Sustainable investments: One for the money, two for the show*

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Abstract

Using a representative sample of the Dutch population, this paper characterizes two groups of sustainable investors in detail: those who invest in sustainable assets primarily for social reasons (*social* sustainable investors) and those who do so primarily for financial reasons (*financial* sustainable investors). Both groups are equally important but have different features. *Social* sustainable investors tend to have a higher level of social preferences, education and trust, and are more likely to be politically left-wing and risk-averse. Recommendations from (social) media and word of mouth seem to motivate only *financial* sustainable investors. In general, lack of information is the main barrier to investing sustainably.

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1. Introduction

Sustainable retail investors have typically been perceived as individuals who invest because of motives that go beyond the payoffs from their portfolios since they would be willing to accept a lower return to invest sustainably (Riedl and Smeets, 2017; Bauer, Ruof, and Smeets, 2021; Brodback, Guenster, and Mezger, 2019).

Recently, however, Pedersen, Fitzgibbons, and Pomorski (2021) present a theory of responsible investing and model, next to sustainability-motivated individuals, sustainability-aware investors that use sustainability scores to update their views on risk and expected returns.[1] According to their model, some households thus primarily take into consideration financial reasons when they choose their sustainable investments. Such different motivations for sustainable investing are also at the heart of the current debate between "value-driven" and "values-driven" sustainable investors (Starks, 2023).[2]

Accordingly, this paper first aims to characterize these two groups of sustainable investors: *financial* sustainable investors (who can be regarded as "value-driven" investors, hence that they invest primarily for the "money") and *social* sustainable investors (who can be regarded as "values-driven" investors, that invest primarily for the "show"). Specifically, we first examine to what extent these types of sustainable investors are present and then investigate a thorough set of characteristics of individuals that ultimately help us describe each group. Second, as recent literature (Briere and Ramelli, 2021) suggests that sustainable investments can help increase the appetite for stock investing, we aim to shed light on whether (*financial* and/or *social*) sustainable investors can help mitigate the general stock market participation puzzle, i.e., the low level of participation of retail investors in the stock market. Third, we aim to understand what the main reasons are for households *not* to invest sustainably.

[1] Pedersen et al. (2021) label them as ESG-motivated and ESG-aware investors, respectively. They further consider regular investors labelled as ESG-unaware investors. Similarly, Goldstein, Kopytov, Shen and Xiang (2022) assume that investors can use ESG information for financial or non-financial reasons.

[2] Previous studies have particularly pointed out the importance of social motives in sustainable investments of households empirically (Riedl and Smeets, 2017; Brodback et al., 2019; Bauer et al., 2021) and theoretically (e.g., Pástor, Stambaugh, and Taylor, 2021; Broccardo, Hart, and Zingales, 2022; Gollier and Pouget, 2022).

We address these research questions by analyzing a representative sample of Dutch households using the LISS (Longitudinal Internet Studies for the Social Sciences) panel. Our survey design allows us to gather a comprehensive set of information about households' characteristics and their motivations and decisions regarding whether or not to hold sustainable investments. In addition to the survey we designed, the LISS panel allows us to employ previous waves of the survey that provide household characteristics shown to be relevant for their financial decisions.

Our main findings are as follows. First, sustainable investors indeed consist of two equally important groups: those that invest primarily for pro-social reasons (*social* sustainable investors) and those that invest primarily for financial reasons (*financial* sustainable investors). *Financial* sustainable investors are more prevalent than *social* sustainable investors, but the volume of sustainable investments done by *social* sustainable investors is on average higher. Overall, these suggest that retail investors are heterogeneous in their motivations for sustainable investing.

Second, we delve deeper into the characteristics of those two above-mentioned types of sustainable investors and show that the two groups exhibit distinctive important features. *Social* sustainable investors exhibit higher social preferences and trust towards others, are more likely left-wing, and have a lower appetite for risk. In addition, they are more likely to possess a university degree. The *financial* sustainable ones are more likely to be influenced by recommendations from (social) media and word of mouth towards investing sustainably. The two groups are both characterized by high sustainable finance literacy. Moreover, sustainable investments primarily driven by *social* reasons mitigate some non-economic barriers to investing in the stock market, specifically the ones related to political orientation and risk aversion.

Lastly, lack of information is by far the most significant reason for *not* holding sustainable investments.

Below we outline our empirical setting step by step and present the detailed findings from those stages. As a first step in our analysis, we investigate the drivers of sustainable investments. Regarding the determinants of sustainable investing, we follow the literature and include individuals' characteristics regarding preferences, literacy, political orientation, and generalized trust. In particular, we analyze the following factors as the drivers of sustainable investing: social preferences (as in Riedl and Smeets, 2017; Bauer et al., 2021; Engler, Gutsche, and Smeets, 2023),

risk-preferences (as in Bauer and Smeets, 2015; D'hondt, Merli, and Roger, 2022), literacy (financial and sustainable, as in Anderson and Robinson, 2021; Filippini, Leippold, and Wekhof, 2021), political orientation (as in Gutsche and Ziegler, 2019), and level of trust (as in Gutsche, Nakai, and Arimura, 2021). Following in spirit various studies on environmentally conscious behaviors and sustainable investments (e.g., Brunen, 2019; Brunen and Laubach, 2022; Kormanyos, 2023; An, Briley, Danziger, and Levi, 2023), we also analyze whether households donate to the environment or are part of an environmental association. We also include in our analysis individual characteristics (age, gender, location, income, and marital status, as in Rossi, Sansone, Van Soest, and Torricelli, 2019, and Löfgren and Nordblom, 2022). We further introduce two novel determinants of sustainable investing: whether households are sensitive to investment recommendations from (social) media or friends ("financial hype") and whether households believe sustainable investments are a form of greenwashing.

Regarding our empirical setting, where we investigate the drivers of sustainable investing, first, we treat sustainable investors as a homogenous group of investors to be in line with the literature. Next we break them into two groups, *social* and *financial* sustainable investors. In our regression specifications, we start with comparing (respectively *social* and *financial*) sustainable investors to households that do not have any financial investments (henceforth referred to as "non-investors"). Our motivation for the choice of this control group is to be able to dig deeper into the participation puzzle.

When comparing *sustainable investors* as one big homogenous group to *non-investor*s, we find that financial hype, sustainable finance literacy, having left-wing political views and a high level of trust are positively associated with being a sustainable investor. Among the personal characteristics of individuals, only academic degree is positively and significantly related to sustainable investments. Unlike what the literature suggests (Riedl and Smeets, 2017; Bauer et al., 2021), we find that social preferences do not drive sustainable investments when sustainable investors are considered as a whole.[3]

When we break down our sustainable investors into *social* and *financial* sustainable investors (versus *non-investors*, respectively), our findings indicate that the drivers of sustainable investing are

[3] The lack of statistical significance in social preferences persists even when we only consider households in our sample that invest in the financial markets.

very different in these two groups. Social preferences are negatively and significantly associated with *financial* sustainable investors, while they are positively and significantly related to *social* sustainable investors. Hence, social preferences, considered a key factor for sustainable investing (Riedl and Smeets, 2017; Bauer et al., 2021), are positively associated with only one of the two groups. Moreover, financial hype only positively and significantly relates to *financial* sustainable investors. This relationship can be linked to previous studies showing the impact of media (e.g., Barber and Odean, 2007) and peer effects (e.g., Bursztyn, Ederer, Ferman, and Yuchtman, 2014) on traditional investments. Furthermore, having a university degree is only positively associated with being a *social* sustainable investor. The role of university degree can be related to studies finding that education is positively associated with civic engagement in all its forms (Putnam, 1995), and the premise that education increases pro-environmental behaviors causally (e.g., Meyer, 2015). Also, we find that trust is mainly related to investing sustainably for *social* reasons which can be linked to previous studies (e.g., Guiso, Sapienza, and Zingales, 2008; Georgarakos and Pasini, 2011) which show that trust affects investment decisions. Next, being a *social* sustainable investor is also associated with being left-wing and risk averse. The coefficient of political views could be related to studies finding that individuals with left-wing views are more willing to pay for the environment (e.g., Aldy, Kotchen, and Leiserowitz, 2012; Bakaki, 2017; Andre, Boneva, Chopra, and Falk, 2022). Our findings on political orientation and risk preferences together might indicate that sustainable investments made for *social* reasons can reduce non-financial barriers to stock investing for individuals with left-wing political views and higher risk aversion, which are two household characteristics that are associated with not investing in the stock market (Kaustia and Torstila, 2011; Guiso and Sodini, 2013). This is a relevant result for policymakers considering the welfare loss estimated in terms of lifetime consumption for non-participating in the stock market (Guiso and Jappelli, 2005; Cocco, Gomes, and Maenhout, 2005). Finally, having a greater level of sustainable finance literacy explains the decision of both *financial* and *social* investors to invest sustainably.

To learn how policymakers and institutional investors (e.g., funds) could target their clients better and incentivize them to invest sustainably, we also compare *financial* and *social* sustainable investors to households that invest in the financial markets but not in sustainable securities (referred to as "traditional investors" henceforth), and our findings outlined in the preceding paragraph are qualitatively confirmed. Moreover, while *social* sustainable investors, compared to

traditional investors, believe that sustainable investments are not greenwashing (in line with their motives of investing in sustainable products for social reasons), it is not the case for *financial* sustainable investors. Overall, our analyses suggest that, in terms of individuals' characteristics, *financial* sustainable investors are more similar to traditional investors than *social* sustainable investors are.

As a next step in our analysis, to further investigate the motives behind the lack of household participation particularly in sustainable assets, we ask households that do not have sustainable investments their reasons for *not* investing in such assets. We find that the most important reason for not investing sustainably is a lack of sufficient information, which is reported by 42.1% of households. Only 5.4% think that sustainable financial products are merely a marketing strategy, while a scant 3.8% state that sustainable assets have low returns as their reason for not investing sustainably. The significant role of information is in line with the previous literature on general stock investing: Merkoulova and Veld (2022) identify stock return ignorance as a key factor preventing individuals from participating in the stock market. We further investigate and show that the lack of sustainable finance literacy is the only variable that positively and significantly explain not investing sustainably due to information barriers, and this applies to both non-investors and traditional investors.

As information in general and sustainable finance literacy in particular seems to be an important barrier to sustainable investments, both for *social* and *financial* sustainable investors, we further dig deeper into the drivers of sustainable finance literacy. We find that social preferences, financial hype, and financial literacy are positively related to sustainable finance literacy, while being a woman is negatively associated with it. Financial magazine is the only source of financial information that is (positively) associated with sustainable financial knowledge.

As additional analyses, we provide insights regarding the characteristics of potential sustainable investors that are not (yet) investing sustainably. Following the literature (e.g., Weber, Weber, and Nosić, 2013; Egan, Merkle, and Weber, 2014; Rossi et al., 2019), we ask a hypothetical question to individuals that do not currently invest in sustainable investments: what would they prefer when having the choice between an investment fund with a return linked to "all the companies in the Netherlands" and "a selection of sustainable companies in the Netherlands". We find that women that do not have any investments would be more likely to choose a sustainable

fund (over a conventional one). When asked which sustainability dimension of ESG is the most important for them, women are more likely to choose "social". While these are only hypothetical choices, they shed light on possible channels to foster sustainable investments.

Our findings are related to several strands of the literature. First, our paper contributes to the literature on the determinants of households' sustainable investments (e.g., Riedl and Smeets, 2017; Rossi et al., 2019; Gutsche and Ziegler, 2019; Gutsche and Zwergel, 2020; Bauer et al., 2021). Previous studies mainly focus on the social motives of households when they invest in sustainable assets (Riedl and Smeets, 2017; Bauer et al., 2021). Giglio, Maggiori, Ströbel, Tan, Utkus, and Xu (2023) provide evidence of heterogeneity in households' motivation to invest in sustainable financial products. There is a significant difference between our sample and theirs: theirs consists primarily of relatively wealthy, older, and male retail investors from Vanguard, whereas our sample, drawn from the LISS panel as mentioned above, is representative of Dutch households. We contribute to this literature by analyzing the characteristics of two equally important groups of retail investors: those that invest in sustainable assets primarily for financial motives (*financial* sustainable investors) and those that do so primarily for social reasons (*social* sustainable investors). Although these two types of sustainable investors are postulated in theoretical models (e.g., Pedersen et al., 2021), to our best knowledge, our study is the first to characterize them empirically. We further show that the two groups have different characteristics regarding social and risk preferences, income, education, trust, and political orientation. We further contribute to this literature stream by analyzing the role of new potential determinants, financial hype and greenwashing beliefs.

Second, more broadly, we contribute to the literature on "value" vs "values" driving sustainable investments of both retail and institutional investors as well as to the literature on investments in ESG funds and stocks (e.g., Døskeland and Pedersen, 2016; Hartzmark and Sussman, 2019; Barber, Morse, and Yasuda, 2021; Humphrey, Kogan, Sagi, and Starks, 2021; Baker, Egan, and Sarkar, 2022; Bonnefon, Landier, Sastry, and Thesmar, 2022; Ceccarelli, Ramelli, and Wagner, 2023) by showing that both "value" and "values" drive the appetites of retail investors for sustainable financial products.

Third, we contribute to the literature on financial literacy and sustainable finance literacy. Previous studies underline the role of information availability (e.g., Gutsche and Zwergel, 2020;

Anderson and Robinson, 2021; Filippini et al., 2021) in driving the choice of sustainable investments. We find that the information barrier, driven by individuals' limited ability to assess which investments are sustainable and which are not (sustainable finance literacy), is the primary driver of not investing sustainably.

