FINANCIAL LITERACY OF FULL-TIME AND PART-TIME UNIVERSITY STUDENTS

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Abstract

This paper presents the results of the financial literacy survey of university students in the economic fields of study. The research was conducted by a questionnaire survey method at two universities, one of them in the Slovak Republic and the other in the Czech Republic. The survey involved both, the full-time students as well as the part-time students. In the framework of this survey, some of the personality characteristics of the participants were found out, and in the second part, they solved a total of thirteen problems in the area of daily financial decision making. The questions examined their financial literacy across four areas of personal finance, namely time value of money and perception of inflation, annuities and debt repayment, risk and investment, and decision making. All questions were assigned as multiple choice questions with four response options, one of which was the correct answer, two incorrect answers, and "I do not know" option. While the part-time students answered over 56% questions correctly, the full-time students answered only 51% questions correctly. After identifying a higher level of total financial literacy of the part-time students we applied the methods of the statistical analysis and subsequently, we detect the areas where daily students are lagging behind. At the end of the article, we summarize the causes of this phenomenon and propose possible solutions to the current situation related to the development of financial literacy. The monitored areas of this article serve as an output of a forthcoming pilot project that focuses on identifying the preferences of consumer attitudes, loans, savings, and investments of a select population of the young generation.

Keywords: financial literacy, personality characteristics, daily decision making, practical learning outcomes.

1 INTRODUCTION

Our everyday lives are full of decisions, and most of them have financial consequences. Every day we decide whether to go to work by car, by public transport or on foot. We are faced with decisions from first thing in the morning – to have breakfast at home or to pick something up on the way to work – until evening – To spend it at home or out with friends. Less frequently we make decisions about accepting or refusing

a new job, about which bank we should keep our personal account in, if we should buy a new car and which type and manufacturer if we should move to a different city for better job opportunities, and so on. Only once or twice in our lives, we decide about pension plans, health insurance or about a new house and how to finance it, which means choosing the most appropriate mortgage. These are often once-in-a-lifetime decisions that have lifelong financial consequences, but people take them when they are young and relatively inexperienced.

The situation in corporate finance is similar. We frequently decide about company accounts, debts, and investments. We have to decide about increasing or reducing production, about foreign acquisitions, entering joint ventures etc. We also have to plan and decide about the motivation of employees, their salaries, social programmes or other non-financial benefits. Such decisions also have long-lasting consequences and can strongly influence the financial health of a firm.

Making the right decisions is of vital importance for maintaining financial stability in professional as well as personal life. One of the key factors for this is having a sufficient level of financial literacy. In this paper, we present the results of a survey of the financial literacy of university students in economic fields of study. Our research included not only full-time students but also part-time students who study alongside employment, which is a source of additional practical and empirical knowledge. Our aim was to detect the differences between the full-time and part-time students, to determine in which areas of financial literacy the difference arises, to identify the reasons and find some solutions.

2 LITERATURE SURVEY

Financial literacy is generally understood as the ability to comprehend finance. Therefore, we consider this ability to be one of the key competencies of the modern human. The concept of financial literacy has undergone relatively energetic development in recent years. This is evident from the increase in the number of works and research devoted to this issue. We mention at least some of them.

We begin with the very simple definition of financial literacy given by Kim. "Financial literacy is the basic knowledge that people need in order to survive in a modern society." (Kim 2001). Mandel provided a more sophisticated definition that incorporates reference to finance. He defined financial literacy as "the ability to evaluate new and complex financial instruments and make informed judgments about both: choices of instruments and extent of use that would be in their own best long-run interests" (Mandell, 2007). The European Commission defines financial literacy as "the capability of consumers and small business owners to understand retail financial products with a view to making informed financial decisions" (Habschick et al., 2007). A few years later the OECD defines financial literacy as follows: "Financial literacy is a combination of understanding, knowledge, skills, attitudes and behavioural patterns necessary to make the right financial decisions and, ultimately, to achieve personal financial well-being. "(OECD & INFE, 2011). Giesler & Veresiu (2014) define financial literacy as "The ability to understand how money works in the world: how someone manages to earn or make it, how that person manages it, how he/she invests it (turn it into more) and how that person donates it to help others." More specifically, it refers to the set of skills and knowledge that allows an individual to make informed and effective decisions through their understanding of finances.

