

THE FINANCIAL LITERACY OF MICRO-ENTREPRENEURS: EVIDENCES FROM ITALY

by Paolo Finaldi Russo*, Ludovica Galotto* and Cristiana Rampazzi*

Abstract

Entrepreneurs, including those who run very small or individual businesses, are often assumed to have sound financial skills as they make frequent financial decisions. This paper explores this issue by analysing the level of financial literacy (FL) of Italian micro-entrepreneurs in comparison with other countries and other Italian adults. The results, based on the 2020 Financial Literacy Survey conducted by the Bank of Italy according to the OCSE/INFE methodology, are threefold. First, Italian micro-entrepreneurs have quite low levels of FL by international standards. Second, compared to other Italians, business owners have only a slightly higher FL; this difference is mainly related with their higher income and more frequent use of financial services. Third, thanks to this small difference in financial skills, micro-entrepreneurs are more likely to make better financial decisions than other adults. These findings suggest that strengthening the weak financial literacy of micro-entrepreneurs can have a positive impact on their ability to make more appropriate decisions and ultimately on the resilience and growth of their businesses.

JEL Classification: G53, L26, J24

Keywords: financial literacy, financial behaviour, micro-entrepreneurs, SMEs.

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* Bank of Italy, Financial Education Directorate

1. Introduction¹

Financial decisions affect almost every aspect of a company's day-to-day operations: from customer and supplier payment terms to liquidity management, from financial planning to inventory management, from relationships with banks to investment decisions. For this reason, entrepreneurs' financial literacy (FL hereafter) can have a significant impact on the growth prospects of the companies (Bruhn and Zia, 2011; Siekei et al., 2013; Drexler et al., 2014; Eniola and Entbang, 2017; Alperovych, Calcagno and Lentz, 2020), on their ability to access external finance (Hussain et al., 2018), to repay debt regularly (Wise, 2013, Kotzè and Smith, 2008) and to mitigate the effects of crises (D'Ignazio et al., 2022).

This is especially true for small business owners, as they typically cannot rely on employees with specialized financial skills and are often forced to seek outside advice (not necessarily from professional providers) and to invest on their own financial education. As a result, micro-entrepreneurs can be expected to be more financially literate than other individuals.

In this paper, we study the financial literacy of Italian entrepreneurs by analyzing data collected by the Bank of Italy in 2020 through the Survey of Adult Financial Literacy promoted by the OECD/INFE. Our results suggest that Italian micro-entrepreneurs have a low level of financial literacy by international standards. Consistent with this evidence, we find that in Italy the difference in FL between business owners and other adults is quite small. Other things being equal, the three main variables explaining this slight difference are, in order: income, age, and education. As for income, the correlation with entrepreneurs' FL could depend on the fact that they manage larger revenue streams and use more financial products/services to run the business; however, causality could also be the other way around, as financial skills themselves could lead to higher income (Frijns et al., 2014). In terms of age and education, entrepreneurs are more concentrated than other adults in the groups that typically have higher levels of FL (working-age and most educated people). Finally, due to this small FL gap, micro-entrepreneurs are more likely to make better financial decisions and have more savvy financial behaviour than other adults.

The paper is organized as follows. The second Section describes the database. Using the metric adopted by the OECD, Section 3 analyzes the FL levels of Italian micro-entrepreneurs compared to both entrepreneurs in other countries and other Italian adults. In Section 4, we repeat the analysis using an indicator for FL that relies more heavily on entrepreneurial competences. Section 5 studies the

¹ The authors are grateful to Riccardo De Bonis, Alessio D'Ignazio, Marilisa Guida and Massimiliano Stacchini for helpful discussions and comments. The views expressed in the article are those of the authors only and do not involve the responsibility of the Bank of Italy.

relationship between FL and different types of financial decisions or behaviours. In Section 6, we draw the conclusions and outline some policy implications.

2. Data

We use the Italian data from the Survey of Adult Financial Literacy promoted by the International Network for Financial Education (OECD, 2018) and collected in early 2020 by the Bank of Italy.² The dataset consists of about 2,000 individuals aged between 18 and 79 years, representative of the Italian population. The sampling weights were subjected to a post-stratification procedure to adapt the composition of the sample with that of the population according to gender, age, and geographical region (D'Alessio et al, 2020).

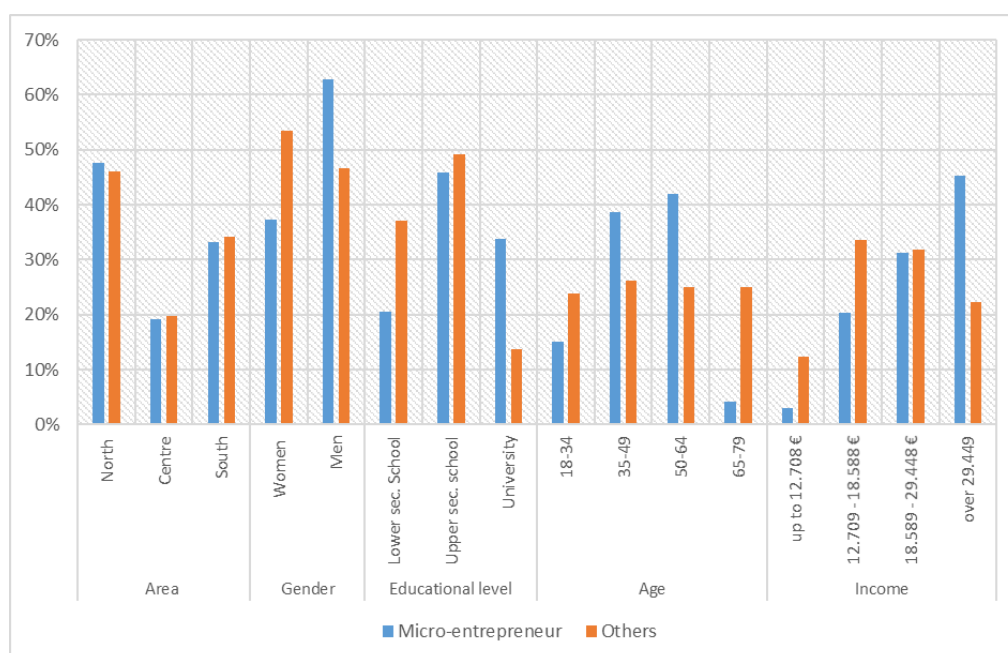
The survey allows classifying the respondents according to 14 categories of occupational status (Table 1). We exploit this information to identify micro-entrepreneurs as those who fall into the following categories of self-employed: i) entrepreneurs/freelancers, ii) merchants/artisans, and iii) farmers. In the remainder of this work, we will refer to these respondents indiscriminately as micro-entrepreneurs, business owners, self-employed, or simply entrepreneurs.

Overall, the sample includes 230 business owners, representing 12 per cent of the total respondents. Several indicators provide reassuring evidence of the survey's representativeness for the categories of entrepreneurs. Table 2 shows that in our sample the percentage of self-employed in the total adult population (11.9 per cent), the share of self-employed in the total number of employed persons (22.5 per cent) and the share of artisans and merchants in the total number of enterprises (53 per cent) are very similar to the values calculated for the Italian population.