Finally, we contribute to the literature on the households' stock market participation puzzle (Guiso and Sodini, 2013; Gomes, Haliassos, and Ramadorai, 2019) by showing that *social* sustainable investors can help decrease non-financial barriers to individuals' stock market participation. We infer this since we find that *social* sustainable investors tend to have left-wing political views and to be more risk averse, which are two household characteristics that are associated with being less likely to invest in the stock market (Kaustia and Torstila, 2011, Guiso and Sodini, 2013). We also support the premise from the literature that certain security designs could encourage household risk-taking (Calvet, Célérier, Sodini, and Vallee, 2023) as we find that risk-averse individuals are more likely to make sustainable investments for *social* reasons.

2. Data and survey design

We designed a survey on individuals' preferences and decisions regarding their sustainable investments. We directed the survey to a representative sample of Dutch households through the LISS panel, which is widely considered as one of the most comprehensive, reliable, and representative samples used in the household finance literature (e.g., Noussair, Trautmann, and Van de Kuilen, 2014; Dimmock, Kouwenberg, Mitchell, and Peijnenburg, 2015; Dimmock, Kouwenberg, and Wakker, 2016; Parise and Peijnenburg, 2019). The LISS panel is based on a probability sample of households drawn from the population register of the Netherlands and administered by CentERdata (Tilburg University). CentERdata is a non-profit research institute focused on academic, social, and policy-related research. Over the past 25 years, the institute has become a prominent player in conducting surveys, policy analysis, and consumer research. The LISS Data Archive offers scholars longitudinal data on various subjects, such as health, family, employment, income, values, and more, so researchers can connect their survey answers with previously collected individual data. Thanks to the LISS staff's expertise, our questions were refined to be understandable by the population at large and thus to avoid possible survey response biases.

Our survey on sustainable investments was conducted in October 2022. Our questionnaire was sent to 2140 individuals of the LISS panel aged 18 or older. The response rate was exceptionally high compared to most surveys employed in the sustainable finance literature since 72.4% (1550) of the individuals contacted responded to the invitation to complete our survey.

Similarly to other papers that employ surveys, our respondents are significantly older than the general population. Moreover, there are no significant differences in gender, income, or education (university degree) between people who answered our survey and those who did not.

In the first part of the survey, we obtained information about individuals' general characteristics and preferences. Specifically, we asked for standard variables in household finance, such as self-assessed financial knowledge (*financial literacy*), similar to Van Rooij, Lusardi, and Alessie (2011),[4] the source of information primarily used to make financial decisions (as in Von Gaudecker, 2015), and a validated measure of *social preferences* (Falk, Becker, Dohmen, Enke, Huffman, and Sunde, 2018; Falk, Becker, Dohmen, Huffman, and Sunde, 2023). We also acquired novel information about their self-assessed sustainable finance knowledge (*sustainable finance literacy*, defined as the perceived ability to distinguish between a sustainable investment and a non-sustainable one), *financial hype* (considering investing in a financial product because (social) media or friends recommend it),[5] and *greenwashing* beliefs (considering sustainable finance a marketing trick). We included these variables given the recent hype on sustainable investments,[6] the uncertainty in using sustainability ratings to assess the sustainability level of an asset (Berg, Koelbel, and Rigobon, 2022), and the considerable number of articles in economics newspapers on greenwashing,[7] as well as a growing interest from academic research (e.g., Yang, 2022; Gibson Brandon, Glossner, Krueger, Matos, and Steffen, 2022; Dumitrescu, Gil-Bazo, and Zhou, 2023; Heath, Macciocchi, Michaely, and Ringgenberg, 2023).

[4] Also, Bauer and Smeets (2015) and Riedl and Smeets (2017) use a self-assessed measure of financial knowledge in their studies.

[5] The concept of *financial hype* is distinct from the usual sources used to make significant financial decisions. This is because it gauges an individual's psychological sensitivity to investment recommendations. Our unreported results show a correlation of only 0.3 between *financial hype* and using *social media* or *friends* as typical sources for financial decisions.

[6] https://www.ft.com/content/50eb893d-98ae-4a8f-8fec-75aa1bb98a48

[7] https://www.ft.com/greenwashing

In the second part of the survey, we obtained information about individuals' sustainable investments. First, we asked whether individuals own sustainable investments. If the answer was positive, we asked the most important reason for them to invest sustainably (*financial* reason or *social* motives).

The *financial* reason was represented as "expecting that sustainable investments would yield a higher risk-adjusted return (profit) than non-sustainable investments". In contrast, *social* motive was represented as "opting for sustainable investments because of the positive impact on society" *and* "would have been willing to accept a lower risk-adjusted return when investing sustainably". In our study, we refer to the first group as *financial* sustainable investors and the other as *social* sustainable investors.

Next, we asked all sustainable investors about the most crucial sustainability topic for them (environment, social, or governance), the absolute and percentage volume invested sustainably, the types of sustainable investments held (for instance, mutual funds, stocks, bonds, ETFs), and the following sustainable investment criteria (positive screening, negative screening, impact investing). We also gathered the sources used to assess if the asset was sustainable.

Furthermore, we asked respondents who did not have any sustainable investments (89.40% of the sample) the reason why they do not invest sustainably. As an experimental question (similar to Weber et al., 2013; Egan et al., 2014; Rossi et al., 2019) we further inquired whether they would prefer to invest in a conventional investment or a sustainable one, whether their motive in this investment would be for *financial* or *social* reasons, and what the most crucial dimension of ESG for them would be (environment, social, or governance). Finally, we also asked all individuals who do not invest sustainably how they would allocate a fixed amount of money between a sustainable investment and a standard one.

3. Descriptive analysis

Table I shows the descriptive statistics of the main variables employed in our multivariate analysis, for the full sample. In what follows, we write these variables in *italics*. Appendix A describes the variables we employ in the following sections in detail. Our complete survey is in Appendix B.

Table I reports that, as of 2022, 10.6% of the Dutch population invests in sustainable assets. Only 19.6% of individuals invest in financial markets (*sustainable investors* or *traditional investors*); among investors, the majority have sustainable investments (54.1%).[8] Table I further shows that 53.8% of sustainable investors (and 5.7% of the individuals in our sample) invest sustainably primarily for *financial* reasons (*financial* sustainable investors), while 38.7% (and 4.1% of the individuals in our sample) did it for *social* motives (*social* sustainable investors).[9] This contrasts with previous studies, conducted in years when probably sustainable investments were less popular, and investors were investing sustainably mainly for *social* motives.[10] We note that a small percentage of sustainable investors (7.5%, or 0.8% of our sample) claimed to invest for non-financial reasons but were not willing to accept lower returns like *social* sustainable investors. We regard them more as sustainable investors who tend to evaluate financial and social motives equally. Given this ambiguity in their response and their small size, we will not consider them in our analysis.

The existence of two primary groups of sustainable investors, *financial* sustainable investors and *social* sustainable investors, is consistent with recent theoretical literature (e.g., Pedersen et al., 2021) and the ongoing debate on "value" and "values" driven sustainable investors suggesting that individuals make sustainable investment decisions for mainly financial or social reasons. Financial motivations for sustainable investing typically revolve around the expectation of higher risk-adjusted returns, while social motivations can be driven by a desire to make a positive societal impact through investments, even if it might mean accepting lower risk-adjusted returns.

Accordingly, this section begins with insights about sustainable investing in general inferred from the descriptive analysis of our survey. Following this, we conduct univariate tests to

[8] 54.1% is obtained by dividing the percentage of *sustainable investors* (10.6%) by the total percentage of individuals investing in financial markets (19.6%), which includes both *sustainable* and *traditional investors* in Table I.

[9] 53.8% is the result of dividing the proportion of individuals who are *financial* sustainable investors (5.7%) by the proportion of those who are *sustainable investors* overall (10.6%). 38.7% is the result of dividing the proportion of individuals who are *social* sustainable investors (4.1%) by the proportion of those who are *sustainable investors* overall (10.6%).

[10] For instance, 60.4% of socially responsible investors in Rossi et al. (2019) state that they invest sustainably to "contribute in this way to improve society" (p. 11), while Riedl and Smeets (2017) find that financial motives play only a minor role in sustainable investing.

shed light on how different (*financial* and *social*) sustainable investors are from *non-investors* and *traditional investors* as well as from each other.

First, *environmental* issues are the most crucial dimension of ESG for 75% of sustainable investors, while only 17.1% of sustainable investors choose *social* and 7.9% *governance* (Figure 1). This aligns with Siemroth and Hornuf (2023), which show that sustainable investments are primarily driven by valuing environmental impact more than social impact. Sustainable stocks (40.9% of sustainable investors invested in them) and mutual funds (39.2%) are the most popular sustainable assets, followed by ETFs (17.5%) and bonds (16.4%) (Figure 2).

Second, the roles of banks and labelling emerge as key factors when we inquired about how sustainable investors mainly assess the sustainability of an investment. Specifically, 23.8% of sustainable investors trust their bank advisor, and 17.7% rely on labelling. Others use information from the internet (12.2%) and sustainability reports (10.4%). These and other sources of information are detailed in Figure 3.[11]

Third, among individuals who do not have sustainable investments, the most important reason for not investing sustainably is a lack of *information*: 43.5% of non-investors in the financial markets and 30% among traditional investors select lack of *information* as the most important reason. *Preferring traditional investments* that only look at return and risk and believing that sustainable investments have *low returns* are chosen by 16.4% and 13.6% of the traditional investors. Section 4.2 and Table IV, Panel A, provide more detail on the barriers to not invest sustainably.

Fourth, we further directed a set of questions to individuals who do not invest sustainably to ask about their "hypothetical investments/allocation". We find that 57.5% of these people would choose sustainable investments (*hypothetical sustainable investment*) instead of conventional assets (Table I). Unreported results indicate that 80% of the hypothetical sustainable investors state they would select sustainable investments for social reasons, while 20% would do so for financial reasons. Even for the potential sustainable investors, *environment* dimension of ESG is considered as the most critical dimension (66.2%), but also *social* (22%) and *governance* (11.8%) are

[11] The sum of the percentages reported does not equal 100% because respondents were allowed to choose multiple options.

chosen more often compared to actual sustainable investors. Section 5.1 contains a broad discussion on the usefulness and limitation of this survey experiment.

Lastly, unreported results indicate that 25% of the overall sample, and 31.5% of the investors subgroup, view sustainable finance as *greenwashing*.[12] Furthermore, only one-tenth of the entire sample, and one-fifth of the investors subgroup, report high *sustainable finance literacy,* despite half of respondents reporting high *financial literacy*.[13] These results suggest that lack of sustainable finance knowledge and mistrust towards sustainable finance are widespread.

Using individual's unique identifier, we retrieve from the primary LISS panel waves other relevant variables, such as individual demographics, economic conditions, *trust*, *risk loving*, personality traits and binary variables indicating if the individual has *left-wing political views*, is a *member* or *donates* to an *environmental organization*. These variables were unavailable for some individuals responding to our survey as they were not asked them during earlier waves.[14] Hence, we have fewer observations for these variables than those we directly collected in our survey.

In our univariate analyses, we compare five groups of individuals: *sustainable investors* (divided into *financial* sustainable investors and *social* sustainable investors), *non-investors*, and *traditional investors*. In multivariate tests in the next sections, (*financial* and *social*) sustainable investors are compared to *non-investors*, and *traditional investors*, respectively.

Before moving to the multivariate analysis, we first conduct univariate tests to describe *sustainable investors*' characteristics and analyze how they differ from *non-investors* and *traditional investors*. In Table II, Panel A, we find that *sustainable investors* tend to have higher *social preferences*, lower *greenwashing* beliefs, greater *sustainable finance literacy*, and are more likely to have *left-wing views* compared to *non-investors* (Column 4) and *traditional investors* (Column 5). Compared to the two same groups, *sustainable investors* also display higher levels of *trust* towards others, *donate* more to environmental organizations, and are more likely to possess a university *degree* (Columns 4-5).

[12] 25% is calculated as the percentage of individuals who rated their belief that sustainable finance is related to *greenwashing* as at least 5 on a scale from 1 to 7.

[13] High *sustainable finance literacy* and *financial literacy* refer to individuals who self-assessed their knowledge as at least 5 on a scale from 1 to 7.

[14] In other words, these individuals did not participate in these questions since, in total, LISS has more than 10,000 members, but on average, only 6,000 individuals are selected to answer a questionnaire, and these variables come from separate questionnaires.

Relative to *non-investors* (Column 4), they have higher *financial hype*, *financial literacy*, are more *risk loving*, more likely to be male, young, live in urban areas, and they have higher *income* (statistically significant at the 10% level). Conversely, Column 5 reports that *sustainable investors* have lower income than *traditional investors* (at the 10% level).

Not distinguishing between *financial* sustainable investors and *social* sustainable investors may oversimplify the description of sustainable investors. This oversimplification is particularly problematic if those two represent different types of individuals. Thus, we conduct the univariate analysis also for the two sub-groups of sustainable investors.

When we split *sustainable investors* into *financial* and *social* ones, we show that distinct patterns emerge (Table II, Panel B). *Financial* sustainable investors possess higher *sustainable finance literacy* and are generally younger than both *non-investors* (Column 5) and *traditional investors* (Column 6). Compared to *non-investors* (Column 5), they display a greater degree of *financial hype*, *financial literacy*, and *trust* (at the 10% significance level). They are also more *risk loving*, more likely to be male, have a university *degree*, and live in urban areas (10%). Compared to *traditional investors* (Column 6), their *income* is (weakly) significantly lower. *Financial* sustainable households are similar to *traditional investors* in various dimensions: *social* and *risk* preferences, political orientation, *trust*, and the likelihood of possessing a university *degree*.

In contrast, *social* sustainable investors display higher *social preferences* and *sustainable finance literacy*, have fewer *greenwashing* beliefs, and are more likely to hold *left-wing views* than both *non-investors* (Column 7) and *traditional investors* (Column 8). Compared to the two same groups, *social* sustainable investors also tend to *trust* more, *donate* to environmental organizations, and possess a university *degree* (Column 7-8). Their *financial hype* and *financial literacy* are higher than those of *non-investors* (Column 7). When compared to *traditional investors* (Column 8), they are less *risk-loving* and are more likely to be *female* (statistically significant at the 10% level).