In order to measure the financial literacy Lusardi, Oggero and Yakoboski have developed a Personal Finance Index (P-Fin Index). "Personal Finance Index measures knowledge and understanding which enable sound financial decision-making and effective management of personal finances. The P-Fin Index is unique in the breadth of questions it asks and the topics it covers to measure financial literacy." (Lusardi, Oggero & Yakoboski, 2017). The P-Fin Index focuses in 8 functional areas: earnings, consuming, saving, investing, managing debt, insuring, comprehending risk and obtaining information. These functional areas inspired also our research.

For purposes of our work, we adopt the definition of the financially literate person published in (Kozubíková, 2015). "It is a person who uses his ability to make a qualified judgment on the basis of the knowledge, skills and experience gained thus enabling him to smooth financial security throughout life." This requires planning of financial flows. Applying a preference for planning cash flow leads to more uniform consumption throughout life, depending on life stage.

A strong positive relationship between financial literacy and household wealth is reported in (Van Rooij, Lusardi, & Alessie 2012). "Our findings provide evidence of a strong positive association between financial literacy and net worth, even after controlling for many determinants of wealth." Furthermore, this work found that "Financial knowledge increases the likelihood of investing in the stock market, and [is] positively related to retirement planning, and the development of a savings plan." Other works discovered that "Financial literacy was strongly related to sociodemographic characteristics and family financial sophistication." (Lusardi, Mitchell, & Curto, 2012; Lusardi & Mitchell, 2011b, Fornero & Monticone, 2011)." From a similar

perspective, (Lusardi, Mitchell & Curto, 2010) observes that "Specifically, a college-educated male whose parents had stocks and retirement savings was about 45 percentage points more likely to know about risk diversification than a female with less than a high school education whose parents were not wealthy."

Many authors confirm (Mishkin, 2008; Banks & Olfield 2008; Behrman, Mitchell, Soo & Brava, 2012, Ayers, 2012) that financial education has the effect of increasing financial literacy and that in many societies the sections of the population with the lowest levels of financial literacy include adolescents and young people, people of retirement age and women. "Around the world, financial education has become an important tool to tackle the growing complexity of financial decisions, especially in the life of the last generation." (Lusardi & Mitchell, 2007). The benefits of financial education are also demonstrated in (Kozubik, Kozubikova, & Rybička, 2017), where the authors compare two groups of students with different levels of financial education.

3 DATA COLLECTING AND METHODS

Data for the present research was collected using a questionnaire survey method at two universities, one in the Slovak Republic and the other in the Czech Republic. The questionnaires were completed by management students in both full-time and part-time study. We obtained a sample of 494 usable questionnaires, from a total of 600 that were distributed. The corresponding response rate is 82.33%. The research included 372 full-time students and 122 part-time students. This ratio matches the ratio of full-time and part-time students in the research population.

The survey first collected some basic information on the participants and then presented a total of thirteen problems concerning daily financial decision making. The areas of financial literacy tested were inspired by the P-Fin Index, as it is presented in (Lusardi Oggero and Yakobski, 2017). We aggregated these eight areas into four categories covering:

Time value of the money and inflation perception.

Annuities and debt repayment.

Investments and risk.

Decision making.

All the problems were presented in the form of multiple choice questions with four response options, one of which was the correct answer, two were incorrect answers, and there was also an "I do not know" option. The last two items on the questionnaire asked which of the questions the respondents considered to be the easiest and the most difficult.

