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## Article

# Financial literacy and economic growth: How Eastern Europe is doing?

Economics: The Open-Access, Open-Assessment Journal

## Provided in Cooperation with:

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*Suggested Citation:* Paşa, Adina Teodora; Picatoste, Xose; Gherghina, Elena Mæadæalina (2022) : Financial literacy and economic growth: How Eastern Europe is doing?, Economics: The Open-Access, Open-Assessment Journal, ISSN 1864-6042, De Gruyter, Berlin, Vol. 16, Iss. 1, pp. 27-42, <https://doi.org/10.1515/econ-2022-0019>

This Version is available at:

<https://hdl.handle.net/10419/306059>

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## Research Article

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# Financial Literacy and Economic Growth: How Eastern Europe is Doing?

<https://doi.org/10.1515/econ-2022-0019>

received September 17, 2021; accepted January 13, 2022

**Abstract:** In this study, we aim to analyse financial literacy as a driver of financial wellbeing and economic growth in three of the most recent EU Member States, namely Romania, Bulgaria, and Croatia. Our particular interest in studying more in-depth these three countries is generated by their difficult pathway in the transition to the Euro and economic convergence on one side and by the limited analysis carried out so far in relation to them on the other side. Various studies indicate that financial literacy is associated with wealth accumulation, and financial education can help achieve economic growth. To conduct the empirical analysis, in this study, we have used primary data provided by the OECD for our specific research purposes. The raw data were collected in a survey carried out in 2019 in seven South Eastern European countries reaching over 1,000 respondents for each country. We used two-stage least-squares regression to test our hypothesis and cluster analysis for comparisons among countries. Conclusions of our research reveal the main differences between countries in terms of financial literacy and reverse causality between financial literacy and economic growth for the analysed countries. Finally, the study gives some insights into the future design of public policies on financial education in these countries.

**Keywords:** financial literacy, economic growth, labour market

**JEL:** G53, F43, J40

## 1 Introduction

The developments in the education sector of countries have proved to have a positive impact on the economic growth of a society, as an increase in the educational level of the individuals improves human capital, which increments the productivity of the workers and translates into an increase in the output of the economy. In this study, we consider that one of the most important drivers of economic growth is the financial education of individuals. Financial education refers to the understanding of the basic concepts of finance, which enables households to make financial decisions to limit the risks triggered by changes in economic conditions and circumstances. This is to say, financial education is about learning how to use money in order to decrease financial vulnerability by not overspending or incurring debts. Financial literacy (FL) combines the knowledge, attitudes, and behaviour necessary to make sound financial decisions to achieve individual financial wellbeing (FW) (Atkinson and Messy, 2012).

At the macroeconomic level, FL can result in a stronger household's balance sheet, which has a positive contribution to the economic growth of nations by increasing social inclusion and reducing inequalities. Some authors have analysed FL from different perspectives – FL effects on personal finance and economic outcomes (Lusardi & Mitchell, 2014), FL in the context of changing economic conditions (Remund, 2010), and FL as a basis to achieve FW (Atkinson & Messy, 2012). Nevertheless, according to our knowledge, very few of them have focussed their analysis in-depth on the Eastern European Countries and on the impact FL has on the economic growth of these countries. The main reason why we have considered in this study to analyse Romania, Bulgaria, and Croatia, is that these countries joined the EU in the last 15 years, having different cultures and, despite their increasing gross domestic product (GDP) growth rates, their real GDP per capita is still under the EU-27 average. In addition, as these three countries should converge towards the rest of the EU Member States, we have considered analysing in this study the correlation

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between FL and GDP growth as a proxy for economic growth. The study of these three Eastern European Countries (EU-3 countries), which are also EU countries, compared to some other Southern Eastern European Countries (specifically, Georgia, North Macedonia, Moldova, and Montenegro), which are non-EU countries deserves to be further analysed to highlight their differences at the macroeconomic level and their advancements towards the economic convergence with the EU high performers.

The main objective of this study is to highlight the impact FL attainment has on the economic growth in Romania, Bulgaria, and Croatia by indicating the differences between these three EU countries with some other South-Eastern European countries in terms of FL and FW. Our original contribution is focused on the importance of FL's role in the economic growth of countries from Eastern Europe. The current COVID-19 pandemic represents a test of resilience, which emphasises the role of financial education in the economic recovery of countries. From the side of the labour market, the decreases in salaries or job losses trigger income vulnerability, which could be alleviated by empowering individuals with more financial confidence in managing their money and the potential subsidies they receive. Moreover, financial education awareness is important as it offers the individuals the opportunity to contribute to their FW, and it improves their financial resistance in recovering from financial shocks.

This study is structured in four parts. The first part covers the theoretical background, which points out the main aspects related to FL and economic growth, establishing the hypothesis for the empirical analysis. The second part outlines the research methodology based on the primary data provided by the OECD. The third part includes the main results derived from the analysis of the economic variables, and it reveals some discussions derived from our study. Finally, the fourth part presents the conclusions of the study and indicates future directions of research.

## 2 Literature Review

The concept of financial education is concerned with transferring financial knowledge (FK) to individuals. Financial education represents the tool to increase the FL level of individuals. Moreover, individuals should learn how to protect their personal finances and react in economic environments that are continuously changing, contributing in this way to the economic growth of their

country. In this regard, nowadays, more than in any other period, to have a stable employment income becomes more difficult for the employees. Some authors (Boshara, 2012) consider that strong household balance sheets can help grow the economy.

One of the factors that trigger the instability in income are the changes in work due to technological progress. The changes resulting from the adoption of new technologies conduct to transformations in the labour market, leading to mismatches in the demand and supply of labour force. Thus, strong imbalances appear, which can lead to higher unemployment rates or lower income for some categories of workers (Acemoglu & Restrepo, 2020; Korinek & Stiglitz, 2021).

