UNIVERSIDADE CATÓLICA PORTUGUESA

Financial literacy amongst Portuguese students attending higher education on business related courses

By

Rui Pedro Assureira Ferreira Silva Sebastião

Católica Porto Business School, Universidade Católica Portuguesa

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Master's Final Thesis presented to Católica Porto Business School, Universidade Católica Portuguesa to obtain a Master's degree in Management

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Rui Pedro Assureira Ferreira Silva Sebastião

Under the guidance of

Professor Susana Costa e Silva and Professor Paulo Duarte

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Abstract

Financial markets are global and financial products that are increasingly complex. Therefore, an individual's financial knowledge is vital for informed decision-making enabling the best personal financial management possible. Given the importance of financial literacy in people's lives, its determinants have tried to be identified to understand how it influences financial literacy levels, namely among young people.

Hence, the goal of this study will be to assess the level of financial literacy of young Portuguese students, addressing the impact of the level of education on the financial literacy of college students. To test this, data from a questionnaire distributed to both Bachelor's and Master's students in business related courses at higher education institutions (namely Coimbra Business School and the Economics Faculty of Coimbra University) and through social media (namely Facebook) were analysed.

The main findings were that both the level of the degree being studied (whether either a bachelor's or master's degree is being studied) and the academic background of the individual's parents have a positive impact on financial literacy. Furthermore, the level of financial literacy of Portuguese students attending higher education is low, especially in terms of their knowledge of the main financial concepts.

Keywords: Financial Literacy, Financial Knowledge, Financial education.

Resumo

Os mercados financeiros são globais e os produtos financeiros são cada vez mais complexos, pelo que o conhecimento financeiro é vital para a tomada de decisões informadas que levem à melhor gestão possível. Dada a importância deste tópico na vida das pessoas, tentou-se identificar os determinantes para perceber como é possível influenciar os níveis de literacia financeira, nomeadamente em jovens.

Assim, o objetivo deste estudo será avaliar o impacto do grau académico a frequentar no nível de literacia financeira dos estudantes universitários. Com esta finalidade, os dados de questionários que foram distribuídos a alunos a frequentar licenciaturas e mestrados em áreas relacionadas com ciências empresariais em instituições de ensino superior (nomeadamente Instituto Superior de Contabilidade e Administração de Coimbra e Faculdade de Economia da Universidade de Coimbra) bem como através de redes sociais (nomeadamente o Facebook) foram analisados.

As principais conclusões do estudo destacam que o nível de educação frequentado dos indivíduos (Licenciatura ou Mestrado) assim como as habilitações dos pais influenciam positivamente na sua literacia financeira. Adicionalmente observou-se que a literacia financeira dos alunos universitários portugueses é baixa especialmente no que respeita ao conhecimento financeiro.

Palavras-Chave: Literacia Financeira, Conhecimento Financeiro, Educação Financeira.

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"Money is inseparable from how you experience it.
Whether you are an advanced trader or a young person budgeting for the first time, you need to understand how your experiences make you predictably irrational,
so you can make smarter investing decisions."
(W. Kenton)

1. Introduction

World economies linked by globalisation are posed with new challenges, as its effects can be felt worldwide. The growing financialization and complexity paired with globalisation hinders an individual's financial knowledge, which "is especially important in times where increasingly complex financial products are easily available to a wide range of the population" (Klapper, Lusardi, & Oudheusden, 2014,p.4).

The study of financial literacy among different population segments took place in different countries. Chen and Volpe (1998), for example, studied the financial literacy of students in the United States of America and concluded that students did not know much about personal finance. Lusardi and Mitchell (2011) noted that in eight countries (Germany, Sweden, Netherlands, Japan, Italy, New Zealand, United States, and Russia) financial literacy levels were very low regardless of the development of the financial market of the country. Borodich, Deplazes, Kardash, & Kovzik (2010) conducted a comparative study in the U.S, Belarus, and Japan and found that Japanese students had greater financial literacy and that Belarusian students had similar levels to American students; Shahrabani (2013) provided evidence of a low level of financial literacy in Israeli students; and Batsaikhan & Demertzis (2018) showed the comparative level of financial literacy in the European Union and provided policy recommendations.

Financial literacy is the application of the financial knowledge that an individual has in order to improve their well-being. In order to allow a comparison of financial literacy between countries the Organization for

Economic Cooperation and Development (OECD) has developed an indicator that aggregates three indicators: financial behaviours, financial attitudes, and financial knowledge.

According to this indicator, Portugal ranks 10th out of the 30 countries analysed (Banco de Portugal, 2015). However, in the questionnaire used, the financial knowledge topic was the one where the Portuguese respondents struggled the most, ranking in 13th among a group of 30 countries (Banco de Portugal, 2015, p. 27). The financial concepts where Portuguese respondents scored higher were about banking products, and the ones where they scored lowest addressed the capital market (Banco de Portugal, 2015, p. 32). In a field study to assess the financial literacy of 1st cycle (primary education) and 2nd cycle (secondary education) students in a school in Oporto, Pacheco, Ribeiro, & Tavares (2016) show that Portuguese students have gaps in their financial knowledge. Also, the lack of financial knowledge in Portuguese students attending higher education was documented in a study by Rainho, Santos, Sousa, & Tavares (2017).

Since financial knowledge shortage was identified, there have been some initiatives to try to improve financial literacy among Portuguese youth. Up to 2012, The Portuguese Association for Consumer Protection (DECO) promoted a campaign to improve financial literacy by supplying tools that allow young people to make informed financial decisions. Several other entities have launched similar initiatives. Since 2017 and up to the last week of October in 2020, the Portuguese Securities Market Commission (CMVM), the Portuguese Insurance and Pension Funds Supervisory Authority (ASF), and the Portuguese Central Bank (BdP) have been and will promote campaigns all over the country to try to improve financial literacy, focusing mainly on students. Portugal is one of the 21 European countries that participate in "European Money Week", during which the Portuguese Bank Association (APB), BdP, one of the Portuguese main banks,

Caixa Geral de Depósitos, amongst others, promote conferences to fight financial illiteracy.

Although there are several initiatives to foster financial literacy, to the best of our knowledge there are no studies regarding the impact of academic degrees on financial literacy. This issue is increasingly relevant when we consider the increase in the number of student enrolling in higher education. According to the Portuguese National Statistics Bureau (INE), the enrolment rate in higher education increased from 27.5% in 2003-2004 to 37.2% in 2017-2018. Moreover, the percentage of students that pursue postgraduate studies also increased, especially due to the change in the organisation of studies following the Bologna Declaration. According to the INE, from the 2008-2009 academic year to 2017-2018, the number of students enrolled in postgraduate studies (Master's level) increased by 32.4% (from 90249 to 119442). The motivation for the current research involves assessing if this increase in the number of students enrolling in higher education translates to higher financial literacy levels among the younger population. Therefore, the present study seeks to assess if education has a significant impact on the financial literacy of university students. Accordingly, it intends to answer the following main research question: How different is financial literacy between students studying for a Bachelor's and a Master's degree?

The thesis proceeds as follows. Section 2, the literature review, offers a brief overview of the conceptions of financial literacy and its determinants. Section 3, research hypothesis, provides the research objectives. Section 4, methodology, shows how the data was collected as well as the treatment that it was submitted to. Section 5, results, presents the research's results. Finally, section 6, conclusions and limitations, presents the major conclusions of the study and presents both the challenges met during this study and possibilities for future research.

2 Literature Review

2.1 Financial Literacy

Financial literacy is a broad term and has various interpretations. The consensus is that it involves two concepts: financial knowledge and financial behaviours that are in a consumer's best interests. This distinction is not clear cut since sometimes financial knowledge is assumed to be the same as financial literacy. For instance, when Lusardi and Mitchell (2011) state that "The National Council on Economic Education (NCEE, 2005) measured financial knowledge among children and adults, but that survey did not gather ancillary information to evaluate whether financial literacy affects behaviour" (Lusardi & Mitchell, 2011,p.5) they are treating financial literacy as financial knowledge, not taking financial behaviour into account. The OECD defined financial literacy as "a combination of awareness, knowledge, skill, attitude, and behaviour necessary to make sound financial decisions and ultimately achieve individual financial well-being" (OECD, 2012,p.2) thus emphasising the complexity of the concept, reinforcing that financial literacy is not solely financial knowledge.

Huston (2010) states that although financial knowledge and financial literacy are related, they are different independent concepts. The researcher's intake of the concept of financial literacy is that it has 2 inherent dimensions: "understanding" and "use". The former refers to personal financial knowledge and the latter to the ability to apply this knowledge to personal finances (Huston, 2010). A previous study from Johnson and Sherraden (2007) goes along with these principles, namely that financial literacy includes both knowledge on topics such as income, spending, credit, saving, and investing, as well as the choices an individual makes. In this study on financial literacy programmes for young people, they conclude that "children may be able to recite desired financial

behaviours" (Johnson & Sherraden, 2007,p.136), but financial literacy would involve the actual application of this knowledge.

A study performed in Malaysia also concludes that higher financial knowledge does not necessarily infer a better financial attitude, and therefore supports this distinction between financial knowledge and financial literacy (Yew, Yong, Cheong, & Tey, 2017). In a recent study on European Union countries, Batsaikhan and Demertzis (2018) links financial knowledge with actual financial behaviour (namely borrowing and household debt levels), finding, at a country level, a positive relationship between the share of households with negative net wealth and the country average financial knowledge score. This result reinforces the link between financial knowledge and personal financial decisions.

The recognition of financial literacy as an actual behaviour that draws on financial knowledge is a perspective that, from a research standpoint, requires a focus on individual's behaviours. Nevertheless, behaviours are based on knowledge so the study of financial knowledge is always crucial for financial literacy assessment.

2.2 Financial Knowledge Determinants

Even though financial literacy is not evenly spread across different segments of the population (Banco de Portugal, 2015), some of the determinants have already been identified in the literature. In the following subsections, some of these determinants are briefly analysed.

2.2.1 Income

Income is expected to impact financial literacy as it is normal to assume that someone who has more money wants to know more and make informed decisions on how to manage it. The scarce literature available on this issue shows evidence of a positive correlation between an individual's income level and financial literacy. For example, Lusardi and Mitchell (2007) show a positive link between the level of income and the financial knowledge of individuals. Later, an Italian-based study by Monticone (2010), points out that wealthier individuals are more likely to invest in their financial education, gaining knowledge that leads to making informed decisions, suggesting that wealth has a positive influence on financial literacy.

2.2.2 Level of Education

Lusardi, Mitchell and Curto (2010) used data from the *National Longitudinal Survey of Youth* to study the influence of socio-demographic characteristics, family characteristics, and peer characteristics on the financial knowledge of America's youth. The results showed that less than a third of young adults had basic financial knowledge about inflation, risk diversification and interest rates, but it was recognized that socio-demographic characteristics have a strong impact on the financial literacy of individuals. The study found "large differences in financial literacy according to educational attainment, especially for those who attended college—their correct response rates were about 7–8 percentage points higher than for those who graduated from high school" (Lusardi *et al.*, 2010,p.368). In Portugal, the evidence produced by a study conducted by Banco de Portugal (2015) concerning the level of financial literacy

of the Portuguese population states that the interviewees that had an academic degree correctly answered more questions testing numeracy, knowledge about insurances, banking products, and investment products, thus inferring a positive relation between these two variables. The average Global Financial Index calculated in this study was significantly higher among qualified individuals (67.95) than within individuals without a qualification (49.25).