Statistical tests were applied to compare the average percentage between single categories. As the variances of the examined subsamples were different, we preferred the Welch t-test over the Student t-test. In this case, the testing criterion has the modified form:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{s_1^2}{N_1} + \frac{s_2^2}{N_2}}},$$

where $\bar{X}_1$, s_1^2, and N_1 are the 1st sample mean, sample variance, and sample size, respectively, and $\bar{X}_2$, s_2^2, and N_2 denoting the 2nd sample mean, sample variance, and sample size, respectively. The associated number of degrees of freedom is then given by the formula

$$\nu \approx \frac{\left(\frac{s_1^2}{N_1} + \frac{s_2^2}{N_2}\right)^2}{\frac{s_1^4}{N_1^2 \nu_1} + \frac{s_2^4}{N_2^2 \nu_2}}.$$

Here $\nu_1 = N_1 - 1$ and $\nu_2 = N_2 - 1$ are the degrees of freedom associated with the first and second sample variance estimates respectively.

The notion of stochastic dominance was used to compare the empirical distributions. It provides a partial ordering Between The Random Variables. For Our Purposes, We Applied The First Order And Second Order

Stochastic Dominance Rules.

Let *X* And *Y* Are Two Random Variables With The Cumulative Distribution Functions $F_X(X)$, And $F_Y(X)$ Respectively. We Say That *X* Dominates *Y* (In The Sense Of The First Order Stochastic Dominance) If $F_X(X) \leq F_Y(X)$ For All *X*, Where A Strict Inequality Holds for at least one *x*. Expressed by the language of probabilities it means that $P[X \geq x] \geq P[Y \geq x]$ for all *x,* and the strict inequality $P[A \geq x] > P[B \geq x]$ holds for at least one *x*. So the random variable *X* tends to reach higher values than random variable *Y*.

Stochastic dominance of the second order is also defined in terms of cumulative distribution functions. Instead of a direct probabilistic interpretation of the cumulative distribution function, the functions $F_X(x)$ and $F_Y(x)$ are required to fulfil the inequality

$$\int_{-\infty}^{x} |F_Y(t) - F_X(t)| \, \mathrm{d}t \geq 0$$

for all *x*, with strict inequality at some *x*. The integral in the inequality can be interpreted as the cumulative area bounded by the graphs of the distribution functions where the areas have opposite signs depending on which of the distribution function approaches greater values. The random variable X dominates Y if the area always remains non-negative.

4 RESULTS

Preliminary results of the statistical analysis indicate that part-time students are more financially literate than full-time students (Polák, Kozubíková & Kozubík, 2018). While the part-time students answered over 56% of questions correctly, the full-time students answered only 51% of questions correctly. These values make it possible to reject the hypothesis of equal average performance at a confidence level exceeding 99%.

In Fig. 1 we can observe this noticeable preponderance of higher percentages in the group of part-time students. On the left side of Fig. 1, we see the probability density functions of the percentages in both groups. The red curve, corresponding to the percentages of the part-time students, is significantly further to the right – meaning towards higher values. Moreover, we can mention not only the higher mode of percentages for the part-time students but also the higher kurtosis of the distribution, which indicates higher reliability of achieving the modal performance level. On the other hand, the probability distribution of the percentages for full-time students has longer tails. The right-hand long-tailed-ness is important, as it shows there are some individuals with the ability to reach extremely good results. It can be seen more clearly in the right-hand graph of Fig. 1 which illustrates the empirical cumulative distribution functions. The heavy right tail causes the crossing of the curves, but it is insufficient to overturn the overall results. The blue graph lies mostly above the red graph and this area is much greater than the area bounded by the graphs where the red line lies above the blue. It guarantees the performance of the part-time students dominates the full-time students in the sense of second-order stochastic dominance.
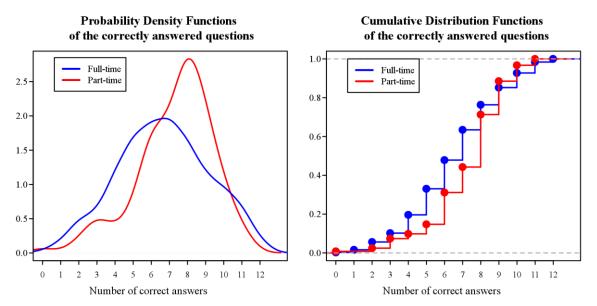

Fig. 1.Graphs of the probability density functions (left) and the empirical cumulative distribution functions of the correctly answered questions (right). The red curves correspond to the group of the full-time students

and the red curves represents the group of part-time students. (Source: Own elaboration.)

