GENDER GAP IN DEBT LITERACY: A CROSS-NATIONAL STUDY OF UNIVERSITY STUDENTS

Andrzej CWYNAR

University of Economics and Innovation Projektowa 4, 20-209 Lublin, Poland andrzej.cwynar@wsei.lublin.pl

Wiktor CWYNAR

University of Economics and Innovation Projektowa 4, 20-209 Lublin, Poland wiktor.cwynar@wsei.lublin.pl

Przemysław SZUBA

Exacto Limited Siemieńskiego 20/38, 35-234 Rzeszów, Poland pszuba@exacto.pl

Abstract. Compared to men, women are at a disadvantage in terms of financial literacy, as shown by many studies. Women have been found less likely to respond correctly to financial test questions and more likely to select 'Don't know' option as compared to men in many national surveys, although causes of the phenomenon are still not fully explained. The main goal of this article is to check whether the gender differential exists among university students based on a new dataset derived from five European countries (selfadministered survey, 1,022 respondents). To pursue this goal, we asked a series of questions: (i) Does the way in which financial literacy scores are determined matter for the gender gap measurement outcomes? (ii) Can the gap be explained by the presumably higher inclination of males to guess or greater tendency of males – as compared to females - to overestimate their capabilities? (iii) If the gender gap in financial literacy of university students exists, what factors can explain the gap? We used three-question single choice test to measure debt literacy - a little-studied aspect of financial literacy - and processed its results to obtain different markers of the literacy, allowing us to control for guessing and overconfidence effects. To gauge the possible gender gap in the literacy, we checked the statistical significance of differences in the test responses between female and male survey participants. We also ran a series of logistic regressions to rule out the possibility that gender differences found in the debt literacy test scores due to non-parametric tests were driven by factors other than gender. We confirm the gender differential in debt literacy among university students comprising our sample. We find that the observed gender gap cannot be explained by the combined effects of test guessing and overconfidence. Female business (including finance) students scored significantly better in a debt literacy test compared to their non-business female peers – an effect not present among male students. This could suggest that - unlike women who tend to increase their debt literacy through professional education - men may acquire the literacy differently and outside the formal education system.

Keywords: financial literacy; debt literacy; gender gap; university students; financial education.

Literature review

GG in FL has been repeatedly confirmed among adult population in many countries (Alessie, van Rooij & Lusardi, 2011; Disney & Gathergood, 2011; Klapper & Panos, 2011; Lusardi & Mitchell, 2011; Sekita, 2011; Beckmann, 2013; Brown & Graf, 2013; Instytut Wolności & Raiffeisen Polbank, 2014; Gentile, Linciano & Soccorso, 2016; Stolper & Walter, 2017). Given that FL is usually measured through a test – be it 'True / False / Don't know' test or a choice test allowing for selection of 'Don't know' option – the research community has acknowledged that GG in FL should be measured as the difference between women and men in the share of: (i) correct test responses, and (ii) 'Don't know' responses (Klapper, Lusardi & van Oudheusden, 2015; Mitchell & Lusardi, 2015; Bucher-Koenen et al., 2017; Stolper & Walter, 2017).

The empirical evidence gathered so far suggests that GG in FL is a pervasive phenomenon: it was found that women are less likely to choose correct test options and more likely to choose 'Don't know' options across all socioeconomic and demographic characteristics and without regard to the measurement instrument. Mitchell & Lusardi (2015) showed that GG in FL exists both in developed and developing countries which suggests that income and wealth may be irrelevant for the phenomenon. Lusardi, Mitchell and Curto (2010) found that the gap is present among the young and the old clusters of the entire population. Mahdavi and Horton (2014) evidenced that the gap persists irrespective of the educational attainment and is clearly visible even among the best-educated individuals. Moreover, Bucher-Koenen et al. (2017) point out that the existence of the gap is not a question of how financial literacy is measured, because it manifests itself in studies adopting short tests as well as in studies adopting considerably more complex measures of financial literacy. Moreover, in the light of research findings gathered so far, it seems that women are less financially literate than men across the majority of possible financial themes (Butters, Asarta & McCoy, 2012; Lusardi & Tufano, 2009; Tennysson, 2010).

