Who Cares about Sustainable Investments?*

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ABSTRACT

This paper aims to identify which characteristics of individuals, investors or not, lead them to prioritize sustainability over profitability. It also assesses the impact of the sources and types of information used and the impact of non-economic factors on the decision-making of (non-)investors. I conclude that the sensitivity of Portuguese individuals to sustainability issues differs between investors and non-investors, not only with regard to the sources used, but also with regard to the topics on which they look for information. However, as far as values and attitudes are concerned, the results are very similar for investors and non-investors.

Keywords: sustainable investments; retail investor; behavioral finance; sources of information
JEL codes: D14; D91; G11; G41.

THERE HAS BEEN INTENSIVE GROWTH in sustainability-themed financial products and services (SRIs – *Socially Responsible Investments*). In the first half of 2021 in Europe, there was a 20% increase in the value of ESG investment funds[1] under collective management (which amounted to around EUR 1.5 trillion) and a 40% increase in the outstanding value of ESG debt instruments (which amounted to EUR 888 billion).[2]

At the end of August 2021, six investment funds in Portugal had the acronym "ESG" in their trading name. These investment funds managed EUR 481 million, which corresponds to a growth of 24% compared to the end of 2020. With regard to the issue of sustainable debt, 10 companies issued ESG-related debt in the

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[1] Environment, Society and Governance (ESG).

[2] Source: ESMA (https://www.esma.europa.eu/sites/default/files/library/esma50-165-1842_trv2-2021.pdf).

first ten months of 2021, totalling around EUR 3 billion.[3] These sustainable debt issues were placed with institutional investors.

Institutional investors have invested more in ESG products than retail investors, but the active involvement of retail investors is increasing and may be an important driver of future growth in demand for sustainable financial products and services. However, little is known about the knowledge and preferences of individual investors in Portugal. As far as we have been able to ascertain, only Silva and Mendes (2020) have studied the profile of Portuguese investors in sustainable investment funds. Their analysis focuses on the sociodemographic characteristics and financial experience of these investors.

The primary objective of this study is different. Not only does it aim to identify which characteristics of individuals, investors or not, lead them to prioritise sustainability over profitability, it also aims to assess the impact of the sources and types of information used and the impact of non-economic factors on the decision-making of (non-)investors. Beal et al. (2005), for example, conclude that fewer than half of investors consider maximising their wealth to be the most important factor when making investment decisions. In this context, it is relevant to investigate the non-economic factors that may promote sustainability-related financial decisions by investors and non-investors in Portugal.

This analysis leads us to conclude that the sensitivity of Portuguese individuals to sustainability issues differs between investors and non-investors, not only with regard to the sources used, but also with regard to the topics on which they look for information. Investors are more influenced by the information they obtain in newspapers, and non-investors are more influenced by the information obtained during social interaction with family and friends and furthermore by the information disclosed by companies. The influence of the Internet, although less strong from a statistical point of view, also differs for both.

However, as far as values and attitudes are concerned, the results are very similar for investors and non-investors. In fact, the higher the risk tolerance, the lower the sensitivity to environmental sustainability issues and the greater the importance of the expected return on the decision to invest. On the contrary, individuals who derive greater pleasure from spending money than saving for the future opt for profits over environmental sustainability, whereas higher levels of post-materialist values are associated with a stronger preference for sustainable investments. Finally, with regard to trust, which is a determining factor of individual behaviour and decision-making, individuals who are trusting of others are more likely to make sustainable investments.

This text is organized as follows: Section I describes the sample used in this study and Section II presents the methodology adopted. Section III discusses the results obtained and the final section presents the main conclusions.

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[3] Source: CMVM (2022).

I. Sample

The database used in this study is based on a Portuguese Securities Market Commission (*Comissão do Mercado de Valores Mobiliários* (CMVM)) survey of the Portuguese population (covering the mainland and islands), the first phase of which was conducted between 5 October 2020 and 12 November 2020. The sample, stratified by gender, age, region and size of locality, included about 10,000 people aged 18 or over, and the interviews were conducted via Computer Aided Telephone Interviews (CATI) for landlines and mobile phones. This survey identified investors and non-investors in the securities market. In the second phase, which took place between 19 October 2020 and 22 January 2021, representative subsamples of non-investors and investors were surveyed using Computer Assisted Personal Interviews (CAPI), Computer Assisted Web Interviewing (CAWI) or CATI, according to the options available, as these surveys took place at the height of the pandemic.[4]

In the first phase of the survey, 15,173 contacts were drawn up. These contacts identified 9,969 interviewees who were decision makers or co-decision makers on matters of a financial nature within their respective households. These interviewees answered a short questionnaire, which identified those who had (did not have) investments in securities and/or other financial products.

In the second phase of the survey, 2,207 people were interviewed, 706 of whom held securities at the time of the survey (Table 1). Both responded to a common set of questions and to questions specific to each group.

Table 1
Sample

	1st phase respondents		2nd phase respondents	
	Number	**%**	**Number**	**%**
Investors	2,722	27.3	706	32.0
Non-investors	7,247	72.7	1,501	68.0
Total	9,969	100.0	2,207	100.0

This article analyses the answers to the only question relating to sustainability in the survey: "*On a scale of 1 to 5, where 1 (strongly agree), 2 (agree), 3 (neither agree nor disagree), 4 (disagree) and 5 (strongly disagree), please state whether you identify with the statement: I think it is more important to invest in companies that are making a profit than to choose companies that are minimising their environmental impact.*" Analysing the responses allows us to gain a better understanding of how investors and non-investors (in short, current, and

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[4] The survey was funded by the European Commission. Details of the survey can be found at Financial literacy for investors in the securities market in Portugal.pdf (cmvm.pt).

potential demand) regard the issue of sustainability from the point of view of the profit/environmental sustainability binomial.

