

Financial knowledge among university students and implications for personal debt and fraudulent investments*

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Executive Summary

In an era of financial digitalization, individuals even at a very young age begin being financially active citizens in the economy. The World Bank's 2014 Global Findex survey documents that a large proportion of young people aged 15-24 globally are actively engaged in making payments using the internet or making transactions using mobile phones. The Organisation for Economic Co-operation and Development (OECD) Programme for International Student Assessment (PISA) 2015 reports that around 64% of 15-year old students sampled globally are engaged in some form of employment, earning money from formal or informal work activities. The PISA programme correlates their financial literacy scores with whether or not they hold bank accounts and finds that a large proportion of students who hold bank accounts do not even reach the minimum threshold of the desired financial literacy proficiency level (OECD, 2017). They are thus exposed to the risks associated with making financial mistakes. This also makes them vulnerable to financial fraud and mismanagement of their resources. As popularly referred to in the business world, '*you pay for what you don't know*' can become a reality for students who do not understand the basic principles of financial literacy. It is therefore of policy interest to understand whether young people have financial capability and understanding of the financial world.

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The OECD defines financial knowledge in terms of the understanding of financial concepts and risks that would provide the skills and motivation to make effective financial decisions (OECD, 2016). Previous studies find that knowledge of financial concepts along with the skills to use them is the cornerstone to making good decisions, which are directly linked to the long-term financial well-being of citizens, and it makes consumers less vulnerable to being exploited or deceived (Campbell, Jackson, Madrian and Tufano, 2011; Lusardi and Mitchell, 2011; Deevy, Lucich and Beals, 2012; deBassa Scheresberg, 2013; and Balloch, Nicolae and Philip, 2015). In recent years, financial knowledge among young people has become a priority in the national strategies of many countries due to the following reasons. First, since rapid financial digitalization, there is a pressing need to protect young people and vulnerable groups from being prime targets for financial fraud. Second, there can be serious negative externalities from ill-formed financial decisions, affecting not only the students themselves, but also their families and the broader well-being of the economy. Third, young people are the future of a nation and sound decisions on financial matters will have positive externalities to wealth creation during the course of their lives and enable them to fulfil long-term goals such as attaining higher education, climbing up the property ladder and contributing towards their pension financing (Jorgensen and Savla, 2010; Lusardi, Mitchell and Curto, 2010; OECD, 2016, 2017).

This study contributes to the existing knowledge-base in two distinct ways. First, we examine the survey results for financial literacy among domestic students at universities in Cyprus and report for the first time their financial aptitude and behaviour. The survey is the first attempt to understand financial literacy among domestic students in Cyprus and aims to inform policy makers on devising appropriate interventions. Further, the survey results will form the ‘pilot’ evidence, informing the government agencies, who are keen to promote financial literacy and financial inclusion in the country, especially for young people. Second, the study sets out to study the implications of financial knowledge for students’ ability to manage their debt and investments. While previous literature alludes to the benefits of financial knowledge in terms of prudent financial behaviour, we contribute to this literature by examining the relationship between financial knowledge levels and (i) students’ understanding of credit card debt and (ii) students’ abstinence from investing their money in fraudulent Ponzi schemes.

The 2016 financial literacy pilot survey of Cyprus covers 881 domestic university students, aged mostly between 18 and 24 years old, across the five biggest universities in Cyprus (two public and three private institutions). In terms of gender, female participants account for about 53% of the sample and male participants 47%. The vast majority of the participants (90%) has joined the university after finishing a public high school, while the largest proportion of the students (29%) is freshman. Further, only about 15% of the participants are Business majors at their university, while the rest 85% are non-Business majors. More information about the socio-demographics of the sample can be found in Table 1.

The survey was conducted with the aim to measure the level of financial knowledge among Cypriot students of basic financial concepts related to simple interest and compound interest calculations, understanding of inflation, consequences of inflation, risk-return relationships, and the benefits of risk diversification. These dimensions have been shown to be important in measuring levels of financial knowledge in previous studies and follows the scales used by Lusardi and Mitchell (2011) and the OECD/INFE (2015) toolkit for measuring financial literacy. The survey questions utilized, and the choices of responses are provided in Table A1 of the Appendix.

