

Article

Financial Literacy: A Case Study for Portugal

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Abstract: This work aims at understanding the level of financial literacy in Portugal, identifying the determinants of financial literacy in the Portuguese population, taking as an example certain sociodemographic factors such as gender and age. The aim is to understand whether there is a high level of adherence to financial literacy programs and initiatives, as well as the impact of financial knowledge variables on the financial literacy of the Portuguese population. The methodology used was quantitative and based on a questionnaire survey. The sample consisted of 600 individuals, all over 18 years old. It was concluded that individuals in the 26 to 35 age group had the best knowledge and that this sample showed better knowledge of interest rates compared to inflation and risk. The exploratory factor analysis shows five factors that determine the financial literacy of the Portuguese population and the way they manage their finances, which are (1) the perception of their current financial situation; (2) planning and controlling personal finances; (3) the perception of risky financial assets; (4) the perception of risk-free financial assets; and (5) savings. This research contributes to expanding scientific understanding in the field of financial literacy and offering support to the review of financial education policies by formulators, aiming to develop tools that help improve the financial behavior of the Portuguese population.

Keywords: financial literacy; financial education; financial knowledge; financial assets; savings



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1. Introduction

We live in a world where the financial literacy of population is very beneficial for their well-being (Gianakos et al. 2023; Grohmann et al. 2018). Individuals with high financial literacy contribute to their financial well-being and to the societies in which they live; by making more informed and judicious economic and monetary decisions regarding the management of their finances, through behaviors that provide better use of their financial resources. (Miller et al. 2015; Lusardi 2019). These behaviors contribute to a better quality of life, helping to reduce financial difficulties, both personal and social, to the point of providing a reduction in symptoms related to stress, anxiety, or depression (Islam et al. 2020).

The financial literature argues that an economically healthy country has a dynamic, mature, regulated, and supervised capital market, since these markets are an irreplaceable and increasingly important element in modern and competitive economies (Almeida et al. 2015; Almeida 2020). Among others, Almeida (2022) highlights the consensus that the investor's goal is to maximize profit and minimize risk; in this context, financial literacy is crucial for economic stability and individual well-being. Authors such as Lusardi and Mitchell (2014) and Kaiser and Menkhoff (2020) stress the importance of education and educational programs to increase this literacy. This makes it possible to understand the evolution of financial systems and the complexity of financial products (Tavares and Almeida 2020).

Recent instabilities in the financial markets, driven by events such as pandemics or armed conflicts, and the increasing digitalization of financial products as well as new products, have underlined the critical importance of financial literacy as a socially relevant tool (Ananda et al. 2024). These developments have revealed gaps in financial literacy, with many individuals facing difficulties in understanding basic financial concepts or making prudent financial decisions, leading them to face difficulties during these recent crises (Mawad et al. 2022). Thus, the growing need for a current assessment of the level of literacy is crucial and necessary to allow for greater investment in financial education.

Financial literacy is important at all stages of a human being's life and should be measured over time, with the literature pointing to an increase in efforts on the part of governments that still show low financial literacy globally (Tavares et al. 2022; Lusardi 2019).

Literacy levels tend to be high among older men, and those who have higher incomes, live in metropolitan areas, have advanced levels of education, pursue areas of study related to finance, and exhibit a high level of self-perceived literacy (Tavares et al. 2023; Sebastião et al. 2024). On the other hand, younger individuals have higher levels of overconfidence. In general, women have lower levels of overconfidence compared to men; however, under specific conditions, they tend to overestimate their knowledge. Individuals who hold degrees, and those who pursue fields of study related to finance, tend to have high levels of overconfidence (Mawad et al. 2022; Ananda et al. 2024). The gender gap in overconfidence is observed predominantly among students, while the influence of academic specialization and the possession of degrees on overconfidence decreases and intensifies, respectively, within this group. These findings emphasize the critical role of financial education (Tavares et al. 2023; Sebastião et al. 2024; Mushtaq et al. 2024).

Daily investment decisions are shaped by various factors, such as trends, motivations, and social interactions, with investors basing their choices on available resources and financial objectives. However, many are influenced by behavioral biases due to a lack of technical knowledge and overconfidence in their decision-making abilities (Inghelbrecht and Tedde 2024; Daud et al. 2024). Financial education plays a vital role in enabling individuals to understand financial concepts, make informed decisions, and manage their finances effectively. Those with greater financial knowledge tend to make more informed choices, contributing to personal and collective financial stability. In addition, confidence is intrinsically linked to financial education, providing a sense of security when dealing with financial matters, promoting a healthy financial culture and driving sustainable economic development (Daud et al. 2024; Mushtaq et al. 2024).

The work has two main objectives. The first objective is to assess the population's knowledge of three central issues: perception of interest rates, inflation, and risk. This objective allowed for an analysis of the results by gender and age group, showing that the male population in the 26–35 age group had the greatest knowledge of interest rates compared to inflation or risk. The second objective was to identify the most relevant factors in the sample using factor analysis. The most relevant factors were perception of the current financial situation, planning and control of personal finances, perception of financial assets with risk, perception of financial assets without risk, and savings. These results have the potential to assist the National Plan for Financial Education (PNFF) and provide information to central and local political authorities in the formulation of financial education policies and programs for different target groups, recognizing the need for specific approaches to reduce the gap between objectives and perceived financial literacy. A quantitative methodology was used, using exploratory statistical analysis and exploratory factor analysis, to extract evidence of the determinants of financial literacy in our sample. To achieve the proposed objective, this work is divided into five sections. In addition to this introduction, the next section reviews the literature. Then the methodology is presented and in the fourth section the results are presented and discussed. Finally, the conclusions are presented.

