Iris Lončar [a]
Tonći Svilokos [b]

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Differences and Similarities in Financial Knowledge between High School Students in Croatia, Bosnia and Herzegovina and Montenegro

Abstract

The financial literacy of young people is central to future economic development, as it affects not only their personal well-being but also the sustainable growth of society as a whole. This study aims to assess financial literacy, or more precisely its component, financial knowledge, among high school students in Croatia, Bosnia and Herzegovina and Montenegro. The following hypotheses will be analysed: (i) there is a significant gender gap in financial knowledge, favouring male students, (ii) there is no statistically significant difference in the level of financial knowledge among students from the three countries, regardless of grade level or source of financial knowledge acquisition, and (iii) students with work experience and income have higher levels of financial knowledge than their peers. Data were collected from 350 Croatian, 138 Bosnian and 102 Montenegrin high school students. Analysis utilized categorical Ordinary Least Squares (OLS) models. The results show an alarmingly low level of financial knowledge among all participants, regardless of nationality. This emphasises the urgent need to improve education systems or introduce alternative methods of financial education in order to develop competent young people who are able to make informed financial decisions. The study is subject to the limitations inherent in survey-based research, including potential biases in self-reported data and limitations in generalising the findings beyond the sample population. This study contributes to the literature by shedding light on the level of financial knowledge among high school students in Croatia, Bosnia and Herzegovina, and Montenegro, highlighting both common challenges and potential areas for targeted interventions. By empirically testing hypotheses and outlining practical implications, the study contributes to policy discussions aimed at improving financial education initiatives tailored to the needs of young people in different socio-cultural contexts.

Keywords: financial literacy, financial knowledge, high school students, Croatia, Bosnia and Herzegovina, Montenegro

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[a] I. Lončar, Ph.D., Associate Professor, University of Dubrovnik, Department of Economics and Business, Croatia (e-mail: iris.loncar@unidu.hr).
[b] T. Svilokos, Ph.D., Associate Professor, University of Dubrovnik, Department of Economics and Business, Croatia (e-mail: tonci.svilokos@unidu.hr). The paper was received on 16.04.2024. It was accepted for publication on 29.01.2025.

1. INTRODUCTION

Financially literate individuals make their consumption, savings and investment decisions based on available information, and their decisions are mainly motivated by the achievement of the highest possible personal benefit within an acceptable level of risk, i.e. by minimising risk within an acceptable level of return. Through the behaviour described, financially literate people achieve a higher quality of personal life, which subsequently translates into economic prosperity for society as a whole. This phenomenon is supported by the European Commission's research (2023), which shows that the countries with the most financially literate populations (Netherlands, Denmark, Finland) are also among the most economically developed EU countries (with a GDP above the EU average and a public debt as a percentage of GDP below the EU average). The influence has also been confirmed by numerous academic studies: from Lusardi & Mitchel (2014), which emphasise the importance of "debt literacy" resulting from financial literacy for macroeconomic outcomes, to the OECD's International Survey of Adult Financial Literacy Competencies (2023), which has shown that a 15% increase in financial literacy correlates with a 1% increase in GDP growth. The recognition of the growing influence of financial literacy on a global scale is certainly one of the reasons why the issue of achieving an adequate level of personal financial literacy has emerged in the analyses of numerous academic and professional studies. Vijay Kumar and Senthil Kumar (2023) found a total of 1,211 peer-reviewed articles on financial literacy in the Scopus database between 1997 and 2021. Although the importance of financial literacy is recognised at the global level, relatively low levels of financial literacy of the population are frequently reported at the national level. According to the Gitnux Report (2023) only 33% of adults worldwide are financially literate, which means that 3.5 billion adults globally do not understand basic financial concepts.

For the purpose of the research, it is necessary to distinguish between the terms financial literacy and financial knowledge, as they are often used interchangeably, although they imply two different concepts. While financial knowledge implies an understanding of basic economic and financial categories and principles, financial literacy is the ability to use this knowledge to manage financial resources and make effective financial decisions. Financial knowledge is a necessary prerequisite for the successful management of personal finances. Understanding money and financial concepts is one of the criteria for assessing an individual financial knowledge (Banthia and Dey, 2022). However, financial skills are also required to use this knowledge. Tezel (2015) defined financial skills as the ability to use relevant knowledge and understanding to manage an expected or unpredictable situation to solve a financial problem and turn it into a benefit and opportunity for one's own advantage. Financial attitudes, which express the mind-sets, opinions and judgements about financial problems (Pankow, 2003), also play a crucial role. Attitudes are usually the result of the influence of a person's environment and background. All of these components together constitute financial literacy, which, according to the definition of the OECD International Network on Financial Education (OECD/INFE, 2022) is the combination of awareness, knowledge, skills, attitudes and behaviour necessary to make sound financial decisions and ultimately achieve individual financial well-being.

