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Sustainability Preferences

The Role of Beliefs

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Abstract

Trillions of dollars flow into socially responsible investments (SRIs), yet it is unclear how investors trade off sustainability with financial performance. To formally evaluate this, we need a reliable method to elicit investors' belief towards the financial performance of SRI, which is still lacking in the literature. In this paper, we formally investigate investors' expectations towards funds' financial performances associated with Environmental, Social, and Governance (ESG) labels through an incentivized field survey experiment that compares three different belief elicitation methods, two incentivized and one unincentivized. Our findings from both incentivized methods suggest that knowledge of a fund's high ESG rating on average positively influences return expectations. This is in contrast to the same group of participants' answers to the commonly used unincentivized Likert scale question. Furthermore, return expectations towards high ESG funds elicited by the incentivized methods are positively correlated with allocation to sustainable funds in an incentivized allocation task. This implies that unincentivized methods of eliciting ESG-related beliefs may be systematically biased. Our research contributes to understanding investors' motive for engaging in SRI, and practically dissecting sustainability preferences.

Keywords: Socially Responsible Investment, Expectations, ESG, Belief Elicitation, Survey Experiment.

JEL Codes: C90, G40, G50.

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1 Introduction

Socially Responsible Investments (SRIs) have gained prominence in the midst of ongoing discussions about sustainability issues, such as climate change, stakeholder benefits, and corporate accountability. Notably, Environmental, Social, and Governance (ESG) factors increasingly attract a tremendous amount of capital and investors' attention.¹ Despite this rise in attention, the literature to date still lacks a formal investigation of how ESG factors can shape investors' return expectations. Without such understanding, one cannot confidently answer the more important question, whether investors are willing to trade off financial performance for sustainability. This paper aims to bridge this gap by formally eliciting investors' expectations in the ESG landscape through an incentivized field survey experiment with actual investors.

Existing literature suggests that ESG investing behavior is mainly attributable to investors' social preferences (e.g., Riedl and Smeets, 2017; Bauer et al., 2021; Humphrey et al., 2021; Pástor et al., 2021; Cornell, 2021). Research in this strand engage in developing ways to measure social preferences, or sustainability preference, without formally evaluate performance expectations. For instance, Riedl and Smeets (2017) find positive correlation between their retail investor participants' ESG investing and their decisions as a second mover in a trust game. In the meantime, they only elicit return expectations of their participants regarding SRI funds compared to conventional funds using unincen-tivized Likert scale questions. They find that most of their sampled investors expect lower returns from SRI funds compared with conventional funds, and argue that such investors are prepared to sacrifice financial gains to pursue SRI. Gutsche and Ziegler (2019) analyze data from a comprehensive unincentivized survey targeting German private financial decision-makers with two stated choice experiments that focused on fixed-interest investment products and equity funds. They also observe strong explicit preferences and a significant willingness to pay for sustainable investment options².

However, investors may not have a clear idea about the implications of having a greener portfolio. Bauer et al. (2021) find that investors exhibit strong social preferences by voting to add another sustainability development goal in their pension fund's strategy. But when asked about what they expect in terms of financial performance from the new strategy, almost half had no idea and more than 40% expected higher or equal performance compared with the less sustainable strategy. Therefore, the motive behind sustainable investing might be far more complicated than social preferences. And without a good assessment of investors' belief towards SRI's financial performance, we cannot conclude whether investors are willing to trade off financial return for sustainability.

¹To put this into perspective, one-third of the 51.4 trillion dollars in total US assets under professional management is using sustainable investing strategies (EUROSIF, 2021). Furthermore, the EU taxonomy (European Commission, 2021) require insurance and investment advisors to collect information on their clients' sustainability preferences, which is also recently the need from MiFID II and IDD.

²Also see Barreda-Tarrazona et al. (2011), Apostolakis et al. (2018), Rossi et al. (2019), Lagerkvist et al. (2020), Pástor et al. (2021), Falk et al. (2023), Oehmke and Opp (2024)

As we know, financial factors, such as risk and return considerations, play a pivotal role in investment decisions (e.g., Amromin and Sharpe, 2014). Investors often balance between ESG factors and financial performance (e.g., Edmans, 2023). Indeed, Hartzmark and Sussman (2019) find suggestive evidence for a perception among investors that funds with high sustainability ratings are likely to outperform and carry less risks compared to conventional funds. Furthermore, expectations of ESG fund returns relative to conventional ones may vary among different investor groups and evolve with a deeper understanding of ESG principles (e.g., Battalio and Mendenhall, 2005; Branch and Evans, 2010; Eusepi and Preston, 2011). Additionally, the interaction between investors' social preferences and their perceptions of ESG factors can influence their return expectations, possibly leading to biased assessments (e.g., Humphrey et al., 2021; Pástor et al., 2021; Goldstein et al., 2022). For instance, in an incentivized lab experiment, Humphrey et al. (2021) find that social preferences can influence how investors process information, such as belief updating, which subsequently affects their subjective probabilities about investments. Specifically, subjects are significantly more pessimistic about investment outcomes when the investment is linked to negative social externalities, despite the objective investment prospects. This complex interplay calls for a serious investigation of investors' expectations towards SRIs' financial performance, which may drive investments in sustainable funds.

However, to date research works on this topic have not used a reliable belief elicitation method. One widely adopted method in this literature is the unincentivized Likert scale (e.g., Nosić and Weber, 2010; Delavande et al., 2011; Riedl and Smeets, 2017; Baker et al., 2022; Heeb et al., 2023). The advantage of Likert scale questions lies in their efficiency, as survey data can be relatively swiftly collected from a large number of respondents due to the simplicity of questions. However, the method has also been questioned. For instance, Manski (2004) advocates for the use of subjective probabilities over Likert scales and other non-cardinal measures to assess expectations, to better align with the principles of modern economic theory. Two primary issues with Likert scales are identified. The first is the interpersonal comparability of responses. For example, interpretations of terms like “performance” and “social impact” in the context of sustainable investment can vary widely between individuals. Likewise, response options such as “much lower, a bit lower, the same, a bit higher, or much higher” may not be uniformly understood, and even within the same individual, interpretations can vary across different contexts. Cognitive research suggests that these responses may not be comparable either across or within individuals (e.g., Wallsten et al., 1986). Furthermore, the interpretation of these scales can also vary significantly among subjects due to factors like cultural differences, potentially leading to responses that cannot be aggregated (e.g., Lee et al., 2002; Heine et al., 2002; Wu and Leung, 2017). The second issue is the coarseness of the response options, which limits the information contained in the responses. Typically, Likert scale options fail to capture the nuances of the underlying perceptions or expectations and, being qualitative,

do not accurately capture precise return expectations. To address these shortcomings, we utilize elicited subjective probabilities, which can be compared with known event frequencies to evaluate the alignment between subjective beliefs and reality. When facing an investment opportunity, investors have a subjective probabilistic distribution towards its future returns. Admitting that, our survey aims to particularly elicit the median of this distribution. This measure is incentivized, cardinal, and facilitates unambiguous interpretation of the belief data.

Furthermore, in some cases, particularly related to SRI, when beliefs could be distorted for motivational reasons or preference-based biases, beliefs elicited from unincentivized measures might not accurately reflect true expectations (e.g., Tsakas, 2021). In the case of belief about financial performance, investors might overstate their expected returns from ESG funds due to desirability bias (e.g., Kunda, 1990; Grimm, 2010; Mayraz, 2011), if they already invested into ESG funds, because doing so confirms their correct investment decision. Conversely, image concerns (either through self signaling or social signaling) might lead them to understate return expectations about ESG funds, because doing so suggests that they invest in ESG funds not just for the money (e.g., Bénabou and Tirole, 2010; Bauer and Smeets, 2015; Riedl and Smeets, 2017). These issues obscure the picture of whether investors are primarily motivated by financial considerations or the genuine concern about societal benefits, or whether they are willing to sacrifice financial performance for higher ESG standards. Thus, a more accurate method to gauge and understand investors' true return expectations towards ESG investments becomes crucial.