The efforts of employees to keep up with the technological progress through training and lifelong learning (Bode & Gold, 2018) and with the risk that some jobs will be replaced by new technologies (World Bank, 2019) generate income instability. In this respect, it is important to note that the risk of replacing the labour force with machinery is higher in the case of routine tasks (Acemoglu & Restrepo, 2020) and, therefore, easily programmed using code lines. Therefore, according to some studies (Chiacchio, Petropoulos, & Pichles, 2018; Graetz & Michaels, 2018), the most vulnerable categories of employees in the technological era are represented by young people and employees with low or medium education. As the working income is influenced by both number of years of study and work experience (Saqib, Panezai, Ali, & Kaleem, 2016; Wannakrairoj, 2013), we can consider that employees receiving low incomes are often in a position to retrain themselves in order to avoid situations where they will not find a job. This situation may place vulnerable groups in difficulty. Therefore, we strongly believe that FL has the drive to help workers overcome unforeseen, less favourable financial situations.

The transformation of work is also represented by the development of the gig economy or platform work, which is a form of employment that uses digital platforms as a place where the demand and supply of work are meeting (Eurofound, 2018a). This is to say, it represents a new type of free labour market, where the workers are like micro-enterprises, every worker becoming responsible for her/his income and financial plans (Huang, Morgan, & Trinh, 2019).

In the case of the work on the platform, income is not stable, as workers carry out tasks according to the needs of the applicant at a price agreed by the two parties. More than that, the work on the platform is transforming the relationship between the employee and the employer in the way work is organised (Eurofound, 2018a).

Moreover, the conditions and the regulations on the labour market, as well as the stability of income, are strongly affected (Eurofound, 2018b). The economy of the platform involves the lack of social insurance, health insurance, and annual leave, and without the existence of an employment contract. This means that the employee–employer relationship takes a new form, similar to collaboration, in exchange for an amount of money. In this way, the workers have to manage their income in order to cover the current and future expenses. Therefore, due to the instability in income that works on the platform may trigger, FL of individuals plays a key role to address the decline in their personal income.

The instability in income represents an effect of uncertain economic situations. For example, recessions are generating a significant decrease in employment income. Therefore, in order to cope with income instability, the importance of FL is increasing. Basic financial education is considered the first line of defense against interruptions in income (OECD, 2020). Moreover, some authors indicate that financial shocks have long-lasting effects undermining economic growth (Ghoshray, Monfort, & Ordóñez, 2020).

An example in this sense is the most recent economic context caused by the COVID-19 pandemic. Because of the restrictive measures and the temporary closure of economic activities, a significant part of the businesses has faced an unfavourable economic situation resulting in a recession. For example, manufacturing industries were affected by the COVID-19 pandemic due to the containment measures, which forced the number of workers to be limited in order to avoid agglomerations, and, second, they faced short-term supply problems (De Vet, Nigohosyan, Núñez Ferrer, Gross, Kuehl, & Flickenschild, 2021). The sectors most affected by the pandemic in Europe were the cultural and creative industries sectors, HORECA, and transport. The effects of the COVID-19 pandemic on the economy have spread, leading to a decrease in the world production of 4.3% in 2020 (UN DESA, 2021). This is to say, the impact of the COVID-19 crisis was three times higher than the financial crisis in 2008.

This situation has triggered decreases in wages or even more job losses, which is reflected in the decline of the population's FW and an increased unemployment rate. According to estimates of the International Labour Organization (ILO), globally, it was registered a fall in total hours of work by 8.8% compared to 2019, as a result of the employment loss (shift to unemployed or inactivity) and the reduction of working hours for some categories of workers (ILO, 2021). At the European Union

level, it has been registered a decrease of employment income by 4.8% in 2020 (European Commission, 2020). As a result of economic and financial insecurity, individuals who do not count with a basic level of financial education can easily become a victim of financial fraud (OECD, 2020). Therefore, we consider that individuals who score significantly in FL could assimilate better financial shocks across economies. Moreover, FL correlates strongly with financial resilience (Demertzis, Domínguez-Jiménez, & Lusardi, 2020).

Several studies highlight the importance of FL, which can be understood as a specific training of individuals (Lusardi & Mitchell, 2014). High FL levels of individuals trigger higher incomes and savings in their households (Disney & Gathergood, 2013). Some authors (Calcagno & Monticone, 2015) consider that financial education is necessary to make the right financial decisions. More than that, other authors mention the importance of providing financial education before individuals engage in costly financial transactions (Lusardi, Mitchell, & Curto, 2010), and some studies emphasize the significance of financial education from an early age, indicating that it contributes to individual FW and it supports inclusive growth (Batsaikhan & Demertzis, 2018). For example, in an analysis of developed and developing countries from Asia, Europe, and the United States of America for the interval 1980–2007, some authors (Lo Prete, 2018) have demonstrated the statistically significant inverse relationship between FL and income inequality. In the same way, other authors (Monsura, 2020) reach the same conclusion in their study for the Philippines.

On the other hand, FL produces effects at macroeconomic level, contributing to the stability of the financial markets and to the economic growth and economic development of countries (Ehigiamusoe & Lean, 2019; Kefela, 2011). For instance, Grohmann, Klühs, and Menkhoff (2018) carried out an analysis on 119 countries, which had different levels of economic development, including some from the least developed countries in the world, such as Afghanistan and Mali, and some from the most developed economies, such as Denmark and Finland. According to their results, there is a significant relationship between the level of FL of individuals and their financial inclusion. In this regard, the macroeconomic effects are clear and undoubtful: a higher FL level of individuals has the capacity to contribute to their financial development, which is positively correlated with the economic development of their countries.

Another advantage, which also represents a contribution to the economic development and to the increase

of FL level of individuals, is the improvement of people's capacity to face macroeconomic shocks (Klapper, Lusardi, & Panos, 2013). This correlation is highlighted in research based on the responses of Russian individuals that were interviewed during May 2008 and June 2009, meaning the period of the Great Recession. Therefore, we can say that a higher level of FL of individuals, on one hand. Contributes to macroeconomic stabilisation, and, on the other hand, it has the capacity to mitigate the negative effects of an unfavourable economic context, helping out the economy to recover faster. Moreover, a more recent study underlines the same conclusion. Clark, Lusardi, and Mitchell (2020), following a survey on 2,889 adults between 45 and 75 years old in the United States of America, concluded that people with a higher level of FL, due to the decisions they made in the pre-pandemic period, encountered less financial difficulties during the COVID-19 pandemic period.

