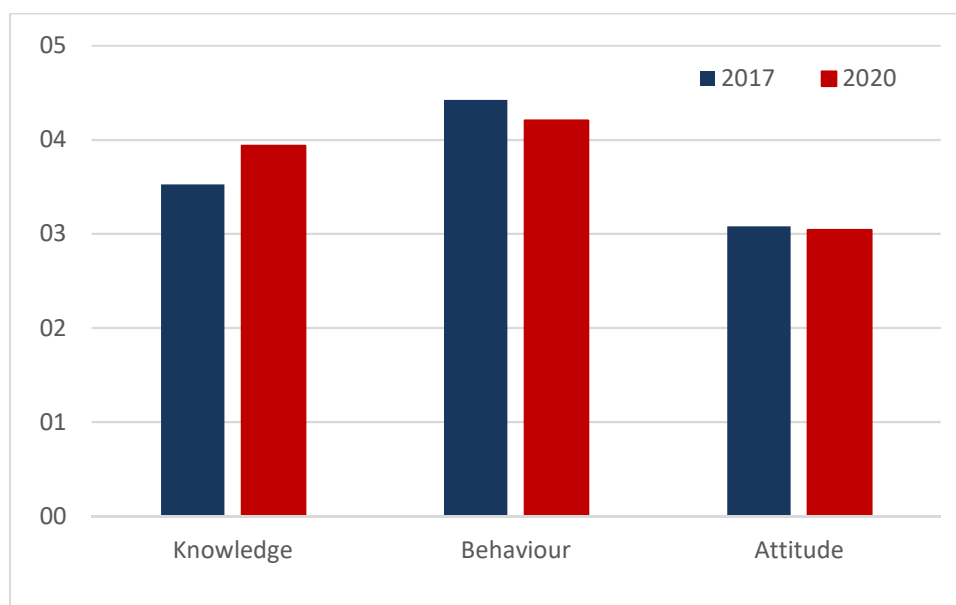
The share of subjects who in 2020 recorded a knowledge score judged sufficient by the OECD – a score of 5 or more out of 7 – was 44.3 per cent, compared with 32.6 per cent in the last survey. The percentage of respondents for whom the behaviour score is judged sufficient – 6 or more out of 9 – is stable compared with the last survey (27.3 versus 27 per cent). As regards attitude, however, the share of those who have a score equal to or greater than 4 (in the scale 1-5) is 13.7 per cent, down from the last survey (18.8 per cent).⁶

⁴ The variations observed in this edition for the 3 components – knowledge, behaviour and attitude – compared with 2017 are respectively equal to 5.9, -2.6 and -0.8 per cent of the range of each measure. For the total financial education score, the growth is 1.7 per cent.

⁵ The financial literacy score in 2017 was 11.0, with a difference from 2020 that is not significantly different from 0 at the usual 95 per cent significance levels. If the 2017 data are corrected by a regression model to take into account the fact that in 2017, for more than half of the sample a different method of conducting the interview was used (via a tablet provided to the interviewees by the survey company, which allows a web collection of data without the need for special knowledge), the gap between the two years is slightly more favourable for behaviour (which reduces the decrease to -0.1) and for attitude (which records a growth of 0.1) and therefore also for the overall score (which recorded a growth in the order of 0.4 instead of 0.2). However, the adjustment of the 2017 values does not produce any significant effect on the position of Italy compared with other countries, nor on the rankings of the socio-demographic categories examined. In assessing the changes that took place between 2020 and 2017, it should also be considered that the population to which the estimates refer has partly changed due to the natural and migratory dynamics in the period and that the estimates are affected by sampling variability.

⁶ The values judged sufficient for the 3 components are different from each other due to the different scale used for their measurement. In percentage terms, these values correspond respectively to 71.4, 66.6 and 75 per cent of the range used for their measurement.

Figure 1: Financial literacy in Italy: the components
(average values)



Between 2017 and 2020, the reduction in the behaviour score was more significant for women, those over 64, and residents in the North. The decline mainly characterizes the factors that are influenced by the economic conditions of the subjects (Table B1), such as the decreased ability to save (question FB2), the inability of income to cover expenses, defined as negative savings (question FB8) or the reduction in the frequency of timely payment of bills and loan instalments (question FB4).⁷ The long stagnation of the Italian economy - in 2019, GDP had not yet recovered to the levels before the global financial crisis - probably influenced the respondents' answers. Positive answers to 'I keep my financial issues under control' (question FB5) and 'before buying something I consider if I can afford it' (question FB3) are also decreasing. On the other hand, the share of those who set themselves long-term financial objectives is substantially stable (FB6).⁸

The financial attitude is detected in the survey through three questions that assess the respondents' tendency to look at financial issues in a long-term perspective (Table B1). The answers show substantial stability between the two surveys (the choice to construct a score with three questions only makes this indicator less robust than the others). In 2020, young people under the age of 35 and students, the unemployed and graduates are confirmed as being slightly below the national average. The attitude of the less educated is improving; the North is slightly less virtuous than in 2017 data, while the South and the Islands show an improving attitude.

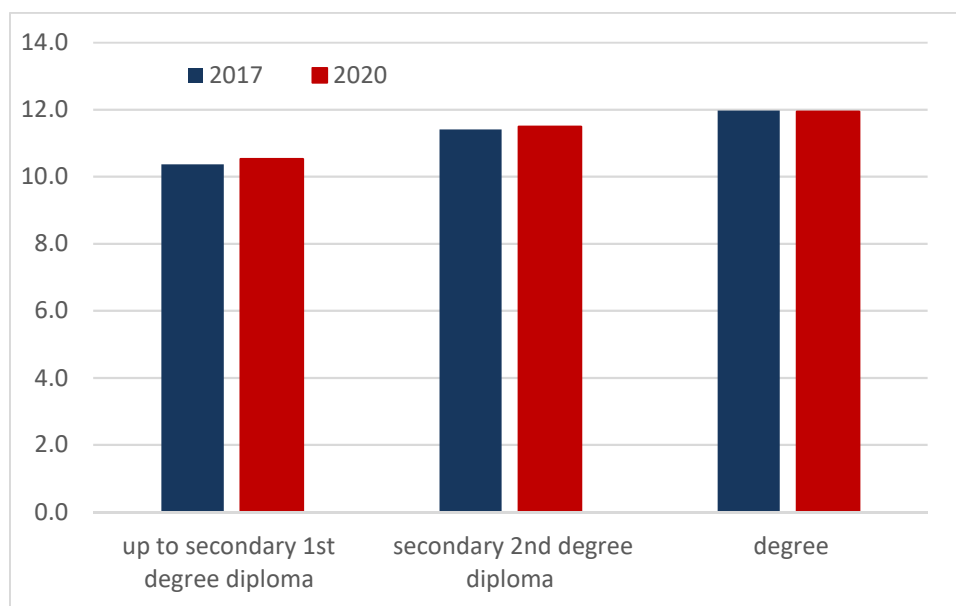
⁷ Comparison with banking statistics - which show an improvement in credit risk in 2019 - is difficult because the survey mainly concerns delays in paying bills and rents, capturing the population of bank debtors to a small extent.

⁸ Among the variables not particularly influenced by economic aspects, there is the component that concerns the budget (question FB1) that was, however, modified in 2020. In 2017, the indicator was only calculated based on the respondents who declared that they participated in the financial decisions of the household, or that they took decisions independently, and that they had a household budget. In 2020, the focus is on the abilities of the individual, rather than the household, and the indicator is modified as follows: the respondent is identified, in addition to the previous criteria relating to household choices, also with any management independent of the household; a dichotomous variable for the budget is not proposed, but six activities relating to it are listed and it is conditional on positive answers to at least two of these. This different formulation may have contributed to the increase in the score recorded in 2020, thanks to the increase in the number of respondents and the new questions relating to the budget.

3.2 Socio-demographic characteristics

By examining the indicators on the basis of the characteristics of the interviewees, the 2020 survey confirms that financial literacy has a high variability across individuals, depending on education, gender, age and geographical area (Table B2). Graduates have a higher level of literacy than individuals with lower levels of education (Figure 2).

Figure 2: Financial literacy in Italy by educational qualifications, 2017-2020
(average values)



Financial literacy is highest between the ages of 35 and 44; it is low in people under 35 (Figure 3), also because young people in Italy leave their families of origin late. As will be shown in sections 3.3 and 5, these gaps are mainly due to the different characteristics of the population in the various age groups, especially in terms of education. The literacy of men is confirmed as being higher than that of women (Figure 4). The same is true for residents in the Centre and North compared with those in the South and the Islands.

The gap between men and women is particularly strong as regards knowledge (Figure 5), especially among those with low educational qualifications and residing in the South and the Island (Figure 6).

Figure 3: Financial literacy in Italy by age group, 2017-2020
(average values)

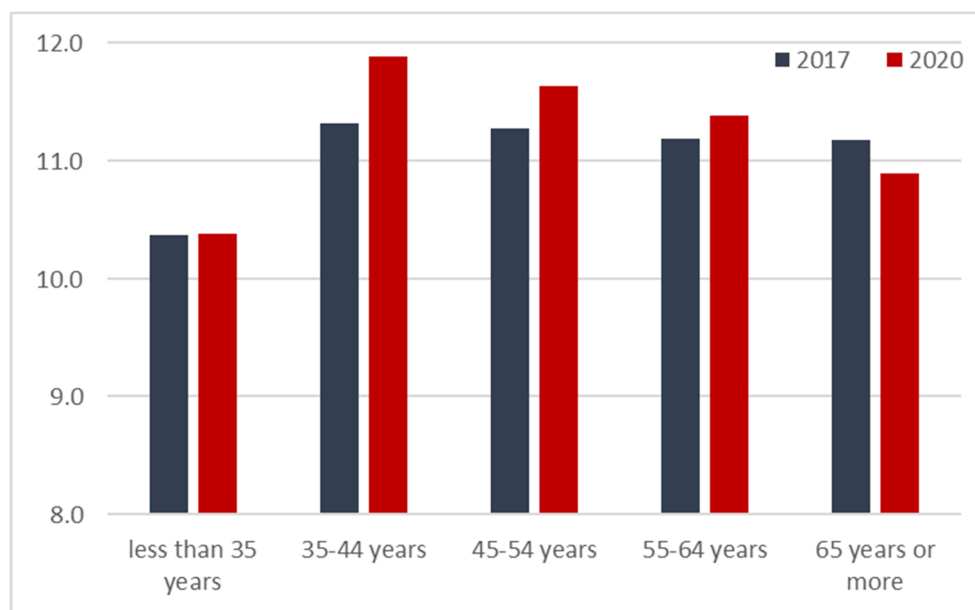


Figure 4: Financial literacy in Italy by gender, 2017-2020
(average values)

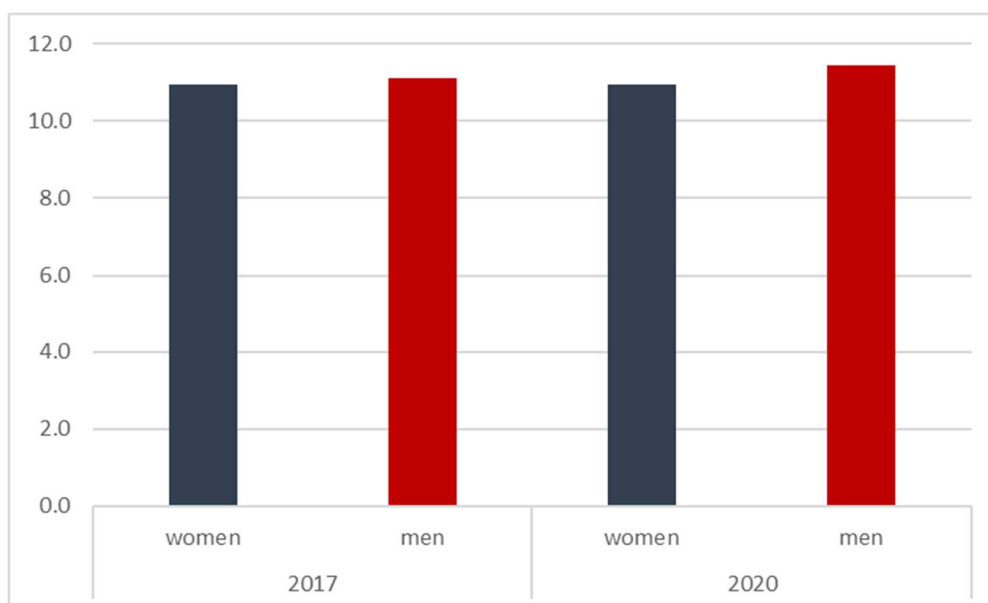


Figure 5: Knowledge, behaviour and attitude in Italy by gender, 2020
(average values)

