

Financial education on secondary school students: the randomized experiment revisited

By

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Aim of the research

To test the effect of financial education on a sample of Italian students enrolled in the final year before graduation

The sample

- 3,820 secondary school students enrolled in the final year before graduation
- 118 classes
- 3 types of schools (classical studies, scientific studies and vocational training)
- 3 Italian cities (Rome, Milan and Genova)

The questionnaire

The test on financial literacy consists of 27 multiple choice questions with four possible answers (only one correct):

- 5 questions about knowledge of bank instruments;
- 5 questions about financial market elements;
- 5 questions about different factors related to risk
- 12 about monetary, financial policies and institutions.

The questionnaire also included: 1) control questions, 2) measures of students' skills and 3) information on socio-demographic characteristics.

Number of correct answers



Financial literacy performance

Course & topics

16-hours course of financial education which lasts 3 months with 6 teaching modules:

1. Basic Concepts of Economics
2. Economic Operators (Households, Companies and Banks)
3. Debt, Indebtedness, and Financing
4. Monetary Policy and the Monetary Institutions
5. Financial Markets
6. Finance and Ethics

In order to standardize the treatment we uniform the material used by teachers in all classes.

The experiment design

A randomized experiment

T0 – The students answer the questionnaire



T1a – The classes are divided into 2
(treatment & control groups)

T1b – Treatment classes attend the course on finance



T2 – The students answer the same questionnaire
(4 months after the end of the course)

Table 1 The sample

	Rome	Milan	Raw total
Treatment group	17	8	25
Control group	11		
Column total	28		36

Figure 1. The experiment design

	Treatment with course	Treatment without course	Control
T ₀	Questionnaire	Questionnaire	
T ₁	16-hour course of financial education		
T ₂	Questionnaire	Questionnaire	
Null hyp.	$E_T[Y_{i2}-Y_{i0}] = 0$	$E_C[Y_{i2}-Y_{i0}] = 0$	$E_{\neq T,C}[Y_{i2}-Y_{i0}] = 0$ by assumption, due to the short time interval between first and second questionnaire
Alternative hyp.	$E_T[Y_{i2}-Y_{i0}] > 0$ Treatment+questionnaire effect significant	$E_C[Y_{i2}-Y_{i0}] > 0$ questionnaire effect significant	
Test on the impact of the course			
Null hyp.	$H_0 : \Delta = E_T[Y_{i2}-Y_{i0}] - E_C[Y_{i2}-Y_{i0}] = 0$		
Alternative hypothesis	$H_0 : \Delta = E_T[Y_{i2}-Y_{i0}] - E_C[Y_{i2}-Y_{i0}] > 0$ Course effect significant		

Table 3 Tests for random assignment

	TWC classes	TC classes	Ho: no significant difference (P-value)
MathGrade	6.496	6.616	0.2727
ItalianGrade	6.598	6.657	0.4881
IntermediateGrade	7.917	7.881	0.7766
Male	0.484	0.504	0.6416
Foreigner	0.048	0.056	0.8052
Volunteering	0.015	0.042	0.2984
Humanities	0.044	0.037	0.781
WouldBeUniversity	0.58	0.524	0.1972
WouldBeEconomics	0.145	0.187	0.2016
FatherDegree	0.109	0.067	0.057
MotherDegree	0.097	0.088	0.6989
FatherClerk	0.176	0.184	0.8094
FatherWorker	0.194	0.174	0.5386
FatherPublicSector	0.073	0.068	0.8204
MotherHousewife	0.309	0.301	0.834
MotherClerk	0.212	0.201	0.7461

TC classes (treatment with course classes); TWC classes (treatment without course classes).

Variable legend: see Appendix.

Table 6. Balancing properties at class level

Variable(s)	Mean	Control	Diff.	t	Pr(T > t)
Number of correct answers	12.543	13.984	1.442	1.87	0.0666*
Male	0.447	0.471	0.024	0.41	0.6828
WouldBeUniversity	0.613	0.525	-0.088	1.64	0.1063
MathGrade	6.635	6.641	0.006	0.05	0.9594
ItalianGrade	6.784	6.689	-0.094	1.01	0.3142
IntermediateGrade	7.967	7.839	-0.128	0.72	0.4719
MathDebt	0.245	0.181	-0.064	1.66	0.1025
WouldBeEconomics	0.148	0.169	0.022	0.59	0.5591
FatherClerk	0.131	0.165	0.034	1.32	0.1934
FatherWorker	0.190	0.202	0.012	0.39	0.7012
FatherPublicSector	0.060	0.062	0.002	0.12	0.9086
MotherHousewife	0.288	0.293	0.005	0.14	0.8881
MotherClerk	0.188	0.206	0.018	0.69	0.4937
FatherDegree	0.115	0.074	-0.041	2.13	0.0368**
MotherDegree	0.094	0.087	-0.007	0.39	0.6967
BrothSistUniversity	0.225	0.175	-0.050	1.23	0.2224
HouseholdSize	2.895	2.903	0.008	0.17	0.8670
Mortgage	0.343	0.384	0.041	0.99	0.3252
Loan	0.247	0.289	0.042	1.13	0.2615
Volunteering	0.118	0.092	-0.027	1.11	0.2731

Variable legend: see Table A1

Figure 2b. Total number of correct answers in the 27 multiple choice questions on financial literacy - TC classes