As regards the developing countries, it is necessary to support the small and medium-sized enterprises, and the FL has a real contribution for better access to external financing, thus leading to the support of the companies' growth process (Burchi, Włodarczyk, Szturo, & Martelli, 2021; Hussain, Salia, & Karim, 2018). These effects are also registered at macroeconomic level through economic growth. In addition, previous studies based on survey data collection of 17 economies in Asia and the Pacific have indicated that financial education is a key element to support economic growth (OECD, 2019). Moreover, other cross-countries panel regressions (Levine, 2005; Popov, 2018) pointed out that financial measures are positively correlated with economic growth. Furthermore, recent studies highlight that financial education contributes to economic growth within the European Union (European Bank Authority, 2020).

However, as several studies indicate, it is not only education that contributes to economic growth, but the reverse causality also exists. This is to say, economic growth is strongly impacted by education, in particular, by the knowledge and skills of people (Hanushek & Wößmann, 2010), and, at the same time, economic growth supports education as the economy can spend more on education. For example, for Bangladesh, an underdeveloped country in Asia, but which was proposed by the United Nations to join the developing countries starting from 2026, a study was carried out using data for the period 1976–2003, which highlighted the bidirectional causality of education and GDP (Islam, Wadud, & Islam,

2007). In another study, Francis and Sunday (2006) revealed that countries with higher per capita gross national income record higher investments in education. Moreover, a recent study (Xu, Hsu, Meen, & Zhu, 2020) identifies the relationship between higher education, economic growth, and innovation ability, where the three elements support each other. However, as Hanushek and Wößmann (2010) argue, the impact of education on economic growth is influenced by the quality of education, and it is important that education in schools is aligned with the needs of the population. Based on the scientific literature, we consider financial education as an important component of education nowadays, which contributes to both FW of individuals and to the economic growth of countries.

Despite the benefits of FL at both microeconomics and macroeconomics levels, all countries, regardless of their level of development, have a low level of literacy. This issue can be found both in developed countries, such as the United States, Japan, and Germany, and also in developing countries, such as Romania (Lusardi & Mitchell, 2014). Thus, we can consider that the level of FL does not necessarily depend on the level of development of the country. However, according to the research results mentioned previously in this study, we expect that the FL of individuals represents a factor that indirectly contributes to the economic growth of countries.

Therefore, the novelty of our study compared to the previous studies consists in our particular interest to analyse more in detail the relationship between the level of FL and economic growth in the three most recent European Union Member States (Romania, Bulgaria, and Croatia), which are subject to permanent scrutiny given their aspirations towards the Eurozone and Schengen accession. Both Eurozone and Schengen membership has proved to offer significant economic benefits to their participating countries. The other Eastern European countries such as Poland, Hungary, Serbia, Slovakia, or the Czech Republic are not included in the current analysis for two reasons. The first reason is that Romania, Bulgaria, and Croatia, although they have achieved high economic growth rates in the last years compared to the rest of the Eastern European countries (World Bank, 2021), they are still lagging behind the European Union's top performers. The second reason is due to the unavailability of recent primary data for the FL components (financial knowledge (FK), financial behaviour (FB), and financial attitude (FA)) as regards the most developed Eastern European countries.



### 3 Methodology and Model Specification

#### 3.1 Data

First, to conduct the empirical analysis of FL, we used the primary data provided by the OECD for our specific research purposes. Therefore, the data on FL in our study are not available as open-source, and their ownership belongs to the OECD. The OECD collected the data on FL via a survey carried out during July 2019 and October 2019 in seven South Eastern European countries: Romania, Bulgaria, Croatia, Georgia, North Macedonia, Moldova, and Montenegro. Second, to verify the relationship between FL and economic growth, we took into account the GDP growth rate in 2019 (annual expressed in percentage reported on the precedent year) from the World Bank open source database. In order to carry out the analysis between FL and economic growth as regards the countries subject to our study, we selected the data corresponding to 2019, the year when the survey occurred for FL.

The questionnaire for the raw data on FL components (FK, FA, and FB) and FW was based on the OECD/International Network of Financial Education (INFE) toolkit for measuring FL and financial inclusion (OECD, 2018). The toolkit ensures the validity of the instruments used across all seven countries analysed in this study, and it can be retrieved from <https://www.oecd.org/financial/education/2018-INFE-FinLit-Measurement-Toolkit.pdf>. In addition, the questionnaire involves four items, namely FK, FA, FB, and FW. All items were measured as follows: FK, 0–7 scale; FA, 1–5 scale; FB, 0–9 scale; and FW, max. 20 points for agree, disagree, and neutral, as indicated in Table 1. Moreover, the OECD/INFE toolkit offers a homogenous approach in analysing FL at the international level, and several studies (Bongini, Iannello, Rinaldi, Zenga, & Antonietti, 2018; De Becker, De Witte, & Van Campenhout, 2019; De Clercq, 2019) have used it successfully in their research.

The total sample size of the population is  $N = 7,422$ . In addition, the selected variables for descriptive statistics are shown in Tables 1 and 2.

Table 1 provides a summary of the demographic profiles of the respondents. We have used descriptive statistics to differentiate the population in the function of gender, country, and group of countries. From the total number of 7,422 respondents, 55.4% were female and 44.6% were male. The respondents were grouped into two categories: EU-3 countries (Romania, Bulgaria, and

**Table 1:** Descriptive statistics by gender, country, and country group

All South-Eastern countries		Frequency	%
Gender	Female	4,109	55.4
	Male	3,313	44.6
Country	Romania	1,060	14.3
	Bulgaria	1,047	14.1
	Croatia	1,079	14.5
	Georgia	1,056	14.2
	North Macedonia	1,076	14.5
	Moldova	1,074	14.5
	Montenegro	1,030	13.9
Country group	EU-3 countries (RO, BG, HR)	3,186	42.9
	Non-EU countries	4,236	57.1

Source: Calculated by the authors based on OECD primary data (2019).

Croatia) and non-EU countries (Georgia, North Macedonia, Moldova, and Montenegro).

For each of the countries analysed in this study, the sample size is above 1,000 respondents, and the confidence level stands at 95%.