In this paper, the focus is on the group of high school students. This is very exposed generation, as today's young people are growing up in a society where the financial landscape is complex and the financial responsibilities of citizens are significant (Amagir et al., 2018). They are confronted with increasingly sophisticated financial products that require not only a high level of financial literacy, but also digital literacy. Since high school students are the bearers of future consumption, i.e. the population that is just preparing to enter the labour market, it is very important for any economy that this population is as financially literate as possible and able to face the challenges of the modern market. Therefore, examining and learning the level of financial literacy of students is a very important segment of financial research. First and foremost, it should be emphasised that financial knowledge is a form of investment in human capital and that all new knowledge in this area makes a valuable contribution to the

development of economic models that lead to a better understanding of the determinants of financial decision-making (Lusardi and Mitchell, 2023). Based on this fact, the study in this paper is limited to the financial knowledge of Croatian, Bosnian-Herzegovinian and Montenegrin high school students. The selected students come from a similar geographical area and are characterised by a similar historical heritage, but in financial terms they have different starting points[1]. The Croatian high school students today live in the European Union and use the euro as their currency, the Bosnian-Herzegovinian students are outside the European Union and use the convertible mark, while the Montenegrin high school students live outside the European Union and the Eurozone but use the euro. Their education is also regulated by different laws and pursued with different strategies. From a policy perspective, De Beckker, De Witte and Van Campenhout (2020) showed that some determinants of financial literacy are deeply rooted in a country's culture and therefore difficult to change in the short term. They suggested that people in countries with a culture of uncertainty avoidance are more financially literate and vice versa. This systemic assumption needs to be taken into account when analysing the results of the study. The existing literature, particularly in relation to Montenegro, is quite scarce, which is highlighted in the second chapter. This was an additional challenge and incentive for the research. Consequently, the question of whether there are regional differences in the financial knowledge of high school students in these three countries arises as a key question that this paper attempts to answer. The analysis of the other components of financial literacy: skills, attitudes and behaviour would require the creation of a much more extensive questionnaire and the conduct of much more sophisticated research, which remains as an idea and possibility for expanding the research in the future.

In addition to the introduction, the paper is divided into four parts. Section 2 provides an overview of the existing research on financial literacy and financial knowledge of high school students. Section 3 describes the methodology, data and variables used in the research. Section 4 reports the results and provides a discussion, and the final section contains concluding remarks.

2. LITERATURE REVIEW OF FINANCIAL KNOWLEDGE IN CROATIA, BOSNIA AND HERZEGOVINA AND MONTENEGRO

Relevant research analyses financial knowledge from a subjective and an objective perspective. Subjective financial knowledge refers to how individuals perceive their understanding, while objective knowledge is measured through questions on specific financial topics. Lusardi and Mitchell's (2014) widely accepted questionnaire covers key areas such as numeracy, inflation understanding, and risk diversification, which many studies have adapted. Building on this Jump$tart Coalition and the Council for Economic Education[2] have developed comprehensive surveys on financial literacy.

The most comprehensive study on financial literacy has been conducted continuously since 2005 by the Organization for Economic Cooperation and Development (OECD), whose first major study on financial literacy at international level was "Improving Financial Literacy: Analysis of Issues and Policies" (OECD, 2005). Of the initial 15 countries that agreed to research the financial literacy of their citizens, 26 countries from Asia, Europe and Latin America, including 12 OECD countries, participated in this international financial literacy survey in 2020 (OECD, 2020b), The OECD survey and its accompanying

[1] Raijas (2021) research, which was conducted in the form of a cross-country analysis on a sample of the Nordic countries: Denmark, Finland, Norway and Sweden, was designed in a similar way.

[2] The Jump$tart Coalition for Personal Financial Literacy is a tax-exempt organisation based in Washington, D.C., consisting of more than 100 national organisations and a network of 51 independent, affiliated state coalitions working together to promote financial literacy among youth, while the Council for Economic Education is a non-profit organisation in the United States that focuses on economic and financial education of students from kindergarten through high school.

questionnaire address three basic categories: financial knowledge, financial behaviour and financial attitudes, while questions on digital financial literacy were added in 2022.

The latest research, conducted by the European Commission between March and April 2023 in 27 European countries based on a sample of 26,139 respondents, shows that, despite large differences between countries, on average only 18% of EU citizens have a high level of financial literacy, 64% have a medium level and the remaining 18% have a low level (European Commission, 2023).

2.1. Financial knowledge in Croatia

In 2010, the World Bank published the study "Croatia - Diagnostic Review of Consumer Protection and Financial Literacy" (World Bank, 2010), which concluded that the main problem in Croatia is the lack of effective campaigns to promote awareness of the importance of consumer financial literacy. This study prompted the Ministry of Finance to introduce measures to provide citizens with a better understanding of banking products and services and to enhance their ability to avoid potential financial problems. In addition, the National Strategic Framework for Consumer Financial Literacy for the period 2015 – 2020 was established in 2014 to improve the financial literacy of the population (Official Gazette, No. 11/2015).

Numerous studies on the level of financial literacy followed. They focussed on selected components of financial literacy or on selected categories of respondents. Some of the more comprehensive research conducted in Croatia in the last ten years, which include the younger population in the selected group of respondents are highlighted below. One of the first is the research by Vehovec et al. (2015), which included 900 respondents in the sample. The study analysed the influence of socio-demographic variables: regional affiliation, size of the place of residence, age, gender and education level of the respondents as well as household income - on financial literacy, but also on its individual components: knowledge, attitudes and behaviour. The analysis showed that the most vulnerable group with the lowest level of knowledge are citizens from smaller cities, younger age, lower education level, female gender and lower income, as well as unemployed people, to whom financial education policies should be primarily directed. Anđelinović et al. (2016) published the results of a survey conducted on a sample of 1,600 students at the University of Zagreb, which showed that the level of financial literacy varies greatly among students from different fields of study. The research indicated that the type of study programme and work experience largely determine financial knowledge and literacy, while socio-demographic characteristics prove to be less important. Lončar et al. (2017) analysed a group of 4,601 high school students. The result that only 9% of the high school students surveyed, i.e. only 421 of them, had basic financial knowledge was worrying.