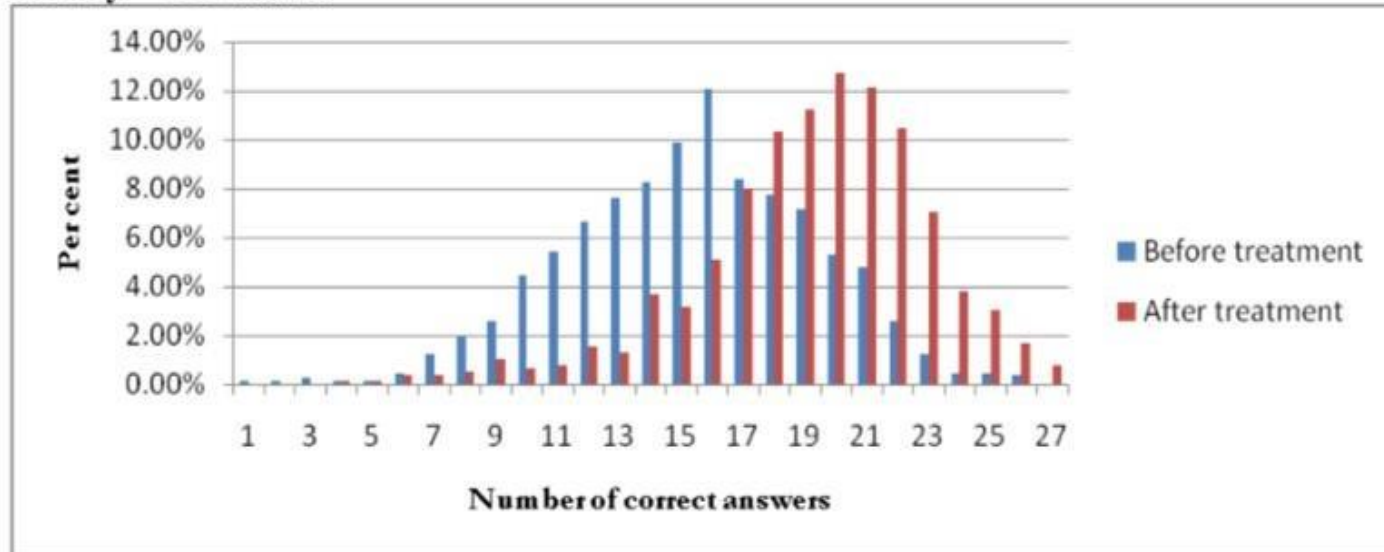
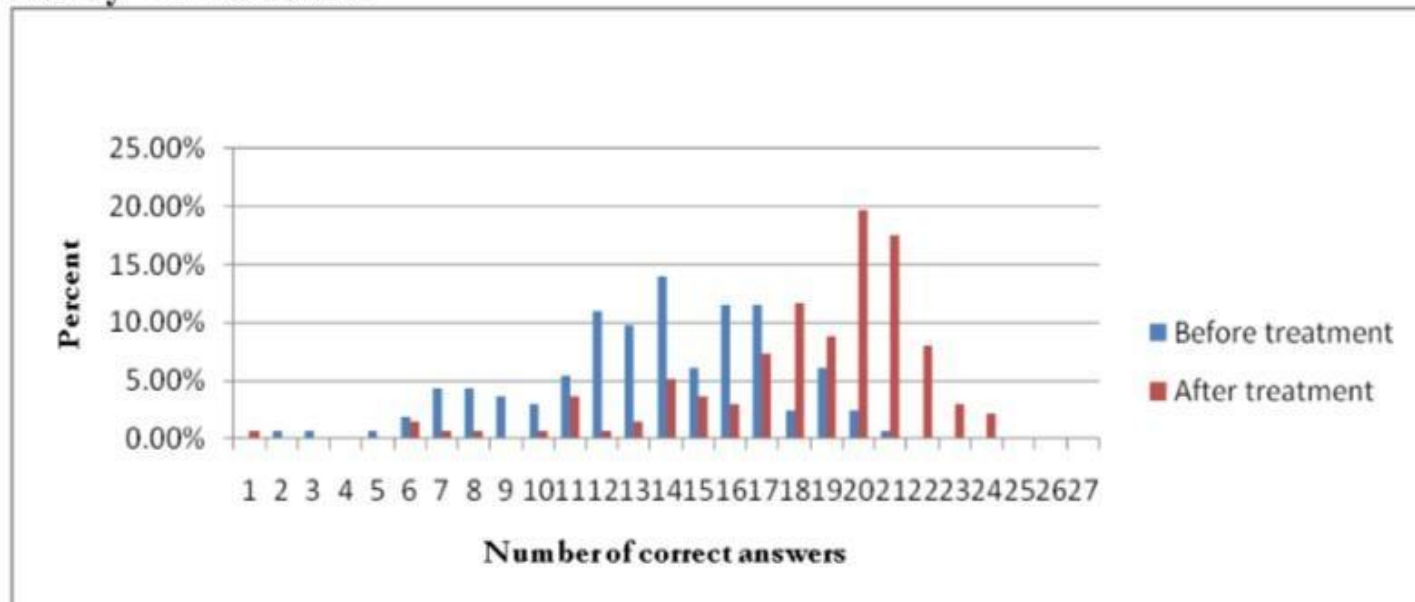


Figure 2c. Total number of correct answers in the 27 multiple choice questions on financial literacy - TWC classes



Preliminary findings

Ex ante difference between treatment and control group
13.96 against 12.11 correct questions

Ex post difference between treatment and control group
18.36 against 14.88 correct questions

The difference widens with a progress for both

Research hypothesis

$$H_0: \Delta = E_T[Y_{i2} - Y_{i0}] - E_C[Y_{i2} - Y_{i0}] = 0$$

Both at (the i-th) student level or class level

We repeat our test by collapsing our observations at class level in order to eliminate the within class externality effect.

Econometric model

We perform a first diff-in-diff test (Inbens and Wooldridge, 2009) on the overall sample at student and class level.

$$Y_{i,t} = a_0 + a_1Treat_{i,t} + a_2Post_{i,t} + a_3Post * Treat_{i,t} + \sum_j a_jX_{i,t} + \varepsilon_{i,t}$$

Fixed effects to capture unobservable factors

Table 5. Multivariate diff in diff results at student level - group fixed effects with standard errors clustered at group level

VARIABLES	All sample	North	Rome	Milan	Genova	All sample
Post	2.565*** (0.955)	0.816 (1.340)	-1.747 (1.616)	4.847*** (0.528)	0.0955 (1.209)	4.829*** (0.997)
Interaction	2.275** (1.091)	3.682** (1.579)	8.481*** (1.903)	-0.0434 (0.606)	4.813*** (1.426)	-0.00549 (1.088)
North*post						-4.706*** (1.603)
North*treat*post						4.715** (1.833)
Constant	13.91 (16.02)	30.31** (13.80)	11.90 (8.677)	8.203 (15.74)	33.59** (14.58)	15.33 (15.68)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1836	930	302	604	1232	1836
R-squared	0.498	0.463	0.621	0.634	0.486	0.519

Table 10.3 Differential impact of the course on different groups of students

	(1)	(2)	(3)	(5)	(6)	(7)
TreatPost	4.301*** (0.291)	3.738*** (0.272)	3.817*** (0.268)	3.806*** (0.212)	4.366*** (0.291)	4.076*** (0.232)
Treat*Male	-0.979** (0.392)					
Treat*top50%ItalianGrade		0.109 (0.352)				
Treat*top50%MathGrade			-0.051 (0.342)			
Treat*HighSchool				-0.39 (1.133)		
Treat*FutureUnivStudents					-1.096*** (0.391)	
Treat*FutureStudentsOfEconomics						-1.310*** (0.483)
ClassFixedEffects	YES	YES	YES	YES	YES	YES
Constant	4.889** (1.967)	5.203** (2.033)	4.997** (2.001)	5.044** (1.971)	4.937** (1.965)	5.068** (1.965)
Observations	1172	1172	1172	1172	1172	1172
R-squared	0.455	0.452	0.452	0.452	0.455	0.455

Standard errors in parentheses

*** p<0.01, ** p<0.05, *p<0.1

A more in-depth insight

Figure 3 Share invested in cash, government and corporate bonds and stocks before and after the treatment in TC classes

Shares of money held in current accounts or invested in government bonds, corporate bonds and shares before and after the course in financial education when individuals interviewed answer the following question: *You inherit 100,000 euros with which you plan to buy a flat in 4 years. How do you invest the money ? (Please indicate shares invested in the four available options: current account, government bonds, corporate bonds and shares))*