In this paper, we conduct a formal investigation of investors' return expectations towards ESG funds, and the impact of these expectations on their investment decisions. This is accomplished through a field survey experiment by integrating data on investors' beliefs and preferences with their allocations of investments between an ESG fund and a conventional fund in an incentivized allocation task. In particular, we partnered with a Dutch asset management firm that offers a range of index fund products, including some ESG products. We conducted the experiment with their retail clients.

Altogether, we use three methods to elicit return expectations. First, we adapt the Exchangeability Method to obtain an incentivized and quantitative measure of respondents' return expectations for the fund. This method is robust to variations in risk attitudes, non-linear probability weighting, and source dependence, enabling a precise elicitation of median return expectations (e.g., Hossain and Okui, 2013; Baillon, 2008; Abdellaoui et al., 2011; Schlag et al., 2015; Jiao, 2020). To implement this method, we selected a high ESG fund and elicited beliefs in two conditions: in one, we disclose its high ESG rating, while in the other, we conceal it. All other information (excluding the fund's identifying information), including the fund's historical returns, remains consistent across both conditions. This can reveal whether investors associate the high ESG label with financial performance. Second, we use the widely-adopted, unincentivized Likert Scale Method (e.g., Nilsson, 2008; Nosić and Weber, 2010; Delavande et al., 2011; Riedl and

Smeets, 2017; Bauer et al., 2021; Baker et al., 2022; Heeb et al., 2023), asking participants to assess their expected return of ESG funds in comparison to conventional funds. And third, we use the Choice Matching Method (e.g., Prelec, 2004) to obtain another incentivized, but qualitative, measure of return expectations. The method relies on the same question as the unincentivized Likert scale, but then adds incentives based on an additional prediction task and a matching protocol. Therefore, we have two incentivized methods to cross validate, and we have both unincentivized and incentivized Likert scale questions to compare with each other. Research indicates that incentivized methods tend to yield more accurate results than their unincentivized counterparts (e.g., Gächter and Renner, 2010; Wang, 2011; Trautmann and van de Kuilen, 2015). By employing these three elicitation methods we aim to address the challenges in eliciting investors' return expectations.

We find that, on average, investors tend to understate their return expectations for ESG funds compared to conventional funds when responding to unincentivized Likert scale questions, whereas the same group of subjects reported higher return expectations associated with a high ESG label in both incentivized methods. Specifically, in response to the unincentivized Likert scale question, 51.2% of respondents expected ESG funds to financially underperform conventional funds, whereas only 28.5% anticipated ESG funds to outperform. This is consistent with the core insights from some studies that utilize the unincentivized Likert Scale Methods (e.g., Riedl and Smeets, 2017; Sultana et al., 2018). Conversely, based on the Exchangeability Method, investors predicted a fund labeled as high ESG to yield a 3.3% higher median return over a one-year horizon than the same fund without ESG information. Remarkably, participants who indicated that ESG funds would underperform in the unincentivized Likert scale question reported a 5.8% higher return expectation for the fund with high ESG label relative to none in the Exchangeability Method. Additionally, the Choice Matching Method corroborates the findings from the Exchangeability Method. Without incentives, the minority of respondents (32.4%) expected ESG funds to outperform non-ESG funds, while 40.2% anticipated the opposite. However, with complete incentives, expectations shifted, with 44.1% predicting ESG funds to outperform non-ESG funds and 36.5% expecting the reverse. This pattern suggests that investors are prone to understate their return expectations for ESG funds in comparison to conventional funds in response to the unincentivized Likert scale question. This suggests when subjects respond to unincentivized elicitation about return expectations, image concern is potentially the main driver of biases. Therefore, solely relying on unincentivized belief elicitation methods could systematically bias results about investor expectations towards financial performance related to ESG. And this could be a general problem in belief elicitations when the decision maker potentially has systematic motivational biases.

We then show that the beliefs elicited using the incentivized methods significantly correlate with ESG investing decisions. We introduce a lottery incentive at the end of

the survey, with a reward of €400 investment credit for 2 participants who completed the survey. Assuming they would win the prize, participants had to allocate this amount between two products offered by our collaborating fund: one with a strong emphasis on sustainability and the other an index fund tracking a weighted blend of three MSCI indexes. Both funds are categorized under the same risk level and have similar management fees (0.5% vs. 0.4%). Participants were told that this allocation would be implemented if they were to win the prize. Our findings reveal beliefs about ESG fund performance elicited from both incentivized methods, the Exchangeability Method and the Choice Matching Method, significantly positively correlate with allocation to the ESG product. Nevertheless, we can not identify a significant relationship between allocation and return expectations towards ESG funds obtained through the unincentivized Likert scale question. These results give us additional confidence that the beliefs elicited using the incentivized methods were closer to investors' actual beliefs.

In our exploratory analyses, we observe that investors displayed substantial heterogeneity across their ESG return expectations, with variations significantly correlated with demographics and financial status, consistent with existing research (e.g., Sandberg et al., 2009; Giglio et al., 2021, 2023). Moreover, investors perceiving low ESG as indicative of higher risk reported a lower expected return for the fund labeled as low ESG compared to the one without such label, according to the Exchangeability Method.

Taken together, our findings reveal that investors' beliefs of the financial performance of ESG investments are pivotal in forming their sustainability preferences, which in turn influence their decisions to invest in ESG. Our formal examination of investors' beliefs addresses the issue of biased results stemming from the unincentivized elicitation method such as Likert scale questions. By gaining insights into investors' genuine return expectations for SRI, we can better understand their motives for SRI-related investment choices, and funds can better tailor their ESG strategies to cater to their clients.

2 Study Design

In order to investigate investors' expectations towards the financial performance associated with a high ESG label, we conducted an online survey experiment among index fund investors who are clients of a Dutch asset management firm, Meesman Indexbeleggen. Meesman is an investment firm founded in 2005, managing over one billion euros in assets under management and serving more than 30 thousand clients. Meesman specializes in passive investing and provides a variety of index funds, including a selection of ESG-index funds. Meesman has two types of investment funds: those without sustainability considerations (such as Equity Worldwide Total), and those with sustainability characteristics (such as Equity Responsible Future).

In this section, we first provide an overview of the survey structure. Subsequently, we

explain the detailed methodologies used for belief elicitation. Finally, we elaborate other key measurements, including respondents’ demographics, investing experience, preferences, financial literacy, and other survey items.

2.1 Design Overview

The survey comprises four main modules. It starts with a consent form, and a brief introduction to the survey’s content as well as the associated incentives. We provide three types of rewards to encourage participation and careful decision-making. Firstly, we randomly selected one respondent from the first 100 who completed the survey to receive a cash reward of €200. Secondly, we randomly selected one respondent from all who completed the survey to receive another cash reward of €200 plus any monetary incentives determined by their answers in the survey and luck. For the subject who was selected to receive this reward, we randomly selected a payoff-relevant module to determine his/her payment.³ Lastly, we randomly selected one respondent from all who completed the survey to receive €400 Meesman investment credits, which can only be allocated between two Meesman products. More details will be provided shortly.

