Lisbon School of Economics & Management
Universidade de Lisboa

MASTER

FINANCE

MASTER´S FINAL WORK

DISSERTATION

AN ESSAY ON FINANCIAL LITERACY AND SUSTAINABLE INVESTING

DUARTE ALEXANDRE COELHO BOTELHO

DECEMBER - 2022

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SUPERVISION:
PROF. DR. ALCINO TIAGO CRUZ GONÇALVES

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Regardless of anything, I'm gonna write my own story and my own ending.

Without the assistance of wonderful people, I never would have been able to write the last page of this chapter of my life.

At the start, I'd want to express my gratitude to Professor Tiago Gonçalves, who has been my most consistent source of support and encouragement during this journey.

I owe a tremendous debt of gratitude to my mom and dad, Magda and Pedro, for their unending love and encouragement, not just during my dissertation writing process but throughout my whole life.

Without the many friends I've made along the way throughout my academic life, the journey to this point would not have been as enlightening and joyful as it was.

I'd want to end by saying how grateful I am to the ISEG community; over my five years here, I went through a profound personal transformation and am now proud to call this institution my home.

I hereby express that all the errors remain my own.

ABSTRACT AND KEYWORDS

The objective of the present study is to determine the association between sustainable investing and financial literacy. Some studies demonstrate a positive association between financial literacy and sustainable investing, while other research indicates a negative relationship between the two. Not only is the current body of literature inconclusive, but there is also a scarcity of study in this particular subject; consequently, we deemed it essential to analyze the issue. In addition, there was no research on this topic for the Portuguese population at the time of writing, making this study an important contribution to the literature.

To develop this dissertation, the CMVM 2020 Online Investor Survey Results were analyzed to determine the factors that characterize a Portuguese green investor. To quantify the level of financial literacy, we employed two distinct indices: the first, an objective index based on the responses of participants to the survey's financial literacy quiz, and the second, a subjective index developed exclusively based on each individual's perceived knowledge. According to the data, both basic and advanced financial literacy have a positive correlation with sustainable investing. Demographic characteristics have a favourable correlation with sustainable investing, and the same holds true for risk perception. The results show that the income level at any level is not statistically significant. The results indicate that financial literacy plays a crucial role in explaining an individual's inclination to become a sustainable investor.

Keywords: Financial Literacy; Sustainable Investing; Risk Perception

JEL CODES: G53; G50; G11

RESUMO

O objectivo do presente estudo é determinar a associação entre o investimento sustentável e a literacia financeira. Alguns estudos demonstram uma associação positiva entre a literacia financeira e o investimento sustentável, enquanto outros estudos indicam uma relação negativa entre os dois. Não só o actual corpo de literatura é inconclusivo, como também existe uma escassez de estudo neste assunto específico; consequentemente, considerámos essencial analisar a questão. Além disso, não houve investigação sobre este tema para a população portuguesa na altura da redacção do presente relatório, o que torna este estudo um importante contributo para a conversa.

Para desenvolver esta dissertação, foram analisados os resultados do Inquérito aos Investidores Online da CMVM 2020 para determinar os factores que caracterizam um investidor verde português. Para quantificar o nível de literacia financeira, utilizámos dois índices distintos: o primeiro, um índice objectivo baseado nas respostas dos participantes ao questionário de literacia financeira do inquérito, e o segundo, um índice subjectivo desenvolvido exclusivamente com base no conhecimento percepcionado de cada indivíduo. De acordo com os dados, tanto a literacia financeira básica como a literacia financeira avançada têm uma correlação positiva com o investimento sustentável. As características demográficas têm uma correlação favorável com o investimento sustentável, e o mesmo se aplica à percepção do risco. Os resultados mostram que o nível de rendimento a qualquer nível não é estatisticamente significativo. Os resultados indicam que a literacia financeira desempenha um papel crucial na explicação da inclinação de um indivíduo para se tornar um investidor sustentável.

Palavras-Chave: Literacia Financeira; Investimentos Sustentáveis; Perceção de Risco

JEL CODES: G53; G50; G11

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GLOSSARY

FL – Financial Literacy.

ESG – Environmental, Social and Governance.

MFW – Master's Final Work.

OLS – Ordinary Least Squares.

SRI – Socially Responsible Investment.

PLS – Partial Least Squares.

BFL – Basic Financial Literacy.

AFL – Advanced Financial Literacy.

PFL – Perceived Financial Literacy.

1. INTRODUCTION

Investing is an absolute requirement in today's society. The days a person might work for 40 years, retire, and live a quiet life are long gone. Millennials, Gen-Xers, and later generations are beginning to lose faith in the social security system, and the so-called guaranteed pension no longer appears to be so *secure*.

The only way to ensure a worry-free retirement (in some cases early retirement) is to invest early in life and plan for the future, but this is only possible if individuals, regardless of gender, age, or location can engage with the financial markets effectively, and today, with a few exceptions, the vast majority of the world's population can begin to invest. It is only reasonable to think that financial illiteracy would discourage individuals from participating in the markets (Rooij et al., 2011), given that a considerable amount of people only possesses a miniscule amount of financial knowledge (Lusardi and Mitchell, 2007) and investing without financial expertise is comparable to gambling.

The health of our planet is an additional concern, with enormous proportions, that this generation and the generations to come must address. Every day, there are new reports showing animal species on the verge of extinction, or that global warming is worsening, floods all over the world and a scarcity of water are only a few of the numerous issues that must be addressed.

Obviously, actions such as quick five-minute showers, using public transport and recycling are actions that when done in bulk by most of us can have a huge difference, however, there is also a financial way to make a difference and tackle both the environmental problems of the world and the personal finance issues of individuals. The answer is sustainable investing. Every company listed in the stock market is evaluated through a rigorous ESG (environmental, social and governance) rating, which let individuals choose if they want to invest in companies that have a more sustainable mission. And being sustainable does not mean that the returns are being sacrificed (Waddock and Graves, 2000; Gonçalves, Pimentel and Gaio, 2021), however only highly literate individuals in the field of finance could successfully manage their financial and non-financial goals (Borgers and Pownall, 2014).

This research seeks to determine if there is a correlation between an individual's financial knowledge and their propensity to be a sustainable investor, as well as if

demographic characteristics have a favourable or negative association with green investment among the Portuguese population.

This study had access to the CMVM (Portuguese Securities Market Commission) Investor Survey Results from 2020, which we used as a database for this study. Two indexes were developed to better comprehend the financial literacy level. The first is an adaptation of Rooij et al. (2011), which divides financial literacy into two variables: basic financial literacy (BFL) and advanced financial literacy (AFL). To create these variables, we divided the questions used in the survey based on their level of difficulty. In addition, we conducted a factor analysis where each question is associated with a factor loading generating a score for each degree of literacy. The second index is Perceived Financial Literacy, which is based only on an individual's self-evaluation of their financial knowledge.

The population in the sample collected in the 2020 CMVM survey performs well on the fundamental level of financial literacy, but not so well on more advanced themes, as indicated by our data. Since the vast majority believes they have merely a basic or average level of financial literacy, their self-perception appears to be somewhat accurate.

Concerning sustainable investment, only approximately 7% of the sample have or are willing to invest in sustainable instruments, and slightly more than 40% do not even understand the concept.

There is already some research that attempts to establish a relationship between the level of financial literacy and sustainable investing. Some researchers found that the higher the level of financial literacy, the more likely an individual is to choose a sustainable investment option, while others found no correlation between the two topics.

In extant literature, there is a scarcity of research on this topic, and the conclusions appear to differ from paper to paper. Mavlutova et al., (2021) and Geraldine et al., (2021) have found a positive relationship between sustainable investing and financial literacy, whereas Rossi et al., (2019) and D'Hondt et al., (2022) have found a negative relationship between the two subjects. The purpose of this paper is to continue this debate, which has no clear answer. In addition, there is no research done on the relationship between the two topics for the Portuguese population, which adds an additional level of interest to this research.