It is true that the literature points out that sustainable investment is not synonymous with unprofitable investment (see, for example, Badia et al., 2021 and Edmans, 2011). There are several articles which conclude that economic agents can benefit (not pecuniary) from SRI– see, for example, Barber et al. (2021), Bauer et al. (2021) and Rossi et al. (2019), to name just a few recent references.

Nevertheless, disagreeing with the statement contained in that question means accepting, or agreeing, that it is more important to invest in companies that minimize their environmental impact even if it means foregoing profit. This may mean that these respondents are more sensitive to sustainability issues.[5] Respondents who agree to forego profit in order to minimize the environmental impact of their investments are the preferred market for sustainable finance instruments. Although the question only elicits a rough assessment of preference for sustainability, reference to similar methodologies already exists in the literature. See, for example, Delsen and Lehr (2019), who use the question *"Do you agree with the following statement: My pension fund should do responsible investment, even if this will require me to pay a higher pension premium or receive a lower pension"*.

The respondents' answers are summarized in Table 2. A number of important conclusions emerge from these responses. Firstly, the proportion of respondents who are more responsive to sustainability (i.e., minimizing the environmental impact) than to profit is lower than expected. In fact, only 7.9% (13.6%) of respondents strongly disagree (disagree) with that statement, while 13.2% (25.8%) strongly agree (agree). Secondly, investors in securities are most likely to put profit before sustainability, as 53.9% agree or strongly agree with that statement and only 15.4% disagree or strongly disagree. The percentages for non-investors are 32.0% and 24.4%, respectively.

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[5] Disagreeing with that statement may have another meaning: someone who disagrees knows that there is no need to forego a return in order to have sustainable investments. Given the limited knowledge of these matters evidenced by a sample (although not a representative one) of residents of Portugal (see CMVM, 2022), it is reasonable to assume that this is not the meaning that should be attributed to the responses to this question.

Table 2
Response to the question about sustainability

I think it is more important to invest in companies that are making a profit than to choose companies that are minimising their environmental impact	Investors		Non-investors		Total	
	Number	**%**	**Number**	**%**	**Number**	**%**
1 = strongly agree	155	22.0	137	9.1	292	13.2
2 = agree	225	31.9	344	22.9	569	25.8
3 = neither agree nor disagree	203	28.8	499	33.2	702	31.8
4 = disagree	75	10.6	225	15.0	300	13.6
5 = strongly disagree	34	4.8	141	9.4	175	7.9
Don't know / No answer	14	2.0	155	10.3	169	7.7
Total	706	100.0	1,501	100.0	2,207	100.0

The survey used 30 questions to identify the profile of the respondents and assess the importance of information sources and values and attitudes relating to responsiveness to sustainability issues. As some respondents did not answer all the questions, the final sample used in this study includes 1,757 respondents. A brief description of these respondents is given in Table 3.

One in five respondents had completed tertiary or polytechnic education, most were married, with a net monthly income of more than EUR 1,000, and 24.6% were living with at least one person under the age of 18 in the household. The sample is gender-balanced, 33.6% of respondents did not save in the last year and 36.1% were investors in securities at the time of the survey. In terms of financial knowledge, 30.8% of the individuals in the sample self-assessed their knowledge as being below or well below the average for the Portuguese population.

With regard to effective knowledge about financial matters (revealed by the responses), slightly fewer than one in five correctly answered 8, 9 or all 10 questions that were asked, while 6.5% correctly answered three or fewer questions. Almost half of the respondents used the Internet as a source of information about financial markets and products (slightly fewer used the TV), and most were looking for general news about the economy.

Table 3
Descriptive analysis of the sample

	Number	%
Polytechnic/higher education completed	348	19.8
Married	1,184	67.4
Entrepreneurs	73	4.2
Gender (Female)	895	50.9
Children under the age of 18 in the household	433	24.6
Net monthly income		
More than €1000	1,076	61.2
Less than €500	118	6.7
Residing in a town with more than 100,000 inhabitants	315	17.9
Currently an investor	634	36.1
Financial literacy		
Self-assessment: below or much lower than the average	541	30.8
Number of correct answers: 8, 9 or 10	342	19.5
Number of correct answers: 0, 1, 2 or 3	114	6.5
Sources of information		
Friends and family	451	25.7
Companies	178	10.1
Account manager	480	27.3
Internet	863	49.1
Newspapers	543	30.9
TV	833	47.4
None	196	11.2
Type of information		
Real estate	394	22.4
Legislation	142	8.1
Stock market	286	16.3
General news about the economy	1,001	57.0
Interest rates	674	38.4
Respondent has not saved in the past year	590	33.6
Number of respondents in the sample	1,757	100.0

II. Methodology

As mentioned above, the main aim of this paper is to identify which characteristics of individuals may make them more sensitive to sustainability issues than corporate profits.

The variable of interest (*Interest in SRI*) is used as a dependent variable in the model:

Interest in SRI = f (sociodemographics, information, values and attitudes)

This model combines the various sociodemographic characteristics of the respondents, their attitudes and values and the sources and type of information they look at in order to assess the extent to which these characteristics, attitudes and values influence a preference for sustainability.

The variable results directly from the responses to a survey question (see Section 2), which was coded on a Likert scale of 1 to 5. Since it is an ordinal variable, the various *ordered logit* models are estimated by maximum likelihood.