The set of hypotheses attempting to explain the puzzle of GG in FL is surprisingly small. Hsu (2015) hypothesized that the gap is a matter of the division of labor in same-sex couples (households) with men specializing in household finance management. Although Hsu (2015) does not mention this, the claim can be linked to the theoretical framework of Jappelli and Padula (2013) in which the level of an individual's financial literacy depends on her / his incentives to acquire the literacy. Male household members may have stronger motivation to equip themselves with financial literacy because of the sense of responsibility for the financial well-being of their family members. Hsu (2015) suggests that the specialization of men in the realm of finance may be linked to traditional social roles of men, however perhaps men are at the same time – for still undiscovered reasons – more predispose to manage finances. Unfortunately, the empirical research did not bring results unambiguously confirming this hypothesis (Brown & Graf, 2013; Bucher-Koenen et al., 2017; Fonseca et al., 2012).

Brown and Graf (2013) posited that GG in FL might be explained by women being less interested in financial issues compared to men. However, despite it has been found that finance is more interesting to men than to women (Chen & Volpe, 2002; Ford & Kent, 2010), no support has been gained for the hypothesis that observed gender differences in this interest may explain GG in FL (Brown & Graf, 2013). Ford and Kent (2010) proved also that women show less interest in finance than men because of affective reasons, i.e.

they are more likely to attach negative emotions to financial matters (e.g. women may tend to have the feeling of threat in relation to financial markets more often and/or more intense in comparison with men).

Perhaps the affective differences in women's and men's attitudes toward financial markets – corroborated by Ford and Kent (2010) – may be related to the language which is predominant in the field of finance. Boggio et al. (2015) noticed that the language of finance refers to such spheres as competition, war, sport, rivalry, games, i.e. to spheres which are mostly masculinized. Such language may be viewed by women as alien. As a result, women may have a difficulty with identifying themselves with the sphere of finance.

Data and method

Data were collected through a self-administered survey at 26 universities in five countries: Bulgaria, Poland, Portugal, Ukraine, and Wales, between 11 May 2017 and 18 July 2017. Students were sent an e-mail inviting them to fill in the attached questionnaire. The questionnaire featured a cover letter introducing the survey to students as well as assuring them of the anonymity of their responses. Our data set consists of 1,022 student responses to a range of survey queries (DL test and respondent traits). We used the instrument designed by Lusardi and Tufano (2009) to gauge the DL of participants. The instrument is a 3-question single choice test resulting from the adaptation of a classic FL instrument (known as the 'Big Three' – see Mitchell & Lusardi, 2015) to debt specificity. Lusardi and Tufano's (2009) instrument allows measurement of knowledge and skills regarding (i) interest compounding (first question), (ii) how credit cards work (second question), and (iii) the time value of money concept (third question).

Although the 'Big Three' was validated throughout many waves of national panel surveys (Mitchell & Lusardi, 2015), it is questioned for its properties, such as brevity and closed questions, which can entail guessing and other distorting effects (Hastings, Madrian & Skimmyhorn, 2013). In a standard approach to processing the results of FL tests, a correct answer is coded as 1, while all remaining options (incorrect answers, 'Don't know' responses and 'Prefer not to answer' responses) are coded as 0 (such a measure is labelled as Score 1 in our study - see Table 1). However, an indication of an incorrect answer conveys significantly different information compared to the information transmitted by a 'Don't know' or 'Prefer not to answer' response (DK and PNTA, henceforth). The selection of an incorrect answer in a DL test can mean that the respondent either guessed the answer or selected it because of overconfidence, which is treated as a serious behavioral bias (Kahneman, 2011). To get an insight into this effect, we used another operationalization of DL based on a respondent's result of the 'Big Three' DL test, labeled as Score 2 (see Table 1). We considered Score 2 as a proxy for the combined effects of guessing and overconfidence. Additionally, as mentioned in the Literature review section, financial literacy researchers tend to define GG in FL by indicating two patterns: (i) females are less likely to provide correct answers to FL questions, and (ii) females confess that they do not know the answer more often than males. Hence, we deemed the inclination to select DK or PNTA responses worth closer attention and, as a result, we applied Score 3 as a proxy for the propensity to confess one's ignorance regarding debt issues (see Table 1 for details).