Figure 1 shows the composition of micro-entrepreneurs in the survey sample by area, gender, education, age and income classes in comparison with other individuals. More often than the rest of the sample, micro-entrepreneurs are male, belong to the middle age classes (between 35 and 64 years), are better off, and have higher levels of education (almost 80 per cent have completed at least secondary education or have a university degree; see also Table 3).

² The questionnaire is described in OCSE/INFE (2018). The Italian version of the questionnaire as well as the data collected in 2017 and 2020 are published on the Bank of Italy's website (<https://www.bancaditalia.it/statistiche/tematiche/indagini-famiglie-imprese/alfabetizzazione/index.html>).

Figure 1: Sociodemographic characteristics (1)
(percentages)



Notes: (1) Income classes are set as the income quartiles of the 2016 Italian Survey on Household Income and Wealth (SHIW).

3. Italian entrepreneurs' financial literacy

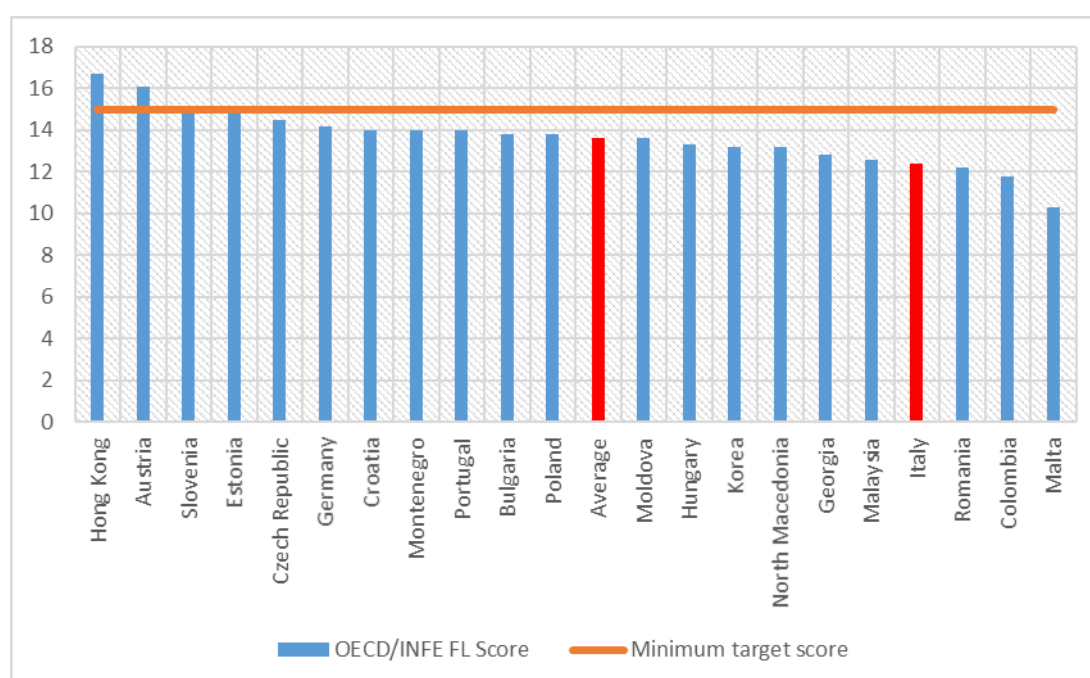
Following the methodology proposed by the OECD-INFE, we compute for each respondent a FL score that ranges between 1 and 21. The score is calculated as the sum of three components: i) knowledge, ii) behaviour, and iii) attitude.

- (i) The knowledge score is derived from the number of correct answers to seven financial questions related to the understanding of basic economic concepts (inflation; interest rate; difference between simple and compound interest; risk diversification). The score for financial knowledge ranges from zero to 7.
- (ii) The behaviour score is calculated as the number of "financially savvy" behaviours (i.e. saving money actively, paying bills on time, planning future expenditures) and ranges from zero to 9.
- (iii) The financial attitude score ranges from 1 to 5 and is calculated as the weighted sum of three correct answers to questions that provide information about individual attitude towards saving, especially retirement saving, in a long-term perspective.

3.1 *The international comparison*

According to the OECD/INFE indicator, the average value of financial literacy among Italian micro-entrepreneurs is equal to 12.4, slightly higher than half of the maximum score of 21. This is a quite poor level in the international comparison. With respect to the other 20 countries that participated in the 2020 Adult Financial Literacy Survey, Italian entrepreneurs are at the bottom of the ranking and far below the international average (Figure 2). The gap is greater with European countries with higher GDP per capita, i.e. Austria and Germany.

Figure 2: Financial literacy of entrepreneurs: an international comparison
(averages)



Our assessment that Italian entrepreneurs' FL is rather low is also confirmed by the distance to the "minimum target score" of FL set by OECD-INFE (and corresponding to 70 percent of the maximum score; Table 4). This result is particularly worrying given that the OECD minimum refers to a sufficient level of financial literacy set for the entire population, whereas we might reasonably expect the minimum target score of individuals who work in business and make financial decisions on a daily basis to be at a higher level.

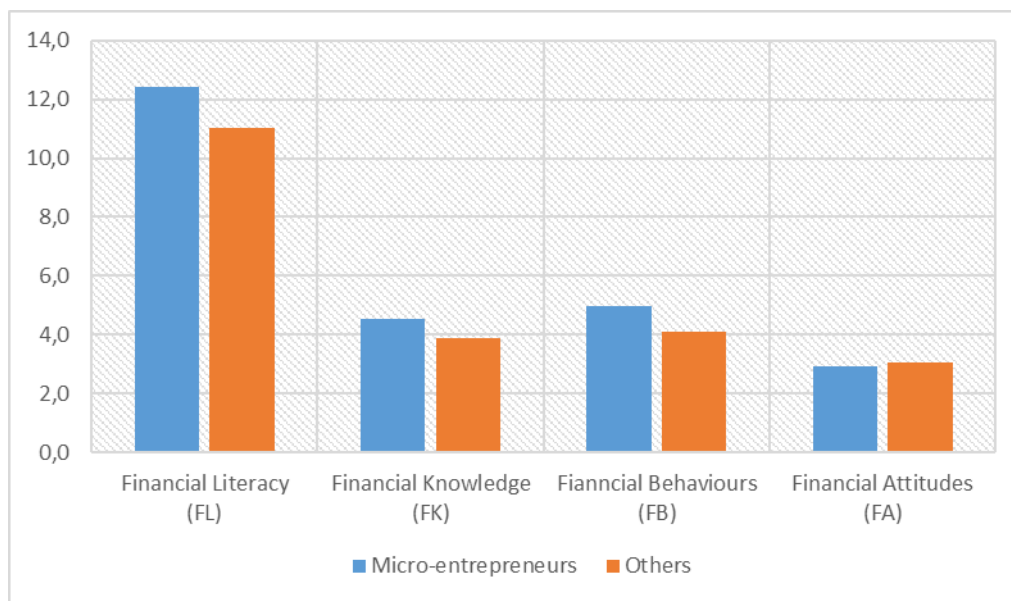
3.2 *Entrepreneurs vs. other adults in Italy*

The average FL of Italian entrepreneurs is 12.4, only slightly higher than the corresponding figure for other Italian adults (11.0), which is already low by international standards. As reported in D'Alessio

et al. (2020), Italy is at the bottom of the international OECD rankings in 2020, as it did in 2017. Even if our definition of business owners includes quite heterogeneous occupational status, the average FL scores of the groups are quite similar, varying from a minimum of 12.2 for merchants and artisans up to 12.6 among free lancers and other entrepreneurs.