Despite the relationship between the level of education and financial knowledge being documented in several studies, there is also empirical evidence of a correlation between the level of education and the financial behaviour component of financial literacy. Mandell and Klein (2009) have already sustained the idea that individuals possessing a higher education degree manage their money better and have a better understanding of financial instruments. Other authors such as Calvet, Campbell, and Sodini (2007) and Kimball and Shumway (2006), corroborate this positive link between the level of knowledge and financial literacy by showing that households and financially educated individuals are more likely to diversify and invest efficiently. Therefore, considering the literature, it is expected that people who pursue higher education degrees, such as bachelor's or master's degrees, display higher financial literacy.

2.2.3 Area of Study

Although certain financial concepts are part of daily life and therefore people are acquainted to some of them, they might not fully understand them. On the other side, people who have studied them are expected to display better financial literacy.

In a study conducted in American universities by Volpe, Chen, and Pavlicko (1996), it was observed that non-business majors are less knowledgeable than business majors. Later, Chen and Volpe (2002) confirmed these findings by

studying the personal financial literacy of college students and concluded also that business majors are more likely to show better knowledge about personal finance than students who are not from business majors. More recently, more evidence was provided by Murphy (2005) who noticed that business majors were more financially literate than non-business majors, and that business classes positively impacted the student's knowledge about money.

The impact of administering a specialised course to improve financial literacy in high school students was assessed by Pang (2010) and found that students who were subjected to this course performed better than those who were not. Adopting a cross-cultural perspective, a recent study compared the levels of financial knowledge between high school and college students in the U.S., Belarus, and Japan revealing that students who had personal finance training scored significantly better on the test than the ones who did not have it (Borodich *et al*., 2010). In 2016, Heath (2016) studied the effectiveness of these types of initiatives, and the evidence shows that these courses have a larger effect on self-assessed financial literacy than on financial literacy in itself.

The majority of the literature points out that there is in fact a positive link between people who have financial education in their background, either in high school, university, or through attending seminars or initiatives, and higher financial literacy due to the fact that they have a better grasp of basic financial concepts.

2.2.4 Professional Experience and living status

Another determinant which factors into the financial knowledge of an individual is work experience. Hancock, Jorgensen, and Swanson (2012) stated that the knowledge of students of financial instruments is influenced by their

work experience. College students who work while studying may experience positive but also negative outcomes. As they recognise, "Students who worked more hours per week had better financial knowledge than students who did not work" (Hancock *et al*., p.3, 2012). But, these were the ones who also displayed the riskier credit card use and had more debt (Lyons, 2004; Norvilitis & Maclean, 2010) which is puzzling. Nevertheless, other studies by Monticone *et al.* (2010) and Banco de Portugal (2015), found that the people who were in work scored better than unemployed people in the financial knowledge enquiry, as a result supporting the idea that there is a positive link between professional experience and financial literacy.

Regarding living status, no studied were found examining the influence of students living away from home, but it is expected that students who live away from home display better financial knowledge enabling them to better manage their money, than if they were to continue living at home with their parents.

2.2.5 Gender

Gender is a determinant that the literature finds to have significance in financial literacy. For instance, Lawrence, Christofferson, Nester, Moser, Tucker, and Lyons (2003) have studied credit card usage of university students and conclude that female university students are more likely to have a credit card and usually accumulate more debt (Micomonaco & Muffo, 2003).

Chen and Volpe (2002) studied the personal financial literacy differences among university students. They observed that females are less prone to acquire financial knowledge and are less willing to learn about it than males, suggesting significant gender-based differences. Other evidence also shows that females have poorer personal management skills (Borden, Joyce, & Dawn, 2008), and that they are more likely to write a bank check with insufficient funds, despite being

the ones that have a higher probability of having a budget (Hayhoe, Leach, Turner, Bruin, & Lawrence, 2000). Wang (2011) agrees that men usually tend to have more financial knowledge and that they display better management behaviours, meaning that they search for information about the global economy and about the assets they plan to invest in.

Complementing this evidence, a more recent study conducted in India observed that gender was an important variable and that men were substantially more financially literate than women (Bharucha, 2017). Also in 2017, four researchers, Bucher-koenen, Lusardi, Alessie and Rooij (2017), tested financial knowledge in three separate countries (the United States, Netherlands, and Germany) and found that despite the different social and cultural realities, there were significant evidences for the existence of this gender gap (Bucher-koenen, Lusardi, Alessie, & Rooij, 2017).

Cultural context seems to play a role in financial knowledge. A Malaysian study on financial literacy of university students, concluded that although men showed better financial knowledge, they scored worse than females with regards to their financial attitude (Yew et al., 2017), emphasising the importance of cultural contexts for the gender differences found in various different studies.

2.2.6 Age

The age factor is widely used to explain financial literacy, because it is commonly said that with age comes experience and, thus, it is expected that older people face more complex situations that require studying some financial concepts, such as asking for a loan to buy a house or a car. The knowledge on the relationship between age and financial knowledge has an inverted U-Shape, meaning that initially, financial knowledge grows with age, peaks at middle age

(roughly between 40 and 60) and then starts to decline (Monticone, 2010). The decline can be due to the deterioration of cognitive functions of the individual (Agarwal, Driscoll, Gabaix, & Laibson, 2007). Delavande, Rohwedder, Willis, and Delavande (2008) provided support to U-shape by showing that cognitive ability improved financial knowledge. In Portugal, a Banco de Portugal (2015) report about financial literacy show that the global financial literacy index increases to its maximum from the 16-24 years old to the 25-39 years old age cluster, following a decrease from that point onward, as evidenced by Monticone (2010). Furthermore, Lusardi *et al* (2011) indicate that older populations present lower levels of education, and by that may be especially vulnerable.

2.3 ***Parental Influence***

Individuals must acquire knowledge, skills, and values to become independent and parental socialisation plays a great part in it. Parental socialisation refers to the learning process that an individual undergoes through his parents, with regard to acquiring knowledge and competences that they use in their lives, namely to manage their finances (Gudmunson & Danes, 2011). A study by Shim *et al*. (2010) reports that parent socialisation has a direct and indirect effect. They observe that the socio-economic status of the parents and their financial knowledge, as well as their own behaviours, have a substantial positive effect on the financial behaviour of students. Therefore, family and especially parents seem to have a strong role on the lives of their children, and these tend to take after their parents' attitudes and behaviours, including, for example, money management behaviour. Norvilitis and Maclean (2010) study the parental influence on college students and report that parents have significant influence in both knowledge and decision making of the students and highlight that students whose parents used a hands-on approach show lower levels of

debt. Lusardi *et al.* (2010) report that parents were an important channel for young students to gain financial knowledge.

Draut and Silva (2004) observed that students who come from poorer families do not manage their money as well as students who come from higher income families, probably because these students did not have much financial knowledge prior to college. Likewise, Shim, Barber, Card, Xiao, and Serido (2010) present empirical evidence that there is a correlation between the parents' income and the financial knowledge of young adults. Families who are wealthier probably have more financial knowledge and display better financial decisions passing on to individuals either through direct advices or "lead by example". Parents who earn less and possess lower education levels have lesser tools to be able to transmit financial knowledge to their children and young students whose mothers had received a sound education displayed better financial literacy. As a result, it can be concluded that parental socialisation strongly influences how individuals manage their money.

3 Research Hypothesis

Financial literacy is both the financial knowledge possessed and the application of it. In this research, the dependent variable to be tested is the level of financial knowledge of Portuguese students attending higher education. The independent variables are clustered into 3 dimensions: Income, Socio-demographic factors, and Education.

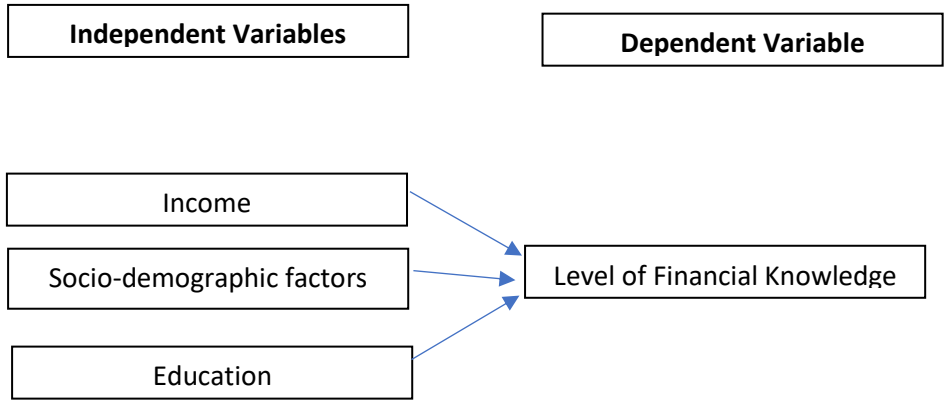


Figure 1. Conceptual model

The goal of the study is to assess the impact of the level of education on the financial knowledge of university students. Using the literature review as a frame of reference, a set of research hypotheses is hereby proposed.

Master's students are usually older, have experienced more, either professionally or personally, and are attending a higher level of education. Education is key to having a better grasp of financial instruments (Mandell & Klein, 2009), and to making decisions that are better grounded. Therefore, it is expected to have a positive influence on a student's financial knowledge.

H1: Master's students present higher financial knowledge than bachelor's students

The family background of an individual involves the reality and lifestyle in which someone is raised, and both influences their knowledge and shapes their behaviour. Parents with higher incomes and that discuss investments at home are bound to influence their children's views and behaviour towards investments (Robb & Sharpe, 2009). Parents who have higher education studies have more education and knowledge, and also take more cautious and informed decisions, hence transmitting more knowledge (Shim et al., 2010; Lusardi et al., 2010).

Thus, the parental influence, either through parental socialisation or through the parents' background characteristics. Therefore, it is expected that students who have lesser educated parents and were raised in tougher circumstances are more likely to have less financial knowledge.

H2: Family background influences financial knowledge

People gather more financial knowledge earlier in life, between the ages of 16 to 30, since they have little to none in younger stages. As they grow older, their financial knowledge increases as they need to take more complex decisions, such as how to finance their purchases (like e.g. a house or a car). This might explain the exponential increase in financial knowledge early in life, in the age bracket mentioned above, which Monticone (2010) observed. Therefore, it is expected that older students present a greater amount of financial knowledge.

H3: Age is positively linked to financial knowledge

Wang (2011) states that men usually tend to have more financial knowledge and that they display better management behaviours. Bucher-Koenen, Lusardi, Alessie, and Rooij (2017), tested financial knowledge in three separate countries (United States, Netherlands and Germany) through the use of surveys and

concluded that there were gender difference gaps (Bucher-Koenen *et al.*, 2017). Hence, male students are expected to demonstrate having a greater amount of financial knowledge than female students.

H4: Male Students are more knowledgeable

Previous findings have provided evidence of a positive link between working students and financial knowledge in other countries such as the U.S.A. (Hancock et al., 2012) and Italy (Monticone, 2010). It is expected that if student-workers earn a wage they need to be more knowledgeable to manage their salary and make better financial decisions.

H5: Student-workers have greater financial knowledge

Despite not being supported in the literature, it is strongly believed by the researcher that students who are living away from home, apart from their parents have to make wiser decisions when managing available money, since they have more responsibilities and an obligation to manage a limited budget, and therefore they should display better financial knowledge. Based on this belief, the innovative H6 is presented.

