The effect of financial education on literacy and behavior: evidence from the field (and from the laboratory)

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The importance of being (financially) literate

- Households are required to take complex financial decisions that have long-term consequences on their welfare.
- A growing literature documents an extensive incidence of financial illiteracy around the world. Many individuals are not familiar with basic economic concepts, such as inflation, interest compounding and risk diversification (Lusardi and Mitchell, 2014).
- Widespread financial illiteracy called for the implementation of financial education programs aimed at empowering households to take informed financial decisions.

Financial education, literacy and behavior

- Our work uses an experimental framework to assess the impact of a short course in financial education on the financial literacy and investment attitudes of students of a medium-scale University in the North-East of Italy.
- We investigate how actual and self-assessed variations in financial knowledge are interweaved with each other.
- College students are endowed with all the mathematical knowledge needed to understand financial education concepts due to the completion of the high school studies.

Randomized trials strategy

- Treatment group participants listen to a short course in financial education dealing with inflation, interest compounding and risk diversification. The course lasts for about 20 minutes and consists of videos during which a male teacher accompanies his voice with slides.

- Control group participants listen to a short course on the history of the Venetian lagoon. The course lasts for about 20 minutes, consists of videos and is provided by a male teacher.

- Treatment and control group participants area asked a battery of questions both before and after the intervention.

Outcomes of interest

- Three financial literacy questions elicit the understanding of the notions of inflation, interest compounding and diversification.
- Three investment attitudes questions elicit to what extent individuals are able to manage financial literacy notions to take the correct actions in hypothetical situations.
- One question is devoted to measure the self-assessed financial literacy of respondents on a numerical scale from 1 (lowest) to 7 (highest).
- The same experimental framework is administered through the field and the laboratory.

Estimation strategy

- We compare the variations in the outcomes before and after the intervention between the treatment and the control groups.
- The same estimation strategy is implemented both in the field and in the lab case.
- The field experiment was completed by 579 participants (321 treated, 258 control).
- The lab experiment was completed by 100 participants (52 treated, 48 control).

Field: effects on actual financial literacy

- On average, attending the short course significantly increases the number of correct answers in this domain by 0.229 (s.e. 0.052). This amounts to say that pre-intervention levels rise by 10%.
- The effect is driven by the increase in the knowledge of the notions of inflation and interest compounding.
- No significant differences in the treatment effect across genders. Stronger effects are found for students in economics, languages, sciences and for those enrolled in undergraduate studies.

Field: effects on investment attitudes

- The average number of correct answers in this domain significantly increases by 0.229 (s.e. 0.070) due to the short course attendance. This amounts to say that pre-intervention levels of investment attitudes rise by about 12%.

- No significant differences in the treatment effect across genders and tracks of studies. Stronger effects are found for students in economics and languages.

Field: effects on self-assessed financial literacy

- On average, the short course attendance increases students' self-assessments by 0.761 (s.e. 0.080). This variation induces a 20% increase in the pre-intervention levels of students' self-assessments.
- This strong effect is found for both genders and it is confirmed if the sample is broken down by field and track of study.
- To what extent variations in self-assessed financial literacy are consistent with variations in actual financial literacy and investment attitudes?

Field: actual and self-assessed financial literacy

Changes in actual financial literacy	Changes in self-assessed financial literacy			
	Decrease	Equal	Increase	Total
	%	%	%	%
Decrease	1.90	5.18	3.80	10.88
Equal	4.15	39.03	26.94	70.12
Increase	1.55	6.74	10.71	19.00
Total	7.60	50.95	41.45	100.00

- For about 30% of the sample the improvement in self-assessed financial literacy is not matched by an improvement in actual financial literacy.

- The short course attendance induces a positive effect on the variation in self-assessed financial literacy even if the variation in the number of correct answers is controlled for.