The baseline financial literacy survey results can be summarized as follows:

First, in terms of financial knowledge (Table 2), we observe that only 6.24% of the Cypriot students who were surveyed were able to answer all the questions correctly. When considering at least 4 correct responses out of 6, which reflects a good financial knowledge proficiency level, we find only 36.9% of the students fall into this category. In terms of average financial knowledge scores, we find that Cypriot students have an average score below 50%. Although the financial knowledge average scores cannot be strictly compared across countries due to dissimilarities in survey questions and survey designs, we observe that the Cypriot students' average financial knowledge scores are comparatively lower than those reported in similar studies (OECD 2016; Philippas and Tzora 2017; Ergun, 2018).

Second, when evaluating the statistical significance of the socio-demographics that explain high financial knowledge among students, we observe the following (Tables 3 and 5): financial knowledge levels of female students are lower than those of males; students originating from STEM (science, technology, engineering and mathematics) disciplines at the high-school level, who majoring in Business at the university level, and those from public universities have higher levels of financial literacy, while freshman students have significantly lower financial knowledge; and parental income plays a key role in explaining financially knowledgeable students. Interestingly, we observe that parental background and parental advice does not play an important role for high financial knowledge, although a graduate father seems to play a marginally significant role for high financial knowledge.

Third, in terms of evaluating the statistical significance of students' soft skills and traits, we find that students who consider themselves good in mathematics and/or general knowledge have higher financial knowledge. A strong negative and significant relationship is found between financial knowledge and avoiding in-depth thinking, which indicates that students with high financial knowledge tend to possess high in-depth thinking skills.

Fourth, financial knowledge is found to be a strong and statistically significant influencing factor for students' understanding of credit card debt. Financially knowledgeable students have a significantly

greater ability to manage their credit card debt than their peers (Table 6). This result is robust to six alternative estimations and after including a large set of socio-demographic factors as well as controlling for skills and traits. Along with financial knowledge, we observe that gender plays a strong role, with male students significantly better at understanding credit card debt. Also, students using social media more intensely have a lower probability of understanding how to manage their credit card debt. Such students may therefore be more prone to falling prey to social media pressure and envy. In terms of soft skills and traits, two robust and statistically significant skillsets emerge: in-depth thinking and attitude towards risk. We see that students with greater in-depth thinking skills and a conservative risk-taking attitude have a higher likelihood of being better managers of their credit card debt than their peers. To summarize the results for credit card debt management, financial knowledge is observed to have a distinct and statistically significant channel of influence for sound financial behaviour among students and this channel is not substituted by socio-demographic factors or various skillsets.

Fifth, we find that financial knowledge is the most significant and robust factor explaining university students' abstinence from engaging in fraudulent investment companies or Ponzi schemes, after being approached to become members (Table 7). After controlling for various heterogeneous factors among students, in the statistical analysis we observe that financially knowledgeable students have a significantly higher probability of declining the offer to engage in Ponzi schemes than their peers. Other socio-demographics, skills and traits that explain this investment behaviour include gender (with female students more prone than male students to be engaged by Ponzi schemes), students with lower in-depth thinking and students using social media more intensely.

To summarize, the research study reveals comparably lower levels of financial knowledge among undergraduate university students in Cyprus, with freshman students showing lower levels of financial knowledge. Various socio-demographic factors, skills and traits play a significant role in explaining university students' financial knowledge, including gender, subject disciplines, income and soft skills; however, parents' characteristics do not play an important role. Further, the study reveals that financial knowledge has a distinct channel of influence on students' understanding of managing their credit card debt and students' ability to deter themselves from fraudulent investments or Ponzi schemes. Financial knowledge is observed to be the most significant factor of influence in explaining university students' financial behaviour, above various socio-demographics, skills and traits.

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Tables

Table 1: Respondent characteristics. This table reports summary statistics regarding the frequency and proportion of the respondent characteristics tabulated across female students, male students and the entire sample.