This study is structured as follows: in section 2, we explore the existing literature. Section 3 describes the research questions and hypotheses under study. In section 4, we describe our data and methodology. Following section 5, we present the results of our analysis. Lastly in section 6, we discuss the main conclusions.

2. LITERATURE REVIEW

2.1. Financial Literacy

Financial literacy is the possession of knowledge and understanding of financial concepts and risks, and the skills, motivation, and confidence to apply such knowledge to make effective decisions across a range of financial contexts, to improve the financial well-being of individuals and society, and to enable participation in economic life (OECD, 2014).

It has never been easier to enter the financial markets than it is today (Jiang et al., 2020), thus the individual investor must navigate not just the sophistication and complexity of the financial markets, but also the economic and political uncertainty (Rodrigues et al., 2019). Therefore, financial literacy is a need since people with a high level of financial literacy tend to make wiser decisions and manage some fundamental aspects of their personal finances, such as budgeting, spending, saving, and employing financial instruments to generate good returns, more precisely (ANZ, 2008).

It is essential to select valid measures of financial literacy to assess an individual's financial literacy. According to Li (2020), the usual measures rely on survey-based measurement, self-assessed measurement, and other measurement techniques such as proxy-based on demographics and proxy-based on outcomes. A Recent study (Lusardi, 2012) indicates that survey-based measurement is the most common method for assessing an individual's financial literacy, since it can be altered to maximize the accuracy of data obtained by the researcher. Typically, this technique incorporates three distinct areas. The first pertains to an individual's ability to comprehend the fundamentals of financial instruments. The second area assesses an individual's knowledge of financial basics, such as time value of money, nominal and real values, leverage, volatility, and risk, among others. The third domain examines the mathematical skills and ability to perform numerical computations of an individual investor.

Finance is an integral part of everyone's daily life, and financial literacy (FL) is likely the greatest asset for preventing citizens from becoming overly indebted (Tomáková et al., 2011). Additionally, a higher level of FL amongst the general population would reduce the likelihood of a future financial crisis like the one in 2008 (ECB, 2019).

There is no such thing as high returns without risk, and, while operating in the financial markets can surely provide huge rewards to investors, there are numerous risks associated with the financial markets. Thus, sound financial education is crucial to safeguard investors, since it equips them with the information to comprehend the fundamentals of personal finance (Borkovcová et al., 2011). Moreover, individuals who master financial literacy tend to be less risk averse and participate in the financial markets (Zhang et al., 2020).

According to Bannier and Schwarz (2018), individuals with greater financial knowledge have greater wealth, which can be attributed to the fact that those who have access to financial education throughout their formative years are more likely to save and invest (Bernheim Garrett, 2013).

Individuals with low financial literacy tend to have portfolios that lack diversification (Calvet et al., 2007), whereas those with higher financial literacy hold more diverse portfolios (Gaudecker, 2015).

According to Lusardi and Mitchell (2014), financially savvy individuals tend to receive larger returns on their investments and are more likely to save for retirement, invest in stocks, and amass more wealth overall (Lusardi et al., 2007). A study by Lührmann et al. (2015) found that a lack of financial literacy is associated with lesser wealth, an inability to save due to poor budgeting abilities, and a decreased involvement in the stock market.

It is reasonable to suppose that individuals with less financial expertise are the ones who seek professional guidance the most. However, this is not the case, since individuals with a greater level of education are more inclined to visit a financial counsellor, whereas financial illiterates avoid delegating portfolio decisions (Calgagno & Monticone, 2015).

When it comes to debt decisions, it is crucial to highlight the data that individuals who lack financial literacy are more prone to make poor financial decisions, fail on their debts, and participate in excessive debt borrowing (Lusardi and Tufano, 2015). Similarly,

Lusardi and Scheresberg (2013) discovered that financially illiterate individuals are more likely to suffer costly borrowing fees.

Financial literacy does play a significant role in the process of making financial decisions, nevertheless, it is not the only aspect that influences the investor.

Research by Rooij et al. (2011) indicated that most of the public has a fundamental understanding of finance, but only a tiny portion of the population advances beyond the most elementary areas. Age, education, and gender are the three most significant determinants of financial literacy, as demonstrated in this paper. This study also revealed that the portion of the sample with the lowest financial literacy would not be investing in equities.

Age, gender, income, and level of education are the same demographic parameters that determine investing decisions and influence financial literacy (Kent Baker et al., 1977; and Wilbur et al., 1977). Lührmann et al. (2015) found similar results to early 1970s studies in the demographic metrics that influence the investment decision, but also that gender is an exacerbating factor because females in the study are less likely to save, generally have less wealth, have less financial knowledge, and are generally less interested in financial issues than males.

Warren and McConkey (1990) thought that the standard demographic criteria were only sufficient to distinguish between passive and active investors. Al-Tamimi (2006) found that major factors such as religious inclinations, reputation of the firm, ethics, and investment diversification play a significant role in the financial decision-making process of investors. Consequently, lifestyle choices must be considered to create a more accurate investor profile.

Kadoya (2020) investigated the relationship between the previously listed demographic and economic parameters when financial literacy is broken into three components: knowledge, attitude, and behaviour. By splitting financial literacy into three categories, Kadoya was able to disprove several previously held beliefs, such as the notion that females are less financially literate than males, but he reached similar conclusions on the positive correlation between age, education, and the level of financial literacy.

2.2. Sustainable Finance

Sustainable finance is the process of considering environmental, social, and governance (ESG) factors when making investment decisions in the financial sector, resulting in greater long-term investments in economically sustainable activities and projects (European Commission, 2021).

Sustainable finance plays a crucial role in achieving the climate and sustainability objectives outlined by policymakers, as it channels private investments into a climate-neutral, climate-resilient, and resource-efficient economy that will help achieve both the intended growth and the climate objectives (European Commission 2021).

Today, more than ever, individuals appear to be conscious of the need to alter their habits to ensure a better planet in the future. This is supported by a poll conducted by PwC (2019), which reveals that 35 percent of respondents seek to select as many ecologically friendly products as possible and 41 percent prefer to avoid plastic, and that 81 percent of the sample expects corporations to be environmentally responsible.

On the financial market, a growing willingness to adapt is also becoming increasingly apparent. When discussing sustainable finance, two financial instruments immediately come to mind: the green bond, which is similar to a traditional bond, except that the money raised will be used to achieve a climate/environmental goal (Markus Hoffmann, 2016), and ESG funds, which are composed of only the most socially and ethically responsible companies (Gonçalves at al., 2021). The green bond market has grown by an astounding 50 percent over the past five years (World Bank, 2021), and assets under management for ESG funds have increased by a startling 52 percent over the past year (Morningstar, 2021). The data suggests that an increasing number of individuals are establishing and expanding their financial positions in sustainable instruments.

Being a socially responsible investor is the easiest method to practice sustainable finance. To obtain this status, individuals must consider not just financial goals such as profit/return, but also ethical, social, and environmental goals (Camilleri, 2017).

At the end of the day, every investor seeks returns (Subandi & Basana, 2021), and while being a socially responsible investor substantially decreases the number of portfolio-building alternatives, it does not necessarily reduce the potential profits that can be earned. Rosen et al., (1991) discovered that most investors are unwilling to sacrifice

potential profits for a sustainable future, nonetheless, Hamilton et al. (1993), Waddock and Graves (2000) and Gonçalves et al. (2022), all reached the same conclusion: neither the individual investor nor the company stands to lose potential profits by being social/sustainable investors.

