

# STATISTICAL ANALYSIS OF FINANCIAL KNOWLEDGE, ATTITUDES AND BEHAVIOUR OF THE HIGHER EDUCATION STUDENTS IN SELECTED COUNTRIES AND SLOVAKIA

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## Abstract

Over the past years, financial knowledge, skills and understanding the financial information has moved mainly due to world financial crisis and need for consumer protection into centre of interest of many countries. National and international public authorities, as well as private institutions and organizations have been and are currently developing a number of initiatives helping improve financial education and literacy standards. Several international studies and national surveys have published their findings on the financial literacy. The aim of the paper is to review, compare and analyse selected issues of available financial literacy surveys' data or their conclusions about financial knowledge, attitudes and behaviour of the population, particularly of population of higher education students in selected countries. Comparing levels of FL across countries as well as across different determinants of financial literacy makes it possible to see which countries or which groups perform best and begin to identify effective strategies and good practices. Findings of the original Slovak higher education students' financial literacy research are confronted with the foreign situation as well as among different subgroups of Slovak students.

**Key words:** financial literacy, financial education, financial knowledge, higher education

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## Introduction

Technological progress and political dominance of ideology supporting deregulation and free market enabled in economics to create and profit from more complex and riskier financial products offered to wider range of people. Such trend has significantly changed actual financial market using new financial services and products and allowing own financial decisions of consumers. These tools and individual control, however, relates also with higher

responsibility for the appropriate financial decision-making or with necessity to confront potentially inauspicious solutions of financial or property issues.

Nowadays households have to make decisions to a greater extent in all areas of personal finance from loans through insurance to retirement planning. Formerly public retirement insurance have ensured most of the citizens in present individual decisions are required about how much of retirement contribution they would save and how much they would invest, if people plan about retirement funding at all. In the past lending institution required implicitly from their clients proofs of sufficient income for covering mortgages or consumer loans with respect to other financial liabilities. In present there is an offer of loan product without the need to guarantee, or evidence or secure the loan or only with a minimum of evidence. Consumers have to decide by themselves what payments they can afford with respect to risk of losing their homes.

Almost unlimited financial products and services offerings to consumers together with the increasing number of financial subjects providing loans, insurance and investment services have being developed for a long time in developed countries until the time when the products and services have become so complex and consequences of inability of consumers to understand them already intolerable.

It's been always true and today even more that correct decisions can be made only on the basis of good knowledge and experiences. Therefore, one of the prioritized solutions of current socio-economic problems is increasing of the level of the financial knowledge and practical skills of the populations.

Evaluation of the financial education, practical skills level and financial attitudes and behavior of population is the aim of many national and international surveys as well as the aim of the project of the Slovak scientific grant agency with the title „Financial literacy (FL) of Slovak higher education (HE) students. Proposed paper is a partial study of the research project.

## **1 Defining and measuring financial literacy**

Financial literacy definitions have been summarized in different research works of financial literacy; the most comprehensive review of published research during the term between 1996 and 2008 that included financial literacy/financial knowledge/consumer /economic literacy (used interchangeably) measures was compiled by Huston in 2010. Her research outcomes offer some definitions. The newest comprehensive study aimed at the term FL was done by

Oanea and Dornean (2013) by reviewing the literature and international looking for the definition of terms “financial” and “literacy”, for a better understanding of meanings of these two concepts. Their definition is brief and clear with the emphasis on the financial awareness: “Financial literacy implies a persons’ minimal knowledge about financial terms such as money, inflation, interest rate, credit and others, but besides this the abilities and skills of that person to use all this information in personal life, being aware about the consequences of its financial actions.”

Some published definitions of FL incorporate also personal attitudes towards financial issues of saving, borrowing, investing and securing and active performing on financial market, e.g. Dvořáková (2009) in Tomášková, Mohelská, & Němcová (2011). Attitudes and personal experiences with financial tools can affect personal behavior on the financial market, but using them as a factor in measuring the FL can distort the overall measure.