	Female students		Male students		Entire sample	
	Frequency	%	Frequency	%	Frequency	%
A. Demographics						
1. Gender	468	53.12	413	46.88	881	100
2. Years of age						
18 to 20	256	29.06	84	9.53	340	38.59
21 to 24	190	21.57	290	32.92	480	54.58
25 or above	22	2.50	39	4.43	61	6.92
B. Education						
1. High school type						
a) Public	420	47.67	376	42.68	796	90.35
b) Private	48	5.45	37	4.20	85	9.65
2. High school discipline						
a) STEM	326	37.00	335	38.02	661	75.03
b) Non-STEM	142	16.12	78	8.85	220	24.97
3. University type						
a) Public	211	23.95	207	23.50	418	47.45
b) Private	257	29.17	206	23.38	463	52.55
4. University class rank						
a) Freshman	131	14.87	126	14.30	257	29.17
b) Sophomore	131	14.87	90	10.22	221	25.09
c) Junior	95	10.78	99	11.24	194	22.02
d) Senior or beyond	97	11.01	87	9.88	184	20.89
e) Graduate level	14	1.59	11	1.25	25	2.84
5. University disciplines						
a) Business majors	84	9.53	52	5.90	136	15.44
b) Non-business majors	384	43.59	361	40.98	745	84.56
C. Parents' information						
1. Monthly income						
a) Under €1500	178	20.20	118	13.39	296	33.60
b) €1500 to €3000	224	25.43	203	23.04	427	48.47
c) €3001 to €5000	50	5.68	72	8.17	122	13.85
d) above €5000	16	1.82	20	2.27	36	4.09
2. Education						
a) No parent has high-school degree	36	4.09	30	3.41	66	7.49
b) One parent has high-school degree	55	6.24	50	5.68	105	11.92
c) Both parents have high-school degree	185	21.00	167	18.96	352	39.95
d) One parent has university degree	99	11.24	90	10.22	189	21.45
e) Both parents have university degree	93	10.56	76	8.63	169	19.18
D. Other						
1. Financing of studies						
a) Parents' savings	248	28.15	200	22.70	448	50.85
b) Loan that parents will repay	84	9.53	88	9.99	172	19.52
c) Other	136	15.44	125	14.19	261	29.63
2. Plans after finishing current degree						
a) Continue study	186	21.11	154	17.48	340	38.59
b) Find job	120	13.62	122	13.85	242	27.47
c) Not sure yet	162	18.39	137	15.55	299	33.94
3. Source of financial advice						
a) Parents	373	42.34	246	27.92	619	70.26
b) Friends	10	1.14	12	1.36	22	2.50
c) Professionals	7	0.79	12	1.36	19	2.16
d) Internet/Media	36	4.09	69	7.83	105	11.92
e) Other	42	4.77	74	8.40	116	13.17

Table 2: Patterns of responses to financial knowledge questions. This table presents the patterns of responses to the six financial knowledge questions tabulated across female students, male students and the entire sample. Table A1 of the Appendix details the context of each question.

	Female students		Male students		Entire sample	
	Frequency	%	Frequency	%	Frequency	%
Panel A: Distribution of answers						
Q1. Simple interest calculation						
Correct	275	58.76	332	80.39	607	68.90
Wrong	56	11.97	34	8.23	90	10.22
Don't know	56	11.97	28	6.78	84	9.53
Refuse to answer	81	17.31	19	4.60	100	11.35
Q2. Compound interest calculation ¹						
Correct	117	25.00	208	50.36	325	36.89
Wrong	229	48.93	163	39.47	392	44.49
Don't know	91	19.44	28	6.78	119	13.51
Refuse to answer	31	6.62	14	3.39	45	5.11
Q3. Understanding of inflation						
Correct	253	54.06	228	55.21	481	54.60
Wrong	37	7.91	33	7.99	70	7.95
Don't know	156	33.33	135	32.69	291	33.03
Refuse to answer	22	4.70	17	4.12	39	4.43
Q4. Consequences of inflation						
Correct	117	25.00	127	30.75	244	27.70
Wrong	74	15.81	71	17.19	145	16.46
Don't know	238	50.85	192	46.49	430	48.81
Refuse to answer	39	8.33	23	5.57	62	7.04
Q5. Risk & Return						
Correct	368	78.63	333	80.63	701	79.57
Wrong	23	4.91	34	8.23	57	6.47
Don't know	63	13.46	33	7.99	96	10.90
Refuse to answer	14	2.99	13	3.15	27	3.06
Q6. Benefits of risk diversification						
Correct	132	28.21	142	34.38	274	31.10
Wrong	98	20.94	98	23.73	196	22.25
Don't know	223	47.65	161	38.98	384	43.59
Refuse to answer	15	3.21	12	2.91	27	3.06
Panel B: Distribution of correct answers						
No correct answers	32	6.84	11	2.66	43	4.88
One correct answer	80	17.09	38	9.20	118	13.39
Two correct answers	116	24.79	74	17.92	190	21.57
Three correct answers	102	21.79	103	24.94	205	23.27
Four correct answers	64	13.68	97	23.49	161	18.27
Five correct answers	56	11.97	53	12.83	109	12.37
All correct answers	18	3.85	37	8.96	55	6.24

Note:

¹ Following the OECD/INFE (2016) treatment, the response to Q2 is only considered to be correct if the respondent could also calculate simple interest as per Q1.