The first module elicits participants’ beliefs towards financial performance. In this module, participants were randomly assigned into two conditions, depending on whether they were provided with ESG rating information (the ESG-Info condition) or not (the No-ESG-Info condition). Participants in both conditions were presented with information of the same fund. The fund chosen for our study, a product offered by Meesman, ranks in the highest ESG score category among Meesman’s investment offerings, which they recommended to call it a “Dark Green” fund in our survey. Specifically, the fund tracks the MSCI World Custom ESG Index, encompassing around 1600 shares from large and medium-sized companies across 23 developed countries. This fund excludes companies that do not sufficiently take people, the environment, and good corporate governance into account. Participants were not told which fund was selected, but were given descriptions of the fund without any detail that could reveal the particular fund or its sustainability performance. Additionally, participants in the ESG-Info condition received information indicating that the fund’s ESG rating is “Dark Green,” representing the highest level of ESG, and also simple explanations about ESG concept. The No-ESG-Info condition was not exposed to any ESG-related information. Then participants observed historical annual returns of the fund for six consecutive years, and we elicited their beliefs towards the fund’s future returns using the Exchangeability Method (EM). One of the belief elicitation questions was randomly selected to determine the participant’s payment if this module was selected as payoff-relevant.

The second module mainly serves as a distraction task between the first and third belief elicitation modules. Its main objective is to gauge participants’ ambiguity attitudes, adapted from the method used in Dimmock et al. (2016). We provide a detailed

³Out of the four modules, three were payoff-relevant.

elaboration of this module in Section A.1 in the Appendix A.

The third module examines respondents' expected returns concerning ESG funds as opposed to conventional funds through an alternative incentivized approach known as the Choice Matching Method (CM) (e.g., Cvitanić et al., 2019). Therefore, we can compare the results from two incentivized belief elicitation methods with those acquired through the widely-adopted unincentivized Likert scale approach. In this module, we randomly assigned participants into three distinct treatments, each featuring different incentive scenarios: No Incentive, Partial Incentive, and Full Incentive. If this module was selected as payoff-relevant, respondents would receive rewards in accordance with the incentive scenario they were assigned to.

The fourth module consists of a set of survey questions. It includes unincentivized Likert scale questions concerning the comparison of sustainable funds to conventional ones, in terms of both return and risk. Additionally, participants were asked to express their perspectives on the impact of ESG investing, along with their preference for passive versus active investment strategies. This module also includes questions about participants' financial background, financial literacy and current financial situation. Furthermore, participants were asked to provide demographic information, such as their gender, age, and educational background.

At the end of the experiment we added a lottery incentive. All participants were asked to make an investment allocation of the €400 Meesman credits between two Meesman products assuming that they were to win the lottery. These two funds were: "Aandelen Wereldwijd Totaal" (Equity Worldwide Total), an index fund that tracks a market-weighted combination of three MSCI indexes: the MSCI World Custom ESG Index, the MSCI Emerging Markets Custom ESG Index, and the MSCI World Small Cap Custom ESG Low Carbon Index; "Aandelen Duurzame Toekomst" (Equity Sustainable Future), designed for investors seeking an index fund with a stronger focus on sustainability, which invests globally in stocks aligned with various sustainable themes. Both funds were categorized within the same risk-return spectrum. It was highlighted that the management fee for Equity Worldwide Total is 0.4%, slightly lower than the 0.5% fee for Equity Sustainable Future. Participants were provided detailed information about these two funds, including links for further explanations of their compositions and country allocations. Moreover, Participants were also informed that their investment decisions would be implemented if they were selected to receive the credits.

2.2 Belief Elicitation

In this section, we provide a detailed and comprehensive explanation of the three distinct belief elicitation methods employed across the modules of our study.

2.2.1 The Exchangeability Method

Investors form subjective probabilistic belief distributions regarding the financial returns of funds. We utilize the Exchangeability Method to elicit investors' median return expectations towards the selected fund in the first module. The method is based on Braithwaite (1931), Fellner (1961) and Baillon (2008), and later adopted for instance by Abdellaoui et al. (2011) and Jiao (2020).

The exchangeability method is based on the idea of splitting the state space into equally likely complementary events that are revealed through binary lottery choices (e.g., Baillon, 2008). Denote S_R as the state space, which in our case represents the range of all possible returns of the fund. (E, x) is a binary prospect that yields payoff $\in x$ if the event E occurs, where $E \subset S_R$ occurs, and $\in 0$ otherwise. Suppose the probability of E equals to $P(E)$ and the agent's utility function is $u(x)$, and the agent has probability weighting function $w(P)$. As the Exchangeability Method requires the agent to compare only uncertainties from the same source, one weighting function is sufficient. Therefore, the expected utility from prospect (E, x) is presented by $w(P(E))u(x)$.

In order to elicit the median return belief, we need to find the point $r_{\frac{1}{2}}$ that divides the state space into two complementary events R_2^1 and R_2^2 , such that the agent is indifferent between two prospects (R_2^1, x) and (R_2^2, x) : $(R_2^1, x) \sim (R_2^2, x)$. Therefore, $r_{\frac{1}{2}}$ is the agent's median return belief, and we have $w(P(R_2^1))u(x) = w_A(P(R_2^2))u(x)$ which is equivalent to $P(R_2^1) = P(R_2^2)$. Figure 1 illustrates how the model above by employing the Exchangeability Method proceeds to obtain a subject's median belief.

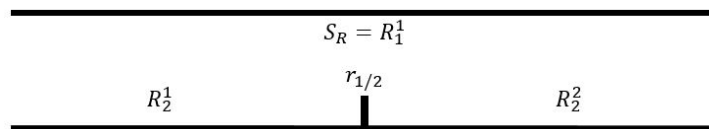


Figure 1: Decomposition of Return State Space

Note: This figure illustrates the procedure of eliciting a subject's median return belief.

To elicit each median return expectation, participants were asked to make five rounds of binary lottery choices, so as to reach the desired precision level of 1.25%, which is the possible maximum distance between the elicited median and the actual one. In the task, we randomly selected six consecutive years in the fund's historical data, and showed subjects annual returns over these six years. We then designed the lottery contingent on the seventh-year return. For instance, in the first round, participants chose between the following two lotteries:

- Lottery A: win $\in 50$ if the fund's return in the seventh year is equal to or greater than 0%, and $\in 0$ otherwise;
- Lottery B: win $\in 50$ if the fund's return in the seventh year is less than 0%, and $\in 0$ otherwise.

We calculated and obtained that the annual returns of the fund was bounded in $[-40\%, 40\%]$, but this was not revealed to participants. We simply use this information to compose the following lotteries. Choosing Lottery A in Round 1 indicates that the participant’s median return expectation falls within the range of $[0\%, 40\%]$, and choosing Lottery B suggests the opposite. Suppose a subject chooses Lottery A in Round 1. The next question then divides the range $[0\%, 40\%]$ further at the mid-point 20%, and subjects are asked to choose between two lotteries that yield a reward depending on whether the seventh-year return is in $[0\%, 20\%]$ or $[20\%, \infty)$. We then repeat this process for a total of five rounds. The median return expectation elicited corresponds to the mid-point of the range selected for the lottery in the fifth round.

After these five rounds to elicit participants’ median return expectation for the seventh year, we continued the process to investigate how they would update beliefs given either a positive or negative return information scenario. We showed participants a positive seventh-year return and a negative seventh-year return scenario in random order, and elicited their median return expectations for the eighth year following the same procedure of the Exchangeability Method as explained above. Participants were informed that one of the two scenarios was real, and if this module was selected, only the real scenario would be potentially selected to be payoff-relevant.