Figure 3 and Table 4 display that the difference from the other adults is concentrated in the financial knowledge and financial behaviour components.

Figure 3: Financial literacy scores in Italy
(OECD-INFE scores; averages)



A closer look at the questions included in the financial knowledge sub-score, the most robust of the three components,³ shows that the percentage of correct answers is always higher for micro-entrepreneurs than for other adults (Table 5). Nonetheless, notable gaps in financial knowledge are evident among a not insignificant proportion of entrepreneurs: the percentage of those who cannot calculate simple interest rate is 33 per cent; a mere 31 per cent correctly answered the questions on simple interest and compound interest rates combined, and 35 per cent of entrepreneurs do not have a clear concept of risk diversification.

To test the hypothesis that higher financial competences could reflect differences in sociodemographic characteristics relative to other adults (i.e., whether the FL gap is due to the higher education of micro-entrepreneurs), we analyze the FL of entrepreneurs using a multivariate approach that includes a large number of variables. We estimate a linear regression model in which the dependent variable is the FL score and the covariates are represented by a set of individual sociodemographic

³ See D'Alessio et al. (2020) for a discussion on the robustness of the three sub-scores.

variables. Our variable of interest is the dummy *Entrepreneur*, which equals 1 for micro-entrepreneurs: the estimated coefficient of this variable measures the difference in the FL score between entrepreneurs and other adults. Other covariates include geographic area, age, gender, education, income and use of financial products. Table 6 provides the descriptive statistics for the variables considered in the estimates.

Table 7 shows the results of the OLS regressions that include progressively geographic area, age, gender, and education level (columns 1-5). Considering these characteristics, the difference in FL between entrepreneurs and the rest of the sample gradually decreases from 1.4 to 0.9 points (remaining significantly positive). With the inclusion of the dummies identifying the income quartiles (column 6) the estimated coefficient of *Entrepreneur* drops to 0.6, becoming non-significantly different from 0. These results confirm that the difference in FL between business owners and other adult is quite small and is largely due to sociodemographic characteristics of the individuals.

The main factors associated with the average FL difference of 1.4 points between entrepreneurs and other adults are, in order of relevance, income, age, and education (while geographic region and gender have no or less relevant effects).⁴ Income is by far the most important factor. This could be interpreted as a learning-by-doing effect, as entrepreneurs may have more opportunities to improve their financial skills managing larger income streams; but causality could also be the other way around for the positive effects of higher FL on their income. As for age and education, entrepreneurs are more concentrated in classes that typically have higher FL levels: people in working-age (35-64 years old) and with higher education (Lusardi and Mitchell, 2011).

The importance of income (and money management) among the covariates is somehow confirmed by a regression that takes also into account the number financial products used by the individuals. The results reported in the column 7 show, as expected, that the coefficients of the new variables are significantly positive and, more importantly for our analysis, that the difference in FL between entrepreneurs and the rest of the sample almost disappears (the estimated coefficient of *Entrepreneur* falls to 0.2).

We tested the robustness of our results by running alternative specification of our regressions. First, we used, as dependent variable, the sub-score of financial knowledge (FK) instead of the FL score; results are qualitatively unchanged (Table 8). Second, our results are confirmed also when we included in the control group only employed people to make a more stringent comparison between entrepreneurs and other workers (Table 9). Finally, we tested different ways to account for the use of financial products

⁴ We ranked the covariates by evaluating the effects of their exclusion, in turn, from the model estimated in Table 7, col. 6. Specifically we focused on the changes in the estimated coefficient of *Entrepreneur* and in the R-squared statistic.

to reduce possible endogeneity due to the fact that knowledge about some financial products/services is taken into account when calculating the FL score.⁵

4. Beyond the OCSE/INFE financial literacy score

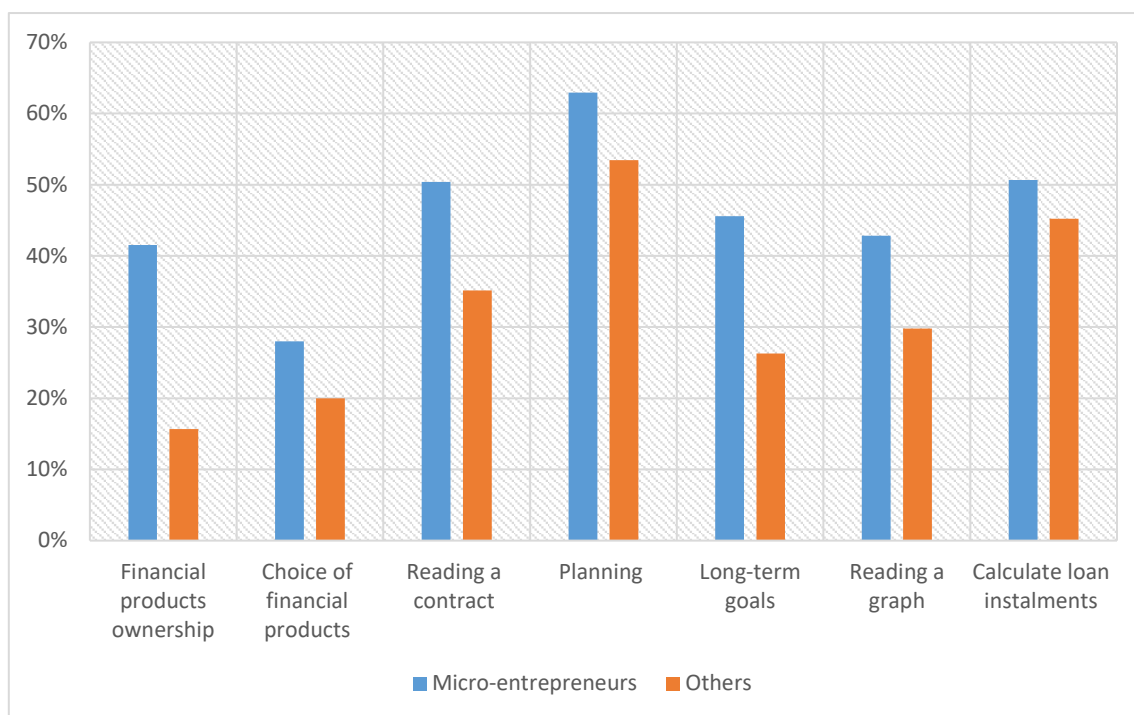
The OECD working definition of financial literacy is “A combination of awareness, knowledge, skill, attitude and behaviour necessary to make sound financial decisions and ultimately achieve individual financial wellbeing.” (OECD 2018). Consistently, the FL score developed by the OECD/INFE relies on a methodology aimed at measuring financial competences that can lead adults to make sound financial decisions. However, the same indicator may not adequately measure the financial knowledge and abilities entrepreneurs need to make financial decisions to run their businesses. The use of an inaccurate instrument could help explain the tiny difference in FL between entrepreneurs and the rest of the population that we highlighted in the previous Section. In this Section, we explore this hypothesis by refining the analysis and constructing an indicator that better reflects the expertise required to run a business.

