

# ON THE REGIONAL DIFFERENCES IN FINANCIAL LITERACY OF THE UNIVERSITY STUDENTS\*

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**Abstract:** *Financial literacy belongs to the key components of education for life in modern society and its importance grows every day. Various research studies on this issue have shown that there is a gap among the different sections of people such as men and women, young and adults, rural and urban and also many other categories of people. This article focuses on the university students in former Czechoslovakia that has before 25 years been split into two separate countries. The questionnaire survey method was applied to determine the average score of financial literacy among the students of six different universities. The statistical analysis has shown a surprising significant shift between both countries and as well between regions.*

**Keywords:** *Financial literacy, questionnaire survey, university students, Czech Republic, Slovakia.*

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## 1. INTRODUCTION

Our lives in the modern world are full of decisions, and many of them have financial consequences. Some of them are routine everyday decisions, like deciding whether to go into the work by public transport or to walk. In the evening we can decide whether to eat at home or go out for dinner. Besides these simple situations, we less frequently meet situations with deeper consequences. We have to decide if accept or refuse new job opportunity, we select a bank, where to keep our personal finance. Only a few times in our life we decide in situations with whole life consequences, like participating in the pension schemes. How the world, and especially the financial markets, and financial products become more complex, these decisions require a more sophisticated approach, higher level of financial knowledge and skill. By other words, it requires a growing level of financial literacy.

The financial literacy is in general considered as the ability to comprehend finance. A growing number of research works provide alternative approaches to the notion of the financial literacy. For example Giesler & Veresiu define in [1] the 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. Mandell in [2] defines, that financial literacy is „the ability to evaluate the 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”. For purposes of our article, we adopt the concept of the financially literate person in accordance with [3]. „It is a man 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.”

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More studies have documented geographic differences in financial literacy. We can mention [4] where is presented the geography of the financial literacy in the USA. The results show that “The states with the highest levels of financial literacy tend to be located across the northern half of the country, while the states with lowest levels of financial literacy are in the eastern and southern parts of the country.” The results of this study also show negative correlation between the financial literacy average score and the poverty level in the single states. Research work [5] has documented geographic differences in financial literacy among Italian regions. They have shown, that industrial Northern regions prove higher level of financial literacy than Southern regions. Similarly, Klapper & Panos studied in [6] large geographical disparities in the level of financial literacy in Russia. The authors have proved that these disparities can be explained by living in urban and rural areas.

The present paper focuses on the situation in the Czech Republic and in Slovakia. One of the aims is to compare the situation in both countries, which formed one federation in recent history. Former Czechoslovakia split into two sovereign states 26 years ago, so we are interested in possible changes. The second aim is to compare the development in the urban and rural regions in both countries and identify the differences if any.

## 2. METHODS

In order to obtain necessary data about the financial literacy of the university student, we have applied the questionnaire survey method. The questionnaire included two sections, one of them concerned in the socio-demographic information and the second part contained a set of questions that focused on the financial problems. The first part of our questionnaire included questions about the age, gender, field, and form of study (full-time or part-time) and residence of the respondents. We collected as well as information about their previous financial education and their attitudes to financial literacy, namely the importance they accredit to financial literacy and their self-appraisal.

The problems solved in the second part have covered the following four categories of financial literacy:

- Time value of the money and inflation perception,
- Annuities and debt repayment,
- Investments and risk,
- Decision making.

All problems were presented in the form of the multiple-choice questions with four response options. Only one of the options was always the correct answer, two options were the incorrect answers, and the last choice was an „I do not know” option.

Our aim was to detect, compare and explain the regional differences in financial literacy. It was interesting to compare average scores in both countries as they formed one whole in recent history. So, we can observe some differences in financial literacy development in the last decades. Therefore, our first step was comparing the average scores attained in Czech Republic and Slovakia.

In the sake of attaining relevant results, we have selected from our sample only the regions with at least 40 respondents. After calculating the average scores of correct answers for each research participant we are ready to apply the statistical testing of our research hypotheses.

To compare the average performances between single regions we have used the Welch two sample t-test in the form of one side alternative. It enabled to compare the selected regions each to each. In order to compare all selected regions, we put in use method of analysis of variance and Tukey HSD test.