Sociodemographic factors
Many studies conclude that women are more interested than men in SRI investments (Delsen and Lehr, 2019; Dorfleitner and Nguyen, 2016; Rossi et al, 2016; Wins and Zwergel, 2016; Hood et al., 2014; Junkus and Berry, 2010; Nilsson, 2008; Clark-Murphy and Soutar, 2004 and Tippet, 2001, for example). However, Haigh (2007) reaches the opposite conclusion, while Chamorro-Mera and Palacios-González (2019), Riedl and Smeets (2017), Williams (2007) and McLachlan and Gardner (2004) do not discover any gender differentiation.

With regard to marital status, the conclusions of the few existing studies that analyse this issue are more fragile because they are contradictory. Rossi et al. (2019) and Wins and Zwergel (2016) conclude that SRI investors are more likely to be married, while Junkus and Berry (2010) report that SRI investors are more likely to be single and Pérez-Gladish et al. (2012) found no association between marital status and investing in sustainable funds.

The existence of dependants, related to the size of the family unit, was not statistically significant in Delsen and Lehr (2019) with regard to investors in pension funds in the Netherlands, and in Méndez-Rodríguez et al. (2015), in relation to Spanish and Australian investors. However, Wins and Zwergel (2016) report a positive association between the existence of dependants and the probability that an individual will invest in socially responsible funds, whereas Rossi et al. (2016) conclude that interest in financial products with SRI characteristics decreases if there are children in the household.

In terms of activity or occupation, Woodward (2000) states that a typical SRI investor is in a professional or managerial occupation, while Pérez-Gladish et al. (2012) assert that this type of investor tends to be employed in the services sector. However, Rossi et al. (2016) conclude that "*working status*" does not influence the financial decisions of individuals regarding SRI investment. Delsen and Lehr

(2019), in turn, state that "*self-employed persons*" and "*housekeepers*" are more likely to favour sustainability.

The literature documents more homogeneous results for education. Chamorro-Mera and Palacios-González (2019), Delsen and Lehr (2019), Rossi et al. (2019), Riedl and Smeets (2017), Wins and Zwergel (2016), Pérez-Gladish et al. (2012), Cheah et al. (2011), Junkus and Berry (2010), Nilsson (2008), Haigh (2007), Getzner and Grabner-Kräuter (2004), Tippet (2001) and Woodward (2000) found a positive association between level of education, namely university education, and holding (or willingness to hold) SRIs, while Méndez-Rodríguez et al. (2015) found the same association for Australia but not for Spain, and Williams (2007) and McLachan and Gardner (2004) did not find a statistically significant relationship between these variables.

Regarding age, on the one hand, Gutsche et al. (2021), Riedl and Smeets (2017), Dorfleitner and Nguyen (2016), Bauer and Smeets (2015), Hood et al. (2014), Cheah et al. (2011), Junkus and Berry (2010) and Tippet (2001) report that SRI investors tend to be younger, but Pérez-Gladish et al. (2012), Woodward (2000) and Lewis and Mackenzie (2000) concluded that a typical SRI investor is middle-aged, while Rossi et al. (2019) maintain that older individuals tend to be more sensitive to this type of investment. On the other hand, Wins and Zwergel (2016) and McLachlan and Gardner (2004) found no relationship between SRI investors and age.

Another variable considered in the literature is area of residence. Rossi et al. (2019), Pérez-Gladish et al. (2012) and Nilsson (2008) state that SRIs are more relevant to inhabitants of big cities, but Wins and Zwergel (2016) find no such relationship between these variables. Williams (2007) finds a positive association for Australian investors, but not for investors in Germany, Canada, the United Kingdom, and the United States.

Also, in terms of sociodemographic characterization, two other variables are mentioned in the literature: financial literacy and income. For Junkus and Berry (2010) and Tippet and Leung (2001), SRI investors have lower incomes, while Rossi et al. (2019), Cheah et al. (2011) and Getzner and Grabner-Kräuter (2004) state the opposite. Pérez-Gladish et al. (2012) present results that are consistent with the idea that SRI investors have average income, but Riedl and Smeets (2017), Wins and Zwergel (2016), Nilsson (2008) and McLachlan and Gardner (2004) report that there is no relationship between SRIs and income. Williams (2007) concludes that income is a relevant variable in the case of Australia and Canada, but not in Germany, the United Kingdom or the United States.

As for financial literacy, Rossi et al. (2019) and Riedl and Smeets (2017) report a non-existent or even negative association between SRI investments (or interest in this type of investment) and self-assessment of financial knowledge. This is consistent with the results of Bauer and Smeets (2015). However, Rossi et al. (2019) find a positive association between objective financial literacy and interest in SRI investments, but in Gutsche et al. (2021) this correlation is negative. The latter also conclude that "*we generally find no significant relationship between*

self-reported financial literacy and 'share of sustainable investments larger than zero'. In some specifications, however, we find a weak positive correlation suggesting that self-reported financially literate persons are more likely to invest in a sustainable manner." On the other hand, Gutsche et al. (2020) do find a positive relationship between holding SRIs and effective financial knowledge.

In short, the existing empirical evidence has not produced homogeneous results regarding the sociodemographic characterization of (potential) investors in socially responsible assets. Some works (e.g., Gutsche and Zwerger, 2020; Riedl and Smeets, 2017; Williams, 2007) even mention that they find little evidence that sociodemographic factors influence SRI. This context, and the fact that the different conclusions may be related to cultural differences, makes it even more relevant to analyse the Portuguese case.