When we compare *social* and *financial* sustainable investors to each other (Column 9), important differences emerge. *Social* sustainable investors demonstrate higher *social preferences*, are less likely to have *greenwashing* beliefs and be influenced by *financial hype* (at the 10% significance level), have stronger *left-wing views*, and higher levels of *trust*. They also tend to be less *risk-loving*, *donate* more to environmental organizations, and are more likely to be *female* (significant at the 10% level), older, and hold a university *degree*. Finally, *financial* sustainable investors have on average

significantly lower absolute and percentage volume invested sustainably. And while *social* sustainable investors invest more in volume, *financial* sustainable investors are slightly more important as a fraction of survey respondents. Hence, the two groups are of equal importance.

In addition, *financial* sustainable investors are less inclined than *social* sustainable investors to rely on bank advisers and labeling when assessing the sustainability of investments (Figure 4).

In unreported results, we further find that on average *financial* sustainable investors (compared to *social* sustainable investors) use significantly more *financial magazines* and *financial advisors* as the main sources of information when making important financial decisions. Other differences are that *financial* sustainable investors are more likely to have (sustainable) *ETFs*, and less likely to have (sustainable) *mutual funds*. Finally, they are less likely to choose *environment* and more likely to select *governance* as the most critical ESG dimension.

4. Sustainable investments: drivers and barriers

In this section, we discuss the drivers of and barriers to sustainable investments. We first follow the literature and consider sustainable investors as a homogenous group. Next, we treat sustainable investors as a heterogenous group by studying the drivers of *social* and *financial* sustainable investments. In the final subsections, we discuss the barriers to *social* and *financial* sustainable investments.

4.1 What drives sustainable investments?

We present our findings on the factors associated with the decision to hold sustainable investments. To do so, we build on the existing literature and also introduce new variables (*financial hype* and *greenwashing* beliefs).

Our study provides a comprehensive analysis that aims to give a complete picture of sustainable investors using a representative sample of a country's population. Unlike previous studies that primarily focus on experienced investors or customers of specific financial institutions,[15] our analysis encompasses a broader range of participants. This approach enhances the generalizability of our findings, as we also include a large segment of the population not

[15] To the best of our knowledge Rossi et al. (2019) and Anderson and Robinson (2022) are the only exceptions.

currently engaged in the financial market. In this section, our objective is also to investigate whether sustainable assets can overcome some non-financial barriers to stock investment.

Table III, Panel A, presents the results of linear probability models with a binary dependent variable. First, to compare our findings with previous literature, we consider sustainable investors as a uniform group and present the results of our analyses in the first two columns of the Table III. Then, we categorize sustainable investors based on their primary motivation for investing sustainably, which can be either *financial* (Columns 3-4) or *social* (Columns 5-6). The binary dependent variables indicate whether the individual is a *sustainable investor* (1) or a *non-investor* (0) (Columns 1-2), a *financial* sustainable investor (1) or a *non-investor* (0) (Columns 3-4), a *social* sustainable investor (1) or a *non-investor* (0) (Columns 5-6).

Results in Columns 1-2 show that *financial hype*, *sustainable finance literacy*, *university degree*, *left-wing political views* (significant at the 10% level), and *trust* are positively associated with holding sustainable investments. After disaggregating *sustainable investors*, we find that being a *financial* sustainable investor (Columns 3-4) is positively associated with *financial hype*. Having higher *social preferences* correlates negatively with being a *financial* sustainable investor (Column 3-4) while correlating positively with being a *social* sustainable investor (Column 5-6). Furthermore, results in Columns 5-6 show that having *left-wing views*, higher *trust*, being more risk averse, and possessing a university *degree* are positively correlated with *social* sustainable investing. Both financial and social sustainable investors are characterized as having high *sustainable finance literacy*. Overall, our findings in Columns 1-2 of Table III are new since only two other studies (Rossi et al., 2019; Anderson and Robinson, 2021) used a representative population sample, but they did not study *social preferences*, *trust*, and *left-wing political views*.

Panel B of Table III replicates Panel A using a different control group: traditional investors. The dependent variable represents whether the individual is a *sustainable investor* (1) or a *traditional investor* (0) (Columns 1-2), a *financial* sustainable investor (1) or a *traditional investor* (0) (Columns 3-4), a *social* sustainable investor (1) or a *traditional investor* (0) (Columns 5-6). In Columns 1-6, we find that higher *sustainable finance literacy* is the only significant variable associated with being a *sustainable investor* rather than a traditional one, regardless of the primary reason (*financial* or *social*). Moreover, all else equal, *social preferences* and *income* are negatively related to being a *financial* sustainable investor, when other behavioral controls are not included (Column 3). Furthermore, as shown in Columns

5-6, *greenwashing* beliefs are negatively related to being a *social* sustainable investor, while having a university *degree*, *left-wing views*, and higher *trust* (at the 10% significance level) are positively related to being a *social* sustainable investor. Similarly to Panel A of Table III, *risk-loving* has a negative association with *social* sustainable investors (Column 6).[16]

We now interpret our findings from Table III. Individuals' *social preferences* are not, ceteris paribus, associated with the decision to invest in sustainable assets (Columns 1-2 of Table III, Panel A and B). This differs from Riedl and Smeets (2017) and Bauer et al. (2021) who find a positive association between social preferences and sustainable investing. In our analysis, the insignificant coefficient can be due to the presence of *financial* sustainable investors, which represents a minority in previous studies (Rossi et al., 2019). When we consider *financial* and *social* sustainable investors separately, social preferences continue to play an essential role in sustainable investing: compared to non-investors and traditional investors, *financial* sustainable investors are associated with lower *social preferences*, while *social* sustainable investors have higher *social preferences*.

We further show that *financial hype* ("considering investing in financial products because (social) media or friends recommend them") is positively related to investing in sustainable assets. The recent increase in the attention concerning sustainability-related issues, and the fact that green assets delivered high returns in recent years (e.g., Pástor, Stambaugh, and Taylor, 2022), may have driven word-of-mouth and (social) media promotion of sustainable investing. Hence, individuals who are more influenced by these factors are also more likely to invest sustainably. Peer effect, a similar concept, has been found to affect investment choices in financial markets (e.g., Bursztyn et al., 2014) and environmental behaviours (Bernard, Tzamourani, and Weber, 2022). Moreover, Barber and Odean (2007) find that stocks receiving media attention attract investors. Therefore, similar psychological drivers may also operate in the context of sustainable investing. In particular, we notice that *financial hype* is positively associated with *financial* sustainable investors (Table III, Panel A, Columns 3-4), but not with *social* sustainable investors (in Columns 6 of Panel A and B of Table III). Consequently, the tendency to consider investments based on recommendations about them is significantly related mainly to those investors who prioritize higher risk-adjusted returns, i.e., *financial* sustainable investors.

[16] Personality traits are not included in Table III since, in unreported results, they were consistently found to be insignificant.

Next, we find that *sustainable finance literacy* is significantly positively related to sustainable investments (as in Filippini et al., 2021), regardless of the sample and sub-groups of sustainable investors considered. This variable captures an individual's self-assessed ability to understand an investment's sustainability level rather than an objective sustainable finance knowledge as measured by Filippini et al. (2021). *Sustainable finance literacy* is also the only variable that is positively associated with the absolute volume invested sustainably regardless of the sample considered (Appendix C). As we document in Section 4.2, making information on sustainable investments more transparent and accessible could help improve individuals' sustainable finance literacy and in turn incentivize more individuals and investors to invest sustainably.

Furthermore, our results show that having a university *degree* is positively associated with sustainable investing, particularly with being a *social* sustainable investor (Table III, Panel A and B, Columns 5-6). The role of university degree can be related to studies finding that education is positively associated with civic engagement in all its forms (Putnam, 1995), and the premise that education increases pro-environmental behaviors causally (e.g., Meyer, 2015).

We further find that *left-wing* individuals are more likely to be *social* sustainable investors (Table III, Panel A and B, Column 6). The coefficient of political views could be related to studies finding that individuals with left-wing views are more willing to pay for the environment (e.g., Aldy et al., 2012; Bakaki, 2017; Andre et al., 2022). Furthermore, previous studies related to traditional investments find that left-wing individuals are less likely to invest in stocks (e.g., Kaustia and Torstila, 2011), attributing this effect to their usual more negative values-related views towards the stock market.[17] Consequently, we infer that sustainable investments may mitigate some of the value-expressive reasons that deter individuals with left-wing views from participating in the stock market, since we find that *social* sustainable investors are more likely to be left-wing than, particularly, non-investors (Panel A, Column 6). Similarly, the literature indicates that risk aversion is another barrier to stock investing (Guiso and Sodini, 2013). In relation to this, we show that sustainable investments made for *social* motives seem to reduce the barriers to investing in the stock market for risk-averse individuals since we find that risk aversion is positively associated with being a *social* sustainable investor (see particularly Column 6 in Panel A where the comparison to

[17] "The stock market, or its near synonym Wall Street, has a rather questionable image among part of the public." (Kaustia and Torstila, 2011, p. 3)

non-investors enables us to infer to the market participation puzzle, as mentioned above).[18] This result is consistent with previous studies finding that security design can foster household risk-taking (e.g., Calvet et al., 2023). These findings are particularly relevant given that the welfare loss incurred when households do not participate in the stock market is estimated to be around 1.5% to 2% of lifetime consumption (Guiso and Jappelli, 2005; Cocco et al., 2005).

Table III further reports that *trust* ("the subjective probability attributed to the possibility of being cheated"[19]), a key factor for investing in stocks (e.g., Guiso et al., 2008; Georgarakos and Pasini, 2011), also plays a similar role for sustainable investments, particularly those made with social motives (Column 6 in Panel A of Table III). The coefficient of *trust* remains, though, (weakly) significant when we compare *social* sustainable investors to traditional investors (Column 6 in Panel B of Table III). The importance of *trust* is also confirmed by the evidence in Section 3 that *social* sustainable investors are more likely than the *financial* ones to rely on bank advisors and on labelling to assess the sustainability of the investment (Figure 4). Our results are in line with those of Löfgren and Nordblom (2022) and Ceccarelli et al. (2023), which show that labelling is important for sustainable investors. Hence, it is essential that the labelling system of sustainable funds is reliable since there is a risk of exploiting the trust of those *social* sustainable investors.

Moreover, our results in Table III show that *greenwashing* beliefs are unrelated to holding sustainable investments, when sustainable investors are considered as a single group. This result might suggest that some sustainable investors doubt whether sustainable finance can truly deliver on its environmental promises. When we decompose sustainable investors and compare them to traditional investors (Panel B of Table III), we also find no significant difference between *financial* sustainable investors and traditional investors in terms of their *greenwashing* beliefs (Columns 3-4). Conversely, *social* sustainable investors are associated with significantly lower *greenwashing* beliefs than traditional investors (Columns 5-6).

Finally, we show that *financial* sustainable investors have lower *income* than traditional investors do (Columns 3-4 in Panel B of Table III). This result might be due to the fact that, in

[18] In our sample, only 14 sustainable investors do not invest in (sustainable) mutual funds, stocks, or ETFs. We re-run the regressions without those individuals, and these results on being left-wing and risk aversion do not change.

[19] Guiso et al. (2008), p. 1.

the Netherlands, some green funds offer tax benefits,[20] so investors with lower income might consider more sustainable investments for financial reasons due to existence of tax reliefs.

In further tests, as outcome variable, we look sustainable investments measures in volume and as the percentage of an individual's portfolio. When we focus within the set of sustainable investors, we confirm the finding from Section 3 that *financial* sustainable investors have less absolute volume and percentage of their portfolio invested in sustainable investments than *social* sustainable investors (Appendix C).

In summary, this section suggests that the two groups of sustainable investors are different, implying that policy makers and financial institutions could use different strategies that target each of these specific subgroups to promote sustainable investments. In particular, emphasizing typical left-wing themes related to sustainable investments[21] and reducing uncertainty regarding greenwashing could increase the number of investors with social motives investing sustainably. In contrast, promoting the potential benefits of sustainable investments in terms of returns and risk through (social) media and word of mouth might be an effective way to attract *financial* sustainable investors. Additionally, access to information is crucial for both types of sustainable investors. Both have a high self-assessed ability to distinguish a sustainable investment from a conventional one, but *social* sustainable investors also rely more on bank advisors and on labelling.

4.2 Why do people NOT invest in sustainable investments?

Sustainable investors consist of about 10.6% of the population in our sample (similar to the 8.5% as in Rossi et al., 2019). We asked to the 89.4% of the individuals in our sample that do not hold sustainable investments to identify the reasons (or barriers) preventing them from investing sustainably. As reported in Table IV, Panel A, the most important reason by far is "not having enough information", which has been selected by 43.5% of *non-investors* and 30% of *traditional investors*. This result is consistent with Merkoulova and Veld (2022)'s findings that stock return ignorance is a major factor leading to stock market non-participation. Only 5.2% of *non-investors* (7.1% of *traditional investors*) indicate as a reason that sustainable investments are only a marketing strategy, 2% (16.4%) would prefer (in case they have to invest) to buy traditional

[20] https://www.rvo.nl/subsidies-financiering/regeling-groenprojecten

[21] For instance, environmental protection, anti-discrimination measures, affirmative action, employee conditions, and non-negative impact on marginalized communities (Di Giuli and Kostovetsky, 2014).

investments, and 2.6% (13.6%) believe that sustainable assets have low returns. The rest of the surveyed households provide general arguments (e.g., I don't have enough money or enough time, or I have never thought about it).

To better understand this information barrier to investing sustainably, in unreported results we investigate what sources of information households use to make important financial decisions. We find that *friends* are, on average, the source of information that is employed more often by *non-investors* while *internet* is the most popular source among *traditional investors* and *sustainable investors*. Unreported t-tests results show that, compared to *non-investors, sustainable investors* are considerably more likely to use every source besides social media. Hence, *sustainable investors* diversify their sources of information more than *non-investors*.

