

THE LEVEL OF KNOWLEDGE OF FINANCIAL LITERACY AND RISK OF THE PORTUGUESE

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The themes of financial literacy and financial risk have been the subject of systematic study in recent decades, as inescapable variables that characterize the individual's financial performance, and it also emerges as a factor for maintaining social well-being. The purpose of the present study is to study the level of knowledge of literacy and financial risk of the Portuguese and to ascertain whether sociodemographic and professional variables interfere in the levels of literacy and financial risk knowledge. The methodology used is quantitative, and the measurement instrument is based on a questionnaire survey that assesses the levels of knowledge of literacy and financial risk. The sample consists of 830 Portuguese individuals, from different regions in mainland Portugal, over 18 years of age. The results show that Portuguese individuals have a higher level of knowledge of financial literacy than financial risk, the levels of knowledge of financial literacy are satisfactory and the levels of knowledge of financial risk are low. It is also noteworthy that individuals who have a educational background in the area of management or similar have higher average levels of knowledge of financial literacy. With increasing age and level of training there is also an increment in the levels of knowledge about financial literacy and on the best way to manage financial risk. So, there is a need for financial education initiatives that involve all the contributors to financial knowledge.

Key words: financial literacy, financial risk, financial education, financial decisions, financial well-being



INTRODUCTION

Financial literacy and financial risk have been gaining importance in people's daily lives. This is due to new and increasingly complex financial products, to the subprime crisis in 2008, and, more recently, to the financial and economic impact of the Covid-19 pandemic. There is no manner to universally define and measure financial literacy, according to Ouachani, Belhassine and Kammoun (2020). However, financial literacy can be understood as the degree of mastery of key concepts that provides people with capacity and trust to manage their personal finances conveniently. Financial literacy is characterized as the ability to read, analyze, manage and communicate the financial aspects of everyday life of individuals who are at the level of their material well-being. It can also be explained as the level of knowledge about the characteristics of markets, their instruments, their regulation, their institutions, and as the competence to use the acquired knowledge in the financial area. Several studies focus on the definition and the measure of this concept. Different items are used in the literature and are typically related to the study topics. The used calculation methods differ across the different studies.

In human perception, risk is often associated with loss. On the other hand, it is also associated with the number of investors concerned by the impact on the results of any future events. The risk is therefore subjective, and its perception is influenced by several factors, including cognitive, emotional, demographic and personality (Aren and Zengin 2016). Better financial knowledge leads investors to gain greater risk tolerance, as it is indicated by Bannier and Neubert (2016). These authors point out that this is not only because of a greater ability to analyze information, but also because investors become more able to make riskier and higher-return investments.

Ayadi, Challita and Groen (2019) found empirical evidence that all southern and eastern Mediterranean countries are falling behind EU Mediterranean countries, regarding financial development, which is defined as the improvement of functions in the financial area, like pooling of savings, risk



diversification, and allocating and monitoring capital for productive investments. The authors compared all African southern and eastern Mediterranean countries with a sample of seven EU Mediterranean countries, of which the most financially developed one was Spain, and the least financially developed country was Cyprus. For the authors, economic growth and the creation of jobs in that region is affected by the exclusion of financial services by families and micro, small and medium companies. This indicates the authors' view on these two different concepts: economic growth and financial development. It is clear that there is a symbiosis between both, because economic growth depends heavily on financial development. According to them, it is necessary to invest in financial education enhanced for the least qualified ones, because there is a lack of financial education in part of the population, which stops them from understanding and using financial services efficiently.

In all populations it is important to characterize standards of literacy and financial risk and to measure its levels, in order to define training strategies, training areas and population groups with greater training needs. This characterization/measurement should be carried out continuously, in order to identify the registered progress and to improve the implemented strategies. Portugal is an adequate case study, not only because students who are not from economic areas graduate without having financial training, but also because the level of indebtedness of the Portuguese families and of the Portuguese State is high (Bank of Portugal 2011; 2016).

This article aims to study the level of knowledge of financial literacy and financial risk of the Portuguese and to ascertain whether sociodemographic and professional variables interfere in the levels of literacy and financial risk knowledge. To materialize these objectives, after this introduction, the article presents the literature review and in the third section the methodology. In the fourth section, results and their discussion are presented, in particular the levels of knowledge of financial literacy, financial risk and statistically significant differences. At the end, the conclusions are presented.



LITERATURE REVIEW

The themes of literacy and financial risk are indispensable issues in the area of human development, with several studies that refer to its importance.