Information
As regards the influence of the information obtained about financial markets and products, Abreu and Mendes (2012) argue that investor behaviour when trading financial instruments is impacted by the sources of information used by individuals. In particular, overly confident investors trade less often when they obtain information from friends and family, while investors who are not overly confident trade more often when they use specialized sources of information. Peress (2004) states that it is to be expected that investors who acquire information, or spend more time obtaining information, will trade more frequently. Barreda-Tarrazona et al. (2011) also conclude, in an experimental study, that individuals are sensitive to the ethical information they receive and that their intention to invest in SRI funds increases if they have more information. We therefore conclude that the sources of information used may influence individuals' opinions of the profitability/sustainability binomial.

Looking for information from friends and family is one example of how tips/information are transmitted (and received) through social interaction and used by people in a particular group to gain social approval or avoid social disapproval within that group. This social interaction may be an important source of information before decisions about investment are taken (Gutsche et al. 2021; Gutsche and Zwergel, 2020; Hong et al., 2004).

Some of the empirical literature documents the impact of peers on financial decisions when peers interact with each other. This applies to the decision to invest in financial markets (Hong et al., 2004), saving for retirement (Duflo and Saez, 2003) and risk aversion (Ahern et al., 2014). These studies conclude that the influence of peers induces behaviour that is more in keeping with the norm for these peers. Beshears et al. (2015), however, conclude that information from peers may produce the opposite reaction. Information from peers about higher savings rates may lead individuals with low savings to abandon the norm of their peers and reduce their respective savings. In the case of SRI investments, Riedl and Smeets (2017) find a positive correlation between interacting with family and friends and this type of investment, but this is not the case in Bauer and Smeets (2015), while the evidence presented by Gutsche et al. (2019) also

suggests a positive (although not entirely conclusive) association between those variables.

Nilsson et al. (2010) also conclude that SRI and conventional investors use different sources and types of information before making investments. SRI investors use financial advisers more often to obtain information about the SRI characteristics of financial products (in this case, investment funds). This may be explained by the possibility that these investors are more concerned about the sustainability dimensions of their financial investments than more traditional financial concerns (e.g., risk and return). Nevertheless, Nilsson et al. (2010) find no evidence of any differences between investors with a greater and lesser involvement in SRI investments in terms of recourse to financial advisers. Williams (2007) maintains that, as more detailed information is necessary to analyse ethical issues, it is to be expected that SRI investors will make more active use of the Internet as a source of information, although he only finds empirical support for this hypothesis in one of the five countries he analysed. Gutsche and Zwergel (2020) find a positive association between the number of sources of information used by individuals and the probability of these individuals having SRI investments. However, Chamorro-Mera and Palacios-González (2019) conclude that prior knowledge of SRIs does not help to identify different segments of savers.

Values and attitudes

More and more studies are analysing the impact of non-economic factors on the decision-making of investors and non-investors. For example, Beal et al. (2005) conclude that fewer than half of investors consider maximising their wealth to be the most important factor for their investment decisions. It is therefore important to investigate the non-economic factors that may influence financial decisions.

Among the different types of values and preferences that may condition investment decisions, the literature has analysed the following: social context, for example, communication with friends and family (see previous section); social preferences (Bauer et al., 2021); preferences for *sin* stocks (Pasewark and Riley, 2010); environmental values (Gutsche et al., 2020); political affiliation (Gutsche et al., 2021); religiosity (Bauer and Smeets, 2015); altruism (Brodback et al., 2019); generosity (Gutsche et al., 2021); preference or appetite for risk (Riedl and Smeets, 2017); individual trust (Gutsche and Zwergel, 2020).[6]

In this study, it is not possible to analyse most of these issues because the survey on which it is based does not contain the necessary questions. However, the survey includes questions relating to some of the respondents' values and attitudes. Among the questions used in this study are the following: "*I would like to know to what extent you agree or disagree with the following statements*:

- "*It gives me greater pleasure to spend money than to save for the future*"
- "*I personally and systematically manage my personal finances*"

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[6] Only one of the various references for each theme is cited.

- *"Before I buy anything, I carefully consider whether I can afford to spend the money"*

The answers to these 3 questions are coded on a Likert scale from 1 to 5, where 1 corresponds to "strongly disagree" and 5 to "strongly agree". Based on these answers, I constructed the binary variables "*pleasure in spending money*", "*I do not manage my finances*" and "*I consider my expenditures*", which are equal to 1 where the answers to these questions are, respectively, "I strongly agree", "I strongly disagree" and "I strongly agree".

Another question allows us to build a *proxy* for *trust*, an attitude that is considered by Guiso and al. (2008) and Falk et al. (2018) to be essential for understanding individual behaviour: "*Do you read the contracts for the financial products (e.g., savings deposits, investments, loans, insurance) you purchase?*". The alternative responses are: "*yes, I read them very carefully*"; "*yes, I read them somewhat carefully*"; "*yes, I read them, but not very carefully*"; "*I don't read them, I trust the verbal information given by counter staff*"; "*I don't read or attach much importance to them*". For Nilsson (2008) and Gutsche and Zwergel (2020), for example, individuals who are trusting of others are more likely to make sustainable investments. Thus, respondents who claim not to read the contracts for the financial products they purchase because they trust what the counter staff tell them are considered to be individuals who are trusting of others ("*trust*" is a binary variable, equal to 1 for individuals who trust the verbal information given by the counter staff).

It is also possible to construct an indicator to quantify respondents' risk preference or tolerance using the question: "*If you unexpectedly received 100,000 euros to invest, on condition that you invest it in the following options, how would you distribute the money among these options: bank deposits or similar products with capital guarantees; bonds or investment funds in bonds; investment funds with stocks and bonds; a portfolio of about 15 shares in different companies; shares in a company I know well; gold, silver, oil and other commodities; other investments*". In this case, the continuous variable "*risk applications*" was constructed, which corresponds to the sum of the percentages put into "bonds or investment funds in bonds", "investment funds with stocks and bonds" "a portfolio of about 15 different company shares" and "shares in a company I know well". This variable ranges between 0 and 100, with higher values corresponding to a greater risk tolerance.