Table 1. Applied approaches to processing DL test results (Source: own study)

Measure	Coding	Range of values	
Score 1	Correct answer = 1	From 0 to 3	
	Incorrect answer = 0		
	Don't know answer = 0	FIOIII 0 to 3	
	Prefer not to answer = 0		
Score 2	Correct answer = 0		
	Incorrect answer = 1	From 0 to 3	
	Don't know answer = 0	F10111 0 to 5	
	Prefer not to answer = 0		
Score 3	Correct answer = 0		
	Incorrect answer = 0	From 0 to 3	
	Don't know answer = 1		
	Prefer not to answer = 1		

Our research strategy provided for two steps. Firstly, we compared the significance of gender differences in the DL test results. We applied two general approaches to assess the results: (i) for each gender group we calculated the share of respondents who answered the first (second, third) question correctly, the share of respondents who answered all questions correctly, and the share of respondents who answered all questions incorrectly, as well as (ii) for each group we estimated the means of Score 1, Score 2, and Score 3. To check the significance of gender differences in results obtained through the first approach, we applied chi-squared and Cramér's V tests. U Mann-Whitney test was used when evaluating results obtained through the second approach. The selection of the tests was preceded by a standard analysis of these tests applicability to the properties of examined datasets (Szwed, 2008).

Secondly, we used Score 1 as the dependent variable in a series of logistic regressions. The regressions were conducted to rule out the possibility that gender differences found in the DL test scores due to non-parametric tests were driven by factors other than gender. Previous financial literacy literature suggests that some sociodemographic characteristics (e.g. education, age, income) are strongly related to measured FL levels (e.g. Alessie, van Rooij & Lusardi, 2011; Klapper & Panos, 2011; Sekita, 2011). To control for the effects of these other factors, we estimated two regression models for an entire sample including gender as a key diagnostic variable, however distinct in terms of the other factors (without and with them – Model 1 and Model 2). Model 3 and Model 4 were estimated separately for males and females. Table 4 reports the results of estimated logit models.

Additionally, we used these results to investigate the factors responsible for DL (in terms of Score 1) among all respondents, and – particularly – among males and females. In running the models, we applied a broad gamut of potential independent variables (see Table 5 in Annex for details). Some of them deserve brief explanation (particularly those that turned out to be significant in our regressions). MAJOR was measured through respondents' self-reports of their major of study (=1, if the respondent reported non-business; =0 otherwise). EXPERIENCE 1 was generated as a binary indicator equal to 1 should respondents worked while studying, 0 otherwise.

Grade orientation (GO, hereafter) and learning orientation (LO, henceforward) indices were estimated in accordance with the approach developed by Roedel, Schraw and Plake (1994). Academic orientation reflects an individual's motivation to study for its own sake (LO), or to achieve better grades (GO). We do not provide details regarding LO and GO estimation to keep the length of this article within required boundaries (see Roedel, Schraw & Plake., 1994 for details). The variable GO (LO) were coded in the following way: =1 if respondent's GO (LO)>sample median; =0 otherwise. TUITION was estimated with the following 'Yes / No' question: 'Do you pay for your studies?' (Yes=1, No=0). SCHOLARSHIP (for academic performance) was estimated in the same way, based on the following question: 'Do you have a scholarship?' (Yes=1, No=0).

Results

Table 5 (Annex) provides a numerical description of our sample. Female respondents were overrepresented in the sample, as has been the case in prior studies focused on university students (e.g. Chen & Volpe, 2002; Hanna, Hill & Perdue, 2010; McCabe, Butterfield & Treviño, 2006). In terms of age, our sample was dominated by young individuals – an observation that corresponds with common sense and the division of the sample between full-time students and part-time students (60.5% and 39.5%, respectively). Regarding the countries that participated in our study, almost 53% of respondents filled out the questionnaire in Poland (this resulted from the fact that the project was administered remotely from Poland and, consequently, as many as seven Polish universities joined the research). The other extreme is Bulgaria, represented by a mere 16 respondents. Such a distribution of our sample in terms of the country in which the survey was conducted might have caused a bias in the results. In terms of major of study, business students represented 73.6% of the total sample, while non-business students – 26.4%.

Our survey revealed gender differences in some sociodemographic and economic attributes in the sample we explored. Firstly, women reported the possession of a financial product less frequently than men (68.3% vs. 79.8%), and even less frequently – the possession of a loan product (51.3% vs. 64.4%), an indication of lesser experience with financial markets on the part of female students. Interestingly, more business and finance major students were among women than among men (76% vs. 69.6%). Also, women reported that they didn't pay for their studies and that they were receiving a scholarship for the academic performance more frequently than men (23.9% vs. 19.0%, and 18.8% vs. 13.2%, respectively). Finally, women more often represented village and smaller towns, while men more often reported larger towns and cities as their place of residence.