Studies on the importance of financial literacy

| 94 | Authors Mandell and Klein (2009), Grifoni and Messy (2012) and Ward and Lynch (2018) mention that people with more knowledge and financial skills can make better decisions. Lusardi and Tufano (2015) and Calcagno and Monticone (2015) conclude that financial literacy is especially important when financial products are complex. Ignorance of the world of finance leads to wrong decisions and represents significant costs. Klapper, Lusardi and Panos (2013), Lusardi (2015) and Letkiewicz, Lim, Heckman and Montalto (2019) also understand that people with strong financial skills make better work planning and savings for retirement, have a lower level of indebtedness and save more. The authors noted that households with strong financial skills generally increase their savings levels at times of economic recession.

People with better financial literacy can more easily withstand economic shocks, not requiring credit, avoiding over-indebtedness, which allows for financial security and contributes to the economic development of societies (Lewis and Messy 2012; Sucuahi 2013; Cossa, Magdalene and Mota 2018; Siyanbola 2018). As far as consumption is concerned, Rahmandoust et al. (2011) and Akhtar and Liu (2018) wrote that consumers with better financial literacy make better decisions for themselves and their families, and increase their economic security and welfare. Ayadi (2013) states that, besides its effect on growth, developing an inclusive financial system for people with different levels of financial literacy may have a positive impact on equality, giving poorest individuals opportunities to save up and credit which is needed in their lives.

Authors Gouws and Shuttleworth (2009) and Ahmed, Rahmandoust and Noreen (2018) mentioned that, in the business world, change is sudden and that information circulates at



the speed of light. Only with evolved financial literacy can the balance between the relevance of information and its ability to perceive and interpret it be established.

In addition to the previously presented studies, others such as Gorbachev and Prado (2019) and Potrich and Vieira (2018) conclude that more experience and more financial literacy lead investors to acquire greater risk tolerance. The authors' understanding is that by increasing the level of financial literacy and by having greater ability to analyze information, the investor improves the ability to make riskier and more returnable investments. Lusardi and Mitchell (2014) studied the level of education and training of parents and their impact on their children's financial literacy. Zulaihati, Susanti and Widyastuti (2020) refer that financial alphabetization positively influences the financial behaviour of professors.

Variables studied in financial literacy

Financial literacy studies are referenced to several variables, such as: gender, age, level of education, region, marital status, professional situation, income level, training in economics/finance, financial experience and knowledge, employment and profession (Fonseca et al. 2012; Santos, Silva and Gonzalez 2018; Bannier and Schwarz 2018). According to the life cycle theory, age is one of the most important factors, in terms of loan markets (Modigliani and Brumberg 1954).

Abreu and Mendes (2009), Bharucha (2019), Deenanath, Danes and Jang (2019) and Kuntze, Wooldridge and Whang (2019) studied the knowledge of financial investors and their levels of financial literacy, and related this correlation to the impact on the likelihood of wealth accumulation and retirement planning. Windfried (2017) explains that Millennials from the European Union consider creating a personal budget to be important but require advice on financial services.

For Pacheco, Ribeiro and Tavares (2016) and Tavares, Almeida and Cunha (2019) the factors with impact on financial literacy are: (i) the financial education and training taught by the family during childhood and adolescence, (ii) the education and financial training taught by school during childhood and adolescence,



(iii) perceptions about savings, and (iv) understanding the price of money. However, Finke, Howe and Huston (2016) and Hanson and Kalthoff (2018) understand that essential notions about stocks, risk diversification and portfolio management are needed. Related to this topic Knoll and Houts (2012) and Lusardi and Mitchell (2014) underline the importance of being capable of analyzing interest rates, inflation, risk diversification and sales discount, while Potrich and Vieira (2018) and Salem (2019) highlight issues such as inflation, interest rate, value of money in time, risk, diversification, stock market, credit and government bonds and financial literacy.

The degree of financial literacy has an impact on wealth accumulation and future financial life planning. There is basic knowledge of financial literacy that should be taken into account. Aspects such as knowledge for dealing with interest rates, inflation rates, risk diversification, perceptions of savings and understanding of financial markets are unavoidable variables in the level of financial literacy. In a study conducted by Garg and Singh (2018) the financial literacy of young people is studied, relating it to socioeconomic and demographic factors. Ranyard et al. (2020) refer that, in England, financial education became compulsory at schools in 2014, and that curricular plans include interest rates, credit, forms of payment, inflation, savings, and investments.