Table 3: Summary statistics. Summary statistics of the variables used in the regression analysis. Columns (1) and (2) report the mean and standard deviation (S.D.) of the variables for the entire sample. Columns (3) and (4) report the mean and standard deviation of the variables for the subsample of students who answered at least four questions correctly (FK_DUMMY = 1), whereas columns (5) and (6) report the mean and standard deviation of the variables for the subsample of students who answered fewer than four questions correctly (FK_DUMMY = 0). Column (7) reports the *t*-statistics testing the difference of means between columns (3) and (5). All the variables are defined in Table A2 of the Appendix. * denotes *p*-value <0.1; ** denotes *p*<0.05; *** denotes *p*<0.01.

	Entire sample		At least 4 correct answers (FK_DUMMY = 1)		Fewer than 4 correct answers (FK_DUMMY = 0)		Diff. (3)-(5) (7)
	Mean (1)	S.D. (2)	Mean (3)	S.D. (4)	Mean (5)	S.D. (6)	
Financial Literacy							
FK_SCORE_1	0.498	0.260	0.779	0.125	0.334	0.157	0.445***
FK_SCORE_2	0.318	0.349	0.661	0.213	0.118	0.241	0.543***
FK_SCORE_SELF	3.147	1.382	3.600	1.350	2.881	1.332	0.719***
Demographics							
GENDER	0.469	0.499	0.575	0.495	0.407	0.492	0.168***
PRIVATE_SCHOOL	0.096	0.295	0.102	0.303	0.094	0.291	0.008
STEM_SUBJECT	0.750	0.433	0.833	0.373	0.701	0.458	0.132***
PUBLIC_UNI	0.474	0.499	0.633	0.482	0.381	0.486	0.252***
UNI_BUSINESS_MAJOR	0.154	0.362	0.262	0.440	0.092	0.289	0.170***
FRESHMEN	0.292	0.455	0.258	0.438	0.311	0.463	-0.053*
ABOVE_SENIOR	0.237	0.426	0.262	0.440	0.223	0.417	0.039
SEEK_JOB	0.275	0.447	0.265	0.442	0.281	0.450	-0.016
Parents' background							
PARENTS_INCOME	0.0409	0.198	0.071	0.257	0.023	0.151	0.048***
GRADUATE_FATHER	0.0806	0.272	0.086	0.281	0.077	0.267	0.009
GRADUATE_MOTHER	0.134	0.341	0.135	0.343	0.133	0.340	0.002
PARENTS_SAVINGS	0.509	0.500	0.511	0.501	0.507	0.500	0.004
ADVICE_PARENTS	0.703	0.457	0.680	0.467	0.716	0.451	-0.036
Skills and Traits							
MATHS_SKILLS	4.367	1.698	4.640	1.643	4.207	1.711	0.433***
IT_SKILLS	4.728	1.591	4.843	1.545	4.660	1.616	0.183*
GEN_KNOW	4.906	1.320	5.100	1.243	4.793	1.351	0.307***
AVOID_THINKING	2.899	1.633	2.650	1.650	3.045	1.606	-0.395***
AVOID_NUMBERS	3.079	1.592	2.871	1.597	3.201	1.578	-0.330***
PAY_BILLS_ON_TIME	5.555	1.659	5.742	1.572	5.446	1.699	0.296**
RISK_TAKING	4.527	1.449	4.628	1.438	4.468	1.453	0.160
LIVE_FOR_TODAY	3.860	1.974	3.680	2.030	3.964	1.936	-0.284
OPTIMISM	4.886	1.671	4.932	1.574	4.860	1.726	0.072
SOCIAL_MEDIA_USE	0.414	0.493	0.388	0.488	0.430	0.496	-0.042

Table 4: Correlation matrix for financial literacy variables. Pearson (Spearman) correlations are reported in the upper (lower) diagonal. All the variables are defined in Table A2 of the Appendix.

	FK_DUMMY	FK_SCORE_1	FK_SCORE_2	FK_SCORE_SELF
FK_DUMMY		0.827	0.750	0.251
FK_SCORE_1	0.850		0.879	0.148
FK_SCORE_2	0.773	0.887		0.267
FK_SCORE_SELF	0.253	0.141	0.270	

Note: All the correlation coefficients are significant at the 1% level.