To this end, we extracted from the questionnaire a subset of seven questions that relate more narrowly to three entrepreneurial and business skills: i) the ability to select and use financial products and services (ownership of financial instruments related to business activities, selection of financial instruments); ii) self-reported attitudes toward financial decision-making (reading a contract, financial planning, long-term goals); and iii) knowledge of the main elements of financial instruments (ability to read a spreadsheet, ability to calculate interest rates for a mortgage).

Figure 4 reports percentages of business owners and other adults responding “correctly” to these seven questions. Differences between the two groups are especially large (higher than 15 percentage points) in the ownership of business-related financial products, the propensity to set long-term goals and the capacity to read a contract. Conversely, the gap is lower than 10 percentage points in the ability to choose financial products, to reason over the amount of instalments for loans with different terms, and to make financial plans. However, the overall results for entrepreneurs are far from optimal. For most of these aspects, the percentages of entrepreneurs showing higher knowledge/skills or better behaviours are lower than 50 percent. For example, less than 30 per cent of entrepreneurs have recently purchased a financial product acting thoughtfully in this choice, i.e. by shopping around or seeking independent information or advice.

⁵ Results not displayed but available upon request.

Figure 4. Components of the Entrepreneurial Financial Literacy Score (1)
(percentages of 'correct' answers)



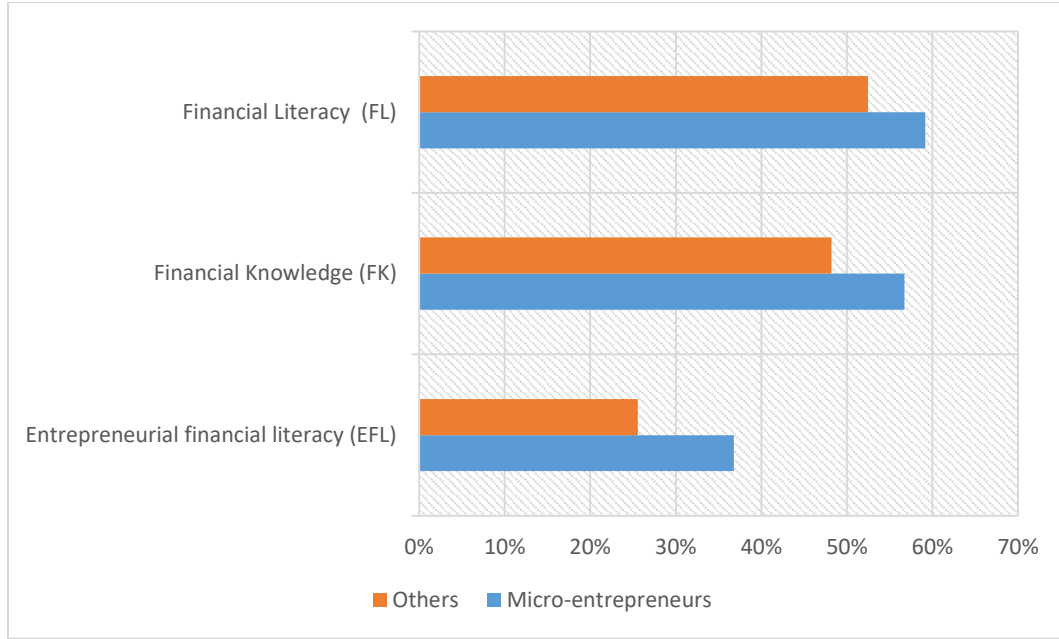
Note: (1) See Table 10 for the definitions of the variables. In the EFL score *Choice of financial product* ranges between 0 and 2; in this Figure it is considered as a dummy equal to 1 if the variable is equal 1 or 2.

Our new indicator, the Entrepreneurial Financial Literacy Score (EFL score, henceforth), is computed as the algebraic sum of the values taken by these seven variables, ranging from 0 to 8 (see Table 10 for details). The average EFL score is equal to 3.3, one point higher than the rest of the population (Table 11).

Does the novel indicator tell us something more about the financial competences of micro-entrepreneurs? In order to compare the levels of financial literacy measured by the three different scores (FL, FK and EFL), we normalize them with the corresponding number of notches⁶: for instance, the normalized value of the average FL score for entrepreneurs, which is equal to 12.4, is 59 per cent (i.e., $12.4/21$). Figure 5 and Table 12 clearly show that financial skills appears rather modest for both entrepreneurs and other adults, independently of the considered indicator. Measured by the EFL score, financial culture appears to be significantly lower (37 per cent) than with the FL and FK indicators (59 and 57 per cent), as the former is based on less elementary competences.

⁶ We cannot simply take into account the maximum value of the three indicators since for the FL score the lower value is equal to 1 whereas for the other two scores is equal to 0. Thus, FL score, which ranges between 1 and 21, has 21 notches; FK (0-7) and EFL (0-8) have 8 and 9 notches, respectively.

Figure 5. Normalized financial literacy scores
(averages)



As for the difference between entrepreneurs and the rest of the sample, the figure indicates that the gap is relatively wider for the EFL score than with the two OCSE/INFE scores. This evidence could suggest that the use of a specific indicator, such as the EFL score, may lead to more robust results for the purpose of our analysis.

Therefore, we repeated the econometric analysis presented in Table 7, using the EFL score as the dependent variable instead of the FL score. The results are similar in qualitative terms (Table 13). Entrepreneurs, *ceteris paribus*, tend to be slightly more financially literate, on average, than the rest of the population. The difference in financial literacy score in favor of business owners decreases as we account for increasingly more sociodemographic variables (geographic area, age, gender, and education). Unlike previous results, however, the decline in the difference is more limited and the coefficient of *Entrepreneur* remains significantly positive even in the specification that includes income variables.⁷

However, comparing the results of econometric estimations of different dependent variables (EFL, FL and FK) may be misleading. To provide a more robust evidence that the EFL score really identifies a larger gap between business owners and other adults, for each model presented in Tables 7, 8 and 13 we computed the ratio of the estimated difference (the value of the coefficient of *Entrepreneur*) to the sample average value of the corresponding dependent variable (i.e. we express the estimated difference in FL between the two groups in percentage of the mean value of FL for the population). The

⁷ We did not replicate the specification presented in the last column of Table 7 that includes the dummies for the use of financial products for avoiding endogeneity issues (these variables enter directly in the computation of the EFL score).

values of these “normalized” gaps are reported in Table 14. The differences in financial competences measured by the EFL score are actually larger, ranging between 25 and 43 percent of the average value of the Italian population (column 3), whereas those related to OCSE/INFE FL and FK scores are in the order of 5-18 per cent (columns 1 and 2). In the models that take into account all sociodemographic variables, being an entrepreneur is associated with an entrepreneurial literacy score 25 per cent higher than the average adult, while it is 5 per cent higher for the OCSE/INFE FL and FK scores (Table 14, row (6)).