In Table IV, Panel B, we further analyze what drives the selection of "I don't have enough information" as a reason of not investing sustainably. Column 1 considers *non-investors*, and Column 2 considers *traditional investors*. We find that *sustainable finance literacy* is the primary driver of not investing due to *information* barriers for both *non-investors* and *traditional investors* (Columns 1-2). Hence, being unable to distinguish a sustainable investment from a non-sustainable one is a significant factor that keeps a fraction of the population away from investing sustainably. For *non-investors* (Column 1), higher *financial literacy* and using an independent *financial advisor* as source of information are negatively associated with reporting lack of *information* as a reason not to invest sustainably. Using *friends* and *bank advisors* as information sources are positively associated with reporting information barriers. This latter result might be explained by the tendency of individuals who rely on bank advisors for financial decisions to be more inattentive to financial matters (Hackethal, Haliassos, and Jappelli, 2012). Furthermore, banks may lack the capabilities to adequately educate those who are not already investing in any financial product about sustainable investments (Gutsche and Zwergel, 2020).

Since our results in this section and in the previous one indicate that *sustainable finance literacy* is a key factor for investing in sustainable assets, the policy implication is that making information on sustainable investments more transparent and accessible could incentivize individuals and investors to invest sustainably.

4.3 Knowledge is key: sustainable finance literacy

Given that *sustainable finance literacy* is what mostly drives the information barriers to investing sustainably, we analyze its determinants in Table V (Columns 1-3) employing our entire sample. We find that *sustainable finance literacy* is positively associated with *social preferences*, *financial literacy*, *financial hype*, having a university *degree*, and using *financial magazines* as a source of information of financial decisions.

We further find a negative relationship between being *female* and *sustainable finance literacy*. This relationship holds even when a measure of general *self-esteem* and *personality traits* are included in the empirical model (Column 3). The gender gap for *financial literacy* (e.g., Bucher-Koenen, Alessie, Lusardi, and Van Rooij, 2021) is already known and well-studied, thus our findings suggest that the same underlying factors may drive the gender gap for *sustainable finance literacy* as it is even more sophisticated than the financial one (Filippini et al., 2021). The results are qualitatively similar if we exclude sustainable investors from the sample in the first three columns.[22] When we consider only the sample of investors (Table V, Columns 4-6), the gender gap is partially attenuated. This result is line with the premise that women in finance are different from the general female population (Adams, Barber, and Odean, 2016).

Among investors (Table III, Columns 4-6), *social preferences* and reading *financial magazines* are positively associated with *sustainable finance literacy*, while using the *bank advisor* as the primary source of information when making important financial decisions is negatively related. Hence, these results suggest that banks should do a better job in informing their investor's clients about sustainable investments (as in Gutsche and Zwergel, 2020). We do not have data on the bank used by our respondents, so we cannot examine for which banks this effect is more relevant. Our results could be explained by the lack of customized advice provided by advisors (Foerster, Linnainmaa, Melzer, and Previtero, 2017). Moreover, Hackethal et al. (2012) find that investors who rely heavily on bank advisors are more prone to financial inertia. Finally, our results might be due to the lack of competence of bank advisors (Linnainmaa, Melzer, and Previtero, 2021).

Overall, *social preferences* and reading *financial magazines advisor* as the primary source of information when making important financial decisions are positively related to self-assessed sustainable finance knowledge both for the general population and for investors.

[22] Results are available upon request.

5. Additional analysis

5.1 Potential sustainable investors

We employ a survey experiment question and study individuals who are not currently investing in sustainable assets but who could potentially invest in the future. There are several reasons as to why it is important to analyze those potential investors. First, as mentioned above, investors that do not invest in sustainable financial products represent about 89.40% of our sample. Thus, studying these "potential" sustainable investors is essential in increasing our understanding of sustainable investments at large and if any help increase them.

Second, given the relevance of the participation puzzle and the potential role that sustainable investments could have in addressing it, it is important to investigate the preferences of individuals who do not currently invest sustainably but may choose to do so in the future.

Third, in examining potential sustainable investors, our study targets financially disengaged individuals with limited financial knowledge or interest (Anderson and Robinson, 2021). The scenario we use is analogous to some pension systems that allow individuals to choose their investments. To ensure that participants can make informed decisions, we designed the question and options to be as clear and comprehensible as possible. As a result, given the considerable stock return ignorance present among non-investors (Merkoulova and Veld, 2022), the options that respondents can choose are *intentionally* generic, hence not incentivized: "Investment fund with a return (profit) linked to all the companies in the Netherlands" versus "A selection of sustainable companies in the Netherlands."

Rossi et al. (2019) employed a comparable method using a representative sample of the population. Other studies that use "hypothetical investment questions" in a context not related to sustainable investing are Weber et al. (2013) and Egan et al. (2014). Rossi et al. (2019) show that women choose sustainable investments more frequently than men in their hypothetical lottery. Our study incorporates more key variables than those in their study, and thus our findings may offer new insights. Other studies that analyze the potential sustainable investments demand (e.g., Gutsche and Ziegler, 2019; Heeb, Kölbel, Paetzold, and Zeisberger, 2022; Gutsche et al., 2023) focus only on expert financial decision-makers; hence they provide participants with more specific incentivized options, but their samples do not consider people with little to no familiarity with investments, thus their samples are less representative in that regard.

Our findings reported in Table VI, Columns 1-4, indicate that several variables are associated with individuals' hypothetical choices to invest sustainably. The sample includes *non-investors* and *traditional investors*. Specifically, choosing the sustainable investment option (versus the traditional one) in the hypothetical question (Columns 1-2) is associated with having higher *social preferences*, being *female*, being an environmentalist, and having *left-wing political views*. Conversely, those individuals with high *financial hype*, *risk-loving*, and *greenwashing* beliefs are less likely to opt for sustainable investing.

The same variables are also associated in the same way with the hypothetical volume (Columns 3-4), expressed as a percentage, allocated to sustainable investment compared to the traditional one. However, income is negatively related to the hypothetical decision to invest sustainably (Columns 1-2) rather than the hypothetical volume of sustainable investing (Columns 3-4)

Hence, we find that the group of people who are usually more likely to be financially disengaged (Kaustia and Torstila, 2011; Anderson and Robinson, 2021), including women (Bucher-Koenen et al., 2021), would prefer to invest sustainably if they entered the financial market.

Furthermore, in Columns 5-8 we only consider *traditional investors*, since some of them would potentially invest sustainably; Column 7-8 report that, among traditional investors, possessing a university degree is negatively associated with the hypothetical volume invested sustainably, while being an environmentalist (being a *member* or *donating* to an environmental organization) and having *left-wing views* are positively associated with it.

It is worth noting that *sustainable finance literacy* never plays a role in hypothetical sustainable investment choices (Table VI, Columns 1-8), while it did for actual sustainable investments (Table III). This result suggests that information barriers limit the expression of individuals' values in their actual portfolio choices.

5.2 Most important ESG dimension

In our survey we asked sustainable investors (current and hypothetical) what the most important ESG dimension for them is. We focus only on the drivers for *environment* and *social* since most people chose them,[23] and they are more directly related to sustainability.

Table VII, Columns 1-2 show that selecting *environment* is positively associated with having a university *degree*, *left-wing political views* (significant at the 10% level), while it is negatively related to *greenwashing* beliefs and *risk loving*.

Table VII, Columns 3-4 report that being a woman is positively related to choosing *social* as the most important sustainable dimension. S*ocial* includes gender equality, thus perhaps it could be seen as the most pertinent issue for women. Therefore, ESG funds might potentially increase women's participation in financial markets by emphasizing the social dimension of sustainable funds. Moreover, having a university *degree* is negatively associated with choosing *social*, while beliefs in *greenwashing* have a positive association with selecting *social*.

When we only consider the actual sustainable investors' sample (Table VII, Columns 5-8), being *female* is no longer associated with preferring the *social* dimension (Columns 7-8), suggesting that women who invest are not representative of the general population of women (Adams et al., 2016). A complementary explanation for our finding could be that ESG investments particularly attract investors caring mostly about the environmental dimension (Siemroth and Hornuf, 2023), which may discourage some prospective female investors who are more interested in the social aspect.

In the sample of sustainable investors, choosing *environment* as preferred dimension is positively associated with *environmental donations* and *being a member of an environmental organization* (Column 6). On the other hand, *social preferences* are positively correlated with choosing the *social* dimension as the most important ESG criteria (Columns 7 and 8). Hence, further emphasizing the social aspect may increase the flow of funds from altruistic investors to sustainable investments.

6. Discussion and conclusion

Using the LISS panel, we surveyed a representative sample of the Dutch population to extensively analyze, mainly, what drives individuals to invest sustainably, whether individuals'

[23] Only 12 people picked the *governance* dimension, which does not enable us to run regressions for it.

motives for sustainable investing play a role, whether sustainable investors can help mitigate the stock market participation puzzle, and which barriers there are to sustainable investing.

Inspired by the ongoing academic debate on "value-driven" and "values-driven" sustainable investing (e.g., Starks 2023), we empirically investigate the prevalence of different motives to hold sustainable investments. In our paper, we uncover two broad groups: investors who invest sustainably primarily for social reasons (*social* sustainable investors) and those who do so primarily for financial reasons (*financial* sustainable investors). We find that these different reasons for investing sustainably exist and that both groups are important players in the retail market for sustainable investments. *Financial* sustainable investors outnumber *social* sustainable investors, while *social* sustainable investors have a higher percentage of their portfolio invested sustainably.

Unpacking sustainable investors into *social* and *financial* ones proves to be essential in depicting a complete description of the sustainable retail investors market, as we find that drivers of sustainable investing are very different for these two groups. We find that having higher social preferences, left-wing political views, more trust towards other people, a university degree, and being risk averse are positively associated with *social* sustainable investors' investments. In contrast, recommendations through (social) media and word of mouth are positively related to sustainable investments of only *financial* sustainable investors. The perceived ability to distinguish which investments are sustainable and which are not (sustainable finance literacy) seems to be a crucial driver of investing sustainably for both investor groups. We further find that *social* sustainable investors rely more on bank advisors and labelling when assessing the sustainability of the investments compared to *financial* sustainable investors.

Overall, the policy implications of our empirical findings are that differentiated strategies can be used to attract financially-driven and socially-driven sustainable investors. On the one hand, reliable labelling, addressing greenwashing concerns and highlighting left-wing themes related to sustainable investments can be effective in addressing socially-driven investors. On the other hand, emphasizing the financial benefits of sustainable investing through (social) media and word of mouth might attract financially-driven investors. Furthermore, the ability to judge the sustainability of an investment, that is, sustainable finance literacy, is vital for both groups.

Next, *social* sustainable investors could help mitigate non-financial barriers to individuals' stock market participation since we find that *social* sustainable investors have left-wing political views and are risk averse, which are two household characteristics that are associated with being less likely to invest in the stock market (Kaustia and Torstila, 2011; Guiso and Sodini, 2013; Calvet et al., 2023). This is important when considering the substantial welfare loss estimated in terms of lifetime consumption for nonparticipating in the stock market (Guiso and Jappelli, 2005; Cocco et al., 2005). Hence, by emphasizing left-wing themes associated with sustainable investments, such as environmental protection, anti-discrimination measures, affirmative action, employee conditions, and non-negative impact on marginalized communities (Di Giuli and Kostovetsky, 2014), policymakers and financial institutions can potentially reach two targets at once: increase participation in the stock market and increase the overall amount of money invested sustainably.

Moreover, information barriers are the primary reason why households do not invest sustainably. Sustainable finance literacy, the perceived ability to distinguish between sustainable and non-sustainable investments, is the most critical driver of this information barrier, and financial magazines are the only source that enhances this perceived ability. Governments and financial institutions can reduce uncertainty surrounding sustainable investments by improving policy interventions and information campaigns that provide accessible, unambiguous, and transparent criteria for environmentally sustainable assets.

Finally, women who do currently not invest would be more likely to choose a sustainable fund over a general stock market index, in case they would participate in financial markets. Women also consider *social* (among ESG) to be the most crucial sustainability dimension, which is probably due to gender-equality related considerations typically emphasized in the *social* dimension of ESG. Hence, policymakers and financial institutions might potentially increase women's interest in (sustainable) investing by encouraging more efforts from companies or sustainable funds to promote gender equality.

Our work opens avenues for future research. Specifically, subsequent studies could verify our findings by merging a survey with transaction and administrative data, which we could not access and would permit a larger number of observations. Moreover, in our paper, we focus on two broad groups of sustainable investors: those who invest primarily for financial reasons and those who do so for social reasons. We acknowledge that both financial and social reasons

encompass various sub-reasons that future research can investigate and enrich the analysis by allowing different degrees of trade-offs between financial and social reasons.

