



Lisbon School  
of Economics  
& Management  
Universidade de Lisboa

# **MASTERS IN MANAGEMENT (MIM)**

## **MASTERS FINAL WORK**

DISSERTATION

### **FINANCIAL LITERACY AND SUSTAINABLE INVESTMENT: A STUDY OF UNIVERSITY STUDENTS AND WORKING INDIVIDUALS IN PORTUGAL**

ÉRICA BRUNA DE ALMEIDA CARLOS

OCTOBER 2024



Lisbon School  
of Economics  
& Management  
Universidade de Lisboa

# **MASTERS IN MANAGEMENT (MIM)**

## **MASTERS FINAL WORK**

DISSERTATION

### **FINANCIAL LITERACY AND SUSTAINABLE INVESTMENT: A STUDY OF UNIVERSITY STUDENTS AND WORKING INDIVIDUALS IN PORTUGAL**

ÉRICA BRUNA DE ALMEIDA CARLOS

**SUPERVISOR:** PROF. MARIA JOÃO COELHO GUEDES

**JURY:**

**PRESIDENT:** PROF. MARIA EDUARDA M. A. SOARES

**RAPPORTEUR:** PROF. RICARDO MARINO F. RODRIGUES

**SUPERVISOR:** PROF. MARIA JOÃO COELHO GUEDES

OCTOBER 2024

## ACKNOWLEDGEMENTS

This dissertation represents the output of my most challenging academic year to date nevertheless I am extremely grateful for this journey, along with its ups and downs and I would like to thank all of those who contributed to this achievement.

First, I would like to thank my Professor and Supervisor Maria João Coelho Guedes for her availability, feedback inputs and words of encouragement throughout this past year. I found that the process of writing a dissertation can sometimes be very solitary and we can find ourselves uncertain and doubting the outputs of our work and in every step of the process, my supervisor inspired and encouraged me to keep pushing forward and continuously improve the quality of this research and for that I am deeply grateful.

Next, I would like to give a special thanks to my fellow colleagues that contributed to this beautiful journey at ISEG. I am incredibly lucky to have been able to meet so many incredible people from every part in the world, to learn from them, overcome all those days and nights studying at the library and foster incredible friendships that have enriched my life.

Last but not least, I would like to express my gratitude to my family that supported me during my whole academic journey and also to my friends who I'm very thankful for their patience, encouragement and understanding in the many gatherings I had to miss to achieve the present work.

Finally, the findings of this dissertation were presented during World Investor Week by Professor Maria João Guedes, following an invitation from AEM and CMVM for the e-conference "Financial Empowerment: Diversity, Investment and Future" contributing to the understanding of how financial empowerment can be a tool for creating better opportunities for individuals.

## RESUMO

O crescente foco global na sustentabilidade e a necessidade de os consumidores contribuírem para o desenvolvimento social, incorporando critérios Ambientais, Sociais e de Governança (ESG) nas suas escolhas de investimento, realçam uma lacuna no que diz respeito à compreensão dos determinantes da participação em Investimento Sustentável (SI).

Nesse sentido, este estudo pretende colmatar esta lacuna focando-se na investigação da relação entre Literacia Financeira (FL) e a participação em Investimento Sustentável (SI) entre estudantes universitários e profissionais em Portugal.

Os resultados demonstraram que os indivíduos mais jovens apresentam níveis mais elevados de Literacia Financeira Sustentável (SFL) em comparação com os profissionais, sugerindo uma maior consciência dos fatores ESG. Além disso, os resultados mostram que a exposição à informação de SI através de ambientes académicos ou de local de trabalho pode aumentar a probabilidade de envolvimento em alternativas de investimento sustentável. As conclusões estão em linha com pesquisas anteriores que destacam a importância de uma compreensão mais profunda dos temas da sustentabilidade na promoção de decisões de investimento responsáveis.

O estudo procura fornecer insights para o desenvolvimento de políticas financeiras sustentáveis através de iniciativas que promovam a educação financeira, a acessibilidade aos mercados financeiros e o estabelecimento de padrões regulamentares claros para produtos financeiros classificados como sustentáveis.

**Palavras-Chave:** Literacia Financeira, Investimento Sustentável, Literacia Financeira Sustentável, ESG

*ABSTRACT*

The increasing global focus on sustainability and the need for consumers to contribute to societal development by incorporating Environmental, Social and Governance (ESG) criteria into their investment choices, highlights a gap in regard to the understanding of the drivers of Sustainable Investment (SI) engagement.

In that sense, the research aims to address this gap focusing on the investigation of the relationship between Financial Literacy (FL) and Sustainable Investment (SI) engagement among university students and working professionals in Portugal.

The results demonstrated that younger individuals exhibit higher levels of Sustainable Financial Literacy (SFL) compared to working professionals suggesting stronger awareness of ESG factors. Furthermore, the findings show that exposure to SI information through academic or workplace settings can increase the likelihood of engagement in SI alternatives. The findings align with previous research that highlights the importance of a deeper understanding of sustainability topics in fostering responsible investment decisions.

The study seeks to provide insights for the development of sustainable finance policies through initiatives that promote financial education, accessibility to financial markets, and the establishment of clear regulatory standards for financial products classified as sustainable.

**Keywords:** Financial Literacy, Sustainable Investment, Sustainable Financial Literacy, ESG

**TABLE OF CONTENTS**

<b>ABSTRACT</b> .....	<b>V</b>
<b>LIST OF ABBREVIATIONS</b> .....	<b>VIII</b>
<b>CHAPTER 1 – INTRODUCTION</b> .....	<b>1</b>
1.1 Background .....	1
1.2 Relevance of the study .....	1
1.3 Main Problem and Research Question .....	2
1.4 Structure of the Research .....	2
<b>CHAPTER 2 – LITERATURE REVIEW</b> .....	<b>3</b>
2.1. Financial Literacy .....	3
2.1.1 Benefits of FL and Impact on Decision-Making .....	3
2.1.2 Determinants of Financial literacy .....	5
2.2 Sustainable Investing .....	6
2.3 Sustainable Finance Literacy .....	7
2.4 Trends in Literature .....	8
2.5 Financial Literacy in Portugal .....	10
<b>CHAPTER 3 – SAMPLE AND METHODOLOGY</b> .....	<b>11</b>
3.1. Sample .....	11
3.2. Descriptive Statistics .....	11
3.3. Variables .....	13
3.3.1 Dependent Variables .....	13
3.3.2 Independent Variables .....	14
3.2.3 Control Variables .....	16
3.4. Model .....	18
<b>CHAPTER 4 – RESULTS AND DISCUSSION</b> .....	<b>19</b>
4.1 Results .....	19
4.1.1 Results on FL .....	19
4.1.2 Results on Sustainability Awareness .....	22
4.1.3 Results on Financial Behaviour .....	24
4.2. Regression Results .....	30
4.3 Discussion .....	33
<b>CHAPTER 5 - CONCLUSION</b> .....	<b>35</b>
5.1 Implications on Policy and Role of Institutions .....	35
5.2 Limitations and Suggestions for Future Research .....	35
5.3 Conclusion .....	36
<b>REFERENCES</b> .....	<b>38</b>
<b>APPENDIX</b> .....	<b>44</b>

**LIST OF TABLES**

Table 1 - Descriptive Statistics and Pearson Correlation Matrix.....	12
Table 2 – Operationalization of the variables of the study .....	17
Table 3 - Perception of Self-FL .....	19
Table 4 - FL Scores.....	20
Table 5 - Independent Two Sample T-Tests - FL.....	20
Table 6 - ANOVA test - FL .....	21
Table 7 - Sustainability Awareness Results.....	22
Table 8 - Independent Two Sample T-Tests - SFL.....	23
Table 9 – Savings Frequency .....	24
Table 10 - Differences in Investment Patterns.....	27
Table 11 - Financial Behaviour: Information Sources.....	28
Table 12 - Tabulation of FL and Traditional Investment .....	29
Table 13 - Tabulation of FL and SI Engagement .....	29
Table 14 - Regression Results – SI Engage .....	30

**LIST OF FIGURES**

Figure 1 - Financial Engagement (Traditional vs SI) .....	25
Figure 2 – Traditional Investment Patterns by type.....	26
Figure 3 - Sustainable Investment Patterns by type.....	26

**LIST OF ABBREVIATIONS**

ESG – Environmental, Social and Governance

EU – European Union

FL – Financial Literacy

OECD - Organisation for Economic Co-operation and Development

SDG – Sustainable Development Goals

SFL – Sustainable Financial Literacy

SI – Sustainable Investment/Investing

SRI – Socially Responsible Investment



## CHAPTER 1 – INTRODUCTION

### *1.1 Background*

In recent years, the financial markets worldwide have witnessed a significant shift towards the integration of sustainability matters into investment decisions. This change in perspective reflects a wider recognition of the necessity of alignment of consumers' financial interests with environmental, social, and governance (ESG) criteria, promoting economic growth and social well-being while combatting urgent societal concerns related to climate change, social inequality, the post-effects of COVID-19 pandemic and corporate governance practices (Cui et al., 2020). Based on this, sustainable investments or green financial products, have emerged as a crucial component of the present financial markets, attracting the interest of certain individuals when making their investment decisions even when potentially presenting lower financial return rates when compared with traditional financial assets of equivalent nature (Gáspár et al., 2023). Individuals' ability to actively participate in sustainable investment practices may be closely tied to their financial literacy and understanding of sustainability, both of which serve as critical factors in making well-informed financial decisions (Degryse et al., 2023; Christopher & Nithya, 2024).

### *1.2 Relevance of the study*

Understanding the relationship between financial literacy (FL) and sustainable investment (SI) practices is essential because first, it can contribute to the development of educational and policy initiatives aimed at enhancing FL levels within targeted groups, consequently encouraging consumers to make informed financial decisions that align with their values; second, it provides critical insights into the factors that drive the engagement in sustainable investing, helping policy makers and financial institutions to develop strategies that promote responsible financial behaviour and increase the engagement with sustainable financial products (Dumitrescu, 2022).

The growing awareness of sustainability and its crucial role in achieving societal goals emphasizes the relevance of this study and its contemporary significance. The increasing global prioritization of sustainable development highlights the importance of understanding how FL influences SI decisions. This knowledge can contribute to the gap between financial knowledge and sustainable practices, ultimately contributing to the realization of several

agendas such as the United Nations' 2030 Agenda regarding the Sustainable Development Goals (SDGs), the Paris Agreement, and many others (Christopher & Nithya, 2024; Yucel et al., 2023).

### *1.3 Main Problem and Research Question*

In Portugal, the country's low level of FL and financial engagement across various age groups, with younger generations presenting higher levels of FL, emphasizes the importance of research of FL of the Portuguese population (Almeida et al., 2024). The increasing interest in sustainable investments highlights a clear gap in the understanding of how FL impacts sustainable investment practices within the Portuguese population. This area remains under-researched, which highlights the need for further research on the relationship between FL and SI in Portugal.

The present study is focused on addressing the question of “How does the level of Financial Literacy impact the Sustainable Investment practices of university students and working individuals in Portugal?”. By answering this question, the study seeks to contribute to a deeper understanding of the drivers of SI decision-making and the role of FL in shaping these decisions.

University students and working professionals in Portugal represent the scope of this research and the focus relates to the examination of their FL levels, investment behaviours and engagement responsible investment alternatives. While the study seeks to provide valuable insights for research, it is limited to the low levels of investment and investment diversification within the Portuguese population.

### *1.4 Structure of the Research*

The first chapter provides a literature overview on FL and the emergence of SI highlighting key theoretical frameworks and empirical findings. The following chapter contains the methodology employed in the study including the data collection and description of the sample utilized in the study. The third chapter presents the findings followed by a discussion that analyses the results in comparison with the findings of previous literature. The final chapter concludes the thesis by summarizing the key findings, discussing implications and suggestions for further research.

## CHAPTER 2 – LITERATURE REVIEW

### *2.1. Financial Literacy*

Financial literacy (FL) can be defined as the ability to understand economic information and apply it to make wise and informed financial decisions contributing to the realization of one's financial objectives (Lusardi et al., 2014). These decisions encompass aspects such as financial planning, wealth accumulation, retirement savings and debt management (Mitchell et al., 2014).