The Exchangeability Method offers multiple advantages over alternative approaches, such as circumventing the complications of differential risk attitudes, nonlinear probability weighting, complex mathematics, and source dependence (e.g., Baillon, 2008; Schlag et al., 2015; Jiao, 2020). It also avoids the problem due to the lack of participants’ statistical sophistication, or that their stated probabilities of complementary events do not sum up to unity. Another advantage is that this method explicitly gives us the median return expectation, whereas other methods are not clear whether the elicited return is the mean, mode or other measures on the subjective belief distribution.

2.2.2 The Choice Matching Method

In our third module, we elicited participants’ return expectations using the Choice Matching method. The literature mainly relies on unincentivized Likert scale questions to elicit investors’ expectations towards the financial performance (such as return and risk) of funds, stocks, or other assets, as well as ESG funds compared to conventional funds (e.g., Riedl and Smeets, 2017; Hartzmark and Sussman, 2019). When asking subjects to assess the relative performance in general (not for a particular fund as in our Exchangeability Method), it is difficult to assess whether respondents tell what they truly believe. The true subjective belief is therefore an unverifiable truth, just like beliefs about the probability that god exists, life quality or customer satisfaction. Regarding the actual relative ESG performance, there is no consensus even among researchers (e.g., Pelozo, 2009; Aguinis and Glavas, 2012; Eccles et al., 2014; Friede et al., 2015). Eliciting beliefs towards an unverifiable truth in an incentive compatible way has been a challenge. To achieve

this and to increase comparability between incentivized and unincentivized beliefs about ESG performance, we adopt the Choice Matching Method (e.g., Cvitanić et al., 2019). Importantly, this method adds incentives to the Likert scale question, allowing for a direct comparison of our results with the unincentivized Likert scale results in the literature, and it serves as an additional validation of our Exchangeability Method results.

In the Choice Matching Method, participants first respond to a multiple-choice question (MCQ), which can take the form of a Likert scale question. Subsequently, they engage in an auxiliary task that asks to predict the frequency of each answer being selected by all other participants. The incentives are contingent on two factors: their accuracy in the auxiliary prediction task (the prediction reward) and the performance of other respondents whose MCQ answers are the same as their own (the matching reward) (e.g., Savage, 1971; Gneiting and Raftery, 2007; Cvitanić et al., 2019). Let us denote S_r the prediction reward calculated by a proper scoring rule for individual respondent r . \bar{S}^{-r} represents the mean prediction reward of all other respondents (excluding r) who chose the same MCQ option in the prediction task. A respondent r is assigned a score of zero if there is any unselected option in the MCQ, that is, an option not chosen by at least one other respondent besides r . Otherwise, respondent r receives a score $\lambda S_r + (1 - \lambda)\bar{S}^{-r}$, wherein $\lambda \in (0, 1)$ denotes a predetermined weight factor. That is to say, the incentive received by respondent r is a weighted average of her own prediction reward S_r and the average prediction reward of her matched subjects \bar{S}^{-r} .

To implement this and to compare the effect of different incentive schemes, in Module 3 we randomly assigned participants into three different treatments: the No Incentive, Partial Incentive, Full Incentive conditions. For all respondents in these three conditions, the Likert scale question is to evaluate the financial performance of ESG funds relative to conventional funds. In particular, they had to choose an option that best reflects their opinion on the following statement: I expect that the returns of index mutual funds that exclude companies with a low ESG score, compared to index mutual funds that do not exclude companies with a low ESG score. And the options given were “Much lower,” “A bit lower,” “The same,” “A bit higher,” “Much higher” and “I don’t know.”

In the No Incentive condition, respondents were solely required to respond to the Likert scale question without any additional incentives. Once respondents provided their answers, they were asked to confirm their choices. If they were dissatisfied with their responses, they could modify them and provide their answers again. And these steps are consistent across all three treatments.

In the Partial Incentive condition, respondents must answer the same Likert scale question and make a prediction in the auxiliary prediction task. Specifically, they were asked to predict the percentage of other respondents (excluding themselves) who selected options “The same,” “A bit higher,” or “Much higher” in the Likert scale question. Participants were compensated based on their accuracy in answering the prediction question. The maximum reward was set at € 50. Then for every 1% deviation from the true percent-

age, there is a deduction of €5 from the maximum reward. Consequently, the possible payoff varies from €0 to €50. Should a participant’s prediction deviates by 10% or more, they would receive no prediction reward. In essence, the more accurate the prediction, the greater the reward. Participants initially answered the Likert scale question. Following this, they were presented with the prediction question and informed about the prediction reward. Subsequently, they were allowed to modify their answer to the Likert scale question once before confirming.

In the Full Incentive condition, similar to the Partial Incentive treatment, participants began by answering both the Likert scale and the prediction question. Just like in the Partial Incentive treatment, they were informed about the prediction reward, and additionally the matching reward. We match respondents who made the same selection on the Likert scale question. The matching reward is the average prediction reward of all other participants in one’s matched group. After learning about both rewards, participants were allowed to modify their answer to the Likert scale question once before confirming.

2.2.3 The Unincentivized Likert Scale Question

In Module 4 of our experiment, we incorporate the commonly adopted unincentivized Likert scale question from the literature (e.g., Riedl and Smeets, 2017; Hartzmark and Sussman, 2019; Humphrey et al., 2021; Baker et al., 2022; Heeb et al., 2023). All respondents were asked to express their opinions on the statement: I expect that the returns of sustainable investment funds compared to less sustainable investment funds are: 0 = I don’t know, 1 = much lower, 2 = a bit lower, 3 = the same, 4 = a bit higher, 5 = much higher.⁴

2.3 Other Measures

Apart from the unincentivized Likert scale question above, Module 4 also contains measures of participants’ demographic information, including gender, age, origin, educational background, occupation, and income, referring to the Netherlands Census and Statistics Netherlands. We also asked questions about their investment experience, such as years of investment experience, portfolio size, and monthly investments. Meanwhile, we elicited their social preferences, which included trust, positive and negative reciprocity, and altruism as in the Global Preference Survey (e.g., Falk et al., 2018). Another set of questions asked about their opinions, such as preferences between index and active ESG funds, sustainability risk, ESG impact, energy transition preference and energy efficiency engagement. Additionally, we assessed participants’ financial literacy through an incentivized question (receiving €50 from a lottery for correctly answering the question) focusing on the calculation of expected returns based on Kuhnen (2015). Table B.1 in the Appendix B provides details of the questions used to in Module 4.

⁴Note that this is a slightly different framing of the question than in the Choice Matching module.

2.4 Procedure

Survey invitations were distributed to Meesman’s clients along with the Meesman monthly newsletters. Almost all Meesman clients were subscribed to the newsletter and thus received the invitation. These invitations included a link to the survey, allowing clients to easily access and begin the survey with a simple click. The online survey was initiated on June 9, 2023, and it remained accessible to participants until August 31, 2023. Figure A.2 in the Appendix A graphically represents the number of respondents who participated following the initial launch of the survey, as well as those who responded following our subsequent reminders. In particular, at the initial launch, 408 participants initiated the survey, of which 134 completed it. Following our two reminders, the total number of participants who started the survey rose to 901, with 287 completing it. The average time to complete the survey was approximately 25 minutes. Additionally, the announcement of the survey’s reward was made on October 30, 2023.

2.5 Sample Characteristics

Table 1 provides a comprehensive overview of the demographic information, preferences, and beliefs of our survey respondents. Table B.1 in Appendix B defines the specific items outlined in Table 1. The demographic breakdown of the sample reveals that 65.85% were male, with an average age of 44.26 years. Educational attainment was relatively high, with 37.98% holding a university degree and a further 29.97% possessing a college degree (HBO, Higher Vocational Education in the Netherlands). The majority, slightly over two-thirds, were employed in paid positions. The average monthly income among respondents was €3853. Regarding portfolio size, slightly over 60% of respondents had portfolios under €50000. In terms of financial literacy, just over one-third of the respondents correctly answered the question about calculating expected returns.