On the most general level, our results evidence very low financial literacy among students, including those majoring in business (though, the latter fared slightly better than the rest in DL test). The mean Score 1 for entire sample reached a mere 0.84 on a scale from 0 to 3.

Table 2. Descriptive statistics for the variables significant in logit models

(Source: own study)

	Mean	Median	Minimum	Maximum	SD
Gender	0.37	0.00	0	1	0.483
Country 1	0.53	1.00	0	1	0.499
Country 2	0.02	0.00	0	1	0.124
Country 3	0.10	0.00	0	1	0.295
Country 4	0.29	0.00	0	1	0.452
Country 5	0.08	0.00	0	1	0.264
Major	0.26	0.00	0	1	0.441
Experience 1	0.63	1.00	0	1	0.482
LO	14.61	15.04	5.135	18.609	2.670
Tuition	0.78	1.00	0	1	0.415
Scholarship	0.17	0.00	0	1	0.373

Table 3. Results of debt literacy test (Source: own study)

Table 3. Results of debt literacy test (Source: own study)					
	All	Male	Female	Test of difference between genders	
				$\chi^2 = 7.724$,	
AC (%)	2.5	4.3	1.4	V = 0.088	
				(p = 0.005)	
				$\chi^2 = 60.947$,	
AIC (%)	42.2	26.5	51.7	V = 0.247	
				(p = 0.000)	
				$\chi^2 = 45.318$,	
FC (%)	46.4	60.1	38.2	V = 0.212	
				(p = 0.000)	
				$\chi^2 = 46.433$,	
SC (%)	28.6	41.1	21.1	V = 0.214	
				(p = 0.000)	
TC (0/)	8.8	11 /	7.2	$\chi^2 = 5.313$, $V = 0.72$	
TC (%)	0.0	11.4	7.2	(p = 0.021)	
Caona 1 (maan)	0.84	1.13	0.67	U = 81,671	
Score 1 (mean)	0.04	1.13	0.67	(p = 0.000)	
Caara 2 (maan)	1 47	1.46	1.40	U = 115,471	
Score 2 (mean)	1.47		1.48	(p = 0.740)	
Caara 2 (maan)	0.60	0.41	0.06	Ü = 92,081	
Score 3 (mean)	0.69	0.41	0.86	(p = 0.000)	
L			ı		

AC (all correct): the share of respondents who answered all questions correctly; AIC (all incorrect): the share of respondents who answered all questions incorrectly; FC (first correct): the share of respondents who answered the first question correctly; SC (second correct): the share of respondents who answered the first question correctly; TC (third correct): the share of respondents who answered the most difficult question correctly (i.e. third test question).

Table 3 shows the result of non-parametric tests used to gauge gender differences in DL levels among our survey participants. The tests corroborated that in terms of standard DL measure – Score 1 – women were less debt literate than men. The gender differential in DL was found regardless of studied country, reported college major (business or non-business) and age cohort. Also, our study showed that females were more likely than males to provide DK or PNTA responses to each question of DL test. Overall, 15.8% of females and 5.9% of males provided one of those responses in all test questions. We found Score 3 – measuring frequency of DK and PNTA answers – double as much for women compared to men. However, we found only a slight and statistically insignificant

difference in Score 2 – used as a proxy for the combined effects of guessing tendency and overconfidence – between males and females.

Males responded correctly all test questions three times more often compared to females. Simultaneously, females responded incorrectly to all test questions almost two times more often compared to males. Moreover, male students performed significantly better than their female peers in terms of the first and the second test question. Interestingly, the difference in male and female students' responses to the third test question – deemed the most difficult one – was insignificant.

The results of our logit models confirmed gender differences in DL indicated by nonparametric tests. We found that gender was significantly and positively linked to DL level as measured by Score 1 with and without controlling the effects of other variables potentially explaining the level of DL (Model 2 versus Model 1). All estimated models are characterized by high overall fit (measured by correct classification coefficient). Model 2 indicated three variables significantly related to Score 1, apart from the variable GENDER, namely: MAJOR, COUNTRY, and TUITION. The sign of the relationship between MAJOR and Score 1 was negative in Model 2, indicating that business students were more debt literate than their non-business peers. We found country among the independent variables the most strongly associated with DL of both genders. In terms of the odds ratio, non-business students had almost 40% fewer chances for high Score 1 compared to business ones. Model 2 also showed that Polish, and especially Ukrainian, students were substantially more likely to score well on the DL test in comparison with Welsh students (reference group). As shown in Table 4, TUITION was positively linked to Score 1, meaning that students who paid for their studies ended up with higher Score 1 compared to those who were exempted from the tuition fees. According to the odds ratio, students paying tuition had almost 80% higher chances for higher Score 1 than their tuition exempted peers.