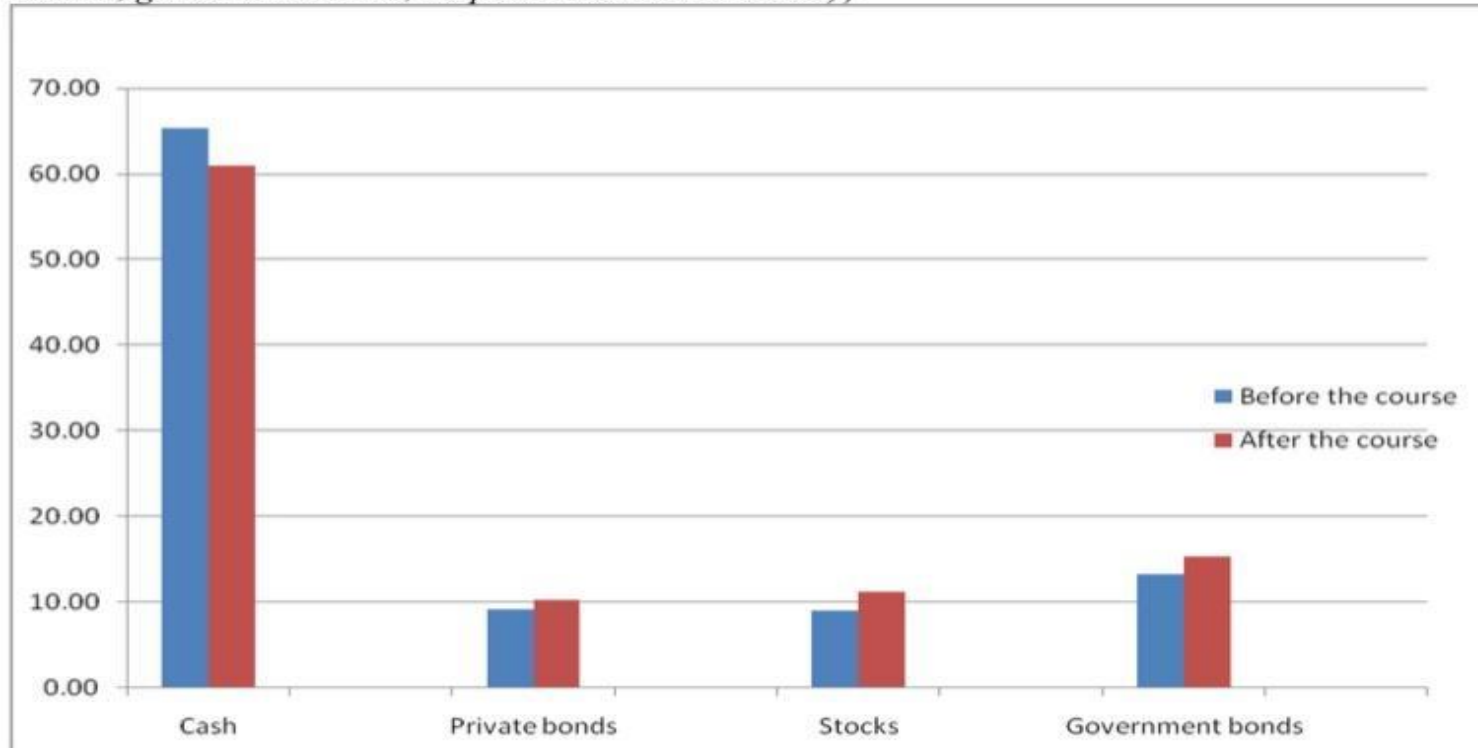


Table 8. Effect of the treatment on the propensity to invest in cash – Rome Milan database – parametric tests

Test type	Parametric test		Non parametric rank sum test	
	[t-test]			
		p-value		p-value
<i>All sample</i>	-4.506	(0.000)	2.890	(0.004)
<i>Treatment group</i>	-4.935	(0.000)	2.866	(0.004)
<i>Control group</i>	-1.041	(0.509)	0.550	(0.582)

Shares of money held in current account when individuals interviewed answer the following question: *You inherit 100,000 euros with which you plan to buy a flat in 4 years. How do you invest the money ? (Please indicate shares invested in the four available options: current account, government bonds, corporate bonds and shares)*

Table 9 - Parametric and non parametric test on the readership of economic and financial articles in journals

Test Type	Average difference (from t_1 to t_0)	z- stat	p-value
Tests on Distributions	(One-sample t-test)		
Change in readership			
<i>a) Overall sample</i>	0.165		[0.000]
<i>b) TWC classes</i>	0.256		[0.000]
<i>c) TC classes</i>	0.209		[0.000]
TC vs TWC	0.046		[0.337]
Non parametric tests			

Table 11. Progress in financial literacy synthesis of econometric findings from the reshaped sample

TWC classes						
Parental job and education	Not included	Not included	Not included	Included	Included	Included
Class fixed effects	No	No	No	No	No	No
Constant	0.405*** (0.059)	0.439*** (0.066)	0.298** (0.131)	0.414*** (0.082)	0.511*** (0.094)	0.243 (0.149)
Observations	12657	8289	4342	9181	6103	3078
R-squared	0.004	0.005	0.009	0.01	0.013	0.023
TC classes						
	All sample	Treatment	Control	All sample	Treatment	Control
Parental job and education	Not included	Not included	Not included	Included	Included	Included
Class fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.266*** (0.048)	0.502*** (0.069)	0.406*** (0.102)	0.336*** (0.072)	0.588*** (0.183)	0.443*** (0.125)
Observations	12631	8289	4342	9181	6103	3078
R-squared	0.04	0.032	0.05	0.04	0.033	0.057

Table 2. Difference in difference tests at student level (with or without propensity score matching (PSM))

	First (before course) test			Second (after course) test			Diff. in diff
	Control	Treatment	Diff.	Control	Treatment	Diff.	
All sample							
Plain	12.211 (0.187)	13.956 (0.123)	1.745*** (0.224)	14.880 (0.305)	18.358 (0.125)	3.479*** (0.330)	1.734*** (0.399)
PSM	12.719 (0.210)	13.956 (0.126)	1.237*** (0.245)	15.471 (0.290)	18.358 (0.128)	2.887*** (0.317)	1.650*** (0.400)
Milan							
Plain	13.041 (0.308)	13.988 (0.171)	0.947*** (0.352)	10.723 (0.599)	17.690 (0.169)	6.967*** (0.623)	6.020*** (0.715)
PSM	12.309 (0.407)	13.988 (0.170)	1.679*** (0.441)	11.968 (0.651)	17.690 (0.169)	5.722*** (0.672)	4.043*** (0.804)
Genova							
Plain	10.436 (0.338)	11.455 (0.396)	1.018* (0.521)	10.256 (0.815)	18.358 (0.396)	8.101*** (0.906)	7.083*** (1.045)
PSM	12.367 (0.466)	11.455 (0.391)	-0.912 (0.608)	11.167 (1.023)	18.358 (0.391)	7.191*** (1.095)	8.103*** (1.252)
Rome							
Plain	13.410 (0.293)	14.706 (0.166)	1.296*** (0.336)	18.168 (0.322)	19.558 (0.177)	1.391*** (0.368)	0.094 (0.498)
PSM	13.992 (0.320)	14.706 (0.175)	0.714* (0.364)	18.055 (0.332)	19.558 (0.187)	1.503*** (0.381)	0.789 (0.527)
North							
Plain	11.791 (0.228)	13.555 (0.159)	1.765*** (0.278)	10.548 (0.486)	17.803 (0.159)	7.255*** (0.511)	5.490*** (0.582)
PSM	12.141 (0.292)	13.555 (0.159)	1.414*** (0.333)	11.672 (0.499)	17.803 (0.158)	6.131*** (0.523)	4.717*** (0.620)