### 3. RESULTS

We conducted the research at six universities and we targeted the students of similar study programs. The questionnaires were completed by management students and informatics students in both full-time and part-time study. So, we collected 1 031 filled questionnaires from 1 250 distributed items. It represents a relatively high response rate of 82.48%.

The sample contains 637 students with residence in the Czech Republic and 394 students with residence in the Slovak Republic, which is approximately proportional to the ratio of the inhabitants in both countries. Among the respondents, there have been 494 students of the management science and 537 students of the informatics. What is concerning the gender, there was 625 males and 406 females.

The first challenging question was to examine the difference between Czech and Slovak students. We summarize the results of the Welch t-test in table 1. We see the average score in Czech Republic is 50.4%, while in Slovak it makes only 43.1%. The corresponding  $p$ -value is less than  $10^{-8}$ , so we can reject the zero hypothesis about the performance differences. On the contrary, we can with a very high confidence level conclude, that the average performance in the Czech Republic is significantly better than in Slovakia.

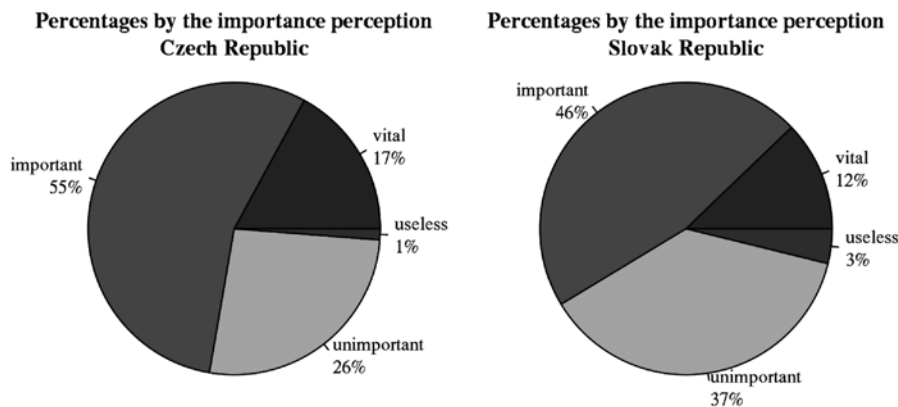


Figure 1: Percentages of the population in Czech Republic and Slovakia according to financial literacy importance perception. (Source: own elaboration.)

Country	Mean	t-statistics	p-value
Czech Republic	50.43	2.8548	0.006468
Slovakia	43.07		

Table 1: Results of the  $t$ -test for equality of the average scores in Czech Republic and Slovakia. (Source: own elaboration.)

In order to explain possible reasons for the difference in the scores, we analyzed both samples by the importance of financial literacy perception. The percentages are graphically presented in figure 1. We can easily recognize, the portions of students that consider financial literacy to be vital or important, are much higher in the Czech Republic. We confirmed these findings by Z-test of the population proportions. The results are outlined in table 2.

<i>Importance level</i>	<i>Country</i>	<i>Percentage</i>	<i>Z-statistics</i>	<i>p-value</i>
Vital	Czech Republic	17.04	3.1323	0.03838
	Slovakia	12.18		
Important	Czech Republic	55.23	5.5016	0.009499
	Slovakia	46.47		
Unimportant	Czech Republic	26.49	10.31	0.0006616
	Slovakia	37.50		
Useless	Czech Republic	1.23	4.774	0.01445
	Slovakia	3.85		

Table 2: Results of the Z-tests for the population portions according to financial literacy importance levels perception. (Source: own elaboration.)