Models 3 and 4 allowed us to examine whether male and female students' Score 1 responds similarly or differently to potential independent variables other than gender. We noticed a significant difference between males and females in the role of a college major for DL. This variable was insignificant in the model explaining DL of males (Model 3), while significant in the model performed for females (Model 4). Female students majoring in business scored significantly better in DL test compared to their non-business female peers. In terms of the odds ratio, non-business female students had almost 50% lower chances for high Score 1 compared to their business female peers.

Another important difference between genders was found with respect to effect scholarship had on DL. Females who were awarded scholarship were also more likely to display higher DL level as compared to their counterparts not receiving scholarship. In terms of odds ratio, female students receiving the scholarship had almost 80% bigger chances for higher DL test score in comparison to their female peers not receiving the scholarship. Again, such an effect was not found among male students.

Table 4. Results of logistic regressions with Score 1 as the dependent variable (Source: own study)

(Source. own study)						
Variable	Model 1 (All)	Model 2 (All)	Model 3 (only males)	Model 4 (only females)		
Gender	0.994***	1.075***				
Country 1		1.363***	1.133**	-0.406		
Country 2		-0.180	-18.835	-2.620***		
Country 3		2.735***	3.314***	-0.751		
Country 4		0.471	0.423	-1.205***		
Country 5		reference group	reference group	reference group		
Major		-0.457**	-0.110	-0.666***		
Experience 1		0.199	0.276	0.328*		
LO		0.053	0.088*	0.037		
Tuition		0.561**	0.512	-0.173		
Scholarship		0.352	-0.268	0.587**		
Constant	-1.600***	-3.812***	-3.661***	-0.069		
Observations	999	903	343	560		
-2 log Likelihood	1051.514	894.487	393.183	723.685		
Overall Chi- square	43.139***	121.639***	56.782***	52.633***		
R ² Nagelkerke	0.063	0.187	0.209	0.120		

^{*} Statistically significant at p<0.1

In light of the results brought by Model 4, female students who worked while studying were more likely (with almost 40% more chances) to score well in the DL test than their non-working female peers. On the other hand, Model 3 showed that more learning-oriented male students had almost 10% more chances for high Score 1 than their less learning-oriented male peers. Finally, in terms of the country, Polish and Ukrainian male students had significantly higher chances for high DL test results compared to Welsh students, while female Portuguese students were significantly less likely to perform well on the test in comparison with the reference group.

Discussion, limitations and concluding remarks

In many respects, the results of our research are consistent with the findings of former authors. We corroborated that females who participated in our study were less likely to give correct answers to DL test questions and more likely to choose DK or PNTA options – the patterns well-recognized in previous studies (Lusardi & Mitchell, 2014; Klapper et al., 2015; Bucher-Koenen et al., 2017). Although we were not able to fully control for the combined effects of guessing and overconfidence, our results suggest that higher DL of males can't be simply explained by a higher inclination to guess in the DL test, or men's overconfidence in own financial sophistication, in comparison to women's.

Our finding on the role of major for the gender gap in DL – which is in line with results of Chen and Volpe (2002) who found that college major had a stronger effect on females' FL – suggests that, unlike women, financial education may be less relevant for men to become financially literate. Males seem to acquire financial literacy somehow differently. This may mean that financial education programs addressed to women are particularly needed. This may also support the claim of Bucher-Koenen et al. (2017) that females and males are characterized by different patterns of FL acquisition in which past

^{**} Statistically significant at p<0.05

^{***} Statistically significant at p<0.01

experiences can have a critical role. This belief seems to be convincing as self-reports of our respondents revealed that male students were more financially experienced, i.e. male students reported the use of financial products more frequently than female participants.

What we noticed in terms of the effect scholarship had on DL of male and female participants in our study may, in turn, support the theoretical proposition of Jappelli and Padula (2013) who posited that individuals need to have incentives to build FL. In light of our findings, awards such as scholarship seem to motivate female students to increase their debt literacy. We did not find evidence that male students responded to scholarship-related incentives in the same way. This gender difference may be consistent with the rationale formulated by Agnew and Harrison (2015) who posit that the decision to study should be considered an investment decision which must take into account not only the opportunity cost of a student's time and tuition costs but also an estimate of future returns on the investment. Aware of pay inequalities in the labor market, female students may attach greater importance to scholarship as a component of the return on the investment in the university study.