2. Literature Review

2.1. Concept of Financial Literacy

Financial literacy is not a simple concept that can be defined in agreement by many different authors (Huston 2010). However, even from the oldest definitions, it is possible to verify the persistence of the relationship between literacy and financial knowledge. It is possible to conclude that this knowledge is fundamental for the perception of current financial issues, given the gradual increase in available financial instruments and their consequent complexity (Tavares et al. 2022); namely, due to the evolution of the population's standard of living, the evolution of the economy and its respective impact on personal finances.

With a greater degree of importance, this knowledge stands out for being crucial for the implementation of financial attitudes present in the various problems and daily scenarios of a subject, so that they optimize their monetary savings, and contribute to productivity, stability, and respective development of society (Emmons 2005; Lusardi and Mitchell 2014).

It can, therefore, be seen that this knowledge is not uniform across the various definitions of financial literacy. This is evident in a wide range of concepts related to finance, economics, or currency (Sconti 2022). According to Tavares et al. (2022), this knowledge is defined in broader concepts, identified as financially fundamental. From the simplest learning to the most complex and advanced, such as loans, investments, or retirement plans, it should be emphasized that, in general, knowledge in itself reflects all the financial instruction gained during the different stages of a person's life, which allows them to expand their vocabulary, to which they can be stimulated in their values, attitudes, or in various practical matters, to be observed in their society and in their day-to-day life (OECD 2021).

Thus, there is a relationship between literacy and respective financial competence and skills. There is a need to understand and demonstrate the competence to apply knowledge in everyday life, considering different scenarios and plans, regardless of their probability (Orton 2007). The person must have the ability to make decisions with confidence or conviction, in order to establish effective management of their personal finances and ensure that they are not affected by financial crises or other events of convenience (Tavares et al. 2022; Korankye and Pearson 2022).

Literacy is also related to financial responsibility, whereby citizens are responsible for putting their diverse financial knowledge into practice in order to understand the far-reaching consequences of their financial decisions on the quality of life of their societies, families, and individuals, with the aim of becoming an asset to the society to which they belong (OECD 2021). Everyone should be able to judge sources of finance and investment astutely, as well as the advice they provide (Skica et al. 2022).

Through the various studies and authors listed, financial literacy can be defined as the financial knowledge provided and experienced during the various cycles of each individual's life that simultaneously stimulates their behaviors and values present in their daily routines, so that they manifest the aptitude to make the most convenient decisions regarding their financial position, with the aim of establishing a better management of their monetary means. Financial literacy also implies that the individual is aware of all the possible outcomes of their financial decisions.

2.2. Financial Literacy—Evidence

According to Lusardi and Mitchell (2007), studies prior to 2007 highlight a low level of financial literacy, despite the population of a society such as the United States recognizing and expressing that knowledge about the economy is important. The low financial literacy present in societies and the urgent and necessary implementation of measures and programs to increase it are corroborated by Gedvilaite et al. (2022).

According to Schleicher (2019), financial literacy is becoming increasingly important, as it is easier and easier to gain access to the wide range of financial information available on the internet. This information does not always come across as truthful, to the point where it

is up to the users to be able to analyze and select, contributing to growth in financial terms (Schleicher 2019).

More recent studies highlight that, in developed societies, such as Switzerland, financial literacy is high (Leippold et al. 2022). However, the level of financial literacy related to sustainability, in this case, of Swiss families, is low, which allows us to conclude that the possession of knowledge related to sustainability may not have a significant impact on the assessment of literacy (Leippold et al. 2022). According to Hii et al. (2022), those who invest in the financial market tend to have financial knowledge about the products underlying the same investments.

2.3. Determinants of Financial Literacy and Financial Education

According to the OECD (2021), financial education can be described as the process of learning about the financial market by its consumers and investors, so that they are more capable and confident during their daily lives to make more rigorous, accurate, and better informed decisions, with the aim of improving their financial situation.

General financial education is seen as relevant to the population, given that it allows access to available financial means, the respective accumulation of assets obtained through investments made, and, more importantly, describes a person's future work, as well as their consequent remuneration, which influences the habits, hobbies, or respective financial decisions made during a respective individual's day-to-day life (Vitt et al. 2000). For Vitt et al. (2000), the use of money has a huge impact on people's feelings, contributing to personal and family well-being to the point that it should not be undervalued.

Several authors test students' financial literacy and several express the high importance of financial education. Financial education, in Huston's (2010) view, is an essential tool available to a human being to improve their monetary wisdom, so that they can successfully implement this knowledge in their respective financial lives. and adopt appropriate behaviors given their monetary situation.

Miller et al. (2015) found evidence about the importance of financial education, concluding that it has a huge impact on the financial behavior of a family or even a population. The author also concludes that the place and the way in which knowledge is transmitted is not significant. For Kaiser and Menkhoff (2020), financial education present in schools can stand out as one of the ways to combat low participation by the population in non-school initiatives, with the aim of guiding them in more informed financial decisions. The authors point to financial education in schools as vital to improving the financial knowledge of students and populations.