More recent surveys, conducted by the Croatian National Bank and Croatian Financial Services Supervisory Authority in 2023, showed an average score of 12 out of 20 for Croatian citizens, with the under-19 group scoring the lowest, highlighting a persistent challenge in youth financial education. (CNB & HANFA, 2023).

2.2. Financial knowledge in Bosnia and Herzegovina

In 2014, Bosnia and Herzegovina was included in the global research on financial literacy for the first time, and until then no particular importance was given to this topic, neither from the aspect of inclusion in scientific research nor from the aspect of inclusion as a subject of study in the education system. According to the analysis conducted by Klapper et al. (2015), the citizens of Bosnia and Herzegovina are among the most financially illiterate inhabitants of Europe, with a result (27% financially literate people) at the bottom of the list of European countries. An interesting result of this survey is that despite the overall low financial literacy, the citizens of Bosnia and Herzegovina understand the problem of inflation much better than the world average and especially than the average of developing countries. Almost 70% of respondents from Bosnia and Herzegovina answered the question on inflation correctly, while this percentage is

around 50% worldwide. This suggests that people can understand financial concepts when they gain experience, i.e. when they are confronted with the practical implementation of the concept or a financial problem in their everyday lives.

A somewhat opposite picture emerges from the study conducted at national level by Halilović et al. (2019). They surveyed 582 respondents from all parts of Bosnia and Herzegovina and, when analysing the collected data, concluded that the level of financial literacy in the country is still relatively low, as financial knowledge is below the minimum levels prescribed by the OECD/INFE, but still better than the average of selected OECD countries. The results are shown in Table 1.

Table 1. Assessment of financial literacy in BiH compared to OECD surveys

	Financial knowledge	Financial literacy
The average of 30 countries - OECD survey	4.6	13.2
The average of 17 countries - OECD survey	4.9	13.7
Financial literacy scores in B&H - total sample	5.3	14.5
Respondents aged between 18 and 29	4.86	14.12

Source: author's processing based on Halilović et al., 2019

The authors also pointed out that according to the results of the Anova and Kruskal-Wallis tests, there is a statistically significant difference in knowledge depending on the age of the respondents.

The next major national survey, which included a sample of 1,046 respondents, was conducted by Okičić et al. (2021) and provided interesting results. According to its results, almost no one, 94.71% of respondents – to be precise, gave the correct answer to the question about the compound interest account, 56.41% of respondents are not familiar with risk diversification, 55.16% do not understand the calculation of the conversion of one currency into another, and the most surprising is the fact that 52.87% of respondents do not know that there is a stock exchange in Bosnia and Herzegovina.

The most recent research (Smolo and Knezović, 2023), conducted on a sample of 638 citizens from Bosnia and Herzegovina between the ages of 18 and 65, showed average literacy, as only one in three respondents could correctly answer all three questions that tested knowledge of basic financial categories: interest calculation, inflation and risk diversification.

2.3. Financial knowledge in Montenegro

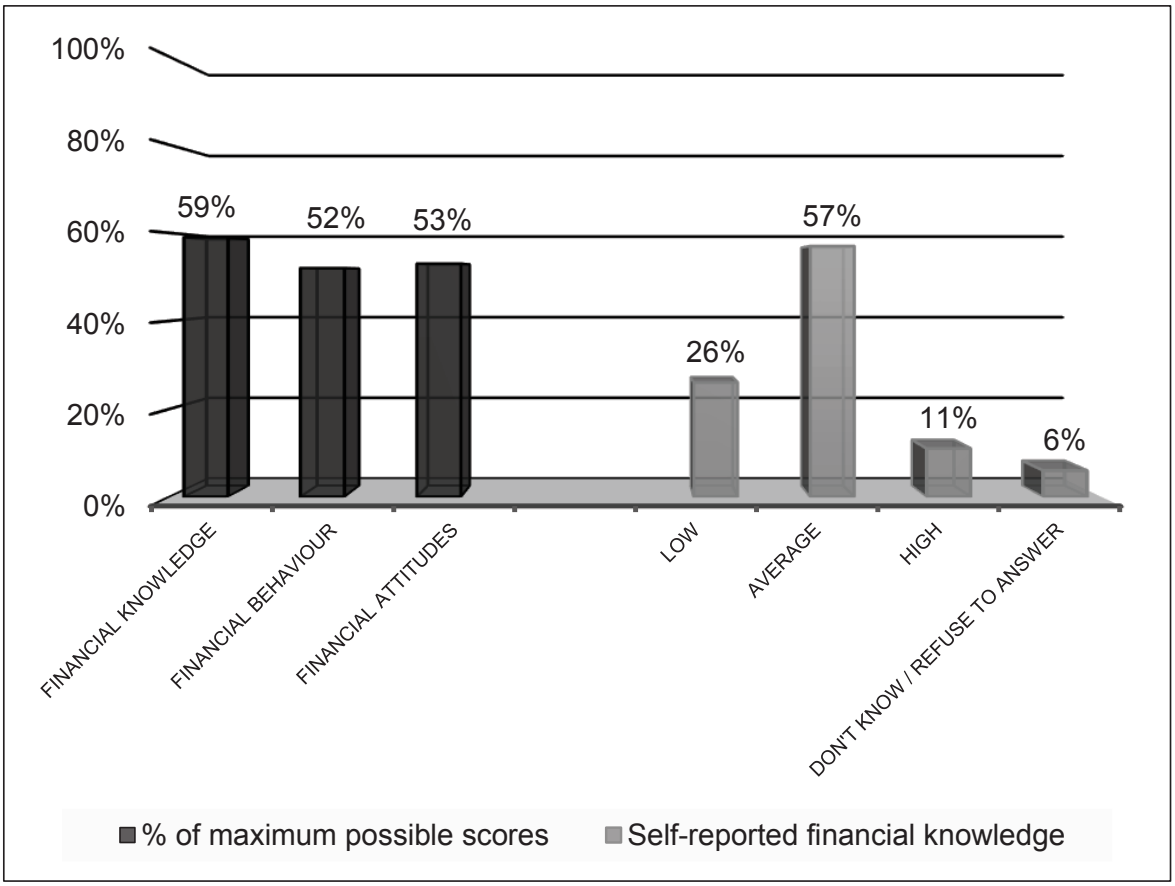
Not only academics and professionals, but also the general public in Montenegro is aware of the importance of financial education (Fabris and Luburić, 2016). However, as far as we have researched, there are no national scientific studies that would quantify the level of financial literacy of the citizens of this country. It is important to point out that in order to create, implement and manage policies to promote financial literacy of the population, it is necessary to conduct a national measurement of financial literacy and develop a national strategy for financial education based on the results (Vehovec et al.).