The primary inquiry is: "What factors determine the sustainable investor?". Numerous articles have addressed this subject, with most settling for similar conclusions, mentioning returns, attitude, religion, and demographic characteristics, as well as a few others that may vary from paper to paper.

Financial Literacy appears to be the one aspect on which many researchers cannot agree on. Some believe it is positively correlated with sustainable investing, while others say it is negatively correlated, and others find very little correlation.

Borgers and Pownall (2014) discovered that attempting to consider both financial and non-financial goals is an incredibly arduous undertaking that could only be managed by someone with a high level of financial knowledge.

Geraldine et al. (2021) produced an analytical study using PLS, a statistical model that can handle many independent variables, with a sample of people between the ages of 21 and 30 and found that FL has a significant and positive effect on SRI intentions among stock investors. Mavlutova et al., (2021) also found a positive correlation between FL and SRI among the population of Latvia.

Rossi et al. (2019) and D'Hondt et al. (2022) discovered that financial literacy has a negative relationship with sustainable investing, since individuals with higher FL are likely to be less interested in SRI products, based on their empirical findings. On the same page, Anderson et al. (2020) demonstrated a low degree of environmental and financial knowledge crossover.

3. RESEARCH QUESTION AND RESEARCH HYPOTHESIS

The primary objective of this study is to examine the relationship between sustainable investing and the financial literacy of individuals as described in the literature, focusing on the investing and personal characteristics of the Portuguese investors in the financial markets.

According to the literature, there is a substantial quantity of research correlating financial literacy with a positive market return. Being a sustainable investor makes it more difficult to construct a well-diversified, possibly high-return portfolio. Most investors are not willing to sacrifice potential gains for a more sustainable future (Rosen et., 1991), but some believe that returns do not need to be sacrificed to achieve a better tomorrow (Hamilton et al., 1993 and Waddock and Graves, 2000), and only by having a high level of financial literacy can an individual manage both financial and non-financial goals (Borgers and Pownall, 2014).

There are few studies that present evidence of a correlation between financial literacy and sustainable investing; thus, there is insufficient fortitude on this association.

Not only is the information available quite small but the researchers' conclusions differ, some have found that financial literacy has a negative relationship with sustainable investing (Rossi et al., 2019 and D'Hondt et al., 2022), meaning that the more financial knowledge an individual has, the less likely they are to engage in sustainable investing, whilst others found a positive correlation (Mavlutova et al., 2021 and Geraldine et al., 2021).

This study will contribute to the academic community by analysing the relationship between the level of financial literacy and the readiness to be a sustainable investor in Portugal during a global financial crisis, using data from the 2020 CMVM survey.

It is essential to know the extent to which Portuguese investors are financially educated and their propensity to invest in sustainable alternatives, as well as if financial literacy is a reliable and effective driver for sustainable investing. In addition to financial literacy, other major variables of market participation must be analysed, including individual risk profile, investor wealth, and gender, among others. Taking this into account, we will be able to comprehend the most significant drivers of market participation and, as a result, soon programs can be created to enhance those drivers at an

early stage of an individual's life to promote the financial stability of the population while maintaining the healthiest planet possible.

Considering the previously cited literature, this study will test two distinct research hypotheses. For the first hypothesis, we will adapt the test theory proposed by Rooij et al. (2011) to determine the correlation between financial literacy and sustainable investment, as well as the will to invest in this type of products.

H1: A higher level of financial literacy enhances the propensity to invest in sustainable instruments.

Since financial literacy is not the only element that influences the decision to adopt a sustainable investing strategy, we examine other variables already mentioned in the literature, such as age, gender, and income (Lührmann et al., 2015 and many others).

H2: Sustainable investing is correlated with demographic factors.

4. DATA AND METHODOLOGY

4.1 Data

The purpose of the 2020 CMVM survey was to understand the demographic, geographic, and socioeconomic profile of the respondents, their level of financial literacy, their attitudes towards risk and their bias, as well as their financial decision-making process, investment portfolios, and intentions regarding sustainable finance specially during midst of a world health and economic crisis.

The total number of respondents to the study was 2,897, but only 40.2% were classed as investors since they possessed at least one financial asset; the remaining 59.8% had no investments and are therefore classified as non-investors.

Regarding the demographic and socioeconomic aspects of the survey, 55.5% of respondents were female, 43.7% were male, and 0.2% were of another gender. In this study, most respondents were 30 years old or under (64.19%), whilst only 11.36% were 51 or older. In terms of education, 93.4% of respondents hold a bachelor's degree (completing) or higher. In the economic area, 58.85% of respondents had a net monthly income of less than 1000 euros, which is extremely low given the minimum wage for Portugal in 2020 was just 635 euros gross per month, and only 8.50% of respondents had a net monthly income of more than 2500 euros.

Concerning financial literacy, we may observe the perceived financial knowledge of the respondents, of whom 45.3% admit to having very little (35.6%) to no comprehension altogether (9.7%) and only 4.1% believe they are experts. All the information cited above can be found in appendix A2.

Nevertheless, we can determine the actual level of financial literacy of survey respondents by analysing their responses to a series of questions. The themes of the questions range from basic numeracy to advanced concepts such as Euribor and leverage. Regardless of the level of difficulty of the questions, the percentage of replies classified as "No answer" is usually around 30 percent, and in addition to all the statistics shown in Table 1, just 2.8% of the overall sample answered all questions correctly.

TABLE 1: WEIGHTED PERCENTAGE OF CORRECT, INCORRECT AND "DO NOT KNOW" ANSWERS IN THE 2020 CMVM SURVEY.

	Numeracy question	Inflation question	Risk/Return question	Portfolio diversity question	Underlying Asset question
Correct	15.6%	62.6%	64.9%	58.5%	59.8%
Incorrect	51.6%	6.6%	4.5%	10.7%	8.6%
No answer	32.8%	30.8%	30.5%	30.8%	31.6%

	Bond question	Guaranteed capital question	Leverage question	Euribor question	Capital at risk question	Spread question
Correct	27.5%	16.1%	47.3%	28.4%	53.7%	44.0%
Incorrect	41.3%	52.8%	19.4%	40.7%	15.1%	24.5%
No answer	31.2%	31.1%	33.3%	30.9%	31.1%	31.4%

To further analyse the sample's financial literacy, the information is organized into basic and advanced financial literacy categories which was a technique first utilized by Rooij et al. (2011). Questions concerning numeracy, inflation, risk/return, diversification, and underlying assets will contribute to the Basic Financial Literacy (BFL) level, while the remaining questions will establish the Advanced Financial Literacy (AFL) level.

According to the data in Table 2, 55.9% of respondents understand the majority, if not all, of the fundamentals of finance, while an astounding 30.2% did not answer a single question correctly on the basic level and the average was three correct questions. When it comes to more difficult themes, only 11.7% of participants answered 5 or more questions correctly, and the average score for the advanced level was only 2. The reported results corroborate the premise of Rooij et al. (2011) that most of the population has some basic financial knowledge, but that relatively few individuals advance beyond this level.

TABLE 2 - PERCENTAGE OF CORRECT QUESTION BY LEVEL

	Basic level	Advance level
0 correct answers	30.2%	31.5%
1 correct answer	0.9%	7.6%
2 correct answers	3.3%	15.1%
3 correct answers	9.7%	19.0%
4 correct answers	22.2%	15.2%
5 correct answers	33.7%	8.4%
6 correct answers	only 5 questions	3.3%

To further analyse the level of financial literacy in this sample we now look at the answers by gender.

The results reported in Table 3 are consistent with the research of Lührmann et al. (2015), which suggests that females tend to be less aware and interested in finance than males. Table 3 demonstrates conclusively that females are less accurate than males across all topics discussed in the survey, which can also be validated by a negative t-test in both the BFL (-4.8024) and AFL (-17.1312). The t-tests reveal that, on average, males score 3.15 accurate responses on the BFL, whereas females score 2.77. Males average 2,8 accurate responses in the AFL, while females average 1,67. All t-test values discussed in this section may be found in tables 15 and 16 of the appendix.