The previous conclusions are in line with evidence highlighted by other authors, including Huston (2010), who points out financial education as the main factor that influences financial literacy, arguing that it is essential to understand the variation in financial results. This perspective was reinforced by Klapper et al. (2012), which highlights that financial literacy increases proportionally with the level of education.

In line with this idea, the OECD (2021) highlighted financial education policy as essential to empower individuals, increase financial resilience, and promote financial stability. Lührmann et al. (2018) argues that an intervention in financial literacy in adolescence has significant impacts with some consistency, not only on students, but also on the future of the society to which they belong.

According to Vitt et al. (2000), a subject must express confidence, but not excessively, when confronted with their financial education, as confidence increases the probability of financial education being successful in converting it into literacy. However, too much self-esteem can lead to not correctly estimating financial decisions. Still, on the effect of overconfidence, Merkle (2017) adds that the respective investors expect more beneficial interest rates of return and more favorable investment returns, as well as underestimating the volatility of the financial market, when subject to the effect itself. However, trust is essential for consumers and investors to be more perceptive in the way they deal with

variable everyday financial problems and situations (Vitt et al. 2000), and it is also as a determinant for greater investor participation in the financial market (Xia et al. 2014).

Gavurova et al. (2017) concluded that university students in Slovakia who focused on studying economics or finance did not show a significant increase in financial literacy when compared to students from other areas. The authors concluded that financial knowledge was not dependent on the area of study, corroborating the evidence found by Lusardi (2019) that increasing financial knowledge is only achieved through systematic and methodical financial education.

According to Shim et al. (2015), young people learn both in formal (schools) and non-formal (internet or other sources of information) environments, in such a way that both environments contribute to the development of healthy financial practices.

Other factors such as gender, age, income, or education determine financial literacy according to authors such as Lučić et al. (2020), Dundure and Sloka (2021), and Siegfried and Wuttke (2021). Table 1 summarizes some of the conclusions from several studies on the determinants of literacy in various investigations. Authors such as Wieliczko et al. (2020) and Chen and Chen (2023) emphasize the importance of savings as a crucial factor for economic development. They argue that saving boosts investments and promotes financial stability at personal and national levels. Furthermore, studies such as Bialowolski et al. (2022) demonstrate that financial literacy is essential for responsible financial behavior. Conversely, the lack of financial literacy is associated with problems such as high-cost loans, as highlighted by Lusardi (2019). This competence enables individuals to make smart and timely financial decisions, driving the accumulation of wealth and savings. To mitigate the risk of financial crises, authors such as Johri et al. (2023) and Sinnewe and Nicholson (2023) point to financial planning and budgeting as crucial tools of financial literacy in this context.

Table 1. Conclusions and variables from studies on financial literacy.

Variable	Author(s); Year	Conclusion
Education	(Miller et al. 2015).	Where the transmission of financial knowledge takes place is irrelevant.
	(Lusardi and Mitchell 2014; Mitchell et al. 2011).	A poor education is insufficient to understand more complex concepts such as risk diversification.
	(Lusardi and Mitchell 2007; Shim et al. 2015; Gianakos et al. 2023).	There is a severe concern about gaining financial knowledge among the population.
	(Gavurova et al. 2017; Almeida et al. 2022).	The acquisition of financial knowledge is not dependent on the degree or level of education of the associated courses designed to obtain this insight.
	(Gavurova et al. 2017; Almeida et al. 2022).	Courses associated with financial management, both in secondary and university education, do not demonstrate significant effectiveness in disseminating financial knowledge when compared to courses at a similar level of education.
Professional Experience	(Beal and Delpachitra 2003; Bucher-Koenen and Lusardi 2011; Vitt et al. 2000).	Those who demonstrate high professional experience will tend to demonstrate superior financial literacy.
Income	(Mashumi et al. 2023).	Low levels of literacy are normally associated with low levels of pay.

Table 1. Cont.

Variable	Author(s); Year	Conclusion
Self-confidence	(Bannier and Schwarz 2018; Vitt et al. 2000).	Self-confidence in a non-excessive way is essential for gaining financial literacy, in order to manifest benefits for the financial health of families.
	(Xia et al. 2014).	Self-confidence increases the population's participation in the financial market.
Numeracy	(He and Ahunov 2022; Skagerlund et al. 2018).	Mathematical skills give rise to better financial literacy—those who present it emphasize good financial literacy.
Gender	(Amonhaemanon 2022; Bucher-Koenen et al. 2017; Karakurum-Ozdemir et al. 2019; Leippold et al. 2022; Yeh 2022).	Males, at any age, have greater financial literacy than females.
Age	(Lusardi 2019).	Young adults highlight low literacy compared to other adult ages.
	(Mitchell et al. 2011).	The financial literacy present in different age groups shows a decline after the age of 50.

Source: Own elaboration.

2.4. Level of Financial Literacy in Portugal Measured by Bank of Portugal

In Portugal, through the National Financial Education Plan, surveys on this topic have been carried out among the Portuguese population over the age of 16; they are carried out every 5 years. The first was carried out in 2010, for which the objectives relating to the questionnaire were defined at the time. These are based on measuring the population's perception, knowledge, and understanding of the banking system (Banco de Portugal 2011).