Finally, based on a question related to self-assessment of financial knowledge ("*on a scale of 1 (much lower than the average) to 5 (much higher than the average), how would you assess your financial knowledge compared to the average for the Portuguese population?*") and on 10 questions related to effective financial knowledge (see Annex 2), it was possible to construct an indicator of overconfidence to assess excess self-assessment by each respondent of their effective reported knowledge. In the sample, the average number of correct responses to the 10 financial literacy questions is 6. Thus, respondents who self-assessed their knowledge as being equal to the average for the Portuguese population and who

correctly answered fewer than 5 financial literacy questions were considered to be overconfident, as were those who self-assessed their knowledge as being higher or much higher than the average for the Portuguese population and who correctly answered 7 or fewer financial literacy questions. The binary variable "*overconfident*" is equal to 1 in these cases (and is equal to 0 otherwise).

III. Results

Sociodemographic factors

Table 4 shows the results of the estimation of several models in which some sociodemographic characteristics of the respondents were alternately used as explanatory variables (columns [1] to [9]), and column [10] shows the estimates obtained for the model that includes all those variables.

The first conclusion that can be drawn from these results is that, unlike Gutsche and Zwerger (2020), Riedl and Smeets (2017) and Williams (2007), the evidence available indicates the relevance of sociodemographic factors in terms of the responsiveness of Portuguese families to sustainable investments. In fact, although some variables are not statistically significant (household composition and financial literacy in models [3], [7] and [10], and age in model [10]), the other sociodemographic variables that characterize the profile of the respondents are significant for the usual levels of significance.

In particular, we conclude that women and people with academic degrees (undergraduate or polytechnic) are more responsive to sustainability (favouring sustainability over corporate profits). These results concur with those reported by most of the studies consulted. There is also evidence that an individual's occupation is relevant, with employers and self-employed professionals showing a higher preference for profit than for environmental sustainability.

Table 4
Ordered logit model – sociodemographic factors

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
Gender (Female)	0.312 *** *3.62*									0.289 *** *3.27*
Married		-0.38 *** *-4.14*								-0.37 *** *-3.44*
Adults			-0.01 *-0.26*							0.062 *1.05*
No. under 18 years of age			0.026 *0.41*							0.108 *1.58*
Employer/Entrepreneur				-0.79 *** *-3.23*						-0.77 *** *-3.06*
Freelancer				-0.4 ** *-2.12*						-0.38 ** *-1.99*
Employee				-0.21 * *-1.89*						-0.19 *-1.61*
Disabled				-0.84 * *-1.89*						-0.77 * *-1.71*
Completed higher education					0.209 ** *2.02*					0.203 * *1.74*
Less than primary education					-0.28 * *-1.77*					-0.32 * *-1.94*
Aged 18 to 25 (Z)						0.343 ** *2.15*				-0.02 *-0.09*
Aged 26 to 40 (MIL)						0.054 *0.49*				-0.02 *-0.11*
Aged 41 to 55 (X)						-0.03 *-0.23*				-0.01 *-0.09*
Low financial literacy							0.157 *0.83*			0.001 *0.01*
High financial literacy							0.135 *1.03*			0.076 *0.55*
Place of residence – up to 5 000 inhab.								0.197 *1.43*		0.194 *1.38*
Place of residence – bet. 5 000 and 20 000 inhab.								0.296 ** *2.13*		0.272 * *1.91*
Place of residence – bet. 20 000 and 100 000 inhab.								0.279 ** *2.09*		0.265 * *1.93*
High salary									-0.06 *-0.49*	-0.05 *-0.37*
Low salary									0.671 *** *4.07*	0.565 *** *3.29*
LR stat	13.2 ***	17.2 ***	0.25	21.4 ***	8.8 **	4.9	1.6	6.0	16.3 ***	78.6 ***
Number of observations	1 757	1 757	1 753	1 757	1 757	1 757	1 757	1 757	1 757	1 753

*, ** and *** indicate statistical significance in bilateral tests, at 10%, 5% and 1%, respectively. In the case of professions/occupations, only those categories that proved to be statistically significant were included in the table (column 4).

Concerning income, our results are similar to those of Junkus and Berry (2010) and Tippet and Leung (2001), and make it possible to identify families with lower incomes as being more sensitive to sustainability. Finally, with regard to place of residence, the results run counter to those in the literature in that they identify inhabitants of bigger cities (more than 100,000 inhabitants)

as being most interested in corporate profits, along with inhabitants of smaller towns (less than 5,000 inhabitants).

Information

There are significant differences between investors and non-investors as regards the information sources consulted, and also as regards the topics on which they are looking for information. Thus, the sample was split between investors and non-investors in order to better identify the differences between these two groups.

The first conclusion is that different sources of information are likely to influence the responsiveness of investors and non-investors to sustainability issues *versus* corporate profits (Table 5). Compared with individuals in the same group who do not look for information, investors are more influenced by the information they obtain in newspapers, and non-investors are more influenced by information obtained through social contact with family and friends and also by information disclosed by companies. The influence of the Internet, although less strong from a statistical point of view, also differs for both. The number of sources of information used is relevant for non-investors, but not for investors.