In Table 2, we have analysed the FL components, namely knowledge, behaviour, and attitude, to which we have added the FW of individuals. Financial education promotes, *inter alia*, FW, which is divided into financial

**Table 2:** Descriptive statistics for FL and FW

All South-Eastern European countries	Mean	Median	Mode	Std. deviation
FK score (from 0 to 7)	4.0	4.0	5.0	1.8
FB Score (from 0 to 9)	5.1	5.0	5.0	1.8
FA score (from 1 to 5)	2.8	2.7	2.3	0.9
FW score (max 20)	8.7	9.0	10.0	4.7
EU-3 countries (RO, BG, HR) (N = 3,186)	Mean	Median	Mode	Std. deviation
FK score (from 0 to 7)	3.9	4.0	5.0	2.0
FB score (from 0 to 9)	5.1	5.0	5.0	1.9
FA score (from 1 to 5)	2.8	2.7	3.0	0.9
FW score (max. 20)	9.4	10.0	10.0	4.4
Non-EU countries (N = 4,236)	Mean	Median	Mode	Std. deviation
FK score (from 0 to 7)	4.0	4.0	5.0	1.7
FB score (from 0 to 9)	5.1	5.0	5.0	1.8
FA score (from 1 to 5)	2.8	2.7	2.3	1.0
FW score (max 20)	8.2	8.0	8.0	4.9

Source: Calculated by the authors based on OECD primary data (2019).

security and financial freedom of choice (Consumer Financial Protection Bureau, 2015).

### 3.2 Methodology

In this study, the authors have considered choosing among the variables the FL, as a wide range of studies (Fernandes, Lynch Jr, & Netemeyer, 2014; Sundarasan, Rahman, Othman, & Danaraj, 2016) have indicated that FL has a significant positive effect on personal finances of individuals, triggering their FW (Bucher-Koenen, Alessie, Lusardi, & Van Rooij, 2021). Moreover, given the OECD/INFE initiatives, which support policymakers to design and implement national strategies for financial education, the authors considered using in this study the dimension of FL based on the OECD (2016) definition. This definition breaks down FL into three components, namely FK, FB, and FA. FK represents the knowledge and understanding of financial concepts (Kimiyaaghalam & Safari, 2015; Remund, 2010). FB refers to how people are budgeting, saving, investing, etc. FA includes individuals' preferences in relation to personal finances (Johan, Rowlingson, & Appleyard, 2021) and includes their attitude towards long-term planning (OECD, 2015). As regards FW, in this study we have used the definition given by the Consumer Financial Protection Bureau (2015), which considers FW as *"a state of being wherein a person can fully meet current and ongoing financial obligations, can feel secure in their financial future, and is able to make choices that allow enjoyment of life."* In addition, FW represents a reflection of individuals' economic conditions (Rutherford & Fox, 2010) and protects individuals against economic risks (Goldsmith, 2000).

In this section, we analyse the three components of FL for the countries in our sample with the aim to understand the differences in FW across countries, which influence their socio-economic conditions.

The search for causal relationships among the variables related to FL drives most of the authors to use regression analysis. In this respect, some authors focused on logistic or probit regression models (Douissa, 2020; Khan, Putthinun, Watanapongvanich, Yuktadatta, Uddin, & Kadoya 2021), whereas other authors used linear regressions (Sharma, Arora, Sinha, Akhtar, & Mehra, 2021; Zahra & Anoraga, (2021). Our study deals with two-stage least-squares regression (2SLS) and, for this purpose, we used STATA Statistics software, 13th version.

As our aim is to emphasise in our study the EU-3 countries, namely Romania, Bulgaria, and Croatia, as

EU Members States, the first step of our analysis is to check whether there are differences among countries that result from the EU membership. In this respect, we compared the EU-3 countries with the rest of South-Eastern European Countries for which primary data were available. In addition, the second step was to find some causal relationships for the EU-3 countries. Considering the literature review and our objectives, the hypotheses tested in this study are the following:

**H1.** FK is equal in all seven South-Eastern European countries, independently of their belonging to the EU

**H2.** FB is equal in all seven South-Eastern European countries, independently of their belonging to the EU

**H3.** FA is equal in all seven South-Eastern European countries, independently of their belonging to the EU

**H4.** FW is equal in all seven South-Eastern European countries, independently of their belonging to the EU

To contrast the hypotheses from 1 to 4 in this study, we used a mean analysis comparison, which is presented in the following tables. Previously, we applied the Levene tests for an equal variance to identify the variance equality of the analysed groups.

The causal relationships for the EU-3 countries, which represent the focus of our paper, were analysed according to the following hypotheses:

**H5.** FB/FA/FK influences FW

**H6.** FW positively influences the GDP growth

In order to prove the above relationships, we used the econometric model described in Section 3.3, of this study.

### 3.3 The Model

The contrast of hypotheses H5 and H6 requires analysing the existence of causal relationships in which two endogenous variables intervene: FW and GDP\_Growth. The definitions of the two independent variables are the following:

- *FW = respondents' opinion on elements related to their "state of being wherein they can fully meet current*

and ongoing financial obligations, can feel secure in their financial future, and are able to make choices that allow enjoyment of life” Consumer Financial Protection Bureau (2015);

- GDP growth = annual change in percentage points in a country’s economic output to measure how fast a national economy is growing.

H5 states that FB, FA, and FK influence FW. Under this assumption, we considered the following:

$$FW_i = \beta_0 + \beta_1 FB_i + \beta_2 FA_i + \beta_3 FK_i + U_{1i}, \quad (1)$$

FW = Financial well-being

FB = Financial behaviour

FA = Financial attitude

FK = Financial knowledge

where  $i = 1, 2, \dots, N$ ,  $N = 7,422$  observations

According to H6, FW positively influences GDP\_Growth. Furthermore, we have considered that both the intercept and the angular coefficient of this equation could be different in function of the EU membership; therefore, the proposed equation is the following:

$$GDP\_Growth_i = \alpha_0 + \alpha_1 FW_i + \alpha_2 EUB_i + \alpha_3 EU\_Well_i + U_{2i}, \quad (2)$$

GDP growth = Gross domestic product annual growth rate (%)

FW = Financial well-being

EUB = 1 for EU countries and 0 for Non-EU countries.

EU\_Well = it is the product of FW\*EUB, and it is equal to 1 for EU countries and equal to 0 for Non-EU countries. where  $i = 1, 2, \dots, N$ ,  $N = 7,422$  observations.

In this equation, EUB is a dummy variable equal to 1 when the country belongs to the EU and equal to 0 when the country does not belong to the EU. Furthermore, EU\_Well is a new variable, which represents the product of FW by EUB, and it is equal to 1 when the country belongs to the EU and equal to 0 when the country does not belong to the EU.