In 2020 (the last survey carried out to date), respondents' savings habits were highlighted, as well as a widespread concern about maintaining some level of savings to cover unexpected expenses. Compared to 2015, in 2020, Portuguese society is more informed about the wide range of existing financial products, and is more involved within the banking system and shows greater confidence in the over-the-counter services offered by banks and their respective boards. Respondents also show a greater interest in news about the real estate market and, for those who are within the banking system, it appears that they are more up to date with the financial information made available about them.

Regarding financial knowledge, the conclusions of studies carried out in Portugal are in line with the conclusions already established by other studies—males have greater knowledge, in financial terms—corroborating the conclusions of other authors (Amonhaemanon 2022; Leippold et al. 2022; Yeh 2022). The population's financial knowledge increases with income, as well as with the level of education (a precarious level of education is shown to be insufficient), with the older population, aged over 70, also being the least knowledgeable age group (Centeno et al. 2021; Tavares et al. 2022). The same authors also conclude that the population between the ages of 25 and 54 years old has better literacy. In terms of income, respondents who have a monthly net income above EUR 1000 have better financial literacy (Centeno et al. 2021). The study by Banco de Portugal (2020) concludes that the general financial knowledge of the Portuguese population, comparatively between 2015 and 2020, does not show significant evolution (Centeno et al. 2021).

Finally, in an international approach, in comparative terms, Portugal ranks higher than the OECD average in terms of the overall indicator of financial literacy, and negatively in terms of both the general financial knowledge of the population and their financial well-being (Centeno et al. 2021).

2.5. Three Central Questions in Financial Literacy

As previously mentioned, the measurement of financial literacy has been a prominent topic in several academic and practical studies, especially in the context of personal finances

and resource management. Authors aiming to adequately understand the level of financial competence of individuals, or populations, have essentially resorted to a series of questions that address different critical areas.

In the various works, there is an almost unanimous use among researchers of three central questions and areas, among others we point out [Lusardi and Mitchell \(2011\)](#), [Skagerlund et al. \(2018\)](#), [Leippold et al. \(2022\)](#), [Tavares et al. \(2022\)](#), and [He and Ahunov \(2022\)](#). Researchers point to numeracy, savings, and investment decisions as the three central and most important areas of financial literacy. These are measured by three fundamental concepts, which are (i) numeracy measured by the ability to calculate interest rates, (ii) understanding what inflation is and its impact, and (iii) the perception of risk diversification. By including these areas and recurring questions in studies on financial numeracy, it is possible to obtain a comprehensive and accurate view of individuals' financial skills.

In this sense, the inclusion of questions related to interest rates makes it possible to assess participants' understanding of how these rates influence the cost of credit and investment returns. Knowledge of the impact of inflation is crucial to assess participants' awareness of how currency devaluation can affect purchasing power over time. Finally, issues related to risk and diversification are fundamental to determine the ability of individuals to understand and manage the different types of risk associated with financial decisions.

In that regard, we included and analyzed three questions proposed by [Lusardi and Mitchell \(2011\)](#), [Lusardi \(2019\)](#), [Amonhaemanon \(2022\)](#), [Yeh \(2022\)](#), and [Zaimovic et al. \(2023\)](#).

Q. I Numeracy and the ability to calculate interest rates

Suppose you had USD 100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow? More than USD 102; exactly USD 102; less than USD 102; do not know; refuse to answer.

Q. II Understanding what inflation is

Understanding of inflation "Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account?" More than today; Exactly the same; Less than today; Do not know; Refuse to answer.

Q. III The perception of what risk diversification is

"Please tell me whether this statement is true or false. "Buying a single company's stock usually provides a safer return than a stock mutual fund". True; False; Do not know; Refuse to answer".

Numerous studies spanning from the earliest investigations, exemplified by [Hilgert et al. \(2003\)](#), to contemporary research such as that documented by [Leippold et al. \(2022\)](#), employ questionnaires as a fundamental tool for subsequent analysis. This approach's main objective is to find evidence that allows us to provide insights and conclusions about the financial literacy of populations.

3. Methodology and Sample

Like [Greener \(2008\)](#) and [Osei-Kyei and Chan \(2017\)](#), the work uses a quantitative analysis, where observations will be made on responses obtained through a questionnaire survey. To process and analyze the questionnaire, two tools were used—Microsoft Excel and SPSS 26.

In the first phase, the correlations between the different variables under study were analyzed, based on the central questions used in Lusardi's work. To study the survey, the principal component analysis of factor analysis (PCA) is used. In the opinion of [Hair et al. \(2010\)](#), factor analysis is a set of multivariate statistical techniques that analyze the patterns of complex relationships simultaneously, to define the structure underlying a set of variables.

For [Malhotra \(2001\)](#), PCA is an interdependence technique, as it simultaneously examines a set of interdependent relationships. For the author, these variables must be specified based on previous investigations or the investigator's judgment. PCA was used to extract the preponderant factors when choosing apartments. [Pestana and Gageiro \(2014\)](#) and [Marôco \(2018\)](#) understand that it is an exploratory analysis technique that aims at discovering and analyzing a set of interrelated variables to constitute a measurement scale for factors that, in some way, control the original variables. Therefore, we intend to use PCA to reduce the large number of variables considered into a much smaller number of factors.