The interpretation of country results in terms of the gender gap in DL poses a challenge. Among countries examined in our study, Ukraine exhibited the greatest difference between males' and females' means of Score 1 and Score 2. However, this is the only regularity found in our study with regard to the link between country and gender gap in DL. Perhaps, the finding can be explained by particularly strong femininity (or, alternatively, weak masculinity) as a cultural feature in Ukrainian society, as documented by Hofstede (2017). Additionally, the results in terms of country cohorts can be distorted because of the sample skewness towards Polish respondents (and extremely low share of Bulgarian participants), as mentioned in 'Method' section of this article. Nevertheless, the association between those two variables deserves a close attention in future research.

On a more general level, we confirmed serious DL shortcomings of university students, including business ones, known from previous studies (Chen & Volpe, 2002; Hanna et al., 2010). Our findings may mean that the actions taken by governments, regulatory as well as educational bodies in response to the recent crisis were not effective, at least in those countries we investigated and with respect to financial education – especially offered to women who are still at a disadvantage in terms of DL compared to men.

Our findings must be interpreted with consideration of the potential bias resulting from the fact that some key variables were self-reported and, as a result, may be overestimated because of social desirability. Also, our survey was based on a convenience sample suffering from shortcomings typical for non-representativeness. However, the convenience sampling procedure is a standard in large-scale studies in populations of students. Nevertheless, a study of students' debt literacy, based on a cross-national representative sample, would be desirable.

Acknowledgements: This work was supported by Polish Ministry of Science and Higher Education grant [contract no. 0057/DLG/2016/10 under the program 'Dialogue' (within a project entitled 'Debt Watch')].

References

- Agnew, S., & Harrison, S. (2015). Financial literacy and student attitudes to debt: A cross-national study examining the influence of gender on personal finance concepts. *Journal of Retailing and Consumer Services*, 25, 122-129.
- Alessie, R., van Rooij, M., & Lusardi, A. (2011). Financial literacy and retirement preparation in the Netherlands. *Journal of Pension Economics and Finance*, 10(4), 527-45.
- Allgood, S., & Walstad, W.B. (2016). The effects of perceived and actual financial literacy on financial behaviors. *Economic Inquiry*, 54(1), 675-697.
- Almenberg, J., & Dreber, A. (2015). Gender, stock market participation and financial literacy. *Economics Letters*, 137, 140-142.
- Bajtelsmit, V.L., Bernasek, A., & Jianakoplos, N.A. (1999). Gender differences in defined contribution pension decisions. *Financial Services Review*, 8(1), 1-10.
- Beckmann, E. (2013). Financial literacy and household savings in Romania. *Numeracy*, 6(2), article 9.
- Boggio, C., Fornero, E., Prast, H., & Sanders, J. (2015). Seven ways to knot your portfolio. Is investor communication neutral? NETSPAR Academic Series Working Paper No. DP 10/2015-030. Tilburg: Network for Studies on Pensions, Aging and Retirement.
- Brown, M., & Graf, R. (2013). Financial literacy, household investment and household debt. Working Papers on Finance no. 13/1. Swiss Institute of Banking and Finance, University of St. Gallen.
- Bucher-Koenen, T., Lusardi, A., Alessie, R., & van Rooij, M. (2017). How financially literate are women? An overview and new insights. *Journal of Consumer Affairs*, 51(2), 255-283.
- Butters, R.B., Asarta, C.J., & McCoy, S. (2012). Financial literacy and gender in U.S. high schools. *Journal of Economics and Finance Education*, 11(2), 142-149.
- Charness, G., & Gneezy, U. (2012). Strong evidence for gender differences in risk taking. *Journal of Economic Behavior & Organization*, 83(1), 50-58.
- Chen, H., & Volpe, R.P. (2002). Gender differences in personal financial literacy among college students. *Financial Services Review*, 11(3), 289-307.
- Disney, R., & Gathergood, J. (2011). Financial literacy and indebtedness: New evidence for UK consumers. Nottingham: University of Nottingham.
- Fonseca R., Mullen, K.J., Zamarro, G., & Zissimopoulos, J. (2012). What explains the gender gap in financial literacy? The role of household decision making. *Journal of Consumer Affairs*, 46(1), 90-106.
- Ford, M.W., & Kent, D.W. (2010). Gender differences in student financial market attitudes and awareness: An exploratory study. *Journal of Education for Business*, 85(1,) 7-12.
- Gentile, M., Linciano, N., & Soccorso, P. (2016). Financial advice seeking, financial knowledge and overconfidence. Evidence from the Italian market. Commissione Nazionale Per Le Società E La Borsa Working Paper. Rome: CONSOB.
- Hanna, M.E., Hill, R.R., & Perdue, G. (2010). School of study and financial literacy. *Journal of Economics and Economic Education Research*, 11(3), 29-37.
- Hastings, J.S., Madrian, B.C., & Skimmyhorn, W.L. (2013). Financial literacy, financial education, and economic outcomes. *Annual Review of Economics*, 5, 347-373.
- Hofstede, G. (2017). Cultural dimensions. Retrieved from Geert Hofstede's web site: https://geert-hofstede.com/cultural-dimensions.html (access: 19 September 2017).