Shen, Lin, Tang and Hsiao (2016) report that people with better financial literacy tend to exhibit more positive attitudes in resolving financial disputes, and so they have higher levels of financial well-being. On this topic, the authors Taft, Hosein, Mehrizi and Roshan (2013) conclude that there is a positive correlation between age, financial literacy and financial well-being. Moreover, the highest level of financial well-being is associated with financial literacy. A higher level of financial literacy leads to lower financial concerns and reduces the fear of making these decisions. This point of view is not shared with Stolper and Walter (2017). These authors conclude that the level of financial literacy is different when we compare low and high-income people. In the study which was conducted for Germany, the authors observed that young people, the elderly,



and low-income people have low literacy levels and as such are prone to make financial mistakes, and therefore, age is not a relevant factor.

In Bannier and Neubert's view (2016), financial literacy is relevant in the assumption of financial risks, but there are differences between men and women. According to the authors, in order to reduce the gender gap in investment patterns, financial literacy and risk tolerance for females need to be increased.

Moreover, Aren and Zengin (2016) identified a correlation between financial literacy and investment preferences. They also concluded in their study that financial literacy was higher in men than in women and that single women tend to take more financial risks than married women. The availability to take on financial risks was also studied by Chu and Wang (2017). The authors found a strong correlation between financial literacy and risky behaviours in financial assets. They concluded that the more financial literacy there is, the less courage there is to take risks by households with a higher financial level, because they are more careful with investments. Thus, it is important to separate all the aforementioned variables, such as gender and marital status, to recognize which ones are the most relevant to investment patterns and risk tolerance.

Based on the defined objectives and the review of the literature carried out in the present study, the following hypotheses related to the knowledge of financial literacy and financial risk with sociodemographic and professional variables were elaborated and which will be tested in the empirical part are:

- Hypothesis 1: There is a positive correlation between knowledge of financial literacy and knowledge of financial risk.

This hypothesis has the support of the authors Gorbachev and Prado (2019) and Potrich and Vieira (2018).

- Hypothesis 2: Men have a higher level of financial literacy and know how to deal better with risk.

This hypothesis is based on the authors Aren and Zengin (2016) and Bannier and Neubert (2016).

- Hypothesis 3: Individuals who have training in the area of Management and alike areas have a higher level of financial literacy and risk management.



Hypothesis 3 is formulated based on Lusardi and Mitchell (2014); Tavares et al. (2019); Garg and Singh (2018) and Chu and Wang (2017). Note that, by “Management and alike areas”, we mean degrees in Management, Economics, Finance, and Accounting. These are areas we decided to group, because all include Mathematical Finance, Statistics and Portfolio Management, which are relevant subjects for this study.

- Hypothesis 4: With increasing age, knowledge about financial literacy increases.

Hypothesis 4 is based on the authors Santos et al. (2018) and Bannier and Neubert (2016).

- Hypothesis 5: With increasing the level of training, the levels of knowledge of financial literacy and knowledge about financial risk increase.

This hypothesis has the authors Garg and Singh (2018), Potrich and Vieira (2018) and Salem (2019).

- Hypothesis 6: Individuals working on their own or others have better levels of financial literacy and risk management.

Hypothesis 6 is based on the authors Bharucha (2019) and Kuntze et al. (2019).

- Hypothesis 7: A higher level of financial literacy and knowledge of financial risk is associated to a higher level of income.

This hypothesis is supported by the authors such as Santos et al. (2018), Knoll and Houts (2012), and Salem (2019).

METHODOLOGY

Population and Sample

The target population of the present study are the Portuguese over 18 years of age. Portugal already held, by the Bank of Portugal, two surveys assessment of financial literacy. The first one was held in 2010 and the second one in 2015 (Bank of Portugal 2011; 2016). The results of the surveys, over time, allow us to evaluate the results of previously implemented actions and to analyze the changes in behavioral patterns in financial decision making. In the second survey, 30 countries participated, and Portugal in the aggregate indicator of financial



behavior was in 8th place, in the aggregate indicator related to financial attitudes was in 5th place and in the aggregate indicator of financial knowledge was in 13th place. Regarding the global financial literacy indicator (sum of the results of the three indicators described above), Portugal appears in 10th place. The data collection process used to survey the participants consisted on the application of the stratified non-probabilistic sampling method, in which the application of the questionnaire was national. The idea was obtaining identical groups with and without training in the field of Management and alike areas. Thus, the sample consists of quotas (more or less identical) of some characteristics of the population study (gender, marital status and training in the area of Economics and alike) in a non-random manner, to ease the operation of the entire process and to reduce the associated costs.