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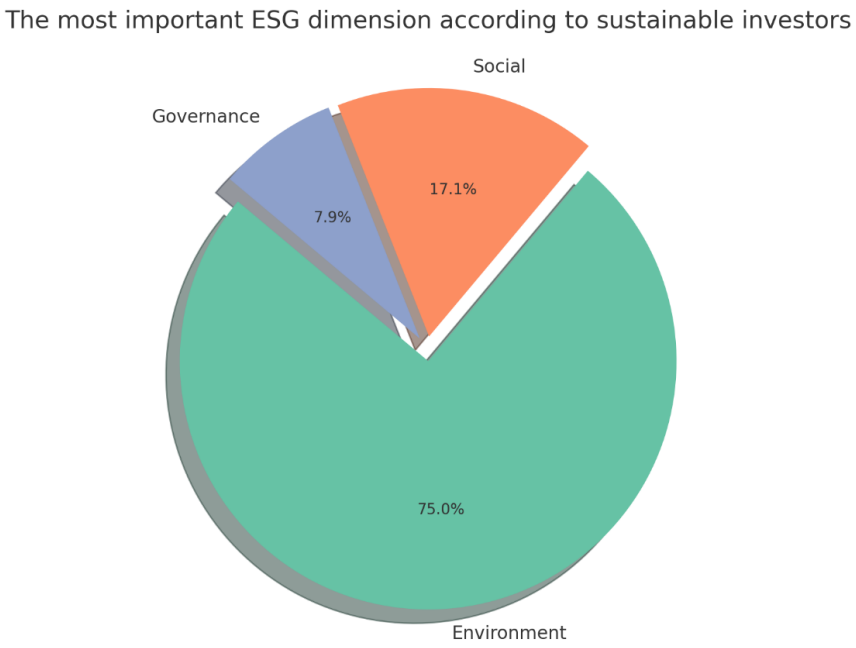


Figure 1. Most important sustainability dimension. This graph illustrates the responses to the question "If you had to choose, which sustainability topic do you think is the most important?", which was asked to sustainable investors.

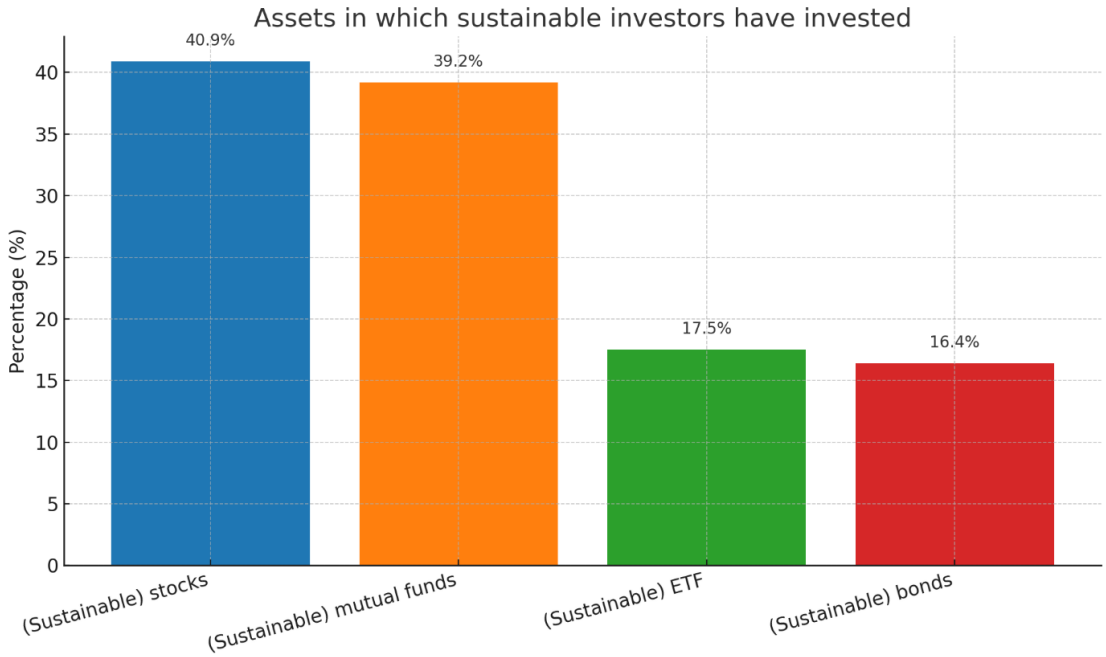


Figure 2. Assets in which sustainable investors have invested. This graph illustrates the responses to the question "Which sustainable investments do you have?", which was asked to sustainable investors.

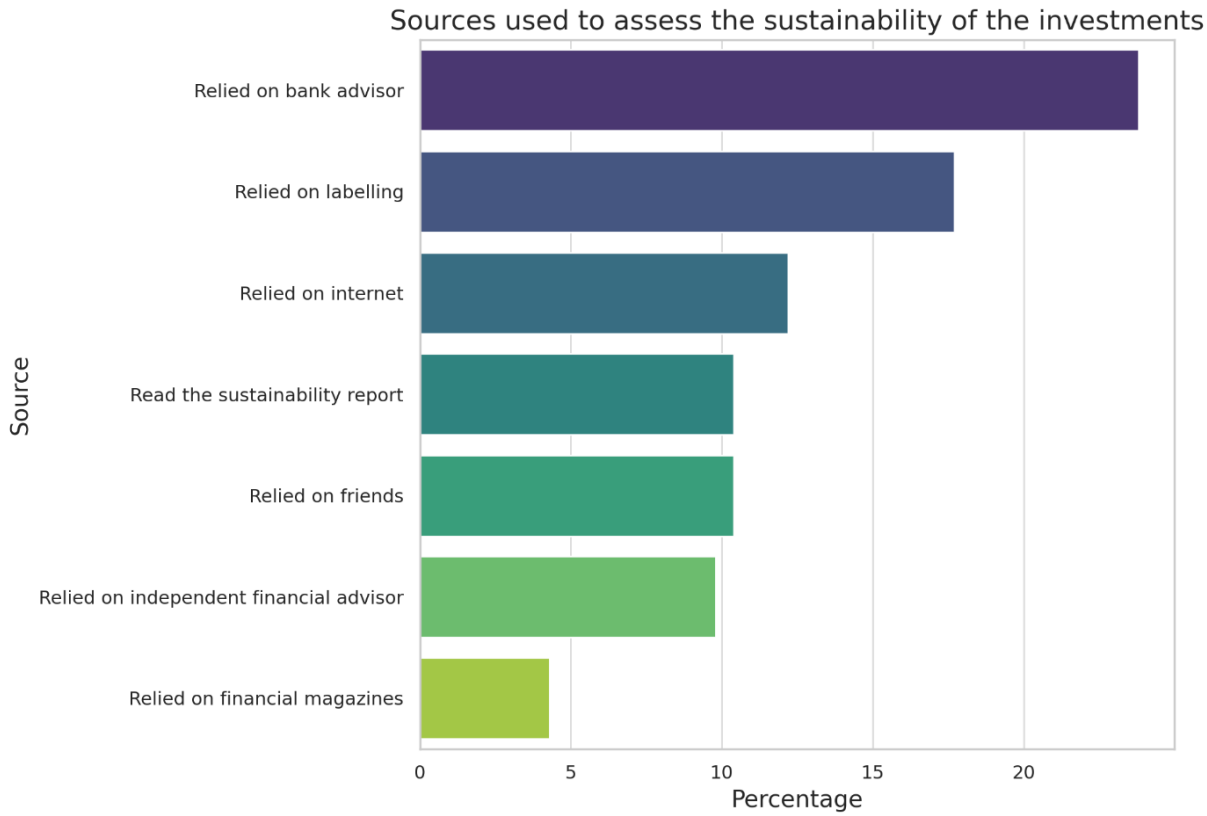


Figure 3. Sources used to assess the sustainability of the investments. This graph shows the percentage of respondents who, on a 7-point scale, strongly agree (indicating a score of at least 6) that they used a specific source to evaluate the sustainability of an investment. The question posed, "How did you primarily determine that the investment was sustainable?", was directed solely at sustainable investors.

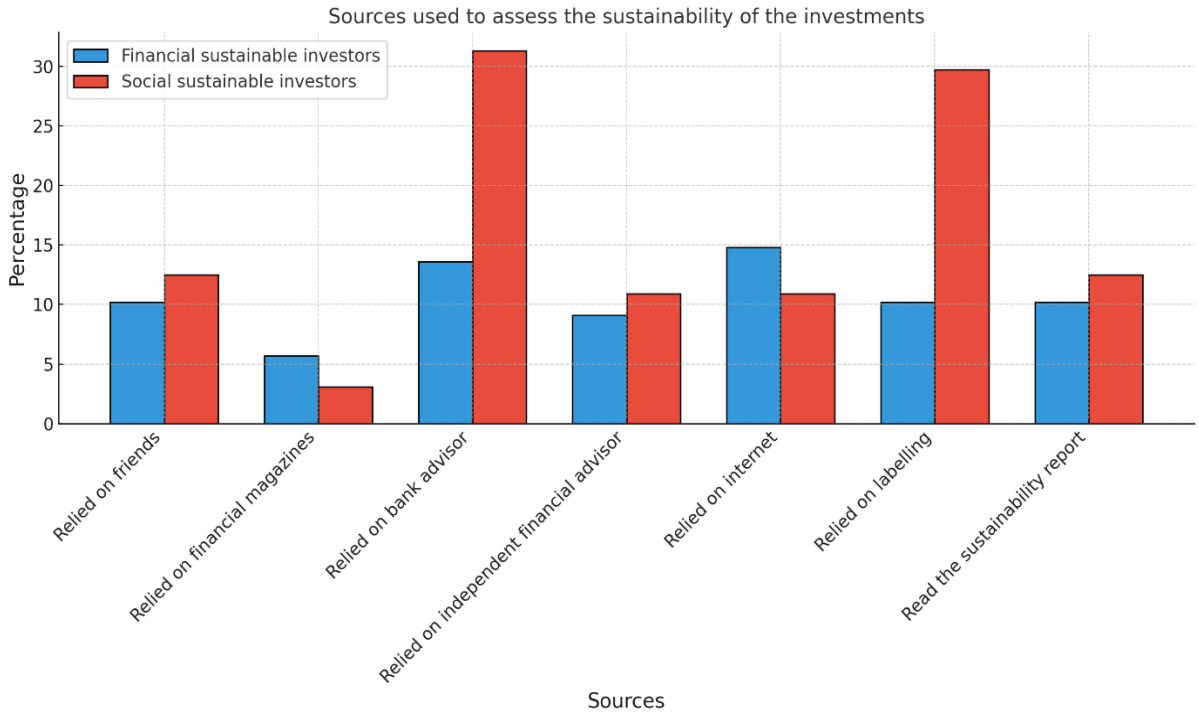


Figure 4. Sources used to assess the sustainability of the investments – *financial* and *social* sustainable investors. This graph displays the percentage of respondents who strongly agree, with a score of 6 or higher on a 7-point scale, that they used a specific source to evaluate the sustainability of an investment. Respondents were asked: "How did you primarily determine that the investment was sustainable?". This question was directed exclusively at sustainable investors. The graph contrasts the responses of *financial* sustainable investors (investors that bought sustainable assets primarily for financial reasons), and *social* sustainable investors (investors that bought sustainable assets primarily for non-financial reasons, even at the cost of a lower risk-adjusted return).

Table I. Descriptive statistics

Panel A: Overall sample. This table reports summary statistics for the main variables we use in our analysis.

Variables	N	Mean	St. Dev.	Min	Max
Sustainable investments					
Sustainable investors	1550	0.106	0.308	0	1
Financial sustainable investors	1550	0.057	0.231	0	1
Social sustainable investors	1550	0.041	0.199	0	1
Other sustainable investors	1550	0.008	0.088	0	1
Other groups					
Traditional investors	1550	0.090	0.287	0	1
Non-investors	1550	0.804	0.397	0	1
Preferences and traits					
Social preferences	1550	4.254	1.687	1	7
Greenwashing	1550	4.080	1.204	1	7
Financial hype	1550	2.370	1.447	1	7
Financial literacy	1550	4.486	1.351	1	7
Sustainable finance literacy	1550	2.754	1.392	1	7
Preferences and traits (from LISS panel)					
Left-wing views	1222	0.299	0.458	0	1
Trust	1483	6.039	2.276	0	10
Risk loving	1168	3.773	2.506	0	10
Environment donation	1224	0.176	0.381	0	1
Environment member	1224	0.074	0.261	0	1
Demographics (from LISS panel)					
Female	1550	0.489	0.500	0	1
Age	1550	55.557	17.497	18	95
Non-urban	1550	2.755	1.342	1	5
Income (in Log)	1550	7.020	1.992	0	11.864
Degree	1550	0.154	0.361	0	1
Married	1550	0.535	0.499	0	1
Reasons for NOT investing in sustainable financial products					
Information	1386	0.421	0.494	0	1
Marketing trick	1386	0.054	0.226	0	1
Prefer traditional investment	1386	0.035	0.183	0	1
Low returns	1386	0.038	0.190	0	1
Hypothetical sustainable investment					
Hypothetical sustainable investment	1386	0.575	0.495	0	1
Hypothetical sustainable volume	1386	52.814	31.013	0	100
Environment	961	0.677	0.468	0	1
Social	961	0.211	0.408	0	1

Table II. Group averages

Panel A: Mean difference 1. This table reports the average values for each variable based on the groups. Column 1 considers *sustainable investors* (investors that have sustainable investments), Column 2 considers *non-investors* (individuals that do not have any financial investments), and Column 3 considers *traditional investors* (investors that do not have sustainable investments). The mean differences between the groups are displayed in Columns 4-6. The symbols ***, **, and * denote the significance of the differences at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Variables	Sustainable investors	Non-investors	Traditional investors	(1) - (2)	(1) - (3)	(2) - (3)
Preferences and traits						
Social preferences	4.622	4.206	4.250	0.416***	0.372**	-0.044
Greenwashing	3.890	4.089	4.221	-0.199*	-0.331**	-0.132
Financial hype	3.134	2.184	3.136	0.950***	-0.002	-0.952***
Financial literacy	4.872	4.378	5.000	0.494***	-0.128	-0.622***
Sustainable finance literacy	3.732	2.572	3.221	1.159***	0.510***	-0.649***
Preferences and traits (from LISS panel)						
Left-wing views	0.412	0.288	0.277	0.124***	0.135**	0.011
Trust	6.869	5.910	6.243	0.960***	0.627**	-0.333
Risk loving	4.348	3.595	4.748	0.753***	-0.399	-1.152***
Environment donation	0.294	0.168	0.124	0.126***	0.170***	0.0445
Environment member	0.101	0.070	0.080	0.031	0.021	-0.010
Demographics (from LISS panel)						
Female	0.390	0.518	0.343	-0.128***	0.047	0.176***
Age	52.110	56.226	53.643	-4.116***	-1.533	2.583*
Non-urban	2.567	2.803	2.550	-0.235**	0.017	0.253**
Income (in Log)	7.248	6.926	7.592	0.322*	-0.344*	-0.667***
Degree	0.366	0.115	0.257	0.251***	0.109**	-0.142***
Married	0.482	0.549	0.479	-0.067	0.003	0.070
N	164	1246	140			