Considering the Kaiser–Meyer–Olkin (KMO) test, it is analyzed to see whether it allows for a good factor analysis and the Bartlett's test is used to see its significance level; if this is 0.000, it leads us to reject the hypothesis that the correlation matrix in the population is the identity matrix. Thus, we can conclude that factor analysis is suitable. If this is not the case, the use of this factorial model should be reconsidered. Thus, for KMO values between]0.9–1.0] the suitability rating is excellent; between]0.8–0.9] it presents excellent suitability; between]0.7–0.8] is classified as good suitability; between]0.6–0.7] regular; between]0.5–0.6] mediocre suitability; and $KMO \leq 0.5$ an inadequate suitability.

Once the correlation between the variables in both previous tests has been verified, we can proceed with the factor analysis, where we will analyze Cronbach's alpha to verify the internal consistency of the factors ([George and Mallery 2003](#)). Thus, for Cronbach's alpha intervals between]0.9–1.0] the internal consistency of the factors can be considered excellent; between]0.8–0.9] is good; between]0.7–0.8] is acceptable; between]0.6–0.7] is doubtful; between]0.5–0.6] is considered poor; and for Cronbach's alpha values ≤ 0.5 , it is considered unacceptable.

The number of components extracted did not always follow the precepts presented by [Norusis \(2006\)](#), which state that only components with an eigenvalue greater than 1 should be considered, as this rule is not always generally applicable ([Sharma and Rojek 2020](#)).

The orthogonal factor rotation model was used due to its greater simplicity, as in orthogonal rotation the original orientation between factors is preserved; that is, the factors after rotation remain orthogonal. To rotate the factor axes, we used the varimax orthogonal method with Kaiser normalization, whose objective, according to [Marôco \(2018\)](#), is to obtain a factor structure in which one and only one of the original variables is strongly associated with a single factor, being, however, little associated with the other factors, eliminating intermediate values, which make the interpretation of the results difficult.

The varimax rotation method maximizes the sum of the squared variances of the loadings of each factor ([Manly 1986](#)). For [Pestana and Gageiro \(2014\)](#), this type of rotation minimizes the number of variables with high loadings on a factor, obtaining a solution in which each main component approaches ± 1 , in the case of association between both; or zero, in the case of no association. The same authors state that orthogonal rotation aims to extreme the values of the loadings, so that each variable is only associated with one factor ([Pestana and Gageiro 2014](#)), which makes this method of orthogonal rotation preferred by many analysts.

Taking into account the problem of the work, as already highlighted, a questionnaire was written using the "LimeSurvey" platform, ensuring data protection. To ensure that respondents were responsible for their answers, and did not require authorization when collecting data, only adult individuals who had access to a technological device with internet access and capable of responding to the survey were approached. A sample of people with Portuguese nationality was aggregated, bringing together a final sample of 600 individuals who responded to the entire questionnaire and 410 who responded incompletely, not being included in the sample.

Finally, the influence of factors resulting from factor analysis on pertinent aspects of financial literacy was assessed using multiple linear regression. The regression model was estimated by considering the coefficient of correlation (R), coefficient of determination (R^2), Durbin–Watson statistic, Kolmogorov–Smirnov normality, and collinearity test. A

significance level of 5% was applied when analyzing the regression, based on the *p*-value (observed significance level).

The coefficient of determination, denoted as R^2 , quantifies the extent of the effect of independent variables on the dependent variable, as delineated by the regression model (Marôco 2018). R^2 signifies the proportion of total variability explained by the regression ($0 \leq R^2 \leq 1$), or alternatively, the proportion of total variability of *Y* attributed to the dependence of *Y* on all *X_i* as defined by the regression model’s fit to the data. An R^2 value of 0 indicates a poor fit, while 1 denotes a perfect fit. The threshold considered adequate for characterizing a fit is subjective (Marôco 2018). In exact sciences, R^2 values exceeding 0.9 are generally deemed indicative of a strong fit, whereas in social sciences, a value surpassing 0.5 suggests a favorable fit.

Multicollinearity among explanatory variables was absent, as evidenced by variance inflation factor (VIF) values being less than 2 for all models in the empirical analysis (Marôco 2018).

4. Presentation and Analysis of Results

At this point in the work, a sociodemographic analysis is initially addressed, followed by both an assessment of financial knowledge and an examination of the various hypotheses discussed in the previous chapter. Subsequently, an analysis of financial knowledge is carried out, followed by a study of the respondents’ financial awareness. Finally, an interpretation of the financial attitudes and behaviors expressed during the course of the survey is presented, in which a factor analysis is included, so that an in-depth investigation of the effect of financial knowledge on these certain behaviors can be carried out.

4.1. Sociodemographic Characterization

In order to explore sociodemographic data about the sample, Table 2, presented below, was created.

Table 2. Sociodemographic characterization.