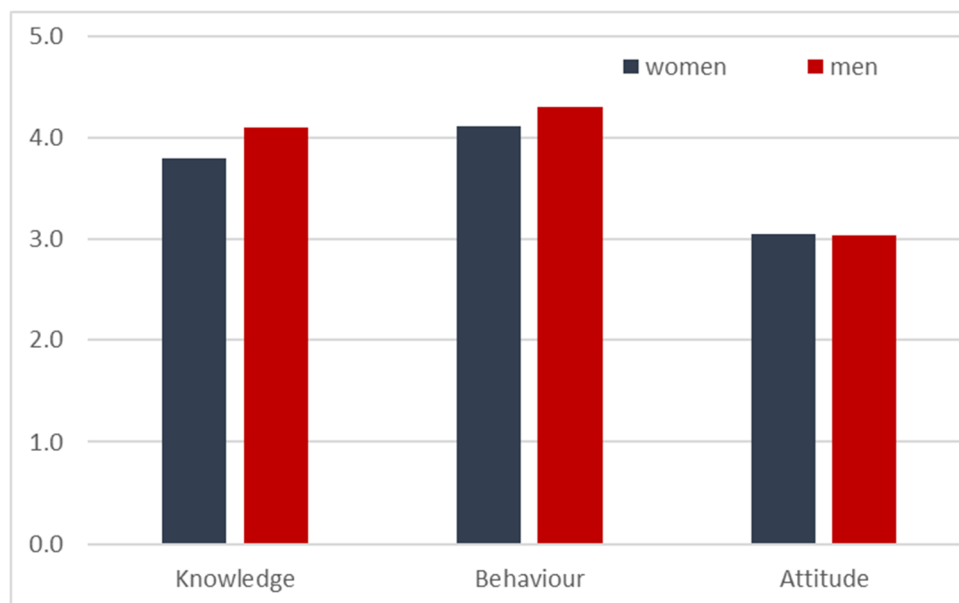
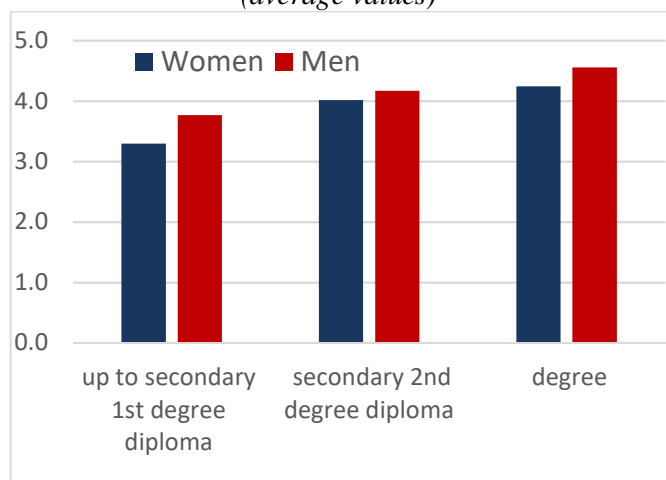
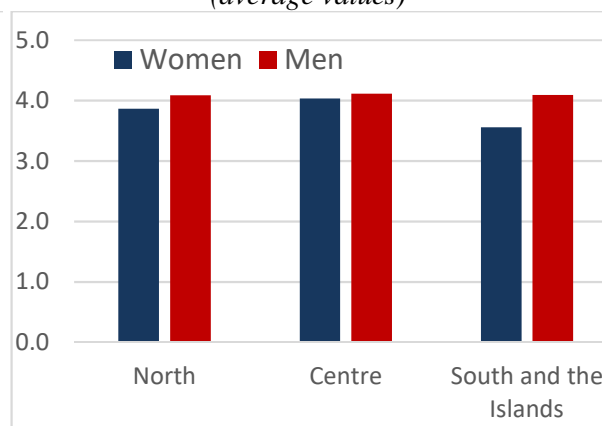


Figure 6: Financial knowledge in Italy, 2020

By gender and educational level
(average values)

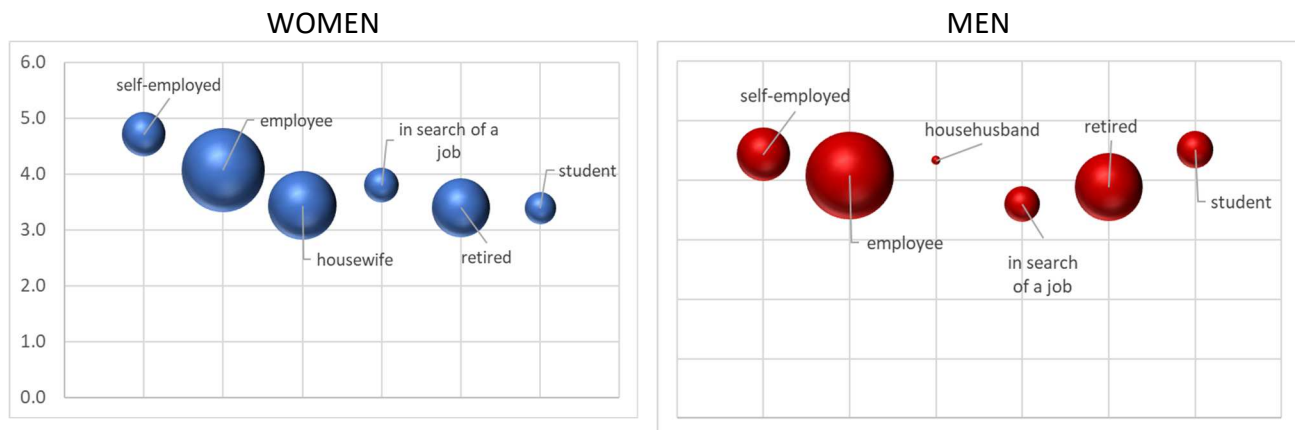


By gender and geographical area
(average values)



When analysing the gender gap by occupational status, the importance of participation in the labour market emerges, and, therefore, the aspect of a personal income to be managed, a factor that favourably affects financial knowledge. Housewives and retired women contribute to widening the gap in knowledge levels, representing the most fragile subgroups, while self-employed female workers are more prepared than their male counterparts (Figure 7).

Figure 7: Financial knowledge in Italy by gender and occupational status, 2020 ^(*)
(average values)



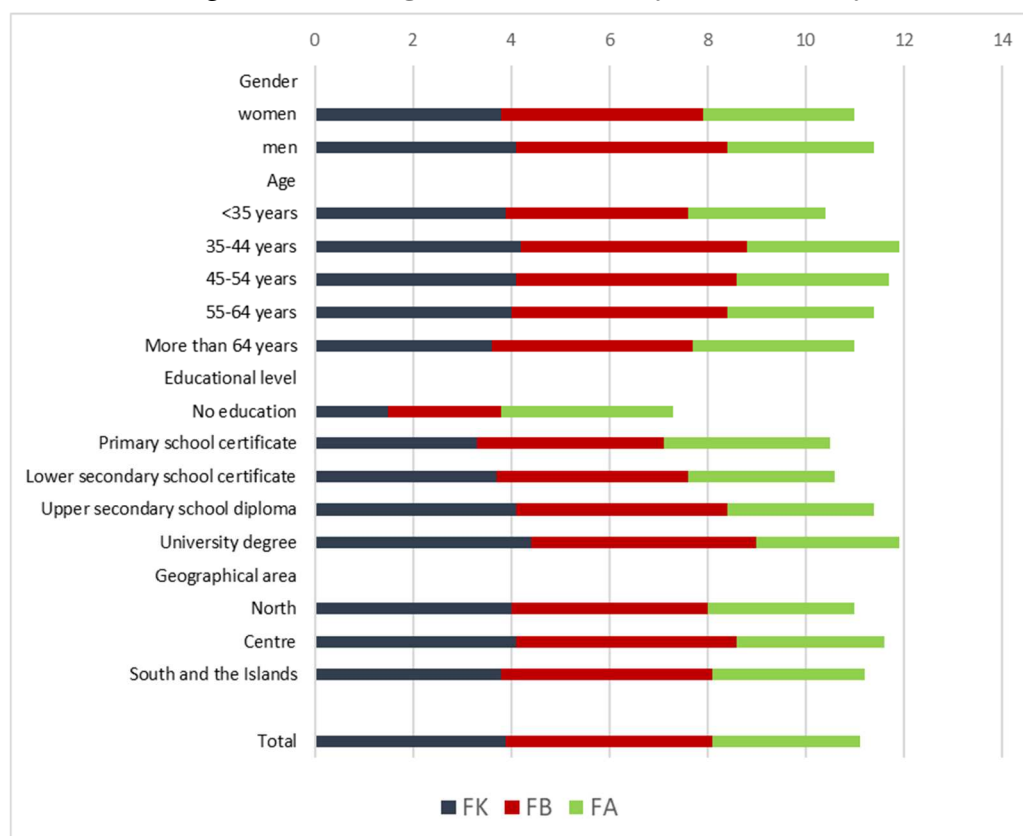
(*) The level of financial knowledge of each group is the value corresponding to the centre of the sphere, whose dimension is the group size.

3.3 A regression analysis

The analysis of average literacy scores does not allow us to understand the role of individual factors (Figure 8). The characteristics of individuals that influence literacy are correlated to each other: for example, the elderly on average have lower educational qualifications than the youngest and are more frequently women than men.

To evaluate the effects of various explanatory variables, all other conditions being equal, four linear regression analyses were conducted: the dependent variables are the three components of financial literacy and the total indicator. The independent variables are gender, age (which also captures cohort effects), educational qualification and geographical area of residence. We used the entire sample of 4,412 individuals interviewed in the two surveys in 2017 and 2020 jointly, introducing a dummy that indicates the year of the survey.

Figure 8 – Average financial literacy scores in Italy in 2020



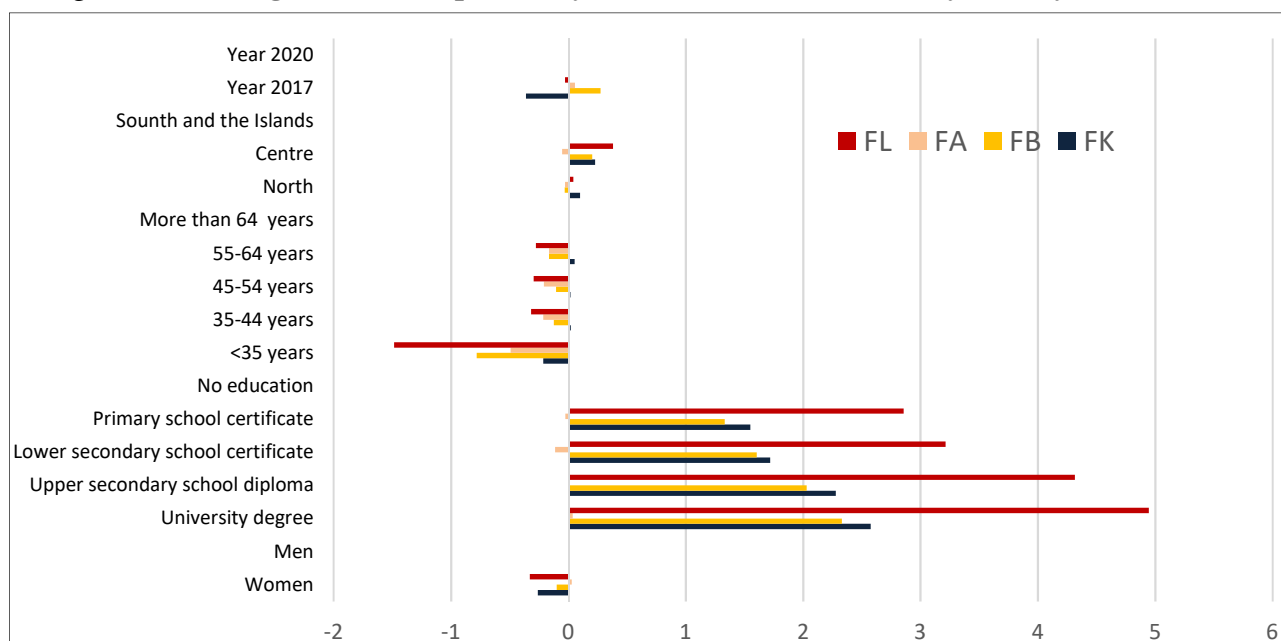
Legend: FK = Financial Knowledge; FB = Financial Behaviour; FA = Financial Attitude.