Further examination of the gender statistics reveals that 94 percent of both females and males possess a bachelor's degree (or are in the process of obtaining one) or higher, indicating that the disparity cannot be attributed to this factor. In contrast, only 32% of females hold a bachelor's degree or higher in finance-related areas such as finance, management, and accounting, whereas 42% of males do. This may account for a portion of the disparity, but not the entirety.

TABLE 3 – PERCENTAGE OF CORRECT ANSWERS BY GENDER

Question	Answer	Female	Male
Numeracy	Incorrect	25.9%	16.3%
	Correct	35.6%	64.1%
	Do not know	38.4%	19.7%
Inflation	Incorrect	8.3%	4.5%
	Correct	52.7%	75.4%
	Do not know	39.0%	20.1%
Risk Return	Incorrect	5.5%	3.4%
	Correct	55.9%	76.6%
	Do not know	38.6%	20.0%
Diversification	Incorrect	12.7%	8.1%
	Correct	48.3%	71.8%
	Do not know	39.0%	20.1%
Underlying Asset	Incorrect	8.3%	9.2%
	Correct	51.7%	70.2%
	Do not know	40.0%	20.6%
Leverage	Incorrect	19.3%	19.4%
	Correct	38.6%	58.8%
	Do not know	42.2%	21.7%
Capital at risk	Incorrect	15.6%	14.5%
	Correct	44.8%	65.4%
	Do not know	39.6%	20.1%
Bonds	Incorrect	43.0%	39.2%
	Correct	17.4%	40.5%
	Do not know	39.6%	20.3%
Guaranteed Capital	Incorrect	48.3%	58.8%
	Correct	12.4%	20.9%
	Do not know	39.4%	20.2%
Euribor	Incorrect	30.4%	19.2%
	Correct	31.5%	61.2%
	Do not know	38.1%	19.6%
Spread	Incorrect	58.1%	67.9%
	Correct	3.4%	12.1%
	Do not know	38.6%	20.0%

In Table 17 in the appendix, we cross examine the level of financial literacy with age and find that as age progresses, the population's accuracy level for each question decreases significantly, indicating that the population between 18 and 30 years old has the highest level of financial knowledge, whereas the population over 65 years old has the lowest level of financial knowledge.

We will now analyse the relationship between financial literacy and sustainable investing, namely the readiness to invest in sustainable products (already investing).

TABLE 4- PERCENTAGE OF ALL CORRECT ANSWERS BY LEVEL OF FINANCIAL KNOWLEDGE

Sustainability\Questions	Basic FL	Advanced FL	All correct
Had/have or willing to have	59.5%	11.2%	9.5%
Not a priority to have	61.6%	11.6%	9.8%
Never heard/Does not know the meaning	40.4%	1.4%	1.2%
Lack of information to decide	50.9%	3.2%	3.0%

TABLE 5- ANOVA TEST FOR SUSTAINABILITY AND BFL

Analysis of Variance						
Source	SS	df	MS	F	Prob > F	
Between groups	23.67119	5	4.734238	5.09	0.0001	
Within Groups	1765.369	1898	0.930121			
Total	1789.04	1903	0.940116			
Bartlett's test for equal variances			chi2(5)= 10.7581		Prob>chi2=0.056	

TABLE 6- ANOVA TEST FOR SUSTAINABILITY AND AFL

Analysis of Variance						
Source	SS	df	MS	F	Prob > F	
Between groups	138.1706	6	23.02843	26.46	0	
Within Groups	1650.865	1897	0.870253			
Total	1789.04	1903	0.940116			
Bartlett's test for equal variances			chi2(5)= 10.7581		Prob>chi2=0.056	

Regarding sustainability, only 6.1% of the population who answered this part of the survey is willing to make investment in this field. Green investing is not a priority for 23.6% of investors, whereas 23% of investors are aware of sustainable investments but lack the knowledge to make portfolio-enhancing investments (Table 4). The most surprising finding is that 47.3% have never heard of or do not understand what a sustainable investment is.

When analysing sustainability and financial literacy together, we obtained results consistent with the literature since only individuals with high level of literacy can manage both financial and non-financial goals (Borgers and Pownall 2014). Individuals who fall under the "green investor" banner perform better in all categories, both in the basic level questions and in the advanced levels defined above, compared to those unaware of the existence of such investments and those who lack the information to make an investment. With the help of the Anova test (Tables 5 and 6) we found that there is a statistically significant (since the Prob > F is below 0.05) difference between the mean for each of the type of sustainability group.

In both the BFL and AFL, the group of investors that are indifferent to sustainability does better than the green investors. This may occur due to the fact that literate investors are less inclined to forego potential rewards for a more sustainable future (Rosen et al., 1991).

TABLE 7 – GENDER DISTRIBUTION BY SUSTAINABILITY GROUP

Sustainability\Questions	female	male
Had/have or willing to have	34.5%	63.8%
Not a priority to have	36.0%	63.1%
Never heard/Does not know the meaning	57.2%	42.2%
Lack of information to make a decision	47.7%	51.6%

Some of the outcomes can be attributed to gender. As previously demonstrated in this survey, females had a lower degree of financial knowledge than males across all topics covered. In table 7 we can observe the gender distribution across the sustainability groups;

the only group with a majority of females, coincides with the group that has the lowest outcomes in both the AFL and BFL.

4.2 Methodology

For this empirical research, we will employ the variables contained in the CMVM survey data sample. Our analysis will be based on the investor's age and gender, their level of education, their monthly income, their self-risk perception, their level of financial literacy which will be our independent variables and their willingness to be a sustainable investor, which is our dependent variable.

In the analysis, the first two variables to be evaluated are demographic factors. For the first variable, investor's age (variable age), we will consider the age of CMVM survey respondents in 2020, and this variable might take any value greater than zero.

The second variable to be investigated is the gender of the investor (variable gender), which refers to the respondent's gender and has only two possible values: 1 for male and 0 for female.

The analysis will also take into account the respondent's monthly income (variable income), which has only four possible options: if the participants select 1, their monthly income is less than or equal to 500€; if they select 2, their monthly income is between 501€ and 1000€; if they select 3, their monthly income is between 1001€ and 2500€; and if they select 4, their monthly income is greater than 2500€.

Then, we will consider the participant's level of education (variable education), which indicates the respondents' level of education and has six possible values: if the value is 1, then the respondent has no education's degree; if the value is 2, then the respondent only attended until the basic school; if the answer is 3, then the respondent studied until high school (secondary); if the response is 4, then the respondent has at least an undergraduate or Bachelor's degree or is finishing the degree; and, if the answer is 5, then the respondent has at least a Master's degree, a MBA, a Doctorate degree or higher.

Moreover, another crucial element to examine is the individual's self-risk perception (variable risk perception), in which we seek to comprehend the individual's perception of financial decisions or investment behaviour in relation to risk. This variable has only five

possible values, where 1 is assigned to very risk-averse investors and 5 is assigned to low-risk-averse investors (risk enthusiasts).

For the dependent variable sustainable investment, there are four potential values, ranging from 1 (green investors or those who are willing to be) to 4 (investors who lack the information necessary to decide on sustainable investing).

4.2.1 Financial Literacy Measurement

The financial literacy index will be divided into three components. The first two components will measure fundamental and advanced financial literacy. To create this breakdown, we divided the questions according to their level of sophistication. Numeracy, inflation, and true-false questions on risk and return, diversification, and the value of the underlying asset comprise the questions assessing fundamental knowledge. The advanced questions cover subjects such as leverage, capital at risk, bonds, guaranteed capital, Euribor, and spread.