When it comes to investment preferences, respondents showed a higher inclination towards ESG index funds as compared to active ESG funds. On sustainability, there was a general skepticism towards the idea that less sustainable funds are riskier than sustainable ones. Participants generally believed that ESG funds positively impact society. Concerning fund performance, there was a tendency to believe that index funds outperform active funds financially, while ESG funds underperform compared to conventional funds.

Respondents displayed altruistic tendencies, moderate levels of trust, and a strong inclination towards positive reciprocity. In contrast, their propensity for negative reciprocity was weaker towards themselves than towards others. On average, respondents were willing to donate 14.65% (€146.54) of a €1000 windfall. Additionally, their interest in investing in energy transition was moderate, and they strongly agreed that asset managers should actively engage in improving companies’ energy efficiency.

Table 1: Summary Statistics

This table presents summary statistics of respondents in the survey. Table B.1 defines the variables. The lower number of observations in the ESG Return by Likert Scale and Index Fund Return questions is due to the exclusion of participants who responded with “I don’t know.”

	Mean	Median	SD	Obs.
Demographics				
Gender				287
Male	65.85%			
Female	34.15%			
Age	44.26	39	14.64	287
Origin				287
Dutch	91.99%			
Others	8.01%			
Investing Experience (year)				287
1-3	41.81%			
4-10	32.06%			
Above 10	26.13%			
Education				287
University	37.98%			
College	29.97%			
Lower than College	3.83%			
Other	28.22%			
Occupation				287
Paid Work	67.60%			
Other	32.40%			
Monthly Income	€3852.92	€4750	€1732.51	287
€0 to €3000	19.51%			
€3000 to €5000	40.42%			
Above €5000	38.33%			
Total Investment				287
€0 to €10K	29.27%			
€10K to €50K	31.01%			
Above €50K	39.72%			
Correct Expected Return Calculation	34.84%			287
Social Preferences				
Altruism (1-7)	5.02	5	1.72	287
Trust (1-7)	3.56	3	1.45	
Positive Reciprocity (1-7)	5.62	6	1.04	
Negative Reciprocity (Self) (1-7)	2.68	3	1.30	
Negative Reciprocity (Others) (1-7)	3.69	4	1.39	
Donation (1-1000)	146.54	100	190.80	
Energy Transition Preference (0-100)	49.66	50	30.40	
Energy Efficiency Engagement (1-7)	5.54	6	1.47	
Beliefs by Likert Scale				
ESG Return by Likert Scale (1-5)	2.74	2	0.97	282
Index Fund Return (1-5)	3.78	4	0.98	286
ESG Index Fund Preference (1-7)	4.75	5	1.47	287
Active ESG Fund Preference (1-7)	3.39	3	1.74	287
Sustainability Risk (1-7)	3.52	3	1.43	287
ESG Impact (1-7)	5.24	5	1.28	287

3 Results

This section presents our main findings in the following order. In Section 3.1, we first present the median return expectations elicited through the Exchangeability Method.

This is followed by a comparison with their return expectations measured by the unincentivized Likert Scale Method, detailed in Section 3.2. Subsequently, in Section 3.3, we present the findings from the Choice Matching Method to show that they are consistent with those from the Exchangeability Method. In Section 3.4, we further show that the return expectations elicited from both incentivized methods significantly correlate with investment allocations. Section 3.5 shows additional results regarding heterogeneity of return expectations and perception of risk-return trade-off for ESG funds.

3.1 Return Expectations from the Exchangeability Method

In this section, we analyze respondents' median return expectations towards the same fund based on the Exchangeability Method, comparing between the ESG-Info condition and the No-ESG-Info condition. Recall that we elicited three expectations: we presented participants with six years of annual returns and elicited the seventh-year return expectation, and then we presented a positive and a negative scenario, and elicited the eighth-year return expectation.

Result 1: According to the Exchangeability Method, a high ESG label leads to higher return expectations over a one-year horizon in the ESG-Info condition compared with the No-ESG-Info condition, but not in subsequent belief updating.

Figure 2 presents the comparison of respondents' median return expectations in both the ESG-Info and No-ESG-Info conditions, based on three elicited median beliefs: the seventh-year return, the eighth-year return in a positive and a negative scenario. On average, respondents who saw a high ESG label in the ESG-Info condition expected higher financial return relative to those in the No-ESG-Info on the same fund in the 1-year forecast horizon ($p = 0.05$). However, when either positive or negative return information was revealed for the seventh year and respondents were asked to forecast the eighth year, no statistically significant difference is observed between the two conditions.

In Table 2, we use regressions to investigate the determinants of median return expectations. We conduct Ordinary Least Squares (OLS) regressions, with participants' median return expectations elicited using the Exchangeability Method as the dependent variable. Our main independent variable is the binary treatment variable *High ESG Info*, which is equal to 1 for respondents in the ESG-Info condition, and 0 otherwise (the No-ESG-Info condition). We control for measures of preferences and individual characteristics from the end-of-experiment questionnaire.

Column (1) in Table 2 clearly shows that the high ESG rating label had a significant positive effect on median return expectations, compared with no ESG information ($p = 0.05$). On average, respondents' median annual return expectation is 3.32% higher when they know the fund has high ESG rating compared to without ESG rating information. In columns (2) and (3), we investigate the influence of high ESG rating information