The most significant factors for explaining the differences in the various aspects of financial literacy are the educational qualification, age group and, more limitedly, gender and geographical area (see Table B3 for regressions and Figure 9 for a summary of the results). In particular, the educational qualification is significant for the overall indicator and for all three of its components; considering the contribution to R^2 education is also the main variable affecting the overall financial literacy and the components of knowledge and behaviour. As regards age, only the class under 35 appears to have a financial literacy level that, all other factors being equal, is decidedly (and significantly) lower than that of people over 65 (the benchmark in our exercise). The particularly important role that age assumes with reference to attitudes towards the future contributes to this result: younger people appear less attentive than others to the issues of precautionary savings and, in general, to long-term issues.

A financial literacy level lower than that of the elderly also characterizes - other things being equal - the other age groups, but to a lesser extent, and with coefficients that are not always significant (Table B3). The age profile shown in the previous section (Figure 3), which increases up to 34 years and then tends to decrease after the age of 35, is therefore essentially attributable to the different composition of the population by age group, in particular in terms of educational qualifications.

The gender gap is significant for knowledge and for the overall score. The results of the regressions (Figure 9) are confirmed by conducting the econometric exercises separately for the years 2017 and 2020.

Figure 9 – Average effect of explanatory factors of financial literacy in Italy, 2017-2020 (*)



(*) Regression estimates with marginal effects only. Benchmark: estimates in 2020, individual residents in the South and the Islands, over 64 years old, with no education, men. For the significance of coefficients and for further details, see Table B3.

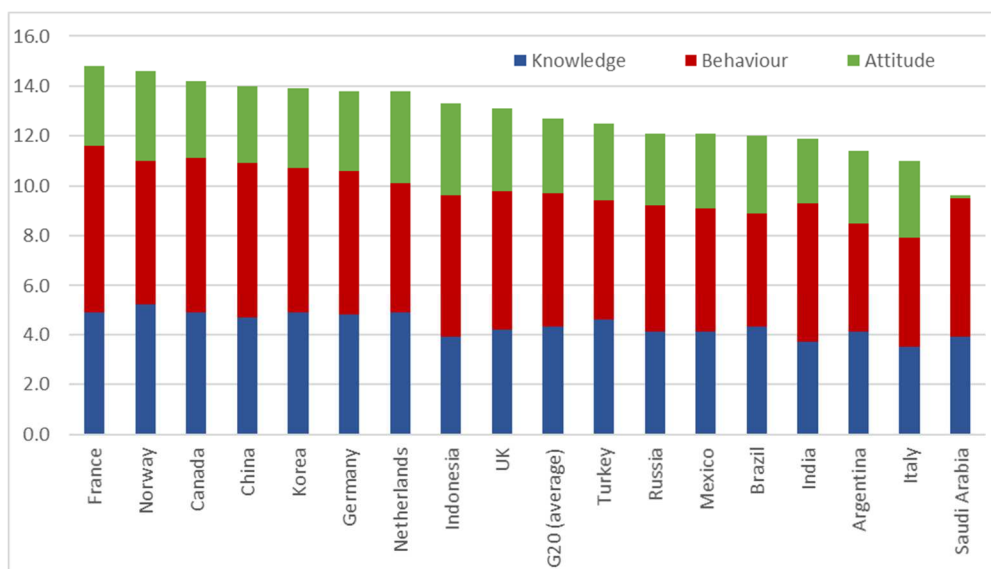
Legend: FL = Financial literacy; FK = Financial Knowledge; FB = Financial Behaviour; FA = Financial Attitude.

3.4 International comparison

In 2020, Italy is confirmed, as in 2017, at the bottom of the OECD international ranking (Figures 10 and 11).⁹

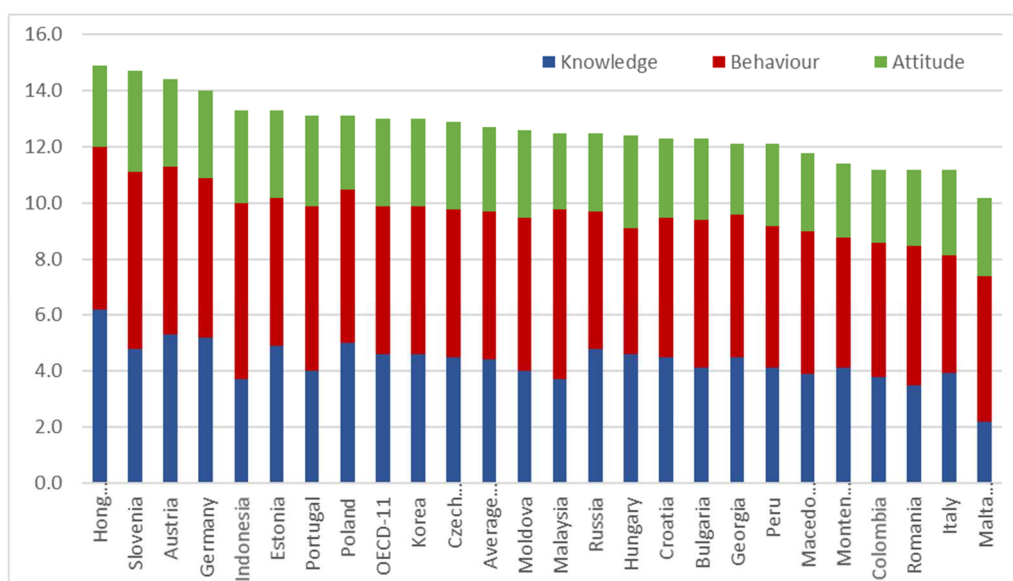
⁹ Considering the overall financial literacy score, in 2020 Italy is in 25th position out of the 26 countries considered, ahead of Malta alone, which used a partially different questionnaire, however. Italy has a slightly better relative position for knowledge (20th) and more definitely for attitudes (12th), while it is last for behaviour. By adopting an alternative index that measures the three components on an identical scale (for example from 0 to 10), Italy would slightly improve its relative position, coming 22nd (overtaking Montenegro, Colombia and Romania).

Figure 10: International comparison: financial literacy in 2017
(average values)



Source: OECD (2017), G20/OECD INFE, 'Report on adult financial literacy in G20 countries'.

Figure 11: International comparison: financial literacy in 2020
(average values)^(*) ^(**)



Source: OECD (2020) International Survey of Adult Financial Literacy. (*) The average is computed on 23 countries, excluding France, Malta and Thailand. (**) Malta computed the scores using a smaller number of questions, four for knowledge and seven for behaviour.

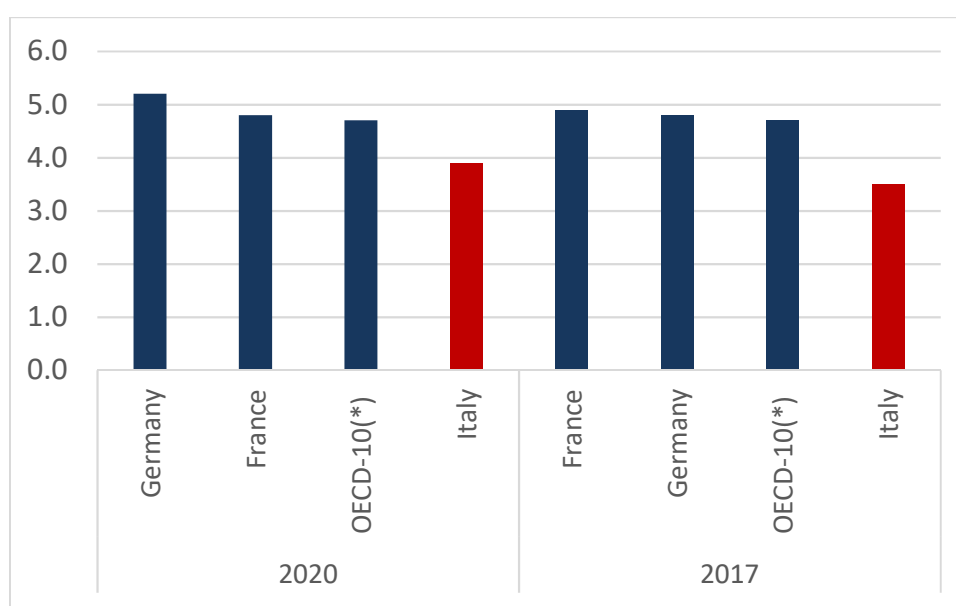
The 26 countries participating in the 2020 wave have an average score of 12.7 - 13 for OECD countries - while, as mentioned above, Italy's score is 11.2.

Comparisons across countries must be considered with caution, as the surveys are not fully harmonized. For example, some countries conduct face-to-face interviews, while some prefer telephone interviews and others carry out surveys via the web, a mode that requires the availability of a computer and therefore tends to select more educated individuals. In other cases, the survey is carried out (as Italy did in 2017 for about half of the sample) via tablets provided to respondents by

the survey company that, while preserving the speed in collecting the survey data via web, reduce the selection effect and the cognitive barriers necessary for their use.¹⁰

Among the 26 countries that participated in the survey, 12 belong to the OECD, but the OECD average is calculated on 11 countries.¹¹ France is added as the twelfth country, but only for the comparison of financial knowledge: in fact, the Banque de France did not conduct the analysis on behaviours and attitudes. Knowledge is the most comparable indicator across countries with very different rates of GDP growth, development of financial markets and regulations.¹² By focusing on the large European countries (Figure 12 and Table B4), between 2017 and 2020, Germany, like Italy, increased its score, while France recorded a slight decline. The average of the OECD countries participating in both surveys is unchanged: it is affected by the slight reduction in the scores of Korea and Hungary and the decrease of just below 1 point for Portugal.

Figure 12. Financial knowledge: a comparison among the largest European countries
(average values, 2020 and 2017)



(*) For the comparison between the two surveys, we refer to the simple average of the scores reported by the ten OECD countries that participated in both editions: Austria, Korea, Estonia, France, Germany, Italy, the Czech Republic, Poland, Portugal and Hungary.

However, the Italians are aware of their modest financial knowledge (Table B5). The percentage of individuals who believe they have below average knowledge is about 20 percentage points higher than the OECD average. The tendency to underestimate their knowledge is stronger among women: in 2020, 33 per cent of them rate their level of financial knowledge as below average,

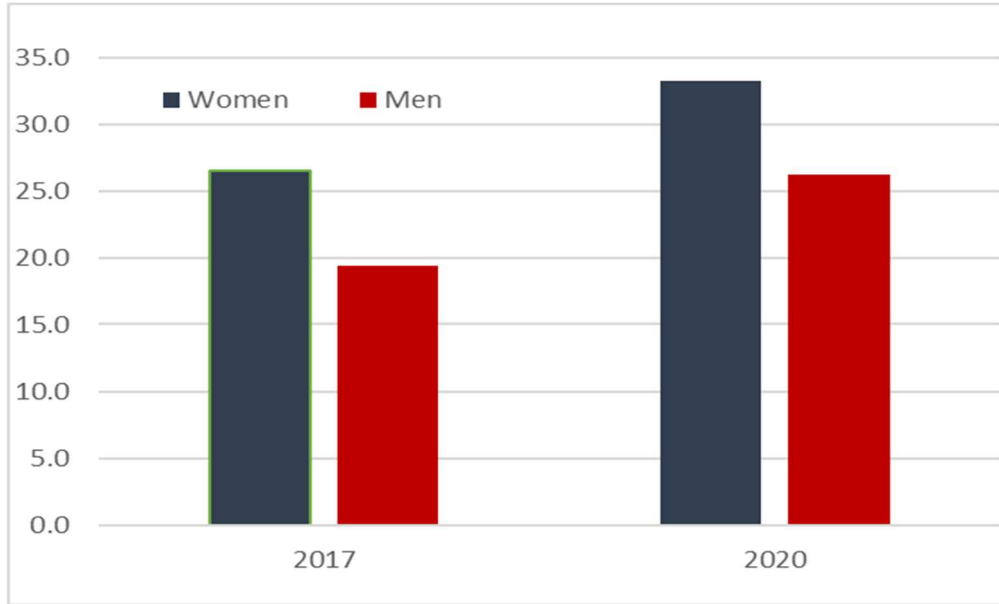
¹⁰ As shown above, the data collected by Italy in 2017 only indicate small differences due to the mode of interviewing in person compared with that carried out via tablet.