There are multiple definitions of FL within the academic and professional realm. Huston (2010) defines financial literacy as a skill that is part of the human knowledge and is used in financial activities to increase the benefits derived from consumption.

The Organisation for Economic Co-operation and (OECD)., characterizes FL as a composite of “awareness, knowledge, skills, attitude, and behaviour necessary for making rational financial decisions” (OECD 2023, p. 23), contributing to individual financial well-being, which represents its primary advantage.

Additionally, the U.S. Financial Literacy and Education Commission (2020) defines FL as the skills, knowledge, and tools that enable individuals to make decisions and take action to achieve their goals when provided access to a financial system.

The above-mentioned definitions describe FL as a multidimensional concept that entails cognitive, behavioural, and practical dimensions that are essential for individuals to navigate the complexities of the financial landscape and achieve their financial goals.

The growing complexity of the financial system highlights the importance of FL in the present-day context as a tool that equips individuals with the necessary knowledge to navigate complex decisions related to financial management (Lusardi et al., 2014).

#### *2.1.1 Benefits of FL and Impact on Decision-Making*

FL shapes decision-making and investment behaviours, employing a substantial influence on individuals' financial actions (Lusardi & Mitchell et al., 2014).

Enhanced financial understanding provides individuals with tools to make wiser decisions and generates benefits in matters related to saving, debt management, retirement

planning, and increased participation in the stock market. This ultimately leads to enhanced wealth accumulation among individuals (Lusardi & Mitchell, 2007).

Low levels of FL carry significant costs manifested as higher levels of debt associated with high interest rates (Lusardi & Tufano, 2015) along with low levels of savings (Stango & Zinman, 2009) and weak budgeting skills. Individuals exhibiting lower levels of FL demonstrate reduced engagement in financial markets and when involved, these individuals tend to possess portfolios characterized by a lack of diversification (Calvet et al., 2007 & Yoong, 2011).

Furthermore, FL is a critical life skill that is crucial for the achievement of financial security, economic growth, and overall sustainable development (Zaimovic et al., 2023).

Populations that are financially literate can significantly impact the progress on various sustainable development goals. Specifically, they could contribute to several Sustainable Development Goals (SDG), namely the reduction of poverty (SDG 1), improvement in well-being (SDG 3), enhancement of education quality (SDG 4), promotion of gender equality (SDG 5), contribution to economic growth (SDG 8), reducing inequalities (SDG 10), and fostering responsible consumption and production (SDG 12) (Zaimovic et al., 2023).

Moreover, financial literacy plays a crucial role in promoting stability within society. A population that possesses higher levels of FL is better equipped to navigate economic downturns, unexpected financial shocks and therefore decreasing the likelihood of financial disruption and economic instability (Hastings et al., 2013; Raya, 2024).

Previous research also suggests that improved financial literacy is associated with greater resilience in managing daily financial obstacles such as job loss or unexpected medical expenses (Dwyer et al., 2011). Additionally, communities with higher levels of FL tend to experience lower rates of poverty and higher rates of economic mobility contributing to overall social and economic well-being (Lusardi & Tufano, 2015).

Taken all together, FL not only empowers individuals but also strengthens the broader economy. Investments made by governments in FL education and the promotion of widespread access to financial information and resources have been demonstrated to yield significant benefits, including enhanced economic resilience, stability, and sustainable economic growth (Klapper et al., 2015).

### *2.1.2 Determinants of Financial literacy*

According to Zaimovic et al. (2023), one of the main questions in research is what are the determinants that influence the levels of financial literacy among individuals.

FL can be divided into multiple components being one of them Financial Knowledge (OECD, 2023). A solid grasp of fundamental financial concepts, including inflation, compounding, risk diversification, and credit scores, is essential for making effective financial decisions (Hastings et al., 2013). The understanding of these concepts and the possession of numeracy skills in a financial context is crucial for individuals to compare various financial products and services. This knowledge empowers them to make complex decisions, navigate financial matters with confidence, and respond adeptly to news and events that may affect their financial well-being (OECD, 2023).

Another key component of FL is Financial Behaviour (OECD, 2023). People's actions and behaviours in their consuming habits play a significant role in shaping their financial situation and health. Behaviours such as not actively saving money, delaying the payment of bills, and neglecting to plan future expenditures, whether expected or unexpected, can have a negative impact on an individual's financial well-being. Several authors have investigated the connection between FL and financial behaviour, and the findings consistently demonstrate that a higher level of FL is associated with improved financial behaviour (Hastings et al., 2013).

Huston (2010) highlighted Financial Education as a contributing factor that enhances an individual's human capital, particularly emphasizing their level of financial knowledge (Huston, 2010). Financial Education can be viewed as the support of a strong and resilient economy (U.S. Financial Literacy and Education Commission, 2020). This perspective suggests that financial education is a crucial determinant explaining the differences in financial outcomes. This viewpoint finds support in the Financial Literacy report by Klapper et al. (2015), where the authors concluded that the level of financial literacy experiences a notable increase corresponding to higher levels of educational attainment. Financial education was also studied in (Cordero et al., 2022) research, where they reached a conclusion that financial education is positively associated with increased financial literacy.

Financial attitude is often characterized by authors as the emotions and beliefs individuals hold when it comes to spending and investing money (Zaimovic et al., 2023). According to

OECD (2023), individuals who exhibit financial knowledge and responsible financial behaviours are still primarily influenced by their attitudes, encompassing their thoughts about money, attitudes toward it, and their general perspective on numbers (Zaimovic et al., 2023; Fernandes et al., 2014). These attitudes can serve as significant predictors of financial literacy and therefore we can consider financial attitude as another component of financial literacy.

Socio-demographic factors may also serve as explanatory variables of the variations in levels of financial literacy. Variables such as age, income, gender, educational attainment, field of study and cognitive abilities can influence an individual's ability to navigate complex financial situations more adeptly (Mitchell et al., 2014).

### *2.2 Sustainable Investing*

In recent years, the investment markets have suffered a paradigm shift with the emergence of sustainable investing. The increased awareness of climate change and global environmental concerns have significantly increased the spotlight on corporations (Li et al., 2021). Investors now exert significant pressure on corporations expecting them to integrate social responsibility matters into their operations in order to assure their continuity and success. This new approach to investment has an impact on decision-making and considers not only the traditional metrics of financial return but also a new evaluation method that includes Environmental, Social and Governance (ESG) criteria (Pástor et al., 2021) “leading to more long-term investments in sustainable economic activities and projects” (European Commission, 2021).

ESG factors have gained a pivotal role as indicators that guide investors in their investment analysis and decision-making through evaluation of corporate behaviour, future financial performance, and sustainable development (Li et al., 2021).

The ESG framework comprises three components. Environmental considerations involve an assessment of a company's environmental impact, covering its carbon footprint, resource utilization, commitment to renewable energy, and contribution to a circular economy (Clark et al., 2015 & Hoepner et al., 2016). Social criteria involve evaluating a company's impact on stakeholders, community engagement, and diversity initiatives (Clark et al., 2015) while addressing issues of inequality, inclusiveness labour relations as well as human rights issues (European Commission, 2021); and Governance factors focus on the company's leadership

structure, employee relations, ethical standards, and transparency towards shareholders (Gompers et al., 2001).

The growing emphasis on ESG integration within investment strategies highlights a fundamental re-evaluation of the traditional perception of investments solely driven by financial returns (Eccles et al., 2014).

The evolving recognition of sustainable investing's importance derives from its capacity to align financial objectives with social and environmental goals. Organisations are acknowledging the critical importance of integrating sustainability in their operations not only as an ethical matter but also as a strategic necessity (Hoepner et al., 2016). In order to prosper in a changing global environment, organisations are currently changing their business models to embrace sustainability, redesigning their strategies to address ESG concerns proactively (Clark et al., 2015; Scholtens & Sievänen, 2013). This commitment to prioritize sustainability highlights the recognition that ESG practices contribute not only to ethical corporate social responsibility but also to sustained financial performance and long-term value creation (Eccles et al., 2014).

Sustainable investing is progressively recognized as a method towards the achievement of the United Nations's SDGs. In the European Union's policy framework, sustainable finance plays a pivotal role in driving economic expansion while concurrently advancing the objectives of the European Green Deal. By directing investments towards a robust and resilient economy that operates in a climate-neutral and resource-efficient manner, sustainable finance facilitates both economic growth and the realization of environmental sustainability goals (European Commission, 2021).

Investors today, actively contribute to this effort by fostering impactful changes within companies that in turn adopt socially responsible practices that generate environmental and social benefits by aligning their corporate strategy with sustainable development objectives (Kölbel et al., 2020).

### *2.3 Sustainable Finance Literacy*

The concept of “Sustainable Financial Literacy” (SFL) was introduced through research conducted by Filippini et al. (2022), and it describes the knowledge regarding the regulations, norms, and standards of financial products with sustainable characteristics.

SFL is progressively recognized as a crucial competency in navigating the complexities of sustainable finance, particularly as the landscape of sustainable investment options continues to evolve.

When it comes to current regulatory guidelines, such as the EU Taxonomy, they are not rigid nor define a mandatory standard that defines a financial product as sustainable while the existing ratings for sustainability do not follow a homogeneous trend (Berg et al., 2022). This regulatory ambiguity creates a challenging environment for both investors and regulators, making it difficult to establish a clear, consistent benchmark for sustainability across financial products.

This lack of convergence regarding sustainability ratings makes it more difficult to ensure information transparency and makes it more challenging to assess individuals' knowledge about these products (Filippini et al., 2022).

For this reason, being literate regarding sustainable financial matters represents an essential factor in making informed decisions regarding innovative sustainable products. Moreover, SFL enables investors to evaluate the long-term impacts of their investments both in their portfolio and in broader societal and environmental outcomes (Amir & Serafeim, 2018).

Degryse et al. (2023) examined the relationship between sustainable financial literacy (SFL) and engagement in sustainable investments within the Dutch population, finding a positive correlation between these variables. The study also revealed that women are more inclined to choose sustainable funds over general stock market funds, with a particular emphasis on the social dimension of sustainability. This underscores the influence of gender roles in shaping investment preferences and considerations in sustainability.

### *2.4 Trends in Literature*

Limited research has been conducted regarding the association between financial literacy and sustainable investing. Moreover, the existing literature lacks a consensus on the relationship between these two aspects. On one hand, some authors (e.g. Anderson & Robinson, 2022, Filippini et al., 2024 and others) have observed a negative relationship between FL and Sustainable Investment (SI) practices, while others have identified positive association (e.g. Geraldine & Ottemoesoe, 2022; Varmaz et al., 2021 and others).



In line with Geraldine & Ottemoesoe's (2022) study, on a sample of people between the ages of 21 and 30, FL has a positive association with Socially Responsible Investment (SRI) attitudes among individuals that actively participate in the stock market while also discovering that financial attitude plays a significant positive effect on SRI targets.

Research by Varmaz et al. (2021) on the preferences of young adults for sustainable investments, concludes that students tend to show a preference towards global ESG Funds offering higher returns and lower risk. The study found that sociodemographic characteristics do not significantly influence preferences for ESG funds, with behavioural factors such as attitude, conscious, personal traits, financial literacy, and risk aversion playing a more significant role. Although the study found that financial literacy (FL) and the choice of ESG funds were negatively related, people with higher FL levels were actually more likely to pick these funds.

In contrast, Rossi et al. (2019) identified a negative relationship between FL and sustainable investing (SI), suggesting that individuals with higher FL levels exhibit less interest in sustainable financial products. This finding aligns with the conclusions of Filippini et al. (2024). Their survey focused on Swiss households, that show to possess high levels of "classical" financial literacy, while having a low understanding of sustainable products. Furthermore, the study concludes that neither classical nor sustainable financial literacy measurements significantly impacted the holding of sustainable assets.

Anderson & Robinson (2022) conducted a study involving a large group of Swedish households to investigate the relationship between environmental attitudes and investment choices. They discovered that households with eco-friendly beliefs are not necessarily inclined to possess portfolios that contain sustainable assets. This result can be explained due to financial disinterest and difficulties in accessing information about green investment options. Sustainable investing introduces additional complexity to financial product comprehension, potentially impeding less financially savvy individuals from expressing their preferences when constructing their investment portfolios.

