

The Influence of Income and Gender on Financial Literacy

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Summary

- Research questions: Are income and financial literacy related? Is income an influencing factor on financial literacy?
- Methods: A questionnaire-based Financial Literacy test of 956 students is used to analyze influences on financial literacy.
- Results: (1) Males are more financially literate than females, (2) higher income people know more about financials than lower income people, but (3) rich females exhibit higher financial literacy than poor males.
- Structure of the article: 1. Purpose and Motivation; 2. Methodology; 3. Results
4. Conclusions; 5. About the Author; 6. Bibliography

1. PURPOSE AND MOTIVATION

We investigate if income and financial literacy are related because we want to find out if income is an influencing factor on financial literacy. Since literature already reveals that practical experience with financials benefits financial literacy (Chen & Volpe, 1998), it is likely that income is an essential influence on financial literacy. If this is the case, this information will incentivize the need for effective measures to improve financial literacy of especially poor people. The more people become financially literate, the more effective financial decisions will be made which benefits society as a whole.

Parents have often been suspected to be one of the most influential factors of financial literacy of children (Grohmann & Menkhoff, 2015). We want to know more about other influences on financial literacy. We assume that students with higher income are more financially literate because it is likely that households with larger monetary resources have a broader exposure to financial products. We base our hypothesis that available money has an influence on financial literacy on findings in literature where students who are seniors, employed or from higher status families show higher credit card knowledge which indicates that exposure to money helps students to

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perform better financially (Danes, Hira, & Tahira, 1987). Others even argue that financial literacy and college drop-out probability are related (Lyons, 2007). Peculiarly, studies indicate that many college students are not well equipped to make efficient financial decisions and that they are poor managers of

their financials (Markovich & De Vaney, 1997). “The social and economic gains from tackling low financial performance dwarf any conceivable cost of improvement” (OECD, 2016) which is an essential driver to look for key areas to improve financial literacy.

2. METHODOLOGY

We conducted a paper-and-pencil form survey of students and a total of $n=956$ students completely filled-out questionnaires. The survey was conducted at ten different institutions. We found a strong interest in our efforts on the part of these institutions and all of them asked for feedback regarding the results of the survey, because they wanted to know if there was anything that they should do about the financial literacy of their students. We provided this feedback in the form of descriptive results. We did not name the students' institutions, though, because some institutions asked that their students' affiliation be kept confidential for fear that results could be used for competitive purposes and damage some institutions' reputations.

We adjusted our sample by creating equal gender proportions to account for the actual distribution of the German national student population. This reduces the number of useful questionnaires to $n=696$, but at the same time eliminates a potential sampling bias that would distort further analyses.

The questionnaire consists of 19 questions. We look at the income question “How much money do you have available to spend monthly after deducting all costs?”¹ and eighteen financial literacy questions to test financial knowledge and cognition. Some of the questions were taken from literature to be able to capitalize on prior experiences and potentially compare results of this study to

others. Specifically, financial literacy questions one through nine were taken from previous research studies, and questions ten to eighteen were newly developed. The use of established questions reduces the likelihood that measurement errors occur and facilitates comparison with other studies. With respect to the quality criteria of the data set, the measurements undertaken are objective, reliable, and of valid nature (Diekmann, 2004).

In order to be able to measure objective financial literacy a data transformation will take place. We construct an “objective” performance score based on the correctness of answers to these eighteen financial literacy questions (0=right, 1=wrong), which we call Financial Literacy Score (FLS). The score is the sum of eleven knowledge questions, as well as seven cognitive questions. The maximum raw score to be obtained in this category is eighteen (100%). The eleven knowledge question are relating to the four subcategories: money & transactions, planning & managing finances, risk & return and financial landscape. The seven cognition questions represent the subcategories: identification of financial information and application of information in a financial context. The definitions are in line with the OECD definition of financial literacy (OECD, 2014).

Next, we describe the whole sample as well as male and female responses based on answers to the income question “How much money do you have available to spend monthly after deducting all costs?”. We aggregate for students

¹ Income Question: Possible Answers A) \$ 600, B) \$ 601-800, C) \$ 801-1,000, D) \$ 1,001-1,200, E) \$ 1,201 or more, F) Not sure

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who have less than thousand euro available, call them low income and for students with more than thousand euro available and call them high income. We base this decision on our own rationality which labels the lower two-thirds of answer options (600 or less, 601-800, 801-1000) as low income group and the upper third (1001-1200, 1201 and more) as the high income group. Then, we describe the

Financial Literacy Score of the whole group, followed by male and female scores. A simple linear regression analysis was conducted to determine if financial literacy (dependent variable) could be predicted by income (independent variable). The null hypothesis tested is that the regression coefficient (slope) is zero.