However, the OECD (2020a) has conducted a survey on the level of financial literacy in the South East Europe region, which includes Montenegro. The results of the survey, in which 1,030 Montenegrin citizens participated, are shown in the following Graph 1.

The financial knowledge of adults in Montenegro is relatively stronger than their consumer behaviour or attitudes. Financial literacy in Montenegro was rated at 4.1, which is in line with the overall score in the region. This result means that, on average, respondents answered 58% of the 7 financial literacy questions correctly. While men achieved a slightly better average score (4.3), women scored 3.9. It is particularly interesting that the group of young people (aged between 18 and 29) achieved a score of 4.2.

Based on the findings, the National Committee for Financial Education Development was es-

Graph 1. Objective evaluation and subjective assessment of financial knowledge in Montenegro



Source: author's processing based on OECD data (OECD, 2020a)

tablished in Montenegro with the aim of coordinating the preparation of the national financial education development programme. At the first meeting in 2020, it was determined that the focus should be on the younger population, i.e. school-age children, whose financial knowledge should be improved using innovative and technologically advanced methods and with the support of OECD experts (CBCG, 2020). The programme for Financial Education Development in Montenegro 2023–2027 itself was adopted in 2022 and covers the period 2023-2027 (CBCG 2022).

3. METHODOLOGY, DATA AND VARIABLES

This research is based on data collected through an online survey conducted among high school students between March 1 and April 30, 2023. The survey was conducted using a convenience sampling method, where participants were recruited through high schools. Teachers and school administrators helped distribute the survey link, ensuring participation from a broad range of students from different types of schools. A total of 590 responses were collected, with 59.3% of participants from Croatia, 23.4% from Bosnia and Herzegovina, and 17.3% from Montenegro. Although the survey does not claim to be statistically representative of the entire student population, it provides valuable insights into the financial knowledge of students in these three countries.

The questionnaire consisted of questions comparable to those used in OECD research. In the first part, 10 questions were asked about the demographic characteristics of the respondents, in the second part 12 questions were asked to determine the level of financial knowledge. In the second part of the questionnaire, respondents were instructed to choose the answer offered

if they were sure they knew it, and otherwise to choose the answer "I do not know" to minimise the possibility of accidentally choosing the correct answer if they did not know it. The scale used in this study is intended specifically to measure financial knowledge rather than broader dimensions of financial literacy, such as attitudes and behaviour.

To assess the internal consistency of the financial knowledge scale, we calculated Cronbach's Alpha. The scale demonstrated good reliability, with a Cronbach's Alpha of 0.732, indicating an acceptable level of internal consistency for the items used to measure financial knowledge. All individual items had corrected item-total correlations above the acceptable threshold of 0.3, further confirming that each item contributes adequately to the overall measurement of financial knowledge.

In this paper the Ordinary Least Squares (OLS) method was used to build models to check how various profile characteristics of respondents affect their financial knowledge. The general representation of the OLS model can be written as follows (Bailey, 2005):

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \ldots ++ \beta_n x_n + \varepsilon \qquad (1)$$

where:

- Y is the dependent variable (in our case that is variable SCORE)
- $X_1, X_2, \ldots, X_n$ are the independent variables (in our case that would be various dummy variables)
- $\beta_0, \beta_1, \beta_2, \ldots, \beta_n$ are the coefficients or regression coefficients representing the estimated relationships between the dependent variable and each independent variable.
- ε is the error term, representing the unexplained or random variation in the dependent variable not accounted for by the independent variables.