Given that FW is the endogenous variable of the first equation when proposing the second one, we are assuming the existence of unidirectional causality between the two variables that this model tries to explain, but the possibility of an inverse causality between FW and GDP\_Growth should also be analysed. This has a significant effect on FW since, in such a case, both the structure of the model and the appropriate estimation method would be different.

To analyse the possibility of reverse causality, GDP\_Growth has been introduced in the first equation as an additional explanatory variable and, furthermore, we

have applied the Hausman test (Hausman, 1978; Hausman & McFadden, 1984), concluding that there is indeed an interdependence between GDP\_Growth and FW; therefore, a simultaneous equations model is proposed.

The description of this model is as follows:

Equation (1):

$$FW_i = \beta_0 + \beta_1 FB_i + \beta_2 FA_i + \beta_3 FK_i + \beta_4 GDP\_Growth_i + U_{1i}, \quad (3)$$

FW = Financial well-being

FB = Financial behaviour

FA = Financial attitude

FK = Financial knowledge

GDP growth = Gross domestic product annual growth rate (%)

Where  $i = 1, 2, \dots, N$ ,  $N = 7,422$  observations.

Equation (2):

It remains as specified before:

$$GDP\_Growth_i = \alpha_0 + \alpha_1 FW_i + \alpha_2 EUB_i + \alpha_3 EU\_Well_i + U_{2i}, \quad (2)$$

GDP\_Growth = Gross domestic product annual growth rate (%)

FW = Financial well-being

EUB = 1 for EU countries and 0 for Non-EU countries.

EU\_Well = FW\*EUB is equal to 1 for EU countries and equal to 0 for Non-EU countries.

## 4 Results and Discussion

The results for the mean comparison were conducted with a  $t$ -test for two independent samples by considering two groups. As indicated above, Group 1 is composed of the EU-3 countries (Romania, Bulgaria, and Croatia), whereas Group 2 is composed of the rest of the countries in the sample (namely, Georgia, North Macedonia, Moldova, and Montenegro). Table 3 shows that the Levene test for equal variances was applied, and its results indicate that it is not possible to assume equal variance for any of the items analysed since in all items  $p$ -value is below 0.05. The mean of each item for both country groups is presented in Table 4.

Table 2 indicates that EU-3 countries have statistically different means results for FK, FA, and FW. This shows that those statistically meaningful differences between EU-3 countries and the Non-EU countries analysed in this study for FK, FA, and FW are  $-0.106$ ,  $0.042$ , and  $1.220$ , respectively, which indicate that FK is higher in the Non-EU countries compared to the EU-3 countries.



**Table 3:** Results of the *t*-test for means comparison

Item	Levene's test for equality of variances		<i>t</i> -test for equality of means				
	<i>F</i>	Sig.	<i>t</i>	df	Sig. (2-tailed)	Mean difference	Std. error difference
FK	104.661	0.000 <sup>(a)</sup>	−2.405	6325.146	0.016 <sup>(c)</sup>	−0.106	0.044
FB	4.413	0.036 <sup>(a)</sup>	0.913	6736.255	0.361 <sup>(b)</sup>	0.040	0.043
FA	13.510	0.000 <sup>(a)</sup>	1.955	7054.843	0.051 <sup>(d)</sup>	0.042	0.022
FW	71.196	0.000 <sup>(a)</sup>	11.320	7203.955	0.000 <sup>(c)</sup>	1.220	0.108

<sup>(a)</sup>Equal variance cannot be assumed, since  $p$ -value  $\leq 0.05$ .

<sup>(b)</sup>Equal means must be assumed ( $p$ -value  $> 0.05$ ).

<sup>(c)</sup>Equal means cannot be assumed ( $p$ -value  $\leq 0.05$ ).

<sup>(d)</sup>Equal means could not be assumed for  $p$ -value  $\leq 0.1$ , that is, the means differences could exist with 90% of probability.

**Table 4:** Descriptive statistics for items in H1 to H4, regarding belonging to the EU

Group statistics					
Item	Country group	<i>N</i>	Mean	Std. deviation	Std. error mean
FK	EU-3 countries	3,186	3.9350	1.97469	0.03498
	Non-EU countries	4,236	4.0406	1.72563	0.02651
FB	EU-3 countries	3,186	5.1142	1.87710	0.03326
	Non-EU countries	4,236	5.0746	1.81574	0.02790
FA	EU-3 countries	3,186	2.7986	0.89902	0.01593
	Non-EU countries	4,236	2.7563	0.95320	0.01465
FW	EU-3 countries	3,186	9.4203	4.36499	0.07733
	Non-EU countries	4,236	8.2004	4.88471	0.07505

Source: Calculated by the authors based on OECD primary data (2019).

At the same time, FA and FW are more favourable in Romania, Bulgaria, and Croatia, as the means difference is positive. FA represents the attitude of an individual towards money spending, taking into account its environment. Some authors (Herdjiono & Damanik, 2016) state that FA influences FB, whereas some others (Riyazahmed, 2021) consider that FB has a significant impact on FW. Therefore, this can explain the positive correlations between Romania, Bulgaria, and Croatia in terms of FA and FW.

The results of the tests for hypotheses 1–4 are presented in Table 5. From this analysis, we can reach the conclusion that overall, FL and FB do not present discrepancies in none of the countries analysed in this study. Nevertheless, FK is higher in the non-EU countries

compared to the EU-3 countries, whereas FA and FW are lower in the non-EU countries compared to the EU-3 countries. Some studies (Beckmann & Reiter, 2020) claim that individuals who experienced economic turbulences with the transition from planned to market economies have higher FK about inflation. This could explain why FK is higher in the non-EU countries compared to the EU-3 countries in our sample.

Table 6 shows the gender analysis means comparisons for all countries in our study and for the two groups of countries. Based on the gender analysis, we observe some differences, which also appear between the two groups of countries. The means differences are calculated between men and women (Tables 7–9).

**Table 5:** Results of H1 to H4 testing

H1: FK is equal in all South-Eastern European countries, independently of their belonging to the EU	Rejected
H2: FB is equal in all South-Eastern European countries, independently of their belonging to the EU	Accepted
H3: FA is equal in all South-Eastern European countries, independently of their belonging to the EU	Rejected (90%)
H4: FW is equal in all South-Eastern European Countries, independently of their belonging to the EU	Rejected

Source: Calculated by the authors based on OECD primary data (2019).