H6: Students who are living away from their parents have greater financial knowledge

4 Methodology

4.1 *Data collection methods and sample*

In the literature there is no commonly accepted method to assess the financial knowledge of individuals. Bearing in mind the aims of this work data were collected through a questionnaire, made available via the Google Docs platform, and distributed across several classes in Portuguese universities, namely Coimbra Business School and the Economics Faculty of Coimbra University, and through social media, namely Facebook.

The same procedure of using questionnaires was adopted in several studies such as Chen and Volpe (1998), Hancock *et al.* (2012), as well as by Banco de Portugal (2015), and even in different countries, like Israel (Shahrabani, 2013), the U.S., Japan, and Belarus (Borodich et al., 2010).

The advantage of this method is the wide reach of applicants in a short amount of time without being expensive.

The present study was conducted in Portugal. The sampling frame factored in students who were attending Portuguese higher education courses in Economics, Management, and Marketing. A sample of 185 was collected between 25th February and 23rd March 2019.

All the answers were anonymous, so that there were no constraints to the participation of students. This ethical procedure made them not worried about having their level of financial knowledge tested.

4.2 *Methods for data analysis*

Regarding the data statistical analysis, IBM SPSS software was used to access the significance of the relevant topics, as well as to identify possible correlations.

The assumption that the data collected is normally distributed was studied using histograms, standardised skewness and kurtosis (Hair, Black, Babin, & Anderson, 1995, p.71). The standardised skewness and kurtosis are obtained using a z-test applied to a normality test. If the z value exceeds ± 1.96, which corresponds to a .05 error level, then the distribution is non-normal (Hair *et al.*, 1995,p.72). With a sample size of n=185, the Central Limit Theorem was considered adequate. For the identification of outliers the criterion of ±2.5SD from the mean was used.

The standard correlation coefficient Pearson's *r* was used with variables with an interval scale of measurement (Howell, 2011). When one variable was measured as a dichotomy then the correlation coefficient that we produce was the point biserial correlation. When both variables were as dichotomies was performed phi correlation coefficient. Because correlation is sensitive to the sample size, Cohen's rule of thumb to the strength of correlation (Cohen, 1988) was considered:

$\pm .10 \leq r \leq .29$ small; weak

$\pm .30 \leq r \leq .49$ medium, moderate

$\pm .50 \leq r \leq \pm 1.0$ large, strong

ANOVA (Analysis of Variance) was used to test differences between means. The assumption of homoscedasticity was verified with Levene´s test. When the Levene's test was statistically significant or when the size of the groups to be compared was very different, Brown-Forsythe correction was considered (Vallejo & Escudero, 2000). Principal Component Analysis was used to reduce the

number of variables and to support the use of a score based on several variables (Stevens, 2009).

Chi-Squared was performed to test if the distribution of one categorical variable is contingent on a second variable. For expected frequencies less than 5, the Fisher Exact test was performed (Sprent & Smeeton, 2001).

4.3 *Questionnaire*

The Questionnaire is structured in four parts. The first section enquires about the self-perception of the knowledge of some financial instruments and concepts, as well as financial literacy itself, using a 5 level *likert* scale that goes from "very low" to "very high". The second section consists of 10 multiple choice questions about financial concepts with 4 possible answers, one of which being "do not know". An example: "Euribor" is one of the main reference rates of the Eurozone and…: (a) Is set by the European Central Bank. (b) Is set by the Banco de Portugal. (c) Results of loans made by a group of European banks. (d) I do not know. Following the pattern of section two, the third section has 6 questions related to numeracy in the same way and ends asking again about the self-perception of the individual's financial literacy level. Finally, the questionnaire's last section asks about personal details, such as age, gender, professional experience, field of study, level of education, income, family background education, and household income, in order to draw the socio-demographic profile of the students surveyed.

The income variable was not analysed since the data collected concerning this issue was not reliable. Many students who were living away from home had reported that they had no income nor allowance, while others did, raising doubts on the perceptibility of the question.

The answers of the respondents were used to calculate the percentage of correct answers and were grouped into three groups consistent with previously

analysed literature (Chen & Volpe, 1998): a score of over 80% represents a high level of financial knowledge; a score between 60% and 79%, represents a medium level of financial knowledge; a score below 60%, represents a low level of financial knowledge.

5. Results

5.1 Sample characterisation

Students' ages vary from 18 to 53 years old with a mean of 22.20 (SD=3.06). Analysing the age distribution, we can observe that the age group of 31 and 53 years old behaved as *outliers* distancing themselves 2.9SD and 10SD from the mean, respectively. After excluding these two subjects from the sample it amounted to 185 individuals and the standardized asymmetry goes from 32 to 2.7.

As is observable in Table 1, the sample consisted of 185 individuals; 57.8% (n=107) of the male gender and 42.2% (n=78) of the female gender. 58.9% (n=109) were living away from home, 20.0% (n=37) were working students. The minimum age was 18 years old and the maximum was 26 years old, with a mean of 21.98 years old (DP=1.94).

	N	%		n	%	n	%
Gender			**Qualifications**	mother		father	
Female	107	57.8	1st Cycle	15	8.1	16	8.7
Male	78	42.2	2nd Cycle	80	43.2	90	48.9
Living away from home							
No	76	41.1	Bachelor's	56	30.3	50	27.2
Yes	109	58.9	Post-graduate, Master's	34	18.2	28	15.2
Working student			or Doctorate				
No	148	80.0	**Age**	Min.	Max.	M	DP
Yes	37	20.0		18	26	21.98	1.94

Table 1. Gender, living status, worker student and parents' qualifications

As for the parents' qualifications, 8.1% (n=15) of the mothers and 8.7% (n=16) of the fathers only concluded the primary school (Table 1). The majority of mothers (n=80, 43.2%) and of the fathers (n=90, 48.9%) had qualifications that they had gained during secondary education, from the 2nd cycle (5th to 12th grade). 30.3% (n=56) of the mothers and 27.2% (n=50) of the fathers graduated from university. The post-graduate, master's, or doctorate level was obtained by 18.2% (n=34) of the mothers and 15.2% (n=28) of the fathers.

	n	%		n	%
Bachelor's	**110**	**59.5**	**Masters**	**75**	**40.5**
Business and public audit	1	0.9	Financial Analysis	2	2.7
Trade and International Econ. Relations	3	2.7	Business and Public Audit	1	1.3
Accounting	1	0.9	Economics	12	16.0
Economics	80	72.7	Economics and Public Politics	1	1.3
Management	12	10.9	Finance	3	4.0
Marketing Management	1	0.9	Management	34	45.3
Hotel Management	1	0.9	Marketing Management	4	5.3
Marketing	7	6.4	Service and Technology Management	1	1.3
Accounting and Audit	2	1.8	Management and Industrial Strategy	1	1.3
Didn't answer	2	1.8	Marketing	12	16.0
total	110	100	Financial Mathematics	1	1.3
			Accounting., taxation and business finance	1	1.3
			Didn't answer	3	4.0
			total	75	100

Table 2. Level of education and area of expertise

As for the level of education, Table 2 shows that the sample is comprised of 110 undergraduate students (59.5%) and 75 (40.5%) that were attending a master's degree (table 2). The most represented undergraduate degree is economics, with a percentage of 72.7% (n = 80). In the master's courses, the most represented one is Management, with a percentage of 45.3% (n = 34).

5.2 Financial knowledge analysis: Empirical results

Self-perception of financial knowledge

Respondents were asked to evaluate their knowledge on five issues of financial knowledge (Euribor, bank uncovered, fixed and variable interest rates, spread, credit cards and loan modalities) on a five-point scale that ranged from very low (1) to very high (5). In this way we consider it legitimate to obtain a sum that evaluates the perception of financial knowledge.

The scores in the self-perception of financial knowledge ranged from 1 to 5 with an average of 3.31 (SD = 0.72). For a more intuitive interpretation of the results, the sum of the scores was divided by the number of items (six) in order to be reduced to the response scale. An average of 3.31 indicates that the subjects situated their knowledge just above the average.

The standardised skewness was of -2.6 and the standardised kurtosis was 3.1 points to no normality.

Financial knowledge

The financial knowledge was obtained by applying a knowledge test with multiple choice answers. In the first part, the questions were about financial knowledge (12 questions) and the second part was about numeracy (6 questions). As it was a knowledge test, the answers were considered as right (1) or wrong (0) and it obtained a total score. The distribution of the answers by the options is presented in the appendix. In this case the use of PCA is not justified because the correct answers are considered cumulative but independent, meaning more correct answers mean greater knowledge. Three scores were obtained on financial knowledge, numeracy and a total score that includes the first two. In Table 3 and through the average proportion of correct answers we can verify that the subjects showed more knowledge in numeracy than in financial knowledge.

In financial knowledge, they scored an average of 54%, in numeracy 71% and in the total score 60%. The higher average of right answers is in numeracy questions, suggesting that students are able to rationalise and use logical thinking. On the other hand, the lower average of right answers in the financial knowledge part suggests that they do not know the concepts and definitions very well, having in the question regarding Euribor a higher percentage of a single wrong answer (47.1%) than the right one (42.8%). (Table 15)

Although the variables do not present normal distributions, with standardised skewness and kurtosis superior to |1.96| we assume that the central limit theorem (Graphs 5, 6 and 7) could be applied since no outliers were observed and the sample could be considered large (Murteira, Ribeiro, Silva, & Pimenta, 2001).

	Minimum	Maximum	Mean	SD	% right answers (average)	SS	SK
FK	0	10	5.96	2.43	54%	-1.13	-2.35
Numeracy	1	6	4.23	1.52	71%	-3.68	-1.49
TK	2	16	10.19	3.49	60%	-1.70	-2.21

SD – standard deviation; SS – standardized skewness; CP – standardized kurtosis; FK - Financial Knowledge; TK - Total Knowledge

Table 3. Average scores in financial knowledge, numeracy, and total score.

Furthermore, it is observable that almost half of the people questioned got a score below 60% (49.5%), 31.9% of the students had a medium level of financial knowledge and less than 20% (18,7%) presented a high level of financial knowledge, which is an indication that students who are attending higher education in business related fields do not possess much financial knowledge (Table 4).

	Frequency	Percent
<60%	90	49,5
60%-79%	58	31,9
>=80	34	18,7

Table 4. Total Financial Knowledge Scores

Academic qualification vs financial knowledge perception and financial knowledge

		N	M	SD	F(df)	p
Self-perception of comprehension in financial knowledge	Bachelor's	110	3.30	0.68	0.061	.805
	Master's	75	3.32	0.78	(1,184)	
Financial Knowledge	Bachelor's	107	5.08	2.18	41,510	<.001**
	Master's	75	7.21	2.21	(1,181)	
Numeracy	Bachelor's	107	3.82	1.53	20.203	<.001**
	Master's	75	4.80	1.32	(1,172.78)	
Total Knowledge	Bachelor's	107	8.91	3.12	43.085	<.001**
	Master's	75	12.01	3.17	(1,181)	

[a] Levene's test was meaningful [F(1,180)=4.201, p=.042; it was considered the Brown-Forsythe correction.