Despite these insights and several contributions to academic literature on the topic, there are still remaining gaps that need to be further researched to untangle the complexities between the associations between FL and SI. As our understanding of FL and SI evolves, it

is crucial to engage in continuous investigation and analysis to expand the comprehension of these concepts and their impact on financial decision-making and societal well-being.

### *2.5 Financial Literacy in Portugal*

As per the European Central Bank's article titled "ECB Communication with the Wider Public", the Portuguese population ranked lowest in FL levels among the 19 Eurozone countries (Gardt et al., 2021). Approximately 25% of the Portuguese population correctly answered at least three out of five questions related to risk diversification, inflation, arithmetic, and compounding interests. In contrast, the German and Dutch populations exhibited the highest levels with a 63% correct response rate (Klapper, 2020).

According to the OECD's 2023 International Survey of Adult Financial Literacy, Portugal scored the 13th position in the global ranking of Financial Literacy among thirty-nine countries, encompassing 20 OECD member nations. The Portuguese population obtained an indicator higher than the average of the participating countries and equivalent to the average of OECD member states. Portugal's involvement in this survey spanned both 2020 and 2023, obtaining equivalent results across both years. The findings indicate that the country exhibits above-average financial attitudes and behaviours but lags behind in terms of financial knowledge (OECD, 2023). Additionally, the survey analysis provides valuable insights into the areas that need targeted intervention to enhance FL levels and financial participation among the Portuguese population.

Taken all together, the proposed hypotheses are:

***H1:*** *There is a positive association between the level of FL and the engagement in SI practices for students and working professionals in Portugal.*

***H2:*** *Individuals with greater level of SFL are more likely to prioritize sustainable investments.*

***H3a:*** *Students who receive FL education or SI information from their university are more likely to engage in SI.*

***H3b:*** *Working professionals who receive FL education or SI information from their employer are more likely to participate in SI.*

## CHAPTER 3 – SAMPLE AND METHODOLOGY

### *3.1. Sample*

In order to understand and study the relationship between financial literacy, sustainable investment practices, and demographic factors influencing financial behaviour, a survey was designed to collect data from both university students and working professionals across Portugal. The survey was designed in the software QualtricsXM and comprised multiple sections that focused on financial literacy, financial behaviour, sustainable investment awareness and engagement along with demographic data about the respondents.

The survey was distributed among the targeted participants through multiple channels (email and online platforms) and there was an effort to encourage participants to provide complete, honest, and comprehensive responses to ensure the accuracy and reliability of the data collected.

The data collection took place between December 2023 and August 2024 and after review of the responses, 308 observations were considered valid and were included in the final sample.

### *3.2. Descriptive Statistics*

Table 1 presents the descriptive statistics and the correlation matrix between the variables.

**Table 1 - Descriptive Statistics and Pearson Correlation Matrix**

	Mean	S.D.	Min	Max	1	2	3
<b>1</b> Engagement in SI			0.000	1.000	1.000		
<b>2</b> Financial Literacy Sustainable Financial Literacy	2.494	0.764	0.000	3.000	0.077	1.000	
<b>3</b> Age	3.406	1.446	0.000	8.000	0.158***	0.317***	1.000
<b>4</b> Gender	40.581	13.676	19.000	78.000	-0.031	-0.022	-0.287***
<b>5</b> Education Level			0.000	1.000	-0.024	-0.157***	0.101*
<b>6</b> Residential Area			1.000	5.000	0.025	0.130**	0.343***
<b>7</b> Exposure Employer - WI			1.000	3.000	-0.077	-0.168***	-0.223***
<b>8</b> Exposure University - Curricular Plan			0.000	1.000	0.401***	-0.025	0.204***
<b>9</b> Exposure University - Extracurricular Activities			0.000	1.000	0.189	0.227*	0.153
<b>10</b>			0.000	1.000	0.258**	0.205*	0.167

	4	5	6	7	8	9	10
<b>4</b> Age	1.000						
<b>5</b> Gender	-0.178***	1.000					
<b>6</b> Education Level	-0.168***	0.056	1.000				
<b>7</b> Residential Area	0.220***	0.074	-0.186***	1.000			
<b>8</b> Exposure Employer - WI	-0.126*	0.047	0.032	-0.158**	1.000		
<b>9</b> Exposure University - Curricular Plan	-0.160	-0.066	-0.056	-0.177		1.000	
<b>10</b> Exposure University - Extracurricular Activities	0.146	-0.251**	0.204*	-0.057		0.328***	1.000

Note: N = 308 observations segmented into 237 working professionals and 71 students.

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

The sample is composed of 308 complete respondents with an average age of approximately 40.6 years (S.D. = 13.68), 178 of which are men representing around 58% of the sample while 130 are women representing about 42%. The group of participants indicates a diverse age range from 19 to 78-year-old respondents. By disaggregating the sample by students and working individuals, the values are:

- Working individuals: This subgroup consists of 237 respondents with an average of 44.9 years of age (SD = 11.79), ranging from 21- and 78-year-olds. The respondents within the present group are typically older which was expected. In terms of gender, the working professionals' group consists of 147 men (62.03%) and 90 women (37.97%).
- Students: This subgroup consists of 71 students with a lower average age of 26.2 years (SD = 8.93). The age range for the present group is more restricted ranging from 19 to

59-year-olds reflecting a younger demographic of university attendants. In terms of gender, the students group consists of 31 men (43.66%) and 40 women (56.34%).

In relation to the level of educational attainment, the proportions are varied with the largest proportion of respondents holding a Bachelor's degree (40.91%). The proportion of participants that possess a high-school degree or less constitute 31.82% of the sample while 20.78% of the respondents detain a Master's degree. The remainder of the respondents represent a smaller percentage of the sample representing respondents that hold a Doctorate degree (2.60%) or Postgraduate degree (3.90%).

The statistics reveal that the sample is well-educated which may positively correlate with the level of FL and interest in sustainable investing.

The income question was marked as optional, which led to fewer responses in this area compared to other questions. Among the 284 respondents who chose to answer the question regarding their annual income, the results indicate that more around 61% of the respondents are placed within the lower income categories ranging from no income to 20.000 € of gross annual income. This is below than the converted annual equivalent of the average monthly income in Portugal for the second trimester of 2024 (1.640 €) (Instituto Nacional de Estatística, 2024), meaning that a significant portion of the sample earns below the national average. This dominance of lower income levels may limit individuals' capacity to participate in investment activities, including sustainable investing, potentially influencing their decision-making and engagement in those practices.

### *3.3. Variables*

The present section comprises the variables used in the study which are categorized into dependent, independent and control variables according to their nature.

#### *3.3.1 Dependent Variables*

##### *Engagement in SI (SI Engage)*

The assessment of an individual's participation in sustainable investment activities was defined as a binary variable "SI Engage" that equals to one if the respondent actively engages in sustainable investment options and zero otherwise.

### 3.3.2 Independent Variables

#### *Financial Literacy (FL)*

The variable “FL” measures the financial literacy level of the respondents. Building upon the study of Lusardi & Mitchell, (2011), where FL is measured through the use of a three-questions. The two first questions refer to the understanding of the key economic concepts related to “Compounding Interest” and “Inflation”; and the third question evaluating the knowledge regarding risk diversification, which is crucial to the performance of informed investment decisions. The questions are as follows:

**Question 1:** Assuming that you have €100 invested in a savings account and that the applicable annual interest rate is 2%. Assuming there were no deposits or withdrawals after 5 years, how much do you think would be available in the account?

The provided possible answers participants were asked to choose from are as follows (in bold the correct one): **1.1 More than 102€**; 1.2 Exactly 102€; 1.3 Less than 102€; and 1.4 I don't know.

The second question is:

**Question 2:** Assuming that the applicable annual interest rate for your savings account is 1% and the annual inflation rate is 2%. After a year, what would your purchasing power be with your savings account balance?

The respective provided answers are (in bold the correct answer): 2.1 Higher than today; 2.2 The same; **2.3 Less than today**; and 2.4 I don't know.

Finally, the third question is:

**Question 3:** Consider the following statement and classify it as true or false: “Buying shares of a single company yields a safer return than buying shares of a mutual fund”: 3.1 True; **3.2 False**; and 3.3 I don't know.

#### *Sustainable Financial Literacy (SFL)*

The literature on the measurement of individuals’ sustainable financial literacy is scarce. In order to measure this variable, we adapted the model introduced by Filippini et al. (2022) and inquired the respondents regarding the following aspects: meaning of ESG criteria, distinguishment between traditional investing from sustainable investing, certification of ESG products, identification of types of sustainability investments and awareness of labels

that define a product/activity as sustainable. The measurement of SFL is based on a scoring system ranging from 0 to 8, where 0 represents a low level of SFL and 8 represents a high level of SFL. The respondents were asked six key questions:

1) Are you aware of the meaning of the acronym "ESG"?; 2) What distinguishes sustainable investing from traditional investing?; 3) Are you aware of any "label" that certifies a particular financial product as "sustainable"?; 4) Are you aware of any "label" that certifies a certain economic activity as "sustainable"?; 5) In how many of the 3 ESG elements (Environment, Social and Governance) does a company need to stand out to be considered sustainable in the financial markets?; 6) Of the following options, which do you consider to be sustainable investments? Where the offered answers were: **6.1 Stock in Renewable Energy Companies**; **6.2 Impact Investment Funds (investment fund that seeks to generate positive social and environmental impact alongside financial returns)**; 6.3 Stock in Fossil Fuel Companies; **6.4 Circular Economy Investments**; 6.5 Stock in Tobacco Companies; and 6.6 Cryptocurrency Investments.

These questions evaluate the respondent's awareness and understanding of SI concepts, certifications, and distinctions from traditional financial practices.

#### *Age (Age)*

Age represents the respondents biological age and is often related to investment behaviour with different age groups potentially showing varying levels of financial engagement (Henager & Cude, 2019).

#### *Gender (Gender)*

Investment behaviour and preferences may be influenced by gender differences including engagement in sustainable investment options (Degryse et al., 2023). Thus, in this study, gender is a dummy variable that equals to one if the respondents are female and zero if the respondent is male.

#### *Exposure Employer/University to SI*

This variable assesses whether an individual has access to information on sustainable investment provided by their employer (for working professionals) or their university (for

students). For the latter, the exposure may occur via their academic curricular plan or via extracurricular activities promoted by their institution. The assessment of the exposure variable is made using three dummy variables: one for exposure through the employer (for working professionals), one for exposure via the curricular plan (for students), and one for exposure through extracurricular activities (for students). Each dummy variable equals one if the respondent indicates exposure through these channels, and zero otherwise.

### *3.2.3 Control Variables*

#### *Area of residence (Residential Area)*

The area where a respondent resides can influence their access to financial resources, information and variety of investment opportunities. The variable "Residential Area" is categorical and indicates the respondent's place of residence, with the following categories:

- 1 – Urban Area;
- 2 – Suburban Area; and
- 3 – Rural Area.

#### *Education Level (Education Level)*

The level of education is likely to impact both FL, financial behaviour, awareness and engagement with sustainable investment options making it a relevant variable for the study (Klapper et al., 2015). The variable "Education Level" is categorical, indicating the respondents' highest level of education achieved, with the following categories:

- 1 - High-school or lower;
- 2 - Bachelor's degree;
- 3 – Master's degree;
- 4 – Doctorate degree; and
- 5 – Postgraduate degree.

Table 2 summarizes the variable operationalization.