Gender	n	%
Female	304	50.67%
Male	293	48.83%
Nonbinary?	3	0.50%
Total	600	
Age	n	%
18 to 25	145	24.17%
26 to 35	207	34.50%
36 to 45	111	18.50%
46 to 55	92	15.33%
56 to 65	37	6.17%
66 or over	8	1.33%
Total	600	
School Background	n	%
Academic background in economics, management, finance, accounting, or similar	157	26.17%
School background in other areas	443	73.83%
Total	600	

Table 2. Cont.

Professional Experience	n	%
No experience to report	55	9.17%
1–3 years	126	21.00%
3–5 years	46	7.67%
5–10 years	121	20.17%
+10 years	252	42.00%
	Total	600
Monthly salary of the household to which the respondent belongs	n	%
Up to EUR 750	58	9.67%
EUR 751–1000	102	17.00%
EUR 1001–1500	170	28.33%
EUR 1501–2000	99	16.50%
EUR 2001–2500	58	9.67%
Above EUR 2501	64	10.67%
Did not answer	49	8.17%
	Total	600

Source: Own elaboration.

Table 2 shows that the sample was made up of a very similar percentage in terms of gender, female (50.07%), male (48.83%) and 0.50% of nonbinary respondents.

The sample consists of 34.50% of respondents aged between 26 and 35 years old, and 73.83% of respondents have backgrounds in academic areas that are not linked to economics, management, finance, or accounting. Another characteristic of the sample that we consider interesting is that 42% of respondents have more than 10 years of professional experience, and 28.33% have an income between EUR 1001 and EUR 1500.

4.2. Financial Knowledge (Lusardi's Three Big Questions)

The survey includes three major questions: interest rates, inflation, and risk diversification. The three fundamental concepts about savings and investment decisions include (I) numeracy measured by the ability to calculate interest rates, (II) understanding what inflation is, and (III) the perception of risk diversification.

Below is a table summarizing the responses to the three major questions that will be used for comparison with international results.

Table 3 shows that 74.75% of respondents have a high level of knowledge about interest rates and their impact on income. When asked about inflation and risk, and the impact of these variables on profitability and personal finances, approximately 50% of respondents have an understanding of these variables, but a lower level of knowledge compared to interest rates. Inflation is understood by 56% of the population and risk by 49.67%. When the answers are analyzed together, only 31.33% of the surveyed population responds correctly, showing understanding of the three variables together.

Table 4 describes the correct answers to the three central questions used in works with similar objectives and described above, analyzed by gender and age group.

Table 4 shows that the male gender has greater financial knowledge and perception when assessed by the three questions—interest, inflation, and risk—compared to the female gender. Of the male respondents ($n = 293$), 49.15% got all three questions right, while for females ($n = 304$), 13.81% of the total population got all three questions right, with 77% of the total sample who got all three questions right ($n = 188$) being male. This allows us to corroborate the evidence found, among others, by [Bucher-Koenen et al. \(2017\)](#); [Amonhaemanon \(2022\)](#); and [Yeh \(2022\)](#).

Table 3. Literacy measured by three questions.

Central Questions	Total Sample (n = 600)	
	Correct	Incorrect
Q. I	74.75%	25.25%
Q. II	56.00%	44.00%
Q. III	49.67%	50.33%
Set of three questions	31.33%	68.67%

Source: Own elaboration.

Table 4. Gender and age in literacy.

Questions	Gender (n = 600)		Age					
	M (n = 293)	F (n = 304)	18 to 25	26 to 35	36 to 45	46 to 55	56 to 65	66+
They answered the three central questions correctly.	49.15% (n = 144)	13.81% (n = 42)	23%	35.83%	20.32%	14.97%	4.28%	1.60%

Source: Own elaboration.

The age group that demonstrates the best knowledge, when measured by the three questions, are the respondents aged between 26 and 35 years old, with the age groups 55 years old and older having the lowest knowledge, corroborating results described, among others, by [Lusardi \(2019\)](#) and [Lusardi and Mitchell \(2011\)](#).

4.3. Factor Analysis

Factor analysis presupposes the existence of a smaller number of unobservable variables; as a form of validation and robustness analysis of the model, we calculated the KMO statistic and performed the Bartlett test. Considering the value of KMO (0.839), which according to [Pestana and Gageiro \(2014\)](#) and [Marôco \(2018\)](#) allows for a good factor analysis, and since the Bartlett test has an associated significance level of 0.000, it leads us to reject the hypothesis that the matrix of correlations in the population is the identity matrix, thus, showing that the correlation between some variables is statistically significant. We can conclude that the factor analysis is appropriate.

We also see in [Table 5](#) that the eigenvalues of the five factors are all greater than 1 (Kaiser criterion). Several attempts were made to ensure that the loading of each variable was greater than 0.5; that is, variables with loading lower than 0.5 were successively removed ([Table 6](#)).

Factor analysis resulted in the extraction of five factors responsible for 62.046% of the total variance ([Table 6](#)). The unexplained variance, of 37.954%, may be related to other less relevant factors, resulting from other combinations of variables.

Once the correlation between the variables in both previous tests has been verified, we can proceed with the factor analysis, where we will analyze Cronbach’s alpha to check the internal consistency of the factors.

This factor analysis aims to understand the determining factors of financial literacy in the Portuguese population, and the way people manage their personal finances. We will now describe how the factors selected from the analysis of the main components were named and interpreted ([Table 6](#)).