Characteristics that might affect financial knowledge include gender, country of origin, school attended, grade level attended, previous work experience for which a certain amount of money was obtained, the respondents' main source of pocket money, and the main way they acquire financial knowledge. It was also interesting to see how well respondents rated their financial knowledge in relation to the actual achieved result.

The selection of variables was guided by both: theoretical framework and empirical evidence from previous studies. Gender, school type, grade level, work experience, and the source of financial knowledge were chosen based on their documented relationship to financial knowledge (Fonseca et al., 2012; Anđelinović et al., 2016; Halilović et al., 2019). These variables were included to capture a range of demographic and socio-economic factors that are likely to influence the financial knowledge of high school students in the selected countries.

The OLS regression model assumes a linear relationship between the dependent variable (financial knowledge) and the independent variables. A critical assumption of OLS is that the independent variables are not highly correlated, which would lead to multicollinearity issues (Greene, 2000). To address this, variance inflation factors (VIF) were calculated and showed that multicollinearity was not a significant concern. Another potential limitation relates to omitted variable bias, as certain important factors such as parental education level or socioeconomic background were not included in the model. Future studies could incorporate these variables to reduce the risk of omitted variable bias.

In OLS regression with categorical variables, the first step is to convert the categorical variables into a format that can be used in the regression model. This process is known as "dummy coding" or "one-hot encoding" (Alkharusi, 2012). The coefficients for the dummy variables indicate how much the dependent variable's expected value changes when moving from the reference category to the category represented by the dummy variable, with all other variables remaining constant. Table 2 contains the list of calculated dummy variables.

The second group of questions for assessing financial knowledge contains twelve questions from which variable SCORE and SCORE_BIN were calculated.

Table 2. Dummy variables calculated on the basis of the first group of questions

	Description/question	Variable
1	Gender	D_Gender_M
2	What country do you come from?	D_BiH
3		D_MTN
4		D_CRO
5	What school do you attend?	D_GIM
6		D_4YHS
7		D_3YHS
8	What class are you in?	D_1G
9		D_2G
10		D_3G
11		D_4G
12	Have you ever done any work for which you received financial compensation?	D_work_Y
13	What is the main source of your money (pocket money)?	D_PM_parent_for_work
14		D_PM_parent_no_work
15		D_PM_gifts
16		D_PM_other
17		D_PM_fam_buis
18		D_PM_work
19	Where did you get your financial knowledge from?	D_FK_internet
20		D_FK_other_med
21		D_FK_other
22		D_FK_friends
23		D_FK_parents
24		D_FK_schools
25	Assess the level of your own financial knowledge (note 1 – low knowledge, 5 – high knowledge)	D_KE_1
26		D_KE_2
27		D_KE_3
28		D_KE_4
29		D_KE_5

Source: authors

4. RESULTS AND DISCUSSION

A descriptive analysis of the questions relating to the profile of the respondents is intended to give an insight into the sample to make the results easier to interpret.

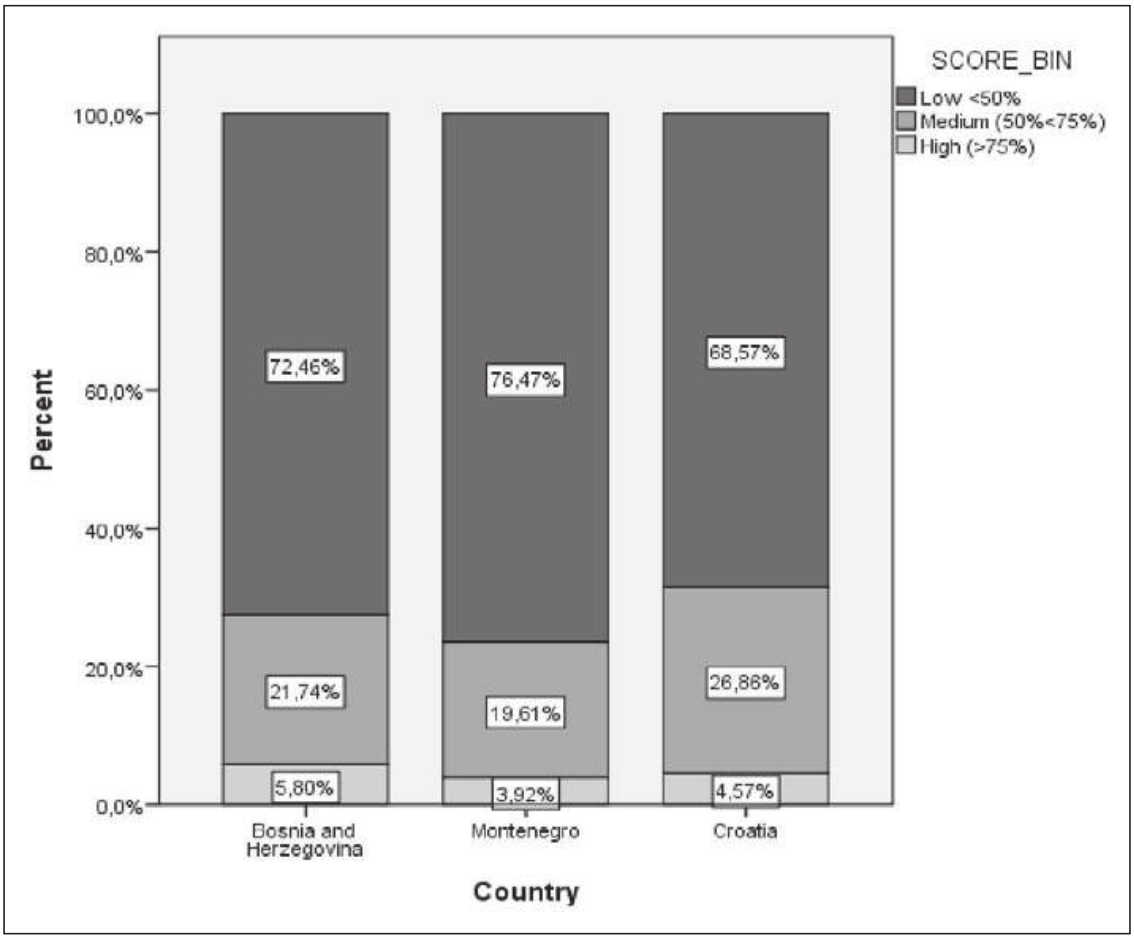
Table 3. Descriptive statistics of explanatory variables