**Table 2 – Operationalization of the variables of the study**

<b>Type</b>	<b>Variable</b>	<b>Abbreviation</b>	<b>Description</b>
<b>Dependent</b>	Engagement in SI	SI_Engage	Dummy variable that represents individuals who engage in sustainable investment.
<b>Independent</b>	Financial Literacy (FL)	FL	The variable FL represents an individual's level of financial literacy, measured on a scale from 0 to 3.
	Sustainable FL	SFL	The variable SFL measures an individual's sustainable financial literacy, scored on a scale from 0 to 8.
	Exposure Employer - WI	Exposure_WI	Dummy variable that represents working individuals who are exposed to SI information by their employer.
	Exposure University - Curricular Plan	Exposure_CP	Dummy variable that represents students who are exposed to SI information by their university - curricular plan.
	Exposure University - Extracurricular Activities	Exposure_EACT	Dummy variable that represents students who are exposed to SI information by their university - extracurricular activities.
<b>Control</b>	Age	Age	Age
	Gender	Gender	A dummy variable that takes the value "1" if the individual is female, and "0" if the individual is male.
	Education Level	Education_level	A categorical variable that represents the individual's level of education.
	Residential Area	Residential_Area	A categorical variable that represents the individual's area of residence (urban, suburban and rural).

### 3.4. Model

The present study used a logistic regression using the software STATA 18. The results were obtained using the logistic regression model in order to estimate the likelihood of an individual's engagement in SI, following the equations bellow, adapted from Yucel et al. (2023):

$$(1) SI Engage_i = \beta_0 + \beta_1 FL + \beta_2 Age + \beta_3 Gender + \beta_4 EducationLevel + \beta_5 Residential Area + \epsilon$$

$$(2) SI Engage_i = \beta_0 + \beta_1 SFL + \beta_2 FL + \beta_3 Age + \beta_4 Gender + \beta_5 EducationLevel + \beta_6 Residential Area + \epsilon$$

$$(3) SI Engage_{student_i} = \beta_0 + \beta_1 Exposure CP + \beta_2 Exposure EACT + \beta_3 Age + \beta_4 Gender + \beta_5 EducationLevel + \beta_6 Residential Area + \epsilon$$

$$(4) SI Engage_{wi_i} = \beta_0 + \beta_1 Exposure WI + \beta_2 Age + \beta_3 Gender + \beta_4 EducationLevel + \beta_5 Residential Area + \epsilon$$

## CHAPTER 4 – RESULTS AND DISCUSSION

### 4.1 Results

#### 4.1.1 Results on FL

Table 3 presents the results for the self-perception of FL. When asked what their perception of their level of FL is, most respondents considered their FL levels to be moderate (60.71%) with only 15.26% of the sample rating it as high. This self-assessment of the level of comfort with their financial knowledge indicates that most respondents feel confident in their financial knowledge. Nevertheless, there is still a significant proportion of participants that classify their FL level as low (20.78%) or lower (3,25%) which can ultimately impact their financial behaviour, attitude and ability to make informed investment decisions.

**Table 3 - Perception of Self-FL**

Self_FL	Overall sample			Male	Female
	Freq.	Percent	Cum.	Percent	Percent
None	1	0.32	0.32	0.00	0.77
Very Low	9	2.92	3.25	2.25	3.85
Low	64	20.78	24.03	15.17	28.46
Moderate	187	60.71	84.74	64.61	55.38
High	47	15.26	100.00	17.98	11.54
Total	308	100.00		100.00	100.00
				t-test: 3.161***; $p = 0.002$	

When we evaluate the responses regarding the self-perception of FL and analyse the gender differences in the results, we can conclude that male respondents tend to demonstrate more confidence in their level of FL, majority classifying their self-level of FL as “Moderate” (64.61%) or “High” (17.98%), when compared with women that tend to classify their level as “Moderate” (55.38%) and low (28.46%) showing less comfort in their financial knowledge. When comparing the means for the responses, we conclude that there is a statistically significant difference in the self-perception of FL mean ( $p < 0,01$ ), which aligns with prior research performed by (Bucher-Koenen et al., 2017) where they analysed gender differences in FL across multiple countries and concluded that women’s self-reported financial literacy measures are lower when compared with men.

Table 4 presents the results for FL as measured in the survey. The FL levels were measured through the completion of three questions. For each correct answer, the respondents

aggregated one point to their total score. The results, as shown in table 4, reveal that most respondents performed well with 62.66% answering all three questions correctly indicating a high level of financial understanding and 27.27% scoring at least two questions correctly. Only a small percentage of participants scored 0 (3.25%) or one correct answer (6.82%). These results suggest that the sample has a relatively high level of FL which aligns with the educational attainment results.

**Table 4 - FL Scores**

FL	Freq.	Percent	Cum.
0 - None	10	3.25	3.25
1 - Low	21	6.82	10.06
2 - Medium	84	27.27	37.34
3 - High	193	62.66	100.00
Total	308	100.00	

To examine potential differences in FL levels across various groups, independent samples t-tests were conducted to compare the mean FL scores between working professionals and students, as well as between male and female participants. It was assumed that significant differences in FL levels would exist between these groups. Table 5 presents the results of the t-tests.

**Table 5 - Independent Two Sample T-Tests - FL**

T-test	Groups	Obs	Mean	S.D.	t	df	p
1	WI	237	2.451	0.783	-1.771*	306	0.078
	Students	71	2.634	0.681			
2	Male	178	2.596	0.709	2.773***	306	0.006
	Female	130	2.353	0.815			
3	Male - WI	147	2.565	0.732	2.887***	235	0.004
	Female - WI	90	2.267	0.832			
4	Male - Student	31	2.742	0.575	1.180	69	0.242
	Female - Student	40	2.550	0.749			

\*, \*\* and \*\*\* indicate statistical significance at 10%, 5% e 1%, respectively.

According to table 5, the mean level of FL for students (M=2.634, SD=0.681, N=71) is higher than the mean of working professionals (M=2.451, SD=0.783, N=237), however the

difference in means (-0.182) is relatively small. The difference between the two groups is only marginally significant at 10%.

When analysing the gender differences between groups, for the overall sample and for the two main groups working individuals and students, the results show that there is a statistically significant difference between the measured FL scores for male (M=2.596, SD=0.709, N=178) and female (M=2.353, SD=0.815, N=130) respondents. Accordingly, male respondents have higher FL scores than female respondents ( $p < 0,01$ ). The results hold when analysing Working Individuals (WI), the difference is slightly larger and statistically significant ( $p < 0,01$ ). However, among students, the difference between the gender is not statistically significant ( $p > 0,1$ ).

Additionally, the ANOVA test was conducted to determine whether there are significant differences in FL scores among individuals based on their residential areas (urban, suburban and rural). The results demonstrated that urban residents (M=2.649, SD=0.604, N=134) tend to have higher FL scores on average when compared to suburban (M=2.392, SD=0.824, N=97) and rural residents (M=2.351, SD=0.885, N=77). The p-value indicates that there is a statistically significant difference in FL scores between individuals living in urban, suburban and rural areas ( $F(2,305) = 5.13, p < 0,01$ ). Furthermore, to test the assumption for equal variances between groups, the Chi-Squared test results indicated a significant difference in variances across the groups ( $p < 0,01$ ). We can conclude that Residential Area influences the differences in means across urban, suburban and rural areas with urban respondents having the highest mean FL score, underscoring the role of access to information (Raya, 2024).

**Table 6 - ANOVA test - FL**

<b>Groups</b>	<b>Obs</b>	<b>Mean</b>	<b>S.D.</b>	<b>Chi2(2)</b>	<b>p</b>
Urban	134	2.649	0.604	17.219***	0.000
Suburban	97	2.392	0.824		
Rural	77	2.351	0.885		
Total	308	2.494	0.764		

<b>Source</b>	<b>SS</b>	<b>df</b>	<b>MS</b>	<b>F</b>	<b>p</b>
Between Groups	5.826	2	2.913	5.13***	0.006
Within Groups	173.160	305	0.568		
Total	178.987	307	0.583		

### 4.1.2 Results on Sustainability Awareness

Table 7 presents the results for sustainability awareness. The results on ESG and SI highlight varying levels of familiarity and understanding of the topics among the respondents. The answers show us that while there is a relatively high level of familiarity with SI with 38.96% of the sample stating that they are “Moderately familiar” and 11.36% admitting to be “Very Familiar”, there are significant gaps in respect of knowledge areas particularly concerning ESG awareness where 41.23% of the respondents admitted not being able to identify the ESG criteria and only 46.10% of the sample being able to correctly do so. The results also reveal that there is a generally positive attitude towards ESG considerations with majority of respondents recognizing its importance (46.10% of respondents saying they think it is “Important” and 20.78% think it as “Very important”) and believing in the long-term value creation for shareholders (52.27% - respondents that selected “Agree” or “Totally Agree” when asked their opinion on the affirmation). Nevertheless, there is a substantial portion that remains neutral regarding ESG matters (28.57%) indicating that there is still work to be done to in raising awareness to strengthen the individuals understanding of ESG criteria.

**Table 7 - Sustainability Awareness Results**

<b>Familiarity with SI</b>	<b>Freq</b>	<b>Percent</b>	<b>Cum.</b>
Not familiar	56	18.18	18.18
A little familiar	97	31.49	49.68
Moderately familiar	120	38.96	88.64
Very familiar	35	11.36	100.00
<b>Total</b>	308	100.00	

<b>Identification of ESG Criteria</b>	<b>Freq</b>	<b>Percent</b>	<b>Cum.</b>
Environmental and Social Goals	2	0.65	0.65
Environmental and Sustainable Goals	9	2.92	3.57
Environmental, Social and Governance	142	46.10	49.68
Environment, Sustainability and Governance	28	9.09	58.77
I don't know	127	41.23	100.00
<b>Total</b>	308	100.00	

<b>Opinion on ESG Importance</b>	<b>Freq</b>	<b>Percent</b>	<b>Cum.</b>
Not important	7	2.27	2.27
A little important	7	2.27	4.55
Neutral	88	28.57	33.12
Important	142	46.10	79.22
Very important	64	20.78	100.00

<b>Total</b>	308	100.00	
<b>Opinion on Long-Term value creation</b>	Freq.	Percent	Cum.
Totally Disagree	5	1.62	1.62
Disagree	9	2.92	4.55
Neutral	133	43.18	47.73
Agree	116	37.66	85.39
Totally Agree	45	14.61	100.00
<b>Total</b>	308	100.00	

To examine potential differences in SFL levels across various groups, independent samples t-tests were conducted to compare the mean SFL scores between working professionals and students, as well as between male and female participants. Table 8 presents the results of the t-tests.

**Table 8 - Independent Two Sample T-Tests - SFL**

<b>SFL</b>							
<b>T-test</b>	<b>Groups</b>	<b>Obs</b>	<b>Mean</b>	<b>S.D.</b>	<b>t</b>	<b>df</b>	<b>p</b>
<b>1</b>	WI	237	3.131	1.320	-6.493***	306	0.000
	Students	71	4.324	1.481			
<b>2</b>	Male	178	3.281	1.398	-1.7802*	306	0.076
	Female	130	3.577	1.499			
<b>3</b>	Male - WI	147	3.102	1.307	-0.4281	235	0.669
	Female - WI	90	3.178	1.346			
<b>4</b>	Male - Student	31	4.129	1.522	-0.976	69	0.3325
	Female - Student	40	4.475	1.450			

\*, \*\* and \*\*\* indicate statistical significance at 10%, 5% e 1%, respectively

The mean level of SFL for students (M=4.324, SD=1.481, N=237) is significantly higher than that of the working professionals (M=3.131, SD=1.320, N=71). The test shows a large difference of 1.193 points ( $p<0,01$ ) suggesting that students tend to have better awareness and knowledge of sustainability matters. When analysing the gender differences between groups, the difference in SFL between male and female respondents is marginally significant at the 10% level ( $p<0,1$ ) demonstrating that women have slightly higher SFL scores than men. Within the groups WI and students, the results did not show significant gender differences in SFL. We can conclude that students are more aware with SFL, highlighting

the role of education and academic exposure to sustainability in shaping their SFL (Hastings et al., 2013).

*4.1.3 Results on Financial Behaviour*

The financial behaviour results are presented in the following section. According to table 9, that presents the savings behaviour of individuals, there is a mixed picture among the respondents. The majority of participants saves regularly with 68.51% of the population saving on a monthly basis and only 16.23% admitting not saving at all which may reflect the existence of financial constraints that prevents them from saving and/or lack of habit in saving regularly. Interestingly, students save more regularly than WI (77.46% saving monthly when compared with 65.82% WI) which may be derivate from different financial capacities, priorities and less financial responsibilities. Furthermore, we can also observe that women tend to save more regularly than men (74.62% saving monthly when compared with 64.04% WI), demonstrating a safer savings pattern. This finding is consistent with prior research that states that women are perceived to be more risk-averse than men and therefore saving more (Dang & Viet Nguyen, 2021; Lee & Pocock, 2007; Kureishi & Wakabayashi, 2013).