Regarding factor 1, observing the variables that contribute to explaining this factor allows us to conclude that we are dealing with variables related to the perception of the current financial situation. Thus, this factor is explained by the fact that the current financial situation may limit the ability to obtain goods and services, the concern about paying current bills and the fact that money does not last forever. This factor presents good consistency.

Table 5. Total variance explained.

	Initial Eigenvalues			Extraction Sums of Squared Loads			Rotation Sums of Squared Loads		
	Total	% in Variance	% Cumulative	Total	% in Variance	% Cumulative	Total	% in Variance	% Cumulative
1	4.819	24.093	24.093	4.819	24.093	24.093	3.208	16.041	16.041
2	2.608	13.039	37.132	2.608	13.039	37.132	2.480	12.400	28.441
3	2.411	12.056	49.188	2.411	12.056	49.188	2.269	11.343	39.784
4	1.546	7.731	56.919	1.546	7.731	56.919	2.266	11.331	51.115
5	1.025	5.127	62.046	1.025	5.127	62.046	2.186	10.930	62.046

Extraction method: principal component analysis.

Table 6. Rotating component array.

	1	2	3	4	5	
My financial situation limits my ability to obtain the goods and services I want	0.786					Perception of the current financial situation
My personal finances control my life	0.786					
My financial situation limits my ability to do things that are important to me	0.721					
Paying my current expenses usually worries me	0.703					
I feel like financially I am just getting by	0.648					
I worry that my money will not last forever	0.626					Planning and controlling personal finances
I personally and systematically control my personal finances		0.741				
I set long-term goals and do everything I can to achieve them		0.727				
I follow a careful financial budget		0.727				
I keep track of my money		0.661				Perception of risky financial assets
Derivative financial instruments (e.g., CFD, warrants, forex, swaps)			0.816			
Investment funds			0.745			
Stocks			0.697			
Obligations			0.646			Perception of risk-free financial assets
Term deposits				0.851		
Retirement savings plans				0.833		
Savings certificates/treasury certificates				0.772		Savings
I save now to prepare for old age					0.852	
I regularly put money aside for the future					0.744	
I carry out planning for the future					0.699	
Cronbach’s alpha	0.822	0.726	0.741	0.820	0.794	

Extraction method: principal component analysis.

In factor 2, the observation of the variables that contribute to explaining this factor allows us to conclude that we are dealing with variables related to the planning and control of personal finances. This factor presents as variables the definition of long-term objectives, monitoring money and following a strict budget, and personally and systematically controlling personal finances. This factor presents an acceptable consistency.

Factor 3 gives us insight into the perception of risky financial assets. Hence, there is a perception of risk related to derivative financial instruments, investment funds, shares, and bonds. This factor has an acceptable consistency.

Factor 4 presents the factors related to the perception of risk-free financial assets. Thus, the base products for risk-free (or very low risk) assets are term deposits, retirement savings plans, and savings certificates. This factor presents good consistency.

Regarding factor 5, the observation of variables that contribute to explaining this factor allows us to conclude that we are dealing with variables related to savings. Thus, this factor is explained by the concern with saving for old age, putting money aside on a regular basis to safeguard the future, and carry out planning for the future. This factor presents good consistency.

4.4. Multiple Linear Regression

To perform the analysis of the multiple linear regression, the following three questions in the questionnaire were taken as independent variables: (1) I follow a strict financial budget; (2) carry out planning for the future; and (3) I regularly put aside money for the future. As explanatory variables, the factors that resulted from the exploratory factor analysis were tested (see Table 7).

Table 7. Dependent variable according to the statement in the model.

	Model 1—I Follow a Strict Financial Budget		Model 2—Carry Out Planning for the Future		Model 3—I Regularly Put Money aside for the Future	
(Constant)	3.404	***	4.167	***	4.178	***
Factor 1—Perception of the current financial situation	0.112	***	−0.131	***	−0.196	***
Factor 2—Planning and controlling personal finances	0.796	***	0.426	***	0.384	***
Factor 3—Perception of risky financial assets	−0.131	***	−0.110	***	−0.105	***
Factor 5—Savings	0.237	***	0.455	***	0.674	***
R	0.788		0.723		0.845	
R ²	0.621		0.523		0.713	
R ² a	0.619		0.520		0.711	
D W	2.044		1.961		2.095	
F	325,577	***	163,397	***	370,518	***

Source: Own elaboration. Note: H₀ = equality of variances/means; * $p < 0.05$; ** $p < 0.01$, and *** $p < 0.001$.

In all three models, every variable demonstrates statistical significance at the 0.001 level, indicating the robustness of standard deviations through the ordinary least squares (OLS) approach. This methodology proves effective in addressing potential heteroscedasticity issues commonly encountered in cross-sectional sampling.

Across these models, the F statistic, following a Snedecor’s F-distribution, yields a p -value of 0.000, signifying statistical significance at the 0.001 level. Consequently, the null hypothesis (H₀) is rejected in favor of the alternative hypothesis (H₁), affirming the model’s overall significance.

After estimating the regression, it appears that it has the following explanatory capacity: (1) I follow a strict financial budget, 78.8%; (2) carry out planning for the future, 72.3%; and (3) I regularly put money aside for the future, 84.5%.