**Table 6:** Results of gender analysis means comparison

Gender differences							
All countries							
Item	Levene's test for equality of variances		t-test for equality of means				
	F	Sig.	t	df	Sig. (2-tailed)	Mean difference	Std. error difference
FK	0.013	0.910	6.162	7420.000	0.000 <sup>(c)</sup>	0.264	0.043
FB	15.880	0.000 <sup>(a)</sup>	0.056	6899.041	0.955 <sup>(b)</sup>	0.002	0.043
FA	5.462	0.019 <sup>(a)</sup>	-2.387	6991.587	0.017 <sup>(c)</sup>	-0.052	0.022
FW	0.004	0.951	7.148	7420.000	0.000 <sup>(c)</sup>	0.783	0.110
<b>Romania, Bulgaria, and Croatia</b>							
FK	0.262	0.609	2.725	3184.000	0.006 <sup>(c)</sup>	0.191	0.070
FB	5.625	0.018 <sup>(a)</sup>	-1.083	3008.865	0.279 <sup>(b)</sup>	-0.073	0.067
FA	2.465	0.117	-1.110	3184.000	0.267 <sup>(b)</sup>	-0.035	0.032
FW	0.036	0.850	4.336	3184.000	0.000 <sup>(c)</sup>	0.672	0.155
<b>Georgia, North Macedonia, Moldova, and Montenegro</b>							
FK	0.793	0.373	6.039	4234.000	0.000 <sup>(c)</sup>	0.321	0.053
FB	10.516	0.001 <sup>(a)</sup>	1.030	3884.326	0.303 <sup>(b)</sup>	0.058	0.057
FA	3.092	0.079	-2.225	4234.000	0.026 <sup>(c)</sup>	-0.066	0.029
FW	0.815	0.367	5.559	4234.000	0.000 <sup>(c)</sup>	4.187	0.753

(a) Equal variance cannot be assumed, since  $p$ -value  $\leq 0.05$ .(b) Equal means must be assumed ( $p$ -value  $> 0.05$ ).(c) Equal means cannot be assumed ( $p$ -value  $\leq 0.05$ ).

Source: Calculated by the authors based on OECD primary data (2019).

**Table 7:** Descriptive statistics for items in H1 to H4, regarding gender for all countries

Group statistics					
Item	Gender	N	Mean	Std. deviation	Std. error mean
FK	Male	3,313	4.1413	1.82986	0.03179
	Female	4,109	3.8776	1.83506	0.02863
FB	Male	3,313	5.0930	1.90278	0.03306
	Female	4,109	5.0905	1.79230	0.02796
FA	Male	3,313	2.7456	0.94663	0.01645
	Female	4,109	2.7977	0.91675	0.01430
FW	Male	3,313	9.1576	4.72255	0.08205
	Female	4,109	8.3745	4.66629	0.07280

Source: Calculated by the authors based on OECD primary data (2019).

FL score is statistically different for women and men for all countries together and for the non-EU countries (men have higher scores than women), but it is equal in Romania, Bulgaria, and Croatia. FK score is statistically different for all countries analysed, and men have higher scores than women. FB scores do not show statistically significant differences as regards gender for any of the countries in this study. FA score is statistically different

**Table 8:** Descriptive statistics for items in H1 to H4, regarding gender for EU-3 countries

Group Statistics					
Item	Gender	N	Mean	Std. deviation	Std. error mean
FK	Male	1,448	4.0394	1.99182	0.05234
	Female	1,738	3.8481	1.95663	0.04693
FB	Male	1,448	5.0746	1.93679	0.05090
	Female	1,738	5.1473	1.82579	0.04380
FA	Male	1,448	2.7792	0.91587	0.02407
	Female	1,738	2.8147	0.88467	0.02122
FW	Male	1,448	9.7866	4.35764	0.11452
	Female	1,738	9.1151	4.34885	0.10432

Source: Calculated by the authors based on OECD primary data (2019).

for women and men for all countries together and for the non-EU countries (women have higher scores than men), but it is equal in the EU-3 countries. Finally, the FW score is statistically different for all countries analysed, and men have higher scores than women. Some authors (Zulfiqar & Bilal, 2016) claim that FA has a positive impact on FW.

**Table 9:** Descriptive statistics for items in H1 to H4, regarding gender for Non-EU countries

Group statistics					
Item	Gender	N	Mean	Std. deviation	Std. error mean
FK	Male	1,865	4.2204	1.68979	0.03913
	Female	2,371	3.8992	1.74067	0.03575
FB	Male	1,865	5.1072	1.87635	0.04345
	Female	2,371	5.0489	1.76658	0.03628
FA	Male	1,865	2.7196	0.96928	0.02244
	Female	2,371	2.7852	0.93955	0.01930
FW	Male	1,865	43.3458	24.66810	0.57121
	Female	2,371	39.1586	24.07483	0.49442

Source: Calculated by the authors based on OECD primary data (2019).

The results of the model estimation using the 2SLS method (Table 10), described in Section 3.3, confirm the expected results, which is in line with the academic literature (Lusardi, 2019; Tamimi & Kalli, 2009; United Nations, 2018). On the one hand, all explanatory variables of FW have significant coefficients ( $p$ -value  $< 0.001$  in all cases) and correct signs, according to previous studies. On the other hand, the relationship between the GDP growth and its explanatory variables requires a more detailed comment: the variables FW and EU\_Well are relevant, with  $p$ -values  $< 0.001$ , and, despite the fact that the sign

**Table 11:** Results of H5 and H6 testing

H5: FK/FB/FA influences FW	Accepted
H6: FW positively influences GDP growth	Accepted (only for EU countries)

Source: Calculated by the authors based on OECD primary and secondary data (2019).

of FW coefficient is contrary to the expected ( $-0.0611508$ ), the one of EU\_Well is positive and of a higher magnitude ( $0.0805009$ ).

This means that there are differences between EU and non-EU countries because the effect of FW on GDP\_Growth is negative for the non-EU countries but positive for the EU members (this value is obtained by the sum of EU\_Well and FW, i.e.  $0.0805009 - 0.0611508 = 0.0193501$ ).