**Table 9 – Savings Frequency**

Savings Frequency	Freq.	Percent	Cum.	Students	WI	Male	Female
Monthly	211	68.51	68.51	77.46	65.82	64.04	74.62
Quarterly	21	6.82	75.32	7.04	6.75	7.30	6.15
Twice a year	9	2.92	78.25	1.41	3.38	2.81	3.08
Once a year	17	5.52	83.77	2.82	6.33	7.87	2.31
Doesn't save	50	16.23	100.00	11.27	17.72	17.98	13.85
Total	308	100.00					

Figures 1 and 2 illustrate the results related to respondents' financial engagement in the investment of their savings, highlighting their preference for traditional and/or sustainable investments. The results show that for traditional investment engagement, more than half of the participants invest their savings while a significant portion of the sample (48.05%) responded that they do not invest their savings meaning that there might be a preference for keeping them in low risk/liquid form, preferring to keep their money uninvested or even not being able to invest at all (Figure 1).

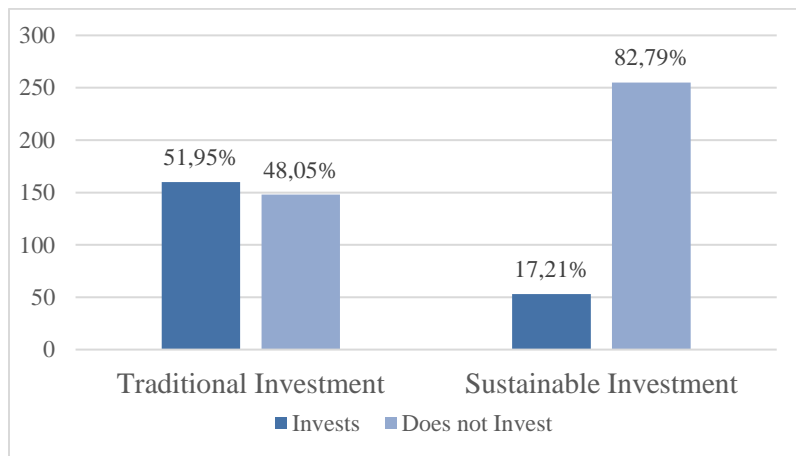


The results also show that a substantial portion of individuals does not save or invests their savings which highlights the need for targeted financial education and support to encourage better financial planning and behaviour.

When analysing the results regarding engagement with sustainable investment, we observe that only a small percentage of the sample (17.21%) engages in the practice which reflects a limited adoption of this investment strategy.

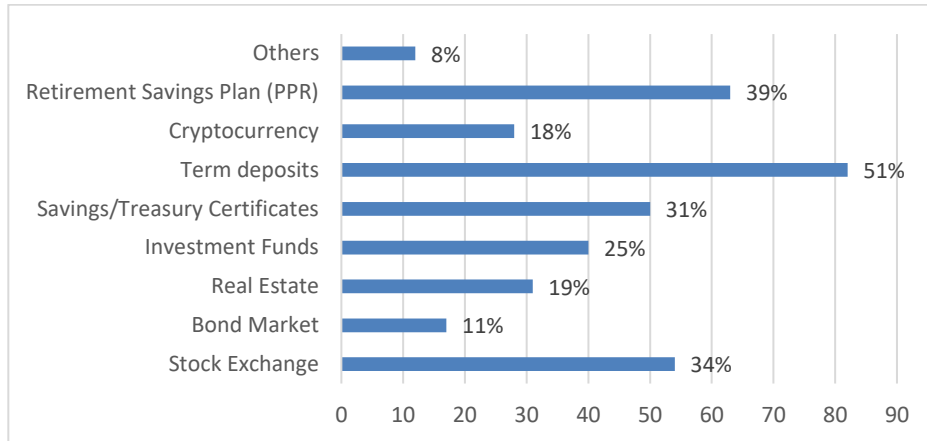
The low levels of engagement indicate significant potential for growth in sustainable investing. This presents an opportunity for targeted initiatives aimed at raising awareness, providing education, and highlighting the benefits of sustainable investments (Fu et al., 2023; de Jong & Rocco, 2022).

**Figure 1 - Financial Engagement (Traditional vs SI)**



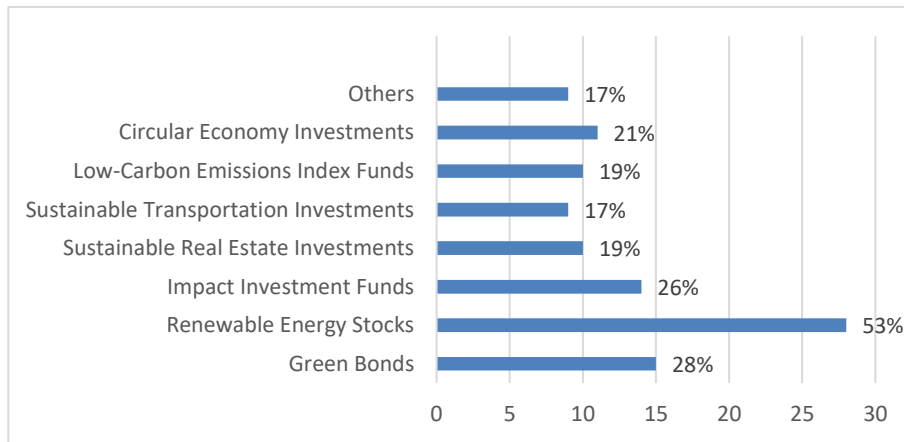
Based on the results obtained and presented in Figure 2, we can observe that term deposits, which are low-risk investments, are the most preferred option among those who engage in investing, with 51% of individuals choosing this form of investment. This is followed by investments in retirement savings plans (PPR) at 39%, and participation in the stock exchange at 34%. The data reflects a diverse range of investment preferences, with a significant portion of the population gravitating towards safer, more traditional options. However, we can also notice the participation in instruments with higher risk, indicating a balanced approach to risk among investors.

**Figure 2 – Traditional Investment Patterns by type**



When we analyse the samples’ sustainable investment patterns, we can observe that the most preferred SI option is Renewable Energy Stock (53%) followed by Green Bonds (28%) and Impact Investment Funds (26%).

**Figure 3 - Sustainable Investment Patterns by type**



In addition, the results for the respondents’ investment patterns when segmented into groups working individuals and students; and male and female respondents, showed interesting results that highlight a tendency determined by generational age (WI vs Students) and gender. The following table presents the findings (Table 10):

**Table 10 - Differences in Investment Patterns**

Traditional Investment	WI	Students	t-test	p	Male	Women	t-test	p
Stock Exchange	29.03%	<b>50,00%</b>	-2.369**	0.019	<b>40.37%</b>	19.61%	2.627***	0.010
Bond Market	9.68%	13.89%	-0.719	0.474	<b>13.76%</b>	3.92%	1.891*	0.060
Real Estate	21.77%	11.11%	1.425	0.156	21.10%	15.69%	0.804	0.423
Investment Funds	20.97%	<b>38.89%</b>	-2.206**	0.029	<b>29.36%</b>	15.69%	1.870*	0.063
Savings/Treasury Certificates	31.45%	30.56%	0.102	0.919	28.44%	37.25%	-1.118	0.265
Term deposits	<b>54.84%</b>	38.89%	1.690*	0.093	48.62%	56.86%	-0.968	0.334
Cryptocurrency	15.32%	25,00%	-1.345	0.181	<b>23.85%</b>	3.92%	3.169***	0.002
Retirement Savings Plan (PPR)	<b>44.35%</b>	22.22%	2.422**	0.017	41.28%	35.29%	0.719	0.473

N: WI - 124; Students - 36 & Male - 109; Female - 51

Sustainable Investment	WI	Students	t-test	p	Male	Women	t-test	p
Green Bonds	22.22%	41.18%	-1.430	0.159	21.88%	38.10%	-1.278	0.207
Renewable Energy Stocks	55.56%	47.06%	0.569	0.572	<b>68.75%</b>	28.57%	3.058***	0.004
Impact Investment Funds	19.44%	<b>41.18%</b>	-1.688*	0.097	21.88%	33.33%	-0.915	0.364
Sustainable Real Estate Investments	16.67%	23.53%	-0.587	0.560	12.50%	28.57%	-1.465	0.149
Sustainable Transportation Investments	16.67%	17.65%	-0.087	0.931	21.88%	9.52%	1.164	0.250
Low-Carbon Emissions Index Funds	22.22%	11.76%	0.898	0.373	18.75%	19.05%	-0.027	0.979
Circular Economy Investments	16.67%	29.41%	-1.059	0.295	15.62%	28.57%	-1.129	0.264

N: WI - 36; Students - 17 & Male - 32; Female - 21

\*, \*\* and \*\*\* indicate statistical significance at 10%, 5% e 1%, respectively

The results revealed several investment choice differences driven by age and gender factors. We can verify that the younger generation is more inclined towards riskier investments as participation in the stock exchange market and investment funds while on the other hand, the older generation opts more for safer investment options as term deposits and retirement savings plans. In terms of gender, men also show a trend of engagement in riskier assets similar to students and additionally cryptocurrency assets. When analysing the results for the differences in SI, we can verify a trend that students show higher interest in SI alternatives than men, but this relationship appears to be statistically significant mainly for engagement with Impact Investment Funds. In terms of gender for SI engagement differences, there is a trend of women showing more interest than men in SI alternatives but the only statistically significant relationship for Renewable Energy Stocks opposes the trend, showing that men are more inclined towards these assets than women aligning with their choices for riskier investments (Hira & Loibl, 2008).

Finally, table 11 presents the findings on the sources of information individuals rely on to guide them on their financial decisions.

**Table 11 - Financial Behaviour: Information Sources**

Information Source	WI	Students	t-test	p	Male	Women	t-test	p
Books	16.03%	15.49%	0.109	0.913	<b>20.22%</b>	10,00%	2.439**	0.015
Websites/Online	50.21%	<b>66.20%</b>	-2.385**	0.018	57.87%	48.46%	1.637	0.103
Financial Consultants	12.66%	9.86%	0.635	0.526	12.36%	11.54%	0.218	0.827
Bank Manager	<b>33.33%</b>	9.86%	3.952***	0.000	25.28%	31.54%	-1.208	0.228
Friends and Family	25.74%	<b>53.52%</b>	4.527***	0.000	20.79%	<b>47.69%</b>	5.192***	0.000
Seminars/Workshops	8.02%	12.68%	-1.197	0.232	10.11%	7.69%	0.728	0.467
Financial Platforms	18.14%	<b>32.39%</b>	2.587***	0.010	<b>24.72%</b>	16.92%	1.649*	0.100
Others	0.84%	1.41%	-0.424	0.672	1.12%	0.77%	0.312	0.755

N: WI - 237; Students - 71 & Male - 178; Female - 130

\*, \*\* and \*\*\* indicate statistical significance at 10%, 5% e 1%, respectively

The results on the sources of information of the sample revealed a mixed pattern across the analysed demographics. The findings show that students and women tend to rely on informal sources of information such as websites and online sources as well as obtaining advice from friends and family. On the other hand, men and working professionals tend to resort to formal sources such as books and/or financial consultants to advise them on their financial decisions.

The existing research between formal and informal sources of financial knowledge follows a pattern that our findings support, where younger generations and women prefer to inform themselves via family and friends or digital methods (Barclays, 2021) while the prevalent sources among older generations reflect a traditional approach to financial planning.

