Cutting Through the Fog: Financial Literacy and Financial Investment Choices

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Outline

Introduction

- What is **Financial literacy**?
  - *"a combination of **awareness, knowledge, skill, attitude and behavior** necessary to make sound financial decisions [...]"* (Atkinson and Messy, 2012, p.14).
  - *"[...] peoples' **ability to process economic information and make informed decisions** about financial planning, wealth accumulation, debt, and pensions."* (Lusardi and Mitchell, 2014, p. 6).
- Why is it important?
  - It potentially affects **financial behavior** and, consequently, **financial well-being** in many ways
  - It is found to be **alarmingly low**, even in developed countries

Financial Literacy around the World

- According to the results of the 2014 Standard & Poor's Global Financial Literacy Survey, only about **1-in-3 adults** worldwide can be considered **financially literate** (Klapper et al., 2015)
- In a sample of more than 150,000 adults from 144 countries, the S&P Survey tests knowledge of **four key financial concepts**:
  - Inflation
  - Diversification
  - Interest compounding
  - Numeracy (interest rate calculations)
- The vast majority of respondents cannot answer correctly to more than two of the corresponding four basic questions in the survey

Related Studies I

- Given its importance, **financial literacy** has been largely studied. It is found to be **associated with**:
  - Stock market participation (Christelis et al., 2010; van Rooij et al., 2011)
  - Retirement planning (Lusardi and Mitchell, 2007, 2011)
  - Ability to cope with negative macro-shocks (Klapper et al., 2013)
  - Returns on savings accounts (Deuflhard et al., 2019) and retirement plan investments (Clark et al., 2017)
  - Under-diversification (Calvet et al., 2009; von Gaudecker, 2015)
  - Mortgage and borrowing costs (Moore, 2003; Lusardi and Tufano, 2015)

Related Studies II

- Although abundant, the debate on the economic importance of financial literacy is still open
- Assessing the **causal impact** of financial literacy on financial behavior is challenging:
  - Investment in financial education is an individual choice which might depend on the same factors that determine the individual's investment behavior and wealth accumulation (Jappelli and Padula, 2013) $\Rightarrow$ Clear **endogeneity** problem
- Many studies use **IV** (Christiansen et al. (2008); Sekita (2011), and others): opening of new universities, diffusion of newspaper, etc...
- However, it is not easy to find truly exogenous instruments, as noted in Fernandes et al. (2014)

Related Studies III

- Field experiments conducted in recent years get mixed results
  - Some of them find that financial literacy programs can improve financial decisions (see, among others, Duflo and Saez (2003) and Drexler et al. (2014))
  - Some others find no significant effects (see for instance Choi et al. (2011) and Collins (2013))
- This **mixed evidence** plead for more research on the linkages between financial literacy and financial behavior, and also for a deeper insight into the channels underlying this relationship

Our Contribution

- In this paper we follow this direction. In particular:
  1. We highlight a **novel channel** linking financial literacy to financial behavior: the **subjective valuation of financial assets**
     - Key to understand why and how financial literacy – or the lack thereof – affects households' investment choices
  2. We overcome the obvious endogeneity between financial literacy and behavior through a **randomized experiment**
     - 2×2 laboratory experiment to analyze how an **exogenous increase in financial literacy** affects agents' willingness to invest in a risky financial asset

Main Findings

- In a nutshell, the **main findings** from the experiment are:
  1. Agents typically undervalue – and do not comprehend – financial assets (compared to non-financial lotteries with the same risk and payoffs)
  2. Financial literacy **improves households' understanding** of financial assets and **increases the value** they assign to them
- These results can be rationalized by **ambiguity aversion**
- They contribute explaining the documented association between **financial literacy and financial market participation** (and the puzzle of low stock market participation)

Outline

Setup

- We ask participants to value a **risky option** in a setup *à la* Holt and Laury (2002):
  - They make 20 choices between the risky option and an increasing safe amount of money. The switching point is the individual **certainty equivalent** (CE_i)
- The risky option is always a **binary lottery** yielding either 14 euros or nothing with equal probabilities
- We randomize over two dimensions:
  1. The **framing** of the lottery: either a **coin toss** or a **financial asset**
  2. **Financial literacy**, through a **financial training treatment** explaining i) what an asset is, ii) how to compute returns and iii) what happens in case of default of the issuer

Framing of the *Coin Toss* Lottery

We offer you:

- **a safe amount of money; or**
- **the possibility of tossing a coin.**

If you opt for the coin toss, you will receive €14 if you get **head**, and €0 if you get **tail**.

You must make 20 sequential choices between tossing the coin and earning a safe amount of money. We propose you 20 possible amounts, from €0.50 to €10, as shown in the table below.

At the end of the experiment a row among the 20 will be randomly selected and your earnings will depend on the option you selected in that row. If you had chosen the coin toss, at the end of the experiment the computer will simulate the coin toss and you will be paid according to the **outcome (head or tail)**.

Example: in the first row, we offer you €0.50. Would you prefer the €0.50 (the safe amount) or the coin toss? And in the second row, we offer you €1, would you prefer tossing the coin or getting €1 for sure? And so on...

Framing of the *Financial Asset* Lottery

We offer you:

- **a safe amount of money; or**
- **a risky financial asset issued by the company AeroFlights SA.**

The financial asset has a **current value** of €10 and, with 50% probability, it will yield a **net return** of 40% at the end of the experiment. With the remaining 50% probability, AeroFlights SA will **default** and the value of the financial asset will be €0.

You must make 20 sequential choices between the financial asset and earning a safe amount of money. We propose you 20 possible amounts, from €0.50 to €10, as shown in the table below.

At the end of the experiment a row among the 20 will be randomly selected and your earnings will depend on the option you selected in that row. If you had chosen the financial asset, you will get its **future value** (at the end of the experiment) that will be established by a market simulator according to the afore-stated probabilities.

Example: in the first row, we offer you €0.50. Would you prefer the €0.50 (the safe amount) or the financial asset? And in the second row, we offer you €1, would you prefer the financial asset or getting €1 for sure? And so on...

Lottery Choice

	The safe amount (on the left)	The financial asset
€0.50	○	○
€1.00	○	○
€1.50	○	○
€2.00	○	○
€2.50	○	○
€3.00	○	○
€3.50	○	○

[...]

The Training Treatment

Before making your choices, please open the file "AdditionalInformation.pdf" by clicking here. In this file, you will find information that might be relevant and that might help when taking your choices. Please **read them carefully!**

1. **What is a financial asset?**
   A financial asset is a financial instrument, as for instance a stock or a bond, that can be traded in financial markets and whose value depends on the characteristics of the issuing company.