Variable	Freq.	%	Variable	Freq.	%
Country			Have you ever done any work for which you received financial compensation?		
Bosnia and Herzegovina	138	23,4	Yes	496	84,1
Montenegro	102	17,3	No	94	15,9
Croatia	350	59,3	What is the main source of your money (pocket money)?		
Gender			From parents for doing the housework	52	8,8
Female	316	53,6	From parents without doing housework	128	21,7
Male	274	46,4	Cash gifts from relatives and/or friends	56	9,5
Year of birth			Other	58	9,8
2003	22	3,7	Working in a family business	70	11,9
2004	298	50,5	Work during school holidays	226	38,3
2005	200	33,9	Where did you get your financial knowledge from?		
2006	58	9,8	Internet	138	23,4
2007	12	2,0	Other media (TV, newspapers, radio)	24	4,1
High school			Other	52	8,8
Gymnasium	290	49,2	Friend	8	1,4
Four-year high school	284	48,1	Parents	276	46,8
Three-year high school	16	2,7	Schools	92	15,6
Class			Assess the level of your own financial knowledge		
1st grade	10	1,7	1 (very low)	40	6,8
2nd grade	32	5,4	2 (low)	84	14,2
3rd grade	196	33,2	3 (average)	268	45,4
4th grade	352	59,7	4 (high)	152	25,8
			5 (very high)	46	7,8

Source: authors

As the data in Table 3 shows, the majority of respondents who participated in the survey are from Croatia. There are slightly more women than men, and they are mostly born in 2004 and attend the fourth grade. They come almost equally from Gymnasium and four-year high schools, and only 16 attend a three-year high school. Almost all of the respondents have experience with paid work, and 38% of them reported that the main source of their pocket money

Graph 2. Financial knowledge by country



Source: authors

is work during school holidays. They acquire financial knowledge mainly from their parents and evaluate it with an average grade.

Unfortunately, looking at the overall results, it seems that their financial knowledge is actually low or very low. Only 16 of the total respondents, i.e. 2.7%, answered the twelve questions in the second part of the questionnaire with 90% success rate or better. The data on the results achieved by country are shown in Graph 2.

Respondents could score a total of 25 points by answering twelve financial knowledge questions. The first two questions each earned one point, seven questions each earned two points, and the last three questions each earned three points. This grading structure was designed to reflect the varying difficulty levels of the questions. The initial two questions were foundational and intended to assess basic knowledge, while subsequent seven questions were more complex, requiring a deeper understanding of financial concepts. The final three questions were the most challenging hence they were valued at three points each. Answers were binned into three categories: Low – for respondents who answered with less than 50% success, Medium - for those who achieved a score of 50% to 75% accuracy, and High - for those who achieved a score above 75% (variable SCORE_BIN).

After the basic descriptive analysis and the calculation of dummy variables, several OLS models were created to test the influence of various demographic and other characteristics of the respondents on their financial knowledge. In all models, the variable SCORE is the dependent variable. The results are shown in Table 4.

Table 4. Regression model results - variable SCORE is dependent variable

Variab.	B	Std. Err.	t	Sig	F	Sig	R^2
Model 1 – Gender (D_Gender_Female omitted)							
(Constant)	9,468	,262	36,100	,000	16,756	,000	,028
D_Gender_M	1,575	,385	4,093	,000			
Model 2 – Country (D_CRO omitted)							
(Constant)	10,497	,252	41,639	,000	2,012	,135	,003
D_BiH	-,526	,474	-1,110	,268			
D_MTN	-1,007	,531	-1,897	,058			
Model 3 – School (D_GIMM omitted)							
(Constant)	9,800	,270	36,268	,000	16,941	,000	,051
D_4YHS	1,130	,384	2,940	,003			
D_3YHS	-5,300	1,182	-4,485	,000			
Model 4 – Grade of study (D_1G omitted)							
(Constant)	9,800	1,484	6,604	,000	3,647	,013	,013
D_2G	-2,112	1,700	-1,243	,215			
D_3G	,271	1,521	,178	,858			
D_4G	,711	1,505	,473	,637			
Model 5 – Previous work (D_work_N omitted)							
(Constant)	9,149	,485	18,848	,000	5,577	,019	,009
D_work_Y	1,250	,529	2,362	,019			
Model 6 – Main source of pocket money (D_PM_gifts omitted)							
(Constant)	8,537	,448	19,053	,000	5,332	,000	,035
D_PM_parent_no_work	-1,385	,608	-2,276	,230			
D_PM_other	2,808	,758	3,704	,000			
D_PM_fam_buis	2,349	,714	3,287	,001			
D_PM_work	2,109	,545	3,872	,000			
Model 7 – Source of financial knowledge (D_FK_other omitted)							
(Constant)	9,731	,650	14,967	,000	2,815	,016	,024
D_FK_internet	,965	,763	1,265	,206			
D_FK_other_med	,936	1,157	,809	,419			
D_FK_friends	5,519	1,781	3,100	,002			
D_FK_parents	,045	,709	,063	,950			
D_FK_schools	,704	,813	,866	,387			
Model 8 – Assessment of financial knowledge (D_KE_1 omitted)							
(Constant)	9,050	,738	12,265	,000	4,656	,001	,031
D_KE_2	,045	,897	,050	,960			
D_KE_3	,928	,791	1,173	,241			
D_KE_4	1,911	,829	2,304	,022			
D_KE_5	2,950	1,009	2,924	,004			