Overall, the results obtained highlighted several relationships between FL, level of educational attainment, residential area and financial behaviour regarding savings and participation in investment activities (traditional and/or sustainable). Table 12 and 13 present the cross-analysis between FL and participation in traditional and sustainable investment along with the chi-squared results between the FL Scores and engagement in traditional investment/sustainable investment respectively. We can observe that higher FL is usually linked with better financial participation while also demonstrating that even among this population, there is still a considerable portion of the respondents that do not engage in

sustainable investment activities suggesting that other factor such as lack of interests/awareness may influence this decision. Education and residential area appear to be linked to higher FL emphasizing the role of access to resources and information in the shaping of financial knowledge (Hastings et al., 2013; Jin & Chen, 2020). The Chi-squared results demonstrate the significance of the findings, with higher FL correlating significantly with engagement with traditional investment ( $p < 0.01$ ) opposed to the correlation with SI investment that appears to be statistically insignificant ( $p > 0,1$ ).

**Table 12 - Tabulation of FL and Traditional Investment**

FL	Savings Investment		
	Does not invest their savings	Invests their savings	Total
0 - None	7	3	10
1 - Low	13	8	21
2 - Medium	51	33	84
3 - High	77	116	193
<b>Total</b>	148	160	308
<b>Chi2(3) = 14.082; p = 0.003</b>			

**Table 13 - Tabulation of FL and SI Engagement**

FL	SI Engagement		
	Does not engage in SI	Engages in SI	Total
0 - None	9	1	10
1 - Low	18	3	21
2 - Medium	73	11	84
3 - High	155	38	193
<b>Total</b>	255	53	308
<b>Chi2(3) = 2.322; p = 0.508</b>			

## 4.2. Regression Results

Table 14 presents the results of the regression analysis using a logistic regression model with robust standard errors, in order to analyse an individual's likelihood of engaging in sustainable investment.

**Table 14 - Regression Results – SI Engage**

VARIABLES	(1) SI Engage	(2) SI Engage	(3) SI Engage Students	(4) SI Engage WI
SFL		0.267** (0.131)		
FL	0.217 (0.243)	0.081 (0.258)		
Exposure CP			0.655 (0.718)	
Exposure EACT			1.232* (0.718)	
Exposure WI				2.426*** (0.461)
Age	-0.013 (0.013)	-0.009 (0.013)	0.004 (0.044)	0.003 (0.018)
Female	-0.041 (0.334)	-0.089 (0.344)	0.224 (0.765)	-0.422 (0.453)
Bachelor's Degree	-1.424*** (0.440)	-1.515*** (0.442)	-2.170* (1.220)	-1.278** (0.533)
Master's Degree	0.094 (0.404)	-0.227 (0.431)	-0.260 (1.224)	0.020 (0.560)
Doctorate Degree	-0.959 (1.104)	-1.214 (1.079)	-0.452 (1.785)	
Postgraduate Degree	-0.278 (0.806)	-0.462 (0.840)		-0.567 (0.948)
Suburban Area	-0.452 (0.389)	-0.457 (0.399)	-2.370** (1.110)	0.324 (0.509)
Rural Area	-0.487 (0.426)	-0.391 (0.427)	-0.256 (0.997)	0.165 (0.520)
Constant	-0.878 (0.996)	-1.548 (1.031)	-1.088 (1.641)	-2.071** (1.006)
Observations	308	308	71	232
R-squared	0.0748	0.0889	0.2794	0.1953

\*, \*\* and \*\*\* indicate statistical significance at 10%, 5% e 1%, respectively

Model (1) shows the results for the first hypothesis (H1), that states that there is a positive association between the level of FL and engagement in sustainable investment practices for

students and working individuals in Portugal. When breaking down the significances for each variable, we can identify that while FL's coefficient is positive suggesting that higher FL results in higher likelihood of engagement in SI, the relationship does not have a statistical significance ( $\beta=0.217, p>0,1$ ). We can observe that having a bachelor's degree in comparison to lower levels of education results in a statistically significant negative relationship with engagement in SI ( $\beta=-1.424, p<0,01$ ). The effects of age, gender and residential area are not statistically significant meaning that they may not be strong predictors of sustainable investment. Overall, the model does not support H1 and therefore we reject the hypothesis of a relationship between FL and engagement in SI.

Model (2) show the results for the second hypothesis (H2), that states that individuals with greater awareness of ESG factors are more likely to prioritize sustainable investments. When running the regression for model (2), we can verify that the coefficient for SFL is positive and statistically significant ( $\beta=0.267, p<0,05$ ) meaning that an increase of the level of SFL would result in a greater likelihood of engaging in sustainable investment. Once again, as observed in model (1) we can verify that the coefficient for individual's that hold a bachelor's degree is negative and significant ( $\beta=-1.515, p<0,01$ ) meaning they are less likely to engage in sustainable investment compared to those with lower education levels. This result supports H2 suggesting that individuals with greater awareness of sustainable investment aspects tend to prioritize sustainable investments which emphasizes the importance of ESG awareness and targeted education for driving sustainable investment behaviour.

Model (3) evaluates the results for H3a that analyses the likelihood of a student engaging in sustainable investment based on their exposure to SI information through their university via curricular activities and/or extracurricular activities. The result indicates that the coefficient for exposure to SI through the curricular plan is positive suggesting that students exposed to this information are more likely to engage in SI however, the relationship is not statistically significant ( $\beta=0.655, p>0,1$ ) meaning that it is not possible to conclude regarding its effect in this sample.

The exposure to SI via extracurricular activities promoted by universities also appears to be positive and higher than the curricular exposure meaning that students who have exposure by this source are more likely to invest sustainably. The variable is significant indicating that

extracurricular activities promoted by the university impact student's preferences towards sustainable investments ( $\beta=1.232, p<0,1$ ).

We can also observe that there is a significant negative effect for students who live in a suburban area compared to those who live in urban areas which indicates a potential geographic influence on investment behaviour ( $\beta=-2.370, p<0,05$ ).

Overall, while the results for model (3) suggest that university-provided information on SI has the potential to increase the likelihood of engagement in SI, the evidence obtained is not strong enough to confirm the H3a confidently potentially due to the small sample size for students and students who engage in SI.

Finally, model (4) shows the results for H3b that analyses the likelihood of working professionals' engagement in SI based on the exposure to SI information from their employer. The exposure to SI information via employer is positive and significant ( $\beta=2.426, p<0,01$ ) suggesting that working professionals who receive this type of information are more likely to engage in sustainable investing. This result supports H3b which states that employer-provided SI exposure increases participation in sustainable investments highlighting the importance of employer-provided resources in promoting SI practices among employees.

Across the four models we can take away that SFL appears to have a more critical role than general FL in predicting engagement in SI. This result suggests that individuals tend to need knowledge related to sustainability to participate in such activities.

Employer-provided information plays a significant role in promoting SI among working professionals while on the other hand, university extracurricular activities seem to have a similar influence on students compared to information provided by students' curricular plan that presented a lower impact on our sample.

In all four models tested we can verify a negative significant relationship for individuals' holding a bachelor's degree and engagement in sustainable investment when compared to individuals with lower levels of education which contradicts the reviewed literature on the influence of education in investment behaviour.

Demographic factors regarding age, gender and residential area generally did not play significant roles in the prediction of SI engagement, though geographic variances may exist for students living in suburban areas when compared to students living in urban areas.



### *4.3 Discussion*

The results of the analysis performed regarding the relationship between FL and SI among students and WI, tested across four models, revealed several key insights. The results on the first hypothesis (H1) regarding the FL influence in predicting SI engagement, were not statistically significant meaning that FL by itself is not a predictor of engagement in SI.

When comparing the results with prior studies, some researchers have found that individuals with higher FL levels are more likely to engage in diverse and responsible investment portfolios (Lusardi et al., 2014), however, the lack of significance of the results obtained is contradicting, aligning with other research that highlights the complexity of the engagement in SI, which may require specific knowledge besides FL itself (Filippini et al., 2024; Varmaz et al., 2021).

The findings for the second model that analyses the relationship between SFL and SI engagement supported the tested hypothesis (H2) highlighting SFL's statistical significance in predicting SI engagement, particularly for students. Respondents with higher levels of SFL demonstrated more likeliness of investing in responsible financial products (Yucel et al., 2023; Bethlendi et al., 2022). The comparison of means between students and working professionals indicated that students tend to have higher SFL scores potentially due to higher exposure to ESG-related topics via academic curricula. In sum, the results for H2 align with other findings regarding the importance of specific knowledge related to sustainable finance in influencing SI engagement (Filippini et al., 2024). Additionally, the analysis also revealed that gender plays a role in determining SFL with female respondents showing higher levels of SFL scores when compared with male participants. This finding shows consistency with previous research showing that women tend to consider social and environmental factors when making their investment decisions (Degryse et al., 2023).

The results for exploring the effects of SI exposure from employers and universities, via academic plan or extracurricular activities, on the likelihood of engaging in SI showed that for working professionals, the availability of SI information in a professional environment is a significant predictor of SI engagement; for students SI exposure via extracurricular activities had a significant impact on their investment behaviours and preference towards responsible financial products.

Previous literature has demonstrated that sociodemographic factors are less influential on SI preferences than behavioural factors, which is a conclusion supported by the results of this study (Varmaz et al., 2021).

Furthermore, the findings suggests that younger individuals and men are more risk-tolerant showcasing this behaviour when opting for investments characterized as volatile and dynamic, while older individuals and women showed to be more risk-averse, demonstrating a preference towards safer investment options. As previously mentioned, the findings agree with the extended literature on the age and gender disparities in financial behaviour among individuals (Yao et al., 2023). Ensuring that individuals have access to clear and comprehensive financial information will help the bridge between the ongoing age and gender gaps in financial knowledge so they can apply it in their everyday decision-making process.

## CHAPTER 5 - CONCLUSION

### *5.1 Implications on Policy and Role of Institutions*

This study has important implications for the development of sustainable finance policies targeted towards the Portuguese population. The emergence of SFL as a significant contributor for SI engagement, can implicate that policy-makers should develop policies towards the information spread of sustainable finance topics within academic realms and to the general public, ensuring that individuals are equipped with the knowledge needed to make informed investment decisions and contribute to the achievement of the SDG and overall societal improvement; on the other hand, financial institutions can contribute to this effort through the innovation of their product offers and contribution to the accessibility of responsible investment options in a clear, comprehensive and transparent way (Fu et al., 2023).

Moreover, the findings also suggest that workplace initiatives encourage individuals in their engagement in sustainable investment as well as academic institutions encourage their students mainly via extracurricular activities (as shown in the results). Companies and universities can play a crucial role in offering SI education and encouraging professionals and student, contributing to the transition to a more sustainable economy (Filippini et al., 2024).

The limited engagement in SI and lower SFL levels observed among the sample highlights a need for public awareness campaigns that emphasize the benefits and availability of SI options (Migliorelli, 2021). The results show that individuals acknowledge the importance of sustainability and its societal benefits, but a considerable portion of the sample remains neutral on the topic. This suggests that there is room for improvement in raising awareness and increasing engagement with SI alternatives. The combined effort of institutions plays a crucial role in spreading knowledge and further enhancing public understanding and commitment to sustainability.

### *5.2 Limitations and Suggestions for Future Research*

While the study provides valuable insights for research, there are some limitations that need to be acknowledged. Firstly, the relatively small sample size, particularly in the subgroups

WI and Students, might limit the generalization of the findings. Future research could benefit from a larger and more diverse sample to improve the conclusions obtained from the results.

Second, the low financial engagement within the sample, resulted in a very limited number of respondents that actively engaged in sustainable investing which consequently has an impact on the interpretation of the results. This limitation provides an opportunity to research the effects on a sample that is financially active. Furthermore, the measurement for both FL and SFL followed a simple straightforward approach when both dimensions are relatively complex meaning that further research can benefit from the design of more tailored and comprehensive approaches to the measurement of these traits. Additionally, further studies could contribute to the topic through the inclusion of other variables such as personal values, cultural factors, type of education path throughout life, and other relevant drivers that further develop our understanding of the drivers of SI participation.

Finally, the absence of clear, legally binding regulatory standards for products labelled as sustainable poses a significant challenge for consumers' understanding of these products. This lack of standardization not only obstructs consumers' ability to make informed comparisons but also discourages active engagement with SI alternatives as individuals may develop scepticism or bias against them. This represents a challenge for research in the measurement of SI engagement when a considerable portion of the population remains indifferent or cautious towards these options. Moreover, the lack of regulation also increases the risk of greenwashing practices, where products are falsely marketed as sustainable without meeting actual ESG criteria (Gatti et al., 2019).