After data collection, it was verified whether the questionnaires were complete, and the existence of outliers was also analyzed, leaving the sample constituted by 830 individuals with characteristics of the study population, most of them male (59.3%). The age of the respondents varies between 18 and 71 years, with a mean of 37 years (SD = 12.04). As for marital status, we have to 50.3% of individuals are single, separated, divorced or widowed and 49.6% are married or are non-married partners. Regarding the level of education, 1.9% have a level of education lower than or equal to 9th grade, 22.7% have secondary education, 50.0% have a Bachelor's degree and 25.4% have a Master's or a PhD. In regard to the area of school training, 56.7% of respondents have training in the area of Management or similar. As for the professional situation of individuals, 12.8% are self-employed workers, 62.3% are workers on behalf of others, 17.6% are students or trainees, 2.7% are unemployed and 1.9% are retired or pensioners. On the net household's annual income, 14.5% have an annual income of less than €10,000.00; 29.9% have a yield between €10,001.00 and €20,000.00; 20.8% between €20,001.00 and €30,000.00; 17.8% between €30,001.00 and €45,000.00; 9.0% between €45,001.00 and €60,000.00 and 8.0% have a gross annual income of more than €60,000.00.



Data Collection Instruments

The questionnaire survey consisted of three parts. The first part consisted of the sociodemographic profile of respondents (gender, age, marital status, level of education, training area, professional situation, annual illiquid income), the second part assessed literacy knowledge levels and the third part referred to the levels of knowledge of financial risk. To assess the levels of knowledge of financial literacy, according to the literature review, 11 multiple choice questions were used (Table 1), where each question has a single correct option that is marked bold.

Table 1: *Questions Assessing Knowledge of Financial Literacy*

<p>Q1- Imagine that the interest rate of your savings account is 1% per year and inflation of 2% per year. After 1 year, you would be able to buy:</p> <p>(A) more than today with the money in this account (B) exactly the same as today with the money in this account (C) less than today with the money in this account (D) I don't know</p>
<p>Q2- Do you think the following statement is true or false? "Bonds are usually riskier than stocks".</p> <p>(A) True (B) False (C) I don't know</p>
<p>Q3- Considering a long period of time (e.g. 10 or 20 years), which asset described below usually gives the highest return?</p> <p>(A) Savings accounts (B) Stocks (C) Bonds (D) I do not know</p>
<p>Q4- Typically, which asset described below displays the largest fluctuations over time?</p> <p>(A) Savings accounts (B) Stocks (C) Bonds (D) I do not know</p>
<p>Q5- When an investor applies his money in different assets, the risk of losing money is:</p> <p>(A) High (B) Low (C) It is indifferent (D) I do not know</p>
<p>Q6- Do you think the following statement is true or false? "If you were to invest €1,000 in a stock fund, you could have less than €1000 when you withdraw your money."</p> <p>(A) True (B) False (C) I don't know</p>
<p>Q7- Do you think the following statement is true or false? "A stock fund combines the money of many investors to buy a variety of stocks."</p> <p>(A) True (B) False (C) I don't know</p>



Q8- Do you think the following statement is true or false? “A 15-year mortgage typically requires higher monthly payments than a 30-year mortgage, but the total interest paid during the lifetime of the loan will be lower.”

(A) **True** (B) False (C) I don't know

Q9- Suppose you had €100 in a savings account and the interest rate was 20% per year and you never raised money or interest payments. After five years, how much would you have in that account in total?

(A) **More than 200 €** (B) Exactly €200 (C) Less than €200 (D) Do not know

Q10- Which of the following statements is correct? If someone buys company B bonds:

(A) It owns a part of company B

(B) **He lent money to company B**

(C) He is responsible for the debts of company B

(D) None of the above options

(E) I don't know

Q11- Suppose you owe €3,000 on your credit card. You make a minimum payment of €30 per month. With an annual rate of 12% (or 1% per month), how many years would it take to eliminate your credit card debt if you didn't make additional new purchases?

(A) less than 5 years (B) between 5 and 10 years (C) between 10 and 15 years (D) **never** (E) I do not know

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The options marked bold are the correct ones.

To evaluate the knowledge levels of financial risk, according to the literature review, 4 multiple choice questions were used (Table 2), where each question has a single correct option that is marked bold.