The differences recorded between the average performances in single categories were not large enough to reject the zero differences hypotheses with a confidence level of at least 95%. The only exception is the category of annuities and debt repayment, where we can reject the zero hypothesis with a confidence level that exceeds 99%. Therefore, we applied stochastic dominance rules. First order stochastic dominance was sufficient in this situation.

The left-hand side of Fig. 2 illustrates the empirical cumulative distribution functions for the number of correctly answered questions in the category of simple interest and inflation perception. In Fig. 2 it is simplified into the shorter name time value of money. We see the curves do not cross. The blue graph is always above the red line or they are identical. This confirms that the percentage of part-time students dominates that of the full-time students. The right-hand side of Fig. 2 illustrates the empirical cumulative distribution functions for the number of correctly answered questions in the category decision making. It is clear that the situation is very similar to that on the left-hand side. It means the percentage of part-time students dominates full-time students. This dominance is in the sense of first-order stochastic dominance in both cases. It confirms the higher average percentage for part-time students.
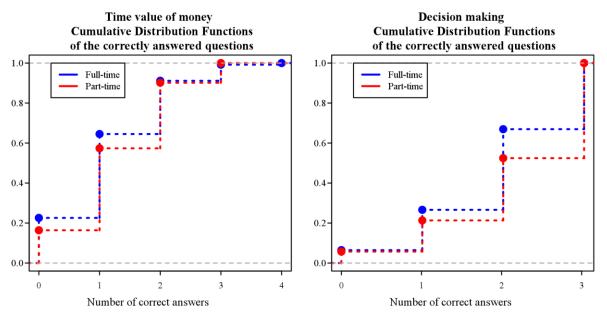

Fig. 2. Graphs of the empirical cumulative distribution functions of the numbers of correctly answered questions. On the left-hand side the category of simple interest and inflation perception and on the right-hand side the category of decision making. (Source: own elaboration)

Fig. 3 illustrates the empirical cumulative distribution functions for the correctly answered questions in the remaining two categories. The left-hand side graph supports rejection of the zero hypotheses for the average percentages in the category annuities and debt repayment. Here it is evident that the number of questions answered correctly by the part-time students dominates over the full-time students in the sense of first-order stochastic dominance. However, on the right-hand side of Fig. 3 we see that the graphs of the cumulative distribution functions intersect at point 1. Moreover, the cumulative area of the two rectangles with the red line as the upper bound is much greater than the area of the rectangle with the blue upper bound. That means breaking both rules of stochastic dominance in the category of investments and risk. Therefore, neither of the groups is better in this category.

We are also interested to know if the percentages are distributed uniformly across all four categories. We feel by intuition that it is unlikely, but we have to back up this feeling with formal proof. We used the Welch t-test to test the equality of average performances between categories. In Table 1 we summarize the results of the tests for all category pairs conducted each to each.

In the questionnaire, we also asked the respondents to say which of the questions they considered to be the easiest and which of them seemed to be the most difficult problem. Surprisingly, there was a rare match in the answers of both groups. Approximately one-fourth of the full-time students and one-fifth of the part-time students decided the easiest question was the following:

A debt of 100 financial units matures within one year. The creditor agrees with repaying it by two equal

payments six months and one year from now. These two payments will be: a) exactly 50 financial units, b) more than 50 financial units, c) less than 50 financial units, d) I do not know, I do not want to answer.
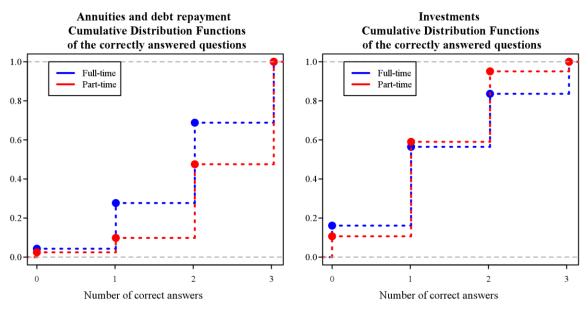