¹¹ Austria, Colombia, Korea, Estonia, Germany, Italy, the Czech Republic, Poland, Portugal, Slovenia and Hungary.

¹² The countries that had joined the 2016 edition were 30 (OECD 2016). Italy joined later, in 2017, together with China, Germany, India, Indonesia and Mexico for the analysis of the G20 countries (G20 / OECD 2017 report). Just over a third of the countries that had participated in the previous survey (2016/2017) joined the 2020 edition.

while in reality they score above average (among men the percentage is 26 per cent; Figure 13).¹³ Between 2017 and 2020, the perception of lacking financial skills has increased.

Figure 13. Underestimation of their own financial knowledge in Italy ^(*)
(percentages)



(*) Individuals who judge their own financial skill as below the average, but have scores above the average.

4. Italians and financial knowledge: excluded, incompetent, competent and experienced individuals

The financial ability of an individual is not a directly observable concept and can only be measured through partial indicators. According to the OECD methodology, the knowledge of individuals is evaluated through a synthetic indicator obtained as the sum of the correct answers. The approach has the advantage of simplicity and clarity, but it also has some limitations. For example, two people who correctly answer the same number of questions do not necessarily have the same knowledge, because they may have answered questions with very different levels of difficulty.

To obtain a synthetic measure of the ability, it is possible to use the Item Response Theory (IRT) (Rasch 1960, Birnbaum 1968). This framework makes it possible to estimate the probability of correctly answering each single question, according to the level of skill possessed by the subject and further parameters, such as the difficulty of each question.

We use the following two-parameter model:

$$P(X_{i,j} = 1 | \theta_j, a_i, b_i) = \frac{e^{a_i(\theta_j - b_i)}}{1 + e^{a_i(\theta_j - b_i)}}$$

where:

¹³ Drawing on the psychology literature, it can be said that Italians fall less frequently into the Dunning-Kruger cognitive bias (Dunning et al., 2003), according to which individuals with little expertise in a field tend to overestimate their own abilities.

$X_{i,j}$ is the answer of the j -th individual for the i -th question;
 θ_j is the ability of the j -th individual;
 a_i is the discrimination parameter for the i -th question;
 b_i is the item difficulty parameter for the i -th question.

The model is composed of two parts: the first concerns the estimation of individual ability/knowledge (θ_j, b_i) and the second relates to the questions employed (a_i).

According to the model, the probability of answering correctly increases when the individual's ability exceeds the difficulty of the question ($\theta_j > b_i$). If the subject's ability is equal to the difficulty of the question, this probability is equal to 50 per cent. The item difficulty parameter is measured by the percentage of people who answered the same question correctly.

The evaluation part of the questions is summarized by their discriminating power (a_i), namely, their ability to discriminate subjects on the basis of their latent skills. The higher the value of this parameter, the higher the power of the question to identify subjects with higher knowledge. Although a_i can theoretically vary from $-\infty$ to $+\infty$, some studies show that even values around 1 can be considered satisfactory (Ceccatelli et al., 2013).

Finally, the model assumes that: 1) the questions only identify one type of ability; and 2) given a certain level of ability, the answers to each question are independent of each other.

The analysis was conducted using the seven questions on financial knowledge: only for these is it possible to objectively determine the correctness of the answers. The OECD methodology assumes that questions relating to behaviour and attitudes also have a correct answer, but this assumption is not always acceptable. Defining good behaviour or a good attitude in the abstract, with no particular reference to the specific situation in which the individual or the country in which he lives is found, may not be correct. The OECD methodology, for example, assigns a positive value to savings behaviour, without any reference to the respondent's age or professional condition, in contrast to the life cycle theory. For instance, after the outbreak of the pandemic, the precautionary savings of Italians increased, but the increase was due to the very serious recession, rather than to a sudden change in financial literacy.

To obtain more robust estimates, the two waves for 2017 and 2020 were considered as a single survey; the sample weights were modified according to the socio-demographic characteristics in 2020.

Table B6 shows the estimates of the parameters relating to the discriminating power (a_i) and the item difficulty (b_i) for the seven questions that define the financial knowledge index. The questions with the highest discriminating power are those relating to the simple and compound interest rate (questions FK3 and FK4); the question about the value of money (FK1), on the other hand, has the lowest discriminating power.

The questions on portfolio diversification and compound interest - FK7 and FK4 respectively - present the highest levels of difficulty; on the contrary, the questions on return/risk and inflation (FK5 and FK6) were the easiest. Overall, the discriminating power of the questions used is satisfactory: those that allow better identification of knowledge are those on simple and compound interest, while the question on inflation seems to have a low discriminatory capacity.

On the basis of the level of financial knowledge estimated for each individual ($\hat{\theta}_j$) and using the k-means classification algorithm,¹⁴ individuals can be classified into four types, for which we have calculated the percentage of the total Italian population aged between 18 and 79 (46.2 million; Table B7).

1. *The excluded.* Considering the two-year estimates together (2017 and 2020), 24 per cent of individuals aged 18 to 79 (11.1 million) have low financial knowledge, reporting an average score of 1.1 on a scale of 0 to 7. In 2020, the share of *excluded* individuals is reduced to 21 per cent. About 28 per cent of them report managing household finances on a daily basis (Table B8; in half of the cases they are households with only one member). Compared with the average, this category of individuals is characterized by: a greater orientation towards spending rather than saving, probably due to their low income; a low participation in financial markets; and a low propensity for searching for information from multiple sources when purchasing a product. Although most of these individuals are aware of their limitations, nearly a third believe they have at least average financial knowledge (Table B9). The frequency of the excluded is higher in the South and the Islands, among those over 65 and those who do not have a diploma (Table B10).
2. *The incompetent.* They are individuals who have some financial knowledge even if it is probably insufficient to make sound financial decisions: their score is 3.2 against an average value of 3.7. They represent about one third of the population (15.2 million adults). In 32 per cent of cases, they are responsible for the daily management of household resources. Their behaviour score is on average similar to that of the overall population. Most of these individuals have a correct perception of their modest knowledge, while 40 per cent tend to overestimate it. The frequency of incompetent people increases in the age group close to retirement (55-64 years), among retirees and among those with a low level of education.
3. *The competent.* With an average score more than one point higher than the overall average (4.9 versus 3.7), they represent about 26 per cent of the total of the 2017-2020 sample (in 2020, they represent 32 per cent). Only in 21 per cent of cases do they claim to manage household finances. They participate more than average in the financial markets. The percentage of competent individuals increases among graduates, self-employed workers and in the age groups under 45. This group has a downward-biased perception of their skills: more than half believe they are below average.
4. *The expert.* They are about 17 per cent of the population and have an average level of financial knowledge that is almost double the average. Only 22 per cent say they are involved in managing the household budget, even if they report keep financial matters under control more frequently than other groups. The expert have the largest percentage of individuals who have bought financial products in the past 12 months, and their frequency increases among males and graduates. Only 11 per cent of them have a correct perception of their skills. The majority believe they are average, while 40 per cent believe they are below average.

¹⁴ The algorithm classifies the units into groups by minimizing the total intra-group variance. Each group is identified by a centroid or midpoint. The algorithm follows an iterative procedure: initially it creates partitions and assigns entry points to each partition randomly; then it calculates the centroid of each group; later it builds a new partition by combining the groups whose centroids are closest; and finally, the midpoints for the new groups are recalculated and so on, until convergence is reached.

Between 2017 and 2020, the financial knowledge of Italians improved: the populations of *excluded* and *incompetent* people decreased; the share of *competent* persons increased by approximately 10 percentage points. The number of *expert people* increased by less than one percentage point (Table B11).

The previous analysis is relevant from a financial education policy perspective. Indeed, there are large sections of the population that manage the household budget on a daily basis, despite not having an adequate level of skills: considering both the *excluded* and the *incompetent*, it is about 8 million adults (17 per cent of the total).

In other cases, however, the lack of financial knowledge may be compensated by the presence in the family of more informed individuals who deal with the management of the household budget. Some studies have shown how households tend to internally specialize skills, including financial ones (Hsu 2016). Having household members who, by choice or lack of necessity, do not have the necessary financial skills can have less negative consequences if decisions are made at the household level, involving the person with the most knowledge. As a matter of fact, in the Survey of Household Income and Wealth (SHIW), in which the person who is most informed about the household budget is interviewed, the results for knowledge of financial issues are better than those observed in the OECD survey, where a random component of the family is interviewed, regardless of their role (Salvatore et al. 2017).

The inadequate financial literacy of some individuals within the household can, however, result in a reduction of their level of autonomy and well-being; this vulnerability can also re-emerge in specific situations, such as when the expert person within the household dies or leaves the household.

The level of financial knowledge is also important for evaluating the economic capacity of households to create financial savings to absorb economic shocks (Klapper and Lusardi 2019, Hasler et al. 2018). The percentage of families who declare that they can sustain sudden expenses equal to their monthly income without having to go into debt rises from 32 per cent of the *excluded* to 63 per cent in the case of the *expert* (Table B12). Similarly, households that believe they can sustain a loss of primary income for at least three months go from 21 per cent of those without financial skills to 50 per cent of those who are more competent.

5. Some results from the Survey on Household Income and Wealth

The Survey on Household Income and Wealth (SHIW), conducted by the Bank of Italy since the 1960s, has been collecting some information on financial knowledge since the 2006 survey. The information in the SHIW has been collected on a non-continuous basis and by asking heterogeneous questions over time, and with respect to the IACOFI survey. In addition, in the SHIW the information is collected only from the household heads, i.e. from those who qualify as being responsible for the household budget, unlike IACOFI.

Although the aspects mentioned above prevent a simple comparison of the two sources, SHIW data allow us to draw some longer-term indications than the IACOFI.

The SHIW collected some data on financial knowledge in the surveys for 2006, 2008, 2010 and 2016 with respectively six, nine, three and three questions, which unfortunately have been heterogeneous over time (see Appendix C). Therefore, the indicators calculated over the various years, obtained as the sum of the correct answers to the related questions, are not directly comparable with each other, presenting a heterogeneity both in mean and in variance. However, assuming that they measure the same variable, it is possible to resort to a standardization of the scores obtained and to study the relative profiles that the different types of households assume over time.

Table B13 reports the average financial knowledge levels of the heads of households in the various types of households for the available years between 2006 and 2016. The values in each year are expressed in standard units, and therefore have an average of 0 and a standard deviation equal to 1. As a result, it is not possible to observe the general dynamics of the index, but only relative variations with respect to the average for the year.

Overall, a good stability of profiles is observed between 2006 and 2016. Low levels of financial knowledge are associated with subjects with low educational qualifications, in old age, born abroad, with low levels of income and wealth and residing in the South and Islands. Higher levels, on the other hand, are found for those with high educational qualifications, in the middle age classes, with high incomes and wealth, employees (except blue-collar workers) and self-employed workers. These results largely confirm what emerged from IACOFI data.

A regression analysis allows us to evaluate both the impact of the various characteristics, all other things being equal, and to examine any trends.¹⁵

Table B14 shows the results of the linear regression in which the level of financial knowledge is related both to the characteristics of the household and to those of the head of the household, who is also the respondent. The basic model (Model 1) considers as independent variables sex, age, educational qualification, type of occupation, the dummy indicating whether the person was born in Italy, the size of the municipality of residence and the geographical area,¹⁶ net wealth and income. Two further models include respectively among the explanatory factors the respondents' year of birth (Model 2), which makes it possible to assess how financial knowledge proceeds across generations, as well as the interaction between the year of birth and gender, which provides information on any tendency to close the gap between men and women over time (Model 3).

The results mostly confirm what has been described above. Levels of financial literacy increase with educational qualifications, wealth and income. Moreover, higher financial knowledge is found for men and residents in the central and northern regions; less knowledge characterizes individuals born abroad. As for age, while the regression in Model 1 shows almost constant values - except for the elderly over 65 who have lower values, in the second (Model 2) the cohort effect is separated from that of age: for a given year of birth, levels of literacy increase with age and as younger generations enter the sample, the literacy tends to improve. The work status and the number of household members do not have significant coefficients.