Table 2: *Questions Assessing Financial Risk Knowledge*

<p>Q12- Imagine we launched a given six sides a thousand times. From 1,000 times released, how many times do you think the given would come as an even number? Of the values below, what is the most likely result?</p> <p>(A) 157 (B) 298 (C) 512 (D) 754 (E) 919 (F) The above answers are all equally likely (G) I do not know</p>
<p>Q13- In the National Lottery, the chances of winning a prize of 10 € are 1%. What is your guess about how many people would win a €10 prize if 1,000 people buy a single lottery ticket?</p> <p>(A) 1 (B) 2 (C) 10 (D) 100 (E) 110 (F) The above answers are also likely to (G) I do not know</p>
<p>Q14- If 5 machines take 5 minutes to make 5 toys, how long would it take 100 machines to make 100 toys?</p> <p>(A) 1 minute (B) 5 minutes (C) 10 minutes (D) 100 minutes (E) 1000 minutes (F) 1 day (G) None of the above options (H) I don't know.</p>
<p>Q15- In a lake, there are water lilies. Every day, the number of waterlilies in flower doubles. If it takes 48 days to bloom the whole lake, how long would it take the baby flowers to cover half the lake?</p> <p>(A) 16 days (B) 24 days (C) 25 days (D) 32 days (E) 26 days (F) 22 days (G) 47 days (H) I don't know.</p>

The options marked bold are the correct ones.

Source: Own elaboration



Procedure

The questionnaires were applied between March and April 2019. These were presented to participants accompanied by a small introductory summary that defines the objectives of the study and ensures that the information provided is anonymous and confidential.

To process the data, IBM SPSS Statistics 25 software was used, and descriptive statistics techniques were used to describe the sample and to perform a descriptive analysis of some variables that characterize literacy knowledge financial and financial risk. The statistical inference technique was used to compare means between groups (Student's t-test to compare two paired samples, Student's t-test to compare two independent samples, ANOVA to compare three or more independent groups and whenever significant differences were found using ANOVA, the Tukey multiple comparison test was used) and to study the relationship between variables (Pearson or Spearman correlation). It is noteworthy that the statistical assumptions for the application of the different tests were previously analyzed, which allowed their application with confidence (Hair et al. 2014; Marôco 2018; Pestana and Gageiro, 2014).

To calculate the size of the effect of the differences in the groups' averages, Cohen's square eta was used. According to Pallant (2013), Cohen's square eta values can be classified as: 0.01 (weak), 0.06 (moderate) and 0.14 (strong). In the evaluation of the magnitude of correlations, Cohen criteria (Pallant 2013) were chosen: a low correlation when $0.10 \leq |r| \leq 0.29$, moderate correlation when $0.30 \leq |r| \leq 0.49$ and high correlation when $|r| \geq 0.50$.

RESULTS AND DISCUSSION

Levels of Knowledge and Financial Literacy and Financial Risk

From the 11 questions which assessed the levels of knowledge of financial literacy and the 4 issues which assessed the levels of financial risk knowledge, 15 new binary variables were obtained, which indicate if the individual got each of the questions



right or wrong (with each correct answer was assigned 1 point and in case it is incorrect was awarded 0 points).

Table 3 shows the number of individuals who responded correctly to each of the 15 questions and their percentages. The questions that obtained the highest percentage of correct answers are related to knowledge of financial literacy and are question Q6 (80.2%, $n = 666$) and question Q1 (70.2%, $n = 583$). It should be noted that questions relating to financial risk knowledge have low percentages of correct answers, with the highest percentage obtained in question Q13 (44.8%, $n = 372$), which shows that people have difficulty doing basic calculations with percentages, as is the case with 1% of 1,000. The descriptive results show that it is important to adopt strategies to improve the financial knowledge (literacy and risk) of the population, for example, making the curricular unit of financial education in schools compulsory, as it was already adopted in 2014 in England (Ranyard et al. 2020).

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Table 3: *Number of Correct Answers and Their Percentage per Question*

	Questions	n	%
Knowledge of Financial Literacy	Q1	583	70.2
	Q2	539	64.9
	Q3	220	26.5
	Q4	635	76.5
	Q5	526	63.4
	Q6	666	80.2
	Q7	548	66.0
	Q8	574	69.2
	Q9	447	53.9
	Q10	399	48.1
	Q11	94	11.3
Knowledge of Financial Risk	Q12	261	31.4
	Q13	372	44.8
	Q14	267	32.2
	Q15	184	22.2

Source: Own Elaboration



To obtain the variable “knowledge of financial literacy”, the sum of the scores which were obtained in the 11 binary variables was performed, which indicated whether the individual got the first 11 questions right or wrong (Q1 to Q11). Thus, the variable knowledge of financial literacy can take values on a scale between 0 (missed all issues) and 11 (hit all issues) points. To obtain the variable “level of knowledge of financial risk”, the sum of the scores obtained in the 4 binary variables was performed, which indicated whether the individual hit or missed questions Q12, Q13, Q14 and Q15, so that the variable knowledge of financial risk can take values on a scale between 0 (got all questions wrong) and 4 (got all questions right) points. Then, in order to make comparisons, among the variables knowledge of financial literacy and knowledge of financial risk, both variables were converted to the same measurement scale, a scale of 0 to 20 points was chosen.