**p<.01; *p<.05; ns – not significant

Table 5.Differences test (ANOVA) on self-perception of comprehension in financial knowledge, financial knowledge, numeracy, and total knowledge according to the academic degree studied

Master's students achieved significantly higher averages in financial knowledge (7.21), numeracy (4.8), and total knowledge (12.01) than their fellow undergraduates (5.08, 3.82 and 8.91 respectively) (Table 5). Interestingly, and

despite the lower knowledge showed by undergraduate students, there were no statistically significant differences in self-perception of comprehension in financial knowledge (Bachelor's=3.30 and Master's=3.32; *p*=.805).

Regarding the link between the academic degree and questions individually it is observable in Table 19 that there were only five questions that did not show a statistical significance. Two were about financial concepts such as mutual funds and checks and the other three were numeracy question about methods of payment, purchasing power, and wealth. The statistically significant question which had the highest percentage of right answers was about term deposits in both Bachelor's (n= 79 %=73.8) and Master's students (n=67 %=89.3).

These findings globally corroborate the literature which points out that there is a positive link between academic qualifications and the level of financial knowledge, with Master's students having performed better, on average, in both the fields (knowledge about financial concepts and numeracy) and, consequently, in terms of overall total knowledge score (Kimball & Shumway, 2006;Mandell & Klein, 2009;Lusardi & Mitchell, 2011).

Gender vs Total knowledge and financial knowledge perception

		N	M	SD	F(df)	*P*
Self-perception of comprehension in financial knowledge	Female	107	3,37	,75	1.756 (1.184)	.187
	Male	78	3,22	,67		
Financial Knowledge	Female	104	5,69	2,31	3.018 (1.181)	.084
	Male	78	6,32	2,55		
Numeracy	Female	104	4,06	1,50	2.971	.087

	Male	78	4,45	1,53	(1.181)	
Total Knowledge	Female	104	9,75	3,29	3.863	.051
	Male	78	10,77	3,68	(1.181)	

**p<.01; *p<.05; ns – not significant

Table 6. Differences test on self-perception of comprehension in financial knowledge, financial knowledge, numeracy, and total knowledge according to gender.

There were no statistically significant differences between the means in self-perception of comprehension in financial knowledge, financial knowledge, numeracy, and total knowledge according to the gender of the respondents (Table 6). Analysing each individual question (Table 20), it is possible to notice that the percentage of right and wrong answers were only statistically significant in 2 of the 17 questions, one in each part (financial knowledge of concepts and numeracy), where male students performed better. The question regarding financial concepts was about whether investing in shares of one company was safer than investing in a mutual fund or not where 74.4% of men answered correctly against 52.9% of women. In respect to the numeracy question, it was about the best payment option for the purchase of a fridge, and 78.2% of men gave the right answer and only 59.6% of women answered it correctly.

Therefore, the existence of a gender gap where men usually perform better than women as suggested by some studies such as Chen & Volpe (2002), Wang (2011), and Bharucha (2017) is not evidenced by differences in the numeracy section of the questionnaire, in the financial knowledge section, nor in the overall level of financial knowledge apart from solely two individual questions.

Professional situation vs financial knowledge perception and financial knowledge

Student-workers scored statistically superior averages than their peers in financial knowledge and in the total knowledge score, but there were no statistically significant differences on numeracy and self-perception, as can be observed in Table 6.

		N	M	sd	F(df)[a]	p
Self-perception of comprehension in financial knowledge	Student	148	3.300	0.72	0.182	.672
	Student worker	37	3.35	0.72	(1,55.66)	
Financial Knowledge	Student	146	5.75	2.41	5.723	.020*
	Student worker	36	6.81	2.35	(1,54.56)	
Numeracy	Student	146	4.12	1.49	3.060	.086
	Student worker	36	4.64	1.61	(1,50.87)	
Total Knowledge	Student	146	9.88	3.39	5.508	.023*
	Student worker	36	11.44	3.64	(1,51.07)	

[a] Although Levene's test was not significant, the Brown-Forsythe correction was considered due to the difference of n in the groups compared

**p<.01; *p<.05

Table 7.Differences test (ANOVA) on self-perception of comprehension in financial knowledge, financial knowledge numeracy, and total knowledge according to the professional situation

Analysing each question separately, we can see in Table 24 that only two questions (about endorsing checks and TAEG) presented statistically significant differences, both in the financial concepts section. Bear in mind that the number of student-workers is a fair amount lower and that this analysis does not take into account their previous jobs; only whether the student is currently working or not.

In summary, the data analysis does not show presence of any positive or negative links between work status and the level of financial knowledge pointed out in the literature (Norvilitis & Maclean, 2010;Monticone, 2010; Hancock *et al.*, 2012).

Qualifications of the family of origin vs perception of knowledge and total knowledge

Firstly, an analysis was made according to the mother's academic background. Secondly, the same analysis was made but by the father's academic qualifications. Finally, an analysis was made using the parent who had a better academic background.

For the ANOVA calculation, the categories of undergraduate and postgraduate training were added, in order to reduce the number of levels of the qualification variable and created the higher education category.

		N	M	sd	F(df)	p	Post hoc
Self-perception of comprehension in financial knowledge	1st Cycle (A)	15	3,52	,55	2.843 (2, 94.59)	.063	-
	2nd cycle (B)	80	3,18	,67			
	Higher Education(C)	90	3,38	,77			
Financial Knowledge	1st Cycle (A)	15	5,13	2,64	2.731 (2, 49.27)	.075	-
	2nd Cycle(B)	78	5,64	2,25			
	Higher Education(C)	89	6,38	2,49			
Numeracy	1st Cycle (A)	15	3,60	1,64	4.141 (2,50.457)	.022*	B<C, p=.037
	2nd Cycle (B)	78	3,97	1,58			
	Higher Education (C)	89	4,55	1,39			
Total Knowledge	1st Cycle (A)	15	8,73	3,58	4.415 (2,54.24)	.017*	B<C, p=.035
	2nd Cycle (B)	78	9,62	3,23			

	Higher Education(C)	89	10,93	3,56

*Although Levene's test was not significant, the Brown-Forsythe correction was considered due to the difference of n in the groups compared

**p<.01; *p<.05; ns – not significant

Table 8. Differences test (ANOVA) on self-perception of comprehension in financial knowledge, financial knowledge, numeracy and total knowledge according to the mother's qualifications

Statistically significant differences were observed in the means of numeracy and total knowledge among the respondents whose mothers had the qualifications between the 2nd cycle of education and those who had mothers with a higher education level, with the latter obtaining higher averages (Table 8). Although the means of those whose mothers had only completed the 1st cycle of education were lower than the other two groups, the reduced sample size (n = 15) did not allow the *post hoc* tests to identify these differences.

Having analysed the questions in the questionnaire individually taking into account the academic degree held by the participant's mother, Table 21 shows that only three questions presented statistically significant differences. Students whose mothers had attended higher education generally presented a higher percentage of right answers than the ones whose mothers had solely attended the basic 1st and 2nd education cycles. The questions about the knowledge of financial concepts, such as the notions of: financial literacy and term deposits, were statistically significant as well as the numeracy question about compound interest. 71.9% of students whose mothers were undergraduate or postgraduate students knew what financial literacy was as opposed to a mere 50% of participants whose mothers had completed the 2nd cycle answering correctly, and 46.7% of those whose mothers had completed the 1st cycle. Interestingly, in the question regarding term deposits, the greatest percentage of students who answered it correctly were the ones whose mothers had only

completed the 2nd cycle with 83.3%, instead of the ones whose mothers had completed a higher level of studies, with a percentage of 82.0%.

		n	*M*	*Sd*	*F(df)*	*p*	*Post hoc*
Self-perception of comprehension in financial knowledge	1st cycle (A)	16	3.18	0.90	1.220 (2, 42.32)	.305	-
	2nd cycle (B)	90	3.24	0.68			
	Higher Education (C)	78	3.41	0.72			
Financial knowledge	1st cycle (A)	15	5.33	2.09	10.098 (2, 72.77)	<.001**	B<C, p<.001
	2nd cycle (B)	88	5.32	2.17			
	Higher Education (C)	78	6.83	2.52			
Numeracy	1st cycle (A)	15	3.67	1.68	4.659 (2, 47.04)	.014*	B<C, p=.013
	2nd cycle (B)	88	3.98	1.59			
	Higher Education (C)	78	4.63	1.33			
Total knowledge	1st cycle (A)	15	9.00	3.00	10.58 (2,72.67)	<.001**	A<C, p<.025
	2nd cycle (B)	88	9.30	3.23			
	Higher Education (C)	78	11.46	3.50			B<C, p<.001

**p<.01; *p<.05; ns – not significant

Table 9. Differences test (ANOVA) on self-perception of comprehension in financial knowledge, financial knowledge numeracy, and total knowledge according to the father's qualifications

Table 9 shows that the subjects whose parents hold a higher education degree display averages that are statistically superior in financial knowledge, numeracy, and total knowledge to those who had qualifications corresponding to the 2nd cycle. The difference between the mean of the subjects with parents having completed the 1st cycle and the average of those whose parents had completed higher education studies were also statistically significant.

As for the individual questions, there were more questions that presented statistically significant differences than in the previous analysis taking into

account the academic degree held by the participant's mother. On four questions in financial knowledge and three in numeracy (Table 21), students performed better if their father had a higher education degree rather than having only completed the 1st cycle or 2nd cycle of education.

To obtain a single indicator of family qualifications, a new variable was created in which solely the highest academic level was considered; whether being completed by either the father or the mother, so that the family influence could be analysed, as a study conducted by Calero & Choi (2017) also did. Only nine subjects were assigned to the "1st cycle" group; that is, there were only nine cases in which both parents only had this academic degree. Therefore, it was not considered in the ANOVA calculation.

		N	M	sd	F(df)	p
Self-perception of comprehension in financial knowledge	2nd Cycle (B)	72	3,21	,70	1.813 (1,175)	.180
	Higher Education(C)	104	3,36	,75		
Financial knowledge	2nd Cycle (B)	70	5,19	2,02	14.039 (1, 172)	.004**
	Higher Education(C)	103	6,54	2,54		
Numeracy	2nd Cycle (B)	70	3,86	1,56	8.678 (1, 172)	.014*
	Higher Education(C)	103	4,53	1,43		
Total knowledge	2nd Cycle (B)	70	9,04	2,98	15.177 (1,172)	<.001**
	Higher Education(C)	103	11,08	3,62		

**p<.01; *p<.05; ns – not significant

Table 10. Differences test (ANOVA) on self-perception of comprehension in financial knowledge, financial knowledge, numeracy, and total financial knowledge according to the families' qualifications

Respondents whose family was classified as having higher education obtained higher means in financial knowledge, numeracy, and total knowledge than those whose families were classified as having completed "2nd cycle" qualifications; in this regard, the difference was statistically significant (Table 10).

In analysing the number of right and wrong answers of each question per family academic qualifications (Table 23), the findings show that there are statistically significant differences in three numeracy questions and in four about financial concepts. In all these questions, students who came from a family that had studied in higher education had a greater percentage of right answers than the ones whose parents only had completed the 2nd cycle.

The literature is supported by these findings, since it shows that parents who have more studies are more likely to be capable of passing down more knowledge about financial instruments and logical thinking (Lusardi et al., 2010); Norvilitis & Maclean, 2010).

Correlation between age and self-perception of comprehension in financial knowledge with scores on financial knowledge, numeracy, and total knowledge

Table 11 shows that age had correlations with the total knowledge scores and both its integrant parts (financial knowledge and numeracy). It also provides evidence of the link between self-perception of financial knowledge and the actual scores.