Fig. 3. Graphs of the empirical cumulative distribution functions of the numbers of correctly answered questions. On the left-hand side the category of annuities and debt repayment and on the right-hand side the category of investments and risk. (Source: own elaboration)

Both groups also reached the same verdict on the most difficult question with 37.4% of the full-time students, and 34.2% of the part-time students selecting the following problem:

> Peter, Paul, and Patrick were born on the same day. Peter will start saving at the age of 25. He begins to deposit €25 per month in the savings account. He will stop accumulation after 20 years, but he will leave the money in his account. Paul will save the amount of €25 at the age of 25 years, however, he will cease after 10 years. He leaves money in the account and continues raising the funds of €25 per month from the age of 55. Patrick will not make any savings at all for the first twenty years. He will start by saving of €25 a month to 20 years before his retirement. All three accounts bear an interest rate of 5% per annum. Who of them will have the highest amount reimbursed when retiring at the age of 65? a) Peter b) Paul c) Patrick d) they will have the same e) I do not know.

However, the students' answers to these problems show interesting paradoxes. The problem declared to be the easiest was answered correctly by only 1.8% of the full-time students and 0.1% of the part-time students. On the contrary, 42% of the full-time students and up to 60.7% of the part-time students gave a correct answer to the problem reckoned to be the most difficult.

5 DISCUSSION

The results of our research highlighted a very interesting paradox, namely that students of both full-time and part-time study very frequently identified the easiest and the most difficult question incorrectly. The possible solution coincides with a situation that we frequently encounter when teaching. If students consider a problem to be easy, they underestimate the preparation and reflection needed to solve the problem. They do not think about the seemingly simple question so thoroughly and quickly deliver an intuitive but incorrect response. On the other hand, they think in depth about the problems stated in a more complex form and so they find the correct solution. This phenomenon also affects the sale of products in financial and other markets. If the consumer is offered an easy solution to meet his or her needs which are underpinned by comprehensible claims, it is easier to excite buying behaviour. Rationality and bid verification become suppressed. The reason may be laziness, but also lack of time and the need to solve a problem with the minimum energy input.

Therefore, developing a logical and systematic approach must be part of the teaching of financial subjects. Appropriately chosen examples can then illustrate to students that underestimating the complexity of a given task or example leads to needless mistakes that have an impact on corporate and personal finances.

The authors found the worst results in the question that the respondents identified as the easiest problem in the questionnaire survey. This question focused on the influence of the time factor in decision making.

Students in both forms of study simply ignored the effect of time in a short period of time, which is quite a big mistake. All the financial processes are built on the time factor. This provides an opportunity to explain this issue to improve students' level of financial literacy.

When explaining the time value of money in the financial management of a company and households, practical examples from everyday life can be applied. As part of the discussion, it is advisable to encourage students to come up with a few examples where they encounter time as a factor. Then you can practice the examples and case studies from a wide range of areas, which include e.g.:

- Buying and selling goods with margins

- Depositing funds on a current or savings account,

- Saving money on an account or investing in business development,

- the use of consumer credit for households,

- The use of operating credit in business financing and many other examples.

Table 1. Results of the Welch *t*-test about zero difference between mean percentages by the categories (Source: Own elaboration)