Secondly, there were several surprising results. In fact, non-investors who obtain information from interacting with family and friends identify more with the statement "*I think it is more important to invest in companies that are making a profit than to choose companies that are minimizing their environmental impact*", thus demonstrating less sensitivity to environmental issues. This differs from the results reported by Riedl and Smeets (2017) and partly by Gutsche et al. (2019). Among the works consulted, only Beshears et al. (2015) suggest that there is a negative relationship between obtaining information from peers and similarity in behaviour regarding SRI investments. In the case of investors, the statistical non-significance of this source of information is consistent with the results of Bauer and Smeets (2015).

Table 5
Ordered logit model – sources of information

Sources of information used	[1] Investors	[2] Non-investors	[3] Investors	[4] Non-investors	[5] Investors	[6] Non-investors	[7] Investors	[8] Non-investors
Friends and family	-0,183	-0,456 ***			-0,232	-0,474 ***		
	-1.15	-3.25			-1.46	-3.32		
Companies	-0,211	-0,543 **			-0,318	-0,569 **		
	-1.09	-2.26			-1.56	-2.43		
Account manager	0,042	-0,194			0,043	-0,177		
	0.29	-1.32			0.27	-1.21		
Internet	-0,211	0,203 *			-0,339 **	0,187		
	-1.39	1.77			-2.11	1.52		
Newspapers	0,458 ***	-0,175			0,577 ***	-0,136		
	2.78	-1.21			3.35	-0.93		
TV	-0,174	0,153			-0,154	0,175		
	-1.17	1.35			-0.98	1.5		
Number of different sources			-0,003	-0,105 **			-0,018	-0,101 **
			-0.05	-2.39			-0.35	-2.13
Includes sociodemographics	No	No	No	No	Yes	Yes	Yes	Yes
LR stat	10.5	28.9 ***	0.00	5.8 **	89.2 ***	60.8 ***	73.0 ***	37.4 **
Number of observations	634	1,123	634	1,123	632	1,121	632	1,121

*, ** and *** indicate statistical significance in bilateral tests, at 10%, 5% and 1%, respectively.

One interesting result relates to information obtained directly from companies, for example, in their financial statements. Also in this case, this source of information is only relevant for non-investors and has a negative impact. Although one might expect that obtaining more information (the base category corresponds to individuals who do not look for information about financial markets and products) may lead to increased awareness among individuals of sustainability issues, the negative correlation detected may be related to individuals having less confidence in the information disclosed directly by companies (Williams, 2007). In particular as, at the time of the survey, companies were still not required to disclose non-financial information in a standardized auditable format.

In the case of more specialized information obtained from an account manager, financial advisers and/or brokers, the results allow us to conclude that this source of information does not influence investors or non-investors. Despite being the third least cited source of information by respondents, it does not seem to have a material impact on their sensitivity to corporate profits/environmental impact issues, which is somewhat in line with the results reported by Nilsson et al. (2010).

Regarding the use of the Internet, the positive coefficient (also statistically significant in the case of regression [2]) is in line with Williams' (2007) conjecture, despite its lack of empirical sustainability for most of the countries analysed by this author. The negative coefficient, which is statistically significant in the case of regression [5], contrasts with the results reported in Nilsson et al. (2010). The positive coefficient associated with investors obtaining information from newspapers and magazines is in line with the results of Nilsson et al. (2010), which conclude that this is a more relevant source of information for investors with greater involvement in SRI investments.

Finally, the negative coefficients associated with the number of different sources of information (which can be interpreted as a *proxy* for greater use of information), which are significant in the case of regressions [4] and [8] for non-investors, are the opposite of those reported by Gutsche and Zwergel (2020) (who find a positive association between the number of sources of information used by individuals and the probability of these individuals holding SRI investments).

With regard to the type of information that respondents regularly monitor (Table 6), obtaining information on interest rates seems to have a very similar negative impact for investors and non-investors. This suggests that those who monitor interest rate developments have a relatively higher preference for corporate profits. General news about the economy is more relevant to non-investors, while news about the real estate market is more relevant for investors. In each case, it increases the preference for sustainability over corporate profits.

Table 6
Ordered logit model – types of information

	[1] Investors		[2] Non-investors		[3] Investors		[4] Non-investors	
Property market	0.538	***	0.117		0.474	***	0.082	
	3.13		0.68		2.74		0.46	
Legislation	0.107		-0.191		-0.021		-0.187	
	0.38		-0.61		-0.08		-0.62	
Stock market	-0.001		-0.412	*	-0.077		-0.329	
	-0.01		-1.89		-0.43		-1.47	
General news	-0.163		0.209	*	-0.115		0.224	*
	-1.02		1.88		-0.66		1.86	
Interest rates	-0.339	**	-0.287	**	-0.188		-0.258	**
	-2.24		-2.26		-1.17		-1.98	
Other information	0.431		-0.037		0.452		0.048	
	0.31		-0.09		0.27		0.12	
Includes sociodemographics	No		No		Yes		Yes	
LR stat	14.5	**	19.1	***	81.3	***	47.9	***
Number of observations	634		1,123		632		1,121	

*, ** and *** indicate statistical significance in bilateral tests, at 10%, 5% and 1%, respectively.

Values and attitudes

The results of the estimate of the ordered *logit* model for the variables related to values and attitudes are shown in Table 7. The results are similar for investors and non-investors, in terms of signs of coefficients and statistical significance. Indeed, the higher the risk tolerance (i.e., the higher the percentage in risk investment), the lower the sensitivity to environmental sustainability issues and the greater the preference for corporate profits. This result is consistent with the results of Bauer and Smeets (2015), who maintain that risk-tolerant clients allocate a smaller amount of their investments to socially responsible banks, and of Bassen et al. (2019), who conclude that risk-tolerant people attach less importance to the climate performance of investment funds compared to their financial performance. However, it contradicts Riedl and Smeets (2017), who report a positive association between risk tolerance and the amount invested in socially responsible equity funds, and Nakai et al. (2018), who do not find any significant effects on the declared preferences for investments in socially responsible companies. Delsen and Lehr (2019), on the other hand, find no evidence that appetite for risk has any influence on preference for sustainability.