Model 3 largely confirms the coefficients of the various explanatory variables and the significant positive effect of the year of birth, highlighting significantly better relative dynamics for women than for men, with a coefficient that is approximately double the other. Therefore, these results indicate a tendency for the financial knowledge gap to close in the period 2006-2016. As we have seen, according to the IACOFI survey, the growth of knowledge in the 2017-2020 period was similar for men and women.

The models, estimated on the whole sample available for each year, for the purpose of robustness analysis were replicated on a sub-sample that excludes panel households, i.e. those that, having been interviewed previously, could present answers partially contaminated by the fact that they have already answered similar or even identical questions in the past (Table B14, right side). The results are consistent with the previous ones.

¹⁵ Since the data have an average of zero in each year, the (relative) dynamics are studied by examining the year of birth of the respondents, the coefficient of which can be estimated together with that of the age groups, having more surveys over time.

¹⁶ Since the data are standardized at year level, it is not necessary to include the dummy variables indicating the survey year.

6. Conclusions

In 2020, the Bank of Italy's IACOFI survey shows a level of financial literacy of Italians which confirms our country's lagging position by international standards, which had already emerged in 2017. Comparing the two editions shows that Italians have improved their financial knowledge, while the scores for behaviours and attitudes remained substantially stable. Financial literacy differs across the various groups of the population: graduates do better than non-graduates; the financial literacy of men is on average higher than that of women; it is very low among young people, it reaches the maximum levels for interviewees around the age of 45, and then falls. Regression analysis identifies education as the main variable that influences literacy followed, at a distance, by age. Our low position in the OECD ranking is thus explained, in part, by the lower levels of education of Italians and the higher share of elderly people compared with other countries.

By conducting an econometric exercise on financial knowledge, Italians were classified into four categories: (i) the *excluded*, whose share in 2020 is equal to 21 per cent of the Italian population; (ii) the *incompetent*, 30 per cent; (iii) the *competent*, 32 per cent; and (iv) the *expert*, 17 per cent. Our estimates confirm that Italians improved their financial knowledge between 2017 and 2020: the percentages of *excluded* and *incompetent* individuals fell, against an increase in the shares of *competent* and, to a small extent, *expert* individuals.

In the survey, respondents are asked to self-assess their financial knowledge. Italians are aware of their limitations: over 50 per cent of respondents rate their level of financial literacy as below average, against an average of around 20 per cent in OECD countries. Women tend to underestimate their knowledge more than men: a third of them believe they have a lower than average level of knowledge despite their score being higher; among men the share is 26 per cent.

The Bank of Italy Survey on Household Income and Wealth (SHIW) has made an analysis of financial literacy possible since 2006, even though the questions have been repeated over the years on a non-continuous basis and heterogeneously. Overall, the results, with respect to socio-demographic variables, are in line with those of the IACOFI survey.

Appendix A – The questionnaire and the computation of indicators

In the survey conducted in 2020, the OECD chose not to substantially change the approach followed in the 2017 edition.

The main indicator that can be obtained from the answers to the questions in the questionnaire is the financial literacy index (FL). It is composed of three partial indicators capturing knowledge, behaviour and attitude (respectively financial knowledge, FK, financial behaviour, FB, and financial attitude, FA).

- FK knowledge - evaluates the understanding of the basic concepts considered fundamental for making adequate financial decisions. The seven questions probe three aspects: a) understanding of simple and compound interest; b) inflation; and c) benefits of portfolio diversification. The score ranges from 0 to 7 and is calculated as the sum of 7 variables (FK1, ..., FK7), all with a value of zero or 1.
- FB behaviour - measures the behaviours associated with adequate management of financial resources, such as savings behaviour, cost control, punctuality in payments and long-term planning. The score from 0 to 9 is calculated as the sum of eight variables (FB1,..., FB8), with a value of zero or 1, except for FB7 which has a value of zero, 1 or 2;
- FA attitude - evaluates the tendency of individuals to think about the future, plan expenses and save. The score ranges from 1 to 5 and is calculated as the average of the scores relating to three questions (FA1, ..., FA3), all with a value between 1 and 5.

The overall financial literacy index $FL = FK + FB + FA$ therefore has a value between 1 and 21. The behavioural component provides the greatest contribution to the general index (with 9 of the 20 total points, equal to 45 per cent), compared with that expressing knowledge (7 out of 20, equal to 35 per cent) and aptitudes (4 out of 20, equal to 20 per cent).

A previous study on Italian data, by Salvatore et al. (2018), highlighted some problems that characterize the cited indices. The knowledge index should have greater weight in the general index, also reflecting its extensive use in literature. The indices regarding behaviour and attitudes tend to over privilege caution in spending and saving, assuming a perspective that may not always be justified. Finally, some behaviours relating to the purchase of financial assets or compliance with deadlines may be affected by the macroeconomic and institutional conditions, which do not favour comparisons over time and across countries.

Below we provide some statistical evidence regarding the ability of these indices to adequately represent the phenomena under study. In particular, by adopting a rather common methodology used when summarizing the answers provided in a questionnaire into an index, we will try to evaluate their level of reliability, i.e. the tendency to provide convergent measures across surveys conducted in the same conditions. As it is unfeasible to have repeated measurements of financial literacy on the same subjects under the same conditions, we will use the Cronbach coefficient below, which measures the reliability by evaluating the internal coherence of the different items that make up each index: the greater the correlation between the items that contribute to the index and the greater the number of items defining the index, the higher the Cronbach coefficient. On the contrary, a low index value signals the presence of heterogeneous factors or noise in the measurement.¹⁷

The indicator relating to knowledge in this survey has a Cronbach reliability coefficient equal to 0.735 (Table A1). It is significantly higher than that relating to behaviour, equal to 0.613, and to that relating to attitudes, which stands at 0.536. While the index regarding attitudes is affected by the limited number of questions (three compared with seven for knowledge and eight for behaviours),

¹⁷ It is assumed that the items that make up the index all measure the same latent variable, albeit with a random error.

the one on behaviours is penalized by a lower internal consistency of the various items that compose it than the other two indices.¹⁸ Overall, only the FK indicator relating to knowledge has a value higher than 0.7, which several authors in the literature identify as the threshold for good reliability.^{19 20}

Table A1

Cronbach reliability coefficients, 2017 and 2020

	Number of items	Cronbach coefficients	
		2017	2020
FK - Financial Knowledge	7	0.702	0.735
FB - Financial Behaviour	8	0.466	0.613
FA - Financial Attitude	3	0.583	0.536
FL – Financial Literacy	18	0.630	0.717

It is interesting to note that the overall FL index, evaluated as the (weighted) sum of the 18 indicators belonging to the three different categories, has a Cronbach index equal to 0.717 in 2020, i.e. lower than that relating to knowledge alone, despite having more than double the items. In 2017, this gap was even wider, resulting in the index relating to FL equal to 0.630 against 0.702 for FK. This could also suggest only using the knowledge component for the analysis, at least in some circumstances, instead of the overall index.

The methodology described in Section 4 can also be used to evaluate the goodness of the indicators. For example, the traditional question about purchasing power (FK1) does not seem to have a high capacity to discriminate individuals' financial knowledge. Two additional questions were also included in the 2020 survey (FK8, FK9), which use a graph to ask interviewees to identify the investment with the highest return among three possible alternatives. The discriminatory capacity of these two questions appears to be higher than the indicators used by the OECD (Table A2).

Overall, the results obtained suggest the usefulness of creating a system for assessing the quality of the OECD methodology which, based on the experience accumulated up to now, makes possible a critical analysis of the indicators used and identifies improvements that could be introduced in the future.

¹⁸ The Cronbach coefficient of knowledge was also significantly higher than that of behaviour and attitude in 2017, with values respectively equal to 0.702, 0.466 and 0.583.

¹⁹ There is no general consensus on what an acceptable value of the Cronbach index is. Some studies judge that values above 0.8 are very good, those between 0.7 and 0.8 good, acceptable between 0.6-0.7 and those with lower values unacceptable. For an in-depth discussion, see Taber (2017).

²⁰ Perhaps both an increase in the questions relating to attitudes and a reformulation of those concerning behaviour, which currently identify the common latent factor with more difficulty, should be considered.

Table A2

**Estimate of the parameters for the discriminant power (\hat{a}_i)
of questions on financial knowledge, 2020**

Question	Discriminant power (\hat{a}_i)		
	Coefficient	Confidence interval	
FK1 – purchasing power	0.95	0.79	1.12
FK2 – interest paid on a mortgage	1.49	1.22	1.75
FK3 – simple interest calculation	2.17	1.76	2.59
FK4 – compound interest calculation	1.50	1.21	1.79
FK5 – risk and reward	1.36	1.06	1.67
FK6 – inflation definition	1.41	1.09	1.74
FK7 - diversification	1.49	1.22	1.77
FK8 - yield comparison chart 1	2.75	2.10	3.40
FK9 - yield comparison chart 2	2.15	1.69	2.62

The questionnaire

FK – Financial knowledge - Score 0 - 7, sum of 7 dummy variables (FK1, ..., FK7)

FK1: *Value of money*

FK1=1 if QK3 =3 or =4.

Imagine that five brothers are given a gift of €1,000 in total. They have to wait for one year to share the money equally and inflation stays at 1%. In one year's time they will be able to buy:

- | | |
|---|-----|
| a) More than you could today | 1 |
| b) The same amount | 2 |
| c) Less than you could buy today | 3 |
| d) It depends on the types of things that they want to buy (Do not read, spontaneous) | 4 |
| e) Don't know | -97 |
| f) Refused | -99 |

FK2: *Interest paid on loan*

FK2=1 if QF4= 0%.

You lend €25 to a friend one evening and he gives you €25 back the next day. How much interest has he paid on this loan?

- | | |
|---------------|-----|
| a) __ , __ % | |
| b) Don't know | -97 |
| c) Refused | -99 |

FK3: *Calculation of interest plus principal*

FK3=1 if QK5= 102.

Imagine that someone puts €100 into a <no fee, tax free> savings account with a guaranteed interest rate of 2% per year. They don't make any further payments into this account and they don't withdraw any money. How much would be in the account at the end of the first year, once the interest payment is made?

- | | |
|----------------|-----|
| a) ____ euro | |
| b) Don't know | -97 |
| c) Refused | -99 |

FK4: *Combined simple interest+ compounding*

FK4=1 if FK3=1 and QK6=1.

How much would be in the account at the end of five years [remembering there are no fees or tax deductions] if you don't make any further payments into this account and you don't withdraw any money?

- | | |
|--|-----|
| a) More than €110 | 1 |
| b) €110 | 2 |
| c) Less than €110 | 3 |
| d) It is impossible to tell from the information given | 4 |
| e) Don't know | -97 |
| f) Refused | -99 |

FK5: Risk and return

FK5=1 if QK7_1 = 1 (true).

1=True, 0=False, -97=Don't know, -99= Refused

The two questions A1) and A2) are asked alternatively at random of half of the sample

A1) An investment with a high return is likely to be high risk

A2) If someone offers you the chance to make a lot of money, it is likely that there is also a chance that you will lose a lot of money

FK6: Inflation

FK6=1 if QK7_2 = 1 (true).

1=True, 0=False, -97=Don't know, -99= Refused

High inflation means that the cost of living is increasing rapidly

FK7: Diversification

FK7=1 if QK7_3 = 1 (true).

1=True, 0=False, -97=Don't know, -99= Refused

The two questions C1) and C2) are asked alternatively at random of half of the sample

C1) It is usually possible to reduce the risk of investing in the stock market by buying a wide range of stocks and shares

C2) It is less likely that you will lose all of your money if you save it in more than one place

FK8 - Returns on investment 1 (IACOFI 2020)

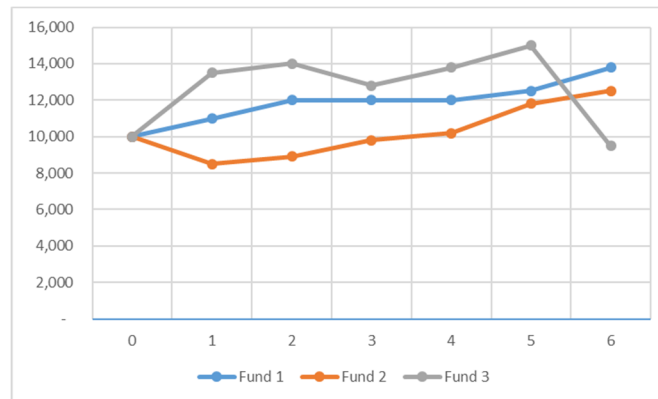
FK8=1 if QK8 = 1. See Figure 1

FK9 - Returns on investment 2 (IACOFI 2020)

FK9=1 if QK9 = 3. See Figure 1

The figure below shows the market value of the three investment funds in which €10,000 were invested six years ago

Figure 1: Funds performance



QK8 [question not included in OECD questionnaire] Assuming that the commissions and expenses are the same for all the funds, which fund obtained the best return after six years?