	Age	Self-perception of comprehension in financial knowledge
Financial knowledge	.397	.394
Numeracy	.282	.269
Total knowledge	.396	.392

Table 11. Correlation between age and self-perception of comprehension in knowledge with scores on financial knowledge, numeracy, and total knowledge

Age moderately correlates with financial knowledge (.397) and total knowledge (.396). With numeracy, age had a low correlation (.282). Self-perception of comprehension of knowledge obtained moderate correlations with financial knowledge (.394) and total knowledge (.392), but low correlations with numeracy (.269) (Table 11).

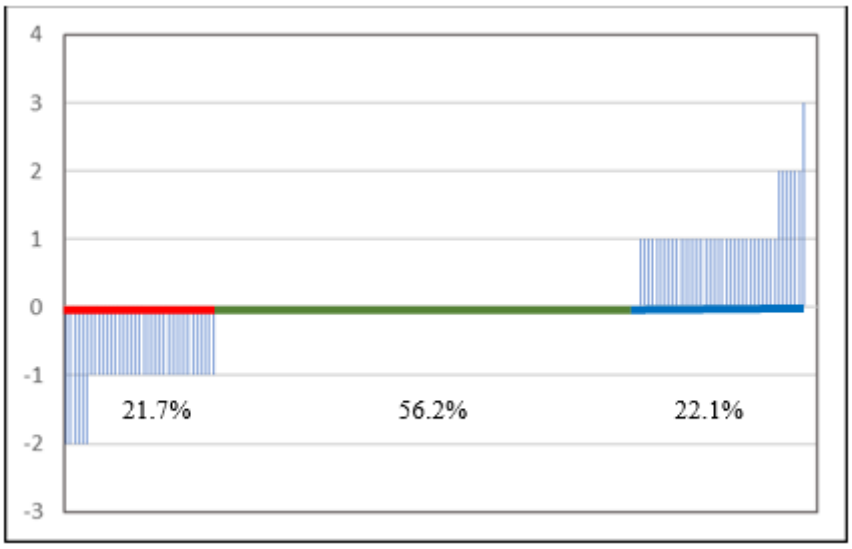
The analysis exploring the average age of students who answered each question correctly and incorrectly shows that in 10 out of 17 questions this variable was significant (Table 25). Since the sample consisted of students and it did not present great variances, the expected results were that these averages would be close. Table 25 shows that the average age of correct answers in significant questions was always higher than the average age of incorrect answers.

What is your self-perception, from 1 to 5, regarding your Financial Literacy?	Mean	sd	rank mean	Wilcoxon Signed Ranks Test	p
Beginning of questionnaire	2.98	0.93	42.00	-0,098	.922
End of questionnaire	2.98	1.01	40.02		

Table 12. Differences on the self-perception of financial literacy prior and after answering the questionnaire

The subjects expressed their answers to the question, "What is your self-perception, from 1 to 5, in relation to your Financial Literacy?" through an ordinal scale of five points. The level of measurement of the variable supported the choice of a nonparametric test; in this case the Wilcoxon's test for repeated measures. As we can see in Table 12, on average, there were no differences in response to the first and second questions.

In a finer analysis, it was examined if there was a change in opinion of some subjects from the question at the start of the questionnaire about self-perception of financial literacy to the same question at the end of the questionnaire. As we can see in Graph 2, 21.7% dropped the classification that was attributed, 56.2% kept it the same, and 22.1% improved their appreciation.



Graph 1. Changing answers from the first to the second question about self-perception in financial literacy

Predictors of financial knowledge

To study the predictors of total financial knowledge, the total scores were considered as variable criterion. Six predictor variables were selected, which in the previous calculations were explanatory of the results in the financial knowledge variable; namely the degree of attendance (1. Master's / 0. Bachelor's), professional situation (1. Student-worker /0. student), parental academic

qualifications (1. Higher education / 0. 2nd cycle), gender (1. Male / 0. Female), age, and living status (1. Away from home/ 0. Home).

	Mean	SD	TK	AD	PS	FQ	G	A	LS
Total knowledge (TK)	10.19	3.48	1						
Academic Degree (AD)	0.41	0.49	.440**a	1					
Professional situation (PS)	0.20	0.40	.179*a	.193**b	1				
Family Qualification (FQ)	0.59	0.49	.288**a	.293**b	-.003 ns b	1			
Gender (G)	0.42	0.50	.147* a	.120ns b	,093 ns b	.044ns b	1		
Age (A)	21.98	1.94	.397**c	.757** a	.296** a	.219** a	.224** a	1	
Living Status (LS)	0.59	0.49	.185 ns a	.063ns b	.143ns b	.050ns b	.201** b	.141ns a	1

**p<.01; *p<.05; ns – not significant; a) point biserial correlation; b) Phi correlation; c) Pearson's correlation.

Table 13.Descriptive analysis and correlation matrix between predictors and variable criterion

As seen in Table 13, the total knowledge obtained a moderate correlation (.44) with the academic degree and with age (.397), a low correlation with family qualifications (.288), and a very low correlation with the professional situation (whether student worked of not). Furthermore, there was a significant correlation (.179) with regard to gender, yet the correlation with regard to living status was not significant (.147). The predictor variables presented correlations of low magnitude with each other, except for age and that presented, as expected, high correlation with academic degree. For this reason, it will not be included in the regression analysis.

Predictor	B	standard error	β	T	p
AD	2.435	.509	.345	4.784	<.001**
PS	0.895	.610	.101	1.469	.144
FQ	1.248	.496	.176	2.516	.013*
G	0.472	.483	.067	0.977	.330
LS	0.909	.485	.129	1.875	.063
R^2		F	P		
.257		11.560	<.001**		

**p<.01; *p<.05; ns – not significant

Table 14.Multiple regression: regression coefficients of the academic degree studied, professional situation, family qualifications, gender, and living status with financial knowledge as criterion

The regression equation explains 26% of variances and was statistically significant. The academic degree studied was the most important predictor in the equation (β = .345). Family academic background was also a significant predictor (β = .176). Professional situation was not predictive (β = .101), nor was gender (β = .067), or living status (β = .129)

Professional experience was expected to have a positive significant link with financial knowledge according to the literature, but in the regression (Table 14) it was not a significant predictor.

Literature states that parents are an important channel in transferring financial knowledge to their children. In tables 13 and 14, we can see that a student whose parents have more academic backgrounds have greater financial knowledge, hence supporting the literature. More educated parents are more likely to be able to transfer financial knowledge and financial behaviours.

The literature finds that having higher education studies translates to having greater financial knowledge. Table 13 and Table 14 not only show that having higher education studies influences the level of financial knowledge, but that the actual academic degree impacts on the level of financial knowledge held.

Gender had no significant impact on financial knowledge, with no evidence of gender differences being found, as was evidenced in the literature.

The age variable is connected to the academic degree studied as is shown in Table 13, but it does not have a significant influence on the level of financial knowledge that students have (Table 14). Thus, the positive link that was expected was not proven.

Research Hypothesis	Expected outcome	Statistical Evidence
H1	Master's students have more financial knowledge than Bachelor's students	Statistical evidence corroborates the research hypothesis
H2	Students whose parents have higher qualifications have more financial literacy	Statistical evidence corroborates the research hypothesis
H3	Age is positively linked to financial knowledge	Not included in regression
H4	Male students are more knowledgeable	No statistical evidence that supports the research hypothesis
H5	Student-workers have greater financial knowledge	No statistical evidence that supports the research hypothesis
H6	Students who are living away from home have greater financial knowledge	No statistical evidence that supports the research hypothesis

Table 15. Evidence on Research Hypothesis

6. Conclusions and Future Research

This study sought to understand the level of financial literacy in Portuguese students attending higher education on business related courses, as well as, if the Portuguese reality matches the determinants recognised by the existing literature.

The findings show that, although Portugal is well placed using the global financial literacy indicator, according to the 2015 Banco de Portugal's report, the financial literacy level of young Portuguese students taking business related courses is quite low. Nearly half of the students enquired achieved a grade below 60%. In face of this result, there is a need to improve the financial knowledge of young students, especially the knowledge regarding the financial concepts. Thus, the solution to this problem may be in inserting a course that teaches children or teenagers about financial concepts so that they are better informed and more accustomed to such instruments.

Regarding the determinants, and more specifically gender, results showed that although the mean scores of male students was higher than female students in both parameters (financial knowledge and numeracy) and, consequently, in total financial knowledge, the variable was not statistically significant. Our study shows that in the Portuguese students attending higher education in business related courses there were no gender differences associated with financial knowledge. These findings differ from studies from researchers such as Chen and Volpe (2002), Wang (2011) and Bharucha (2017), but supports the results obtained by Bucher-Koenen, Lusardi, Alessie, and Rooij (2017).

Students whose family academic background consisted of university studies had better financial knowledge scores; with this being statistically significant, the link emphasised in the literature, specifying that a greater

academic family background leads to a higher level of financial literacy (Norvilitis & Maclean, 2010;Lusardi et al., 2010) was proven.

Finally, in answering the research question "What is the impact of the academic degree studied in the financial literacy of university students?", it can be concluded that students studying business related courses attending a Master's degree have a higher level of financial knowledge than students studying for a Bachelor's. Whether they are studying for a bachelor's degree or a master's is the most important predictor in the equation used, in other words, individuals who possess more studies had a better understanding of financial concepts as well as performing better in the numeracy questions. As a result, they are potentially more able to better manage their personal financial situation.

Limitations and Future Research

Firstly, it is important to notice that this study focuses just on financial knowledge. Although financial knowledge is integral to financial behaviour, the fact that actual financial behaviours were not observed restricts the conclusion to just one aspect of financial literacy.

Other limitations are related with the limited sample collected, which is restricted to a very specific target, Portuguese students attending business related courses such as Economics, Management and Marketing, either studying for a master's or bachelor's degree. This issue restricts the generalisation of the overall findings to other students which are studying different fields and produce concrete conclusions about the overall level of financial literacy in Portuguese university students.

Taking in to account the study's limitations, some future research opportunities arise. Wider studies in demographics, broader spectrums of students who are attending university in other fields, as well as with a bigger

sample (more universities), can be researched and are necessary to generalise the findings. Future studies could also address more questions, namely those regarding risk avoidance criterion, which is involved in the decision-making process of financial decisions.

It would be an interesting future research assignment to test Bachelor's and Master's students who had been subjected to the same specific financial courses in order to see if the difference amongst students of different levels is still valid.