### *5.3 Conclusion*

In conclusion, this thesis aimed to explore the impact of FL on SI practices university students and working professionals in Portugal. The research was driven by the main question on how does FL influences SI engagement within the targeted population. Through the study performed, several insights emerged that deepen our understanding of this relationship, extending the few existing literature and providing practical implication for policy development and institutional action.

The findings of the research indicate that while financially literate individuals tend to be more financially engaged, this engagement is more evident in traditional investment

methods. FL does not seem to be significant in the explanation of the variability of likelihood of SI engagement. On the other hand, SFL, that emerged as a deeper understanding of sustainability criteria combined with financial literacy, showed to be the main driver of the participation in SI investment alternatives (Yucel et al., 2023). Students demonstrated stronger SFL compared to WI suggesting that the younger individuals are more aware of the importance of ESG factors and its application in their investment decisions whereas older individuals appear to be less informed or less concerned about ESG factors. This gap in awareness persists even when individuals obtained higher levels of FL suggesting that despite their financial knowledge, they may still lack concern or understanding of sustainability-related criteria.

Finally, in light of the findings, the study emphasizes the need for targeted policies and initiatives to address the gaps in FL and SI engagement. Educational institutions, employers and policy makers should collaborate to integrate SI topics into curricula and workplace training programs, addressing this gap by ensuring that individuals are equipped with the knowledge to make their financial decisions.

## REFERENCES

- Almeida, L., Chanoca, J., & Tavares, F. (2024). Financial Literacy: A Case Study for Portugal. *Journal of Risk and Financial Management*, 17(5). <https://doi.org/10.3390/jrfm17050215>
- Amir, A. Z., & Serafeim, G. (2018). Why and how investors use ESG information: Evidence from a global survey. *Financial Analysts Journal*, 74(3), 87–103. <https://doi.org/10.2469/faj.v74.n3.2>
- Anderson, A., & Robinson, D. T. (2022). Financial Literacy in the Age of Green Investment. *Review of Finance*, 26(6), 1551–1584. <https://doi.org/https://doi.org/10.1093/rof/rfab031>
- Barclays. (2021, October 11). *Women turn to family and friends before making investment decisions*. <https://home.barclays/news/press-releases/2021/10/women-turn-to-family-and-friends-before-making-investment-decisions0/>
- Berg, F., Kölbel, J. F., & Rigobon, R. (2022). Aggregate Confusion: The Divergence of ESG Ratings\*. *Review of Finance*, 26(6), 1315–1344. <https://doi.org/10.1093/rof/rfac033>
- Bethlendi, A., Nagy, L., & Póra, A. (2022). Green finance: the neglected consumer demand. *Journal of Sustainable Finance and Investment*. <https://doi.org/10.1080/20430795.2022.2090311>
- Bucher-Koenen, T., Lusardi, A., Alessie, R., & van Rooij, M. (2017). How Financially Literate Are Women? An Overview and New Insights. *Journal of Consumer Affairs*, 51(2), 255–283. <https://doi.org/10.1111/joca.12121>
- Calvet, L. E., Campbell, J. Y., & Sodini, P. (2007). Down or Out: Assessing the Welfare Costs of Household Investment Mistakes. In *Journal of Political Economy* (Vol. 115, Issue 5).
- Christopher, A. R., & Nithya, A. R. (2024). Financial Literacy in Promoting Sustainable Finance. *Proceedings of the 3rd International Conference on Reinventing Business Practices, Start-Ups and Sustainability (ICRBSS 2023)*, 353–363. [https://doi.org/10.2991/978-94-6463-374-0\\_31](https://doi.org/10.2991/978-94-6463-374-0_31)
- Clark, G. L., Feiner, A., & Viehs, M. (2015). *From the Stockholder to the Stakeholder: How Sustainability Can Drive Financial Outperformance*. <https://doi.org/https://dx.doi.org/10.2139/ssrn.2508281>

- Cordero, J. M., Gil-Izquierdo, M., & Pedraja-Chaparro, F. (2022). Financial education and student financial literacy: A cross-country analysis using PISA 2012 data. *Social Science Journal*, 59(1), 15–33. <https://doi.org/10.1016/j.soscij.2019.07.011>
- Cui, H., Wang, R., & Wang, H. (2020). An evolutionary analysis of green finance sustainability based on multi-agent game. In *Journal of Cleaner Production* (Vol. 269). Elsevier Ltd. <https://doi.org/10.1016/j.jclepro.2020.121799>
- Dang, H. A. H., & Viet Nguyen, C. (2021). Gender inequality during the COVID-19 pandemic: Income, expenditure, savings, and job loss. *World Development*, 140. <https://doi.org/10.1016/j.worlddev.2020.105296>
- de Jong, M., & Rocco, S. (2022). ESG and impact investing. In *Journal of Asset Management* (Vol. 23, Issue 7, pp. 547–549). Palgrave Macmillan. <https://doi.org/10.1057/s41260-022-00297-7>
- Degryse, H., Giuli, A. Di, Sekerci, N., & Stradi, F. (2023). *Sustainable investments: One for the money, two for the show*. <https://ssrn.com/abstract=4411343>
- Dumitrescu, A. (2022, March 29). *Leaders with sustainable finance literacy*. <https://Dobetter.Esade.Edu/En/Sustainable-Financial-Literacy>.
- Dwyer, R. E., McCloud, L., & Hodson, R. (2011). Youth debt, mastery, and self-esteem: Class-stratified effects of indebtedness on self-concept. *Social Science Research*, 40(3), 727–741. <https://doi.org/10.1016/j.ssresearch.2011.02.001>
- Eccles, R. G., Ioannou, I., & Serafeim, G. (2014). The Impact of Corporate Sustainability on Organizational Processes and Performance. *Management Science*, 60(11), 2835–2857. <https://doi.org/10.1287/mnsc.2014.1984>
- European Commission. (2021). *Overview of Sustainable Finance*. [https://finance.ec.europa.eu/sustainable-finance/overview-sustainable-finance\\_en](https://finance.ec.europa.eu/sustainable-finance/overview-sustainable-finance_en)
- Fernandes, D., Lynch, J. G., & Netemeyer, R. G. (2014). Financial literacy, Financial education, and Downstream Financial behaviors. *Management Science*, 60(8), 1861–1883. <https://doi.org/10.1287/mnsc.2013.1849>
- Filippini, M., Leippold, M., & Wekhof, T. (2022). Sustainable Finance Literacy and the Determinants of Sustainable Investing. *Swiss Finance Institute Research Paper*, 22(02). <https://en.unesco.org/themes/>

- Filippini, M., Leippold, M., & Wekhof, T. (2024). Sustainable Finance Literacy and the Determinants of Sustainable Investing. *Journal of Banking & Finance*, 163. <https://doi.org/https://doi.org/10.1016/j.jbankfin.2024.107167>
- Fu, C., Lu, L., & Pirabi, M. (2023). Advancing green finance: a review of sustainable development. *Digital Economy and Sustainable Development*, 1(1). <https://doi.org/10.1007/s44265-023-00020-3>
- Gardt, M., Angino, S., Mee, S., & Glöckler, G. (2021). ECB Communication with the wider public. In *ECB Economic Bulletin*. [https://www.ecb.europa.eu/pub/economic-bulletin/articles/2022/html/ecb.ebart202108\\_02~5c1e5a116d.en.html](https://www.ecb.europa.eu/pub/economic-bulletin/articles/2022/html/ecb.ebart202108_02~5c1e5a116d.en.html)
- Gáspár, S., Pataki, L., Barta, Á., Thalmeiner, G., & Zéman, Z. (2023). Consumer Segmentation of Green Financial Products Based on Sociodemographic Characteristics. *Journal of Risk and Financial Management*, 16(2). <https://doi.org/10.3390/jrfm16020098>
- Gatti, L., Seele, P., & Rademacher, L. (2019). Grey zone in – greenwash out. A review of greenwashing research and implications for the voluntary-mandatory transition of CSR. *International Journal of Corporate Social Responsibility*, 4(1). <https://doi.org/10.1186/s40991-019-0044-9>
- Geraldine, J., & Ottemoesoe, R. S. D. (2022). FACTORS AFFECTING SOCIALLY RESPONSIBLE INVESTMENT INTENTIONS INVESTORS IN SURABAYA. *International Journal of Financial and Investment Studies (IJFIS)*, 2(2), 74–82. <https://doi.org/10.9744/ijfis.2.2.74-82>
- Gompers, P. A., Ishii, J. L., & Metrick, A. (2001). Corporate Governance and Equity Prices. *National Bureau of Economic Research*.
- Hastings, J. S., Madrian, B. C., & Skimmyhorn, W. L. (2013). Financial literacy, financial education, and economic outcomes. In *Annual Review of Economics* (Vol. 5, pp. 347–373). <https://doi.org/10.1146/annurev-economics-082312-125807>
- Henager, R., & Cude, B. J. (2019). Financial Literacy of High School Graduates: Long- and Short-Term Financial Behavior by Age Group. *Journal of Family and Economic Issues*, 40(3), 564–575. <https://doi.org/10.1007/s10834-019-09626-2>
- Hira, T. K., & Loibl, C. (2008). Gender Differences in Investment Behavior. In *Handbook of consumer finance research* (pp. 253–270).



- Hoepner, A., Oikonomou, I., Scholtens, B., & Schröder, M. (2016). The Effects of Corporate and Country Sustainability Characteristics on The Cost of Debt: An International Investigation. *Journal of Business Finance and Accounting*, 43(1–2), 158–190. <https://doi.org/10.1111/jbfa.12183>
- Huston, S. J. (2010). Measuring Financial Literacy. *Journal of Consumer Affairs*, 44(2), 296–316. <https://doi.org/10.1111/j.1745-6606.2010.01170.x>
- Ike Raya, S. (2024). Exploring the Influence of Financial Literacy and Lifestyle Choices on Financial Management Practices among Young Workers in Batam City’s Urban Landscape. *CEBONG Journal*, 3(3), 94–100. <https://doi.org/https://doi.org/10.35335/cebong.v3i3.227>
- Instituto Nacional de Estatística (INE). (2024). REMUNERAÇÃO BRUTA MENSAL MÉDIA POR TRABALHADOR 1 Junho 2024. *Estatísticas Do Emprego*.
- Jin, M., & Chen, Z. (2020). Comparing Financial Socialization and Formal Financial Education: Building Financial Capability. *Social Indicators Research*, 149(2), 641–656. <https://doi.org/10.1007/s11205-019-02248-z>
- Klapper, L., & Lusardi, A. (2020). Financial literacy and financial resilience: Evidence from around the world. *Financial Management*, 49(3), 589–614. <https://doi.org/10.1111/fima.12283>
- Klapper, L., Lusardi, A., & Van Oudheusden, P. (2015). Financial Literacy Around the World. *World Bank. Washington DC: World Bank*, 2, 218–237. <http://www.FinLit.MHFI.com>.
- Kölbel, J. F., Heeb, F., Paetzold, F., & Busch, T. (2020). Can Sustainable Investing Save the World? Reviewing the Mechanisms of Investor Impact. *Organization and Environment*, 33(4), 554–574. <https://doi.org/10.1177/1086026620919202>
- Kureishi, W., & Wakabayashi, M. (2013). What motivates single women to save? the case of Japan. *Review of Economics of the Household*, 11(4), 681–704. <https://doi.org/10.1007/s11150-013-9191-z>
- Lee, J., & Pockock, M. L. (2007). Intrahousehold allocation of financial resources: Evidence from South Korean individual bank accounts. *Review of Economics of the Household*, 5(1), 41–58. <https://doi.org/10.1007/s11150-007-9004-3>