Number of observations: All sample (3795), Milan (1925), Genova (596), Rome(1273), North(Milan+Genova)

Variables used for matching. *Male* is a dummy for male gender. *MathGrade*, *ItalianGrade* and *IntermediateGrade* are Final grades in Math in the previous school year, in Italian in the previous school year and at final middle school exam respectively. *WouldBeUniversity* is a dummy taking value of one if the student intends to go to University. Controls also include the following (0/1) dummies: *MathDebt* if the student had a “debito” (“insufficient” grade to be recovered with extra courses during summer) in Maths in the previous year, *WouldBeEconomics* if the student intends to study Economics at university; *FatherClerk*, *FatherWorker* or *FatherPublicSector* if the father is an employee in the private sector, a manual worker or a an employee in the public sector, respectively; *MotherHousewife*, *MotherClerk* if the mother is a housewife or an employee respectively, *FatherDegree* (*MotherDegree*) if the father (mother) has a university degree. *BrothSistUniversity* is the number of brothers and/or sisters attending University, *HouseholdSize* the number of people living in the household, *Mortgage (Loan)* a (0/1) dummy if student’s family has a mortgage (loan) and *Volunteering* a dummy taking value of one if the student takes part in volunteering activities.

Table 4. Multivariate diff in diff results at student level - with standard errors clustered at group level

VARIABLES	All sample	North	Rome	Milan	Genova	All sample
Treat	1.368** (0.660)	1.729* (0.900)	1.006 (0.760)	1.934 (1.185)	-0.0360 (1.099)	0.750 (0.734)
Post	2.437** (0.972)	-0.378 (1.421)	4.598*** (1.054)	0.00278 (1.672)	-1.462 (1.730)	4.634*** (1.012)
Interaction	2.133* (1.116)	4.914*** (1.620)	0.189 (1.151)	4.126** (1.854)	7.907*** (2.228)	0.124 (1.116)
North						-1.870*** (0.666)
North*post						-5.035*** (1.742)
North*treat						0.974 (1.161)
North*treat*post						4.827** (1.971)

Table 5. Multivariate diff in diff results at student level - group fixed effects with standard errors clustered at group level

VARIABLES	All sample	North	Rome	Milan	Genova	All sample
Post	2.565*** (0.955)	0.816 (1.340)	-1.747 (1.616)	4.847*** (0.528)	0.0955 (1.209)	4.829*** (0.997)
Interaction	2.275** (1.091)	3.682** (1.579)	8.481*** (1.903)	-0.0434 (0.606)	4.813*** (1.426)	-0.00549 (1.088)
North*post						-4.706*** (1.603)
North*treat*post						4.715** (1.833)
Constant	13.91 (16.02)	30.31** (13.80)	11.90 (8.677)	8.203 (15.74)	33.59** (14.58)	15.33 (15.68)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1836	930	302	604	1232	1836
R-squared	0.498	0.463	0.621	0.634	0.486	0.519

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Group: student class interacted with treatment/control status. Variable legend: see Table A1.

Findings

- The results indicate that we have a questionnaire learning effect - the control group progresses between the first and second survey.
(Spillover effect)
- The course increases significantly financial literacy at both student and class level.
- The effect is different in different urban environments (learning effect is significantly higher in the North than in Rome).
- High grades at final middle school exams, willingness to attend Economics at University and household borrowing status are three factors which significantly and positively affect financial education.
- The results are unable to verify whether the increased financial literacy does decay in the long run or, on the contrary, it does not and leads to superior financial empowerment when young or adult.

Gamblers, scratchers and their financial education

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Objective and results

- We study the the characteristics of slot/videopoker players and scratchers (individuals buying tickets of scratch-off lotteries) and relationship between gambling and financial literacy
- We find that:
 - i. slot and/or videopoker players have 8% lower probability of answering correctly to all the 3 standard financial education questions
 - ii. scratch-off players have a 10 % lower probability of answering correctly to the mutual fund risk diversification question
 - iii. Scratch-off players are as well more impatient and more likely to sacrifice expected value for positive skewness and overestimate the probability of winning at least the price of the ticket

Methodology

- We run an online survey and collected around 400 answers
- We asked for gambling habits, scratch-off tickets characteristics knowledge and financial education

Expected gains and loss selected scratch-off tickets

Scratch-off ticket	Price	Total Revenue ('000)	Player's expected gain	Players' net loss	Player's expected gain over price
Sette e mezzo	1,00 €	58.080,00 €	0,54 €	0,46 €	54%
Nuovo turista x 10 anni	2,00 €	97.920,00 €	1,30 €	0,70 €	65%
Turista per 10 anni	2,00 €	80.640,00 €	1,30 €	0,70 €	65%
Gratta quiz	3,00 €	151.200,00 €	2,00 €	1,00 €	67%
Miliardario	5,00 €	504.000,00 €	3,50 €	1,50 €	70%
Nuovo mega miliardario	10,00 €	780.000,00 €	7,70 €	2,30 €	77%
Nuovo maxi miliardario	20,00 €	1.200.000,00 €	17,01 €	2,99 €	85%

Habits of players' and non players' groups

	All sample	Playing slot/videopoker	Buying scratch-off tickets	Neither buying scratch-off tickets nor playing slot/videopoker	Not scratching because not economically convenient
Fast food – <i>less than once a week</i>	90.32	85.57	89.23	92.02	87.91
Fast food – <i>more than once a week</i>	9.68	14.43	10.77	7.98	12.09
Alcoholic drinks – <i>less than once a week</i>	43.99	32.33	40.00	47.62	38.04
Alcoholic drinks – <i>more than once a week</i>	56.01	67.67	60.00	52.38	61.96
Super-alcoholic drinks – <i>less than once a week</i>	73.99	64.29	69.74	26.06	69.23
Super-alcoholic drinks – <i>more than once a week</i>	26.01	35.71	30.26	23.94	30.77
Tobacco– <i>less than once a week</i>	68.04	46.94	64.95	26.06	70.65
Tobacco– <i>more than once a week</i>	31.96	53.06	35.05	23.94	29.35