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Appendices

Appendix 1- Questionnaire

Literacia Financeira nos estudantes universitários portugueses

No âmbito da minha dissertação de Mestrado em Gestão na Universidade Católica Portuguesa do Porto, respeitante à literacia financeira dos estudantes universitários portugueses, venho solicitar a sua cooperação através do preenchimento do presente questionário. Questionário esse, que se divide em duas partes: uma relacionada com a temática em estudo; e outra, com perguntas gerais de caracterização.
Em função da nova regulamentação de proteção de dados, informo que para efeitos de análise de dados estatísticos, terão de ser registados dados pessoais os quais serão utilizados apenas para a dissertação. A informação fornecida é estritamente confidencial, sendo que não é possível identificar quem respondeu.
O questionário demora aproximadamente 9 minutos.
Agradeço desde já a vossa cooperação.
*Obrigatório

Entre as respostas seguintes escolha aquela que melhor descreve o que significa "Literacia Financeira": *

- A Literacia Financeira corresponde ao conhecimento de conceitos e riscos financeiros
- A Literacia Financeira é relativa aos comportamentos pessoais de gestão de dinheiro
- A Literacia Financeira é a capacidade de fazer julgamentos informados e tomar decisões concretas tendo em vista a gestão do dinheiro

Qual a sua auto-percepção relativamente à sua Literacia Financeira? Indique de 1 a 5 (sendo 1- Muito Baixo 2- Baixo 3- Médio 4-Alto 5-Muito alto) *

Indique o seu nível de compreensão de 1 a 5 (sendo 1- Muito Baixo 2- Baixo 3- Médio 4-Alto 5-Muito alto) nas seguintes temáticas:

Euribor: *

Descoberto Bancário: *

Taxas de juro fixas e variáveis: *

Spread: *

Cartões de crédito: *

Modalidades de empréstimo: *

Conhecimento Financeiro

Qual destas modalidades de investimento requer que o dinheiro esteja investido durante um determinado período ou pagar uma penalização para levantar antes do término do período. *

- Garantia de depósito
- Conta à ordem
- Títulos do Tesouro
- Fundo mútuo
- Não sei

A seguinte afirmação é verdadeira ou falsa: "Investir em ações de uma empresa é mais seguro que investir num fundo mútuo" *

- Verdadeira
- Falsa
- Não sei

Qual das seguintes frases é FALSA? *

- A sua quota num fundo mútuo é proporcional ao numero de ações que detém.
- Um fundo de investimento é uma instituição de investimento coletiva que reúne e gere os fundos provenientes de diversos investidores e os quais investem num conjunto de instrumentos financeiros.
- Como shareholder de um fundo mútuo, tens o direito de dizer aos gestores do fundo o que fazer.
- Não sei.

A "Euribor" é uma das principais taxas de referência na zona euro e…: *

- É definida pelo Banco Central Europeu
- É definida pelo Banco de Portugal
- Resulta dos empréstimos realizados entre um conjunto de bancos europeus
- Não sei

O que é a TAEG (Taxa Anual Efetiva Global)? *

- A TAEG é diferente da Taxa Anual Efectiva por a segunda incorporar impostos ligados ao crédito
- É uma taxa exclusiva aos cartões de crédito
- Representa o custo total suportado pelo cliente que adquire um determinado crédito
- Não sei

O que é a TANB (Taxa Anual Nominal Bruta)? *

- É a taxa que auferida somente nos depósitos a prazo
- É uma taxa líquida
- É a taxa que remunera as aplicações financeiras
- Não sei

Uma taxa de juro variável indexada é: *

- Uma taxa de juro que permanece inalterada no prazo estipulado
- Uma taxa de juro que varia anualmente consoante a Euribor
- Uma taxa de juro revista automaticamente em função da evolução da taxa de referência de mercado a que está associada
- Não sei

Qual o prazo de um depósito a prazo? *

- 1 ano
- 5 anos
- Estipulado por mútuo acordo
- Não sei

O que é um cheque? *

- É um instrumento de pagamento digital que permite a movimentação de fundos para terceiros
- É um instrumento de pagamento em suporte de papel no fim de um período previamente acordado
- É um instrumento de pagamento em suporte papel que permite aos titulares de contas de depósito movimentarem fundos que se encontrem imediatamente disponíveis
- Não sei

Endossar um cheque é: *

- Depositar o cheque
- Quando o cheque é devolvido por falta de fundos
- É a transmissão do cheque a outra pessoa
- Não sei

Numeracia

Suponha que em 2010, o seu rendimento duplicou e os preços dos bens também. Em 2010 quanto conseguirá comprar (assumindo que mantém o mesmo padrão de compras) : *

- Mais que antes
- Menos que antes
- O mesmo
- Não sei

Suponha que investiu 1,000 euros em ações por um período de 2 anos. O preço das ações caiu 40% no primeiro ano (com base no ano anterior) e aumentou 40% no segundo (com base no ano anterior). Neste caso após dois anos: *

- Manteve-se
- Ganhou dinheiro nas ações
- Perdeu dinheiro nas ações
- Não sei

Assuma que um amigo herdou 10 000 euros hoje e o irmão herdará 10 000 euros daqui a três anos. Quem é mais rico? *

São igualmente ricos
O irmão
O amigo
Não sei

Suponha que tem 100 euros numa conta poupança com uma taxa de juro de 2% ao ano em regime de capitalização composta. Após 5 anos quanto dinheiro teria a conta? *

Menos de 110
Exactamente 110
Mais de 110
Não sei

Se um depósito a prazo tiver uma taxa de juro de 2% ao ano e a taxa de inflação for de 4% ao ano. O seu poder de compra: *

Mais que antes
O mesmo
Menos que antes
Não sei

Suponha que está a ponderar comprar um frigorífico que custa 1000 euros. Pode pagar numa de duas formas: (1) 3 pagamentos mensais iguais ou (2) pagar 810 em dinheiro no imediato. Assumindo que a taxa de juro anual é de 10%, qual é a modalidade preferível? *

3 pagamentos iguais
É igual
Dinheiro
Não sei

Novamente, indique o nível da sua auto-percepção relativamente à sua Literacia Financeira? (sendo 1- Muito Baixo 2- Baixo 3- Médio 4-Alto 5-Muito alto) *

Perfil socio-demográfico

Idade

Sexo

Masculino
Feminino

É estudante deslocado?

Sim
Não

É trabalhador estudante?

Sim
Não

Grau académico a frequentar
Licenciatura
Mestrado

Curso a frequentar

Ano a frequentar

Habilitações da Mãe
Sem instrução primária
Possui instrução primária (4ºano)
Possui ensino médio (5º ano até ao 12º ano)
Possui Licenciatura
Possui Pós-Graduação, Mestrado, Doutoramento

Habilitações do Pai
Sem instrução primária
Possui instrução primária (4ºano)
Possui ensino médio (5º ano até ao 12º ano)
Possui Licenciatura
Possui Pós-Graduação, Mestrado, Doutoramento

Rendimento mensal disponível (incluindo mesada/salário)
Não tenho
Até 250 euros
Entre 250 e 500 euros
Entre 501 e 750 euros
Entre 751 e 1000 euros
Mais de 1000 euros

Table 16. Minimum, maximum, means, standard deviations and medians of the self-perception of the degree of understanding in financial knowledge

	Minimum	Maximum	Means	Standard - deviations	Medians	% answers in 1 and 2
Euribor.	1	5	3.12	1.10	3.00	26.2
Bank overdraft	1	5	3.15	1.10	3.00	27.8
Fixed and Variable Interest Rates.	1	5	3.86	0.92	4.00	5.9
Spread.	1	5	2.95	1.07	3.00	32.6
Credit Cards.	1	5	3.65	0.94	4.00	10.2

Loan Modalities.	1	5	3.08	1.02	3.00	25.1

Respondents ranked positively in almost all the aspects questioned, that is, the average was above the midpoint 3 (average comprehension) in five out of the six aspects. The exception is about spread in which the average approached 3 (2.95, SD = 1.07), but did not exceed this value. The concepts that respondents think they comprehend better are the fixed and variable interest rates with a mean of 3.86 (SD = 0.92). In Table 13 we can also analyse the proportion of subjects who classified their level of comprehension as very low (1) or low (2).

Table 17. Proportion of responses to financial literacy issues

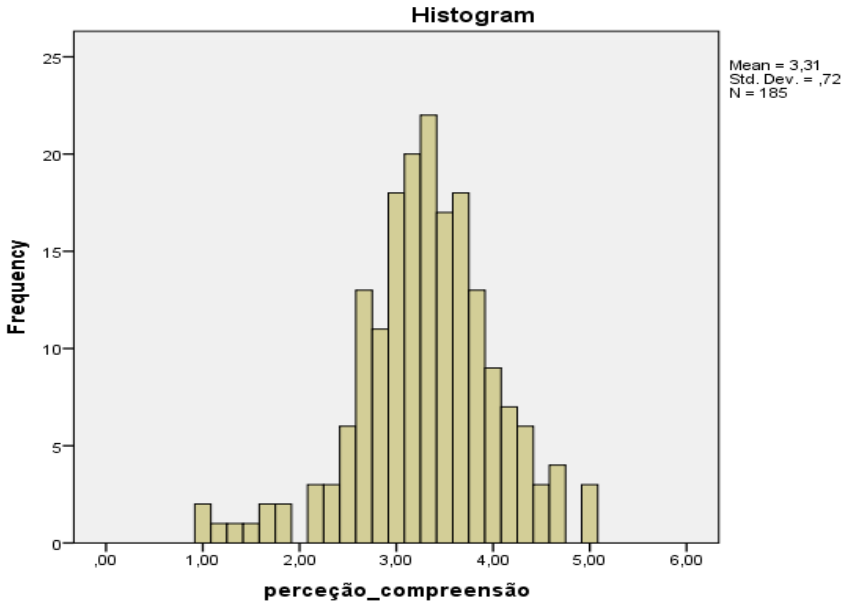
	N	%
Among the following answers choose the one that best describes what Financial Literacy means		
Financial Literacy corresponds to the knowledge of concepts and financial risks	64	34.2
Financial literacy is the ability to make informed judgments and take concrete decisions about money management	111	59.4
Financial Literacy is about personal money management behaviours	12	6.4
Which of these investment modalities requires that the money must be invested during a certain period, or pay a penalty to raise before the end of the period?		
Checking account	12	6.4
Mutual fund	24	12.8
Deposit guarantee	45	24.1
Do not know	34	18.2
Treasury Bonds	72	38.5
The following statement is either T or F: Investing in a company's shares is safer than investing in a Mutual Fund.		
False	114	61.0
Do not know	66	35.3
True	7	3.7
Which of the following statements is false?		

	N	%
Your share in a mutual fund is proportional to the number of shares you hold.	15	8.0
As a shareholder of a mutual fund, you have the right to tell fund managers what to do.	78	41.7
Do not know	63	33.7
An investment fund is a collective investment institution that gathers and manages the funds from (...)	31	16.6
Euribor is one of the main reference rates in the Eurozone and		
It is defined by the European Central Bank	88	47.1
It is defined by the Bank of Portugal	6	3.2
Do not know	13	7.0
It is the result of loans made between a number of European banks	80	42.8
What is APR?		
The APR is different from the Annual Effective Rate because the second incorporates taxes linked to credit	37	19.8
It's a charge exclusive to credit cards	11	5.9
Do not know	51	27.3
It represents the total cost borne by the customer who acquires a certain credit	88	47.1
What is TANB?		
It is the rate that is only earned on time deposits	26	13.9
It is the rate that remunerates the financial investments	95	50.8
It is a net rate	7	3.7
Do not know	59	31.6
An indexed variable interest rate is:		
Do not know	17	9.1
An interest rate that remains unchanged within the stipulated period	16	8.6
An interest rate that varies annually according to Euribor	25	13.4
An interest rate shall automatically be revised in the light of the evolution of the market reference rate to which it is associated	129	69.0
What is the term of a time deposit?		
1 year	17	9.1
5 years	9	4.8
Stipulated by mutual agreement	149	79.7
Do not know	12	6.4
What is a check?		
It is a digital payment instrument that allows the movement of funds to third parties	0	.0

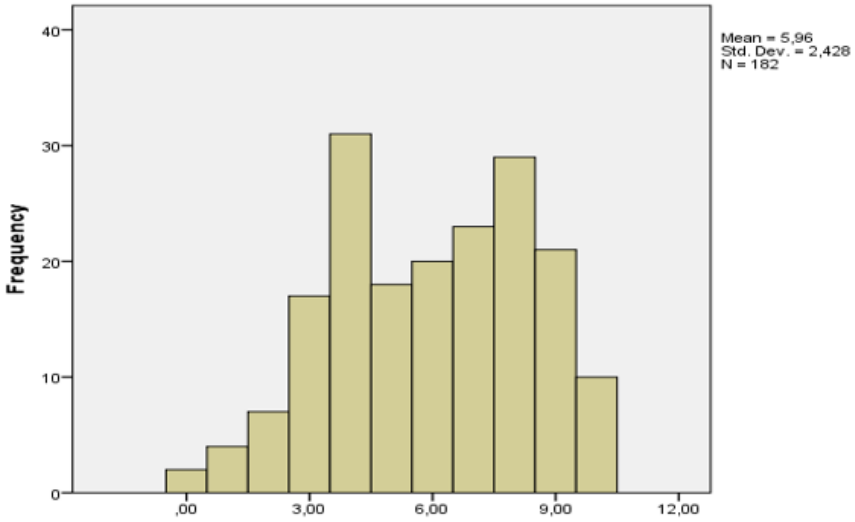
	N	%
It is a paper-based payment instrument at the end of a previously agreed period	55	29.4
It is a paper-based payment instrument that enables deposit account holders to…	132	70.6
Do not know	0	.0
To endorse a check is:		
To deposit a check	10	5.3
It is the transmission of the check to another person	135	72.2
Do not know	30	16.0
When the check is returned for lack of funds	12	6.4

Table 18. Proportion of responses to numeracy questions.