2. **How do you compute the future value of a financial asset, given the rate of return?**
   The future value of a financial asset can be determined knowing its rate of return. By multiplying the rate of return by the current value, you will know the return of the asset, that is, the increase in its value over time. Therefore, the future value of a financial asset will simply be the sum of its current value plus the return. Here you have a brief example: If an asset has a current value of 1000 euros, and its rate of return is 30%, the return will be: $1000 \times 30\% = 300$ euros. The future value of the asset will be $1000 + 300 = 1300$ euros. However, this will happen only if the company does not fail.

3. **What happens if the issuer company defaults?**
   When the issuer company defaults, the financial asset will loose all of its value and therefore its future value will be zero.

Experimental Setup and Real-World Investment Choices

- A natural question is whether the experimental setup replicates the **key features of real-world investment decisions**
- Our design involves a **purposely simple** financial-asset lottery but
  1. The **financial skills** involved in our setup are crucial to make savvy investment choices in the real world. Understanding the concepts of financial assets, return rates, and default risk is part of the core financial knowledge needed to understand real-world financial products (teaching these notions to young people is indeed recommended by the Council for Economic Education (2013) in their National Standards for Financial Literacy).
  2. Our training aims at clarifying the same key terms of the investment on which the **KID** introduced in Europe in 2014 is focused

Experimental Design I

Randomization

Financial training \ Financial framing	0	1
0	**S**	**F**
1	**ST**	**FT**

Experimental Design II

Within this setting we can assess:

- the **impact of the financial framing** on the value assigned to the financial asset, by comparing $\overline{CE}_S$ and $\overline{CE}_F$
- the **effect of an increase in financial literacy** on the willingness to take the risky financial lottery, that is, $\overline{CE}_{FT} - \overline{CE}_F$
- the effect of an increase in financial literacy on the value assigned to the coin toss (which we expect to be zero) as $\overline{CE}_{ST} - \overline{CE}_S$
- the effect of each treatment on **respondents' understanding of the risky option** (both objective and self-assessed)

Sample Description

The experiment was run at the **Behavioral Sciences Lab** of the UPF in December 2016: **260 participants**, divided in eleven 50-minutes sessions split over 2 days

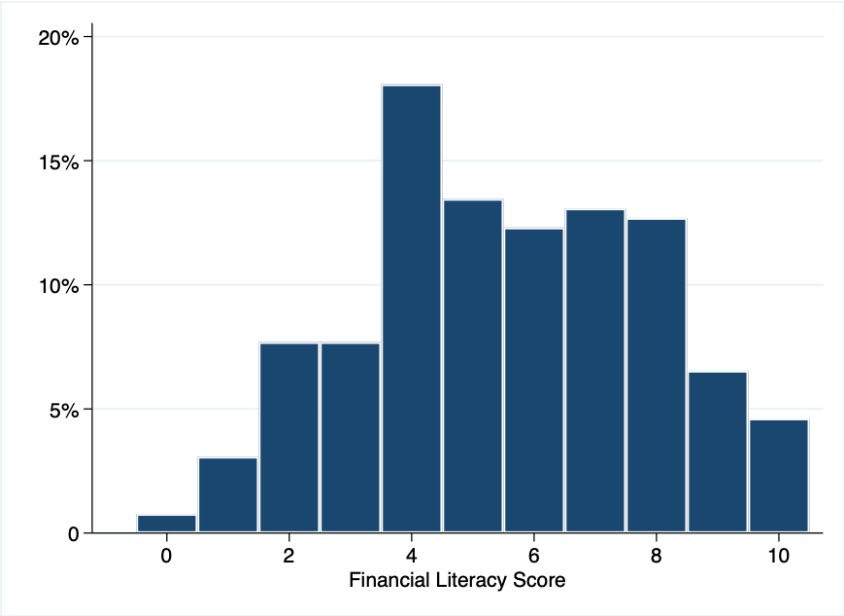
Participants characteristics and mean differences between groups

	Mean	St. Dev.	$\mu_F - \mu_S$	$\mu_{ST} - \mu_S$	$\mu_{FT} - \mu_S$
Female	0.65	0.48	-0.06	0.03	0.05
Age	21.14	3.29	0.35	0.77	-0.02
Work	0.32	0.47	-0.05	0.06	-0.02
Working years	1.48	2.47	-0.02	0.32	-0.29
Family Income $>$ 80K euros	0.05	0.23	0.00	-0.02	-0.02
Family Income 40K-80K euros	0.27	0.45	-0.03	0.00	0.14*
Family Income $<$ 40K euros	0.54	0.50	0.05	0.00	-0.11
Education level: High School Diploma	0.12	0.32	-0.02	-0.09*	0.03
Education level: Bachelor's Degree	0.74	0.44	0.02	0.06	-0.06
Education level: Master	0.10	0.31	0.00	0.03	0.02
Education level: PhD	0.02	0.15	0.02	0.02	0.00
Field of studies: Economics/Finance/Management	0.29	0.46	-0.02	0.03	0.05
Field of studies: Humanities/Law/Political Sciences	0.34	0.48	0.03	-0.02	0.00
Field of studies: Medicine/Biology/Psychology	0.12	0.33	0.00	0.05	0.02
Field of studies: Other	0.24	0.43	-0.02	-0.06	-0.06
Finance Course	0.24	0.43	0.03	0.03	0.05
Self-assessed Financial Literacy (0-10)	4.24	1.81	0.05	0.54*	-0.25
Financial Literacy score (0-10)	5.53	2.37	0.03	0.08	-0.14

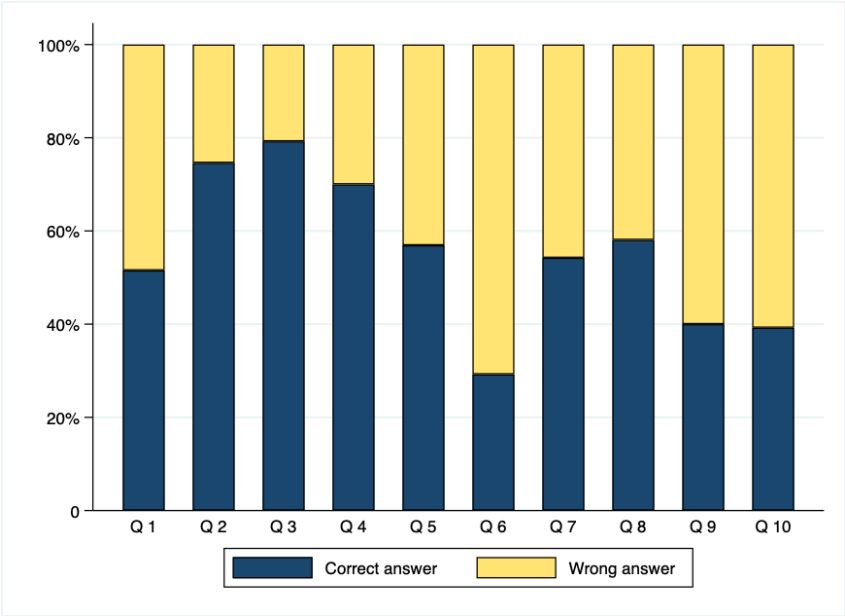
Ex-ante Financial Literacy

Before the lottery choice, we ask standard questions about participants and we run a preliminary **test on financial literacy**, with 10 standard questions