To classify the level of knowledge of financial literacy and financial risk of the 830 individuals, a tripartite division was considered, with their cutoff points 6.67 and 13.33, that is, an interpretation based on a „traffic light“, through the levels of knowledge, namely: low knowledge (red: values ranging from 0 to 6.67), satisfactory knowledge (yellow: values ranging from 6.68 to 13.33) and high knowledge (green: values ranging from 13.34 to 20). This methodology has been used in psychosocial risk studies, in which in the “traffic light” interpretation, green identifies a favorable situation, yellow an intermediate situation and red a risk situation (Silva et al. 2012). Thus, table 4 shows that individuals have good knowledge about financial literacy, since 45.8% are classified as having satisfactory knowledge and 38.8% high knowledge. Knowledge of financial risk is considered low, as most have low levels (61.8%). Given the average values obtained and table 4 data, the level of knowledge of financial literacy of sample individuals can be classified as satisfactory and the level of knowledge of financial risk can be classified as unsatisfactory. A strategy based on developing a financial system for people with different levels of financial literacy can have a positive impact (Ayadi 2013). Therefore, people can gain ability to use financial services more efficiently, contributing to the development of societies and the economy.



Table 4: *Descriptive Statistics of Knowledge of Financial Literacy and Financial Risk*

	Knowledge of Financial Literacy		Knowledge of Financial Risk	
		%		%
Low	128	15.4	513	61.8
Satisfactory	380	45.8	153	18.4
High	322	38.8	164	19.8

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Through the application of the Student's t-test to the variables "knowledge of financial literacy" and "knowledge of financial risk", there were statistically significant differences ($t(829) = -23,521, p < 0.001$). The magnitude of the mean differences has a large effect size (squared eta = 0.40) according to Pallant (2013). Thus, it can be inferred that Portuguese individuals have higher levels of knowledge of financial literacy ($M = 11.46, SD = 4.87$) than knowledge of financial risk ($M = 6.53, SD = 6.31$). Although the knowledge of financial literacy is greater than the knowledge of financial risk, the Portuguese government must implement measures to support training in schools and in families to improve the levels of financial literacy (Tavares and Almeida, 2020) and in this way, according to Bannier and Neubert (2016), increase the knowledge of financial risk. It is urgent to improve the knowledge of financial risk, taking into consideration the answers that the respondents gave to the survey. These included key concepts of Financial Mathematics and Statistics, which indicates a lack of training in these areas.

Testing Hypotheses

From the application of Pearson's correlation, it can be verified that there is a positive and statistically significant correlation between knowledge of literacy and financial risk ($r = 0.44, p < 0.001$), and the correlation is classified as moderate according to Cohen's criteria (Pallant, 2013), which means that higher levels of knowledge of financial literacy are associated with higher levels of financial risk knowledge, which empirically supports



the Hypothesis 1, corroborating, with the results of the studies of Gorbachev and Prado (2019) and Potrich and Vieira (2018).

To find out if there are significant differences in knowledge of financial literacy and financial risk between two independent samples (men and women, singles/divorced/widowed/married, /non-married partners, people who have training in the area of management or similar and people who are not) Student's t-test was used. There were statistically significant differences between men and women in the knowledge of financial literacy ($t(828) = 9,840, p < 0.001$) and in knowledge of financial risk ($t(781.65) = 7,424, p < 0.001$). The magnitude of the average differences, according to Pallant (2013), has a moderate effect size for the knowledge of financial literacy (squared eta = 0.10) and for the knowledge of financial risk (squared eta = 0.06). There were no significant differences in knowledge of financial risk ($t(828) = -1,097, p > 0.05$) between single/divorced/widowed individuals and married/non-married partners, but there are statistically significant differences between single/divorced/widowed individuals and married/non-married partners in the knowledge of financial literacy ($t(828) = -5,033, p < 0.001$). The magnitude of the average differences, according to Pallant (2013), has a low effect size for the knowledge of financial literacy (squared eta = 0.03). There were also statistically significant differences in knowledge of financial literacy ($t(700,124) = 7,452, p < 0.001$) between those who have training in the area and those who do not have, and the magnitude of the mean differences presents a square eta of 0.06, which according to Pallant (2013) is considered a moderate effect size. There were no significant differences in knowledge of financial risk ($t(828) = 0.764, p > 0.05$) among those who have training in the area and those who do not have. From the application of statistical tests and by observing the descriptive measures of Table 5, it can be inferred that in terms of knowledge of literacy and financial risk, men are the ones with the highest average levels, which empirically supports the Hypothesis 2, corroborating the studies of Aren and Zengin (2016) and Bannier and Neubert (2016). In terms of knowledge of financial literacy, it is possible to infer that married individuals or non-married partners have higher average levels and it