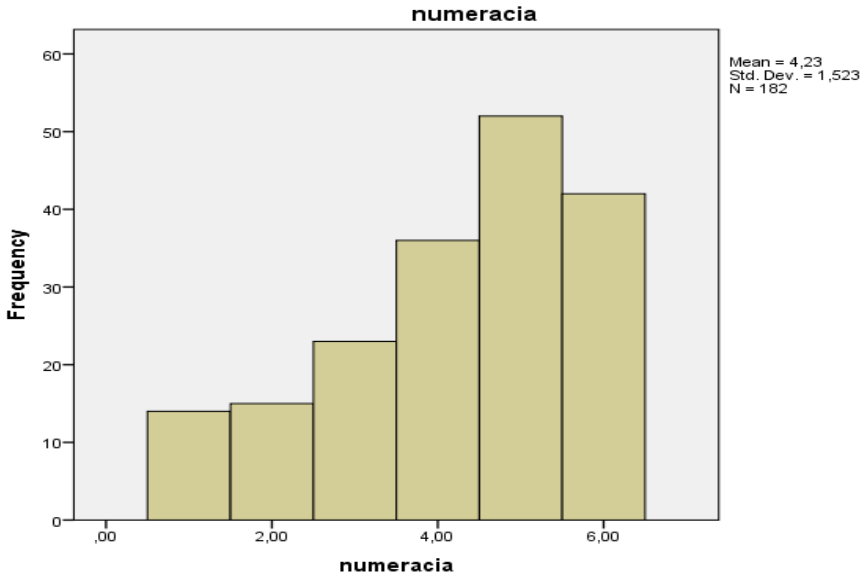
	N	%
Yield in 2010 doubles and the prices of goods as well. In 2010, how much can you buy?		
More than before	10	5,3
Less than before	19	10,2
Do not know	4	2,1
The same	154	82,4
You invested € 1000 in shares for a period of two years. The stock price fell 40% in the first year and increased 40% in the second. After 2 years:		
You earned money on shares	9	4,8
You kept it	38	20,3
Do not know	15	8,0
You lost money in stocks	125	66,8
You inherited € 10,000 and your brother will inherit the same value in three years. Who is richer?		
Do not know	15	8,0
You	127	67,9
Your brother	16	8,6
You are equally rich	29	15,5
You invested € 100 in a savings account with an interest rate of 2% per year under compound capitalization. After 5 years how much money would the account have?		
Exactly 110	28	15,0
More than 110	123	65,8
Less than 110	13	7,0
Do not know	23	12,3
If a term deposit has an interest rate of 2% and the inflation rate is 4%, your purchasing power:		
Is higher than before	4	2,1
Is less than before	149	79,7
Do not know	27	14,4
Is the same	7	3,7
You consider buying a refrigerator of € 1000, and you can pay: (1) 3 equal monthly payments; (2) pay € 810 in cash, immediately.		
Equal Payments	21	11,2
Money	110	58,8
Equals	14	7,5
Do not know	42	22,5



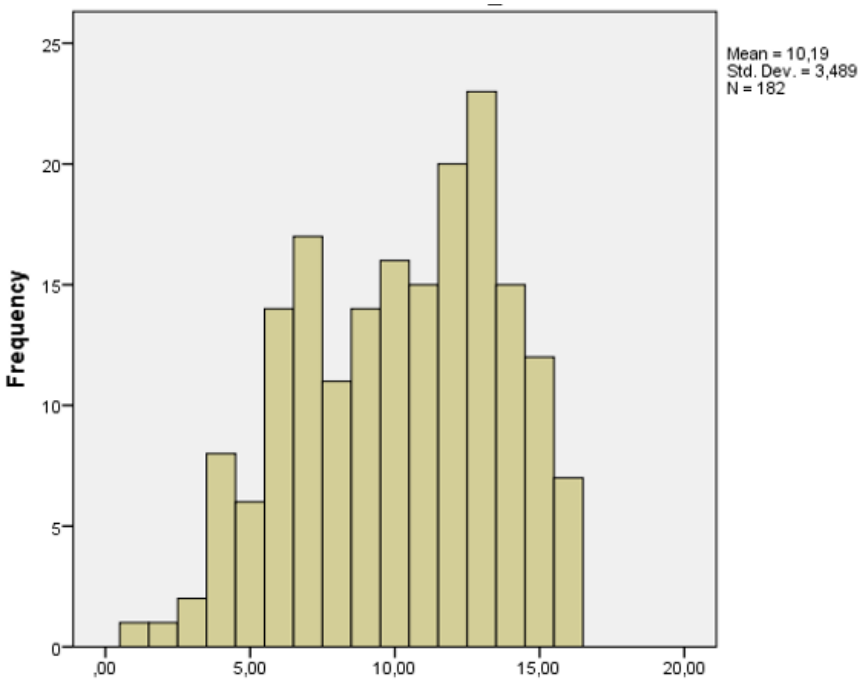
Graph 4. Histogram of self-perception of understanding in knowledge



Graph 5. Histogram of the knowledge score



Graph 6. Histogram of numeracy score



Graph 7. Histogram of the score in total knowledge

Table 19. Number of right and wrong answers by academic degree, Chi-Squared test.

		Bachelor's		Master's			
		n	%	n	%	Chi-Squared	p
Financial Literacy	wrong	49	45.8	23	30.7	4.220	.040*
	right	58	54.2	52	69.3		
Investment Modalities	wrong	74	69.2	38	50.7	6.371	.012*
	right	33	30.8	37	49.3		
Shares vs Mutual Fund	wrong	53	49.5	16	21.3	14.896	<.001**
	right	54	50.5	59	78.7		
Mutual Fund	wrong	67	62.6	37	49.3	3.177	.075
	right	40	37.4	38	50.7		
TANB	wrong	65	60.7	23	30.7	15.977	<.001**
	right	42	39.3	52	69.3		
Check	wrong	74	69.2	55	73.3	.372	.542
	right	33	30.8	20	26.7		
Endorse check	wrong	43	40.2	9	12.0	17.166	<.001**
	right	64	59.8	66	88.0		
Who is the richest	wrong	37	34.6	22	29.3	.554	.457
	right	70	65.4	53	70.7		
Compound Interest Rate	wrong	47	43.9	14	18.7	12.625	<.001**
	right	60	56.1	61	81.3		
Inflation	wrong	30	28.0	6	8.0	11.157	.001**
	right	77	72.0	69	92.0		
Ways of payment	wrong	50	46.7	25	33.3	3.266	.071
	right	57	53.3	50	66.7		
Euribor	wrong	73	68.2	30	40.0	14.299	<.001**
	right	34	31.8	45	60.0		
TAEG	wrong	66	61.7	30	40.0	8.317	.004**
	right	41	38.3	45	60.0		
Indexed Rate	wrong	41	38.3	15	20.0	6.945	.008**
	right	66	61.7	60	80.0		
Purchase Power	wrong	23	21.5	10	13.3	1.979	.160
	right	84	78.5	65	86.7		
Invest1000	wrong	46	43.0	13	17.3	13.249	<.001**
	right	61	57.0	62	82.7		
Term Deposit	wrong	28	26.2	8	10.7	6.677	.010**
	right	79	73.8	67	89.3		

*p<.05; **p<.01.

Table 20. Number of right and wrong answers in each question by genre, Chi-Squared test.

		Female		Male			
		n	%	n	%	Chi-Squared	p
Financial Literacy	wrong	43	41.3	29	37.2	0.324	.569
	right	61	58.7	49	62.8		
Investment Modalities	wrong	60	57.7	52	66.7	1.517	.218
	right	44	42.3	26	33.3		
Shares vs Mutual Fund	wrong	49	47.1	20	25.6	8.732	.003**
	right	55	52.9	58	74.4		
Mutual Fund	wrong	65	62.5	39	50.0	2.844	.092
	right	39	37.5	39	50.0		
TANB	wrong	56	53.8	32	41.0	2.934	.087
	right	48	46.2	46	59.0		
Check	wrong	73	70.2	56	71.8	0.055	.814
	right	31	29.8	22	28.2		
Endorse check	wrong	33	31.7	19	24.4	1.187	.276
	right	71	68.3	59	75.6		
Who is the richest	wrong	38	36.5	21	26.9	1.881	.170
	right	66	63.5	57	73.1		
Compound Interest Rate	wrong	41	39.4	20	25.6	3.799	.051
	right	63	60.6	58	74.4		
Inflation	wrong	22	21.2	14	17.9	0.289	.591
	right	82	78.8	64	82.1		
Ways of payment	wrong	43	41.3	32	41.0	0.002	.965
	right	61	58.7	46	59.0		
Euribor	wrong	62	59.6	41	52.6	0.902	.342
	right	42	40.4	37	47.4		
TAEG	wrong	57	54.8	39	50.0	0.413	.520
	right	47	45.2	39	50.0		
Indexed Rate	wrong	34	32.7	22	28.2	0.421	.516
	right	70	67.3	56	71.8		
Purchase Power	wrong	16	15.4	17	21.8	1.234	.267
	right	88	84.6	61	78.2		
Invest1000	wrong	42	40.4	17	21.8	7.031	.008**
	right	62	59.6	61	78.2		
Term Deposit	wrong	20	19.2	16	20.5	0.046	.830
	right	84	80.8	62	79.5		

*p<.05; **p<.01.

Table 21. Number of right and wrong answers by mothers' academic qualifications, Chi-Squared test.