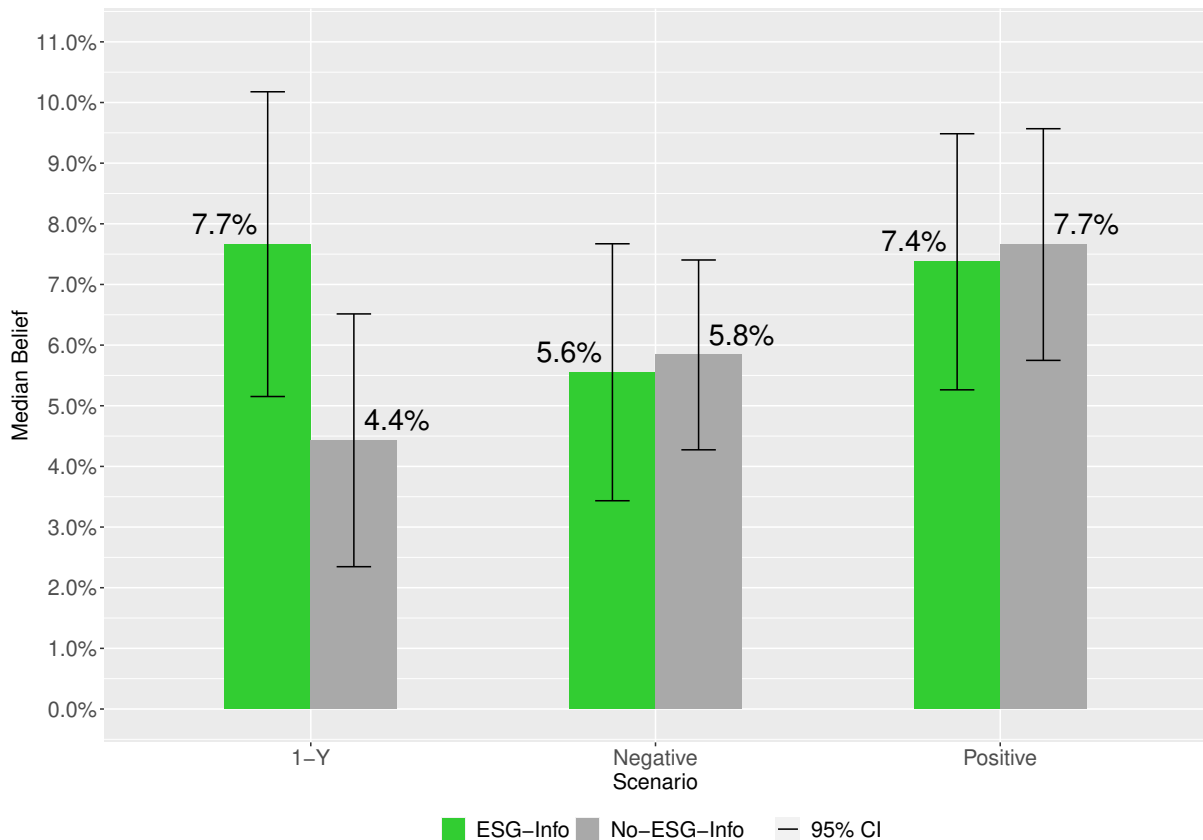


Figure 2: Median Return Expectation Comparison

Note: This figure illustrates participants' return expectations for the fund with high ESG rating information in the ESG-Info condition, contrasted with the same fund without ESG rating information in the No-ESG-Info condition. The comparisons are presented separately for one-year ahead forecast of the seventh year, negative, and positive return scenarios to forecast the eighth year. The green bars depict responses from the ESG-Info condition, while the grey bars represent responses from the No-ESG-Info condition. The difference between the treatment groups in the 1-year horizon forecast is indicated by $p = 0.05$ in a two-sided t-test.

on respondents' belief updating following the revelation of negative or positive return scenarios. The high ESG rating label does not yield a significant impact on respondents' belief updating. The influence of respondents' prior beliefs (specifically, their expectations for returns in the seventh year) on their belief updating is additionally tested in Table A.1 in the Appendix A. The results show that there is significant belief stickiness (a positive correlation between prior and posterior) in both positive and negative scenarios, but more so in the positive scenario.

Additionally, respondents' investment experience and their perceptions of sustainability risk and the social impact of ESG had a significant negative correlation with their return expectations. Specifically, every three more years of investment experience corresponds to a 2.79% reduction in the median annual return expectation. A one unit increase on the Likert scale in perceived sustainability risk and ESG impact results in an increase of 0.97% and a decrease of 1.88%, respectively, in the median annual return expectations.

Before launching our field survey, we conducted an online experiment using student subjects to validate our survey instruments. There, we find a similar positive effect of high

Table 2: Expected Fund Return by Exchangeability Method

This table presents the regression results of participants' return expectations for the fund in the survey. Columns (1), (2), and (3) correspondingly examine the fund's one-year return expectation, negative scenario return expectation, and positive scenario return expectation. The dependent variable is the median return expectation. Demographic characteristics include gender, age, education, investing experience, occupation, income, total investment, monthly investment, portfolio size, and financial literacy (measured by correct expected return calculation). Preferences include altruism, trust, reciprocity, negative reciprocity (Self), negative reciprocity (Others), ESG index fund preference, active ESG fund preference, and donation. Table B.1 defines these variables. For conciseness, only significantly relevant variables are shown in the table. Standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	<i>Dependent variable:</i>		
	<i>Fund's Return Expectation</i>		
	1-Y	Negative	Positive
	(1)	(2)	(3)
High ESG Info	3.321** (1.690)	-0.668 (1.407)	-0.448 (1.529)
Investing Experience	-2.792*** (0.791)	-0.250 (0.658)	-0.673 (0.715)
Portfolio Size	0.001** (0.000)	0.000 (0.000)	0.000 (0.000)
Correct Return Calculation	0.691 (1.841)	-0.227 (1.533)	-0.366 (1.666)
Sustainability Risk	0.966* (0.586)	0.696 (0.487)	0.886* (0.530)
ESG Impact	-1.884** (0.793)	-1.651** (0.660)	-1.345* (0.717)
Negative Reciprocity (Others)	1.243* (0.657)	0.926* (0.547)	0.970 (0.594)
Observations	287	287	287
R^2	0.175	0.090	0.116
Demographics control	YES	YES	YES
Preferences control	YES	YES	YES

ESG label on median return expectations in the 1-year horizon (10.8% in the ESG-Info condition vs. 8.0% in the No-ESG-Info condition, $p = 0.02$). Interestingly, we also find a significant effect in the negative return scenario. Specifically, beliefs were more resilient to (or responded less to) the negative signal when there was a high ESG label versus not (7.0% in the ESG-Info condition vs. 4.8% in the No-ESG-Info condition, $p = 0.07$). See Figure A.3 in the Appendix A for details. Different samples generated consistent results in their 1-year horizon expectations. The difference in belief updating, which might be due to sample characteristics such as investing experience and ESG knowledge, calls for future research.

3.2 Return Expectations from the Unincentivized Likert Scale

To compare with the literature and with the results obtained from the Exchangeability Method, we replicated the widely used unincentivized Likert Scale Method. This method qualitatively elicits respondents' beliefs towards the return of ESG funds relative to con-

ventional funds.

Result 2: According to the unincentivized Likert Scale Method, the majority of respondents expected sustainable funds to financially underperform conventional funds. This contradicts beliefs based on the Exchangeability Method from the same participants.

Based on the Likert Scale, overall, the majority of participants (51.2%) expected that ESG funds financially underperform conventional funds (4.9% expecting much lower returns and 46.3% expecting a bit lower returns from ESG funds); 18.5% believed returns would not differ between the two types of funds; 28.5% expected ESG funds to outperform conventional funds (26.8% expecting a bit higher returns and 1.7% expecting much higher returns); 1.7% expressed that they did not know the answer. Therefore, respondents expected ESG funds to financially underperform conventional funds based on the unincentivized Likert Scale. This is consistent with previous studies using the same method (e.g., Renneboog et al., 2008; Riedl and Smeets, 2017). Figure 3 illustrates the distribution of return expectations based on the unincentivized Likert Scale, for the ESG-Info condition and the No-ESG-Info condition separately. Their patterns are similar.