Distribution of Financial Literacy



Aggregate



By Question

▸ Questions

Sample Validity

- The sample is comparable to those in previous studies
  1. 29% know about interest rate and bonds (25% in van Rooij et al. (2011))
  2. 70% know about diversification (64% in van Rooij et al. (2011))
  3. 57% know stocks are riskier than bonds (60% in van Rooij et al. (2011))
  4. 58% know what a bond is (56% in van Rooij et al. (2011))
- Our sample also replicates the **common patterns of financial literacy**: lower for females; (slightly) increasing in income and higher for those who studied economics and finance

▸ Patterns

Heterogeneity in Ex-ante Financial Literacy

- On average, participants answer correctly to **5.5 questions** (only 5% score 10/10) and declare a financial literacy level, on a 0-10 scale, equal to 4.24
- More than 70% of participants know about **inflation and diversification**, and 80% (60%) know what a stock (bond) is
- Instead, **less than 40% can calculate the final value of an asset** (an apartment) **given the percentage rate of return**, and 50% of them cannot answer the simplest question on interest rate (as in Klapper et al. (2015))

Empirical Strategy

Main specification:

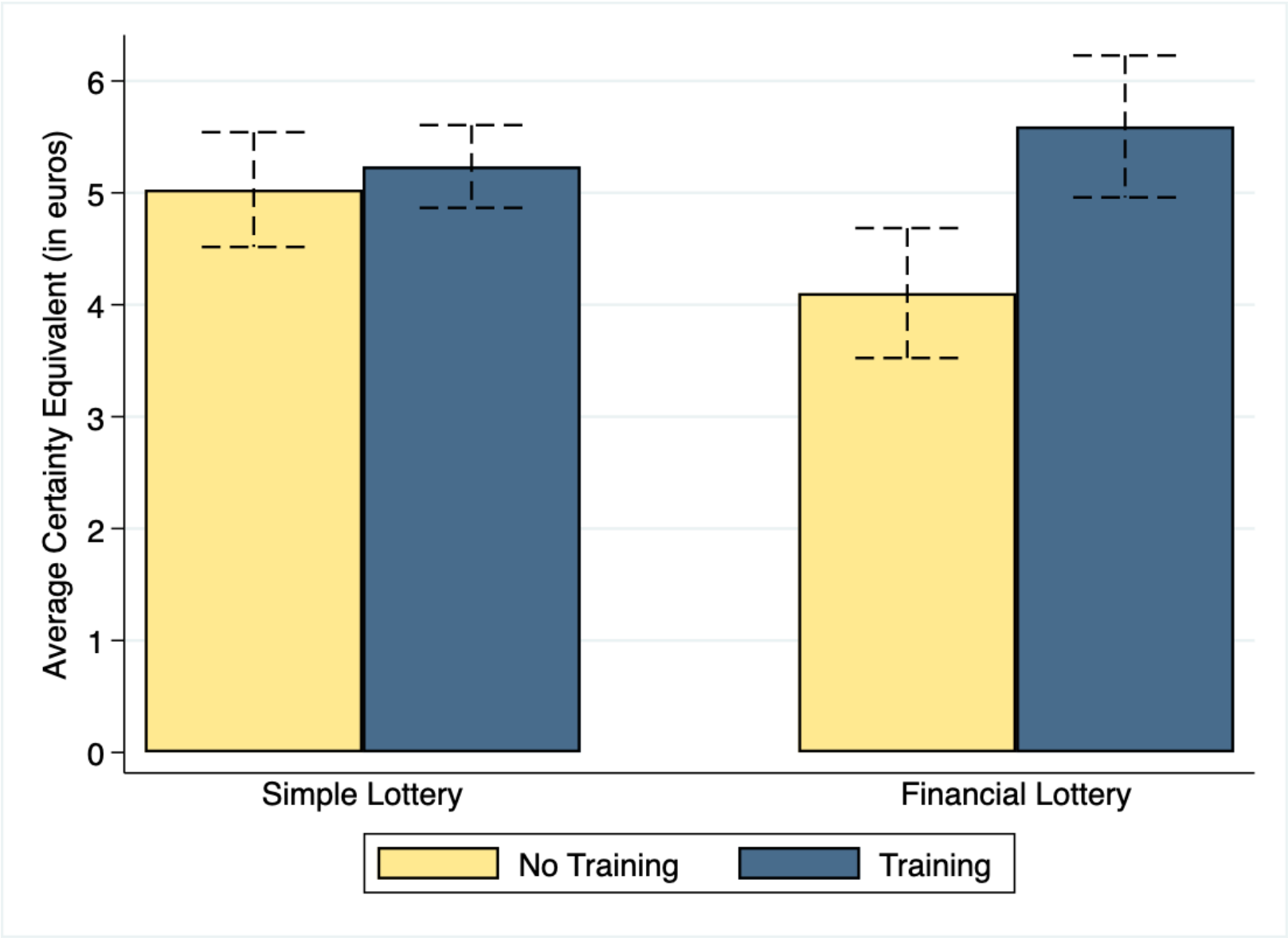
$$Y_i = \alpha + \gamma TRAIN_i + \delta FINLOT_i + \beta TRAIN_i \times FINLOT_i + \phi X_i + \theta_s + \varepsilon_i$$

where:

- Y_i is either *CE* or the **understanding** of the lottery's structure
- δ measures the effect of facing a financially framed lottery compared to a *simple* coin-flip lottery
- γ measures the impact of increasing *financial literacy* on the choice of agents facing the *simple* lottery
- β captures the differential effect of an increase in *financial literacy* on those evaluating the financial asset

Outline

Main Results



Financial Literacy and the CE of the Lottery

Dependent Variable: Certainty equivalent of the risky lottery					
	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) Tobit
FINLOT (δ)	-0.884**	-1.096**	-1.062**	-1.088**	-1.091**
	(0.439)	(0.449)	(0.440)	(0.446)	(0.423)
TRAINING (γ)	0.182	0.156	0.161	-0.021	0.143
	(0.433)	(0.440)	(0.431)	(0.446)	(0.415)
FINLOT×TRAINING (β)	1.241*	1.405**	1.398**	1.566**	1.458**
	(0.631)	(0.652)	(0.639)	(0.651)	(0.615)
Financial Literacy score (0-10)			0.259***		
			(0.095)		
Self-assessed Financial Literacy (0-10)				0.117	
				(0.102)	
Constant	4.991***	7.659***	6.786***	6.891***	8.215***
	(0.558)	(2.291)	(2.269)	(2.323)	(2.215)
Controls	No	Yes	Yes	Yes	Yes
$\delta + \gamma + \beta$	0.538	0.465	0.497	0.457	0.511
	(1.19)	(1.02)	(1.11)	(1.01)	(1.19)
Observations	194	194	194	192	194
Mean Dep. Var.	4.979	4.979	4.979	4.951	4.979
R-squared	0.098	0.266	0.299	0.272	