Identifying and quantifying the factors of FL, the relations among them and their impact on FL summary indicator is still not the resolved problem. Commonly rate of correct answers on interviewed or surveyed questions are computed. Another negative of FL measure concept is inconsistency in question sets in surveys or at interviews, which are influenced according to subjective FL concept perceived by researchers. Not all studies cover all financial areas. Questions have different difficulty level, they are used in different quantity and they are assessed by different methods, which, i.e. may or may not consider missing replies for incorrect answers or they can reduce sample size for corresponding question. Reliability of the questionnaires is mostly not estimated as it may be low due to a higher dimensionality of the financial literacy questions. Results of the different surveys are usually therefore incomparable and comparability among different populations can be allowed only by using identical question sets.

## **2 Financial literacy research**

Research about financial literacy, together with studies, in which Slovakia is included, shows weaknesses in financial matters understanding as well as overestimation of the own financial knowledge among adults in reality in every country (Atkinson & Messy, 2012; Balaz, 2012; Harris, 2012; Huston, 2010; Lusardi & Mitchell, 2011; STEM/MARK, 2010).

Most of the published studies focused at FL of adults most often within single country. Their conclusions state that adult respondents who completed courses of financial education

showed higher chance of savings accumulation and retirement planning, it means that positive changes towards responsible behaving took effects.

According to research higher level of FL corresponds with better personal finance management as well as with greater extent of investors' entrance on the stock market with portfolio chosen and controlled more efficiently. Financially literate people have higher chance to accumulate more wealth. Higher level of FL is not connected only with assets creation, but also with debts and their controlling. Literate citizen are able to avoid high interests and additional fees. It is supposed that FL has its impact on economic stability, supports competitiveness and market innovations.

At the other side, in the area of endeavoring to improve FL, however, some authors identifies some negatives resulting from undemocratic foisting liberal or neoliberal concept of freedom concerned solely on technical issues of economical parameters, what has to lead to persistent personal uncertainty (Arthur, 2012); or in consequences of increasing the financial education some consumers, financial education appears to increase confidence without improving ability, leading to worse decisions (Willis, 2008).

For the purpose of comparison and identification of relevant and potentially applying best practices in financial education leading to raising the level of FL of the population it is necessary to standardize the evaluation with respect to regional specificities and in addition to determining the level of FL also to analyze the factors affecting examined knowledge of the respondents. So far, the most extensive studies about current FL aimed at international comparisons are initiatives of the World Bank (Rutledge, 2010) and the Organization for Economic Cooperation and Development (OECD) (Atkinson & Messy, 2011, 2012). Tullio Jappelli (2010) did an extensive analysis of available economic determinants of literacy based on data from 55 countries from 1995 - 2008.

Although these additional surveys are more or less differentiating in target groups of respondents, measurement approach and methods used, it is possible to identify common findings, and these are the above-mentioned low level of FL, literacy correlated with educational attainment and higher scores for self-evaluation of their own knowledge and skills in finance that have been objectively evaluated. Surveys also show that FL tends to be related with higher incomes and wealth of the respondents.

Given the expectation that young people will face more and more complex financial products and services and being adult they will bear greater financial risks than their parents about saving and planning for retirement or to cover their health needs, Governments of different countries have approved documents, in Slovakia it was the National Strategy for

Financial Education (approved in 2008) (MESR & MFSR, 2008)) and the OECD incorporated into the regular PISA tests of 15-year-olds (including Slovaks) also questions about financial knowledge, attitudes and skills (OECD, 2012). The results will be published during 2013.

HE students have had potentially sufficient time for obtaining knowledge in the field that relates to every person regardless of his/her focus of study. Most of the information and financial knowledge they could learn during two stages of education and starting the third one. Maybe absence of practical experience manifests in unexpected poor average test results of FL of HE students all around the world, as it is shown below.