Form of study	Category	Mean	*t*-statistics	*p*-value
Full-time	Time value	30.64%	-18.954	$< 2.2 \cdot 10^{-16}$
	Annuities and debt	66,40%		
Part-time	Time value	34.02%	-15.504	$< 2.2 \cdot 10^{-16}$
	Annuities and debt	80.05%		
Full-time	Time value	30.64%	-8.547	$< 2.2 \cdot 10^{-16}$
	Investments and risk	47.94%		
Part-time	Time value	34.02%	-3.7182	0.000125
	Investments and risk	45.08%		
Full-time	Time value	30.64%	-18.539	$< 2.2 \cdot 10^{-16}$
	Decision making	66.67%		
Part-time	Time value	34.02%	-11.684	$< 2.2 \cdot 10^{-16}$
	Decision making	73.50%		
Full-time	Annuities and debt	66.40%	8.3947	$< 2.2 \cdot 10^{-16}$
	Investments and risk	47.94%		
Part-time	Annuities and debt	80.05%	11.131	$< 2.2 \cdot 10^{-16}$
	Investments and risk	45.08%		
Full-time	Annuities and debt	66.40%	-0.12649	0.4497
	Decision making	66.67%		
Part-time	Annuities and debt	80.05%	1.8596	0.0321
	Decision making	73.50%		
Full-time	Investments and risk	47.94%	-8.3316	$< 2.2 \cdot 10^{-16}$
	Decision making	66.67%		
Part-time	Investments and risk	45.08%	-8.0456	$< 2.2 \cdot 10^{-14}$
	Decision making	73.50%		

In all these examples the input amount to obtain the required output must be higher in proportion to the benefit obtained. For example, when financing credit operations it is clear that the cost of capital has to be reflected in the price to ensure the margins have the required level. Further study, such as work with interest/profitability etc., loosely follows from this. The lesson students must absorb is that time value is a

normal part of life.

Another possibility is that the example appeared too simple to the students because of its easily imaginable numbers, which automatically led them to a simple answer, which, as mentioned earlier, can be understood as an interesting behavioural shortcut that can be appropriately highlighted in practical lessons. In their practice, the authors encounter and use different levels of complexity of examples and different case studies, where students simultaneously analyse their approaches to solutions and discuss the suitability of the methods applied in solving problems. They encounter the fact that, under moderate time pressure, students choose the easiest solution to a problem, or they are afraid to decide. This behaviour strongly resembles the described approach to the incorrect resolution of the seemingly easiest question.

Conversely, when assessing the most difficult question, students are likely to read more carefully due to the length or apparent complexity of the text of the question. At the same time, they are cautious and expect the use of more sophisticated solution methods. This logically results in higher success in answering the question. This can explain the better results in more challenging categories of financial literacy.

Comparing the percentages of the two groups of students, we observe a strong dominance of the part-time students' group over the full-time students' group. They dominate in all areas of financial literacy apart from one category. We can explain it by the age structure of the two groups of students. Table 2 presents the elementary characteristics of the age structure of these groups. There is not only a marked shift in the average (median) age but also the overall age range. As can be seen, the youngest respondents from part-time students are at the level of the third quartile of the full-time students. It is natural that higher age brings more experience and more rational decision-making.

Table 2. Elementary sample characteristics of the ages in both groups (Source: Own elaboration)

Form of study	Age characteristics					
	Mean	Median	1-st quartile	3-rd quartile	Minimum	Maximum
Full-time	20.47	20	20	21	18	26
Part time	31.33	25.25	30	37	21	55

The finding that financial literacy improves with increasing age is not uncommon. Our result is consistent with the results presented in (Lusardi & Mitchell 2011a, 2011b). They state that "The young and old are less financially literate than the middle-aged, and more educated people are more financially aware." An extensive study (Lusardi, Oggero & Yakoboski, 2017) reported similar results. Questions based on the p-fin index were answered by only 40% of respondents in the lowest age group, while in the 45-59 age group, 54% of the respondents answered correctly. This is evidence that a certain amount of empirical knowledge cannot be compensated by theoretical preparation.

6 CONCLUSION

Our research has shown that full-time students lag behind part-time students in many aspects of financial literacy. This difference can be mitigated to a certain extent by setting problems more closely related to practice. When other research is taken into account, however, it is clear that this difference cannot be completely eliminated.

We have also seen that in both groups of students, the greatest weaknesses are reflected in the very foundations of financial literacy, that is to say, the perception of time as a factor generating value. This message is addressed mainly to lower grades of education, since students do not arrive at university as a blank slate, but are expected to have a basic working toolkit of knowledge. Pre-university training must cover not just theoretical interpretations and definitions of financial concepts of the type "What is it" but also an understanding of "How does it work". It is then necessary to continue in a similar spirit at universities and fix into the subconscious of the students the well-known truth that time is money.

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