Table 1 Summary descriptive findings for players and non players

	All sample	Playing slot/videopoker	Buying scratch-off tickets	Neither buying scratch-off tickets nor playing slot/videopoker	Not scratching because not economically convenient
Overall sample	√	24.5	46.9	44.68	21.99
Male	47	65.7	46.7	45.5	52.68
<u>Within group education distribution</u>					
Elementary /middle school	10.10	22.34	10.88	5.43	3.33
High school	34.98	54.26	43.01	26.09	23.33
First level degree	17.24	8.51	18.65	16.85	20
Second level degree	20.20	11.70	16.06	26.63	23.33
Four years degree	0.49	2.13			2.22
Post degree level	17	1.06	11.4	25.00	27.28
<u>Within group work status distribution</u>					
Student	10.38	13	11.85	9.09	6.52
Self-employed	44.44	46	44.3	44.91	48.9
Employee	10.86	16	13.91	7.49	4.35
Unemployed	10.63	15.23	13.7	7.4	4.30
Retired	2.66	8	2.06	0.53	0
<u>Within group income distribution</u>					
0,5,000€	20.10	18.68	16.67	22.46	18.68
5,000-15,000€	22.72	28.43	22.33	22.45	27.47
15,001 - 25,000€	29.18	30.39	34.01	24	23.07
25,001 - 35,000€	14.11	13.72	13.2	15.5	15.38
35,001 - 55,000€	7.89	3.92	7.1	9.09	7.69
55,001 - 75,000€	3.34	4.90	3.55	2.67	4.39
75,001 - 100,000€	1.43	0.98	0	2.67	1.09
100,001 - 150,000€	0.7	0.98	0.5	0.54	2.20
More than 150,000€	0.47	0	0.5	0.54	

Financial literacy questions

Compound interest → If you had \$100 in a saving account and the interest rate was 2% per year. After five years,

- a) More than \$102
- b) Exactly \$102
- c) Less than \$102

Real interest → If the interest rate on your savings account was 1% per year and inflation was 2% per year

After one year, how much would you be able to buy with the money on this account?

- a) More than today
- b) As much as today
- c) Less than today

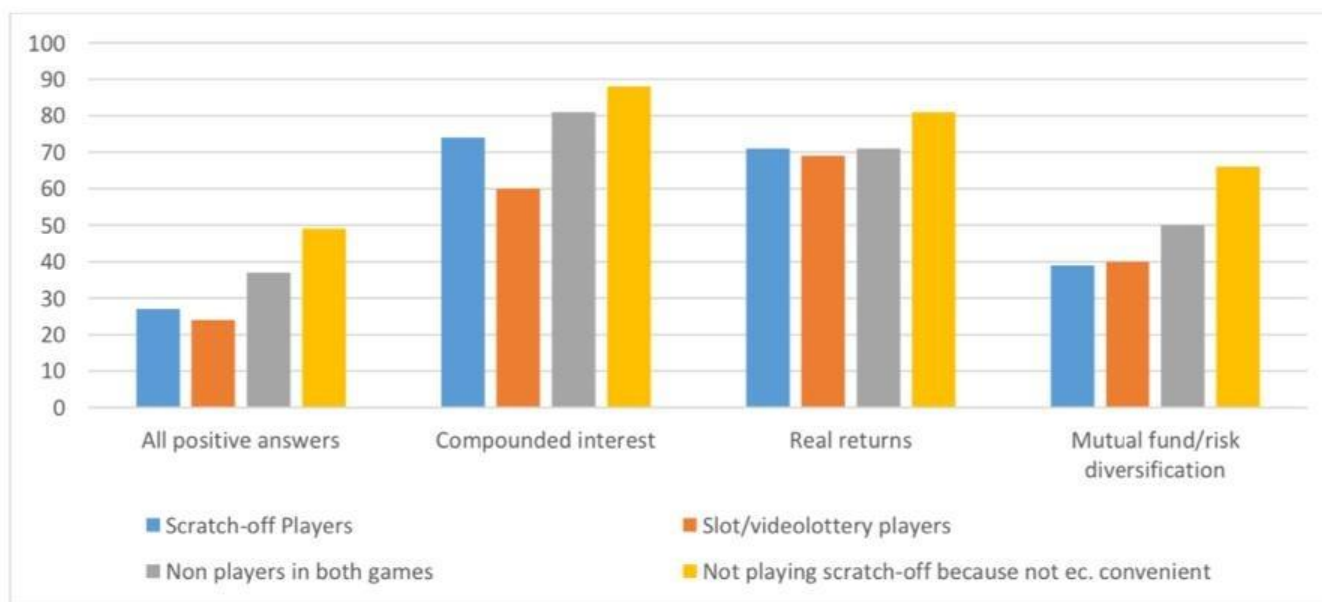
Mutual fund → Please tell me whether this statement is true or false: *“Buying a single company’s stock usually provides a safer return than a stock mutual fund”*

- ◆ True
- ◆ False

Table 2 Descriptive findings on habits of players' and non players' groups

	All sample	Playing slot/videopoker	Buying scratch- off tickets	Neither buying scratch-off tickets nor playing slot/videopoker	Not scratching because not economically convenient
Fast food – <i>less than once a week</i>	90.32	85.57	89.23	92.02	87.91
Fast food – <i>more than once a week</i>	9.68	14.43	10.77	7.98	12.09
Alcoholic drinks – <i>less than once a week</i>	43.99	32.33	40.00	47.62	38.04
Alcoholic drinks – <i>more than once a week</i>	56.01	67.67	60.00	52.38	61.96
Super-alcoholic drinks – <i>less than once a week</i>	73.99	64.29	69.74	26.06	69.23
Super-alcoholic drinks – <i>more than once a week</i>	26.01	35.71	30.26	23.94	30.77
Tobacco– <i>less than once a week</i>	68.04	46.94	64.95	26.06	70.65
Tobacco– <i>more than once a week</i>	31.96	53.06	35.05	23.94	29.35

Figure 1 Financial education and gambling groups



Vertical axis: percent of positive answers

Hypothesis testing on financial education and gambling groups

	Scratchers vs non players of both		Slot/videoplayers vs non players of both		Scratchers vs those that do not scratch because not ec. convenient	
All three questions correct	4.5622	(0.033)	5.3998	(0.020)	14.2992	(0.000)
Compounded interest	3.4284	(0.064)	16.1130	(0.000)	7.8846	(0.005)
Real return	0.0355	(0.851)	0.2645	(0.607)	3.3237	(0.068)
Mutual fund/risk diversification	4.8789	(0.027)	2.8580	(0.091)	11.3591	(0.001)
Avg. number of correct questions	2.0820	(0.038)	2.9651	(0.003)	3.9647	(0.0001)

Pearson χ^2 (p-values in round brackets) except for the last row (t-statistic)

Test for asymmetry - question

Among the 3 different tickets, which one would you buy? *(one answer)*

- i. A 5€ ticket that offers 1 chance over 100 of winning 500€
- ii. A 5€ ticket that offers 1 chance over 1000 of winning 500€ and 1 chance over 1000 of winning 1.000€
- iii. A 5€ ticket that offers 1 chance over 1000 of winning 100€ e 1 chance over 5000000 of winning 1.000.000€

Test for asymmetry - results

	Scratch-off players (1)	Slot/videopoker players (2)	Non players of both (3)	Not playing scratch-off because not ec. convenient (4)
Lottery 1	59.9	52.89	70.72	71.11
Lottery 2	16.28	11.63	14.92	16.67
Lottery 3	23.83	35.48	14.36	12.22
Pearson χ^2	(2) vs (3)	(1) vs (2)	(1) vs (3)	(1) vs (4)
(p-value)	7.19(0.028)	2.46 (0.29)	6.29 (0.043)	5.39 (0.067)

Legend: the table presents percent of respondents to each of the three choices in the Test for asymmetry question for each group indicated in column headers

Overestimation of winning probabilities- question

Please consider the scratch-off ticket with the highest jackpot for each category in first column. How often do you think it is possible to win the jackpot?