Evidence from the laboratory

- The short course attendance significantly improves the average number of correct answers in the financial literacy domain by 0.232 (s.e. 0.129). This amounts to say that pre-intervention levels rise by 10%.
- The overall performance in investment attitude is increased by 0.473 (s.e. 0.140), which implies an increase in the pre-intervention levels by 24%.
- Financial literacy self-assessments of participants on average increases by 0.703 (s.e. 0.196). Pre-intervention levels variation amounts to 20%.

Lab: actual and self-assessed financial literacy

Changes in actual financial literacy	Changes in self-assessed financial literacy			
	Decrease	Equal	Increase	Total
	%	%	%	%
Decrease	4.00	5.00	3.00	12.00
Equal	4.00	38.00	26.00	68.00
Increase	1.00	6.00	13.00	20.00
Total	9.00	49.00	42.00	100.00

- About 30% of the sample declare that their financial literacy improved but their actual skills decrease or remain stuck to the pre-intervention levels.

- The treatment effect on the variation in self-assessed financial literacy is positive even if the variation in the number of correct answers is controlled for.

Conclusions

- We assess the effect of a short course in financial education on financial literacy, investment attitudes and how individuals perceive their level of financial literacy.
- Our intervention is structured according to a completely randomized treatment control group design and it is implemented both in the field and in the lab.
- Investments in financial education are found to increase actual and self-assessed financial literacy as well as investment attitudes.
- For around one third of participants, improvements in self-assessed financial literacy are not matched with improvements in actual skills.

Financial literacy questions: Inflation

Suppose that you leave €1000 to an account that pays an interest rate of 1% per year and has no running costs. Also assumed that inflation is 2% per year. According to you, when in a year you will withdraw your money, will you be able to buy the same amount of goods that you could buy today spending €1000?

1 Yes.

2 No, I will be able to buy a lower amount.

3 No, I will be able to buy a higher amount.

99 I do not know / I do not have elements to answer.

Go back

Financial literacy questions: Interest Compounding

Suppose you had €1000 in a savings account, without running costs, and the interest rate was 2% per year. According to you, after 2 years, how much do you think you would have in the account if you left the money to grow?

1 Less than €1040.

2 Exactly €1040.

3 More than €1040.

99 I do not know / I do not have elements to answer.

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Financial literacy questions: Diversification

Which of the following investment strategies involves a greater risk of losing money?

1 Invest own savings in the securities of one company.

2 Invest own savings in the securities of several companies.

99 I do not know / I do not have elements to answer.

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Investment attitude questions: Real vs. Nominal

Which of the two scenarios listed below do you prefer?

1. You are dealing with an inflation rate of 1% per year (which costs 100 today, it will cost 101 a year) and you are investing all your savings in a financial asset that will give you a yearly return of 6% in 50% of cases and 2% in the other 50% of cases.
2. You are dealing with an inflation rate of 0% per year (which costs 100 today, it will cost 100 a year) and you are investing all your savings in a financial asset that will give you a yearly return of 5% in 50% of cases and 1% in the other 50% of cases.
3. The two scenarios are equivalent.
99. I do not know / I do not have elements to answer.

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Investment attitude questions: Investment Plan

Compare the two investment plans for a period of two years given below. Which investment plan do you prefer?

1 Investing €100 at the rate of 5% for the first year and reinvest the entire amount available at the end of the first year at the rate of 6% for the second year.

2 Investing €100 and after two years getting €111.

3 I am indifferent between the two investment plans.

99 I do not know / I do not have elements to answer.

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Investment attitude questions: Rule of 72

Suppose you owe €1000 on your credit card and the interest rate you are charged is 20% per year compounded annually. If you did not pay anything off, at this interest rate, how many years would it take for the amount you owe to double?

1 2 years.

2 Less than 5 years.

3 Between 5 and 10 years.

4 More than 10 years.

99 I do not know / I do not have elements to answer.

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Self-Assessed Financial Literacy

Financial literacy refers to the set of skills required to understand the opportunities offered by financial markets and invest their savings in a conscious and informed way.