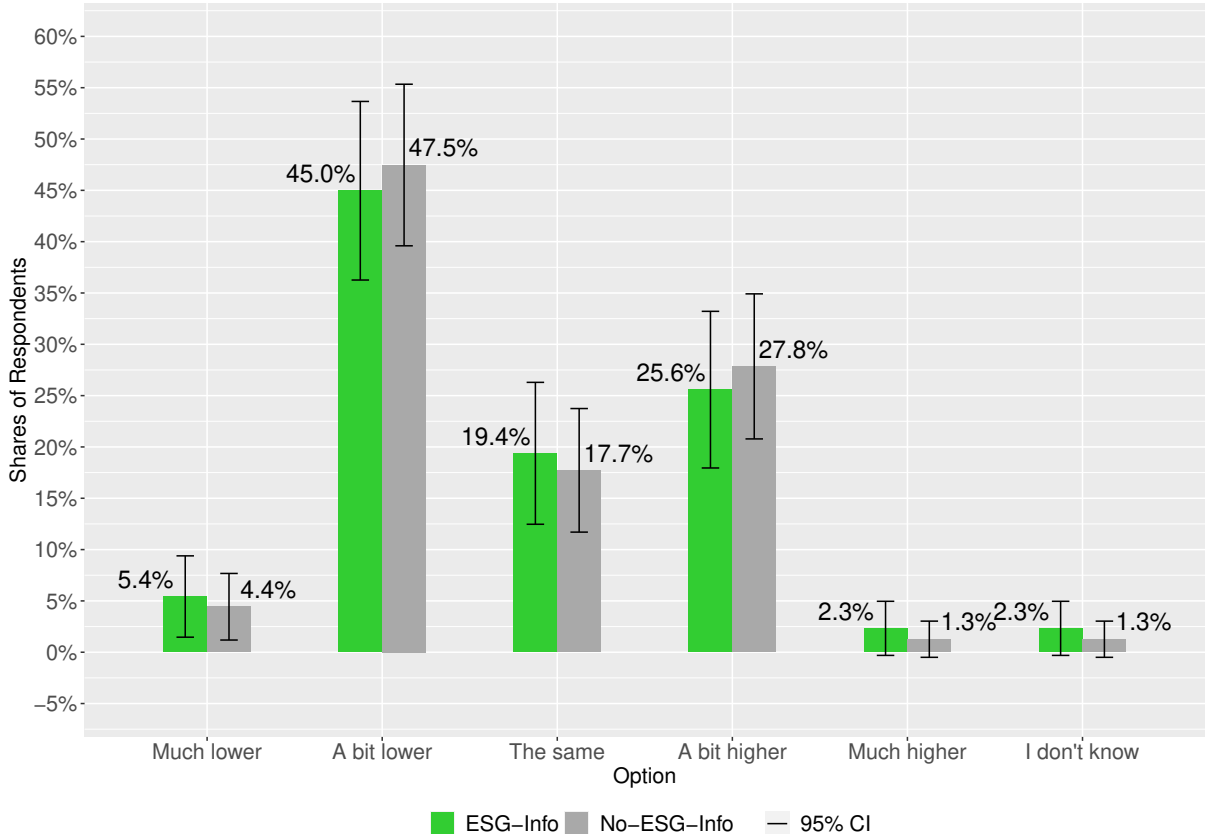


Figure 3: Return Belief by Likert Scale

Note: This figure displays the distribution of return expectations obtained by asking participants the following question: “I expect that the returns of sustainable investment funds compared to less sustainable investment funds: a. Much lower, b. A bit lower, c. The same, d. A bit higher, e. Much higher, f. I don’t know.” The green bars depict responses from the ESG-Info condition, while the grey bars represent responses from the No-ESG-Info condition.

However, respondents' return expectations towards ESG funds as elicited through the unincentivized Likert Scale Method are not completely compatible with those obtained from the same respondents through the incentivized Exchangeability Method. To show this, we conduct a sub-sample analysis. This analysis splits respondents according to whether they said ESG funds would underperform or outperform conventional funds, and then compare their respective median beliefs towards the fund's return elicited through the Exchangeability Method.

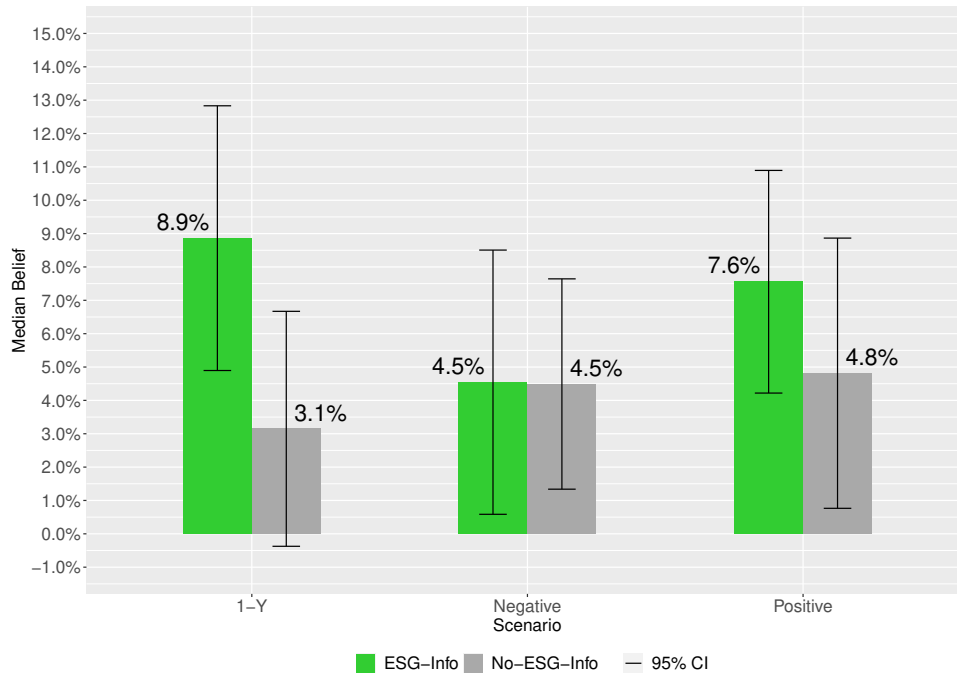
In Figure 4, Panel (a) is for respondents who said ESG funds would financially underperform conventional funds in the Likert scale question, whereas Panel (b) contains respondents who reported the opposite. Each panel then plots their median return expectations based on the Exchangeability Method, separately for the ESG-Info condition from the No-ESG-Info condition. Interestingly, participants who thought ESG funds would underperform conventional funds in the Likert scale question had 5.8% higher median return expectations when there is a high ESG label compared to none in the one year horizon according to the Exchangeability Method ($p = 0.03$). Panel (b) shows a similar pattern: participants who thought ESG funds would outperform also had higher median return expectations by 2.9% ($p = 0.40$) when there is a high ESG label compared with none. Table A.2 in the Appendix A presents the regression results for the sub-sample analysis, which supports this observation. Table A.3 in the Appendix A explores this discrepancy by regressions. Our analysis suggests that return expectations for ESG funds, as measured by the unincentivized Likert Scale Method, exhibit statistically insignificant correlation with the median return expectations elicited through the Exchangeability Method.

3.3 Return Expectations from the Choice Matching Method

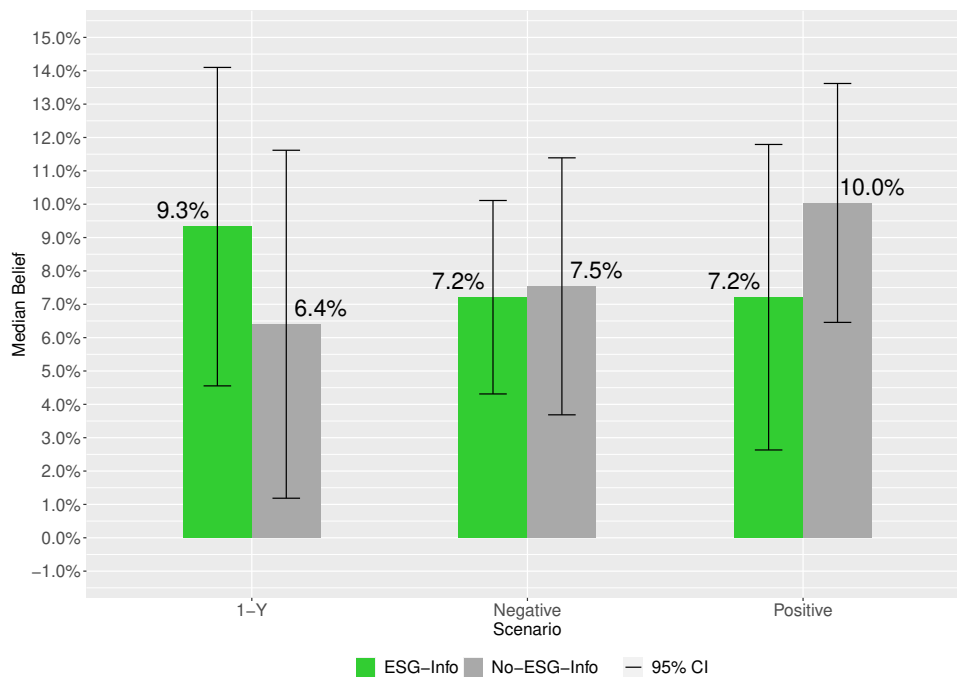
Our findings so far reveal inconsistencies between the results obtained using the qualitative unincentivized Likert Scale Method and the quantitative incentivized Exchangeability Method. In order to ascertain which result is more reliable, we also elicited beliefs using the Choice Matching Method. We can then see whether the two incentivized methods generate consistent results, despite that the Choice Matching Method also employs the Likert scale question, rephrased and presented with incentives.