		1º Cycle		2º Cycle		Higher Education			
		n	%	n	%	n	%	Chi-Squared	p
Financial Literacy	wrong	8	53.3	39	50.0	25	28.1	9.643	.008*
	right	7	46.7	39	50.0	64	71.9		
Investment Modalities	wrong	7	46.7	54	69.2	51	57.3	4.026	.134
	right	8	53.3	24	30.8	38	42.7		
Shares vs Mutual Fund	wrong	7	46.7	31	39.7	31	34.8	0.958	.619
	right	8	53.3	47	60.3	58	65.2		
Mutual Fund	wrong	10	66.7	43	55.1	51	57.3	0.686	.710
	right	5	33.3	35	44.9	38	42.7		
TANB	wrong	10	66.7	42	53.8	36	40.4	5.183	.075
	right	5	33.3	36	46.2	53	59.6		
Check	wrong	13	86.7	51	65.4	65	73.0	2.971[a]	.222
	right	2	13.3	27	34.6	24	27.0		
Endorse check	wrong	4	26.7	24	30.8	24	27.0	0.345[a]	.881
	right	11	73.3	54	69.2	65	73.0		
Who is the richest	wrong	7	46.7	26	33.3	26	29.2	1.895[a]	.394
	right	8	53.3	52	66.7	63	70.8		
Compound Interest	wrong	8	53.3	31	39.7	22	24.7	7.092	.029*
Rate	right	7	46.7	47	60.3	67	75.3		
Inflation	wrong	4	26.7	20	25.6	12	13.5	4.584[a]	.091
	right	11	73.3	58	74.4	77	86.5		
Ways of payment	wrong	7	46.7	39	50.0	29	32.6	5.405	.067
	right	8	53.3	39	50.0	60	67.4		
Euribor	wrong	8	53.3	48	61.5	47	52.8	1.360	.507
	right	7	46.7	30	38.5	42	47.2		
TAEG	wrong	7	46.7	48	61.5	41	46.1	4.234	.120
	right	8	53.3	30	38.5	48	53.9		
Indexed Rate	wrong	7	46.7	25	32.1	24	27.0	2.484[a]	.283
	right	8	53.3	53	67.9	65	73.0		
Purchase Power	wrong	5	33.3	14	17.9	14	15.7	2.682[a]	.273
	right	10	66.7	64	82.1	75	84.3		
Invest1000	wrong	5	33.3	28	35.9	26	29.2	0.910[a]	.659
	right	10	66.7	50	64.1	63	70.8		
Term Deposit	wrong	7	46.7	13	16.7	16	18.0	6.466[a]	.035*
	right	8	53.3	65	83.3	73	82.0		

*p<.05; **p<.01; [a] expected count less than five in at least one cell, Exact Fisher Test was performed.

Table 22. Number of right and wrong answers by fathers' academic qualifications, Chi-Squared test.

		1º Cycle		2º Cycle		Higher Education			
		n	%	n	%	n	%	Chi-Squared	p
Financial Literacy	wrong	7	46.7	44	50.0	21	26.9	9,516	,009*
	right	8	53.3	44	50.0	57	73.1		
Investment Modalities	wrong	9	60.0	64	72.7	39	50.0	9,079	,011*
	right	6	40.0	24	27.3	39	50.0		
Shares vs Mutual Fund	wrong	5	33.3	40	45.5	24	30.8	3,939	,140
	right	10	66.7	48	54.5	54	69.2		
Mutual Fund	wrong	9	60.0	52	59.1	42	53.8	,528	,768
	right	6	40.0	36	40.9	36	46.2		
TANB	wrong	11	73.3	51	58.0	25	32.1	15,297	,000*
	right	4	26.7	37	42.0	53	67.9		
Check	wrong	12	80.0	61	69.3	55	70.5	0.599[a]	.753
	right	3	20.0	27	30.7	23	29.5		
Endorse check	wrong	7	46.7	28	31.8	17	21.8	4.607[a]	.100
	right	8	53.3	60	68.2	61	78.2		
Who is the richest	wrong	9	60.0	29	33.0	20	25.6	6.519[a]	.036*
	right	6	40.0	59	67.0	58	74.4		
Compound Interest	wrong	8	53.3	33	37.5	19	24.4	6.215[a]	.043*
Rate	right	7	46.7	55	62.5	59	75.6		
Inflation	wrong	3	20.0	26	29.5	7	9.0	11.337[a]	.002**
	right	12	80.0	62	70.5	71	91.0		
Ways of payment	wrong	6	40.0	42	47.7	26	33.3	3,550	,169
	right	9	60.0	46	52.3	52	66.7		
Euribor	wrong	11	73.3	56	63.6	35	44.9	7,837	,020*
	right	4	26.7	32	36.4	43	55.1		
TAEG	wrong	7	46.7	52	59.1	36	46.2	2,997	,223
	right	8	53.3	36	40.9	42	53.8		
Indexed Rate	wrong	4	26.7	33	37.5	18	23.1	4.109[a]	.129
	right	11	73.3	55	62.5	60	76.9		
Purchase Power	wrong	4	26.7	15	17.0	14	17.9	1.006[a]	.673
	right	11	73.3	73	83.0	64	82.1		
Invest1000	wrong	5	33.3	33	37.5	21	26.9	2.142[a]	,360
	right	10	66.7	55	62.5	57	73.1		
Term Deposit	wrong	3	20.0	19	21.6	13	16.7	0.720[a]	.716
	right	12	80.0	69	78.4	65	83.3		

*p<.05; **p<.01; [a] expected count less than five in at least one cell, Exact Fisher Test was performed.

Table 23. Number of right and wrong answers by family's academic background, Chi-Squared test.

		2º Cycle		Higher Education			
		n	%	n	%	Chi-Squared	p
Financial Literacy	wrong	39	55.7	29	28.2	13.268	.000*
	right	31	44.3	74	71.8		
Investment Modalities	wrong	55	78.6	54	52.4	12.222	.000*
	right	15	21.4	49	47.6		
Shares vs Mutual Fund	wrong	33	47.1	34	33.0	3.508	.061
	right	37	52.9	69	67.0		
Mutual Fund	wrong	38	54.3	59	57.3	0.152	.697
	right	32	45.7	44	42.7		
TANB	wrong	43	61.4	38	36.9	10.076	.002*
	right	27	38.6	65	63.1		
Check	wrong	47	67.1	75	72.8	0.599[a]	.753
	right	23	32.9	28	27.2		
Endorse check	wrong	24	34.3	26	25.2	4.607[a]	.100
	right	46	65.7	77	74.8		
Who is the richest	wrong	24	34.3	29	28.2	6.519[a]	.036*
	right	46	65.7	74	71.8		
Compound Interest Rate	wrong	28	40.0	27	26.2	6.215[a]	.043*
	right	42	60.0	76	73.8		
Inflation	wrong	22	31.4	13	12.6	11.337[a]	.002
	right	48	68.6	90	87.4		
Ways of payment	wrong	35	50.0	36	35.0	3.900	.048*
	right	35	50.0	67	65.0		
Euribor	wrong	45	64.3	52	50.5	4.109[a]	.129
	right	25	35.7	51	49.5		
TAEG	wrong	44	62.9	48	46.6	4.423	.035*
	right	26	37.1	55	53.4		
Indexed Rate	wrong	25	35.7	26	25.2	2.198	.138
	right	45	64.3	77	74.8		
Purchase Power	wrong	13	18.6	17	16.5	1.006[a]	.673
	right	57	81.4	86	83.5		
Invest1000	wrong	28	40.0	29	28.2	2.143[a]	.360
	right	42	60.0	74	71.8		
Term Deposit	wrong	14	20.0	18	17.5	0.720[a]	.716
	right	56	80.0	85	82.5		

*p<.05; **p<.01; [a] expected count less than five in at least one cell, Exact Fisher Test was performed.

Table 24 Number of right and wrong answers by work status, Chi-Squared test..

		Student		Student worker			
		n	%	n	%	Chi-Squared	p
Financial Literacy	wrong	60	41.1	12	33.3	0.728	.394
	right	86	58.9	24	66.7		
Investment Modalities	wrong	91	62.3	21	58.3	0.195	.659
	right	55	37.7	15	41.7		
Shares vs Mutual Fund	wrong	60	41.1	9	25.0	3.179	.075
	right	86	58.9	27	75.0		
Mutual Fund	wrong	85	58.2	19	52.8	0.349	.555
	right	61	41.8	17	47.2		
TANB	wrong	75	51.4	13	36.1	2.692	.101
	right	71	48.6	23	63.9		
Check	wrong	103	70.5	26	72.2	0.039	.843
	right	43	29.5	10	27.8		
Endorse check	wrong	47	32.2	5	13.9	4.740	.029*
	right	99	67.8	31	86.1		
Who is the richest	wrong	51	34.9	8	22.2	2.129	.145
	right	95	65.1	28	77.8		
Compound Interest Rate	wrong	51	34.9	10	27.8	0.663	.415
	right	95	65.1	26	72.2		
Inflation	wrong	30	20.5	6	16.7	0.274	.601
	right	116	79.5	30	83.3		
Ways of payment	wrong	64	43.8	11	30.6	2.102	.147
	right	82	56.2	25	69.4		
Euribor	wrong	82	56.2	21	58.3	0.055	.814
	right	64	43.8	15	41.7		
TAEG	wrong	87	59.6	9	25.0	13.862	.000*
	right	59	40.4	27	75.0		
Indexed Rate	wrong	46	31.5	10	27.8	0.189	.664
	right	100	68.5	26	72.2		
Purchase Power	wrong	26	17.8	7	19.4	0.052	.819
	right	120	82.2	29	80.6		
Invest1000	wrong	52	35.6	7	19.4	3.447	.063
	right	94	64.4	29	80.6		
Term Deposit	wrong	30	20.5	6	16.7	0.274	.601
	right	116	79.5	30	83.3		

*p<.05; **p<.01; [a] expected count less than five in at least one cell, Exact Fisher Test was performed.

Table 25. Means, standard deviation and ANOVA of age in questions answers

		M	SD	ANOVA	p
Financial Literacy	wrong	21.80	1.84	1.381	.242
	right	22.15	1.98		
Investment Modalities	wrong	21.76	1.83	5.222	.023*
	right	22.43	2.02		
Shares vs Mutual Fund	wrong	21.20	1.46	22.133	<.001**
	right	22.52	2.01		
Mutual Fund	wrong	21.80	1.83	3.061	.082
	right	22.30	2.02		
TANB	wrong	21.41	1.61	18.597	<.001**
	right	22.59	2.03		
Check	wrong	22.11	1.98	1.147	.286
	right	21.77	1.78		
Endorse check	wrong	21.21	1.42	13.529	<.001**
	right	22.34	2.01		
Who is the richest	wrong	21.88	1.71	0.404	.526
	right	22.07	2.02		
Compound Interest	wrong	21.33	1.65	11.867	.001**
Rate	right	22.35	1.97		
Inflation	wrong	21.17	1.50	8.629	.004**
	right	22.22	1.97		
Ways of payment	wrong	21.93	2.06	0.210	.647
	right	22.07	1.84		
Euribor	wrong	21.60	1.71	11.563	<.001**
	right	22.56	2.07		
TAEG	wrong	21.67	1.75	6.408	.012*
	right	22.39	2.05		
Indexed Rate	wrong	21.41	1.60	8.248	.005**
	right	22.28	2.00		
Purchase Power	wrong	21.45	1.55	3.205	.075
	right	22.13	1.98		
Invest1000	wrong	21.24	1.42	14.774	<.001**
	right	22.38	2.03		
Term Deposit	wrong	21.53	1.58	2.870	.092
	right	22.13	1.99		

*p<.05; **p<.01; M – Mean; SD – standard deviation.