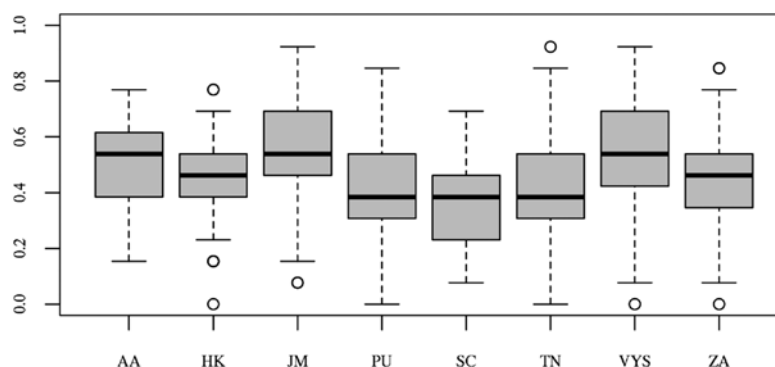


Figure 2: Box plots for the financial literacy scores by regions. Region names abbreviated: AA=Prague, HK=Hradec králové, JM=South Moravia, PU=Pardubice, SC=Middle Czech, TN=Trenčín, VYS=Vysočina and ZA=Žilina. (Source: own elaboration.)

As we have already mentioned, we requested for at least 40 respondents, to include the region in a comparison of the differences. Only six self-governing regions in the Czech Republic and two regions in Slovakia have met this criterion. In the Czech Republic, it was explicitly Prague - the capital city, the Central Bohemian region, the Hradec Králové Region, the Pardubice Region, the Vysočina Region, and the South Moravian Region. Only two, the Žilina and Trenčín regions, fulfilled this condition in Slovakia. The average scores are summarized in table 3.

<i>Region</i>	<i>Average score</i>	<i>Region</i>	<i>Average score</i>
Prague	51,6%	Middle Czech	39,6%
Hradec Králové	46,5%	Vysočina	55,2%
South Moravia	55,5%	Trenčín	42,4%
Pardubice	42,3%	Žilina	44,8%

Table 3. Average scores attained in single regions. (Source: own elaboration)

The box plots in figure 2 illustrate graphically the distribution of the scores achieved in the single regions. There we can observe that participants in three regions, namely Prague, South

Moravia and, Vysočina region attained better results than the other. We confirmed this opinion by Welch t-test, whose results are presented in tables 3-5. We confirmed this opinion by Welch t-test, whose results are presented in tables 4-6. Due to a large number of pairs we had to compare, we present here only the pairs, where the zero hypothesis was rejected. On the opposite side of the results, we see another three regions, namely Middle Czech, Pardubice and, Trenčín. The box plots in figure 2 show the lower value of the attained scores median.

<i>Region</i>	<i>deg. of freedom</i>	<i>t-statistics</i>	<i>p-value</i>
Hradec Králové	83.677	1.5122	0.06712
Middle Czech	78.995	3.1981	0.0009955
Pardubice	78.707	2.8391	0.002877
Žilina	51.548	2.3826	0.01046
Trenčín	86.051	2.732	0.003818

Table 4: Results of the *t*-test for the average scores in the Prague region and regions with significantly worse results. (Source: own elaboration.)

<i>Region</i>	<i>deg. of freedom</i>	<i>t-statistics</i>	<i>p-value</i>
Hradec Králové	122.11	3.7317	0.000145
Middle Czech	58.957	5.4552	$5 \cdot 10^{-7}$
Pardubice	162.2	5.8522	0.000013
Žilina	380.66	6.6399	$5 \cdot 10^{-11}$
Trenčín	150.29	5.4495	$1 \cdot 10^{-7}$

Table 5: Results of the *t*-test for the average scores in the South Moravia and regions with significantly worse results. (Source: own elaboration.)

<i>Region</i>	<i>deg. of freedom</i>	<i>t-statistics</i>	<i>p-value</i>
Hradec Králové	65.875	2.1416	0.01797
Middle Czech	72.232	3.5596	0.0003307
Pardubice	61.557	3.2388	0.0009683
Žilina	45.43	2.8548	0.003234
Trenčín	66.366	3.1544	0.001208

Table 6: Results of the *t*-test for the average scores in the Vysočina region and regions with significantly worse results. (Source: own elaboration.)

Performing the analysis of variance and Tukey HSD test enables to divide the regions into three disjoint groups. These groups contain comparable regions with average scores that do not significantly differ. These groups together with corresponding confidence intervals for the true difference in average scores are presented in table 7. Due to a large number of all pairs, there are present only the cases, when the zero hypotheses are not rejected and the 95% confidence interval contains 0.