- | | |
|-------------------------|-----|
| a) Fund 1 | 1 |
| b) Fund 2 | 2 |
| c) Fund 3 | 3 |
| d) Can't read the graph | -95 |
| e) Don't know | -97 |
| f) Refused | -99 |

QK9 [question not included in OECD questionnaire] Which would have been the fund with the best return if the investment had had to be withdrawn at the end of three years?

- | | |
|-------------------------|-----|
| a) Fund 1 | 1 |
| b) Fund 2 | 2 |
| c) Fund 3 | 3 |
| d) Can't read the graph | -95 |
| e) Don't know | -97 |
| f) Refused | -99 |

FB - Financial behaviour - Score 0-9, sum of 8 variables (FB1, ..., FB8), all dummies except FB7 which has a range of 0-2.

FB1: *Making a budget*

FB1=1 if respondents answered 1 or 2 for the question QF1 or 1 for the question QF1 and, at the same time, they do at least two of the activities in the question QF2.

QF1 Who is responsible for making day-to-day decisions about money in your household?

- | | | |
|----|--|-----|
| a) | You make these decisions by yourself | 1 |
| b) | You make these decisions with someone else | 2 |
| c) | Someone else makes these decisions | 3 |
| e) | Don't know | -97 |
| f) | Refused | -99 |

QF1_a [ASK only if QF1=1 or =-97 or= -98]

- | | | |
|----|------------|-----|
| a) | Yes | 1 |
| b) | No | 0 |
| c) | Don't know | -97 |
| d) | Refused | -99 |

QF2_1 - QF2_

- | | | |
|----|--|-----|
| a) | Make a plan to manage your income and expenses | _1 |
| b) | Keep a record of your spending | _2 |
| c) | Keep money for bills separate from day-to-day spending money | _3 |
| d) | Make a note of upcoming bills to make sure you don't miss them | _4 |
| e) | Use a banking app or money management tool to keep track of your outgoings | _5 |
| f) | Arrange automatic payments for regular outgoings | _6 |
| g) | Refused | _99 |

FB2: Saving in the past 12 months

FB2= 1 if the respondent has been saving money in any financial instrument in the past 12 months (QF3_1, ..., QF3_8=1)

QF3_1 - QF3_99 In the past 12 months, have you been [personally] saving money in any of the following ways, whether or not you still have the money? Please, don't take into account any money paid into a pension, but think about all kinds of savings, such as building up a rainy-day fund or putting money aside for a special occasion. (multiple answers)

- | | | |
|----|--|-----|
| a) | Saving cash at home or in your wallet | _1 |
| b) | Paying money into a <savings/deposit> account | _2 |
| c) | Giving money to family to save on your behalf | _3 |
| d) | Buying bonds or time deposits | _5 |
| e) | Investing in crypto-assets or ICOs | _6 |
| f) | Investing in stocks and shares | _7 |
| g) | Saving or investing in some other way (mutual funds unit, real estate, gold ...) | _8 |
| h) | Has not been actively saving (<i>spontaneous answer</i>) | _98 |
| i) | Refused | _99 |

FB3: Expenses under control

FB3=1 if QS2_3= 1 or 2

QS2_3 How often would you say this statement applies to you? (1=Always, 5=Never, -97=Don't know, -99=Refused)

Before I buy something I carefully consider whether I can afford it

FB4: Paying bills on time

FB4=1 if QS2_5 = 1 or 2

QS2_5 How often would you say this statement applies to you? (1=Always, 5=Never, -97=Don't know, -99=Refused)

I pay my bills on time

FB5: *Having control over the financial situation*

FB5=1 if QS1_5= 1 or 2

QS1_5 I would like to know how much you agree or disagree with the following statement (as it relates to you). (1=completely agree,..., 5=completely disagree, -97=don't know, -99=refused)

I keep a close personal watch on my financial affairs

FB6: *Long term goals*

FB6=1 if QS1_8= 1 or 2

QS1_8 I would like to know how much you agree or disagree with the following statement (as it relates to you). (1=completely agree,..., 5=completely disagree, -97=don't know, -99=refused)

I set long-term financial goals and strive to achieve them

FB7: *Choice of financial products/* Sources of information on financial products

FB7=1 if respondents, who have bought financial products in the last two years, answered 1 or 4 to question QPROD2 or 1 to QPROD3_INT_3...QPROD3_INT_6

FB7=2 if respondents, who have bought financial products in the last two years, answered 1 to question QPROD3_INT_1 or QPROD3_INT_2

QPROD2 Which of the following statements best describes how you made your choice?

- | | |
|--|-----|
| a) I considered several options from different companies before making my decision | 1 |
| b) I considered the various options from one company | 2 |
| c) I didn't consider any other options at all | 3 |
| d) I looked around but there were no other options to consider | 4 |
| e) Don't know | -97 |
| f) Not applicable | -98 |
| g) Refused | -99 |

QPROD3_INT_1 ... _6 Which sources of information do you feel most influenced your decision? (multiple answers)

- | | | |
|----|--|-----|
| a) | Specialist product comparisons or best-buy guidance (such as a specialist magazine, or a price comparison website) | _1 |
| b) | A recommendation from an independent financial advisor | _2 |
| c) | Information from an advert/brochure about this specific product | _3 |
| d) | A recommendation from friends, family or acquaintances | _4 |
| e) | Information provided by bank staff (in person, online or over the phone) | _5 |
| f) | Some other type of information | _6 |
| g) | Refused | _99 |

FB8: Negative savings in the last 12 months

FB8=1 if the respondent answered that he didn't have negative savings in the last 12 months (QF11=0) OR (QF11=1) AND at least one among QF12_ (1_1, 1_3, 2_1, 2_2, 7_1) is equal to 1 (true)

QF11 Sometimes people find that their income does not quite cover their living expenses. In the last 12 months, has this happened to you, personally?

- | | | |
|----|------------|-----|
| a) | Yes | 1 |
| b) | No | 0 |
| c) | Don't know | -97 |
| d) | Refused | -99 |

QF12_1_1- QF12_99[ASK only if QF11=1]

What did you do to make ends meet the last time this happened? (multiple answers)

- | | | |
|----|---|------|
| a) | Draw money out of savings or transfer savings into <current> account | _1_1 |
| b) | Cut back on spending, spend less, do without, delay a planned expense | _1_2 |
| c) | Sell something that you own | _1_3 |
| d) | Work overtime, take an extra job, earn extra money | _2_1 |
| e) | Claim support from the government | _2_2 |
| g) | Borrow from family, friends or the community | _3_1 |
| h) | Borrow from employer/salary advance | _3_2 |
| i) | Pawn something that you own | _3_3 |
| j) | Apply for loan/withdrawal on pension fund | _3_6 |
| k) | Use an authorized, arranged overdraft or line of credit | _4_1 |
| l) | Use credit card for a cash advance or to pay bills/buy food | _4_2 |
| m) | Take out a personal loan from a financial service provider (including banks, credit unions or microfinance) | _5_1 |
| n) | Take out a loan from an informal provider/moneylender | _5_3 |
| o) | Use an unauthorized overdraft | _6_1 |
| p) | Pay bills late; miss payments | _6_2 |
| q) | Other | _7_1 |
| r) | Don't know | _97 |
| s) | Refused | _99 |

FA – Financial attitude – Score 1-5, sum of the average value of the following 3 questions

I would like to know how much you agree or disagree with the following statements (as they relate to you).
(1=completely agree,..., 5=completely disagree, -97=don't know, -99=refused)

FA1:

QS3_11 I tend to live for today and let tomorrow take care of itself

FA2:

QS1_1 I find it more satisfying to spend money than to save it for the long term

FA3:

QS1_3 Money is there to be spent

Appendix B – Statistical Tables

Table B1

Results on the components of financial literacy in Italy, 2017-2020 (percentages, scores)

	Scale	2017	2020
FK1 – purchasing power	0 - 1	0.48	0.50
FK2 – interest paid on a mortgage	0 - 1	0.54	0.79
FK3 – simple interest calculation	0 - 1	0.47	0.60
FK4 – compound interest calculation	0 - 1	0.23	0.23
FK5 – risk and reward	0 - 1	0.73	0.65
FK6 – inflation definition	0 - 1	0.71	0.65
FK7 - diversification	0 - 1	0.37	0.52
FK – Financial knowledge (average score)	0 - 7	3.5	3.9
FB1 – Responsible for expenditures and budgeting	0 - 1	0.31	0.45
FB2 – Saving in the past 12 months	0 - 1	0.49	0.43
FB3 - Before buying I consider if I can afford it	0 - 1	0.81	0.67
FB4 - Punctuality in paying bills	0 - 1	0.73	0.66
FB5 - Expenditure control	0 - 1	0.62	0.55
FB6 - Long-term goals	0 - 1	0.27	0.29
FB7 - Financial products	0 - 2	0.85	0.89
FB8 - Negative savings	0 - 1	0.34	0.27
FB – Financial behaviour (average score)	0 - 9	4.4	4.2
<i>Scale of 1 to 5 where 1 is completely agree ... 5 completely disagree</i>			
FA1 – ‘I tend to live for today and let tomorrow take care of itself’	1 – 5	3.1	2.9
FA2 – ‘I find it more satisfying to spend money than to save it for the long-term’	1 – 5	3.3	3.2
FA3 – ‘Money is there to be spent’	1 – 5	2.8	3.1
FA - Financial attitude (average score)	1 - 5	3.1	3.0
FL - Total financial literacy (FL=FK+FB+FA) (average score, scale 1-21)	1 - 21	11.0	11.2

Table B2

Average scores of financial literacy and its components in Italy, 2017-2020

	Financial knowledge (0 - 7) (FK)			Financial behaviour (0 - 9) (FB)			Financial attitude (1 - 5) (FA)			Financial literacy (FL=FK+FB+FA)		
	2017	2020	Diff. (§)	2017	2020	Diff. (§)	2017	2020	Diff. (§)	2017	2020	Diff. (§)
Gender												
women	3.4	3.8	***	4.4	4.1	***	3.1	3.1		11.0	11.0	
men	3.6	4.1	***	4.4	4.3		3.0	3.0		11.1	11.4	*
Age												
<35 years	3.5	3.9	**	4.1	3.7	*	2.8	2.8		10.4	10.4	
35-44 years	3.7	4.2	***	4.6	4.6		3.1	3.1		11.3	11.9	
45-54 years	3.6	4.1	***	4.6	4.5		3.1	3.1		11.3	11.6	
55-64 years	3.6	4.0	***	4.4	4.4		3.2	3.0	***	11.2	11.4	
More than 64 years	3.3	3.6		4.5	4.1	***	3.3	3.3		11.2	10.9	
Educational level												
No education	2.0	1.5		3.4	2.3	**	3.0	3.5	*	8.4	7.3	
Primary school certificate	3.0	3.3		4.2	3.8		3.2	3.4	*	10.4	10.5	
Lower secondary school certificate	3.2	3.7	***	4.2	3.9	**	3.0	3.0		10.4	10.6	
Upper secondary school diploma	3.8	4.1	***	4.6	4.3	**	3.1	3.0		11.4	11.5	
University degree	4.0	4.4	*	4.8	4.6		3.2	2.9	***	12.0	11.9	
Work status												
Employee	3.7	4.1	***	4.7	4.5	**	3.1	3.0		11.5	11.6	
Self-employed	3.7	4.5	***	4.7	5.0		3.0	2.9		11.5	12.4	
Retired	3.4	3.6		4.5	4.2	**	3.3	3.2	**	11.3	11.1	
Housewife/househusband	3.2	3.5		4.2	3.8	**	3.1	3.3	*	10.5	10.5	
Unemployed	3.2	3.7	**	4.1	3.1	***	2.9	2.9		10.1	9.7	
Student	3.9	4.0		3.4	3.0	*	2.8	2.7		10.1	9.7	
No. household members												
1	3.2	3.6	*	3.1	3.0	*	3.0	3.1		10.5	10.2	
2	3.5	3.9	**	3.1	3.2		3.1	3.0		10.8	10.5	
3	3.8	3.8		4.5	4.2	**	3.1	3.0	*	11.3	11.0	
4 or more	3.5	4.3	***	4.3	4.1	*	3.0	3.0		10.8	11.5	***
Geographical area												
North	3.6	4.0	***	4.5	4.0	***	3.2	3.0	***	11.3	11.0	
Centre	3.6	4.1	***	4.5	4.5		3.1	3.0	**	11.2	11.6	
South and the Islands	3.4	3.8	***	4.3	4.3		3.0	3.1	***	10.6	11.2	
Total	3.5	3.9	***	4.4	4.2	***	3.1	3.0		11.0	11.2	

§ Significance of the difference between the 2020 and 2017 averages: *** p<0.01; ** p<0.05; * p<0.1.