Despite the low values of  $R$ -squared (which could be justified by the size and characteristics of the sample), these results indicate the relevance of the explanatory variables considered, both in the case of FW and GDP\_Growth.

The summary of rejection or acceptance of the two last hypotheses is presented in Table 11. Hypothesis H5 (FK/FB/FA influences FW) should be accepted. Nevertheless, Hypothesis 6 (FW positively influences the GDP growth) should be accepted only for the EU countries. These results are very suggestive and open the door for

**Table 10:** Two-stage least-squares regression

Equation		Observations	Parameters	RMSE	R-squared	F-Statistic	p-value
FW		7,422	4	4.481119	0.0943	271.98	0.0000
GDP_Growth		7,422	3	0.642068	0.0128	263.74	0.0000
Equation (1)		Coefficient	Standard error	t	p >  t	[95% Confidence interval]	
FW	FB	0.664747	0.0292883	22.70	0.000	0.6073384	0.7221557
	FA	0.9750435	0.0598745	16.28	0.000	0.857682	1.092405
	FK	0.2542064	0.0291505	8.72	0.000	0.1970679	0.311345
	GDP_Growth	1.343404	0.2572149	5.22	0.000	0.8392311	1.847577
	cons	-3.455808	1.056238	-3.27	0.001	-5.526166	-1.38545
Equation (2)		Coefficient	Standard error	t	p >  t	[95% Confidence interval]	
GDP_Growth	FW	-0.0611508	0.0073007	-8.38	0.000	-0.0754611	-0.0468405
	EU_CODE	-1.072306	0.066437	-16.14	0.000	-1.202531	-0.9420812
	EU_Well	0.0805009	0.007752	10.38	0.000	0.065306	0.0956959
	_cons	4.445521	0.0606764	73.27	0.000	4.326588	4.564455
Endogenous variables		FW	GDP_Growth				
Exogenous variables		EU_CODE	EU_Well	FB	FA	FK	

Source: Calculated by the authors using STATA 13 software.

**Table 12:** Variables means for the three clusters (C1, C2, and C3)

Cluster	N	FK	FB	FA	FW	Description
C1	2,720	4.87	6.33	3.07	12.93	High FL (Individuals with the highest scores in all the countries analysed)
C2	1,880	4.00	5.09	2.77	8.72	Intermediate FL (Individuals with the lowest scores in all the countries analysed)
C3	2,822	3.78	4.69	2.57	3.96	Low FL (they are Individuals with intermediate scores in all the countries analysed)

Source: Calculated by the authors based on OECD primary data (2019).

new research to analyse the underlying factors that could explain this difference.

In the next stage of our analysis, we aimed to group the respondents according to their level of FL, taking into account four variables: FK, FB, FA, and FW. In order to indicate the state of play in South-Eastern European countries and to identify the countries with low levels of literacy, we conducted a hierarchical cluster analysis using Ward's method. In Tables 12–14 is described the

cluster analysis employed in this study triggered to highlight the role that FL plays on the FW of individuals in the analysed countries.

In the *first step*, we determined the number of clusters in which the total of respondents (7,422) could be grouped together. For this purpose, we used as cluster variables the FK, FB, FA, and FW.

In the *second step*, we described each cluster. From this perspective, we have consolidated three clusters in the function of the level of FL of individuals in each one of them, namely high, low, and intermediate FL clusters, by analysing the mean values of the variables that have intervened in order to group these clusters together.

Cluster 2 is the smallest in terms of the number of respondents (1,880), and it includes the respondents who have an intermediate level of FL. It is also important to note the significant difference between the means of FW in Clusters 2 and 3. This can be interpreted as follows: an intermediate level of FL contributes substantially to the increase of individuals' FW. More than that, with a small increase in the levels of FK, financial behaviour, and FA, FW is considerably stimulated, as indicated in Table 12.

In the *third step*, we validated that these clusters effectively bring together individuals who are linked within the cluster but different from another cluster (i.e. validate the clusters). To this end, the three clusters were classified to check whether they are indeed different by testing against other variables, which have not been used to compile the cluster.

In our paper, we used the dependent variables “EU membership” and “country” in two validation tests, using the analysis of variance (ANOVA) in order to check whether there are statistically significant differences between the three clusters.

In the null hypothesis, the averages of the three clusters are equal, meanwhile in the alternative scenario, at least one of the averages is different:

$$H_0 : \mu_1 = \mu_2 = \mu_3, \quad H_1: \text{at least one is different.}$$

This hypothesis has been tested in the following cases:

**Table 13:** Validation test by EU membership

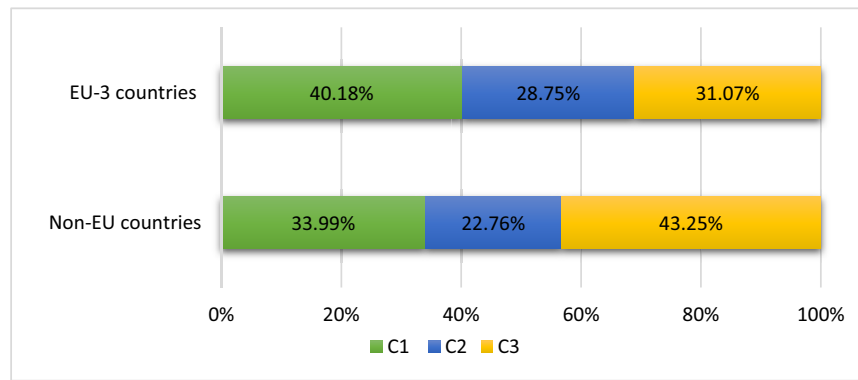
ANOVA					
UE membership					
	Sum of squares	df	Mean squares	F	Sig.
Between groups	28.330	2	14.165	58.708	0.000
Withing groups	1790.034	7,419	0.241		
Total	1818.364	7,421			

Source: Calculated by the authors based on OECD primary data (2019).

**Table 14:** Validation test by country

ANOVA					
Country					
	Sum of squares	df	Mean squares	F	Sig.
Between groups	499.636	2	249.818	63.846	0.000
Withing groups	29029.138	7,419	3.913		
Total	29528.774	7,421			

Source: Calculated by the authors based on OECD primary data (2019).