Table 7
Ordered logit model – values and attitudes

	[1] Investors		[2] Non-investors		[3] Investors		[4] Non-investors	
I don't manage my finances	2,126	***	1,087	*	1,929	***	0,919	
	4.66		1.89		3.32		-1.56	
Pleasure in spending money	-1.289	***	-1,211	***	-1.607	***	.-1,073	***
	-2.64		-4.89		-3.04		-3.99	
Trust	0.377		0.323	**	0.382		0.288	*
	1.51		2.12		1.43		1.82	
I consider my expenditures	-0.419	***	-0.164		-0.607	***	0.188	
	-2.88		-1.52		-3.75		-1.62	
Risk applications	-0.008	***	0.005	***	-0.007	***	-0.004	**
	-3.51		-2.84		-2.63		-2.29	
Overconfident	-0.091		-0.131		-0.236		-0.163	
	-0.55		-1.12		-1.27		-1.31	
Includes sources of information	No		No		Yes		Yes	
Includes information type	No		No		Yes		Yes	
Includes sociodemographics	No		No		Yes		Yes	
LR stat	52.5	***	63.6	***	155.9	***	114.8	***
Number of observations	634		1,123		632		1,121	

*, ** and *** indicate statistical significance in bilateral tests, at 10%, 5% and 1%, respectively.

Similarly, individuals who take greater pleasure in spending money than in saving for the future value corporate profits over environmental sustainability, which may relate to a higher preference for immediate returns or instant rewards (meaning that the discount rates of these individuals are high). The intertemporal preference for present consumption over future consumption can be interpreted as an indicator of (im)patience (Falk et al., 2018; Gusche et al., 2021). However, these authors did not find any evidence of the impact of individuals' temporal preferences on their preferences for sustainable investments.

The variables "*I consider my expenditure*" and "*I do not manage my finances*" can be interpreted as *proxies* for the existence of material and post-material values, respectively. Material values are associated with a preference for meeting material needs (food, housing, for example), while post-material values are associated with meeting non-material needs such as freedom, self-expression, or environmental protection. Higher levels of post-material values are associated with a higher preference for sustainable investments (Delsen

and Lehr, 2019). Although the signs from the estimates for all respondents are consistent with this hypothesis, the results obtained for the non-investor sub-sample are less strong than those for the investor sub-sample, as the statistical significance is weaker. Nevertheless, all the results confirm the association and the empirical results of Delsen and Lehr (2019). Regarding overconfidence, despite the negative sign obtained for the coefficients of this variable in all regressions, this variable does not influence respondents' sensitivity to the profit/sustainability binomial.

Finally, with regard to confidence, although the estimates obtained are positive in all regressions (thus they are in line with the results reported by Nilsson, 2008, and Gutsche and Zwergel, 2020), there is only statistical significance in the regressions made for non-investors.

IV. Conclusion

This paper studies the sensitivity to sustainability issues of Portuguese investors, particularly with regard to their willingness to renounce profit in the interests of increased environmental sustainability. The study is based on a representative survey of the Portuguese population, conducted between the end of 2020 and the start of 2021.

The results show that the respondents who express a willingness to forego profit in favour of increased sustainability are fewer in number than those who do not express such a willingness. Investors in securities value sustainability the least (53.9% do not express a willingness to forego profit for this cause). This means that the potential demand for SRI financial products and services depends heavily on the return provided by these products.

Sociodemographic characteristics identify groups of individuals who are more sensitive to sustainability. Women who have completed tertiary education, those residing in places with between 5,000 and 100,000 inhabitants, and skilled employees are more willing to forego corporate profits. It is therefore possible to define target groups for the placement of sustainable financial products, even if these offer less competitive returns than alternative products.

With regard to sources of information, investors are influenced more by the information they obtain in newspapers, and non-investors are influenced more by information obtained from family or friends, or information disclosed by companies (financial statements). Although one would expect that obtaining more information from companies would lead to an increased sensitivity to sustainability issues in individuals, the negative correlation detected may relate to the fact that the individuals have less confidence in the information disclosed directly by companies. This may be the result of the lack of a standardized format for the disclosure of non-financial information by companies. Given the negative coefficient associated with more recourse to information by individuals, which indicates that too much information may be counterproductive, adopting a standardized format for disseminating this kind of information could be a factor

that inspires confidence in individuals and increases sensitivity to sustainability issues.

Finally, attitudes and values have a huge influence on individuals' sensitivity to sustainability issues. On the one hand, greater risk tolerance is associated with less sensitivity to environmental sustainability issues. Considering that investors have a greater tolerance for risk and as the results indicate that investors are most likely to put profit first, this means that the increase in demand for SRI assets is critically dependent on the return they can offer. On the other hand, prioritising immediate returns and material values increases the preference for investing in companies that do not restrict maximizing profit. Finally, an individual's confidence is positively associated with their sensitivity to sustainability issues. It is therefore imperative to increase confidence in the markets, particularly the financial markets.