Source: authors

The results show a significant gender gap in the financial knowledge of men and women, with men performing better than women. Looking at the binned score, it can be seen that of the total 28 high scores, 78.6% were achieved by men, while of the total 418 low scores, 57.9% were achieved by women. This is in line with many research. Namely, Fonseca, et.al. (2012) calculated that the financial literacy index is about 0.7 standard deviations lower for women than for men ($p < .001$) while Gudjonsson et al. (2022) argue that finance is still seen as a male-dominated field and that women have less financial knowledge as well as less enthusiasm for, confidence in and willingness to learn about financial matters than men.

Model 2 reveals that there are no statistically significant differences in financial knowledge between the respondents from Bosnia and Herzegovina and Montenegro, which variables were included in the model, and from Croatia – omitted variables. This result could be compared with that of the OECD (2020a), which also shows a similar financial knowledge between Croatian and Montenegrin citizens. There is no data for Bosnia and Herzegovina in the aforementioned study.

According to the results of models 3 and 4, there is no significant difference in financial knowledge depending on grade of study, but there is significant difference regarding whether the respondent is a student of a four-year school, a three-year school or a gymnasium. Namely, students from four-year schools achieved a statistically significant better result than gymnasium students, while students from three-year schools achieved an average of more than 5 points less than gymnasium students.

The finding that students from four-year schools outperform gymnasium students in financial knowledge could be attributed to the fact that some students from four-year schools, such as those attending economic schools, have curricula that include subjects specifically aimed at improving their general financial knowledge. In contrast, gymnasium students do not have access to these financial knowledge-focused courses within their curriculum, which likely impacts their performance.

The results of models 5 and 6 show, as expected, that students who have work experience and have earned some money during their life have a higher level of financial knowledge. In general, it has been proved that higher income persons will have better financial knowledge and exhibit more responsible financial behaviour (Mahdzan & Tabiani, 2013; Iriani, et al. 2021). As a rule, the source of financial knowledge did not significantly affect the level of financial knowledge, however, it seems that those who acquire this knowledge from friends still have a slightly higher level of financial knowledge. Nevertheless, this result should be taken with caution, as only eight respondents answered that friends were their main source of financial knowledge (see Table 3).

Finally, the result of model 8 is also expected and indicates that those who rated their knowledge as high or very high actually have statistically greater financial knowledge than those who rated their knowledge as very low. This is in line with results of Knoll a& Houts (2012.) and Serido (2021).

Based on the low financial knowledge levels observed, targeted interventions should be implemented in high schools across Croatia, Bosnia and Herzegovina, and Montenegro. These interventions could involve integrating mandatory financial education modules into the curricula, focusing on practical financial skills such as budgeting, saving, and understanding financial products. Additionally, partnerships between educational institutions and financial organizations could provide students with hands-on experiences through workshops, simulations, or internships, thus enhancing real-world financial skills. Empirical findings, particularly the gender gap and the influence of work experience on financial knowledge, suggest that policy interventions should focus on gender-specific financial education programs and practical financial learning opportunities for students, such as part-time jobs or internships that develop financial skills.

In addition to traditional financial education, policies might also incorporate digital financial literacy into the curriculum, given the growing prevalence of digital financial products. This could include modules on online banking, mo-

bile payment systems, digital investment platforms, and the risks associated with cybersecurity, preparing students for the digital financial landscape.

5. CONCLUSIONS

Financial literacy is the set of knowledge, skills, attitudes and behaviours required to understand financial information and make sound financial decisions on that basis. The population of young people, especially high school students, is particularly vulnerable as this generation is in a transition phase from complete financial dependence to partial or complete financial autonomy. This population will be confronted with financial obligations and increasingly sophisticated financial products and services in the near future, and success in solving their financial doubts and/or difficulties will depend primarily on financial knowledge.

Previous research has shown that young people's financial knowledge is only partially correlated with their social background and micro-social factors, while it is largely determined by the quality of the national education system. Therefore, the empirical study was conducted on a sample of Croatian, Bosnian and Montenegrin high school students with the aim of recognising the similarities and differences of influencing factors in these geographically similar but culturally different countries (Ooi, 2020).