Hsu, J. W. (2015). Aging and strategic learning: The impact of spousal incentives on financial literacy. Federal Reserve Board working paper no. 2011-053 (Washington, DC). Retrieved from: https://www.federalreserve.gov/pubs/feds/2011/201153/201153pap.pdf (access: September 19, 2017).

- Hung, A.A., & Yoong, J.K. (2010). Asking for help. Survey and experimental evidence on financial advice and behavior change. RAND working paper no. WR-714-1. Retrieved from https://www.rand.org/content/dam/rand/pubs/working_papers/2010/RAND_WR714-1.pdf (access: 19 September 2017).
- Instytut Wolności and Raiffeisen Polbank (2014). Stan wiedzy ekonomicznej Polaków [Economic literacy of Poles]. Warsaw: Instytut Wolności and Raiffeisen Polbank.
- Jappelli, T., & Padula, M. (2013). Investment in financial literacy and saving decisions. *Journal of Banking and Finance*, 37(8), 2779-2792.
- Kahneman, D. (2011). Thinking, fast and slow. Farrar, Straus & Giroux.
- Klapper, L., Lusardi, A., & van Oudheusden, P. (2015). Financial literacy around the world: Insights from the Standard & Poor's ratings services global financial literacy survey. Global Financial Literacy Excellence Center, the George Washington University. Retrieved from http://gflec.org/wp-content/uploads/2015/11/Finlit_paper_16_F2_singles.pdf (accessed: July 17, 2017).
- Klapper, L., & Panos, G. (2011). Financial literacy and retirement planning: The Russian case. The Centre for Entrepreneurship Research Working Paper No. WP3 (University of Essex, Essex Business School).
- Lusardi, A., & Mitchell, O.S. (2011). Financial literacy and retirement planning in the United States. NBER Working Paper No. 17108 (Cambridge, Massachusetts, National Bureau of Economic Research).
- Lusardi, A., & Mitchell, O.S. (2014). The economic importance of financial literacy: Theory and evidence. *Journal of Economic Literature*, 52(1), 5-44.
- Lusardi, A., Mitchell, O.S., & Curto, V. (2010). Financial literacy among the young. *Journal of Consumer Affairs*, 44(2), 358–380.
- Lusardi, A., & Tufano, P. (2009). Debt literacy, financial experiences, and overindebtedness. NBER Working Paper No. 14808 (Cambridge, Massachusetts, National Bureau of Economic Research).
- Mahdavi, M., & Horton, N. J. (2014). Financial knowledge among educated women: Room for improvement. *Journal of Consumer Affairs*, 48(2), 403–417.
- McCabe, D. L., Butterfield, K.D., & Treviño, L.K. (2006). Academic dishonesty in graduate business programs: Prevalence, causes, and proposed action. *Academy of Management Learning & Education*, 5(3), 294-305.
- Mitchell, O.S., & Lusardi, A. (2015). Financial literacy and economic outcomes: Evidence and policy implications. *Journal of Retirement*, 3(1), 107-114.
- OECD (2017). PISA 2015 results (volume IV): Students' financial literacy. PISA, OECD Publishing, Paris. http://dx.doi.org/10.1787/9789264270282-en.
- Roedel, T.D., Schraw, G., & Plake, B.S. (1994). Validation of a measure of learning and performance goal orientations. *Educational and Psychological Measurement*, 54(4), 1013-1021.
- Sekita, S. (2011). Financial literacy and retirement planning in Japan. *Journal of Pension Economics and Finance*, 10(4), 637-56.
- Stolper, O.A., & Walter, A. (2017). Financial literacy, financial advice, and financial behavior. *Journal of Business Economics*, 87(5), 581-643.