Additionally, and in accordance with Rooij et al. (2011), we conducted a Factor Analysis where each question was associated with a factor loading and a score was generated for each level of literacy (BFL and AFL).

This factor loadings are obtained by a technique known as factor analysis. Factor analysis is a statistical technique meant to characterize the variability among observed and correlated variables in terms of a possibly smaller number of unobserved variables referred to as factors. This technique extracts the largest common variance across all variables and assigns them a factor loading score. These factor loadings quantify the level of association between a variable and a specific factor. Specifically, in our investigation, we used principal component analysis (PCA), a technique designed to minimize the dataset's complexity while maximizing interpretability and minimizing data loss (values related to the PCA can be found in the appendix in tables 19 and 20). This is accomplished by generating new variables that are uncorrelated and sequentially maximize variance.

In our study, we repeated this procedure twice to generate two factors (variables): one factor, denoted BFL, for the five basic financial literacy questions, and another factor, denoted AFL, for the six advanced financial literacy questions. The initial phase consisted of executing the factor analysis and estimating the principal-component output, which will yield the factor loadings. These factor loadings represent the correlations and weights

between each variable and the corresponding factor. Theoretically, the greater the load, the greater the significance in defining the dimensionality of the factor. If a load has a negative number, it suggests that the factor will be affected negatively. The second phase consisted of rotating the factor loads to achieve a clearer pattern that generated orthogonal factors, with the goal of obtaining factors that are not connected with one another. The final step was to predict the scores, which involved computing the factor scores for the second-stage rotated results.

Last but not least, the third component of financial literacy analysis will take into account subjective financial literacy, which assesses the perceived financial knowledge (PFL) each individual has on oneself. This index is based on the approach of Huang et al. (2021) and is measured by the survey question regarding the individual's knowledge in financial products and financial markets, on a scale from 1 to 5, where 1 represents an individual who admits to having very low financial knowledge and 5 represents an individual with very high financial knowledge.

With the three components we can form two indexes to help in the calculations of the regressions the first index will be composed of the BFL and the AFL whilst the second index will just be the PFL.

4.2.2 Models

To examine the relationship between the dependent variable sustainable investing and the independent variables, we will conduct regression analyses for the equation (1). Specifically, we will model nominal outcome variables using Ordered Logistic Regression (OLR), in addition to Ordered Probit Regression (OPR).

(1) $\text{Sustainable investing} = \alpha + \beta_1 \text{Age} + \beta_2 \text{Gender} + \beta_3 \text{Income} + \beta_4 \text{Education} + \beta_5 \text{Risk Perception} + \beta_6 \text{Financial Literacy Index}$

We tested for multicollinearity after defining our models. It is essential to specify that if the regressors exhibit high values of collinearity (over 0.8), this will lead to a biased estimation of the corresponding regressors and will inflate the standard errors. To assess the model's multicollinearity, we generated the correlation matrix between dependent variables (Table 8).

The obtained results are rather positive, since the corresponding values for all correlations are less than 0.8, indicating that there is no significant correlation between the coefficient regressors, leading to the conclusion that there are no multicollinearity signals.

TABLE 8: CORRELATION MATRIX

	Gender	Age	Education	Income	Risk perception	BFL	AFL
Gender	1						
Age	0.1005	1					
Education	0.0387	0.475	1				
Income	0.0809	0.5845	0.4824	1			
Risk Perception	0.2702	-0.2062	-0.1112	-0.1161	1		
BFL	0.0893	0.0897	-0.0877	0.0359	0.2258	1	
AFL	0.3045	0.2944	0.211	0.2258	0.1166	0.185	1

To increase confidence, the computation of the Variance Inflation Factor (VIF) reaches essentially the same conclusion, obtaining an average VIF of 1.44, which is significantly lower than the commonly accepted cut-off of 10 (if the average VIF value is equal to or greater than 10, the coefficients are correlated and considered redundant). Since we also obtain final values of VIF per variable that are less than 10, this indicates that the regressors are not all correlated, exhibiting minimal variance inflation, — in other words there are no indications of multicollinearity.

TABLES 9: VARIANCE INFLATION FACTOR

Variable	VIF	1/VIF
Age	1.95	0.512240
Income	1.95	0.513934
Education	1.51	0.663450
Risk Perception	1.31	0.762789
PFL	1.29	0.772363
AFL	1.29	0.772680
Gender	1.18	0.846451
BFL	1.07	0.933684
Mean VIF	1.44	

5. EMPIRICAL RESULTS

5.1 Presentation of the results

In this chapter, we will examine the empirical outcomes of comparing each model with two distinct financial literacy indices. The first index consists of the basic and advanced degrees of financial literacy as determined by the factor analysis discussed previously. The second index is comprised just of the individual's perception of their financial literacy.

As previously stated, the Ordered Logistic Regression will be the primary regression that will be analysed; however, as can be seen in Table 10, when comparing OLR with the OPR, the results are consistent.

TABLE 10: EMPIRICAL RESULTS USING FACTOR ANALYSIS BFL AND AFL FOR BEING A GREEN INVESTOR

Variables	OLR	OPR
Gender	0.2127637**	0.123471**
	(0.1025999)	(0.0612718)
Age	0.016115***	0.0100371***
	(0.0046634)	(0.0027607)
Education	0.1321469	0.0850876
	(0.0967263)	(0.0575899)
Income_2	0.0537252	0.0449868
	(0.1362456)	(0.0805029)
Income_3	0.1514331	0.0839658
	(0.143713)	(0.0858112)
Income_4	0.2544453	0.1270915
	(0.2042734)	(0.1220655)
Risk Perception	0.3956323***	0.2442006***
	(0.0506868)	(0.0298242)
BFL	0.2980851***	0.1642787***
	(0.0973686)	(0.057661)
AFL	0.4405414***	0.2545127***
	(0.0863759)	(0.0511476)

Standard errors in parentheses
***p<0.01, **p<0.05, *p<0.1

In the case of the OLR, both levels of financial literacy are statistically significant with a significance level of 1%. An increase of one level in the variable BFL corresponds to a log-odds rise of 0.298 points in sustainable investing, whereas an increase of one level in the variable AFL corresponds to a log-odds increase of 0.4405 points in sustainable investing.

Examining the other variables addressed in the regressions (Table 10), the demographic variables age and gender are both statistically significant. Age with a 1% significance level and gender with a 5% significance level. In fact, the data indicate that for each unit increase in the investor's age and being male, the log-odds of sustainable investing will rise by 0.016 and 0.214, respectively. The remaining demographic variables are statistically insignificant across the OLR and OPR.

The final independent variable is risk perception, which is statistically significant in all regressions at a confidence level of 1%, with an increase of one in the level of risk taking behaviour in the variable resulting to an increase of 0.396% in the log-odds of sustainable investing.

In the table 11 we performed the same regressions using the second index the PFL.

TABLE 11- EMPIRICAL RESULTS USING THE PERCEIVED FL FOR BEING A GREEN INVESTOR

Variables	OLR	OPR
Gender	0.1885502*	0.1064505*
	(0.0974335)	(0.0577339)
Age	0.0169744***	0.010743***
	(0.0045583)	(0.0026851)
Education	0.199206**	0.1215144**
	(0.0958422)	(0.0566434)
Income_2	0.0484065	0.0333181
	(0.1341961)	(0.0787019)
Income_3	0.0433231	0.0145131
	(0.1413184)	(0.0834639)
Income_4	-0.0197105	-0.0301151
	(0.2032076)	(0.11957)
Risk Perception	0.2143781***	0.1325046***
	(0.0511991)	(0.0301002)
PFL	0.7954302***	0.4564556***
	(0.0547215)	(0.0315254)

Standard errors in parentheses
***p<0.01, **p<0.05, *p<0.1

For the subjective financial literacy index, the regression results are comparable to the previous ones, with two major differences. The independent variable education becomes statistically significant with a significance level of 5%. Where an increase in education results in a 0.199 log-odds increase in sustainable investment. Other than these adjustments, the findings of the regressions are consistent.