[illegible]

Overestimation of winning probabilities- results

	% of overestimating scratchers	% of overestimating non scratchers	Test Scratchers vs non Scratchers	Test Scratchers vs non players to both scratch-off lotteries and slot/videopoker	Test Scratchers vs those not scratching because not economically convenient
Percent overestimating wins					
1 euro ticket	28.93	32.29	0.5526 (0.457)	0.3611 (0.548)	0.1531 (0.696)
2 euro ticket	36.04	29.15	2.2695 (0.132)	1.0048 (0.316)	2.3931 (0.122)
3 euro ticket	47.72	50.67	0.3659 (0.545)	2.0635 (0.151)	0.3840 (0.535)
5 euro ticket	57.87	51.57	1.6735 (0.196)	1.4102 (0.235)	1.0025 (0.317)
10 euro ticket	17.26	20.18	0.5842 (0.445)	0.9493 (0.330)	1.6592 (0.198)
20 euro ticket	45.18	48.43	0.4444 (0.505)	1.2190 (0.270)	1.0497 (0.306)

Kanheman-Tversky, all tests are Pearson χ^2 with p-values in round brackets. The table indicates in the first two columns percent of respondents belonging to groups in column headers who overestimate jackpot winning probabilities

Win at least the price ticket- question

Please consider the most favourable ticket for each category in the first column. How often do you think it is possible to win the same amount of the ticket bought?

	<i>every 2-3 tickets</i>	<i>every 4-6 tickets</i>	<i>every 7-9 tickets</i>	<i>every 10-12 tickets</i>	<i>every 20 - 22 tickets</i>	<i>every 50 - 52 tickets</i>	<i>every 80 - 82 tickets</i>	<i>every 100 - 102 tickets</i>
1 € <i>tickets</i>								
2 € <i>tickets</i>								
3 € <i>tickets</i>								
5 € <i>tickets</i>								
10 € <i>tickets</i>								
20 € <i>tickets</i>								

Win at least the price ticket- results

	% of overestimating scratchers	% of overestimating non scratchers	Test Scratchers vs non Scratchers	Test Scratchers vs non players to both scratch- off lotteries and slot/videopoker	Test Scratchers vs those not scratching because not economically convenient
Percent overestimating wins					
1 euro ticket	24.87	21.08	0.85 (0.355)	0.98 (0.32)	1.56 (0.211)
2 euro ticket	18.78	6.73	14.01 (0.00)	9.73 (0.002)	7.63 (0.006)
3 euro ticket	11.17	3.14	10.488 (0.001)	7.733 (0.005)	5.058 (0.025)
5 euro ticket	10.66	2.24	12.763 (0.00)	9.862 (0.002)	4.599 (0.032)
10 euro ticket	8.63	3.14	5.852 (0.016)	4.013 (0.045)	4.331 (0.037)
20 euro ticket	9.64	6.28	1.637 (0.201)	0.9709 (0.324)	1.516 (0.218)

The table indicates in the first two columns percent of respondents belonging to groups in column headers who underestimate number of tickets needed to win the same amount of one ticket bought

Two obstacles

- Lack of interest
- Bad reputation (“finance is gaseous”)

How the young learn

We often use the “filling” scheme: I’m informed, I learn, I know, I’m financially educated

What actually works is

I make experience (puzzles and best practices), I become curious, I want to learn, I know, I’m financially educated

Too few “know why” reduces willingness to acquire “know how”

Human beings are searchers of purpose

The other epidemic

United States, drug overdose deaths, '000

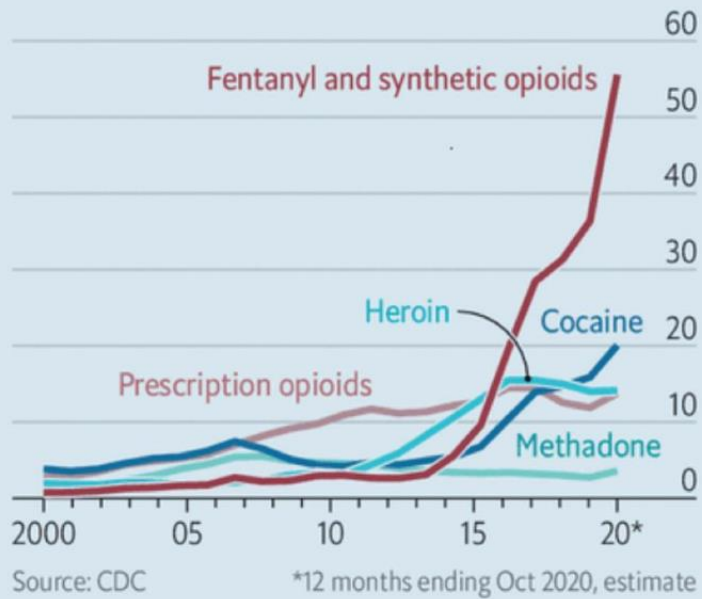
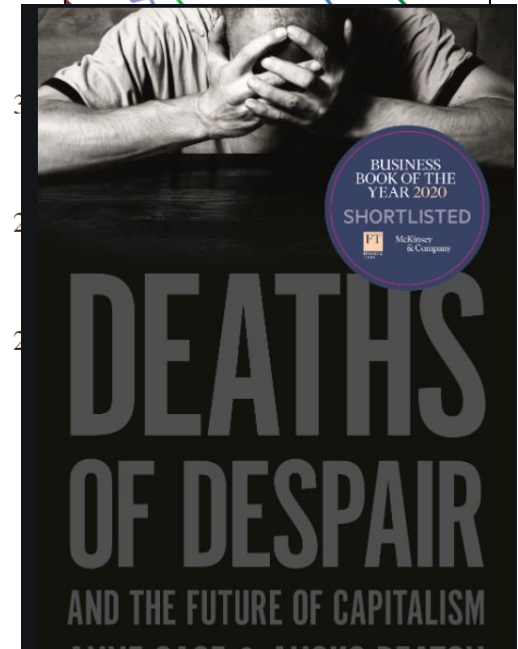
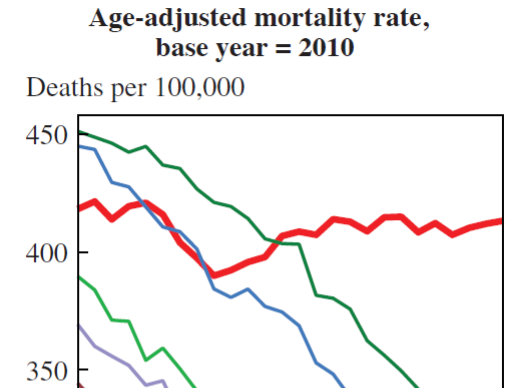
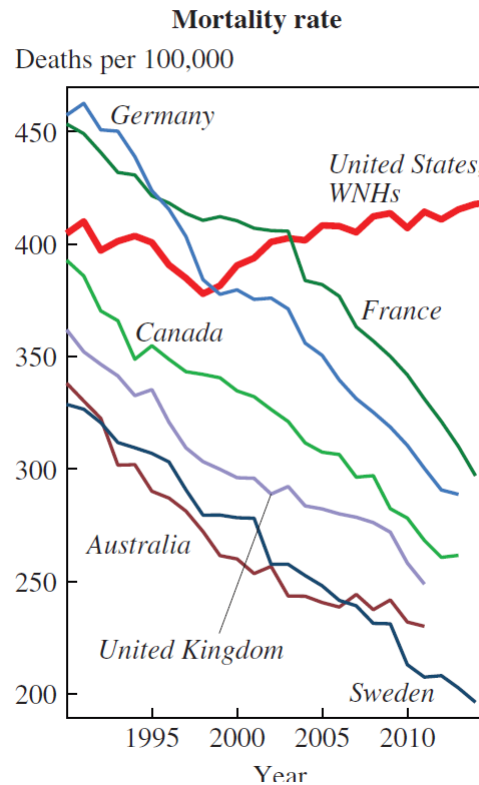