3. RESULTS

The Income of students per month

Most students, 73 percent of the sample, have less than thousand euro available to spend per month and accordingly 27 percent of the students have more than thousand euro available as shown in column three in Table 1. There are similar income patterns for men and women. There are 60 percent of men

in the income segment below thousand euro and 84 percent of women. In contrast, there are 40 percent of men in the high income segment above thousand euro per month and only 16 percent of female students as shown in column 5 and 7 in Table 1.

Table 1: Students and their available income in EUR per month

1	2	3	4	5	6	7
	How much money do you have available to spend monthly after deducting all costs?					
	All students		Male		Female	
EUR available per month	Count	Column %	Count	Column %	Count	Column %
Less than 1000	387	73%	151	60%	236	84%
More than 1000	144**	27%	99**	40%	45**	16%

** significant proportions within columns

Significant proportions within the groups (all students, males and females) are marked in Table 1 in columns two, four and six with two stars. Overall, we find that there are more students with a lower income compared to students with a high income. The same pattern

holds for men and women. Remarkably, in this young age group, there are already more poor female students (84 percent) with an income below thousand euros compared to poor male students (only 60 percent).

Financial literacy of students

The average financial literacy score of all students is 61 percent. Men are on average more financially literate and score 65 percent compared to women who score 58 percent which is demonstrated in Table 2. This

confirms previous findings in literature that students in general have a low financial literacy and that women have a weaker financial literacy compared to men (Lusardi & Mitchell, 2007a). Financial literacy scores of

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poor and rich students as well as male and female students respectively are summarized in Table 2. While poor students score on average only 60 percent, rich students score 70 percent. Comparing scores in the 60 to 70 percent to a class room setting shows that all many scores fail considering a regular grading.

To get the lowest passing grade at least 69.5 percent would be necessary. More importantly, the big difference of 10 percent between the scores of poor students and rich students suggests that there might be a substantial influence of income on financial literacy.

Table 2: Student's Financial Literacy Score

	1	2	3	4
	Financial Literacy Score in %			
	Total	Male	Female	
All students	61%	65%	58%**	

	5	6	7
	Financial Literacy Score in %		
	Less than EUR 1000	More than EUR 1000	
All students	60%**	70%	
Male	65%**	71%	
Female	57%**	68%	

** significant proportions between columns

To validate if the same pattern holds for male and female students, we compare financial literacy scores of rich and poor male students and find that poor males score 65 percent and rich males 71 percent. The difference is even bigger for women, where poor women score only 57 percent and rich women score 68 percent. Hence, not only for the whole student population we find that poor students are less financially literate than rich student but also that the same pattern holds for male and female students respectively. Furthermore,

rich men (71 percent) outperform rich women (68 percent) and poor men (65 percent) outperform poor women (57 percent) regarding financial literacy. Two stars in Table 2 illustrate if there is a significant difference between columns three and four as well as between six and seven. In summary, the same financial literacy pattern we found in the total sample analysis holds for subgroup analysis of financial literacy of men and women. Overall, rich students outperform poor students.

Relationship of income and financial literacy

To answer the question if income influences financial literacy, we look for the strength of the relationship between income (independent variable) and financial literacy (dependent variable). The income of a student is a good predictor of their financial literacy. The results of the simple linear regression show that a significant proportion of the total variation of the financial literacy scores can be predicted by income. Hence, income and financial

literacy are positively associated, which means that rich students are more financially literate than poor students. The equation $Y = 0,17x + 0,495$ in Figure 1 shows that for every additional euro income financial literacy increases by 0.17 percent. The blue fitted line graphically shows the same information. The model explains 94 percent ($R^2=0.9414$) of the variation of financial literacy. This suggests a large effect (Cohen, 1988).