- Li, T. T., Wang, K., Sueyoshi, T., & Wang, D. D. (2021). Esg: Research progress and future prospects. In *Sustainability (Switzerland)* (Vol. 13, Issue 21). MDPI. <https://doi.org/10.3390/su132111663>
- Lusardi, A., & Mitchell, O. S. (2007). Financial Literacy and Retirement Preparedness: Evidence and Implications for Financial Education Programs. *Business Economics*, 42, 35–44. <https://doi.org/https://doi.org/10.2145/20070104>
- Lusardi, A., & Mitchell, O. S. (2011). Financial Literacy and Planning: Implications for Retirement Wellbeing. *NATIONAL BUREAU OF ECONOMIC RESEARCH*. <http://www.nber.org/papers/w17078>
- Lusardi, A. S., Bucher-Koenen, T., Currie, J., van Rooij for suggestions, M., de Bassa Scheresberg, C., Kim, H., St Louis, D., Yu, Y., Lusardi, A., & Mitchell, O. S. (2014). The Economic Importance of Financial Literacy: Theory and Evidence. *Journal of Economic Literature*, 52(1), 5–44. <http://www.nber.org/papers/w18952>
- Lusardi, A., & Tufano, P. (2015). Debt literacy, financial experiences, and overindebtedness. *Journal of Pension Economics and Finance*, 14(4), 332–368. <https://doi.org/10.1017/S1474747215000232>
- Migliorelli, M. (2021). What Do We Mean by Sustainable Finance? Assessing Existing Frameworks and Policy Risks. *Sustainability*, 13(975). <https://doi.org/10.3390/su>
- OECD. (2023). *OECD/INFE 2023 International Survey of Adult Financial Literacy*. <http://www.oecd.org/termsandconditions>.
- Pástor, L., Stambaugh, R. F., & Taylor, L. A. (2021). Sustainable investing in equilibrium. *Journal of Financial Economics*, 142(2), 550–571. <https://doi.org/10.1016/j.jfineco.2020.12.011>
- Rossi, M., Sansone, D., van Soest, A., & Torricelli, C. (2019). Household Preferences for Socially Responsible Investments. *Journal of Banking and Finance*, 105, 107–120. <https://doi.org/10.1016/j.jbankfin.2019.05.018>
- Scholten, B., & Sievänen, R. (2013). Drivers of Socially Responsible Investing: A Case Study of Four Nordic Countries. *Journal of Business Ethics*, 115(3), 605–616. <https://doi.org/10.1007/s10551-012-1410-7>
- Stango, V., & Zinman, J. (2009). Exponential growth bias and household finance. *Journal of Finance*, 64(6), 2807–2849. <https://doi.org/10.1111/j.1540-6261.2009.01518.x>

- U.S. Financial Literacy and Education Commission. (2020). *U.S. National Strategy for Financial Literacy 2020*. <https://home.treasury.gov/system/files/136/US-National-Strategy-Financial-Literacy-2020.pdf>
- Varmaz, A., Riebe, K., & Hegner, S. (2021). Sustainable Financial Literacy and Preferences for Sustainable Investments among Young Adults. *Vierteljahrshefte Zur Wirtschaftsforschung*, 90(4), 43–69.
- Yao, M., Rehr, T. I., & Regan, E. P. (2023). Gender Differences in Financial Knowledge among College Students: Evidence from a Recent Multi-institutional Survey. *Journal of Family and Economic Issues*, 44(3), 693–713. <https://doi.org/10.1007/s10834-022-09860-1>
- Yoong, J. (2011). Financial Illiteracy and Stock Market Participation: Evidence from the RAND American Life Panel. In *Financial literacy: Implications for retirement security and the financial marketplace* (pp. 76–93). [https://repository.upenn.edu/prc\\_papers/214](https://repository.upenn.edu/prc_papers/214)
- Yucel, O., Celik, G., & Yilmaz, Z. (2023). Sustainable Investment Attitudes Based on Sustainable Finance Literacy and Perceived Environmental Impact. *Sustainability (Switzerland)*, 15(22). <https://doi.org/10.3390/su152216026>
- Zaimovic, A., Torlakovic, A., Arnaut-Berilo, A., Zaimovic, T., Dedovic, L., & Nuhic Meskovic, M. (2023). Mapping Financial Literacy: A Systematic Literature Review of Determinants and Recent Trends. In *Sustainability* (Vol. 15, Issue 12). Multidisciplinary Digital Publishing Institute (MDPI). <https://doi.org/10.3390/su15129358>

## APPENDIX

### Appendix 1 – Survey

#### 1<sup>st</sup> Section: Introduction

Dear participant,

My name is Érica Carlos, and I am a master's in management (MiM) student at ISEG.

As part of my master's thesis, I am conducting this survey with the aim of understanding if the level of financial literacy among college students and working professionals in Portugal affects their sustainable investment choices.

Completing this survey should take approximately 10 minutes. Please answer all questions carefully and honestly. The data collected through this survey will be strictly used for the purpose of this research. Moreover, all answers provided will be treated confidentially to protect your anonymity.

For any further questions, please send an email to: [ericacarlos@aln.iseg.ulisboa.pt](mailto:ericacarlos@aln.iseg.ulisboa.pt).

Thank you very much for your collaboration!

**1.1** I confirm that I am currently working/I am a student, I understand the objective of this survey and my participation is completely voluntary, giving my consent to it.

- Yes
- No

#### 2<sup>nd</sup> Section: Financial Education and Financial Behaviour

**2.1** How would you evaluate your level of financial literacy?

- None
- Very Low
- Low
- Moderate
- High

**2.2** Assuming that you have €100 invested in a savings account and that the applicable annual interest rate is 2%. Assuming there were no deposits or withdrawals after 5 years, how much do you think would be available in the account?

- **More than 102 €**
- Exactly 102 €
- Less than 102 €
- I don't know

**2.3** Assuming that the applicable annual interest rate for your savings account is 1% and the annual inflation rate is 2%. After a year, what would your purchasing power be with your savings account balance?

- Higher than today
- The same
- **Less than today**
- I don't know

**2.4** Consider the following statement and classify it as true or false: "Buying shares of a single company yields a safer return than buying shares of a mutual fund".

- True
- **False**
- I don't know

**2.5** You usually save money:

- Monthly
- Quarterly
- Every 6 months
- Once a year
- I don't save

**2.6** What percentage of your income do you save on average?

- Open-ended answer

**2.7** Do you usually invest your savings?

- Yes

- No

**2.8** Please specify the type of investments you usually do:

- Stock market
- Bond market
- Real-estate market
- Investment funds
- Savings/Treasury Certificates
- Term deposits
- Cryptocurrencies
- Retirement Savings Plan
- Other:

**2.9** How do you usually inform yourself about your financial decisions?

- I don't search/I don't need
- Books
- Websites/Online articles
- Financial Consultants
- Bank Manager
- Family/Friends
- Seminars/Workshops
- Financial Platforms (ex. Bloomberg)
- Other:

**2.10** In your opinion, what is the main factor that influences your financial decisions?

- Salary/Financial Stability
- Long-term financial goals
- Level of associated risk
- Social and/or environmental values
- Macro/Micro Economic factors
- Luck
- Instinct/"Gut-feeling"

- Other:

**2.11** When it comes to managing your finances, which statement best reflects your attitude:

- I prioritize my long-term financial goals, even if it means making short-term sacrifices.
- I try to balance my short and long-term financial goals.
- I prioritize short-term financial goals, even if it means sacrificing long-term financial stability.
- I focus primarily on meeting immediate financial needs without much consideration for long-term goals.

### **3<sup>rd</sup> Section: Sustainable Finance**

**3.1** Are you familiar with the term sustainable/responsible investing?

- Not familiar
- A little familiar
- Moderately familiar
- Very familiar

**3.2** Are you aware of the meaning of the acronym "ESG"?

- Environmental and Social Goals
- Environmental and Sustainable Goals
- **Environmental, Social and Governance**
- Environment, Sustainability and Governance
- I don't know

**3.3** What distinguishes sustainable investing from traditional investing?

- Exclusive focus on financial return
- **Search for a balance between positive social and/or environmental impact together with financial return**
- Try to avoid all forms of risk

**3.4** Are you aware of any "label" that certifies a particular financial product as "sustainable"?

- Yes (If yes, please specify)
- No

**3.5** Are you aware of any "label" that certifies a certain economic activity as "sustainable"?

- Yes (If yes, please specify)
  - No
- 3.6** In how many of the 3 ESG elements (Environment, Social and Governance) does a company need to stand out to be considered sustainable in the financial markets?
- **In one of the elements**
  - In two of the elements
  - All of the elements - ESG
  - I don't know
- 3.7** Do you believe that ESG considerations are important for the overall well-being of society?
- Not important
  - A little important
  - Neutral
  - Important
  - Very Important
- 3.8** In your opinion, do companies that prioritize the ESG approach tend to create more long-term value for their shareholders?
- Totally disagree
  - Disagree
  - Neutral
  - Agree
  - Totally agree
- 3.9** Of the following options, which do you consider to be sustainable investments?
- **Stock in Renewable Energy Companies**
  - **Impact Investment Funds (investment fund that seeks to generate positive social and environmental impact alongside financial returns)**
  - Stock in Fossil Fuel Companies
  - **Circular Economy Investments**
  - Stock in Tobacco Companies
  - Cryptocurrency Investments



**3.10** Do you usually look for sustainable investment options?

- Yes
- No

**3.11** (If yes) Please specify the type:

- Green Bonds
- Renewable Energy Stocks
- Impact Investment Funds
- Sustainable Real Estate Investments
- Microfinance and Community Development Investments
- Sustainable Transportation Investments
- Low-Carbon Emissions Index Funds
- Circular Economy Investments
- Organic and Sustainable Food Companies
- Other:

#### **4<sup>th</sup> Section**

##### **4.1 Students**

**4.1.1** Do you believe that your curricular plan addresses the topic of financial literacy and/or sustainable investment?

- Yes
- No
- I don't know

**4.1.2** Does your institution promote activities focused on the theme of financial literacy and/or sustainable investment?

- Yes
- No
- I don't know

**4.1.3** (If yes) Have you ever participated in any of the activities?

- Yes

- No

**4.1.3.1** (If yes) How useful did you find the activities?

- Not useful
- A little useful
- Useful
- Very Useful

**4.1.3.2** (If no) What is the main reason for not participating?

- Lack of time
- Lack of interest in the initiative
- I would rather inform myself through other sources
- Other:

**4.1.4** (If no in 4.1.2) If your university promoted initiatives related to these topics, would you be interested in participating?

- No interest
- A little interest
- Some interest
- A lot of interest

**4.1.5** Have you ever considered your institution's sustainable practices in your financial decisions?

- Yes
- No

## **4.2 Working Individuals**

**4.2.1** Does your employer provide information and/or sustainable investment options?

- Yes
- No
- I don't know

**4.2.1.1** (If yes) In what way?

- Workshops
- Internal web
- Partnerships with specialized entities
- Benefits program
- Awareness campaigns
- Other:

**4.2.1.2** (If no) Would you be interested in having this type of information made available by your employer?

- No interest
- Little interest
- Some interest
- A lot of interest

### **5<sup>th</sup> Section: Government-sponsored programs**

**5.1** Are you aware of any government programs aimed at improving the financial literacy of the Portuguese population?

- Yes
- No

**5.2** (If yes) In your opinion, how effective are government programs in improving financial literacy in Portugal?

- Not effective
- A little effective
- Moderately effective
- Very effective

**5.3** Would you consider using government-sponsored resources or programs to improve your level of financial literacy if you felt the need?

- Yes
- No

## **6<sup>th</sup> Section: Demographic data**

### **6.1 Age**

- Open-ended answer

### **6.2 Gender**

- Male
- Female
- Non-binary

### **6.3 Professional Status**

- Student
- Part-time employee
- Full-time employee
- Self-employed

### **6.4 Level of education**

- High-school or lower
- Bachelor's degree
- Master's degree
- Doctorate degree
- Postgraduate degree

### **6.5 Academic Background**

- Management/Finance/Economics
- Social Sciences
- Technology and Science (STEM)
- Humanities
- Other:

### **6.6 Area of residence**

- Urban (Large municipality)
- Suburban (Periphery of a large municipality)
- Rural

**6.7** Gross annual income (Optional):

- I don't have any income
- <€15 000
- €15 001 - €20 000
- €20 001 - €25 000
- €25 001 - €30 000
- >€30 001

**6.8** Would you like to share any additional comments or suggestions on the topic under study?

- Open-ended answer