Overall, the results of this Section confirm that micro-entrepreneurs show rather low levels of financial literacy even when using a more specific indicator. However, unlike the evidences based on the OECD/INFE scores, the difference in FL with other adults is not negligible and does not depend exclusively on sociodemographic characteristics: entrepreneurs might actually achieve higher levels of financial literacy when running their businesses and making financial decisions on a daily basis. Finally, from a methodological point of view, we highlight that the use of information that takes into account the specific skills needed to run a business seems appropriate for analyzing entrepreneurs’ FL literacy.

5. From financial culture to financial choices

What are the benefits of higher financial competences? How much an entrepreneur can take advantages from financial skills compared with other adults? While the economic literature mainly focuses on the effects of financial literacy for personal well-being,⁸ the evidences for entrepreneurs or small businesses are rather scant.⁹

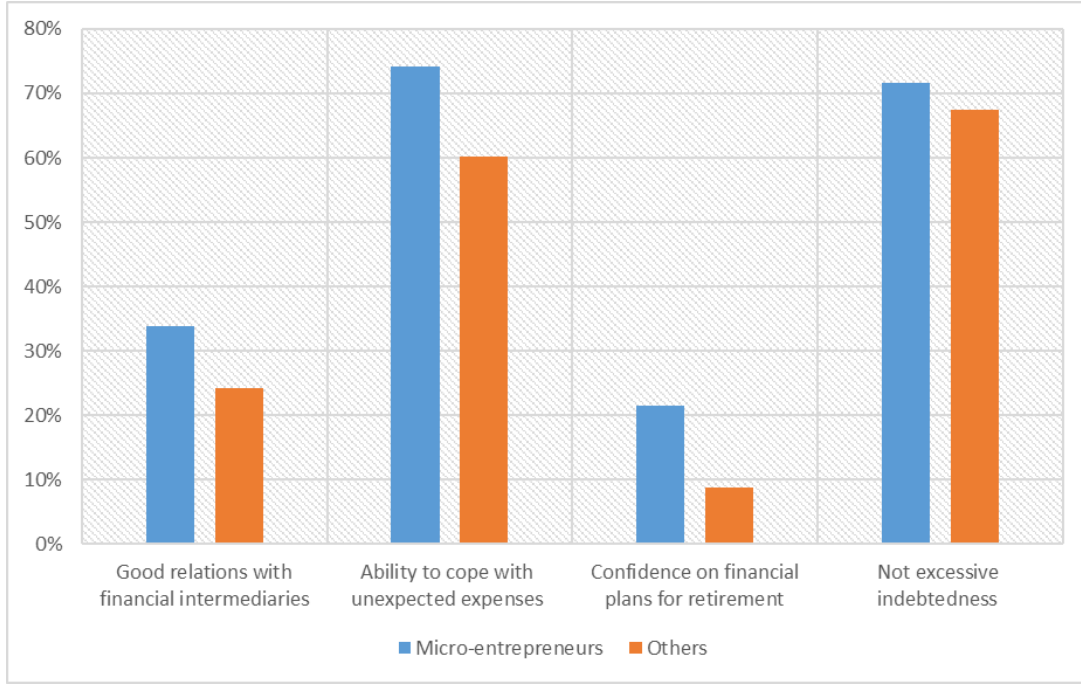
In this section, we try to answer these questions through an econometric analysis that investigates the relationship between FL and some relevant financial behaviours/choices, for both entrepreneurs and other adults. The analysis exploits the questionnaire by focusing on the following four aspects: (i) quality of relationships with financial intermediaries (*trust*), (ii) ability to deal with unexpected expenses (*resilience*), (iii) economic security in retirement (*pension*), and (iv) not excessive indebtedness (*debt*). Table 15 provides a detailed description of these variables.

⁸ For a comprehensive review on this issue, see Lusardi and Mitchell (2014) and Lusardi (2019).

⁹ Analyses mainly highlight the role of FL in improving managerial practices (i.e., budgeting, reporting, credit management) or firm profitability and growth. On these topics, see Bruhn and Zia, 2011; Siekei et al., 2013; Dahmen and Rodríguez, 2014; Drexler et al., 2014; Eniola and Entbang, 2017; Alperovych, Calcagno and Lentz, 2020; Atandi, 2021. Other studies focus on the relationship between entrepreneurs’ financial literacy and their ability to access external finance (Hussain et al., 2018) and to repay their debt regularly (Wise, 2013; Kotzé and Smit, 2008). The evidence on micro-entrepreneurs is almost non-existent, mainly due to the limited availability of data. An exception is a recent paper on Italian micro-firms that emphasize the role of financial literacy in improving the ability to mitigate the effect of the crises (D’Ignazio et al., 2022).

Descriptive statistics indicates that, on average, micro-entrepreneurs make better choices and show higher confidence on financial issues than the rest of the sample. Differences are especially large, higher than 10 percentage points, in the ability to cover unexpected expense with internal funds and the confidence about their plans (Figure 4 and Table 16).

Figure 4. Savvy financial behaviours/choices
(percentages of respondents)



To study the correlation between the likelihood to adopt savvy financial behaviours and the level of financial literacy, we estimate the two following logit models:

$$y = \alpha + \beta \cdot Entrepreneur + \varepsilon \quad (1)$$

$$y = \alpha + \beta \cdot Entrepreneur + \gamma \cdot EFL + \delta \cdot Entrepreneur * EFL + \vartheta \mathbf{x} + \varepsilon \quad (2)$$

where the dependent variable y is, in turn, equal to the dummies *trust*, *resilience*, *pension* and *debt*, *EFL* is the score of entrepreneurial financial competences computed in the previous section, *Entrepreneur* is the dummy identifying micro-entrepreneurs and \mathbf{x} is a vector of sociodemographic variables (age, gender, education, income).

In model (1), the estimated coefficient β simply indicates whether entrepreneurs have a higher probability to adopt savvy financial behaviours. Model (2) helps understanding if the differences are also

due to FL and if FL positive effects are higher for entrepreneurs with respect other adults (through the estimated coefficient of δ , an interaction term between the variables *EFL* and *Entrepreneurs*).

The estimations of equation (1) reported in Table 17 (columns 1, 3, 5, 7) indicate that business owners are more likely to make better choices or show savvy financial behaviours than the rest of the sample. This is true across three out of four variables (no significant differences emerge in terms of over-indebtedness): financial competences associate systematically with better relations with financial intermediaries, higher resilience to unexpected shocks, and more confidence on financial plans for the retirement age.

With the introduction of *EFL* and the interaction term, however, the estimated coefficient of *Entrepreneur* loses its significance while the coefficient of *EFL* is significantly positive for all the four variables (Table 17, columns 2, 4, 6, 8). This result suggests that it is the higher FL that enables entrepreneurs to make better financial choices and engage in more correct financial behaviours, despite the FL gap with other adult is quite small. Finally, the estimated coefficients of the interaction terms, never significantly different from zero, indicates that the correlation between FL and better financial choices/behaviours is not different in the two groups: entrepreneurs do not seem to extract additional benefits than other adults from being more financially skilled.¹⁰

6. Conclusions and policy implications

Entrepreneurs, even those who run very small or individual business, are often said to have fairly solid financial skills. After all, financial decisions are an integral part of the daily life of a business: even through experience alone, small business owners should acquire the financial skills necessary to run a business. Moreover, micro-entrepreneurs may have a greater incentive to invest in their own financial skills, since they often cannot rely on employees with specialized financial knowledge. This paper challenges this commonly held view.