On a scale of 1 to 7, with 1 being the lowest and 7 the highest level, how would you rate your overall level of financial literacy?

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Assessing financial literacy and investment attitudes

- The three questions about investment attitudes asked after the course differ in the amounts reported. We keep the same structure of the questions but we double all the amounts involved.

- The order of the six questions on financial literacy and investment attitudes is randomized to avoid the arising of fixed patterns of answers that could be recalled by participants and spread by "word of mouth".

- The order of the answers is randomized.

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Field: DiD estimates

Financial literacy

	Inflation	Interest compounding	Diversification	Number of correct answers
T	0.046^{*}	0.176^{***}	0.007	0.229^{***}
	(0.027)	(0.032)	(0.028)	(0.052)

Investment attitudes

	Real vs. Nominal	Investment Plan	Rule of 72	Number of correct answers
T	0.016	0.131^{***}	0.082^{**}	0.229^{***}
	(0.041)	(0.039)	(0.035)	(0.070)

The number of observations is 579. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses.

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Lab: DiD estimates

Financial literacy

	Inflation	Interest compounding	Diversification	Number of correct answers
T	0.074	0.213**	−0.054	0.232*
	(0.060)	(0.096)	(0.065)	(0.129)

Investment attitudes

	Real vs. Nominal	Investment Plan	Rule of 72	Number of correct answers
T	0.176*	0.176**	0.120	0.473***
	(0.096)	(0.069)	(0.079)	(0.140)

The number of observations is 100. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses.

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Population and sample frequencies

%	Population	Field experiment	Laboratory experiment
Gender			
Males	34.92	42.66	44.00
Females	65.08	57.34	56.00
Area of study			
Economics	35.97	44.73	61.00
Humanities	20.76	14.16	9.00
Sciences	7.99	9.15	4.00
Languages	35.28	31.95	26.00
Track of study			
BA	70.82	62.00	71.00
MA	25.06	34.89	27.00
PhD	4.12	3.11	2.00
Observations	24,737	579	100

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Field: descriptive statistics

	Before intervention		After intervention	
	Treated	Control	Treated	Control
Financial literacy				
Inflation	0.90	0.90	0.95	0.90
Interest compounding	0.55	0.57	0.72	0.56
Diversification	0.90	0.89	0.88	0.87
Number of correct anwers	2.35	2.35	2.55	2.33
Investment attitudes				
Real vs. Nominal	0.53	0.51	0.54	0.50
Investment plan	0.74	0.76	0.83	0.72
Rule of 72	0.62	0.62	0.67	0.59
Number of correct answers	1.89	1.89	2.03	1.81
Self-assessed financial literacy				
Mean score	3.51	3.35	4.38	3.46
Observations	321	258	321	258

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Lab: descriptive statistics

	Before intervention		After intervention	
	Treated	Control	Treated	Control
Financial literacy				
Inflation	0.85	0.92	0.96	0.96
Interest compounding	0.69	0.52	0.88	0.50
Diversification	0.98	0.94	0.88	0.90
Number of correct anwers	2.52	2.38	2.73	2.35
Investment attitudes				
Real vs. Nominal	0.48	0.52	0.62	0.48
Investment plan	0.85	0.90	0.98	0.85
Rule of 72	0.69	0.56	0.75	0.50
Number of correct anwers	2.02	1.98	2.35	1.83
Self-assessed financial literacy				
Mean score	3.56	3.56	4.37	3.67
Observations	52	48	52	48

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Unit nonresponse

- Our reference population consists of about 25,000 college students. Students who complete the experiment might be those more interested in financial education or those more likely to apply its notions in their daily life.

- Failing to control for unit nonresponse will prevent us from extending the results obtained within our selected sample to the whole population of interest.

- Our results are confirmed even if we control for unit non response by weighted regressions, Heckman procedures to correct for sample selection and by allowing for students' characteristics in the right-hand-side of the first-differenced equations.

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