### **3 Financial literacy of higher education students**

Several bellow summarized selected studies have dealt with the FL of specific cohorts of population of HE business students (Tab. 1). In the table there are presented outcomes of FL ratings of HE students evaluated by different research groups using different questions. To enhance the comparability of the studies only business HE students and only one basic question of the survey about computing simple or compound interest are being compared (correct answers percentages are marked with asterisk \* in Tab.1). Only in this one question's rating there is the difference between the most and the less successful ratio of correct answers of 71,5 percentage points. If we would not consider Ghanaian research because of additional specific conditions applicable only to this case (i.e. respondents were just enrolled business students - high school graduates and question about interest computing demanded compound instead of simple interest computing) there would be the difference between the most and the less successful ratio of correct answers of 10,6 percentage points. The difference between the highest and the lowest correct answer percentages of the whole survey of FL including all questions (with Ghanaian's survey not included) is 24,8 percentage points. Unequal evaluation periods, different sets of surveys' questions, different number of questions (influencing weighting of simple or conversely difficult questions), and usage of questions about attitudes where one cannot say whether the answer is correct or not - those are factors that influence the comparability of the research results as well as its overall significance.

As it was suggested, international FL comparison using existing research results is not appropriate unless it is coordinated among researchers or it is done by one institution as it is the case of OECD Programme for International Student Assessment, concerning the 15 year-olds (OECD, 2012) also Slovaks, but with results not yet published or International Network on Financial Education (Atkinson & Messy, 2011), in which Slovakia is not participated or

World Bank activities manifested in work focusing at consumer protection in nine countries including Slovakia (Rutledge, 2010).

**Tab. 1: Correct answers per cents in several different surveys of business higher education (HE) students' financial literacy**

Mean percentage of correct answers of business students correct answers of question about simple / compound interest computing (whole sample) *	%
(Ansong, 2011) : <b>Ghana</b> 1 university (1st year of study) – 20 question without attitudes scoring 343 students of 1 <sup>st</sup> year of study (response rate 100%); Business students – 100% <b>compound interest</b>	35,9 *18,0
(Bačová, Čonková, & Bričová, 2013) : <b>Slovakia</b> 16 HE institutions, 17 question without attitudes scoring 279 students (response rate 100%); Business students – 100% <b>simple interest</b>	57,8 *78,9
(Tomášková et al., 2011) : <b>Czech Republic</b> 1 HE faculty – 40 questions including attitudes scoring 170 students (response rate 100%); Business students – 100% <b>simple interest</b>	<50,0 *80,0
(Lusardi, Mitchell, & Curto, 2010) : <b>USA</b> Several HE institutions – 3 questions of financial literacy without attitudes scoring. Precise number of business students taken into account is not known (whole sample: 7138 respondents) <b>simple interest</b>	68,9 *84,1
(Oanea & Dornean, 2013) : <b>Romania</b> Several faculties of Economics – 12 questions with attitudes scoring 200 students (response rate 100%), Business students - 100% <b>simple interest</b>	74,8 *89,5

Source: authors

#### **4 Determinants of the financial literacy of Slovak higher education students**

Subsequent part of the paper analyses findings of the research conducted among HE students in Slovakia summary results of which are processed in work of Bačová et al. (2013). The research is part of the preparatory phase to extensive investigation of FL level among HE students in Slovakia.

The survey was joined by 695 students (68,5% of them were women and 31,5% were men) from 9 different fields of study. At this stage an impact of gender and field of study will be analysed using T-test and ANOVA.

##### **GENDER**

Similarly to other FL studies T-test revealed that a significant difference exists between FL of male (mean FL of men = 0,573 (57,3%), standard deviation = 0,135 ) and