We analyze the levels of financial literacy of Italian micro-entrepreneurs using data collected by the Bank of Italy in 2020 through the Survey of Adult Financial Literacy.

Our first result is that the level of Italian micro-entrepreneurs' financial literacy is rather low, compared both to a "minimum target" set by the OECD/INFE and to other countries. This result is

¹⁰ The analysis is robust to different model specifications. Specifically, we estimated the equation on indebtedness taking also in account that a large share of respondent is not indebted.

fully in line with recent evidences on the limited financial competences of Italian population (D'alessio et al., 2021; OECD, 2018) and Italian micro-firms (D'Ignazio et al., 2022).

The second and more important result is that the difference in FL between business owners and other adults is surprisingly small. This difference tends to disappear when we account for several individual characteristics in the econometric analysis, such as geographic area, age, gender, education, income level, and use of financial instruments. Other things being equal, this small difference is mainly related to the following three factors, in order of importance: income, age, and education. Income is by far the most important of the three factors. This could be coherent with the hypothesis of a positive relation between financial experience and financial literacy (i.e., a learning-by-doing effect due to entrepreneurs' need to manage more income streams and use more financial products); but the relation could also be inverted since higher FL levels could lead to larger revenues. Nevertheless, this greater entrepreneurial experience does not seem to provide a significant advantage over other adults in terms of financial literacy, as the FL gap remains rather small on average.

Third, in the last part of the analysis we highlight that these slightly higher levels of financial literacy allow entrepreneurs to make better choices and to adopt more correct financial behaviours. More frequently than other adults, they state to trust in financial intermediaries, to be able of facing unexpected expenses with their own funds, and to be confident over their financial plans for retirement.

We tested the robustness of our results in a number of ways. We considered only other workers in the control group to exclude that our results may only depend on a misleading comparison between entrepreneurs and unemployed or retired people. To mitigate the effects of possible measurement errors in the common indicator of financial literacy (the OECD/INFE FL score), we replicated our analysis with a less debatable indicator of financial knowledge (FK). Our results have been substantially confirmed. More importantly, we tried to overcome the criticism that the OECD/INFE FL and FK scores are computed to measure individual competences in personal financing choices; specifically, we built an indicator based on questions that are more pertinent to business management. On the one hand, the results of the econometric analysis based on this indicator remain qualitatively unchanged. On the other hand, the new indicator of FL shows greater differences between entrepreneurs and the rest of the sample: this suggests that, from a methodological point of view, the analysis of entrepreneurs' FL could be better performed by using information that takes into account the specific skills required to run a business.

Overall, the results of our analysis provide empirical support to the inclusion of micro-and small entrepreneurs among the “specific target groups” that policy-makers need to take into account in their national strategies of financial education, as stated in the Recommendation of OECD Council on

Financial literacy (2020). Our evidences do not allow us to identify a causal link between the limited financial skills of Italian micro-entrepreneurs and the structural weaknesses that typically characterize their business, such as imbalances in the financial structure, high volatility of cash flows, difficulties in accessing credit. Nonetheless, we highlight significant correlations between entrepreneurs' FL and more desirable business choices/behaviours. This suggests that policy initiatives aimed at strengthening the weak financial competences of Italian micro-entrepreneurs may have a positive impact on their ability to make more appropriate financial decisions and, ultimately, on resilience and growth of their businesses.

Appendix

Tables

Table 1. Occupational status (sample units and percentages)

	Units	%
Micro-entrepreneur		
Entrepreneur, Freelance (self-employed)	103	5,3%
Farmer (self-employed)	5	0,3%
Merchant, Artisan (self-employed)	122	6,3%
Salaried worker		
Teacher	45	2,3%
Clerk	445	23,1%
Manager	10	0,5%
Specialized worker/manufacturer	150	7,8%
Worker/manufacturer	107	5,6%
Intermediate manager	30	1,5%
Farmer (employee)	6	0,3%
Out of the labor force		
Housemaker	202	10,5%
Retired	442	22,9%
Unemployed (or looking for employment)	127	6,6%
Student	134	7,0%
Total	1.927	100%

Table 2. Representativeness of the sample for micro-entrepreneurs (units and percentages)

	Our sample	Universe (<i>sources, 2020</i>)
# Adults	1.927	45.947.230 (<i>Istat, Population data</i>)
# Firms	230	5.147.514 (<i>Movimprese</i>)
# Self-employed	230	5.075.968 (<i>Istat, Labour Force data</i>)
# Total employed individuals (self-employed+employees)	1.022	22.661.065 (<i>Istat, Labour Force data</i>)
# Artisans and merchants	122	2.556.593 (<i>Movimprese</i>)
% Firms / Adults	11,9	11,2
% Self-employed / Adults	11,9	11,0
% Self-employed / Total employed individuals	22,5	22,4
% Artisans and merchants / Firms	53,0	49,7

Table 3. Socio-demographic characteristics of the sample (percentages)

Socio-demographic characteristics	Micro-entrepreneurs	Others
Area		
North	48%	46%
Centre	19%	20%
South	33%	34%
Gender		
Women	37%	53%
Men	63%	47%
Educational level		
Lower secondary school	21%	37%
Upper secondary school	46%	49%
University	34%	14%
Age		
18-34	15%	24%
35-49	39%	26%
50-64	42%	25%
65-79	4%	25%
Income (1)		
up to 12.708 €	3%	12%
12.709 - 18.588 €	20%	34%
18.589 - 29.448 €	31%	32%
over 29.449	45%	22%

Notes: (1) Income classes are set as the income quartiles of the 2016 Italian Survey on Household Income and Wealth (SHIW).

Table 4. OCSE/INFE FL score and sub-scores

	Micro-entrepreneurs	Others	Adjusted Wald Test (1)	<i>OECD/INFE minimum target score</i>
Financial Literacy (FL)	12,4	11,0	***	15,0
Financial Knowledge (FK)	4,5	3,9	***	5,0
Financial Behaviour (FB)	5,0	4,1	***	6,0
Financial Attitudes (FA)	2,9	3,1	**	4,0

Notes: (1) * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 5. Issues considered in the Financial Knowledge sub-score (percentages)

	Micro-entrepreneurs	Others	Adjusted Wald test (1)
Impact of inflation on spending power	61%	49%	**
Identification of the interest rate	80%	78%	
Understanding simple interest rate	67%	59%	*
Understanding simple and compounding interest rates	31%	21%	**
Relationship between risk and reward	74%	63%	**
Definition of inflation	74%	64%	**
Risk diversification	65%	50%	***

Notes: (1) * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 6. Descriptive statistics

Socio-demographic characteristics	N.	Mean	Std.	Min	Max
Area					
North	1927	0,37	0,48	0	1
Centre	1927	0,22	0,42	0	1
South	1927	0,41	0,49	0	1
Age	1927	50	16,1	18	79
Gender	1927	0,50	0,50	0	1
Educational level					
Lower secondary school	1927	0,32	0,47	0	1
Upper secondary school	1927	0,51	0,50	0	1
University	1927	0,17	0,38	0	1
Income					
up to 12.708 €	1927	0,12	0,32	0	1
12.709 - 18.588 €	1927	0,33	0,47	0	1
18.589 - 29.448 €	1927	0,31	0,46	0	1
over 29.449	1927	0,24	0,43	0	1
Use of financial products					
0	1927	0,34	0,47	0	1
1	1927	0,41	0,49	0	1
2 or more	1927	0,25	0,43	0	1