Table 5: Determinants of financial literacy. Logistic and OLS regression results of factors influencing students' financial knowledge. The dependent variable in models (1) and (2) takes the value of 1 if the student correctly answers 4 or more questions, and 0 otherwise. The dependent variable in model (3) is the average score from the student responses, wherein each correct answer takes a score of 1, while all other answers take a score of 0. The dependent variable in model (4) is the average score from the student responses, wherein each correct answer takes a score of 1, each wrong answer takes a score of -1 and responses of "Don't Know" or "Refuse to Answer" take a score of 0. All the variables are defined in Table A2 of the Appendix. Model (1) reports results from a logistic regression with clustered standard errors across the academic institutions, whilst Model (2) reports results from a logistic regression with random intercepts across the academic institutions. Models (3) and (4) report OLS regression results with clustered standard errors across the academic institutions. A constant term is always included in the regressions. Standard errors are displayed in parentheses. Critical values for Models (1), (3) and (4) are 1.647 for p -value < 0.10, 1.963 for p -value < 0.05 and 2.581 for p -value < 0.01. Critical values for Model (2) are 2.132 for p -value < 0.10, 2.776 for p -value < 0.05 and 4.604 for p -value < 0.01. VIF diagnostics reveal no evidence for multicollinearity (all VIFs < 1.500). * denotes p -value < 0.1; ** denotes p < 0.05; *** denotes p < 0.01.

	FK_DUMMY		FK_SCORE_1	FK_SCORE_2
	(1)	(2)	(3)	(4)
FK_SCORE_SELF	0.294*** (0.090)	0.293*** (0.066)	0.026** (0.012)	0.010 (0.011)
GENDER	0.570*** (0.110)	0.584** (0.175)	0.070*** (0.006)	0.084*** (0.006)
PRIVATE_SCHOOL	0.400*** (0.118)	0.361 (0.276)	0.025 (0.018)	0.024 (0.032)
STEM_SUBJECT	0.417*** (0.073)	0.420 (0.210)	0.056*** (0.004)	0.061*** (0.015)
PUBLIC_UNI	1.066*** (0.176)	1.086*** (0.170)	0.0132*** (0.015)	0.198*** (0.011)
UNI_BUSINESS_MAJOR	1.156*** (0.159)	1.194*** (0.232)	0.0135*** (0.019)	0.138*** (0.021)
FRESHMEN	-0.522** (0.206)	-0.547** (0.195)	-0.026* (0.016)	-0.053*** (0.010)
ABOVE_SENIOR	-0.054 (0.233)	-0.089 (0.207)	0.003 (0.011)	0.003 (0.018)
SEEK_JOB	-0.034 (0.068)	-0.033 (0.187)	0.017* (0.010)	0.013 (0.021)
PARENTS_INCOME	1.347*** (0.262)	1.483** (0.406)	0.077*** (0.016)	0.083** (0.039)
GRADUATE_FATHER	0.361* (0.199)	0.382 (0.288)	0.035* (0.018)	0.046 (0.038)
GRADUATE_MOTHER	0.055 (0.074)	0.055 (0.233)	0.002 (0.011)	-0.008 (0.019)
PARENTS_SAVINGS	-0.124 (0.230)	-0.130 (0.161)	0.013 (0.015)	0.015 (0.027)
ADVICE_PARENTS	-0.003 (0.084)	0.002 (0.182)	-0.003 (0.006)	-0.004 (0.014)
MATHS_SKILLS	0.061 (0.060)	0.058 (0.053)	0.014** (0.006)	0.015*** (0.005)
IT_SKILLS	-0.036 (0.045)	-0.037 (0.054)	-0.008 (0.005)	-0.006 (0.006)
GEN_KNOW	0.089 (0.074)	0.083 (0.064)	0.016** (0.007)	0.019*** (0.006)
AVOID_THINKING	-0.143*** (0.024)	-0.145** (0.049)	-0.018*** (0.002)	-0.022*** (0.004)
SOCIAL_MEDIA_USE	-0.042 (0.159)	-0.045 (0.167)	-0.009 (0.022)	-0.023 (0.024)
QIC/-2LogL/Rsq	1010.1	970.3	0.254	0.192