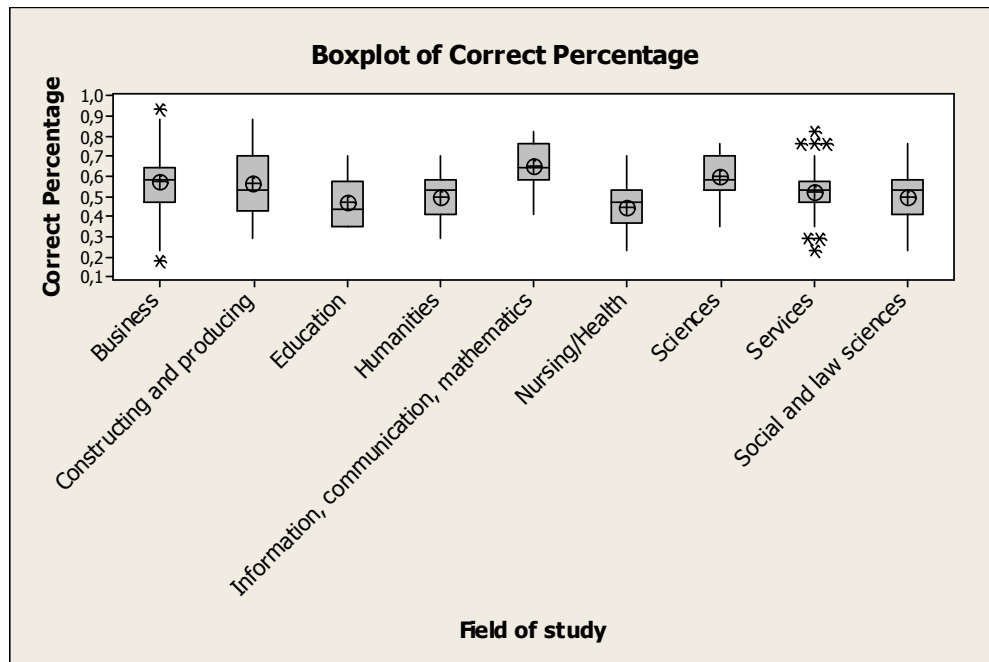
female respondents (mean FL of women = 0,52 (52%), standard deviation = 0,128) , T-Test of difference = 0 (vs not =): T-Value = -4,89, P-Value = 0,000 DF = 402.

Women's score is worse than men's because in general women are probably less interested in the topics of investment and personal finance.

#### FIELD OF STUDY

The distribution of respondents according to their correct score and Field of study is presented in Fig. 1. It is evident that respondents in Field of study such as Education, Humanities, Nursing/Health, Services and Social and law sciences have lower mean level of FL and students of Business, Constructing and Producing, Sciences and mainly Information, communication and mathematics shows better abilities in FL.

**Fig. 1: Distribution of correct answers percentage according to Field of study**



Source: authors

In order to determine whether there are statistically significant means differences of FL scores of all respondents by Field of study, one-way analysis of variance (ANOVA) with Tukey post-hoc test was conducted. Homogeneity of variance was statistically significant.

Scores of FL of students were statistically different among groups with different fields of study,  $F(8; 686)=12,21$ ,  $p=0.000$  (one respondent has not revealed his field of study). Adjusted R-sq =11,45%.

Although unequal group sizes in Tukey post-hoc test result in slightly smaller true family error rate than stated, the post-hoc analysis revealed that students of Information, communication, mathematics and Business, the two fields with highest mean correct answers percentages had significantly different FL (65,49% and 57,79% respectively), and students studying Services (mean=52,25%) and students studying Nursing/Health (mean=44,8%) are also significantly different from other groups.

**Tab. 2. One-way ANOVA summary of field of study mean comparisons on Financial Literacy**

One-way ANOVA: Correct Percentage versus Field of study					
Source	DF	SS	MS	F	P
Field of study	8	1,5184	0,1898	12,21	0,000
Error	686	10,6619	0,0155		
Total	694	12,1803			
S = 0,1247 R-Sq = 12,47% R-Sq(adj) = 11,45%					
Grouping Information Using Tukey Method					
Field of study	n	Mean	Grouping		
Information, communication, mathematics	15	0,6549	A		
Sciences	12	0,5980	A B C D		
Business	79	0,5779	A		
Constructing and producing	24	0,5686	A B C D		
Services	60	0,5225	D		
Humanities	35	0,5025	C D E		
Social and law sciences	212	0,5006	B C D E		
Education	6	0,4706	A B C D E		
Nursing/Health	52	0,4480	E		
Means that do not share a letter are significantly different.					

Source: authors

This study is not without limitations. The sample is not conducted proportionally by random selection, but using a convenient sample could have its value for the preliminary testing of the main survey.

## Conclusion

The paper is a partial output of the currently solved research focused on the level of financial literacy among the higher education students. In this part of the preliminary study a comparison of financial literacy among results of different studies was identified as not



applicable. A comparison among Slovak higher education students of different gender and fields of study was performed. Results of our research confirmed the findings also of other researchers.

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