In the analysis, multicollinearity was assessed using variance inflation factors (VIF). The examination confirmed the absence of multicollinearity issues within the model. Furthermore, examination of the Pearson’s correlation matrix revealed negligible correlations among the variables. Concerning the assumption of residual independence, the Durbin–

Watson test was employed, with the observed values not surpassing the critical thresholds, indicating non-rejection of the null hypothesis (H_0), thereby suggesting absence of autocorrelation in the residuals. Evaluation of the absolute magnitudes of standardized regression coefficients reveals that the independent variables derived from the exploratory factor analysis exert a positive influence on explaining the dependent variable.

5. Conclusions

The objective of this study is, therefore, related to recognizing the level of financial literacy in Portugal, also identifying the determinants of financial literacy in the Portuguese population, taking as an example certain sociodemographic factors such as gender, age, or remuneration. The aim is to understand, across several aspects, whether there is a high adherence to financial literacy programs and initiatives, as well as the impact of the various sources of financial knowledge on the financial literacy of the Portuguese population. More and more societies are becoming aware of the importance of empowering individuals with financial knowledge and capabilities, as to make informed decisions, where they can overcome the various financial challenges caused by market volatility and financial crises. The individual must also be aware of the impact that their financial decisions have, both on society and on themselves.

It is concluded that male respondents have greater financial knowledge than female respondents, similar to the conclusions, among others, by authors such as [Karakurum-Ozdemir et al. \(2019\)](#), [Yeh \(2022\)](#), or [Leippold et al. \(2022\)](#).

It is concluded that respondents aged 26 to 35 are those with the best knowledge, when measured by the three central questions, corroborating the conclusions of [Lusardi \(2019\)](#) and [Gavurova et al. \(2017\)](#).

For the entire sample as a whole, when measured by the same questions, it revealed low knowledge (31.33%), corroborating the conclusions of [Hii et al. \(2022\)](#) and those found in the study by [Centeno et al. \(2021\)](#). It is also concluded that respondents demonstrate better knowledge about interest rates compared to inflation and risk.

Another conclusion, taking into account the concept of financial literacy, is that respondents with financial knowledge show greater concern and attention in the way they behave in financial terms compared to the rest. However, it became clear that there is much work to be performed to achieve an environment where all respondents demonstrate a solid financial understanding, which includes the ability for them to obtain knowledge from someone experienced in important financial areas, to the point of exercising with greater prudence the management of their monetary resources, in order to create, for example, more detailed financial budgets. In that event, there is also work to be performed to improve the financial knowledge and consequent financial literacy of the respective respondents.

Factor analysis allows us to extract five distinct factors, allowing us to conclude each of them. The first factor relates to the perception of the current financial situation. The second factor allows us to conclude that respondents are generally concerned with planning and controlling personal finances and tend to make budgets as a form of control. The third factor refers to the perception of risk associated with different financial instruments, such as derivatives, investment funds, shares, and bonds. The fourth factor deals with the perception of risk-free financial assets, highlighting products such as term deposits, retirement savings plans, and savings certificates, as the most common and most widely known. Finally, the fifth factor is related to the awareness shown by respondents about the importance of saving for the future, including concern about saving for old age and carrying out long-term planning.

Regarding the carried out multiple linear regressions, it was fully explained that the dependent variables (1) I follow a strict financial budget; (2) carry out planning for the future; and (3) I regularly put aside money for the future, are explained by the independent variables represented by the factors of the exploratory factor analysis: (1) perception of the current financial situation; (2) planning and controlling personal finances; (3) perception of

risky financial assets; and (4) savings. These independent variables add robustness to the three models that were presented.

These results provide valuable insights into participants' attitudes and perceptions regarding personal finances, contributing to a broader understanding of financial behaviors, serving as a basis for formulating public policies and designing training as instruments for increasing financial literacy, an important tool in improving the quality of life of the population and the economic development of the country.

A study on financial literacy centered on demographic data and explanatory factors has several practical implications and relevant insights for Portugal. The first is to provide and identify gaps in the financial literacy of the Portuguese population, highlighting specific population groups with lower financial literacy. This allows targeting educational policies and programs at these groups, adapting these programs to achieve more effective results. It provides insights for the development of awareness-raising strategies. It contributes knowledge to the design of specific policy interventions to promote financial literacy in specific demographic groups. For example, personalized financial education courses can be offered to meet the needs of different age groups or income brackets. The study, thus, contributes by providing insights for increasing the population's literacy, leading to better financial decision-making, reducing financial vulnerability, and promoting individual and collective financial well-being in Portugal.

The limitations of this study are the size of the sample, which could have been more representative of the elderly population, and the difficulties in obtaining complete answers to the questionnaire. The successive crises and low economic growth in Portugal may be factors influencing the preparation of the population's financial education.

For future work, a differentiated statistical analysis with different econometric studies on the same area will be interesting. It will also be interesting to carry out a similar study in a later year considering similar hypotheses with a larger sample to understand any differences that may exist. In our opinion, it will be interesting to carry out a study related to pensions and the impact of variables on pension planning, as well as approaches to tax literacy with financial literacy. A study that makes it possible to see more clearly the financial literacy of pensioners or those who do not have compulsory education equivalent to a full secondary education, by making comparisons between these two different ages (younger people who are still studying in compulsory education and older people) would also have value.

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