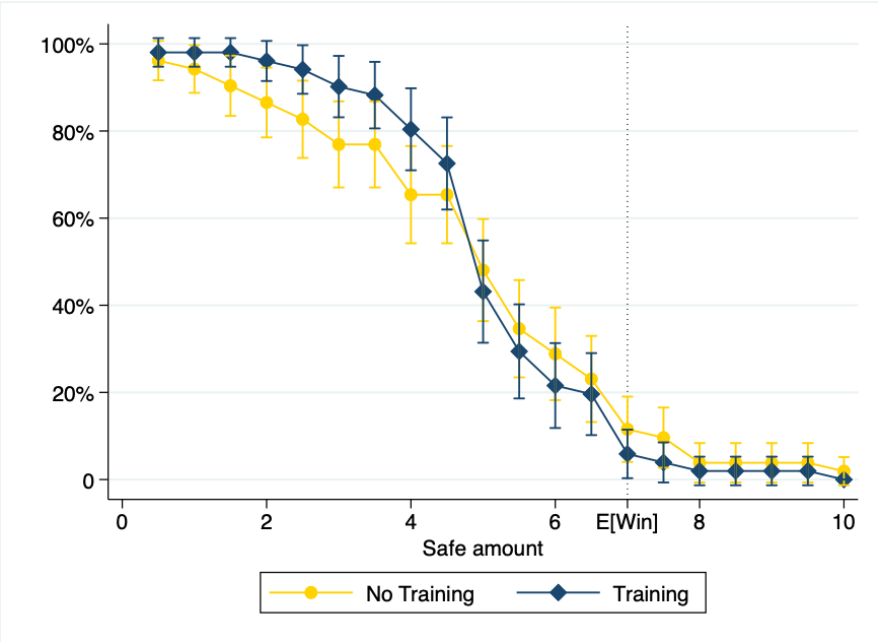
Magnitude of the Effects

Expressed in terms of **percentage risk premium** – calculated as the expected payoff of the lottery minus the certainty equivalent over the expected payoff –, our results imply that:

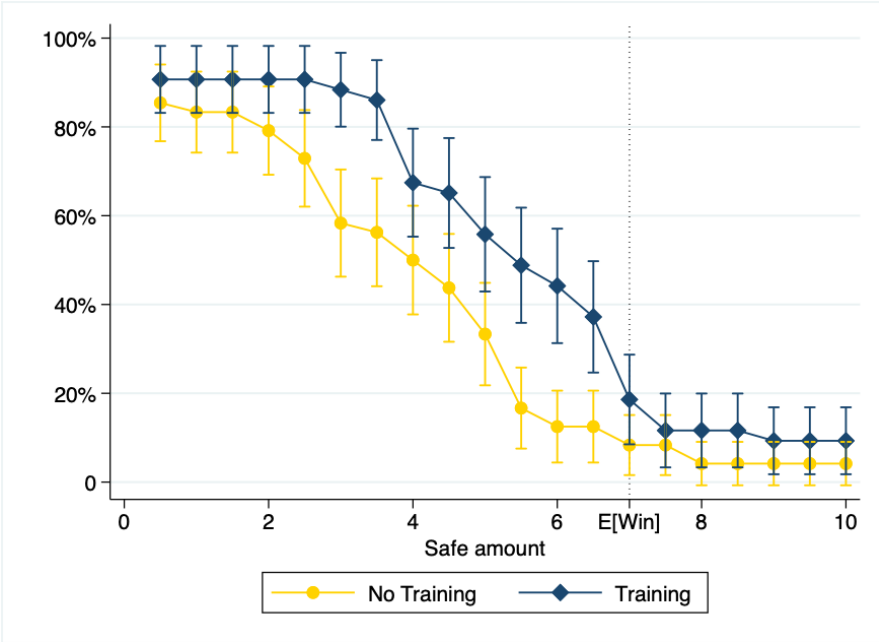
- The average percentage risk premium of the coin-toss lottery is about 28%
- That of the financial asset is 13 p.p. higher, if no training is provided
- For subjects who are given the training treatment, the percentage risk premia of the two lotteries are statistically indistinguishable

Subjects' Choices, by Safe Amount Offered

Probability of accepting the risky lottery



Simple lottery



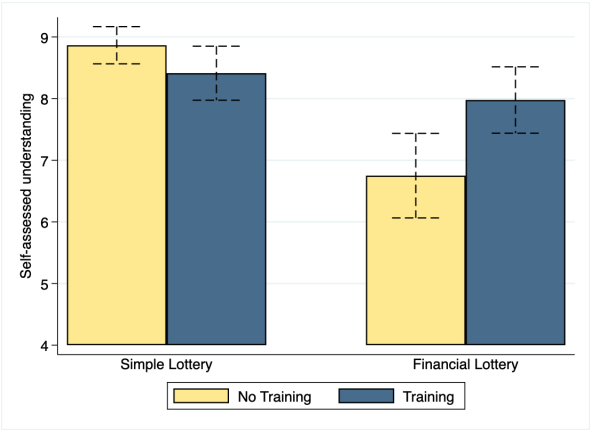
Financial lottery

Understanding of the Lottery I

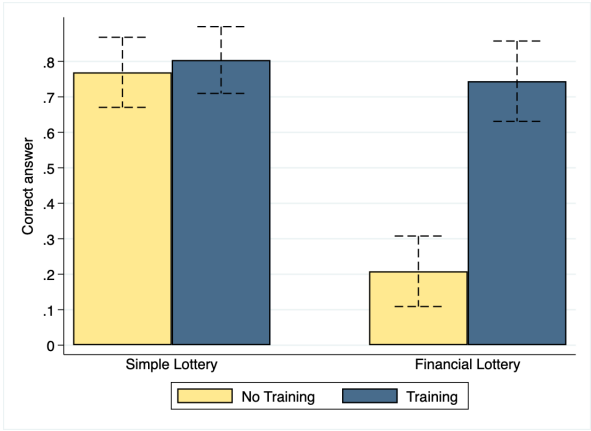
Dependent Variable: Understanding of the Lottery					
	(1) Understanding	(2) Understanding	(3) Correct$_1$	(4) Correct$_2$	(5) Correct
FINLOT (δ)	-2.099***	-2.310***	-0.616***	-0.535***	-0.610***
	(0.408)	(0.401)	(0.086)	(0.090)	(0.087)
TRAINING (γ)	-0.537	-0.644	0.026	-0.001	-0.105
	(0.403)	(0.392)	(0.085)	(0.088)	(0.085)
FINLOT$\times$TRAINING (β)	1.628***	1.826***	0.563***	0.247*	0.477***
	(0.587)	(0.582)	(0.125)	(0.131)	(0.126)
Financial Literacy score (0-10)		0.070	0.038**	0.040**	0.048**
		(0.087)	(0.019)	(0.019)	(0.019)
Constant	9.011***	7.859***	0.764*	0.977**	0.757*
	(0.519)	(2.064)	(0.445)	(0.464)	(0.447)
Controls	No	Yes	Yes	Yes	Yes
$\delta + \gamma + \beta$	-1.007**	-1.128***	-0.027	-0.289***	-0.238***
	(-2.38)	(-2.78)	(-0.31)	(-3.17)	(-2.70)
Observations	194	194	194	194	194
Mean Dep. Var.	8.026	8.026	0.634	0.459	0.397
R-squared	0.211	0.413	0.428	0.418	0.440