- Szwed, R. (2008). *Metody statystyczne w naukach społecznych [Statistical methods in social sciences]*. 1st Edition. Lublin: Wydawnictwo Katolickiego Uniwersytetu Lubelskiego.
- Tennyson, S. (2011). Consumers' insurance literacy: Evidence from survey data. *Financial Services Review*, 20(3), 165–179. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=72336077&si te=ehost-live.
- Van Rooij, M., Lusardi, A., & Alessie, R. (2007). Financial literacy and stock market participation. NBER Working Paper No. 13565 (Cambridge, Massachusetts, National Bureau of Economic Research).

Annex

Table 5. Sample profile (%) (Source: own study)

Variables	Total	Male	Female
		37.1	62.9
Country			
Poland	52.7	52.2	53.0
Bulgaria	1.6	1.3	1.7
Ukraine	9.6	10.8	8.9
Portugal	28.6	24.0	31.3
Wales	7.5	11.6	5.1
All	100	100	100
Age			
A: at least 17 but not more than 19	12.0	14.2	10.6
B: at least 20 but not more than 22	30.4	28.0	32.0
C: at least 23 but not more than 25	23.2	22.2	23.9
D: at least 26 but not more than 28	10.0	10.6	9.7
E: at least 29 but not more than 31	5.6	7.9	4.2
F: 32 or more	18.7	17.2	19.7
All	100	100	100
Place of residence			
A: village	29.4	20.8	34.5
B: town up to 49,999 inhabitants	18.1	14.1	20.5
C: town from 50,000 to 99,999 inhabitants	16.5	19.5	14.7
D: town from 100,000 to 499,999 inhabitants	28.8	37.0	23.9
E: city with 500,000 inhabitants or more	7.2	8.6	6.4
All	100	100	100
University	100	100	100
A: Wyższa Szkoła Ekonomii i Innowacji w Lublinie	29.4	25.8	31.5
B: Politechnika Rzeszowska	9.7	10.1	9.4
C: Glyndwr University	7.6	11.7	5.2
D: ISCAP	26.0	22.9	27.9
E: Ternopil National Economic University	7.3	9.3	6.1
F: Lutsk National Technical University	1.2	0.8	1.4
G: University of Varna	1.6	1.3	1.7
H:. Wyższa Szkoła Informatyki i Zarządzania w Rzeszowie	13.2	16.5	11.3
I: UTAD	1.2	0.3	1.7
J: Others	3.0	1.3	3.9
All	100	100	100
Do you pay for your studies?	100	100	100
Do you pay for your studies:			1

Variables	Total	Male	Female
Yes	77.9	81.0	76.1
No	22.1	19.0	23.9
All	100	100	100
Do you have scholarship? *	100	100	100
Yes, social scholarship	20.4	15.8	23.0
Yes, scholarship for academic			
performance	16.7	13.2	18.8
No	62.9	71.0	58.2
All	100	100	100
Major of study *			
A: Business	73.6	69.6	76
C: Non-business	26.4	30.4	24.0
All	100	100	100
Study level			
A: Undergraduate	65.4	67.6	64.2
B: Graduate	34.6	32.4	35.8
All	100	100	100
Form of study *			
A: full-time / weekday studies	60.5	64.6	58.1
B: extramural (external) / weekend			
studies / part-time studies / evening	39.5	35.4	41.9
studies			
All	100	100	100
Do you have a job or have you had job while attending the university?			
Yes	63.4	63.3	63.5
No	36.6	36.7	36.5
All	100	100	100
Do you have any financial products?	100	100	100
Yes	72.6	79.8	68.3
No	27.4	20.2	31.7
All	100	100	100
How many financial products do you	100	100	100
have?			
None	27.4	20.2	31.7
One	64.1	68.6	61.5
Two	5.2	5.9	4.8
Three and more	3.2	5.4	2.0
All	100	100	100
Do you have any loan products?			
Yes	56.2	64.4	51.3
No	43.9	35.6	48.7
All	100	100	100
How many loan products do you have?			
None	43.9	35.6	48.7
One	52.4	59.0	48.5
Two	2.7	2.7	2.7
Three and more	1.1	2.7	0.2
All	100	100	100
LO (mean)	14.61	14.36	14.77
GO (mean)	7.23	7.23	7.23

^{*} Originally multiple choice, however no respondent indicated more than one option