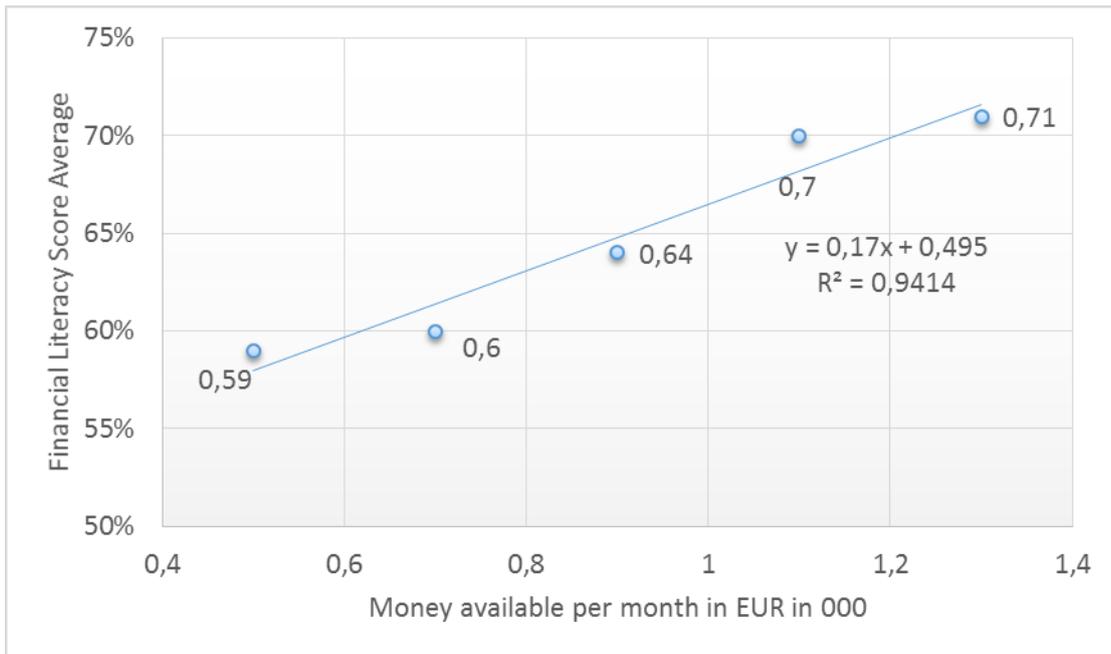


Figure 1: Financial literacy and income per month

In a next step, we look at the same analysis with male as well as female students. We find that the same pattern holds for men and women. In the analysis regarding male students, the equation $Y = 0.075x + 0.6025$ in

Figure 2 shows that for every additional euro income financial literacy increases by 0.075 percent. The model explains 56 percent ($R^2=0.5625$) of the variation of financial literacy.