can also be inferred that individuals who have training in the area of management or similar are those who present higher average levels. In regard to the knowledge of financial risk in the groups of variables marital status and training in the area of management, it can be stated, from a sample point of view, that individuals married or unmarried partners and those who have training in the management area present higher average levels, which is proven with the basic studies Lusardi and Mitchell (2014); Tavares et al. (2019); Garg and Singh (2018) and Chu and Wang (2017). Thus, the Hypothesis 3 is empirically sustained only for the knowledge of financial literacy.

Through the application of Pearson's correlation, there is a statistically significant and positive correlation between age and knowledge of financial literacy ($r = 0.22, p < 0.001$), which indicates that when age increases, the levels of knowledge of financial literacy also increase. This correlation is of low magnitude (Pallant, 2013). Statistically significant differences were found between age and financial risk knowledge ($r = 0.03, p > 0.05$).

Table 5: *Descriptive Measures of Knowledge of Literacy and Financial Risk*

		Knowledge of Financial Risk		Knowledge of Financial Literacy	
Sex	Male (= 492)	7.80	6.43	12.76	4.67
	Female (= 338)	4.67	5.63	9.56	4.52
Civil State	Single/Divorced/ Widower (n = 418)	6.29	6.13	10.63	4.74
	Married/Unmarried partners (n = 412)	6.77	6.48	12.30	4.86
Training in the area of Management	Yes (= 471)	6.68	6.15	12.55	4.37
	No (= 359)	6.34	6.51	10.03	5.13

Using IBM SPSS Statistics 25 software became the age variable into a new variable called age group with 4 age groups (from 18 to 26 years, from 27 to 36 years of age, aged 37 to 46 years and over 47 years), Levene's test revealed the homogeneity of variances, which led to the application of ANOVA, with significant differences in knowledge of financial literacy between the four age groups ($F(3, 826) = 13,434, p < 0.001$). The magnitude of the average differences, according to Pallant (2013), has a low effect size for the knowledge of financial literacy (squared eta = 0.05). Regarding knowledge of financial risk, no statistically significant differences were found between the four age groups ($F(3, 826) = 0.079, p > 0.05$).

Through the application of Tukey's multiple comparison test, there were significant differences in the knowledge of financial literacy between the age groups aged 18 to 26 years ($M = 10.31, SD = 4.68$) and from 37 to 46 years ($M = 12.21, SD = 4.72$), of the 18 at 26 years and over 47 years ($M = 12.66, SD = 5.04$), from 27 to 36 years ($M = 10.38, SD = 4.68$) and from 37 to 46 years ($M = 12.21, SD = 4.72$) and from 27 to 36 years and over 47 years old, demonstrating the formation of two groups. Thus, there is a group with the lowest literacy knowledge levels, whose age is between 18 and 36 years of age with an average value of less than 10.5 and there is another group with the highest literacy knowledge levels whose age group is above the 37 years with an average value above 12, which empirically holds the Hypothesis 4 proving with the basic studies Santos et al. (2018), and Bannier and Neubert (2016). Age is one of the most important factors, in terms of loan markets (Modigliani and Brumberg 1954). Age is one of the most important factors in terms of loan markets (Modigliani and Brumberg 1954). Thus, the inclusion in curricular plans of a curricular unit of financial education in schools is very important, so that in the future young people will have financial knowledge so as not to get into debt and be able to make savings to have a decent life when they retire.

The application of Spearman's correlation allows to verify that there is a statistically significant and positive correlation between the level of education and knowledge of financial literacy ($r = 0.28, p < 0.001$) and between the level of education and



knowledge of financial risk ($r = 0.17, p < 0.001$), which means that with an increment on the level of training, the levels of knowledge of literacy and financial risk also increase, which empirically holds the Hypothesis 5 proving with the basic studies of Garg and Singh (2018), Potrich and Vieira (2018) and Salem (2019). Both are classified as low magnitude correlations (Pallant 2013).