Table 6: Understanding of credit card debt. Logistic regression results of factors influencing students' understanding of credit card debt. The dependent variable takes the value of 1 if the respondent correctly answers the question shown in Panel A, and 0 otherwise. Regression results are reported in Panel B. The definitions for independent variables appear in Table A2 of the Appendix. A constant term is included in the regressions. Standard errors are displayed in parentheses. Models (1), (3) and (5) report results from logistic regressions with clustered standard errors across the academic institutions. Models (2), (4) and (6) report results from logistic regressions with random intercepts across the academic institutions. Critical values for Models (1), (3) and (5) are 1.647 for p -value < 0.10 , 1.963 for p -value < 0.05 and 2.581 for p -value < 0.01 . Critical values for Models (2), (4) and (6) are 2.132 for p -value < 0.10 , 2.776 for p -value < 0.05 and 4.604 for p -value < 0.01 . VIF diagnostics reveal no evidence for multicollinearity (all VIFs < 1.500). * denotes p -value < 0.1 ; ** denotes $p < 0.05$; *** denotes $p < 0.01$.

Panel A						
Question: Suppose you owe €3,000 on your credit card. You pay a minimum payment of €30 each month. At an Annual Percentage Rate of 12% (or 1% per month), how many years would it take to eliminate your credit card debt if you made no additional new charges?						
	Frequency	%				
Less than 5 years	63	7.15				
Between 5 and 10 years	238	27.01				
Between 10 and 15 years	162	18.39				
Never	110	12.49				
Don't know	267	30.31				
Refuse to answer	41	4.65				

Panel B						
	(1)	(2)	(3)	(4)	(5)	(6)
FK_DUMMY	1.042*** (0.182)	1.019** (0.230)				
FK_SCORE_1			2.992*** (0.490)	2.923*** (0.489)		
FK_SCORE_2					2.173*** (0.453)	2.092*** (0.359)
GENDER	0.958*** (0.166)	0.948** (0.241)	0.946*** (0.216)	0.928*** (0.245)	0.943*** (0.174)	0.911** (0.244)
PARENTS_INCOME	-0.312 (0.277)	-0.339 (0.532)	-0.266 (0.316)	-0.280 (0.536)	-0.211 (0.330)	-0.213 (0.533)
ADVICE_PARENTS	-0.232 (0.232)	-0.250 (0.239)	-0.179 (0.275)	-0.184 (0.245)	-0.220 (0.287)	-0.220 (0.243)
AVOID_THINKING	-0.111*** (0.035)	-0.111 (0.072)	-0.086** (0.039)	-0.085 (0.074)	-0.098** (0.039)	-0.100 (0.075)
AVOID_NUMBERS	-0.138*** (0.053)	-0.139 (0.074)	-0.131*** (0.047)	-0.132 (0.075)	-0.130** (0.057)	-0.130 (0.075)
PAY_BILLS_ON_TIME	-0.013 (0.032)	-0.008 (0.068)	-0.009 (0.030)	-0.005 (0.070)	-0.009 (0.038)	-0.009 (0.070)
RISK_TAKING	-0.031*** (0.011)	-0.031 (0.077)	-0.050*** (0.019)	-0.047 (0.080)	-0.041** (0.017)	-0.037 (0.079)
LIVE_FOR_TODAY	0.060 (0.044)	0.059 (0.057)	0.063 (0.050)	0.062 (0.058)	0.062 (0.053)	0.062 (0.058)
OPTIMISM	0.008 (0.042)	0.062 (0.067)	0.001 (0.050)	-0.001 (0.068)	-0.001 (0.051)	-0.003 (0.067)
SOCIAL_MEDIA_USE	-0.338* (0.204)	-0.335 (0.232)	-0.337* (0.200)	-0.330 (0.235)	-0.340* (0.206)	-0.332 (0.235)
QIC/-2LogL	613.0	584.9	591.5	565.7	595.8	568.1