Understanding of the Lottery II

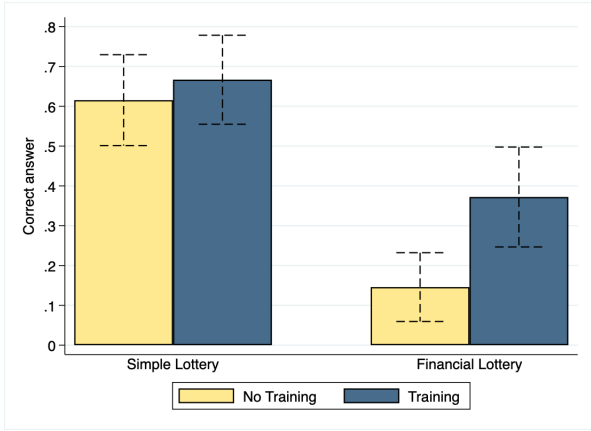
How useful was the teaching?



Self-ass. understanding



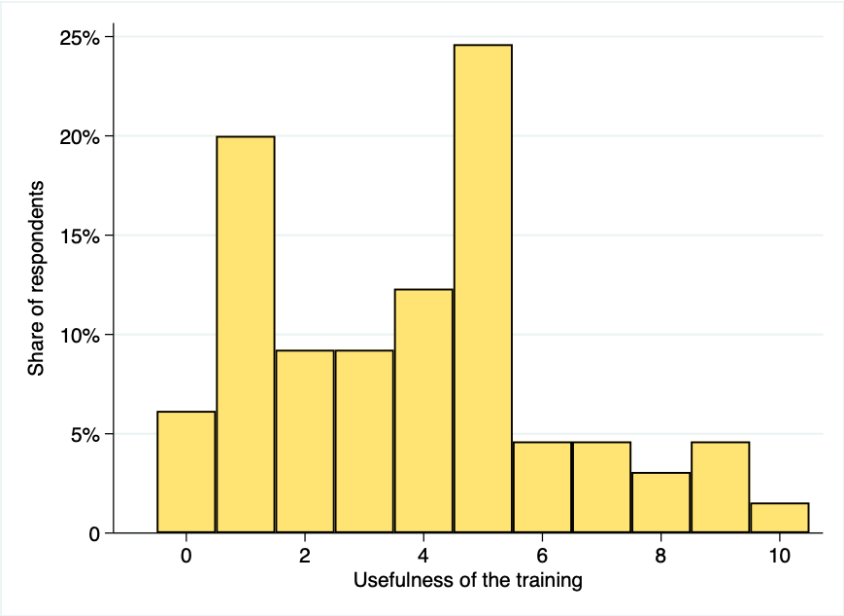
Correct$_1$



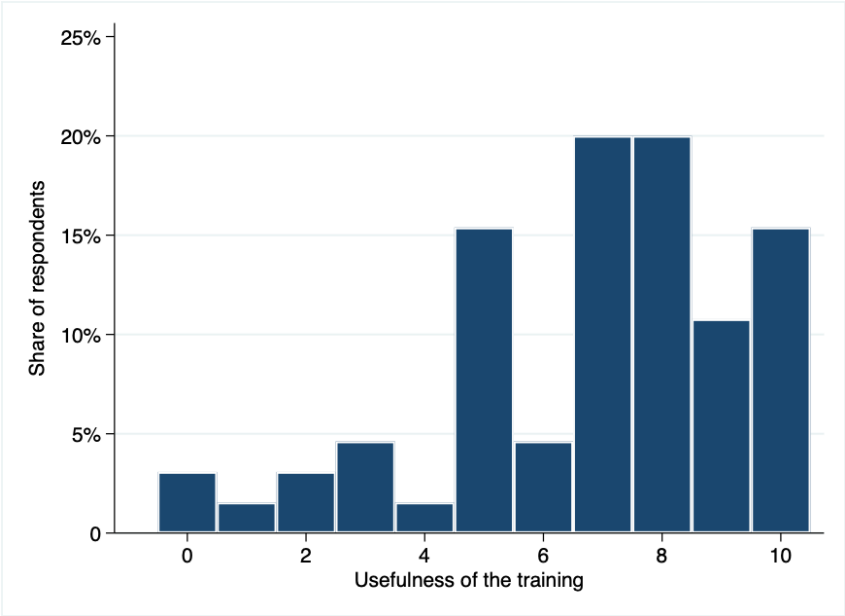
Correct$_2$

Usefulness of the Training Treatment I

Answers to question: "*How useful did you find, from 0 to 10, the information provided (what a financial asset is, how to compute returns...) for your decisions?* "