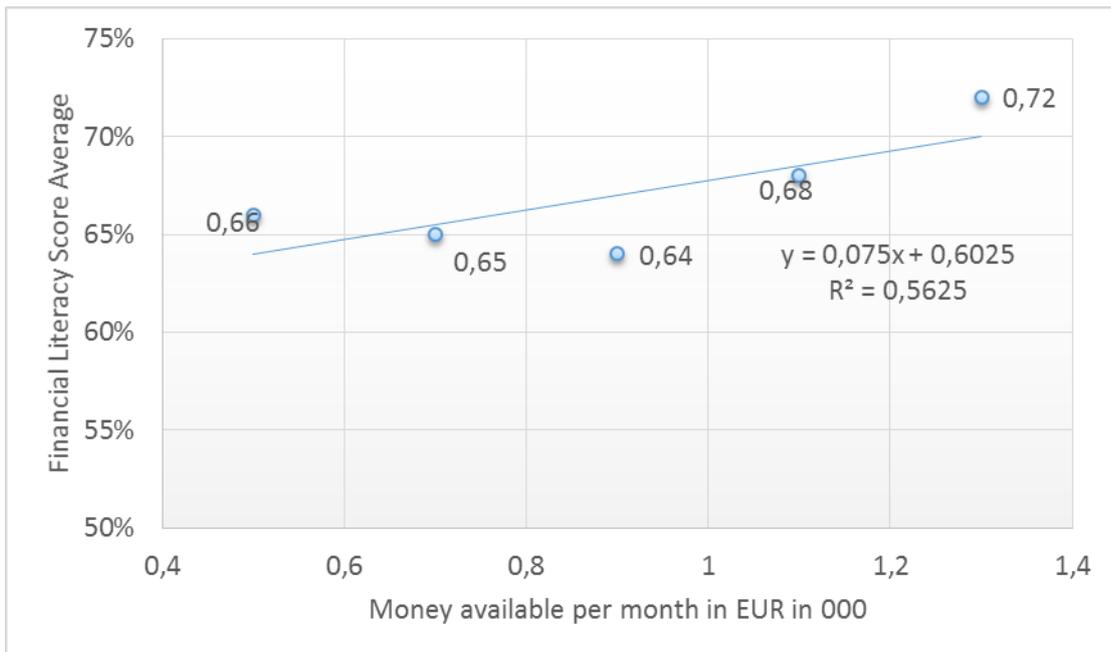


Figure 2: Financial literacy and income per month for men

In the analysis regarding female students, the equation $Y = 0.18x + 0.466$ in Figure 3 shows

that for every additional euro income financial literacy increases by 0.18 percent. The model

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explains 73 percent ($R^2=0.7248$) of the variation of financial literacy.

Even though we see a decrease of the power of the model to explain variation of financial literacy with the male and female population

compared to the total student population, the results are strong enough to assume that income is a significant influence on financial literacy.

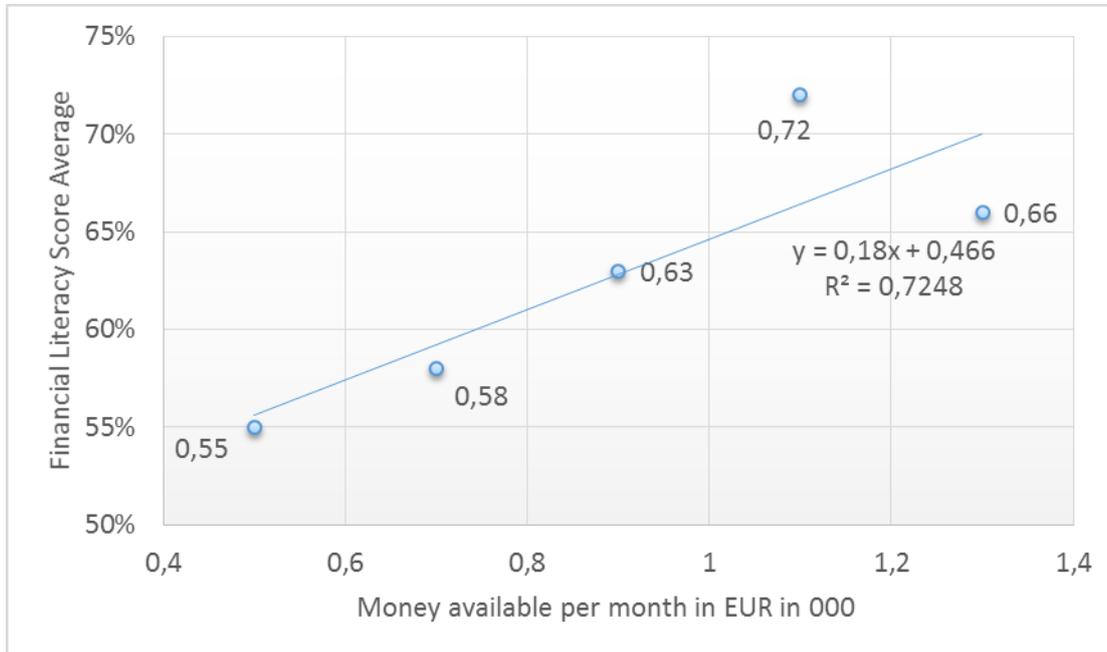


Figure 3: Financial literacy and income per month for women

4. CONCLUSIONS

The results of our analysis show that students' financial performance is significantly influenced by income. The more money they have, the more financial literate they are. We assume that higher income exposes them to more diverse financial decisions which trains them to become more financially literate. This highlights a competitive disadvantage of especially poor students and their intensified need to become more financially literate to

make more efficient financial decisions. It was estimated that an improved financial literacy level of 15 year olds would increase German GDP by 3,600 billion during their working lives (Gillmann, 2016). Policy makers and scholars therefore need to consider the income situation to develop effective and successful financial literacy measures for especially poor people which will not only benefit the individual but also society as a whole.

5. ABOUT THE AUTHOR

Indra Erichsen is research associate at Flensburg University's chair of Business Finance at the International Institute of Management since 2013. During her studies of Business Administration at San Diego State University (US) and Columbia University

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