Table 7: Avoidance of fraudulent investments (Ponzi schemes). Logistic regression results of factors influencing students' involvement in fraudulent investments (Ponzi schemes). The sample for this question is comprised by the respondents who either became a member (N=58) or were approached but turned down the membership (N=233) as tabulated in Panel A. Hence, the dependent variable takes the value of 1 if the respondent avoided the Ponzi scheme, and 0 otherwise. Regression results are reported in Panel B. The definitions of independent variables appear in Table A2 of the Appendix. A constant term is included in the regressions. Standard errors are displayed in parentheses. Models (1), (3) and (5) report results from logistic regressions with clustered standard errors across the academic institutions. Models (2), (4) and (6) report results from logistic regressions with random intercepts across the academic institutions. Critical values for Models (1), (3) and (5) are 1.647 for p -value < 0.10 , 1.963 for p -value < 0.05 and 2.581 for p -value < 0.01 . Critical values for Models (2), (4) and (6) are 2.132 for p -value < 0.10 , 2.776 for p -value < 0.05 and 4.604 for p -value < 0.01 . VIF diagnostics reveal no evidence for multicollinearity (all VIFs < 1.500). * denotes p -value < 0.1 ; ** denotes $p < 0.05$; *** denotes $p < 0.01$.

Panel A						
Question: Have you ever been a member of any of the following companies (three company names were provided)?						
		Frequency	%			
	Yes, I have	58	6.58			
	I have been approached to become a member, but I wasn't interested	233	26.45			
	I have only heard of these companies	197	22.36			
	I do not know these companies	393	44.61			
Panel B						
	(1)	(2)	(3)	(4)	(5)	(6)
FK_DUMMY	0.964*** (0.229)	0.979** (0.343)				
FK_SCORE_1			1.539** (0.688)	1.590* (0.685)		
FK_SCORE_2					1.021*** (0.355)	1.024* (0.453)
GENDER	-0.477* (0.262)	-0.460 (0.385)	-0.488* (0.027)	-0.478 (0.388)	-0.448* (0.234)	-0.436 (0.381)
PARENTS_INCOME	-0.754 (0.532)	-0.811 (0.731)	-0.587 (0.541)	-0.646 (0.720)	-0.520 (0.599)	-0.565 (0.711)
ADVICE_PARENTS	0.238 (0.344)	0.260 (0.343)	0.272 (0.325)	0.291 (0.341)	0.221 (0.359)	0.232 (0.338)
AVOID_THINKING	-0.145 (0.101)	-0.145 (0.091)	-0.143 (0.105)	-0.144 (0.091)	-0.154 (0.105)	-0.154 (0.090)
AVOID_NUMBERS	-0.116* (0.066)	-0.118 (0.102)	-0.105* (0.059)	-0.106 (0.103)	-0.100* (0.059)	-0.100 (0.103)
PAY_BILLS_ON_TIME	0.035 (0.090)	0.031 (0.092)	0.042 (0.089)	0.039 (0.092)	0.039 (0.095)	0.037 (0.091)
RISK_TAKING	-0.125 (0.091)	-0.130 (0.116)	-0.129 (0.093)	-0.136 (0.115)	-0.125 (0.090)	-0.131 (0.114)
LIVE_FOR_TODAY	-0.007 (0.091)	-0.012 (0.084)	-0.005 (0.086)	-0.009 (0.084)	-0.004 (0.081)	-0.008 (0.084)
OPTIMISM	-0.047 (0.138)	-0.048 (0.102)	-0.037 (0.143)	-0.037 (0.102)	-0.045 (0.151)	-0.045 (0.102)
SOCIAL_MEDIA_USE	0.534** (0.270)	0.533 (0.125)	0.518* (0.276)	0.518 (0.348)	0.530* (0.276)	0.522 (0.348)
QIC/-2LogL	288.9	266.8	294.4	269.9	293.5	270.3

Appendices

Table A1: Financial knowledge questions. This table lists the survey questions to capture the financial knowledge of respondents. The second column lists the question topic, the third column reports the question source, the fourth column provides the detailed wording of the question and the fifth column lists the available answer options per question.

No.	Question topic	Question source	Question wording	Answer options
Q1	Simple interest calculation	QK5 from OECD/INFE Survey – like Q1 in Lusardi and Mitchell (2011)	Suppose you put €100 into a (no fee, tax-free) savings account with a guaranteed interest rate of 2% per year. You don't make any further payments into this account and you don't withdraw any money. How much would be in the account at the end of the first year, once the interest payment is made?	Open response Don't Know Refuse to Answer
Q2	Compound interest calculation	QK6 from OECD/INFE Survey	Suppose you put €100 into a (no fee, tax-free) savings account with a guaranteed interest rate of 2% per year. You don't make any further payments into this account and you don't withdraw any money. How much would be in the account at the end of five years?	More than €110 Exactly €110 Less than €110 Don't Know Refuse to Answer
Q3	Understanding of inflation	QK7b from OECD/INFE Survey	High inflation means that the cost of living is increasing rapidly.	True False Don't Know Refuse to Answer
Q4	Consequences of inflation	Q2 from Lusardi and Mitchell (2011)	Imagine that 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 in the account?	More than today Exactly the same Less than today Don't Know Refuse to Answer
Q5	Risk and return	QK7a from OECD/INFE Survey	If someone offers you the chance to make a lot of money it is likely that there is also a chance that you will lose a lot of money.	True False Don't Know Refuse to Answer
Q6	Benefits of risk diversification	Q3 from Lusardi and Mitchell (2011)	Buying a stock of a single company is usually safer than buying a stock of a mutual fund.	True False Don't Know Refuse to Answer