Simple lottery

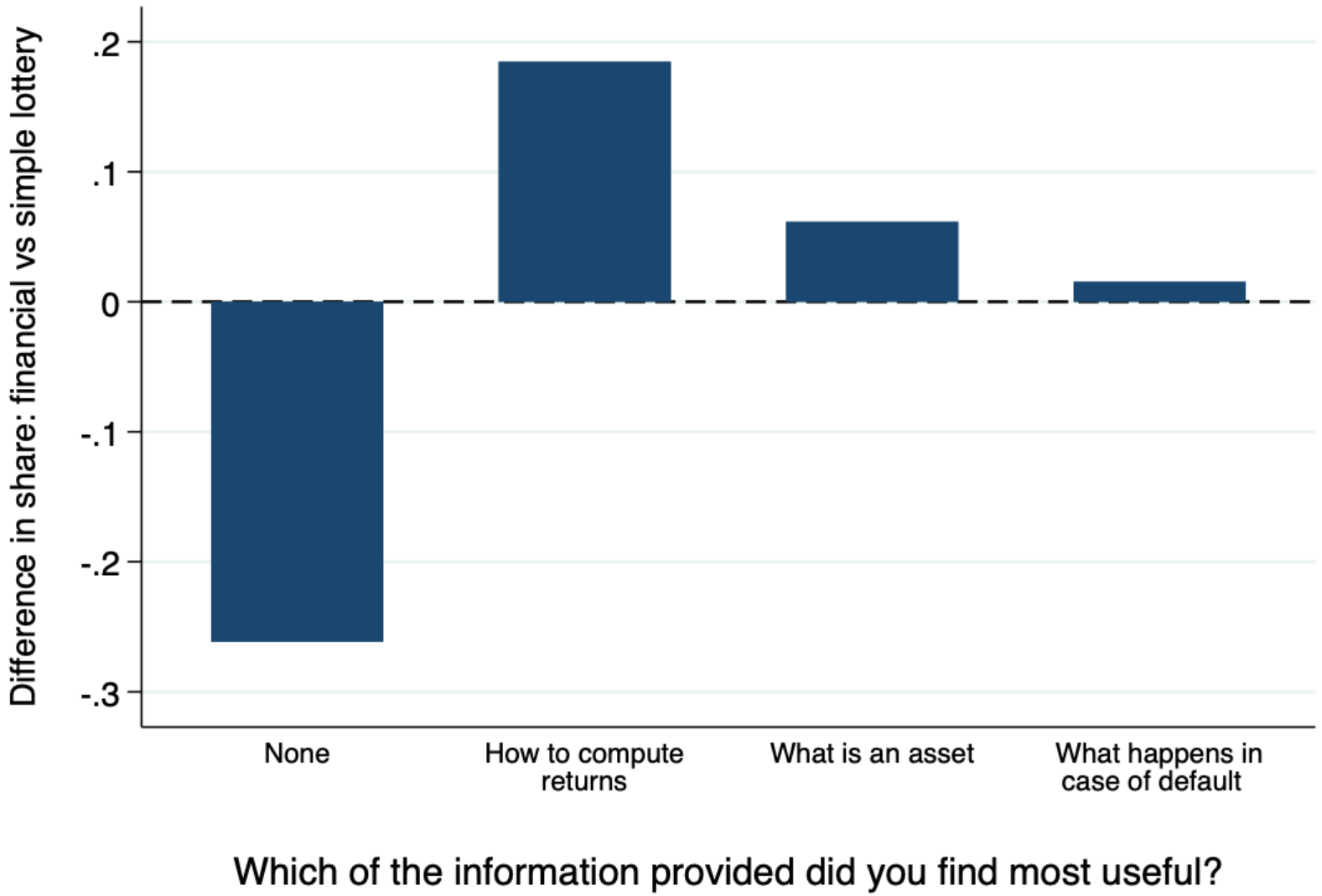


Financial lottery

Usefulness of the Training Treatment II

- When asked about **which of the information** provided by the training was **most useful** for making their choices:
  - The least frequent answer in group *FT* group is *"None"*
  - Interestingly, this option is chosen only by 3 subjects who are in the top quartile of the distribution of ex-ante financial literacy
  - A few more subjects choose the options *"What an asset is"* (14%) and *"What happens in case of default of the issuer"* (31%)
  - The **modal answer** is *"How to compute returns"*

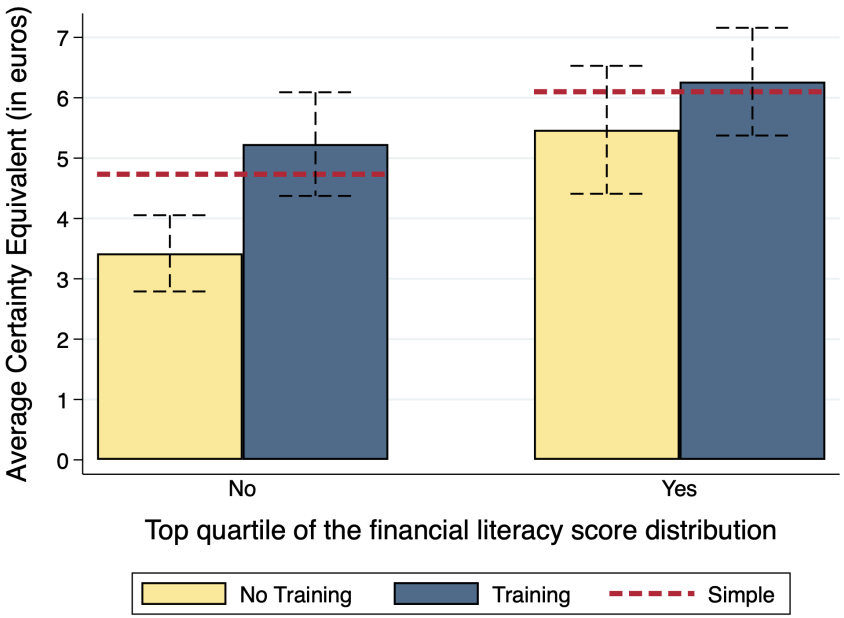
Usefulness of the Training Treatment III

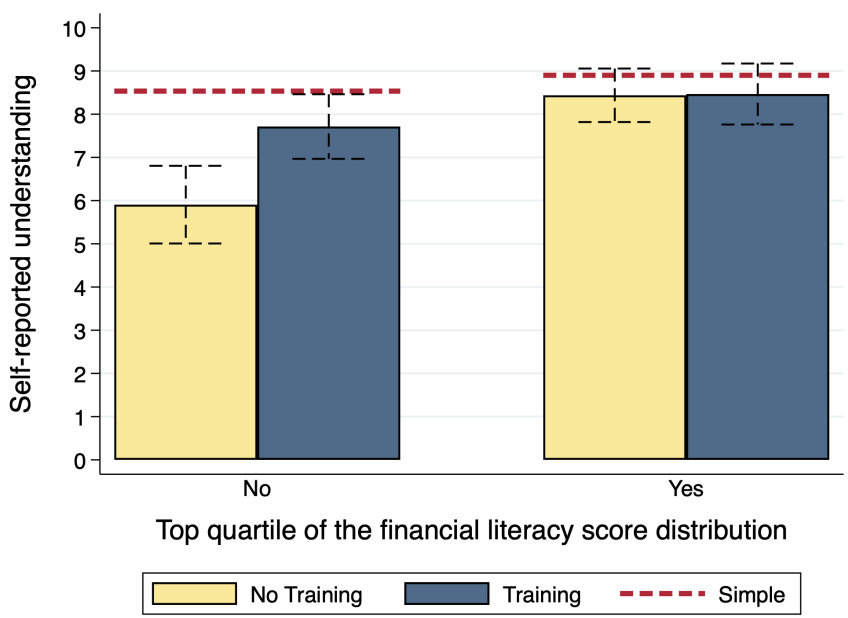


Potential Confounding Effects

- There are **framing differences**, other than the financial terms used in the financial-asset lottery only, which might in principle contribute to explain the negative effect of the financial framing (for instance, the term "probability")
  - However, the training covers the specific financial terms only. Yet, it completely **offsets** the negative effect of the framing
- The effect of the training could be in part due to **salience or endorsement** effects
  - To tackle this concern, we investigate the **heterogeneity of treatment effects** depending on the ex-ante level of financial literacy