Table 7. Financial literacy (*OLS estimates; full sample*)

	(1) FL	(2) FL	(3) FL	(4) FL	(5) FL	(6) FL	(7) FL
Entrepreneur	1.404*** (0.278)	1.410*** (0.279)	1.081*** (0.288)	1.011*** (0.286)	0.861** (0.286)	0.597 (0.306)	0.162 (0.262)
Area: Centre		0.574* (0.239)	0.542* (0.237)	0.548* (0.237)	0.668** (0.239)	0.834*** (0.230)	0.872*** (0.213)
Area: South		0.212 (0.206)	0.215 (0.202)	0.221 (0.201)	0.435* (0.200)	0.969*** (0.204)	1.312*** (0.186)
Age			0.199*** (0.0313)	0.200*** (0.0313)	0.183*** (0.0313)	0.142*** (0.0308)	0.0553 (0.0289)
Age^2			-0.00192*** (0.000326)	-0.00193*** (0.000326)	-0.00162*** (0.000331)	-0.00117*** (0.000322)	-0.000335 (0.000300)
Gender				0.424* (0.183)	0.417* (0.183)	0.382* (0.179)	0.286 (0.165)
Edu: Secondary					1.031*** (0.214)	0.760*** (0.206)	0.471* (0.192)
Edu: Degree					1.478*** (0.287)	0.889** (0.294)	0.493 (0.260)
Income: 2 nd qtl.						0.780** (0.270)	0.770** (0.254)
Income: 3 rd qtl.						2.047*** (0.286)	1.473*** (0.268)
Income: 4 th qtl.						2.469*** (0.321)	1.827*** (0.310)
Financial_instr: 1							1.759*** (0.192)
Financial_instr: 2							3.505*** (0.254)
Constant	11.02*** (0.0996)	10.83*** (0.162)	6.286*** (0.679)	6.041*** (0.691)	5.143*** (0.696)	4.528*** (0.699)	5.452*** (0.655)
N	1927	1927	1927	1927	1927	1927	1927
r2	0.0182	0.0223	0.0489	0.0528	0.0738	0.126	0.258

Notes: Standard errors in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 8. Financial knowledge (*OLS estimates; full sample*)

	(1) FK	(2) FK	(3) FK	(4) FK	(5) FK	(6) FK	(7) FK
Entrepreneur	0.683*** (0.171)	0.682*** (0.171)	0.560** (0.173)	0.519** (0.173)	0.421* (0.171)	0.295 (0.183)	0.115 (0.169)
Area: Centre		0.104 (0.139)	0.0891 (0.140)	0.0928 (0.140)	0.155 (0.140)	0.235 (0.138)	0.237 (0.131)
Area: South		-0.153 (0.121)	-0.177 (0.121)	-0.174 (0.120)	-0.0616 (0.121)	0.205 (0.127)	0.344** (0.126)
Age			0.0536** (0.0184)	0.0545** (0.0183)	0.0467* (0.0183)	0.0255 (0.0180)	-0.0116 (0.0181)
Age^2			- 0.000620** (0.000191)	- 0.000626** (0.000191)	-0.000471* (0.000194)	-0.000241 (0.000189)	0.000115 (0.000188)
Gender				0.255* (0.107)	0.256* (0.108)	0.239* (0.106)	0.194 (0.101)
Edu=Secondary					0.500*** (0.132)	0.364** (0.129)	0.245 (0.125)
Edu=Degree					0.855*** (0.175)	0.570** (0.176)	0.409* (0.165)
Income: 2 nd qtl.						0.402* (0.185)	0.385* (0.183)
Income: 3 rd qtl.						1.070*** (0.194)	0.804*** (0.192)
Income: 4 th qtl.						1.215*** (0.212)	0.928*** (0.212)
Financial_instr=1							0.870*** (0.121)
Financial_instr=2							1.529*** (0.152)
Constant	3.857*** (0.0580)	3.888*** (0.0933)	2.947*** (0.410)	2.800*** (0.415)	2.301*** (0.419)	1.994*** (0.423)	2.358*** (0.427)
N	1927	1927	1927	1927	1927	1927	1927
r2	0.0119	0.0141	0.0234	0.0273	0.0452	0.0816	0.153

Notes: Standard errors in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 9. Financial literacy (*OLS estimates; only entrepreneurs and other workers*)

	(1) FL	(2) FL	(3) FL	(4) FL	(5) FL	(6) FL	(7) FL
Entrepreneur	0.876** (0.303)	0.838** (0.305)	0.810** (0.308)	0.803** (0.306)	0.743* (0.303)	0.594 (0.321)	0.269 (0.278)
Area: centre		0.160 (0.323)	0.214 (0.322)	0.211 (0.322)	0.295 (0.324)	0.476 (0.313)	0.544 (0.292)
Area: south		0.594* (0.294)	0.645* (0.289)	0.637* (0.290)	0.746** (0.288)	1.183*** (0.288)	1.348*** (0.264)
Age			0.235** (0.0748)	0.234** (0.0747)	0.217** (0.0757)	0.151* (0.0713)	0.0723 (0.0651)
Age^2			-0.00251** (0.000830)	-0.00250** (0.000830)	-0.00228** (0.000842)	-0.00166* (0.000795)	-0.000782 (0.000728)
Gender				0.0873 (0.268)	0.135 (0.269)	0.143 (0.263)	0.233 (0.239)
Edu=Secondary					0.670* (0.313)	0.365 (0.311)	0.260 (0.282)
Edu=Degree					0.994* (0.388)	0.273 (0.394)	0.178 (0.353)
Income: 2 nd qtl.						1.017 (0.614)	0.628 (0.528)
Income: 3 rd qtl.						2.117*** (0.612)	1.184* (0.535)
Income: 4 th qtl.						2.789*** (0.643)	1.699** (0.584)
Financial_instr=1							1.821*** (0.319)
Financial_instr=2							3.472*** (0.353)
Constant	11.55*** (0.154)	11.36*** (0.226)	6.137*** (1.621)	6.122*** (1.624)	5.733*** (1.655)	5.638*** (1.543)	6.084*** (1.418)
N	1016	1016	1016	1016	1016	1016	1016
r2	0.0113	0.0166	0.0286	0.0287	0.0363	0.0795	0.216

Notes: Standard errors in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 10. The Entrepreneurial Financial Literacy Score (*description and values*)

Variable	Question
Financial product ownership (1)	- 1 if the respondent holds more than 2 financial products more related to business activities (mean of financial products held by entrepreneurs); - 0 otherwise
Choice of financial instruments	- 1 if the respondent acquired a financial product in the last two years and considered several options or looked around before making the decision or referred to non-specialized information sources. - 2 if the respondent acquired a financial product in the last two years and referred to specialized information sources; - 0 otherwise
Reading a contract	- 1 if the individual agrees or partially agrees to the claim “I tend to ignore the small print unless something goes wrong”, - 0 otherwise
Planning	- 1 if the individual agrees or partially agrees to the claim “I keep a close personal watch over my financial affairs”, - 0 otherwise
Long-term goals	- 1 if the individual agrees or partially agrees to the claim “I set long term financial goals and strive to achieve them”, - 0 otherwise
Reading a graph	- 1 if the individual answers correctly to two questions regarding a chart which shows market value of two investment funds - 0 otherwise
Calculation of interest rates and installments of a loan	- 1 if the individual evaluates correctly the statement "Typically, the monthly payment for a 15-year mortgage is higher than for a 30-year mortgage, but the interest paid over the life of the loan is lower" - 0 otherwise
Entrepreneurial financial literacy score (EFL)	Algebraic sum of the scores of the values taken by the seven variables (ranging 0-8)

Notes: (1) Among the financial products included in the questionnaire, we considered the following as “more related to business activity”: i) Mortgage or home-loan; ii) Personal bank loan or a salary/pension-backed loan; iii) Loans for consumption purposes (cars, electrical appliances, ...); vi) Credit card; v) Bank account; vi) Mobile phone payment account; vii) Prepaid debit card/payment card.