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Annex 1 – List of Variables

Sociodemographic	Definition
Gender (Female)	binary variable, equal to 1 if female
Married	binary variable, equal to 1 if married
Adults	number of adults in the household
No. under 18 years old	number of under 18-year-olds in the household
Employer/entrepreneur	binary variable, equal to 1 if employer or entrepreneur
Freelancer	binary variable, equal to 1 if freelancer
Employee	binary variable, equal to 1 if non-qualified employee
Disabled	binary variable, equal to 1 if disabled
Higher education	binary variable, equal to 1 if polytechnic or higher education completed
Less than primary education	binary variable, equal to 1 if primary education not completed
Aged 18 to 25 (Z)	binary variable, equal to 1 if aged 18 to 25 years
Aged 26 to 40 (MIL)	binary variable, equal to 1 if aged 26 to 40 years
Aged 41 to 55 (X)	binary variable, equal to 1 if aged 41 to 55 years
Low financial literacy	binary variable, equal to 1 if up to 3 correct financial literacy answers
High financial literacy	binary variable, equal to 1 if 8 or more correct financial literacy answers
Place of residence - up to 5,000 inhab.	binary variable, equal to 1 if place of residence up to 5,000 inhabitants
Place of residence - bet. 5,000 and 20,000 inhab.	binary variable, equal to 1 if place of residence between 5,000 and 20,000 inhabitants
Place of residence - bet. 20,000 and 100,000 inhab.	binary variable, equal to 1 if place of residence between 20,000 and 100,000 inhabitants
High income	binary variable, equal to 1 if gross monthly household income higher than 1,000 €
Low income	binary variable, equal to 1 if gross monthly household income lower than 500 €
Sources of information	
Friends and family	binary variable, equal to 1 if respondent obtains financial information from family, friends or colleagues
Companies	binary variable, equal to 1 if respondent obtains financial information from companies, for example financial statements
Account manager	binary variable, equal to 1 if respondent obtains financial information from the account manager, financial concultant or broker
Internet	binary variable, equal to 1 if respondent obtains financial information from the internet
Newspapers	binary variable, equal to 1 if respondent obtains financial information from magazines and newspapers
TV	binary variable, equal to 1 if respondent obtains financial information from the tv or radio
Number of different sources	number of different sources of information used
Type of information	
Real estate	binary variable, equal to 1 if respondent regularly follows real estate news
Legislation	binary variable, equal to 1 if respondent regularly follows legislation on financial products
Stock market	binary variable, equal to 1 if respondent regularly follows stock market news
General news	binary variable, equal to 1 if respondent regularly follows general news about the economy
Interest rates	binary variable, equal to 1 if respondent regularly follows interest rate news
Other information	binary variable, equal to 1 if respondent regularly follows other news
Values and attitudes	
I don't manage my finances	binary variable, equal to 1 if completely disagrees with the statement "I personally and systematically manage my personal finances"
Pleasure in spending money	binary variable, equal to 1 if completely agrees with the statement "It gives me greater pleasure to spend money than to save for the future"
Trust	binary variable, equal to 1 if the answer to the question "Do you read the contracts for the financial products you purchase?" is "I do not read them, I trust the verbal information given by counter staff"
I consider my expenditures	binary variable, equal to 1 if completely agrees with the statement "Before I buy anything, I carefully consider whether I can afford to spend the money"
Risk applications	continuous variable, equal to the sum of the percentages applied in "bonds or mutual fund bonds", "mixed mutual funds", "a portfolio of 15 stocks" and "shares of a company I know well"
Overconfident	binary variable, equal to 1 if respondent assesses his/her financial knowledge as being equal to the average of the Portuguese population and correctly answers less than 5 literacy questions, or if respondent assesses his/her financial knowledge as being higher or very higher than the average and correctly answers 7 or less literacy questions

Annex 2 – Financial Literacy Questions

1. Imagine that five brothers are given a gift of EUR 1,000 in total. If the brothers have to share the money equally, how much does each one get? (**A: EUR 200**)

2. Now imagine the brothers have to wait for one year to get their share of the EUR 1,000 and inflation stays at about 2%. In one year's time, will they be able to buy:

i) More than they could buy today; ii) The same they could today; **iii) Less than they could today.**

3. Imagine that someone puts EUR 100 into a no fee/tax free savings account with a guaranteed interest rate of 2% per year. This person does not make any further payments into this account and does not withdraw any money. How much would be in the account at the end of the first year, once the interest payment is made? **(A: EUR 102)**

4. And how much would be in the account at the end of five years [remembering that there are no fees or tax deductions]? It would be:

i) More than EUR 110; ii) Exactly EUR 110; iii) Less than EUR 110; iv) Impossible to tell from the information given.

5. You lend EUR 25 to a friend one evening and he or she gives you EUR 25 back the next day. How much interest has he or she paid on this loan? **(A: EUR 0)**

6. I would like to know whether you think that the following statement is true or false: "*An investment with a high return is likely to be high risk*" **(A: true)**

7. I would like to know whether you think that the following statement is true or false: "*It is usually possible to reduce the risk of investing in the stock market by buying a wide range of stocks and shares*" **(A: true)**

8. What does it mean for a security to have guaranteed capital on the maturity date?

i) I am entitled to receive the invested capital at any time; ii) On the maturity date, I will always receive the invested capital; **iii) The issuer of the security reimburses the capital invested on the maturity date, provided that it has the financial conditions to do so.**

9. In some financial products, their return is indexed to a reference rate, which is usually "Euribor". Tell me, Euribor is…:

i) A rate defined by the Portuguese Government; ii) A rate defined by the Bank of Portugal; iii) A rate defined by the European Central Bank; **iv) A rate that results from loans made between a group of European banks.**

10. What is the value of a EUR 1,000 investment if the price drops 50% in the first six months and then increases 80% after those six months (assuming no fees and commissions)?

i) Lower than EUR 1,000; ii) Equal to EUR 1,000; iii) Higher than EUR 1,000.

Note: The correct answers are marked in **bold.**