Panel B: Mean difference 2. This table reports the average values for each variable based on the investor groups. Column 1 considers *financial* sustainable investors (investors that bought sustainable assets primarily for financial reasons), Column 2 *social* sustainable investors (investors that bought sustainable assets primarily for non-financial reasons, even at the cost of a lower risk-adjusted return), Column 3 considers *non-investors* (individuals that do not have any financial investments), and Column 4 *traditional investors* (investors that do not have sustainable investments). The mean differences between the groups are displayed in Columns 5-9. The symbols ***, **, and * denote the significance of the differences at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Variables	Financial Sustainable investors	Social Sustainable investors	Non-investors	Traditional investors	(1) - (3)	(1) - (4)	(2) - (3)	(2) - (4)	(1) - (2)
Preferences and traits									
Social preferences	3.955	5.516	4.206	4.250	-0.252	-0.295	1.309***	1.266***	-1.561***
Greenwashing	4.227	3.516	4.089	4.221	0.138	0.006	-0.573***	-0.706***	0.712***
Financial hype	3.386	2.953	2.184	3.136	1.203***	0.251	0.769***	-0.183	0.433*
Financial literacy	4.989	4.719	4.378	5.000	0.611***	-0.011	0.341**	-0.281	0.270
Sustainable finance literacy	3.864	3.688	2.572	3.221	1.291***	0.642***	1.115***	0.466**	0.176
Preferences and traits (from LISS panel)									
Left-wing views	0.222	0.723	0.288	0.277	-0.065	-0.055	0.436***	0.447***	-0.501***
Trust	6.375	7.623	5.91	6.243	0.465*	0.132	1.713***	1.380***	-1.248***
Risk loving	5.034	3.356	3.595	4.748	1.439***	0.287	-0.240	-1.392***	1.679***
Environment donation	0.190	0.404	0.168	0.124	0.022	0.067	0.236***	0.280***	-0.214**
Environment member	0.063	0.149	0.070	0.080	-0.006	-0.016	0.079	0.069	-0.085
Demographics (from LISS panel)									
Female	0.33	0.469	0.518	0.343	-0.189***	-0.013	-0.050	0.126*	-0.139*
Age	48.091	56.234	56.226	53.643	-8.135***	-5.552**	0.009	2.592	-8.143***
Non-urban	2.545	2.531	2.803	2.550	-0.257*	-0.005	-0.271	-0.019	0.014
Income (in Log)	7.107	7.335	6.926	7.592	0.181	-0.485*	0.409	-0.257	-0.228
Degree	0.284	0.516	0.115	0.257	0.169***	0.027	0.401***	0.258***	-0.232***
Married	0.466	0.469	0.549	0.479	-0.083	-0.013	-0.080	-0.010	-0.003
Volume invested sustainably									
Absolute volume (in Log)	8.190	9.067							-0.877***
Percentage volume	35.943	59.043							-23.100***
N	88	64	1246	140					

Table III. Sustainable investments

Panel A. This table reports OLS estimates. Columns 1-2 samples consider *sustainable investors* (investors that have sustainable investments) and non-investors. Columns 3-4 samples include *financial* sustainable investors (investors that bought sustainable assets primarily for financial reasons) and non-investors (individuals that do not have any financial investments). Columns 5-6 samples include *social* sustainable investors (investors that bought sustainable assets primarily for non-financial reasons, even at the cost of a lower risk-adjusted return) and non-investors. The dependent variable in Columns 1-2, *sustainable investors*, is a dummy variable equal to one if the individual has sustainable investments. The dependent variable in Columns 3-4 is a dummy variable equal to one if the individual is a *financial* sustainable investor. The dependent variable in Columns 5-6 is a dummy variable equal to one if the individual is a *social* sustainable investor. The independent variables are detailed in Appendix A. Standard errors are robust to heteroskedasticity and are reported below in parentheses. ***, **, and * refer to significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Sample	Sustainable investors + Non-investors		Financial sustainable investors + Non-investors		Social sustainable investors + Non-investors	
Variables	Sustainable investors		Financial sustainable investors		Social sustainable investors	
Social preferences	-0.001	-0.004	-0.013***	-0.011**	0.012***	0.007**
	(0.005)	(0.005)	(0.004)	(0.004)	(0.003)	(0.003)
Greenwashing	-0.009	-0.004	0.002	0.003	-0.010*	-0.006
	(0.007)	(0.008)	(0.005)	(0.006)	(0.005)	(0.006)
Financial hype	0.031***	0.029***	0.024***	0.023***	0.012**	0.010
	(0.008)	(0.009)	(0.007)	(0.008)	(0.005)	(0.007)
Financial literacy	0.004	0.001	0.005	-0.001	-0.002	0.003
	(0.006)	(0.007)	(0.005)	(0.006)	(0.004)	(0.005)
Sustainable finance literacy	0.037***	0.038***	0.024***	0.023***	0.017***	0.019***
	(0.007)	(0.008)	(0.006)	(0.007)	(0.005)	(0.006)
Female	-0.003	0.009	-0.006	-0.005	0.007	0.013
	(0.017)	(0.019)	(0.013)	(0.015)	(0.012)	(0.014)
Age	0.001*	0.000	-0.000	-0.000	0.001***	0.001
	(0.001)	(0.001)	(0.000)	(0.001)	(0.000)	(0.000)
Non-urban	-0.002	-0.001	-0.003	-0.003	0.000	0.002
	(0.006)	(0.006)	(0.005)	(0.005)	(0.004)	(0.005)
Income	0.002	0.001	0.002	0.000	-0.001	-0.001
	(0.004)	(0.005)	(0.003)	(0.004)	(0.003)	(0.003)
Degree	0.146***	0.128***	0.052*	0.042	0.135***	0.124***
	(0.033)	(0.038)	(0.028)	(0.031)	(0.029)	(0.033)
Married	-0.025	-0.026	-0.009	-0.005	-0.022*	-0.025*
	(0.017)	(0.020)	(0.013)	(0.015)	(0.013)	(0.015)
Left-wing views		0.037*		-0.008		0.062***
		(0.021)		(0.016)		(0.017)
Trust		0.010***		0.005		0.007***
		(0.004)		(0.003)		(0.002)
Risk loving		-0.001		0.004		-0.006**
		(0.004)		(0.003)		(0.003)
Environment donation		0.024		0.005		0.006
		(0.029)		(0.021)		(0.022)
Environment member		-0.019		-0.032		-0.007
		(0.043)		(0.027)		(0.037)
Constant	-0.132*	-0.143*	-0.052	-0.037	-0.107**	-0.120**
	(0.068)	(0.079)	(0.059)	(0.066)	(0.048)	(0.058)
Sources as control	YES	YES	YES	YES	YES	YES
N	1410	1037	1334	983	1310	972
adj. R-sq	0.122	0.121	0.094	0.080	0.102	0.122

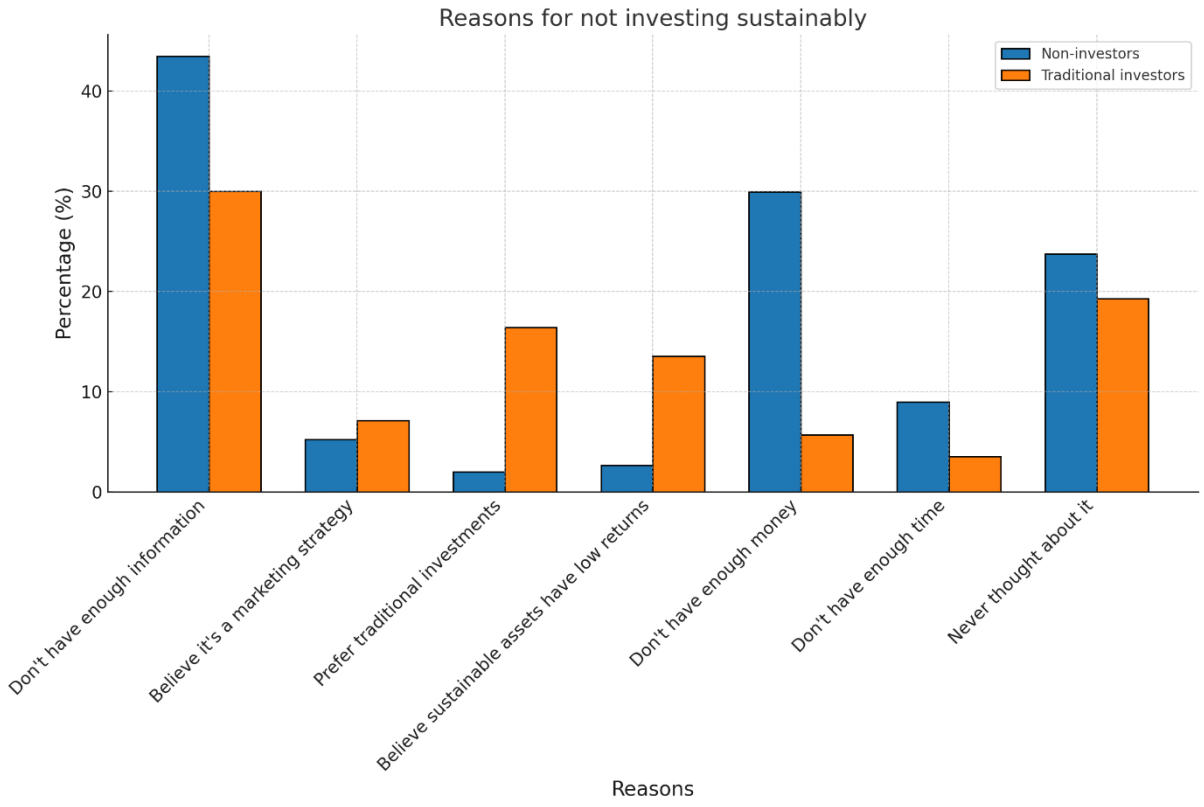
Panel B. This table reports OLS estimates. Columns 1-2 samples consider *sustainable investors* (investors that have sustainable investments) and traditional investors (investors that do not have sustainable investments). Columns 3-4 samples include *financial* sustainable investors (investors that bought sustainable assets primarily for financial reasons) and traditional investors. Columns 5-6 samples include *social* sustainable investors (investors that bought sustainable assets primarily for non-financial reasons, even at the cost of a lower risk-adjusted return) and traditional investors. The dependent variable in Columns 1-2, sustainable investors, is a dummy variable equal to one if the individual has sustainable investments. The dependent variable in Columns 3-4 is a dummy variable equal to one if the individual is a *financial* sustainable investor. The dependent variable in Columns 5-6 is a dummy variable equal to one if the individual is a *social* sustainable investor. The independent variables are detailed in Appendix A. Standard errors are robust to heteroskedasticity and are reported below in parentheses. ***, **, and * refer to significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Sample	Sustainable investors + Traditional investors		Financial sustainable investors + Traditional investors		Social sustainable investors + Traditional investors	
Variables	Sustainable investors		Financial sustainable investors		Social sustainable investors	
Social preferences	0.016	0.002	-0.045**	-0.024	0.078***	0.029
	(0.020)	(0.028)	(0.022)	(0.028)	(0.019)	(0.025)
Greenwashing	-0.041*	-0.031	-0.012	-0.003	-0.069***	-0.045*
	(0.023)	(0.026)	(0.025)	(0.029)	(0.024)	(0.027)
Financial hype	-0.022	0.001	0.001	0.025	-0.041*	-0.037
	(0.024)	(0.029)	(0.026)	(0.033)	(0.025)	(0.029)
Financial literacy	-0.030	-0.012	-0.001	0.007	-0.055**	-0.030
	(0.025)	(0.033)	(0.030)	(0.041)	(0.025)	(0.033)
Sustainable finance literacy	0.100***	0.101***	0.120***	0.108***	0.058**	0.058*
	(0.024)	(0.030)	(0.026)	(0.034)	(0.025)	(0.029)
Female	0.033	0.040	0.060	0.030	0.053	0.037
	(0.062)	(0.078)	(0.072)	(0.091)	(0.062)	(0.077)
Age	0.000	-0.002	-0.001	-0.003	0.004*	0.001
	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)	(0.003)
Non-urban	0.002	0.013	-0.013	0.000	0.021	0.031
	(0.023)	(0.031)	(0.026)	(0.036)	(0.022)	(0.031)
Income	-0.000	-0.000	-0.044**	-0.068***	-0.029*	-0.031
	(0.000)	(0.000)	(0.018)	(0.022)	(0.016)	(0.021)
Degree	0.095	0.052	0.028	0.002	0.192***	0.153*
	(0.064)	(0.085)	(0.071)	(0.092)	(0.069)	(0.083)
Married	0.032	0.034	0.067	0.063	0.008	0.023
	(0.060)	(0.071)	(0.067)	(0.080)	(0.061)	(0.071)
Left-wing views		0.115		-0.034		0.215**
		(0.083)		(0.100)		(0.094)
Trust		0.018		0.020		0.023*
		(0.018)		(0.018)		(0.014)
Risk loving		-0.015		0.004		-0.041***
		(0.015)		(0.017)		(0.014)
Environment donation		0.169*		0.141		0.130
		(0.086)		(0.118)		(0.096)
Environment member		0.017		-0.016		0.033
		(0.132)		(0.147)		(0.136)
Constant	0.323	0.127	0.341	0.340	0.201	0.242
	(0.250)	(0.293)	(0.282)	(0.360)	(0.236)	(0.258)
Sources as control	YES	YES	YES	YES	YES	YES
N	304	213	228	159	204	148
adj. R-sq	0.057	0.079	0.077	0.070	0.250	0.298

Table IV. Why do people NOT invest in sustainable investments?