Table B3

Regression analysis on IACOFI data, 2017-2020 (*)

	FK		FB		FA		FL	
	Estimate	Pr > t	Estimate	Pr > t	Estimate	Pr > t	Estimate	Pr > t
Intercept	1.926	<.0001	2.580	<.0001	3.284	<.0001	7.789	<.0001
Women	-0.259	<.0001	-0.098	0.069	0.029	0.245	-0.328	0.000
Men	0.000	-	0.000	-	0.000	-	0.000	-
University degree	2.577	<.0001	2.332	<.0001	0.038	0.735	4.946	<.0001
Upper secondary school diploma	2.280	<.0001	2.031	<.0001	0.007	0.951	4.318	<.0001
Lower secondary school certificate	1.720	<.0001	1.607	<.0001	-0.113	0.295	3.213	<.0001
Primary school certificate	1.552	<.0001	1.333	<.0001	-0.026	0.811	2.859	<.0001
No education	0.000	-	0.000	-	0.000	-	0.000	-
<35 years	-0.213	0.0282	-0.780	<.0001	-0.491	<.0001	-1.484	<.0001
35-44 years	0.021	0.8385	-0.125	0.184	-0.213	<.0001	-0.317	0.052
45-54 years	0.018	0.8519	-0.104	0.242	-0.209	<.0001	-0.295	0.057
55-64 years	0.053	0.6063	-0.165	0.077	-0.164	0.000	-0.276	0.088
Over 64 years	0.000	-	0.000	-	0.000	-	0.000	-
North	0.099	0.1402	-0.031	0.618	-0.027	0.341	0.042	0.692
Centre	0.228	0.0063	0.204	0.007	-0.051	0.141	0.381	0.004
South and the Islands	0.000	-	0.000	-	0.000	-	0.000	-
Year 2017	-0.360	<.0001	0.275	<.0001	0.057	0.023	-0.028	0.766
Year 2020	0.000	-	0.000	-	0.000	-	0.000	-
R ²	0.062		0.059		0.044		0.081	
n	4,412		4,412		4,412		4,412	
Contribution to R ² according to the Shapley-Owen decomposition formula								
Gender	8.3		0.9		2.3		3.2	
Educational level	80.0		62.7		3.1		80.5	
Age	3.0		16.8		85.6		13.0	
Geographical area	0.7		2.6		1.8		2.1	
Year	8.0		17.0		7.1		1.1	
Total	100.0		100.0		100.0		100.0	

(*) The dependent variable is the financial knowledge indicator in the first column; the financial behaviour index in the second column; the index of financial attitude in the third column; the overall financial literacy indicator in the fourth column.

Table B4

International comparison of financial knowledge, 2017-2020 ^(*)*(percentages of correct answers)*

	FK1 – purchasing power	FK2 – interest paid on a mortgage	FK3 – simple interest calculation	FK4 – compound interest calculation	FK5 – risk and reward	FK6 – inflation definition	FK7 – diversificati on
2020							
Austria	73	89	79	49	92	89	61
France	56	88	65	34	80	79	74
Germany	86	92	63	40	80	85	71
Italy	51	78	59	23	65	65	51
OECD-10 ^(**)	66	87	61	30	79	80	63
2017							
Austria	66	86	68	36	86	85	62
France	59	94	57	34	87	87	75
Germany	71	86	58	39	77	80	65
Italy	48	54	47	23	73	71	37
OECD-10 ^(**)	67	84	61	31	81	82	65

(*) The data for 2020 are in gray, when a reduction compared with the previous survey is observed.

(**) For the comparison between the two surveys, reference is made to the simple average of the scores reported by the ten OECD countries that participated in both editions: Austria, Korea, Estonia, France, Germany, Italy, the Czech Republic, Poland, Portugal and Hungary.

Table B5

Self-reported financial knowledge*(percentages)*

Survey	Percentage of individuals who believe their knowledge:				
	Below average	On average	Above average	Don't know	Total
Italy 2017	47.2	40.6	5.4	6.9	100.0
Italy 2020	50.2	38.3	4.9	6.7	100.0
OECD-12 2020	28.1	51.0	16.7	4.2	100.0

Table B6

**Estimates of discriminant power (\hat{a}_i) and difficulty (\hat{b}_i) parameters
for the questions defining the financial knowledge in Italy**

Question	Discriminant power (\hat{a}_i)			Difficulty (\hat{b}_i)		
	Coefficient	Confidence interval		Coefficient	Confidence interval	
FK1 – purchasing power	0.74	0.62	0.87	0.087	-0.03	0.20
FK2 – interest paid on a mortgage	1.64	1.44	1.84	-0.548	-0.63	-0.47
FK3 – simple interest calculation	2.95	1.92	3.99	-0.063	-0.12	0.00
FK4 – compound interest calculation	2.82	2.04	3.61	0.913	0.81	1.02
FK5 – risk and reward	1.16	0.87	1.45	-0.838	-1.00	-0.67
FK6 – inflation definition	1.20	0.89	1.50	-0.791	-0.95	-0.63
FK7 - diversification	1.14	0.91	1.37	0.328	0.23	0.43

Table B7

Groups of individuals on the basis of their financial knowledge in Italy

Groups	Share of the population	Average knowledge score	Minimum knowledge score	Maximum knowledge score	Average behaviour score	Average attitude score
Excluded	24.5	1.1	0	2	3.8	3.1
Incompetent	33.2	3.2	1	5	4.2	3.1
Competent	25.6	4.9	3	6	4.4	3.0
Expert	16.8	6.4	5	7	4.8	3.1
Total	100.0	3.7	0	7	4.3	3.1

Table B8

Financial behaviours and attitudes of the identified groups of individuals in Italy

Groups	Percentage of individuals who ...					
	... keep their financial matters under control	... manage the household budget	... prefer to spend rather than save	... acquire information before buying	... have bought financial products	... plan expenses
Excluded	32.6	27.7	22.7	3.4	18.9	33.8
Incompetent	32.7	31.6	17.9	5.5	27.4	38.4
Competent	25.3	21.4	16.1	5.9	30.1	36.8
Expert	35.1	22.2	15.1	9.0	35.1	32.0
Total	31.2	26.5	18.2	5.7	27.3	35.8

Table B9

Self-assessment of financial skills by group in Italy

Groups	Percentage of individuals who believe in their skills:				
	Below average	On average	Above average	Don't know	Total
Excluded	3.1	32.0	49.8	15.2	100.0
Incompetent	3.5	35.7	55.6	5.2	100.0
Competent	4.1	38.9	53.4	3.6	100.0
Expert	10.7	50.1	36.2	3.0	100.0
Total	4.8	38.0	50.4	6.9	100.0

Table B10

Distribution of the typologies of individuals by socio-demographic characteristics in Italy

Characteristics	Excluded	Incompetent	Competent	Expert	Total
Gender					
Women	27.0	33.2	24.7	15.1	100.0
Men	21.8	33.2	26.4	18.7	100.0
Geographical area					
North	22.5	35.0	24.9	17.6	100.0
Centre	23.9	31.5	24.0	20.6	100.0
South and the Islands	27.5	31.7	27.3	13.5	100.0
Age					
18-34 years	25.6	30.6	27.2	16.6	100.0
35-44 years	21.9	29.2	29.5	19.4	100.0
45-54 years	22.4	33.7	26.6	17.3	100.0
55-64 years	22.3	36.9	25.2	15.7	100.0
More than 64 years	29.1	36.0	19.6	15.3	100.0
Educational level					
Graduation	21.3	29.8	22.1	26.8	100.0
Diploma	19.3	29.5	30.7	20.5	100.0
Without diploma	28.9	36.7	22.5	11.9	100.0
Work status					
Employee	21.1	31.7	28.5	18.8	100.0
Self-employed	17.3	32.7	31.1	18.9	100.0
Retired	26.1	38.4	19.8	15.7	100.0
Total	24.5	33.2	25.6	16.8	100.0

Table B11

Groups of individuals in Italy, 2017-2020

Groups	Share of the population		Average knowledge score	
	2017	2020	2017	2020
Excluded	27.5	21.0	1.1	1.0
Incompetent	35.9	30.1	3.2	3.2
Competent	20.2	31.7	4.7	5.0
Expert	16.5	17.2	6.4	6.5
Total	100.0	100.0	3.5	3.9

Table B12

Household resilience by group of individuals in Italy
(percentages)

Groups	They are able to meet unexpected expenses equal to their monthly income without getting into debt	They have a household income that has always been enough to cover their expenses	They are able to cover the loss of their main income for at least 3 months
Excluded	31.2	58.4	19.5
Incompetent	46.2	61.1	34.3
Competent	51.4	66.6	37.1
Expert	62.8	77.1	51.0
Total	46.7	64.5	34.2

Table B13

Average financial knowledge score of household heads in SHIW, 2006-2016
(standardized values)

	2006	2008	2010	2016
Gender				
Women	-0.30	-0.23	-0.11	-0.18
Men	0.18	0.13	0.09	0.16
Age				
Up to 30 years	-0.02	-0.03	0.10	-0.08
From 31 to 40 years	0.23	0.22	0.05	0.12
From 41 to 50 years	0.24	0.19	0.15	0.16
From 51 to 65 years	0.16	0.22	0.17	0.16
More than 65 years	-0.42	-0.41	-0.30	-0.28
Educational level				
No education	-1.00	-1.08	-0.73	-1.14
Primary school certificate	-0.44	-0.53	-0.38	-0.54
Lower secondary school certificate	0.01	0.02	0.03	-0.05
Upper secondary school diploma	0.41	0.42	0.19	0.32
University degree	0.54	0.67	0.32	0.55
PhD	1.06	0.91	0.25	0.37
Work status				
Employee	0.23	0.21	0.13	0.19
Self-employed	0.44	0.50	0.29	0.31
Retired and other	-0.28	-0.27	-0.17	-0.22
Born abroad				
No	0.01	0.04	0.02	0.05
Yes	-0.20	-0.44	-0.21	-0.42
Household income fifths				
1st	-0.64	-0.67	-0.34	-0.51
2nd	-0.23	-0.24	-0.17	-0.22
3rd	0.04	0.02	-0.04	0.02
4th	0.30	0.29	0.20	0.25
5th	0.54	0.64	0.34	0.55
Household net wealth fifths				
1st	-0.40	-0.44	-0.24	-0.33
2nd	-0.22	-0.17	-0.03	-0.12
3rd	-0.03	-0.03	-0.10	-0.04
4th	0.19	0.12	0.09	0.08
5th	0.48	0.56	0.29	0.47
Town size				
Up to 20,000 inhabitants	0.01	-0.07	-0.02	-0.01
20,000-40,000 inhabitants	-0.10	-0.07	-0.07	-0.15
40,000-500,000 inhabitants	0.01	0.07	0.04	0.11
More than 500,000 inhabitants	0.06	0.16	0.05	-0.01
Geographical area				
North	0.15	0.18	0.02	0.09
Centre	0.14	0.07	0.14	0.14
South and the Islands	-0.31	-0.33	-0.14	-0.26
Total	0.00	0.00	0.00	0.00

Table B14

Regression analyses on financial knowledge of household heads in SHIW, 2006-2016
(standardized values)