Figure 3. All-Cause Mortality by Country for Age 45–54, 1990–2015

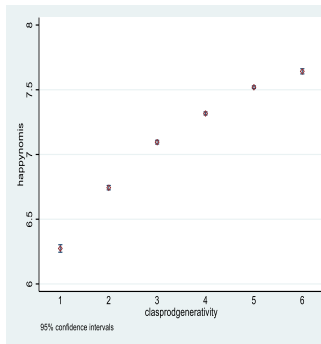


Larry Fink «A sense of purpose»..

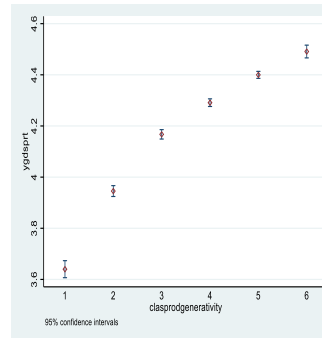
- *Without a sense of purpose, no company, either public or private, can achieve its full potential. It will ultimately lose the license to operate from key stakeholders.*
- *It will succumb to short-term pressures to distribute earnings, and, in the process, sacrifice investments in employee development, innovation, and capital expenditures that are necessary for long-term growth.*
- *It will remain exposed to activist campaigns that articulate a clearer goal, even if that goal serves only the shortest and narrowest of objectives.*
- *And ultimately, that company will provide subpar returns to the investors who depend on it to finance their retirement, home purchases, or higher education.*

Lack of interest needs to be addressed with experience of generative finance...