Panel A. This table and the respective graph present the reasons individuals have indicated for not investing sustainably. In the table, Column 1 considers *non-investors* (individuals that do not have any financial investments), and Column 2 considers only *traditional investors* (investors that do not have sustainable investments).

Reason	Non-investors	Traditional investors
I don't have enough *information* to consider such investments.	43.50%	30.00%
I believe sustainable financial products are only a *marketing strategy*.	5.22%	7.14%
I *prefer traditional investments*.	2.01%	16.43%
I believe sustainable assets have *low returns*.	2.65%	13.57%
I don't have *enough money* for it.	29.94%	5.71%
I don't have *enough time* for it.	8.99%	3.57%
I *never thought* about it.	23.76%	19.29%



Panel B. This table reports OLS estimates. Column 1 includes non-investors (individuals that do not have any financial investments). Column 2 considers only traditional investors (investors that do not have sustainable investments). The dependent variable is a dummy, Information, and it is equal to one if the individual selected "I don't have enough information" as a reason not to have sustainable investments. The independent variables are detailed in Appendix A. Standard errors are robust to heteroskedasticity and are reported below in parentheses. ***, **, and * refer to significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)
Sample	Non-investors	Traditional investors
Variables	Information	Information
Financial literacy	-0.033**	-0.034
	(0.013)	(0.048)
Sustainable finance literacy	-0.081***	-0.095**
	(0.013)	(0.047)
Female	-0.003	0.020
	(0.036)	(0.139)
Degree	-0.023	0.064
	(0.051)	(0.133)
Source - bank advisors	0.032**	-0.003
	(0.013)	(0.052)
Source - financial magazines	-0.015	-0.068
	(0.018)	(0.048)
Source - financial advisors	-0.031**	-0.024
	(0.015)	(0.047)
Source - social media	-0.013	-0.046
	(0.019)	(0.066)
Source - internet	-0.012	0.019
	(0.013)	(0.042)
Source - friends	0.029**	0.059
	(0.012)	(0.049)
Left-wing views	0.013	-0.076
	(0.037)	(0.151)
Constant	1.176***	0.220
	(0.215)	(0.680)
Other demographics	YES	YES
Other variables	YES	YES
N	927	103
adj. R-sq	0.106	0.009

Table V. Knowledge is key: sustainable finance literacy

This table reports OLS estimates. Columns 1-3 consider the full sample, while Columns 4-6 only consider investors in the financial markets. The dependent variable, *Sustainable finance literacy*, indicates the self-assessed ability to understand if an investment is sustainable. The independent variables are detailed in Appendix A. Standard errors are robust to heteroskedasticity and are reported below in parentheses. ***, **, and * refer to significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Sample	Everyone			All investors		
Variables	Sustainable finance literacy					
Social preferences	0.096***	0.108***	0.112***	0.119***	0.166***	0.184***
	(0.020)	(0.027)	(0.028)	(0.042)	(0.060)	(0.063)
Greenwashing	-0.022	0.026	0.022	-0.148**	-0.130*	-0.114
	(0.030)	(0.037)	(0.037)	(0.060)	(0.073)	(0.076)
Financial hype	0.168***	0.190***	0.191***	0.027	0.031	0.035
	(0.026)	(0.033)	(0.033)	(0.051)	(0.062)	(0.063)
Financial literacy	0.236***	0.220***	0.221***	0.159**	0.085	0.081
	(0.025)	(0.031)	(0.031)	(0.068)	(0.093)	(0.096)
Female	-0.502***	-0.461***	-0.441***	-0.371**	-0.358*	-0.317
	(0.063)	(0.080)	(0.086)	(0.145)	(0.199)	(0.208)
Age	-0.008***	-0.006**	-0.005*	-0.008*	-0.009	-0.006
	(0.002)	(0.003)	(0.003)	(0.005)	(0.006)	(0.006)
Non-urban	0.002	0.007	0.010	0.123**	0.118	0.132*
	(0.023)	(0.027)	(0.027)	(0.055)	(0.073)	(0.073)
Income	-0.022	-0.041**	-0.041**	-0.005	-0.033	-0.040
	(0.015)	(0.018)	(0.018)	(0.037)	(0.055)	(0.055)
Degree	0.335***	0.283**	0.244**	0.175	0.205	0.146
	(0.091)	(0.112)	(0.113)	(0.140)	(0.185)	(0.183)
Married	-0.040	-0.055	-0.037	-0.244*	-0.286*	-0.266
	(0.064)	(0.076)	(0.076)	(0.131)	(0.171)	(0.175)
Source - bank advisors	-0.001	0.009	0.010	-0.154***	-0.212***	-0.203***
	(0.026)	(0.032)	(0.032)	(0.050)	(0.066)	(0.069)
Source - financial magazines	0.159***	0.127***	0.124***	0.145***	0.160**	0.171**
	(0.031)	(0.037)	(0.037)	(0.055)	(0.068)	(0.075)
Constant	1.453***	0.988***	1.053*	2.907***	2.923***	2.409*
	(0.262)	(0.373)	(0.539)	(0.640)	(0.992)	(1.354)
Other Sources	YES	YES	YES	YES	YES	YES
Other Variables	NO	YES	YES	NO	YES	YES
Personality traits	NO	NO	YES	NO	NO	YES
N	1550	1060	1060	304	195	195
adj. R-sq	0.279	0.296	0.297	0.158	0.173	0.171

Table VI. Potential sustainable investors

This table reports OLS estimates. Columns 1-4 consider traditional investors (investors that do not have sustainable investments), and non-investors (individuals that do not have any financial investments). Columns 5-8 consider only traditional investors. The dependent variables are *Hypothetical sustainable investment* and *Hypothetical sustainable volume*. *Hypothetical sustainable investment* is a dummy which is equal to 1 if the individual chooses sustainable investment over conventional investment in an experimental question, and 0 otherwise. *Hypothetical sustainable volume* is the percentage volume hypothetically invested sustainably. The independent variables are detailed in Appendix A. Standard errors are robust to heteroskedasticity and are reported below in parentheses. ***, **, and * refer to significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sample	Non-investors + Traditional investors				Traditional investors			
Variables	Hypothetical. sustainable investment		Hypothetical sustainable volume		Hypothetical. sustainable investment		Hypothetical sustainable volume	
Social preferences	0.062***	0.047***	4.248***	2.995***	0.071**	0.012	3.755**	1.056
	(0.008)	(0.010)	(0.503)	(0.581)	(0.029)	(0.032)	(1.860)	(1.908)
Greenwashing	-0.090***	-0.070***	-5.750***	-4.460***	-0.076**	0.004	-2.633	3.083
	(0.010)	(0.012)	(0.669)	(0.745)	(0.032)	(0.038)	(1.979)	(2.014)
Financial hype	-0.032***	-0.025**	-2.030***	-1.619**	0.035	0.061*	1.627	-0.320
	(0.011)	(0.013)	(0.642)	(0.745)	(0.032)	(0.034)	(1.837)	(1.952)
Financial literacy	-0.020*	0.009	-1.674***	-0.113	-0.113***	-0.073	-3.731	-1.615
	(0.010)	(0.012)	(0.628)	(0.718)	(0.037)	(0.045)	(2.260)	(3.041)
Sust. finance literacy	0.005	0.002	0.717	0.513	-0.033	-0.005	-0.418	2.108
	(0.010)	(0.012)	(0.684)	(0.765)	(0.037)	(0.041)	(1.990)	(2.192)
Female	0.081***	0.067**	4.110**	3.538**	0.024	-0.048	5.235	5.266
	(0.027)	(0.031)	(1.630)	(1.802)	(0.086)	(0.094)	(5024)	(5520)
Age	0.001	0.000	0.097*	0.061	-0.001	0.001	0.091	0.127
	(0.001)	(0.001)	(0.056)	(0.065)	(0.003)	(0.003)	(0.206)	(0.198)
Non-urban	-0.003	0.002	-0.405	-0.775	-0.004	0.019	0.492	0.037
	(0.009)	(0.011)	(0.589)	(0.630)	(0.033)	(0.037)	(1896)	(2076)
Income	-0.012*	-0.019**	-0.505	-0.533	-0.012	-0.034	0.033	-0.024
	(0.007)	(0.008)	(0.390)	(0.470)	(0.034)	(0.041)	(1.627)	(2.216)
Degree	0.088**	0.019	6.022**	1.033	-0.005	-0.081	-11.123**	-13.047**
	(0.036)	(0.042)	(2.408)	(2.709)	(0.104)	(0.106)	(5.608)	(5.880)
Married	-0.064**	-0.060**	-1.228	0.687	-0.139*	-0.124	-4.197	-2.390
	(0.026)	(0.030)	(1.687)	(1.855)	(0.082)	(0.087)	(5.003)	(5.758)
Left-wing views		0.160***		13.272***		0.456***		21.252***
		(0.032)		(2.006)		(0.119)		(7.252)
Trust		0.010		0.729*		-0.027		-0.680
		(0.006)		(0.395)		(0.020)		(1126)
Risk loving		-0.020***		-1.167***		-0.018		-1.318
		(0.006)		(0.374)		(0.019)		(1099)
Environment donation		0.147***		9.435***		0.438***		17.337**
		(0.037)		(2.276)		(0.137)		(7.178)
Environment member		0.175***		10.649***		0.389***		27.118***
		(0.047)		(3.353)		(0.131)		(9.520)
Constant	0.855***	0.716***	65.880***	53.923***	1.220***	0.883**	43.849**	12.641
	(0.108)	(0.128)	(6.704)	(7.540)	(0.380)	(0.340)	(19.971)	(22.473)
Sources	YES	YES	YES	YES	YES	YES	YES	YES
N	1386	1030	1386	1030	140	103	140	103
adj. R-sq	0.136	0.177	0.152	0.209	0.072	0.291	0.035	0.236

Table VII. E vs S investing

This table reports OLS estimates. Columns 1-4 consider *sustainable investors* (investors that have sustainable investments) and *hypothetical sustainable investors* (individuals that choose sustainable investment over conventional investment in an experimental question). The dependent variables are *Environment* and *Social*, which indicate if the individual chooses Environment or Social as the most crucial sustainability dimension, respectively. The independent variables are detailed in Appendix A. Standard errors are robust to heteroskedasticity and are reported below in parentheses. ***, **, and * refer to significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sample	Sustainable investors + Hypothetical sustainable investors				Sustainable investors			
Variables	Environment		Social		Environment		Social	
Social preferences	0.021**	0.014	0.003	0.007	-0.015	-0.041	0.042**	0.057*
	(0.010)	(0.013)	(0.009)	(0.012)	(0.024)	(0.037)	(0.018)	(0.031)
Greenwashing	-0.053***	-0.051***	0.030***	0.041***	-0.069**	-0.094***	0.035	0.064**
	(0.013)	(0.015)	(0.011)	(0.012)	(0.030)	(0.029)	(0.028)	(0.032)
Financial hype	0.002	0.006	-0.007	-0.003	-0.005	-0.018	-0.000	0.025
	(0.012)	(0.014)	(0.011)	(0.012)	(0.027)	(0.033)	(0.024)	(0.028)
Financial literacy	0.006	-0.004	-0.004	-0.007	-0.013	-0.034	-0.012	0.005
	(0.013)	(0.014)	(0.011)	(0.013)	(0.036)	(0.042)	(0.034)	(0.040)
Sustainable finance literacy	0.005	0.011	-0.016	-0.014	0.037	0.038	-0.035	-0.032
	(0.013)	(0.014)	(0.011)	(0.012)	(0.036)	(0.040)	(0.032)	(0.040)
Female	-0.049	-0.058	0.084***	0.087***	0.103	0.082	-0.070	-0.031
	(0.032)	(0.036)	(0.028)	(0.032)	(0.075)	(0.081)	(0.070)	(0.081)
Age	0.001	-0.000	-0.001	-0.000	-0.001	-0.002	0.002	0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)	(0.003)	(0.003)
Non-urban	0.006	0.003	-0.009	-0.008	-0.011	-0.047	0.011	0.053
	(0.012)	(0.013)	(0.010)	(0.012)	(0.030)	(0.033)	(0.026)	(0.032)
Income	-0.001	-0.001	-0.001	-0.003	0.011	-0.003	-0.014	-0.002
	(0.008)	(0.009)	(0.007)	(0.008)	(0.019)	(0.027)	(0.015)	(0.026)
Degree	0.141***	0.093**	-0.116***	-0.077**	0.070	-0.065	-0.031	0.032
	(0.036)	(0.042)	(0.030)	(0.034)	(0.075)	(0.097)	(0.067)	(0.091)
Married	-0.003	0.017	0.034	0.009	0.063	0.059	-0.060	-0.058
	(0.032)	(0.036)	(0.028)	(0.031)	(0.074)	(0.082)	(0.067)	(0.071)
Left-wing views		0.065*		-0.016		-0.006		0.046
		(0.037)		(0.032)		(0.103)		(0.097)
Trust		0.013		-0.004		0.001		0.015
		(0.009)		(0.008)		(0.021)		(0.019)
Risk loving		-0.016**		0.011*		-0.011		0.014
		(0.008)		(0.007)		(0.021)		(0.017)
Environment donation		0.050		-0.057*		0.176**		-0.117
		(0.040)		(0.034)		(0.077)		(0.078)
Environment member		0.064		-0.090**		0.309***		-0.296***
		(0.051)		(0.041)		(0.093)		(0.097)
Constant	0.679***	0.755***	0.205*	0.132	0.906**	1.635***	0.091	-0.724*
	(0.132)	(0.154)	(0.116)	(0.144)	(0.360)	(0.433)	(0.320)	(0.426)
Sources as control	YES	YES	YES	YES	YES	YES	YES	YES
N	961	697	961	697	164	110	164	110
adj. R-sq	0.046	0.060	0.041	0.052	0.006	0.070	0.001	0.039