5.2 Robustness

To ensure the results could be relied upon, we employed two measures of robustness: first, a separate regression to determine whether the results are consistent, and second, the introduction of a third financial literacy index.

For the first measure of robustness, a new regression, the Binary Logistic Regression, was calculated. To accomplish this regression, the dependent variable was significantly modified. This model has only two possible outcomes for the Sustainable Investing variable, which are 1 for green investors and 0 for all other survey respondents.

The results reported in Table 12 are consistent with the regressions done in Table 10, with the exception of the variable gender, which has become statistically insignificant for this regression, while education, similar to the OPR, is statistically significant. In addition to the distinctions already described, the Binary regression yields comparable findings to the previously mentioned regressions.

TABLE 12- EMPIRICAL FINDINGS FOR GREEN INVESTING USING THE BINARY LOGISTIC REGRESSION

Variables	Binary Logistic Regression
Gender	0.0330882
	(0.2299327)
Age	0.0243423**
	(0.0098193)
Education	0.4617353**
	(0.2205966)
Income_2	-0.0295929
	(0.3011582)
Income_3	-0.3946784
	(0.3254962)
Income_4	-0.7875947*
	(0.4515092)
Risk Perception	0.5174808***
	(0.10784226)
BFL	0.1199371**
	(0.0617501)
AFL	0.2394588***
	(0.0792057)

Standard errors in parentheses
***p<0.01, **p<0.05, *p<0.1

The second measure of robustness is a third financial literacy index was established. In this situation, we would use the BFL and AFL again, but the way in which we construct the AFL and BFL would differ. This strategy is referred to as the simple approach.

The BFL consists of five distinct questions. This variable's possible values range from 0 to 5, where 0 indicates that the participants got 0 questions accurate on the quiz and 5 indicates that they got 5 questions correct. If a person scored of 3 out of 5, the variable would equal 3 regardless of which question was answered correctly. The AFL variable follows the same rule.

TABLE 13- EMPIRICAL RESULTS USING THE SIMPLE APPROACH

Variables	OLR	OPR
Gender	-0.1952162	0.1453615**
	(0.1127345)	(0.058018)
Age	0.0158006***	0.0097028***
	(0.0044704)	(0.0026479)
Education	0.2043667**	0.1251247**
	(0.0942398)	(0.0563377)
Income_2	-0.0034316	0.0144602
	(0.1324104)	(0.0779557)
Income_3	0.0643284	0.0318521
	(0.1397706)	(0.0830765)
Income_4	0.2032924	0.0984157
	(0.198426)	(0.1184065)
Risk Perception	0.3520783***	0.2147045**
	(0.0498789)	(0.0294816)
BFL	0.0632881***	0.0397117***
	(0.0239553)	(0.0142517)
AFL	0.2286792***	0.1316274***
	(0.0358657)	(0.0211963)

Standard errors in parentheses
***p<0.01, **p<0.05, *p<0.1

When utilizing the simple approach in the OLR and OPR, the results are nearly identical to the base case using the first financial literacy index, with the exception that gender is now statistically significant at a 1% level of significance.

5.3 Discussion of the results

After examining the results shown previously, we can draw conclusions about our hypothesis. We do not reject the first hypothesis, which states that, for the sample collected in the CMVM 2020 survey, a higher level of financial literacy leads to a greater likelihood of being a green investor, confirming the evidence already found in Mavlutova et al. (2021) and Geraldine et al .(2021). Since in all the regressions OLR, OPR and Binary Regression and the 3 different financial literacy indexes used, both the basic and the advanced level of financial literacy are statistically significant.

We do not reject the second hypothesis either. Gender, age, and education are some demographic factors that influence the investor's decision on sustainability. In our review

of the literature, we realized that almost all papers include these three variables as characteristics that influence the level of financial literacy. Since we concluded in the first hypothesis that FL plays a crucial role in sustainable investing, it is only logical that these variables also play a significant role. Despite education being insignificant in the base case it is statistically significant in most of the regressions performed, hence we argue its significance for this sample.

In this study the only demographic variable which is not significant is the level of income, however this result can be skewed since the majority (74.3%) of the sample had an income of under 1500 euros.

The remaining variable is risk perception, which was statistically significant at a 1% significance level across all regressions, indicating that a lower aversion to risk can lead to a more sustainable portfolio.

5.4 Additional Analysis

Since the survey provides information regarding the influence of several economic agents towards individuals deciding of becoming green investors, we have decided to also use the Ordered Logistic Regression to determine what role they play in the decision-making process of an investor when sustainability is the topic.

For all variables shown in table 14, there are only five possible outcomes, with 1 indicating that the economic agent has a massive impact on the investor's decision to make sustainable investments and 5 indicating that the economic agent has no influence all.

According to the results presented in the table 14 only the individual investors, institutional investors, banks and big firms are statistically significant.

Individual investors and banks have a positive relationship with a propensity to invest in environmentally friendly enterprises. A rise of one level in the influence of individual investors and banks increases sustainable investing by 0.1759845 and 0.1664992 log-odds, respectively.

Institutional investors and big firms have a negative relationship with sustainable investing. A rise of one level in the influence of institutional investors and banks

decreases the willingness to be a green investor by 0.2954267 and 0.1311884 log-odds, respectively.

TABLE 14- EMPIRICAL RESULTS OF THE INFLUENCE OF THE ECONOMIC AGENTS TOWARDS GREEN INVESTING

Variables	OLR	OPR
Government	0.0508	0.0320923
	(0.0490809)	(0.0291895)
Individual Investors	0.1759845***	0.09938***
	(0.548469)	(0.0328043)
Institutional Investors	-0.2954267***	-0.1791325***
	(0.0690818)	(0.0417452)
Banks	0.1664992**	0.1080025
	(0.073533)	(0.0447665)
Insurance Firms	0.0051138	-0.0055449
	(0.0688979)	(0.0415775)
Big Firms	-0.1311884**	-0.0777579**
	(0.0574579)	(0.0343877)
Small/mid Firms	0.0643439	0.0355808
	(0.0592847)	(0.0354835)
Religion	0.0232306	0.010722
	(0.046747)	(0.0279598)
Regulators	-0.0657731	-0.0307807
	(0.0509228)	(0.0304087)

Standard errors in parentheses
***p<0.01, **p<0.05, *p<0.1

6. CONCLUSION

The aim of this research was to analyse the main drivers of sustainable investing and to better understand the relationship between sustainable investing and the level of financial literacy and the demographic factor such as age, gender, income and education and the risk-perception of the investor.

Regarding sustainable finance, males are more likely to be green investors, but this can be explained by the fact that females are often less engaged in financial matters, according to Lührmann et al. (2015).

Regarding the dependent variables, we observed that both the AFL and BFL had a favourable effect on sustainable finance, given that only literate individuals can manage both financial and non-financial objectives (Borgers and Pownall, 2014).

For the demographic factors, the results of this study are consistent with extant literature, where variables such as gender, education, and age influence the propensity to be a sustainable investor, which is comparable to the factors that influence the level of financial literacy. However, the level of income has little effect on the propensity to invest in environmentally friendly companies. In all regression analyses, the dependent variable risk perception exhibits a positive connection with sustainability.

This study also provides some intriguing data regarding the impact of a variety of economic agents. Institutional investors and large corporations have a negative influence on the willingness to be a sustainable investor, but individual investors and banks have a beneficial influence. Other agents, such the government, religion, and regulators, have no effect on the decision to become green.