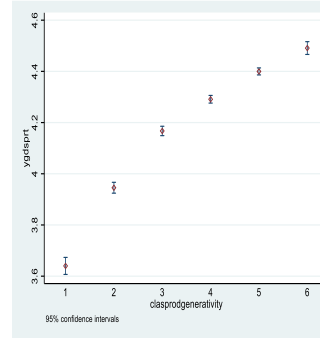
Descriptive findings



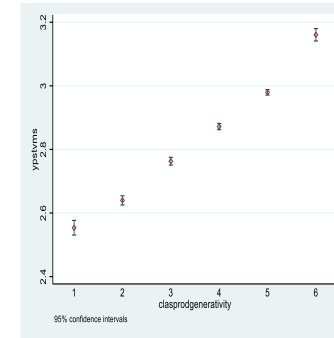
Y axis: life satisfaction



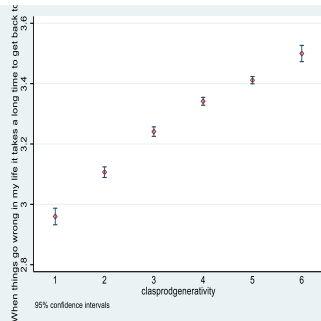
Y axis: feeling in good spirit



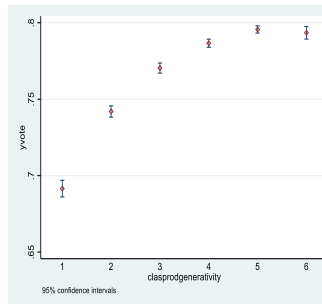
Y axis: calm and peaceful



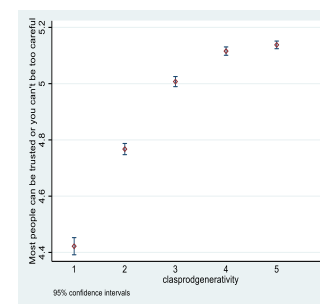
Y axis: positive about myself



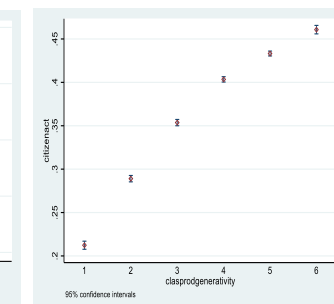
Y axis: resilience



Y axis: voting in last national elections

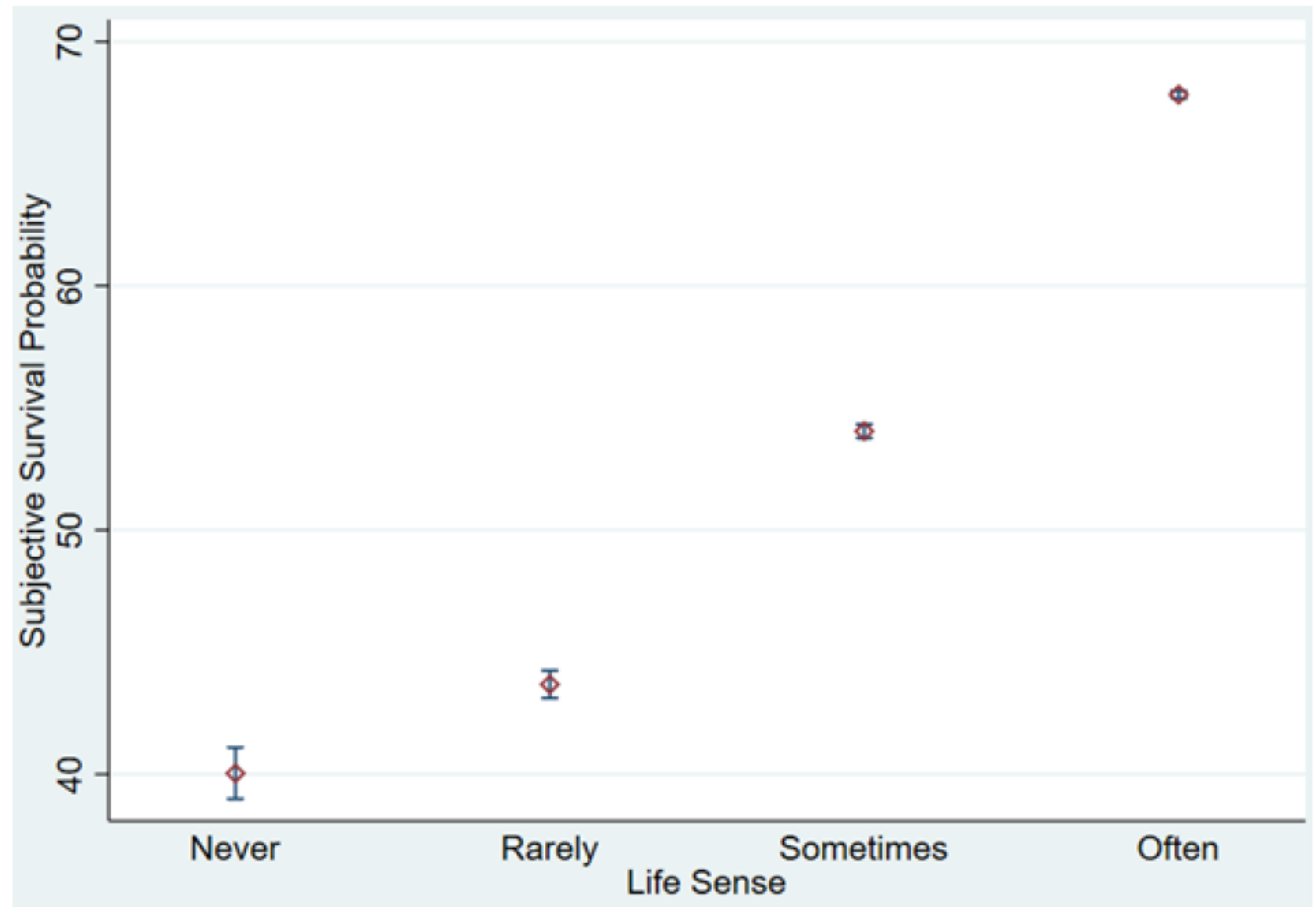


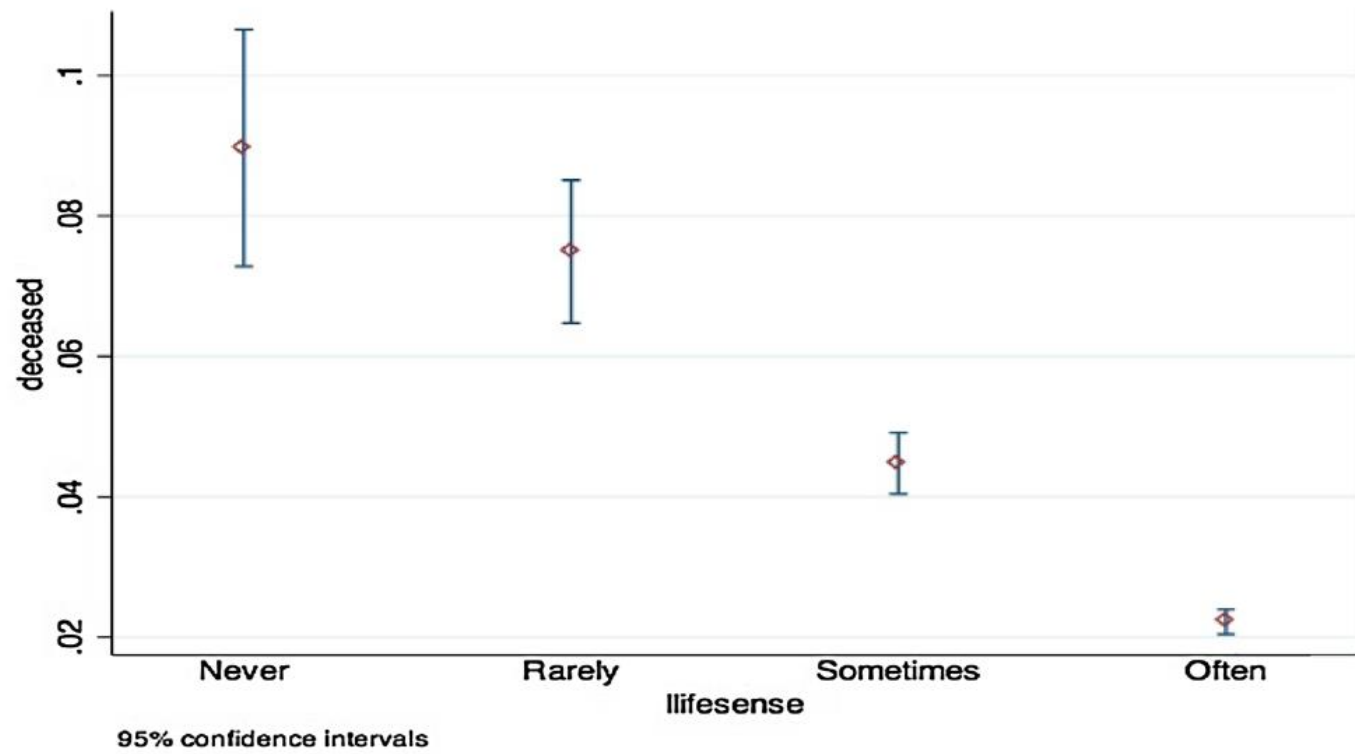
Y axis: most people can be trusted



Y axis: active citizenship

Four regular waves (2006, 2010, 2013 and 2015) of the Survey of Health, Aging and Retirement in Europe (SHARE) database. SHARE is a panel dataset collecting information on more than 45,000 European (plus Israeli) respondents aged 50 and above from 21 countries (in the sixth wave): Austria, Germany, Sweden, Netherlands, Spain, Italy, France, Denmark, Greece, Switzerland, Belgium, Israel, Czech Republic, Poland, Ireland, Luxemburg, Hungary, Portugal, Slovenia, Estonia and Croatia







Generatività in Atto dei Comuni 2022



Toward a concept of “generative” financial education

- Follereau’s tale
- Motivations to learn are crucial...how they can be fuelled ?
- Experience of “generative finance” ie. of the potential positive social and environmental impact of finance stimulates learning and financial education...and contributes to good reputation of finance
- The revolution of generative finance has started (ESG investment funds, (private and government) green bonds, social bonds, etc....)

Potential and threats of digitalisation

- A good experience introduced by relationship with experts is less or more likely to occur with digitalisation ?
- Fake news about finance...
- First type “face to face” relationships
- Second type “webinar” relationships
- Third type “whatsapp” relationships
- Good first type relationships and experience are crucial to introduce financial education