From the results we easily see there are three groups of regions with similar average performance. The first group, with the highest level of financial literacy contains the regions of south Moravia, Vysočina and Prague. All these three regions have achieved higher average score than whole state average. The regions Hradec Králové, Pardubice and Žilina form the second group. Two of them are Czech and their average performance is under the whole state average and Žilina attained average score higher than whole Slovakia average. Remaining two regions – Middle Czech and Trenčín form the third group with the worst results. Their averages are deep under the whole state averages.

<i>Regions</i>	<i>Difference</i>	<i>Lower bound</i>	<i>Upper bound</i>
Pargue – South Moravia	-0.03920	-0.12179	0.04338
Prague – Vysočina	-0.03598	-0.14251	0.07056
South Moravia – Vysočina	0.00323	-0.08020	0.08665
Hradec Králové – Pardubice	0.04139	-0.03701	0.11980
Hradec Králové – Žilina	0.01697	-0.04845	0.08239
Pardubice – Žilina	-0.02442	-0.08500	0.03615
Middle Czech – Trenčín	-0.02784	-0.11993	0.06425

Table 7. True differences and 95% confidence intervals for the average scores' differences for single regions. Only regions with statistically significant different average scores included.  
 (Source: own elaboration)

#### 4. DISCUSSION

When the results are compared by nationality, they show better results for Czech students. This advantage arises partly from the fact that the Czech Republic has implemented a national financial literacy strategy. This strategy is in details presented in [7] p.1177, Table 1. The next significant characteristics of the Czech respondents is the higher importance level they attribute to financial literacy. How stated in (Kozubíková, 2017): „An important factor influencing the progress in financial literacy during education, we have detected the importance that the respondents attribute to the financial literacy”. Thus, comprehending the importance of financial literacy can be crucial to the wasting of the gap between the two countries.

This statement is in accordance with results of the Z-test that rejected the hypothesis with the confidence level of 99%. It means, there is a big deficit in Slovakia in comprehending the importance to be financially literate. We have tested the university students who do not come to university as a blank slate. Therefore, the result shows that there is a large area for financial education at lower degrees.

If we compare individual regions that have achieved comparable results, we can see some common features. For the regions of Prague and South Moravia, there are large metropolises in their center. These are Prague, with more than 1 million citizens and Brno with approx. 0.5 million citizens. These metropolises become industrial centers with dynamic development. The emergence of major business centers gives more opportunities for contact with the financial sector and its modern tools. In addition, several universities are deployed and are also centers of education. Thus, the population has more opportunities to gain practical experience that contributes to higher financial literacy.

The second group with comparable results is formed by the regions that have regional capitals in their center. These regional centers have about 100 000 inhabitants. Each of them is the domicile of the university. Their industrial development is not as dynamic as the two major metropolises mentioned above. Actually, they are economic centers, with many large multinational investment projects in their vicinity.

For the last two regions, it is characteristic they do not have such prominent metropolises in their center. Prague is the regional capital of the Central Bohemia Region, but it is excluded as a separate region. Trenčín is a significantly smaller town than other regional capitals. Therefore, we can consider these two regions to be more rural than the others.



A remarkable exception is the Vysočina Region. This county corresponds, in all its characteristics, to the rural region. Its population density is the lowest in the Czech Republic. The share of urban population is also the lowest among all regions. Nevertheless, the average level of financial literacy reached the second highest level. This result included the Vysočina Region in the highest category.

The results of the descriptive statistics have shown, that there are regional disparities in financial literacy. Consistently with the foreign studies [4] – [6], we see the geographical distribution of financial literacy resembles quite closely that of economic development and industrial activity. This result is consistent also with the cross-country evidence of [9], showing a positive link between economic literacy and economic development.

## 5. CONCLUSION

Our research has confirmed two important facts. At first, the average score in financial literacy is significantly higher in the Czech Republic. This is the result of the educational strategy implementation and consequently higher importance that is attributed to the ability to be financially literate. At the same time, the research confirmed a higher level of financial literacy in the developed urban areas. This geographical distribution of financial literacy is consistent with other worldwide researches. This difference can be mitigated to a certain extent by more consistent implementation of the financial education program in rural schools of all grades.

Findings of our study provide some useful suggestions for policymakers and practitioners interested in targeting the better level of financial literacy. Better understanding the origins of the geographical differences in financial literacy is one of the possible directions of future research.

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