This study contributes to the extent that verifies the findings offered by Mavlutova et al., (2021) and Geraldine et al., (2021), namely that financial literacy is one of the primary drivers of sustainability, particularly in the case of Portugal. Furthermore, it contributes to literature by clarifying previous mixed evidence (e.g. Rossi et al., 2019 and D'Hondt et al., 2022), in favour of a positive association between Financial Literacy and Sustainable Investing.

Our conclusions also provide implications for policy. The results demonstrate that educational curricula must be modified to guarantee that the next generation has a better

grasp of financial concepts, which will result in more sustainable portfolios and a more financially independent life overall. The government can also make strides to provide more information about sustainable investing since almost half of the sample did not understand the concept.

The homogeneity of the sample utilized in the research is a positive quality, yet this can influence the study's findings. Since nearly all the sample had a bachelor's degree, this does not reflect the reality in Portugal, where just 17% of the population has a bachelor's degree. To continue the study of the relationship between financial literacy and sustainable investing, some more tests can be done using this particular sample, such as reducing the number of participants to those who have real financial investments such as stocks, bonds, however even though most of the sample is not an investor because it is still in university or recently finished their bachelors, these individuals are the future investors which makes this findings still worth considering.. For the case of Portugal, there is still work to be done to ensure that the sample size is more representative of the population. Besides that, more studies must be conducted regardless of location so that this relationship can be fully comprehended, as few have been conducted thus far.

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APPENDICES

Appendix A1 – Variable Construction

Variable's name	Variable's designation	Survey's questions
Age	*age*	Por favor indique a sua idade, em anos: _____ Anos
Gender	*gender*	Por favor indique o seu género: 0-Feminino 1-Masculino
Education	*education*	Qual o seu nível máximo de escolaridade concluído? 1- Não concluiu a instrução primária 2- Tem ensino básico completo (9º ano) 3- Tem ensino secundário completo (12º ano) 4- A frequentar o ensino superior 5- Tem ensino superior (politécnico ou universitário) completo 6- Tem Pós-graduação, Mestrado, MBA ou Doutoramento
Income	*income*	Indique o seu escalão de rendimento mensal líquido: 1- Até 500€ 2- De 501€ até 1000€ 3- De 1001€ até 1500€ 4- De 1501€ até 2500€ 5- Mais de 2501€
Market Participation	market_part	A sua carteira atual de valores mobiliários (ou seja, ações, obrigações de empresas, obrigações do tesouro, unidades de participação em fundos de investimento, futuros, opções, CFD/contracts for differences, outros produtos derivados, produtos financeiros complexos, entre outros) representa aproximadamente que percentagem do seu património total? 1- Não tenho valores mobiliários 2- Entre 0% e 25% 3- Entre 51% e 75% 4- Mais de 76%
Subjective Financial Literacy	*subjective_literacy*	Como avalia os seus conhecimentos sobre produtos e mercados financeiros ? 1- Nada conhecedor 2- Pouco conhecedor 3- Moderadamente conhecedor 4- Conhecedor 5- Muito conhecedor

Objective Financial Literacy	financial_literacy	Suponha que coloca €100 num depósito a prazo com uma taxa de juro anual de 2%. Não faz mais depósitos, não levanta dinheiro da conta e não há impostos nem comissões.Quanto é que terá na conta ao fim de 5 anos, sabendo que no fim de cada ano deixa o valor dos juros ficar nesse mesmo depósito a prazo? 0- Exatamente €110 1- Mais de €110 0- Menos do que €110
		Suponha que tem €100 numa conta bancária cuja taxa de juro é de 1% ao ano e que a inflação é 2% ao ano.Daqui a um ano, o que acha que conseguiria comprar com o dinheiro dessa conta, sabendo que não faz mais depósitos, não levanta dinheiro da conta e não há impostos nem comissões? 0- Compraria mais coisas do que hoje 0- Compraria as mesmas coisas do que hoje 1- Compraria menos coisas do que hoje
		Investiu numa obrigação que paga uma taxa de juro fixa. Entretanto as taxas de juro do mercado diminuíram. Se vender essa obrigação após esta diminuição, o preço desta obrigação deve ser: 0- Igual ao preço a que a comprou 1- Maior do que o preço a que a comprou 0- Menor do que o preço a que a comprou
		O que significa um valor mobiliário ter capital garantido na data de vencimento? 0- Na data de vencimento recebo sempre o dinheiro investido 1- Na data de vencimento recebo o dinheiro investido, se o emitente do valor mobiliário tiver condições financeiras para me pagar 0- Tenho direito a receber o dinheiro investido, em qualquer momento
		Na sua opinião, indique se as seguintes afirmações são verdadeiras ou falsas. Um investimento com um retorno elevado tem geralmente associado um risco elevado 1- Verdadeira 0- Falsa
		Geralmente é possível reduzir o risco do investimento no mercado de capitais se comprarmos um conjunto diversificado de ações 1- Verdadeira 0- Falsa
		A rentabilidade de um Produto Estruturado depende, entre outros fatores, da evolução dos ativos financeiros subjacentes ao produto

		1- Verdadeira 0- Falsa
		Indique a definição correta de risco do efeito de alavancagem. 0- É o efeito que existe devido à possibilidade de que o emitente ou a contraparte do contrato não satisfaça alguma das obrigações de pagamento acordadas na aquisição do instrumento ou a devolução do investimento 1- É o efeito multiplicativo das menos-valias ou das mais-valias, caso se preveja incorreta ou corretamente a tendência dos preços, e que pode implicar ter de suportar perdas superiores ao montante investido
		Suponha que pretende aplicar 10 000 EUR num produto que apresenta risco de perda de capital.Este investimento será efetuado com 2 500 EUR do seu próprio dinheiro e os restantes 7 500 EUR são-lhe emprestados pelo Banco.Qual a perda máxima que pode ter de suportar com esta aplicação? 0- 0€ 0- 2500€ 0- 7500€ 10- 10000€
Risk Perception	risk_perception	Como classifica a sua atitude perante o risco financeiro? 1- Muito avesso ao risco / Não gosto mesmo nada de arriscar 2- Avesso ao risco / Não gosto de arriscar 3- Neutro face ao risco / Não gosto nem desgosto de arriscar 4- Propenso ao risco / Gosto de arriscar
Sustainble investment	sustainable_invest	Conheço e já tenho/tive investimentos socialmente responsáveis/sustentáveis: 1- Conheço e já tenho/tive investimentos socialmente responsáveis/sustentáveis 3- Conheço mas não sei o que fazer para investir neles 2- Conheço mas não é uma prioridade para mim investir neles 4- Não conheço / nunca ouvi falar
Influence towards sustainability	govern_influen	Indique o nível de influência dos seguintes agentes no desenvolvimento de investimentos socialmente responsáveis/sustentáveis em Portugal. 1- Muita influência 2- Bastante influência 3- Alguma influência (nem muita nem pouca) 4- Pouca influência 5- Nenhuma influência
	Individual_Influen	Indique o nível de influência dos seguintes agentes no desenvolvimento de investimentos socialmente responsáveis/sustentáveis em Portugal. 1- Muita influência