Table 11. Component of the entrepreneurial financial literacy score (*percentages of 'correct' answers and average score*) (1)

	Micro-entrepreneurs	Others	Adjusted Wald test (2)
Financial products ownership	42%	16%	***
Choice of financial products	28%	20%	
Reading a contract	50%	35%	***
Planning	63%	53%	*
Long-term goals	46%	26%	***
Reading a graph	43%	30%	**
Calculate loan instalments	51%	45%	
Entrepreneurial financial literacy score (EFL)	3,3	2,3	***

Notes: (1) Corrects answers are those that imply higher financial knowledge/ skills or savvier financial behaviours; (2) * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 12. Financial literacy average scores normalized with the corresponding number of notches (*percentages*) (1)

	Micro-entrepreneurs	Others
Financial Literacy (FL)	59%	52%
Financial Knowledge (FK)	57%	48%
Entrepreneurial finance's literacy score (EFL)	37%	26%

Notes: (1) FL score ranges over 21 notches, FK over 8 notches and EFL over 9 notches.

Table 13. Entrepreneurial financial literacy (OLS estimates; full sample)

	(1) EFL	(2) EFL	(3) EFL	(4) EFL	(5) EFL	(6) EFL
Entrepreneur	1.002*** (0.188)	1.001*** (0.187)	0.836*** (0.189)	0.803*** (0.187)	0.705*** (0.188)	0.570** (0.199)
Area: Centre		0.0496 (0.128)	0.0300 (0.126)	0.0329 (0.126)	0.108 (0.125)	0.197 (0.125)
Area: South		-0.169 (0.109)	-0.194 (0.108)	-0.192 (0.107)	-0.0573 (0.108)	0.171 (0.116)
Age			0.0783*** (0.0164)	0.0790*** (0.0163)	0.0684*** (0.0162)	0.0535*** (0.0157)
Age^2			-0.000866*** (0.000170)	-0.000870*** (0.000170)	-0.000674*** (0.000170)	-0.000508** (0.000165)
Gender				0.203* (0.0963)	0.199* (0.0961)	0.183 (0.0943)
Edu=Secondary					0.639*** (0.112)	0.529*** (0.110)
Edu=Degree					0.944*** (0.156)	0.654*** (0.156)
Income: 2 nd qtl.						0.158 (0.130)
Income: 3 rd qtl.						0.654*** (0.144)
Income: 4 th qtl.						1.061*** (0.164)
Constant	2.308*** (0.0513)	2.355*** (0.0887)	0.870* (0.352)	0.753* (0.358)	0.183 (0.373)	-0.00979 (0.359)
N	1927	1927	1927	1927	1927	1927
r ²	0.0357	0.0384	0.0591	0.0625	0.0949	0.135

Notes: Standard errors in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 14. Normalized differences in FL between micro-entrepreneurs and other adults (*ratio of the estimated coefficients of the dummy Entrepreneur to the average value of the dependent variable; percentages*)

Model	Financial Literacy score (FL)	Financial Knowledge score (FK)	Entrepreneurial Financial Literacy score (EFL)
(1)	13%	18%	43%
(2)	13%	18%	43%
(3)	10%	14%	36%
(4)	9%	13%	35%
(5)	8%	11%	30%
(6)	5%	8%	25%
(7)	1%	5%	-

Notes: Values reported in rows from (1) to (7) are based on the equations estimated in the corresponding columns of Table 7 (for the FL score), Table 8 (FK score) and Table 13 (EFL score).

Table 15. Savvy financial behaviours/choices (*description of the variables*)

Variables	Values
Good relations with financial intermediaries (<i>trust</i>)	1 if the respondent claims that the statement “ <i>I trust financial service providers to treat me fairly</i> ” describes its situation completely or very well, 0 otherwise (somewhat, very little, not at all or don’t know)
Ability to cope with unexpected expenses (<i>res</i>)	1 if the respondent answers yes to the question “if you, personally, faced a major expense today – equivalent to your own monthly income – would you be able to pay it without borrowing the money or asking family or friends to help?”, 0 otherwise
Confidence on financial plans for retirement (<i>pens</i>)	1 if the respondent answers very confident or confident to the question “ <i>how confident are you that you have done a good job of making financial plans for your retirement?</i> ”, 0 otherwise
Not excessive indebtedness (<i>debt</i>)	1 if the respondent claims that the statement “ <i>At the moment I have too much debt</i> ” describes its situation very little or not at all, 0 otherwise (somewhat, completely or very well or don’t know)

Table 16. Savvy financial behaviours/choices (*percentages of respondents*)

	Micro- entrepreneurs	Others	Adjusted Wald test (1)
Good relations with financial intermediaries (<i>trust</i>)	34%	24%	*
Ability to cope with unexpected expenses (<i>res</i>)	74%	60%	***
Confidence on financial plans for retirement (<i>pens</i>)	22%	9%	***
Not excessive indebtedness (<i>debt</i>)	72%	67%	

Notes: (1) * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 17. Likelihood of savvy financial behaviours/choices (*logit estimates*) (1)

	(1) trust	(2) trust	(3) res	(4) res	(5) pens	(6) pens	(7) debt	(8) debt
Entrepreneur	0.468* (0.191)	-0.268 (0.420)	0.640*** (0.190)	0.0984 (0.403)	1.034*** (0.238)	-0.458 (0.660)	0.195 (0.178)	-0.339 (0.354)
EFL score		0.259*** (0.0533)		0.553*** (0.0537)		0.229** (0.0745)		0.273*** (0.0455)
EFL*Entr		0.0934 (0.113)		-0.0180 (0.134)		0.209 (0.145)		0.0950 (0.118)
Constant	-1.138*** (0.0793)	-3.667*** (0.719)	0.410*** (0.0670)	-3.790*** (0.672)	-2.329*** (0.110)	-7.749*** (1.364)	0.731*** (0.0650)	0.776 (0.566)
Controls ¹¹		yes		yes		yes		yes
N	1547	1547	1565	1565	1646	1646	1816	1816
Pseudo r2	0.0046	0.0660	0.0073	0.1871	0.0222	0.1612	0.0007	0.0636

Notes: (1) Control variables are gender, education, age, geographic area and income. Standard errors in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

¹¹ The control variables are gender, education, age and geographical area

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