Heterogeneous Treatment Effects I





Heterogeneous Treatment Effects II

- The training has **no effect on** those who are already **highly financially literate**: unlikely that the effect is due to salience or endorsement effects
- Similar evidence emerges if we split the sample depending on whether a participants **studied economics**, took a **finance course**, or give the **wrong answers to the 2 questions on interest and return rates**
- In this latter subsample, the **effect of the financial framing is particularly pronounced**

▸ Heterog. interest rates

Multiple Switchers I

- In the baseline analysis, we exclude *multiple switchers*, for whom we cannot identify a unique CE
- We assess the **robustness of our results** to the inclusion of multiple switchers by:
  - testing whether the treatments affect the probability of behaving inconsistently
  - replicating our baseline estimates including multiple switchers in two ways:
    1. We follow Masclet et al. (2009), and use as outcome the **lowest safe amount accepted**, regardless of whether subjects choose to the risky lottery in any of the subsequent rows
    2. Similar to Holt and Laury (2002), we proxy individual propensity to accept the risky lottery by the **total number of rows** in which the individual prefers this to the safe alternative

Multiple Switchers II

Dependent Variable: Multiple switcher		
	(1)	(2)
FINLOT	0.068	0.074
	(0.072)	(0.070)
TRAINING	0.027	0.056
	(0.072)	(0.072)
FINLOT×TRAINING	0.053	0.009
	(0.106)	(0.105)
Female		-0.017
		(0.056)
Age		0.004
		(0.015)
Work		-0.008
		(0.065)
Family Income > 80K euros		0.050
		(0.110)
Education level: Bachelor's Degree		-0.185**
		(0.091)
Education level: Master		-0.263**
		(0.121)
Financial Literacy Score (0-10)		-0.051***
		(0.015)
	[...]	
Constant	0.034	0.495*
	(0.083)	(0.285)
Observations	260	260
Mean Dep. Var.	0.254	0.254
R-squared	0.078	0.185

Multiple Switchers III

Dependent Variable: Willingness to accept the risky lottery				
	Lowest safe amount accepted		Number of safe choices	
	(1)	(2)	(3)	(4)
FINLOT	-1.005**	-1.105***	-1.448*	-1.594**
	(0.407)	(0.402)	(0.735)	(0.736)
TRAINING	0.206	0.146	0.601	0.609
	(0.407)	(0.399)	(0.735)	(0.730)
FINLOT× TRAINING	1.123*	1.295**	2.408**	2.451**
	(0.575)	(0.573)	(1.039)	(1.048)
Constant	4.871***	6.839***	8.992***	12.990***
	(0.550)	(1.998)	(0.994)	(3.656)
Controls	No	Yes	No	Yes
Observations	260	260	260	260
Mean Dep. Var.	4.433	4.433	9.338	9.338
R-squared	0.075	0.223	0.093	0.219

Summing Up

- The financial framing reduces the CE of the lottery by approximately 20%, and worsens participants' understanding of the lottery structure
- **Financial literacy remedies this distortion and offsets the negative effects of the financial framing on both the CE of the financial-asset lottery, and participants' understanding of its structure**
- The training is useful to participants who have **limited financial literacy** to begin with, and the piece of information they find most useful is the explanation on **how to calculate returns**
- Treatment effects are **negligible in the top 25% of the financial literacy** score distribution

Outline

Financial Literacy & Ambiguity Aversion I

- A potential channel through which financial literacy affects asset valuation is **ambiguity aversion**
- Consider a DM who evaluates an ambiguous prospect according to the smooth model of decision under ambiguity by Klibanoff et al. (2005). Maccheroni et al. (2013) show that the analogous of the Arrow-Pratt approximation for the certainty equivalent in the presence of ambiguity would be:

$$C_i(h) = E_P(h) - \frac{\lambda_i}{2}\sigma_P^2(h) - \frac{\theta_i}{2}\sigma_\mu^2(E(h)),$$

- If $\sigma_\mu^2(E(h))$ – the ambiguity faced by the decision maker – decreases in financial literacy, then financial literacy increases the $C_i(h)$

Financial Literacy & Ambiguity Aversion II

Hence, ambiguity aversion rationalizes our experimental results:

- The financial complexity **reduces the understanding** of the lottery structure
- This **model uncertainty** adds to the objective riskiness of the lottery, i.e., the physical uncertainty due to the randomness of the draw
- If **ambiguity averse**, agents assign higher weights to negative scenarios, in which they invest in an asset which is worse than they understood it to be, than to positive scenarios (in which the opposite happens)
- By equipping individuals with the tools to **navigate the financial complexity of the lottery**, financial literacy reduces the ambiguity and increases the CE of the asset

Understanding and CE of the Financial Lottery

Consistent with this, even among participants whose financial literacy is not manipulated during the experiment (those in group F), those with a worse understanding of the financial lottery are less willing to take it

Dependent Variable: Certainty equivalent of the financially-framed lottery					
	Self-assessed understanding		Objective understanding		
	(1)	(2)	(3)	(4)	(5)
Understanding	0.271**	0.272*			
	(0.118)	(0.142)			
$Correct_1$			2.373***		
			(0.871)		
$Correct_2$				2.294**	
				(0.939)	
Correct					3.406**
					(1.390)
Constant	2.273**	-0.082	1.036	1.250	2.222
	(0.864)	(2.635)	(2.346)	(2.379)	(2.369)
Controls	No	Yes	Yes	Yes	Yes
Observations	48	48	48	48	48
Mean Dep. Var.	4.104	4.104	4.104	4.104	4.104
R-squared	0.103	0.300	0.359	0.338	0.338

Outline

Conclusions

- Financially illiterate households tend to **underinvest in risky financial assets** not because of their riskiness but because of their **inability to understand them**
- A **short financial training** that clarifies the key financial terms of the investment effectively remedies this distortion, and increases the willingness to undertake risk
- **Ambiguity aversion** can rationalize this behavior
- Improving financial literacy can reduce households' aversion towards risky financial products, thus stimulating their participation in financial markets and **possibly improving the financial well-being**