Appendix A. Variable definitions

Variable Name	Definition
Age	Age of the individual (in years)
Degree	The individual has a degree - Binary variable
Environment	Environment is the most important sustainability dimension - Binary variable
Environment donation	Donate to an environmental association - Binary variable
Environment member	Member of an environmental association - Binary variable
Female	The gender of the individual is female - Binary variable
Financial hype	Would you consider investing in financial products because they are recommended by (social) media or by your friends, acquaintances or family? (1-7)
Financial literacy	Self-assessed financial knowledge (1-7)
Greenwashing	How much do you think sustainable investments are greenwashing (1-7)?
Hypothetical sustainable investment	The individual would invest hypothetically in sustainable assets - Binary variable
Hypothetical sustainable volume	Hypothetical % sustainable volume (0-100)
Income (in Log)	Logarithm of the individual income
Information	The reason not to invest sustainably is: "Information" - Binary variable
Left-wing views	The individual has left-wing political views - Binary variable
Low returns	The reason not to invest sustainably is: "Low returns" - Binary variable
Marketing trick	The reason not to invest sustainably is: "Marketing trick" - Binary variable
Married	The individual is married - Binary variable
Personality trait:	
Personality trait - openness	Individual's score in openness to experience (1-5) in the Big Five personality test
Personality trait - extraversion	Individual's score in extraversion (1-5) in the Big Five personality test
Personality trait - agreeableness	Individual's score in agreeableness (1-5) in the Big Five personality test
Personality trait - emotional stability	Individual's score in emotional stability (1-5) in the Big Five personality test
Personality trait - conscientiousness	Individual's score in conscientiousness (1-5) in the Big Five personality test
Prefer traditional investment	The reason not to invest sustainably is: "Prefer traditional investments" - Binary variable
Risk loving	Generally speaking, are you the kind of person who is willing to take risks or who prefers to avoid risks? (0-10)
Self-esteem	Measure of self-esteem (1-7) obtained using the Rosenberg's Self-Esteem Scale
Social	Social is the most important sustainability dimension - Binary variable
Social preferences	How much are you willing to give to good causes without expecting anything in return? (1-7)
Sustainable finance literacy	Self-assessed ability to understand if an investment is sustainable (1-7)
Sources:	*How often do you use the following sources of information when making important financial decisions? (1-7)*
Source - bank advisors	Bank advisors
Source - financial magazines	Financial magazines
Source - financial advisors	Other financial advisors
Source - social media	Social media
Source - internet	Internet
Source – friends	Friends
Sustainable investors:	The individual has sustainable investments - Binary variable
Financial sustainable investors	The individual invests in sustainable assets primarily for financial reasons - Binary variable
Social sustainable investors	The individual invests in sustainable assets primarily for non-financial reasons, even at the cost of a lower risk-adjusted return - Binary variable
Other sustainable investors	The individual invests in sustainable assets primarily for non-financial reasons, but is unwilling to do so at the cost of a lower risk-adjusted return - Binary variable
Trust	Generally speaking, would you say that most people can be trusted, or that you cannot be too careful in dealing with people? (0-10)
Non-urban	Degree of urbanization of the area where the individual lives (1-5) – 1 (Extremely urban), 5 (Not Urban)
Volume:	
Absolute volume	The logarithm of the amount invested sustainably plus one
Percentage volume	The percentage of the financial portfolio invested sustainably

Appendix B. Survey questions (translated from Dutch)

1.1. Subjective Financial Literacy

How would you rate your financial knowledge?
a. 1 (Very poor)

b. 2

c. 3

d. 4

e. 5

f. 6

g. 7 (Very good)

1.2. Financial Information Source

How often do you use the following sources of information when making important financial decisions?
a. Parents, friends, or acquaintances

b. Newspapers

c. Financial magazines, guides, books

d. Bank or mortgage adviser

e. Other financial advisers

f. TV or radio

g. Social media (Facebook, Twitter, Reddit, etc.)

h. Financial information on the Internet

Categories:
1. 1 Never
2. 2
3. 3 Sometimes
4. 4
5. 5 Often
6. 6
7. 7 Always

1.3. Financial Hype

Would you consider investing in financial products because they are recommended by (social) media or by your friends, acquaintances or family?

a. 1 (Absolutely not)

b. 2

c. 3

d. 4 (Maybe)

e. 5

f. 6

g. 7 (Absolutely yes)

1.4. Social Preferences

How much are you willing to give to good causes without expecting anything in return (on a scale of 1 to 7, where 1 means 'completely unwilling', and 7 means 'very willing')?
a. 1 (Not at all willing)

b. 2

c. 3

d. 4

e. 5

f. 6

g. 7 (Very willing)

1.5. Subjective Sustainability Literacy

How well can you estimate which financial investments are sustainable and which are not?
a. 1 (Not good at all)

b. 2

c. 3

d. 4 (Fairly good)

e. 5

f. 6

g. 7 (Very good)

1.6. Investments

Do you have investments (e.g., stocks, bonds or ETFs)?
a. Yes

b. No

→ Question 1.6.1. below is asked only to people who answered a. to q.1.6.

1.6.1. Sustainable Investments

1.6.1. Do you have investments in sustainable assets (for example, green assets or financial assets that consider environmental, social, and governance factors)?
a. Yes

b. No

→ Questions from 1.6.2. to 1.6.6. below are asked only to people who answered a. to q.1.6.1.

1.6.2a. What is the **most important** reason for you to invest sustainably?

a. **Mainly** a financial reason

(For example, you expected that sustainable investments would yield a higher return (profit) than non-sustainable investments)

b. **Mainly** a non-financial reason

(For example, you have opted for sustainable investments because of the positive impact on society)

→ Question 1.6.2a_2. below is asked only to people who answered b. to q.1.6.2a.

1.6.2a_2. Would you also have been willing to accept a **lower return (profit) when** investing sustainably (instead of a higher return when investing non-sustainable)?
a. Yes

b. No

1.6.2b. If you had to choose, which sustainability topic do you think is the **most important**?
a. Environment and climate (e.g., lower CO2 emissions, less energy and water consumption, etc.)

b. Social (e.g., gender equality, ethnic diversity, working conditions, human rights, safety, etc.)
c. Governance (e.g., no corruption and bribery, independence of the board of directors, protection of stakeholders, etc.)

1.6.3a. How much did you approximately invest in sustainable assets? Please give your answer in euros.

….

1.6.3b. What percentage of your total financial portfolio is invested in sustainable assets?

a. (… %)

b. I don’t know

c. I don't want to say

1.6.4. Which **sustainable** investments do you have? (more than one answer is possible)

a. Sustainable stocks

b. Sustainable bonds

c. Sustainable mutual funds

d. Sustainable ETFs

e. Sustainable saving accounts

f. Sustainable pension funds

g. Other sustainable investments, namely…

1.6.5. What is the type of sustainable criteria applied in your sustainable investments? (more than one answer is possible)

a. **Positive** screening: seeking out companies with high sustainability scores (can even include tobacco, weapons, and oil companies, as long as they are more sustainable than their peers)

b. **Negative** screening: screening out controversial companies or sectors (e.g., tobacco, gambling, weapons, and fossil fuels) that do not meet my sustainability criteria

c. Through **impact** investing (investing in companies that pursue a particular social or environmental objective)

d. Other, namely…

e. I don’t know

1.6.6. How did you mainly assess that the investment was sustainable?

a. I relied on the advice of my family, friends or acquaintances.

b. I relied on the advice of newspapers.

c. I relied on the advice of financial magazines, guides, books.

d. I relied on the advice of the bank or mortgage adviser.

e. I relied on the advice of other financial advisers.

f. I relied on the advice on TV or radio.

g. I relied on advice on social media (Facebook, Twitter, Reddit, etc.).

h. I trusted the information I found on the Internet.

i. I was looking for a labelled environmentally sustainable investment, and I trusted that it was really sustainable.

j. I have read the sustainability report of the companies in which I invest.

→ Questions from 1.6.7. to 1.6.10. below are asked only to people who answered b. to q.1.6. or b. to q.1.6.1.

1.6.7. Why don't you have sustainable investments?

a. I don't have enough information to consider such investments.

b. I believe sustainable financial products are only a marketing strategy (greenwashing).

c. I prefer to invest in traditional investments that only look at expected return and risk.

d. I believe sustainable assets have low returns.

e. I don't have enough money for it.

f. I don't have enough time for it.

g. I never thought about it.

f. Other, namely…

1.6.8. Suppose that you have €10,000 to invest over a long-term horizon. What would you choose if you had only the following possibilities (v1_6_8)?

a. Invest the money **traditionally (conventionally)**

(Put the money in an investment fund with a return (profit) linked to all companies in the Netherlands)

b. Invest the money **sustainably**
(Place the money in an investment fund with a return (profit) linked to a selection of environmentally and socially responsible companies in the Netherlands)

→ Questions 1.6.9. and 1.6.9b. are asked only to people who answered b. to q.1.6.8.

1.6.9. Why did you choose the sustainable investment (v1_6_9)?

a. **Mainly** a financial reason

(For example, you expected that sustainable investments would yield a higher return (profit) than non-sustainable investments)

b. **Mainly** a non-financial reason

(For example, you have opted for sustainable investments because of the positive impact on society)

→ Questions 1.6.9a. is asked only to people who answered b. to q.1.6.9.

1.6.9a. Would you also have been willing to accept a **lower return (profit) when** investing sustainably (instead of a higher return when investing non-sustainable) (v1_6_9a)?

a. Yes

b. No

1.6.9b. If you had to choose, which sustainability topic do you think is the **most important** (v1_6_9b)?
a. Environment and climate (e.g., lower CO2 emissions, less energy and water consumption, etc.)

b. Social (e.g., gender equality, ethnic diversity, working conditions, human rights, safety, etc.)
c. Governance (e.g., no corruption and bribery, independence of the board of directors, protection of stakeholders, etc.)

1.6.10. What would you do if you could split the amount between the two?

a. 0 … 100% in the traditional investment (mutual fund with a return linked to the stocks of all publicly listed companies in the Netherlands).

b. 0 … 100% in the socially responsible investment.

1.6.11. How much do you think sustainable investments are related to greenwashing (a marketing ploy to make companies seem more sustainable than they really are)?

a. 1 (Not at all)

b. 2

c. 3

d. 4 (Don't disagree, don't agree)

e. 5

f. 6

g. 7 (A lot)

Appendix C - Sustainable investments – Volume

This table reports OLS estimates. Columns 1-2 consider the full sample, while Columns 3 and 5 only consider investors in the financial markets. Columns 4 and 6 consider only sustainable investors. The dependent variable in Columns 1-4 is *Absolute Volume*, equal to the logarithm of 1 plus the amount invested sustainably. The dependent variable in Columns 5-6 is *Percentage Volume*, which indicates the percentage of the investment portfolio invested sustainably. The independent variables are detailed in Appendix A. Standard errors are robust to heteroskedasticity and are reported below in parentheses. ***, **, and * refer to significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Sample	Everyone		All investors	Sustainable investors	All investors	Sustainable investors
Variables	Absolute Volume				Percentage Volume	
Social preferences	0.011	-0.025	0.233	-0.242*	1.814	-1.588
	(0.032)	(0.034)	(0.192)	(0.125)	(1.445)	(3.444)
Greenwashing	-0.136**	-0.091	-0.559**	-0.169	-1.164	3.705
	(0.056)	(0.068)	(0.227)	(0.128)	(1.757)	(2.459)
Financial hype	0.152***	0.146**	-0.190	-0.145	-0.533	0.820
	(0.053)	(0.064)	(0.235)	(0.118)	(1.710)	(2.838)
Financial literacy	0.049	0.056	-0.106	0.083	-0.282	2.156
	(0.040)	(0.047)	(0.252)	(0.146)	(2.033)	(3.492)
Sustainable finance literacy	0.264***	0.255***	1.061***	0.394***	6.885***	5.163
	(0.054)	(0.064)	(0.246)	(0.134)	(1.783)	(3.233)
Female	0.019	0.162	0.373	0.260	3.056	1.208
	(0.114)	(0.145)	(0.600)	(0.323)	(4.294)	(7.208)
Age	0.005	0.001	0.009	0.037***	0.254*	0.315
	(0.004)	(0.005)	(0.020)	(0.010)	(0.149)	(0.246)
Non-urban	-0.030	-0.003	-0.096	-0.126	1.062	2.553
	(0.041)	(0.046)	(0.214)	(0.119)	(1.737)	(3.157)
Income	0.000	0.000	-0.000	0.000	-0.002	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	(0.003)
Degree	0.774***	0.538**	0.825	-0.548	6.789	-0.279
	(0.234)	(0.265)	(0.630)	(0.341)	(5.073)	(8.315)
Married	-0.077	0.053	0.418	0.123	-3.165	-10.192
	(0.119)	(0.138)	(0.591)	(0.313)	(4.407)	(7.560)
Left-wing views		0.538***				
		(0.166)				
Trust		0.068***				
		(0.026)				
Risk loving		-0.019				
		(0.026)				
Environment donation		0.375*				
		(0.215)				
Environment member		-0.230				
		(0.296)				
Financial sustainable investors				-0.663*		-25.778***
				(0.373)		(8.947)
Constant	-0.403	-1.050*	1.796	8.307***	-21.523	1.413
	(0.478)	(0.558)	(2.421)	(1.269)	(17.731)	(30.883)
Sources as control	YES	YES	YES	YES	YES	
N	1494	1104	248	108	244	104
adj. R-sq	0.086	0.102	0.086	0.357	0.060	0.067