Regarding professional situation, it is intended to compare, in terms of knowledge of literacy and financial risk, the three most representative groups: self-employed ($n = 106, 12.8\%$), employee-employed ($n = 517, 62.3\%$) and student or trainee ($n = 146, 17.6\%$). Levene's test revealed the homogeneity of variances, which led to the application of ANOVA, verifying the existence of significant differences in the knowledge of financial literacy between the three professional situations ($F(2, 766) = 14,039, p < 0.001$). The magnitude of the average differences, according to Pallant (2013), has a low effect size for the knowledge of financial literacy (squared eta = 0.04). Through the application of Tukey's multiple comparison test, there were significant differences in knowledge of financial literacy among students or trainees ($M = 9.69, SD = 4.60$) and self-employed ($M = 12.56, SD = 4.54$) and between students or trainees and workers on behalf of others ($M = 11.75, SD = 4.80$), and workers on their own or on behalf of others obtaining higher average levels of knowledge of financial literacy when compared to the students or trainees. Regarding knowledge of financial risk, there were no statistically significant differences between the three professional situations ($F(2, 766) = 0.804, p > 0.05$). However, from the sample point of view, individuals working on their own or others have higher average levels of knowledge of financial risk, which is evidenced by the studies of the authors Bharucha (2019) and Kuntze et al. (2019). Thus, the Hypothesis 6 is empirically sustained only for the knowledge of financial literacy.

Through the application of Spearman's correlation, there was a statistically significant and positive correlation between illiquid annual income and knowledge of financial literacy ($r = 0.35, p < 0.001$) and between gross annual income and knowledge of financial risk ($r = 0.22, p < 0.001$), so it can be inferred that the higher the annual gross income, the higher the levels of



knowledge of literacy and financial risk, which empirically holds the Hypothesis 7 proving the with the basic studies of the authors Santos et al. (2018); Knoll and Houts (2012) and Salem (2019). According to Cohen's criteria (Pallant 2013), the first correlation is classified as moderate and the second as low.

CONCLUSIONS

Knowledge of literacy and financial risk are two important variables that characterize the financial performance of an individual. The level of knowledge of financial literacy of Portuguese individuals can be classified as satisfactory and the level of knowledge of financial risk can be classified as unsatisfactory. The respondents had some difficulties in simple calculations with percentages.

Based on the results obtained, it can be inferred that there is a positive and statistically significant correlation between knowledge of financial literacy and knowledge of financial risk, which means that higher levels of literacy knowledge are associated with higher levels of knowledge of financial risk, which can help individuals make better decisions. Portuguese individuals have a higher level of knowledge of financial literacy than knowledge of financial risk.

In the present study, as in other studies, some sociodemographic and professional variables interfere in financial literacy. When analyzing differences between men and women, in terms of knowledge of financial literacy and financial risk, it turns out that men are the ones with higher average levels. Knowledge of financial literacy is higher in individuals who have training in the area of management or similar. In terms of the variable marital status, individuals married or unmarried partners have average levels of knowledge of financial literacy. Self-employed workers or workers on behalf of others have a higher average level of knowledge of financial literacy when compared to students or trainees. The levels of knowledge of financial literacy increase with age, higher levels of training are associated with higher levels of knowledge of literacy and financial risk and higher annual illiquid incomes are associated with higher levels of knowledge of literacy and financial risk.



The present study shows that it is necessary to intervene in the training of young people, that is, to reinforce financial education in schools, in order to improve knowledge of literacy and financial risk. Thus, young people will be prepared to start their savings plans and future projections sooner and will be able to make better financial decisions. In order to verify the previous requirement, it is also necessary to invest in teacher training so that they can change/improve the way they transmit knowledge of literacy and financial risk to young people. In the future, it is intended to compare, for the Portuguese population, the levels of knowledge of financial literacy with the perception of individuals regarding their financial literacy.

There is a need for financial education initiatives that involve all the contributors to financial knowledge. These financial knowledge programmes must be implemented at schools, universities, urban and rural areas, and promoted by media campaigns. Still, there should be developed e-learning platforms to use basic financial services. Apart from the studies conducted by the Bank of Portugal, this study is relevant for Portugal in the matters of financial literacy and financial risk of the population. The questionnaire that was utilized allows to define the exact areas where people have more difficulties, which may be useful for policymakers, because it clarifies which topics require more work. It should be noted that this questionnaire survey has a high number of answers and that it is the first academic study on the topics of financial literacy and financial risk. The conclusions presented may help the creators of financial education policies to adopt actions which were already implemented in other Euro-Mediterranean countries, where studies like ours have been conducted before, with similar conclusions. Besides that, governments must facilitate financial education to increase the level of alphabetization regarding capital market. It is necessary to improve public consciousness on the management of financial resources through financial education, in order to better financial knowledge, and especially long-term planning, such as retirement planning and the behaviour of the financial investment. Something important that has not been explored in this study is the role of financial education in financial welfare.



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