Financial Literacy Patterns

Dependent Variable: Pre-treatment Financial Literacy				
	(1) Fin. Lit.	(2) Fin. Lit.	(3) Fin. Lit.	(4) Self-ass. Fin. Lit.
Female	-1.104***	-1.084***	-1.072***	-0.625***
	(0.302)	(0.305)	(0.241)	(0.222)
Age	0.029	0.061	0.107*	-0.059
	(0.044)	(0.068)	(0.062)	(0.057)
Work		-0.400	-0.142	-0.205
		(0.339)	(0.274)	(0.253)
Working years		-0.018	0.012	0.130*
		(0.093)	(0.076)	(0.070)
Family Income > 80K euros		0.264	0.610	1.044**
		(0.653)	(0.513)	(0.469)
Education level: Bachelor's Degree			0.276	0.321
			(0.352)	(0.322)
Education level: Master			0.465	0.767
			(0.526)	(0.482)
Education level: PhD			-0.176	0.088
			(0.910)	(0.833)
Field of studies: Economics/Finance/Management			3.107***	0.779**
			(0.336)	(0.308)
Field of studies: Humanities/Law/Political Sciences			0.647**	-0.091
			(0.305)	(0.280)
Field of studies: Medicine/Biology/Psichology			0.567	-0.327
			(0.406)	(0.372)
Finance Course			1.072***	0.934***
			(0.296)	(0.271)
Observations	260	260	260	258
Mean Dep. Var.	5.531	5.531	5.531	4.236
R-squared	0.118	0.124	0.482	0.257

Back

Financial Literacy Questionnaire I

Suppose you have €100 in a savings account and the interest rate is 20% per year. If you never withdraw money or interest payments, how much would you have in this account after 5 years?

More than €200 ○ | Exactly €200 ○ | Less than €200 ○ | Do not know ○

Imagine that the interest rate on your savings account is 1% per year and inflation is 2% per year. After 1 year, how much would you be able to buy with the money in this account?

More than today ○ | The same as today ○ | Less than today ○ | Do not know ○

Which of the following statements is correct? If somebody buys the stock of firm B in the stock market:

- ○ He owns a part of firm B
- ○ He has lent money to firm B
- ○ He is liable for firm B's debts
- ○ None of the above;
- ○ Do not know

When an investor spreads his money among different assets, the risk of losing money:

Increases ○ | Decreases ○ | Stays the same ○ | Do not know ○

▸ Back

Financial Literacy Questionnaire II

Stocks are normally riskier than bonds. True or false?

True ○ False ○ Do not know ○

If the interest rate falls, what should happen to bond prices?

Rise ○ Fall ○ Stay the same ○ Do not know ○

When you buy a Call option on a stock, you are actually buying:

- ○ The right to sell a stock at a certain price in the future
- ○ The right to buy a stock at a certain price in the future
- ○ The obligation to sell a stock at a certain price in the future
- ○ The obligation to buy a stock at a certain price in the future
- ○ Do not know

▸ Back

Financial Literacy Questionnaire III

Which of the following statements is correct? If somebody buys a bond of firm B:

- ○ He owns a part of firm B
- ○ He has lent money to firm B
- ○ He is liable for firm B's debts
- ○ None of the above;
- ○ Do not know

Someone gives you a scratch card that allows you to win:

- €10 with probability 1/2
- €16 with probability 1/4
- €20 with probability 1/4

Compute and indicate the expected payout. If you do not know, write "Do not know".

Example: if your answer is €10, write:
"10"

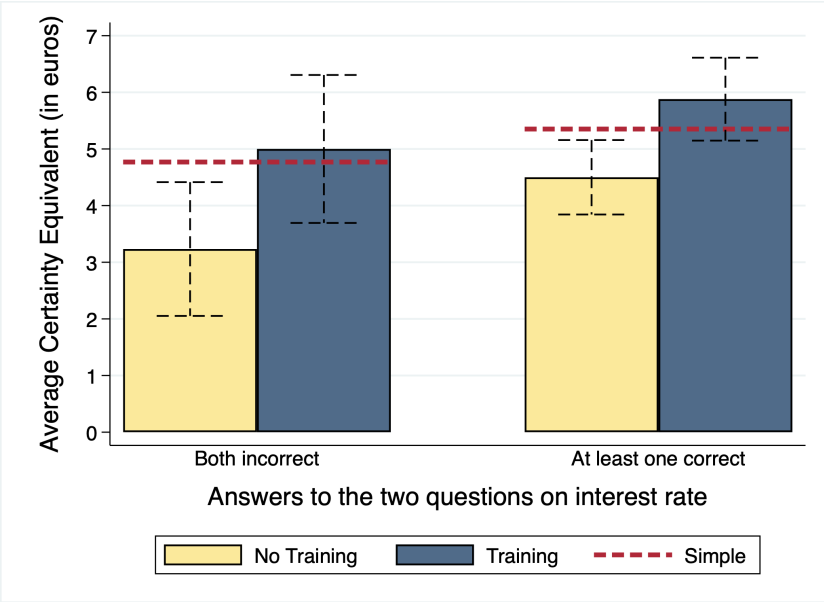
If the value of an apartment increases by 5% per year and today it is worth €450,000, how much will it be worth in two years?

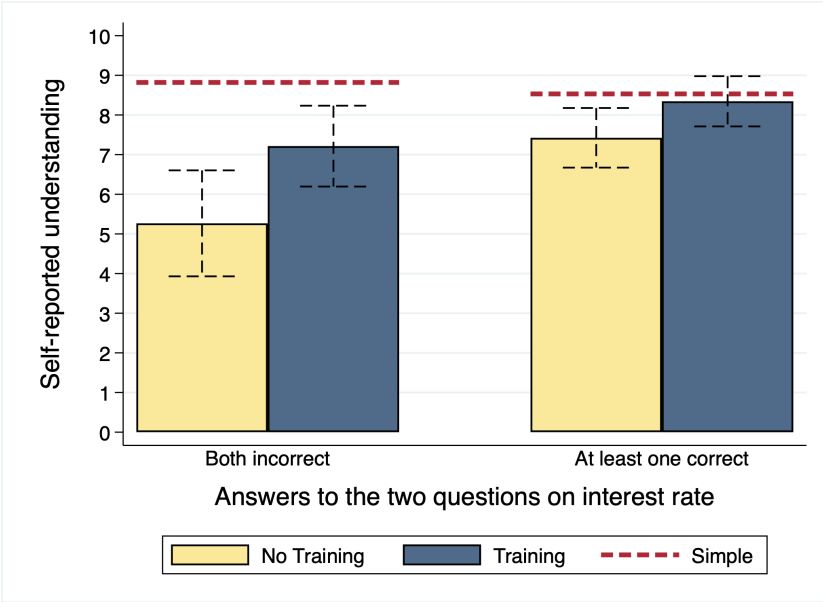
Indicate your answer below, in euros. If you do not know, write "Do not know".

Ex: if your answer is €20000, write:
"20000"

Back

Heterogeneous Treatment Effects III





Back

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