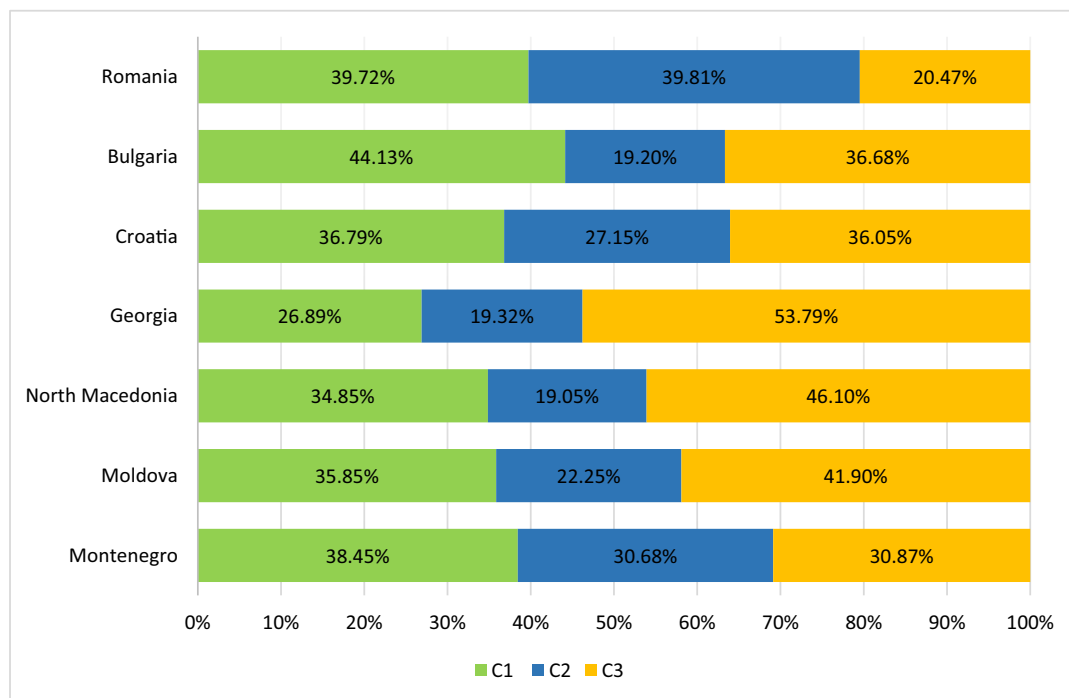
**Figure 1:** Respondents' distribution by clusters and EU Membership. *Source:* Calculated by the authors based on OECD primary data (2019).

Our analysis confirms that the three clusters are performing well as the difference in averages is significant in both cases analysed, with an F value of 58.708 (Table 13), respectively 63.846 (Table 14), and with a very low significance score.

Individuals from the non-EU countries tend to have a lower level of FL compared to the EU-3 countries subject to our analysis (Figure 1). According to the results of our analysis, 43.25% of respondents from the non-EU countries are included in Cluster 3, having a low level of FL, which is 12.1% higher compared to the EU-3 countries. Also, in the case of respondents who have an intermediate level of FL, the situation is similar, the difference

between EU-3 and non-EU countries regarding the weight of respondents who are included in Cluster 2 standing at 6%.

Analysing the results by country (Figure 2), we observe that the highest share of respondents with a high level of FL (Cluster 1) are in Bulgaria (44.13%), followed by Romania (39.72%) and Montenegro (38.45%). Georgia is in the most disadvantageous situation, with 26.89% of respondents included in Cluster 1. In Cluster 3, where respondents with a low level of FL are included, Georgia maintains its position among the countries analysed, with 53.79% of its respondents. Romania has the best position from this point of view, with 20.47% of the respondents included in Cluster 3.



**Figure 2:** Respondents' distribution by clusters and countries. *Source:* Calculated by the authors based on OECD primary data (2019).



Nevertheless, it should be taken into account that the values of the weights at the level of the analysed countries are quite similar for each of the three clusters. Moreover, in none of the countries subject to our analysis, the level of FL is above the level achieved in the most developed countries, which indicates that financial education should be a top priority of national governments in these countries.

The results of our study reveal the necessity of the design and implementation of a financial education curriculum in schools, which should start from an early age. This school curriculum should entail, on the one hand, the training of the teaching staff and, on the other hand the preparation of materials based on real-life scenarios, where basic notions (e.g. simple and compound interest rate, inflation, credit and debit cards) should be acquired. Taking into consideration the importance of FL attainment for the FW of individuals and the socio-economic dimensions of their countries, the authors of this study strongly believe that financial education should be a compulsory subject, which should be included in the school curriculum starting from primary school onwards.

## 5 Conclusion

The current research indicates the state of play of FL in Eastern Europe by gathering relevant information from three EU countries and drawing comparisons with the other four Non-EU countries. The results of our research highlight the key role FL should play in the future design of public policies for financial education, inside and outside the academic environment as a basis to reach FW of individuals, which triggers a positive impact on the economic growth of countries and their sustainable economic development.

Moreover, our analysis demonstrates that a minor increase in the level of FL of individuals helps stimulate their FW considerably. Therefore, in order to prepare individuals to deal with income instability given by changes in their working conditions, national governments should consider investing in financial education.

In addition, in this study, we have shown that the level of GDP growth is positively influenced by the level of FW and that the FW is positively influenced by each of the FL components, namely FK, FA, and FB. The results of our research reinforce the importance that all components of FL have on the FW in Romania, Bulgaria, and Croatia. As FL attainment influences the GDP growth in

the EU-3 countries analysed, this has a positive impact on their convergence with the most advanced European Union Member States.

This study represents an important step in the research related to the impact of FL on the economic growth of countries. Due to the limitation of GDP as an indicator of economic performance (Stiglitz, Sen, & Fitoussi, 2009), we consider that further studies could include more specific indicators to take into account the inequality, such as GINI index or developmental indicators such as United Nations Human Development Index (DHI).

**Acknowledgement:** The authors would like to thank the OECD for providing access to the primary data for this research. Data ownership belongs to the OECD. Any use of data for commercial purposes is strictly prohibited. The information and views set out in this article are those of the main author (ATP) and do not necessarily reflect the official opinion of her employer.

**Conflict of interest:** Authors state no conflict of interest.

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