	2- Bastante influência 3- Alguma influência (nem muita nem pouca) 4- Pouca influência 5- Nenhuma influência
Institutional_influen	Indique o nível de influência dos seguintes agentes no desenvolvimento de investimentos socialmente responsáveis/sustentáveis em Portugal. 1- Muita influência 2- Bastante influência 3- Alguma influência (nem muita nem pouca) 4- Pouca influência 5- Nenhuma influência
Bank_influen	Indique o nível de influência dos seguintes agentes no desenvolvimento de investimentos socialmente responsáveis/sustentáveis em Portugal. 1- Muita influência 2- Bastante influência 3- Alguma influência (nem muita nem pouca) 4- Pouca influência 5- Nenhuma influência
Insurance_influen	Indique o nível de influência dos seguintes agentes no desenvolvimento de investimentos socialmente responsáveis/sustentáveis em Portugal. 1- Muita influência 2- Bastante influência 3- Alguma influência (nem muita nem pouca) 4- Pouca influência 5- Nenhuma influência
BigNonFin_influen	Indique o nível de influência dos seguintes agentes no desenvolvimento de investimentos socialmente responsáveis/sustentáveis em Portugal. 1- Muita influência 2- Bastante influência 3- Alguma influência (nem muita nem pouca) 4- Pouca influência 5- Nenhuma influência
SmallMed_influen	Indique o nível de influência dos seguintes agentes no desenvolvimento de investimentos socialmente responsáveis/sustentáveis em Portugal. 1- Muita influência 2- Bastante influência 3- Alguma influência (nem muita nem pouca)

	4- Pouca influência
	5- Nenhuma influência
Relig_influen	Indique o nível de influência dos seguintes agentes no desenvolvimento de investimentos socialmente responsáveis/sustentáveis em Portugal. 1- Muita influência 2- Bastante influência 3- Alguma influência (nem muita nem pouca) 4- Pouca influência 5- Nenhuma influência
Regulator_influen	Indique o nível de influência dos seguintes agentes no desenvolvimento de investimentos socialmente responsáveis/sustentáveis em Portugal. 1- Muita influência 2- Bastante influência 3- Alguma influência (nem muita nem pouca) 4- Pouca influência 5- Nenhuma influência

Appendix A2 – Demographics Characteristics

Variables		2020	
Number of observations		2897	
gender	female	1608	55.5%
	male	1266	43.7%
	outro	6	0.5%
Age	18-30	1791	64.2%
	31-40	302	10.8%
	41-50	380	13.6%
	51-65	296	10.6%
	65+	21	0.8%
Education	No education	2	0.1%
	Basic Education	6	0.2%
	Secondary Education	182	6.3%
	Bachelors degree	699	24.2%
	Completing bachelors	1100	38.1%
	Master's or higher education	897	31.1%
Income Level	Up to 500€	985	36.7%
	Between 501€ and 1000€	594	22.1%
	Between 1001€ and 1500€	416	15.5%
	Between 1501€ and 2500€	460	17.1%

	Above 2500€	228	8.5%
Perceived FL	Illiterate	199	9.7%
	Basic Knowledge	731	35.6%
	Average Knowledge	732	35.6%
	Advanced	308	15.0%
	Expert	85	4.1%
Percentage of wealth in risky assets	No market securities	2098	
	<26%	521	65.2%
	26%-50%	152	19.0%
	51%-75%	65	8.1%
	>76%	61	7.6%
Types of investment	Stocks	424	17.6%
	Bonds	101	4.2%
	Funds	414	17.2%
	Treasury bonds	416	17.3%
	retirement plans	531	22.0%
	Pension funds	116	4.8%
	Cryptocurrencies	122	5.1%
	Crowdfunding	66	2.7%
	Pension funds	116	4.8%
	Other complex financial products	103	4.3%
Basic Financial Literacy	0 correct answers	875	30.2%
	1 correct answer	26	0.9%
	2 correct answers	96	3.3%
	3 correct answers	281	9.7%
	4 correct answers	643	22.2%
	5 correct answers	976	33.7%
	median	4	
	mean	2.938557	
	(Standard deviation)	2.086419	
Advanced Financial Literacy	0 correct answers	912	31.5%
	1 correct answer	220	7.6%
	2 correct answers	436	15.1%
	3 correct answers	551	19.0%
	4 correct answers	440	15.2%
	5 correct answers	243	8.4%
	6 correct answers	95	3.3%

	median	2	
	mean	2.171212	
	(Standard deviation)	1.839343	
Investment Hold	0	1732	59.8%
	1	591	20.4%
	2	276	9.5%
	3	153	5.3%
	4	84	2.9%
	5	35	1.2%
	6	16	0.6%
	7	2	0.1%
	8	2	0.1%
	9	6	0.2%
Market Participation	Participates in Financial Markets	1165	
	Does not participate in Financial Markets	1732	
Financial Sustainability knowledge	Illiterate	702	38.7%
	Very little knowledge	550	30.3%
	Basic Knowledge	148	8.2%
	Expert	61	3.4%
	Unknown	353	19.5%
Sustainable investment	Had/have or willing to have	116	6.1%
	Not a priority to have	450	23.6%
	Never heard	900	47.3%
	Lack of information to decide	438	23.0%

TABLE 15- TTEST BFL BY GENDER

ttest BFL, by(Gender)						
Group	Obs	Mean	Std.Err	Std.Dev	[95% Conf. Interval]	
Female	1608	2.778607	0.052518	2.105965	2.675596	2.881618
Male	1266	3.153239	0.057268	2.037644	3.040888	3.265589
				t	=	-4.8024
			degrees of freedom		=	2872

TABLE 16- TTEST AFL BY GENDER

ttest AFL, by(Gender)						
Group	Obs	Mean	Std.Err	Std.Dev	[95% Conf. Interval]	
Female	1608	1.679104	0.041593	1.667885	1.597522	1.760687
Male	1266	2.806477	0.052055	1.852162	2.704354	2.908601
				t	=	-17.1312
			degrees of freedom		=	2872

TABLE 17- WEIGHTED PERCENTAGE OF CORRECT ANSWERS BY AGE GROUP

Age\Questions	Numeracy	Inflation	Risk/ Return	Diversification	Underlying Asset
18-30	57.2%	75.4%	79.6%	70.1%	71.5%
31-50	27.7%	36.1%	37.1%	34.4%	35.4%
51-65	14.0%	17.0%	16.8%	15.6%	16.0%
65+	1.1%	1.4%	1.4%	1.4%	1.2%

Age\Questions	Bonds	Guaranteed Capital	Leverage	Capital at Risk	Euribor	Spread
18-30	30.6%	19.3%	58.8%	63.0%	32.6%	47.5%
31-50	18.0%	9.4%	27.0%	33.4%	18.0%	29.7%
51-65	7.8%	4.3%	11.8%	14.5%	7.6%	13.4%
65+	0.8%	0.5%	0.9%	0.9%	0.9%	1.1%

TABLE 18 – WEIGHTED PERCENTAGE OF GENDER BY TYPE OF GREEN INVESTOR

Sustainability\Gender	Male	Female
Had/have or willing to have	5.8%	2.5%
Not a priority to have	22.4%	10.1%
Never heard/Does not know the meaning	53.9%	74.4%
Lack of information to decide	17.9%	13.0%

TABLE 19 - SCORING COEFFICIENTS FOR ORTHOGONAL VARIMAX ROTATION OF AFL

Variable	Comp1	Comp2	Comp3	Comp4	Comp5	Comp6
guaranteed	0	0	1	0	0	0
bond	0	0	0	0	0	1
leverage	0	1	0	0	0	0
capital at risk	0	0	0	0	1	0
Euribor	1	0	0	0	0	0
spread	0	0	0	1	0	0

Note: The scores presented are the final values in the process of predicting the values of the AFL using the factor analysis.

TABLE 20- SCORING COEFFICIENTS FOR ORTHOGONAL VARIMAX ROTATION OF BFL

Variable	Comp1	Comp2	Comp3	Comp4	Comp5
numeracy	0	0	0	0	1
inflation	1	0	0	0	0
riskreward	0	0	0	1	0
diversification	0	1	0	0	0
underlying	0	0	1	0	0

Note: The scores presented are the final values in the process of predicting the values of the BFL using the factor analysis.