The research reveals a significant gender gap in financial knowledge between men and women, with men performing better than women, and no significant difference in financial knowledge between students from Croatia, Bosnia and Herzegovina and Montenegro. Furthermore, financial knowledge does not depend on the school level, but a significant difference was found in relation to the school type of the respondents. Students from four-year schools achieved statistically significantly better result than gymnasium students, while students from three-year schools scored on average more than 5 points lower than gymnasium students. Those students who have some work experience and have eared some money during their lives also have a higher level of financial knowledge.

The results on the influence of individual characteristics of the respondents on their financial knowledge should be interpreted in the context of the overall low level of financial knowledge of high school students found in this survey. This means that the dependent variable does not have the shape of a normal curve, but is bent to the left and has a lower standard deviation, which makes it difficult to recognise the influence of the selected independent variables on the variation of the dependent variable. In addition, this study was conducted on a relatively small sample, which should also be taken into account.

The very low level of basic knowledge shows the need for more intensive investment in financial education or through the school system (in all the countries analysed) or through various projects that could be implemented in universities, civil society associations, etc.

Finally, it could be concluded that future research should not only analyse the financial capabilities of students but also the financial background of their parents, as young people often emphasise that they have acquired their financial knowledge from their parents and not from the education system. Furthermore, a more detailed analysis of financial literacy by different areas of financial knowledge could provide additional information that could contribute to the strengthening of financial curricula in schools and other activities that could support the improvement of young people's financial knowledge, and consequently financial literacy.

There are several limitations to consider in this research. Firstly, the sample used was a convenience sample, which means that the findings may not be generalizable to all high school students in the region. Secondly, the measurement was limited to financial knowledge only, and did not encompass other crucial components of financial literacy, such as financial behaviors and attitudes. The scale, while based on OECD standards, was not validated through extensive pre-testing specifically within the context of these countries, which could affect the reliability and applicability of the results.

Despite these limitations, this research makes an important contribution to understanding

the financial knowledge of high school students in the selected countries. The focus on financial knowledge provides a basic understanding of where educational interventions are most needed. This study is one of the few that provides a cross-country comparison of financial knowledge among high school students in this region, offering insights that could help education policy makers design financial education programs. By identifying a gender gap and the influence of school type on financial knowledge, this research highlights important demographic factors that need to be targeted in financial education initiatives. These findings provide a basis for future studies explore interventions that could improve financial knowledge, especially among vulnerable student populations. Future research should take these limitations into account by including broader components of financial literacy and undertaking a more detailed analysis of financial behavior and attitudes, as well as examining the financial background of parents

Further studies could consider a longitudinal approach to track the development of financial knowledge over time, particularly as students' transition from high school to work or higher education. Such studies would provide valuable insights into how financial knowledge evolves and whether initial educational interventions have lasting impacts.

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Razlike i sličnosti u financijskom znanju između učenika srednjih škola u Hrvatskoj, Bosni i Hercegovini i Crnoj Gori

Sažetak

Financijska pismenost mladih ključna je za budući gospodarski razvoj, zbog toga što ona utječe ne samo na njihovu osobnu dobrobit, već i na održivi rast društva kao cjeline. Ovo istraživanje ima za cilj utvrditi financijsku pismenost, odnosno, preciznije, njezinu sastavnu komponentu: financijsko znanje srednjoškolaca u Hrvatskoj, Bosni i Hercegovini i Crnoj Gori. Ispituju se sljedeće hipoteze: (i) postoji značajan rodni disparitet u financijskom znanju u korist muškaraca, (ii) ne postoji statistički značajna razlika u razinama financijskog znanja među učenicima iz tri zemlje, bez obzira na školsku dob učenika ili izvor stjecanja financijskih znanja i (iii) učenici s radnim iskustvom i zaradom pokazuju nešto višu razinu financijskog znanja u odnosu na druge. Podaci su prikupljeni anketnim ispitivanjem 350 hrvatskih, 138 bosanskih i 102 crnogorska srednjoškolca. Istraživanje se temelji na OLS modelima za kategorizirane varijable. Rezultati ukazuju na alarmantno niske razine financijskog znanja svih sudionika, bez obzira na nacionalnost. To implicira nužnost poboljšanja obrazovnih sustava ili uvođenja alternativnih metoda financijskog obrazovanja s ciljem osposobljavanja pojedinaca kompetentnih za donošenje informiranih financijskih odluka. Istraživanje je podložno ograničenjima specifičnim za istraživanja koja se temelje na anketama, uključujući potencijalne pristranosti u podacima koje su sudionici sami procijenili i ograničenja u generaliziranju nalaza izvan uzorkovane populacije. Ovaj rad daje svoj doprinos znanstvenoj literaturi koja pokušava utvrditi razine financijskog znanja učenika srednjih škola u Hrvatskoj, Bosni i Hercegovini i Crnoj Gori, ističući zajedničke izazove i potencijalna područja za ciljanu intervenciju. Empirijski testirajući hipoteze i nudeći praktične implikacije, istraživanje doprinosi informacijskoj podlozi potrebnoj za rasprave o politikama usmjerenima k unapređenju financijskog obrazovanja strukturiranog prema potrebama mladih u različitim društveno-kulturnim kontekstima.

Ključne riječi: financijska pismenost, financijsko znanje, srednjoškolci, Hrvatska, Bosna i Hercegovina, Crna Gora