Notes: The sources include: OECD/INFE (2015) International Survey of Adult Financial Literacy Competencies *OECD Publishing, Paris*, and Lusardi, A. and Mitchell, O.S., 2011. Financial literacy around the world: an overview. *Journal of Pension Economics & Finance*, 10(4), pp.497-508.

Table A2: Dependent and independent variables definitions.

Variable name	Variable description
Financial Knowledge	
FK_DUMMY	1 if the student correctly answers 4 or more questions, 0 otherwise.
FK_SCORE_1	The average score from the student responses, whereby each correct answer takes a score of 1, whilst all other answers take a score of 0.
FK_SCORE_2	The average score from the student responses, whereby each correct answer takes a score of 1, each wrong answer takes a score -1 and responses of “Don’t Know” or “Refuse to Answer” take a score of 0.
FK_SCORE_SELF ¹	Student self-assessment of his/her financial literacy level.
Demographics	
GENDER	1 if Male, 0 if female.
PRIVATE_SCHOOL	1 if high school is private, 0 otherwise.
STEM_SUBJECT	1 if high school curriculum is primarily concentrated on educating students in STEM disciplines (science, technology, engineering and mathematics), 0 otherwise.
PUBLIC_UNI	1 if university is public, 0 otherwise.
UNI_BUSINESS_MAJOR	1 if student’s major at university is in business, 0 otherwise.
FRESHMEN	1 if the student is a freshman (Year 1 at Bachelor), 0 otherwise.
ABOVE_SENIOR	1 if senior (Year 4 or above at Bachelor) or graduate student, 0 otherwise.
SEEK_JOB	1 if the student intends to seek for a job after (s)he finishes current degree.
Parents’ background	
PARENTS_INCOME	1 if the parents’ monthly income is above €5,000, 0 otherwise.
GRADUATE_FATHER	1 if father has a university degree, 0 otherwise.
GRADUATE_MOTHER	1 if mother has a university degree, 0 otherwise.
PARENTS_SAVINGS	1 if the student’s studies are financed using parents’ savings, 0 otherwise.
ADVICE_PARENTS	1 if the student seeks financial advice from parents, 0 otherwise.
Skills and Traits	
MATHS_SKILLS ²	Average score for skills in mathematics.
IT_SKILLS ²	Average score for skills in using information technology.
GEN_KNOW ²	Average score for breadth of general knowledge.
AVOID_THINKING ²	Average score for cognition in avoiding thinking in depth.
AVOID_NUMBERS ²	Average score for cognition in avoiding information involving numbers.
PAY_BILLS_ON_TIME ²	Average score for discipline in paying bills on time.
LIVE_FOR_TODAY ²	Average score for short-term attitude (tendency to live for today)
RISK_TAKING ²	Average score for risk-taking attitude (tendency to take risks).
OPTIMISM ²	Average score for optimism (tendency to expect more good things to happen).
SOCIAL_MEDIA_USE	1 if the student is using/accessing social media more than ten times per day, 0 otherwise.

Notes:

¹ On a scale of 1 to 7, where 1 means very poor and 7 means very high, how would you rate your overall financial knowledge?

² On a scale of 1 to 7, where 1 means totally disagree and 7 means totally agree, to what extent do you agree or disagree with the following statements (in order of appearance in the table):

- “I am very good at maths”,
- “I am very good at information technology (computers)”,
- “I am very good at general knowledge”,
- “I try to avoid situations that require thinking in depth”,
- “I prefer not to pay much attention to information that includes numbers”,
- “I pay my bills on time”,
- “I see myself as someone who takes risks, rather than avoiding risk.”,
- “I live for today and let tomorrow take care of itself”,
- “I expect more positive events to happen in my life than negative”.