	Whole sample						Excluding panel households					
	Model 1		Model 2		Model 3		Model 1		Model 2		Model 3	
	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
Intercept	0.5966	<.0001	-9.0632	<.0001	-10.135	<.0001	0.5470	<.0001	-10.075	<.0001	-11.222	<.0001
Men	0.0688	<.0001	0.0684	<.0001	3.3258	0.0004	0.0699	<.0001	0.0676	<.0001	3.9542	0.0002
Women	0.0000	-	0.0000	-	0.0000	-	0.0000	-	0.0000	-	0.0000	-
No education	-0.3637	<.0001	-0.3192	<.0001	-0.3074	<.0001	-0.3542	<.0001	-0.3064	<.0001	-0.2929	<.0001
Primary school certificate	-0.2194	<.0001	-0.1970	<.0001	-0.1926	<.0001	-0.1950	<.0001	-0.1691	<.0001	-0.1647	<.0001
Lower secondary school certificate	-0.1032	0.0038	-0.0982	0.0058	-0.0972	0.0062	-0.0536	0.1771	-0.0459	0.2471	-0.0460	0.2452
Upper secondary school diploma	-0.0184	0.6040	-0.0134	0.7040	-0.0133	0.7064	0.0245	0.5349	0.0323	0.4124	0.0322	0.4137
University degree	0.0572	0.1139	0.0597	0.0980	0.0583	0.1057	0.0922	0.0227	0.0971	0.0161	0.0945	0.0190
PhD	0.0000	-	0.0000	-	0.0000	-	0.0000	-	0.0000	-	0.0000	-
Employee	0.0116	0.3220	0.0032	0.7834	0.0076	0.5210	0.0212	0.1239	0.0118	0.3939	0.0171	0.2200
Self-employed	0.0144	0.3537	0.0041	0.7929	0.0101	0.5181	0.0069	0.7077	-0.0046	0.8040	0.0030	0.8714
Retired and other	0.0000	-	0.0000	-	0.0000	-	0.0000	-	0.0000	-	0.0000	-
Up to 30 years	0.0447	0.0630	-0.1808	<.0001	-0.1735	<.0001	0.0097	0.7110	-0.2396	<.0001	-0.2277	<.0001
From 31 to 40 years	0.0467	0.0059	-0.1330	<.0001	-0.1220	0.0002	0.0429	0.0294	-0.1561	<.0001	-0.1401	0.0004
From 41 to 50 years	0.0416	0.0080	-0.0888	0.0006	-0.0809	0.0018	0.0379	0.0435	-0.1077	0.0005	-0.0961	0.0021
From 51 to 65 years	0.0441	0.0007	-0.0323	0.0686	-0.0279	0.1158	0.0277	0.0820	-0.0579	0.0073	-0.0516	0.0169
More than 65 years	0.0000	-	0.0000	-	0.0000	-	0.0000	-	0.0000	-	0.0000	-
Born abroad	-0.0938	<.0001	-0.0956	<.0001	-0.0951	<.0001	-0.1302	<.0001	-0.1330	<.0001	-0.1325	<.0001
No. of household members	0.0000	0.9971	-0.0027	0.4436	-0.0036	0.3098	-0.0023	0.5860	-0.0052	0.2169	-0.0063	0.1350
Up to 20,000 inhabitants	0.0586	<.0001	0.0564	<.0001	0.0553	<.0001	0.0839	<.0001	0.0815	<.0001	0.0806	<.0001
20,000-40,000 inhab.	0.0017	0.9082	-0.0009	0.9544	-0.0007	0.9631	0.0281	0.1000	0.0255	0.1339	0.0245	0.1500
40,000-500,000 inhab.	0.0740	<.0001	0.0726	<.0001	0.0723	<.0001	0.1056	<.0001	0.1039	<.0001	0.1040	<.0001
More than 50,000 in.	0.0000	-	0.0000	-	0.0000	-	0.0000	-	0.0000	-	0.0000	-
North	0.0600	<.0001	0.0618	<.0001	0.0622	<.0001	0.0582	<.0001	0.0601	<.0001	0.0606	<.0001
Centre	0.0921	<.0001	0.0935	<.0001	0.0932	<.0001	0.0874	<.0001	0.0888	<.0001	0.0883	<.0001
South and the Islands	0.0000	-	0.0000	-	0.0000	-	0.0000	-	0.0000	-	0.0000	-
1st net wealth fifth	-0.0911	<.0001	-0.0963	<.0001	-0.0973	<.0001	-0.0977	<.0001	-0.1036	<.0001	-0.1045	<.0001
2nd net wealth fifth	-0.0426	0.0029	-0.0451	0.0016	-0.0451	0.0016	-0.0531	0.0016	-0.0557	0.0009	-0.0558	0.0009
3rd net wealth fifth	-0.0314	0.0212	-0.0330	0.0151	-0.0324	0.0170	-0.0556	0.0006	-0.0564	0.0005	-0.0556	0.0005
4th net wealth fifth	-0.0495	0.0001	-0.0505	<.0001	-0.0499	<.0001	-0.0659	<.0001	-0.0667	<.0001	-0.0660	<.0001
5th net wealth fifth	0.0000	-	0.0000	-	0.0000	-	0.0000	-	0.0000	-	0.0000	-
1st income fifth	-0.1479	<.0001	-0.1485	<.0001	-0.1446	<.0001	-0.1580	<.0001	-0.1577	<.0001	-0.1532	<.0001
2nd income fifth	-0.1103	<.0001	-0.1112	<.0001	-0.1096	<.0001	-0.1080	<.0001	-0.1091	<.0001	-0.1077	<.0001
3rd income fifth	-0.0867	<.0001	-0.0881	<.0001	-0.0874	<.0001	-0.0852	<.0001	-0.0876	<.0001	-0.0862	<.0001
4th income fifth	-0.0394	0.0025	-0.0410	0.0016	-0.0415	0.0014	-0.0358	0.0226	-0.0383	0.0145	-0.0394	0.0119
5th income fifth	0.0000	-	0.0000	-	0.0000	-	0.0000	-	0.0000	-	0.0000	-
Year of birth			0.0050	<.0001	0.0055	<.0001			0.0055	<.0001	0.0061	<.0001
Men* Year of birth					-0.0017	0.0006					-0.0020	0.0003
Women* Year of birth					0.0000	-					0.0000	-
R ²	0.225		0.229		0.230		0.241		0.246		0.248	
n	7,418		7,418		7,418		5,281		5,281		5,281	

Appendix C – Financial knowledge indicators in the SHIW

Table C1 summarizes the information on the financial knowledge variables detected in the four surveys considered: there is little overlap between the questions in the various surveys. Only one of the 13 variables detected over time was maintained in all four surveys and only one other is present in three surveys (Table C1).

Table C1

Questions on financial knowledge in SHIW, 2006-2016 (*)

(shares of correct answers, units)

Year	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13				
	QMUTUO	QINT	QCC1	QUIZ6	QUIZ3	QTASSO	QRISK1	QRISK2	QPREVC1	QPREVC2	QPREVC3	QPREVC4	QRISK1(**)	Average (***)	N. Questions	Sample size	Cronbach st. Alpha (****)
Whole sample																	
2006	52.6	59.2	50.0	52.0	27.1	40.0	-	-	-	-	-	-	-	47.0	6	3,992	0.75
2008	66.0	72.8	60.7	-	-	-	44.9	33.9	25.5	32.4	32.9	19.6	-	43.0	9	7,977	0.73
2010	58.4	69.5	-	-	-	-	51.7	-	-	-	-	-	-	60.0	3	7,951	0.55
2016	-	61.4	-	-	-	50.1	-	-	-	-	-	-	51.6	54.0	3	7,418	0.61
Excluded panel households																	
2006	52.6	59.2	50.0	52.0	27.1	40.0	-	-	-	-	-	-	-	46.8	6	3,992	0.75
2008	65.2	72.4	60.9	-	-	-	44.8	34.0	25.6	31.6	32.4	19.5	-	42.9	9	5,722	0.73
2010	57.3	68.5	-	-	-	-	52.0	-	-	-	-	-	-	59.3	3	3,330	0.55
2016	-	60.2	-	-	-	48.4	-	-	-	-	-	-	50.4	53.0	3	5,281	0.61

(*) The table reports the names of the variables. In 2006, the questions were in a monographic section and were asked of about half of the sample. In the lower part of the table, panel households are excluded in the 2008-2016 computations.

(**) Variable QRISK1 in the 2016 survey has a slightly different wording from that used in 2008.

(***) Average 2006 = (Q1+Q2+Q3+Q4+Q5+Q6)/6 - Average 2008 = (Q1+Q2+Q3+Q7+Q8+Q9+Q10+Q11+Q12)/9 - Average 2010 = (Q1+Q2+Q7)/3 - Average 2016 = (Q2+Q6+Q13)/3.

(****) alpha standardized Cronbach reliability index (0-1).

Therefore, the indicators defined in each year as the average of the correct answers for the available variables cannot be directly compared.

In the paper, based on the assumption that the questions measure the same latent variable, we proceed to a standardization of the sum of the correct answers, so that the indicators for each year have the same mean and the same variance and their distributions can be compared.

The reliability coefficients of the indices that measure financial knowledge over the various years, i.e. the share of variability of the indicators expressing the latent variable, are higher in 2006 and 2008 than in more recent years, respectively equal to 0.75 and 0.73, also reflecting the greater number of variables used in these two years.²¹ In 2010 and 2016, the reliability is lower, between 0.55 and 0.61.

²¹ The standardized Cronbach Alpha coefficient is a function of the mean of the correlation coefficients between the variables used to construct the financial knowledge indicator r , and of their number k : $\alpha = kr / (1 + (k-1) r)$ (Cronbach, 1951).

References

- Birnbaum A. (1968), Some Latent Trait Models and Their Use in Inferring an Examinee's Ability, edited by F. M. Lord and M. R. Novick, *Statistical Theories of Mental Test Scores*, Reading, Addison-Wesley.
- Ceccatelli C., T. Di Battista, F. Fortuna, F. Maturo (2013), L'Item Response Theory come strumento di valutazione delle eccellenze nella scuola, *Science & Philosophy*, Vol. 1, n. 1, pp. 143-156.
- Cronbach L. J. (1951), Coefficient alpha and the internal structure of tests, *Psychometrika*, n. 16, pp. 297-334.
- di Salvatore A., F. Franceschi, A. Neri, F. Zanichelli (2018), Measuring the financial literacy of the adult population: the experience of Banca d'Italia, *Questioni di Economia e Finanza (Occasional Papers)*, n. 435, June.
- Dunning D., K. Johnson, J. Ehrlinger, J. Kruger (2003), Why People Fail to Recognize Their Own Incompetence, *Current Directions in Psychological Science*, Vol. 12, n. 3, pp. 83–87.
- Hasler A., A. Lusardi, N. Oggero (2018), Financial fragility in the US: Evidence and implications, *GFLEC Working Paper*, no. 1.
- Hsu J.W. (2016), Aging and Strategic Learning: The Impact of Spousal Incentives on Financial Literacy, *Journal of Human Resources*, Vol. 51, no. 4, pp. 1036-1067.
- Kaiser, T, A. Lusardi, L. Menkhoff, C. J. Urban, (2020), "Financial education affects financial knowledge and downstream behaviour", *Nber Working Paper Series*, n. 27057.
- Klapper L., A. Lusardi, (2019), Financial literacy and financial resilience: Evidence from around the world, *Financial Management*, Vol. 1, n. 26, <https://doi.org/10.1111/fima.12283>.
- OECD (2016), [OECD/INFE 2016 International Survey of Adult Financial Literacy Competencies](#).
- OECD (2017), [G20/OECD INFE Report on Adult Financial Literacy in G20 Countries](#).
- OECD (2020), [OECD/INFE 2020 International Survey of Adult Financial Literacy](#).
- Montanaro, P., A. Romagnoli (2016), "La financial literacy in PISA 2012: un'analisi dei risultati e il ruolo delle famiglie in Italia", Banca d'Italia, *Questioni di Economia e Finanza (Occasional Papers)*, n. 335, July 2016.
- Rasch G. (1960), Probabilistic Models for Some Intelligence and Attainment Tests, Copenhagen, Danish Institute for Educational Research.
- Romagnoli, A., M. Trifilidis, (2013), "Does financial education at school work? Evidence from Italy," Banca d'Italia, *Questioni di Economia e Finanza (Occasional Papers)*, n. 155, April.
- Taber K.S. (2017), "The use of Cronbach's alpha when developing and reporting research instruments in science education", *Research in Science Education*, n. 48, pp. 1273–1296.