Result 3: Based on the Choice Matching Method, the majority of respondents expected ESG funds to financially outperform conventional funds. The incentives lead respondents to adjust their return expectations for ESG funds upwards.

Remember that our Choice Matching Method was implemented with three distinct conditions: No Incentive, Partial Incentive and Full Incentive. Figure 5 illustrates return expectations in these different incentive conditions: In the No Incentive condition, 32.4% of participants expected ESG funds to outperform conventional funds financially, while 40.2% believed the opposite. In the Partial Incentive condition (with only prediction



Panel (a): Median Belief of Investors Expressing Lower ESG Returns by Likert Scale



Panel (b): Median Belief of Investors Expressing Higher ESG Returns by Likert Scale

Figure 4: Median Belief by Sub-group

Note: This figure illustrates the comparisons of respondents' median return expectations toward the fund elicited by the Exchangeability Method, in the ESG-Info and No-ESG-Info conditions, categorized by their responses to the unincentivized Likert scale question regarding ESG funds' performance relative to conventional funds. The green bars depict responses from the ESG-Info condition, while the grey bars represent responses from the No-ESG-Info condition. Panel (a) displays the return expectations of respondents who indicated that ESG funds financially underperform conventional funds in the unincentivized Likert scale question. Panel (b) displays the return expectations of respondents who indicated that ESG funds financially outperform conventional funds in the unincentivized Likert scale question.

incentive), 32.6% predicted outperformance of ESG funds; whereas 46.7% expected underperformance. Conversely, in the Full Incentive condition (with both prediction and matching incentives), 44.1% anticipated ESG funds to outperform conventional funds; whereas 36.5% expected ESG underperformance. These results indicate that adding the matching incentive shifted expectations towards better ESG performance, consistent with the Exchangeability Method results.

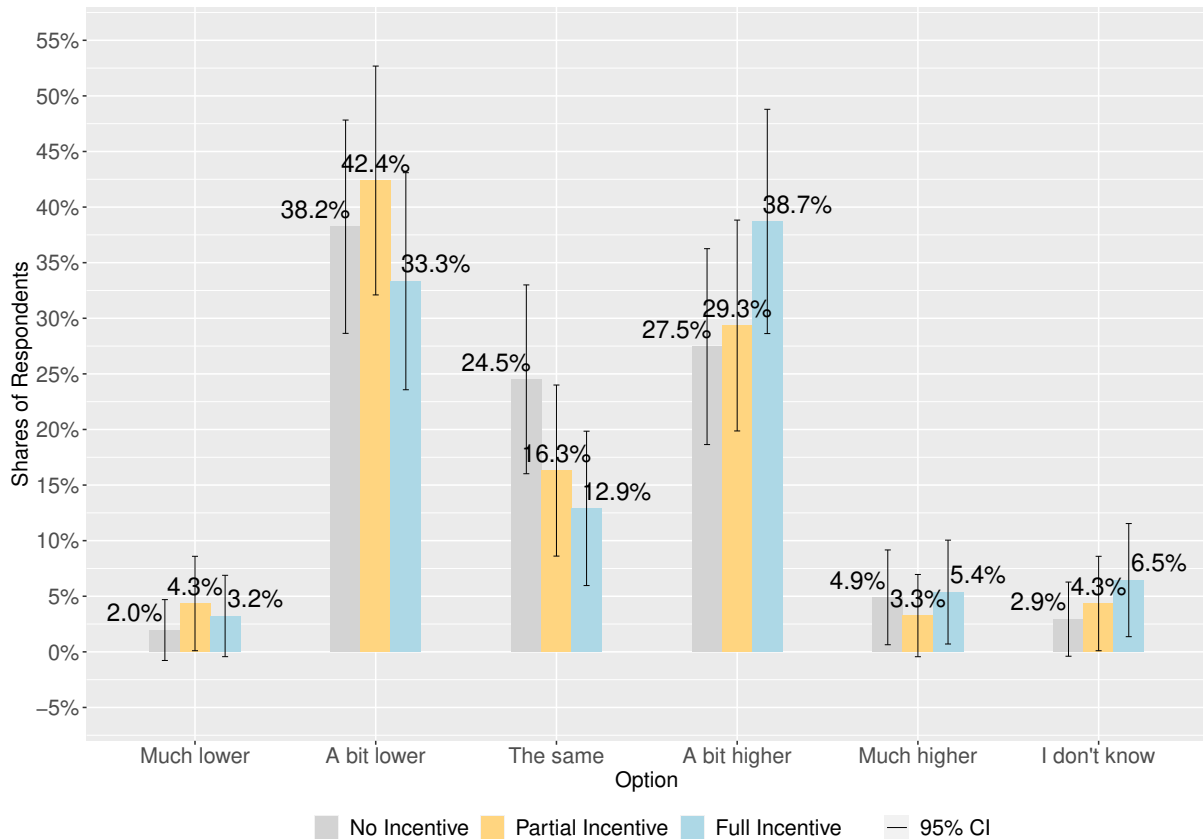


Figure 5: Return Expectation Distribution by Choice Matching Method

Note: This figure illustrates the distribution of return expectations for ESG funds among participants in the three incentive conditions. The bars represent participants’ responses to the statement, “I expect that the returns of index mutual funds that exclude companies with a low ESG score, compared to index mutual funds that do not exclude companies with a low ESG score are: a. Much lower, b. A bit lower, c. The same, d. A bit higher, e. Much higher, f. I don’t know.” The grey bars represent responses from the No Incentive condition, the yellow bars illustrate responses from the Partial Incentive condition, and the blue bars indicate responses from the Full Incentive condition.

Additionally, the experimental module for the Choice Matching Method implementation first asked the questions, and then showed incentives while allowing subjects to modify their answers after seeing those incentives. This allowed us to investigate participants’ reactions to incentives. Figure 6 illustrates the distribution of participants’ modification directions across the three incentive conditions. The grey bars on the left side depict respondents’ shifts from choosing higher return for ESG funds to choosing lower return (including changes from “Much higher” or “A bit higher” to “A bit lower” or “Much lower”). Conversely, the blue bars on the right side depict respondents’ shifts from a lower return assessment for ESG funds to higher return (including changes from

“Much lower” or “A bit lower” to “A bit higher” or “Much higher”).

In the No Incentive treatment, 4.9% of respondents modified their responses downward to lower return, while 2.0% modified upward to higher return. However, this difference is not statistically significant ($p = 0.25$). In the Partial Incentive treatment, after observing the prediction incentive, 1.1% of respondents modified their responses downward to lower return, while 2.2% modified upward to higher return (again insignificant difference, $p = 0.56$). In the Full Incentive treatment, after knowing the incentives, 4.3% of respondents modified downward to lower return; in contrast, 11.8% modified upward to higher return. This difference is statistically significant ($p = 0.06$). These results suggest a significant tendency among respondents to adjust their return expectations towards ESG funds from lower to higher than conventional funds when there is the matching reward in the Choice Matching Method.

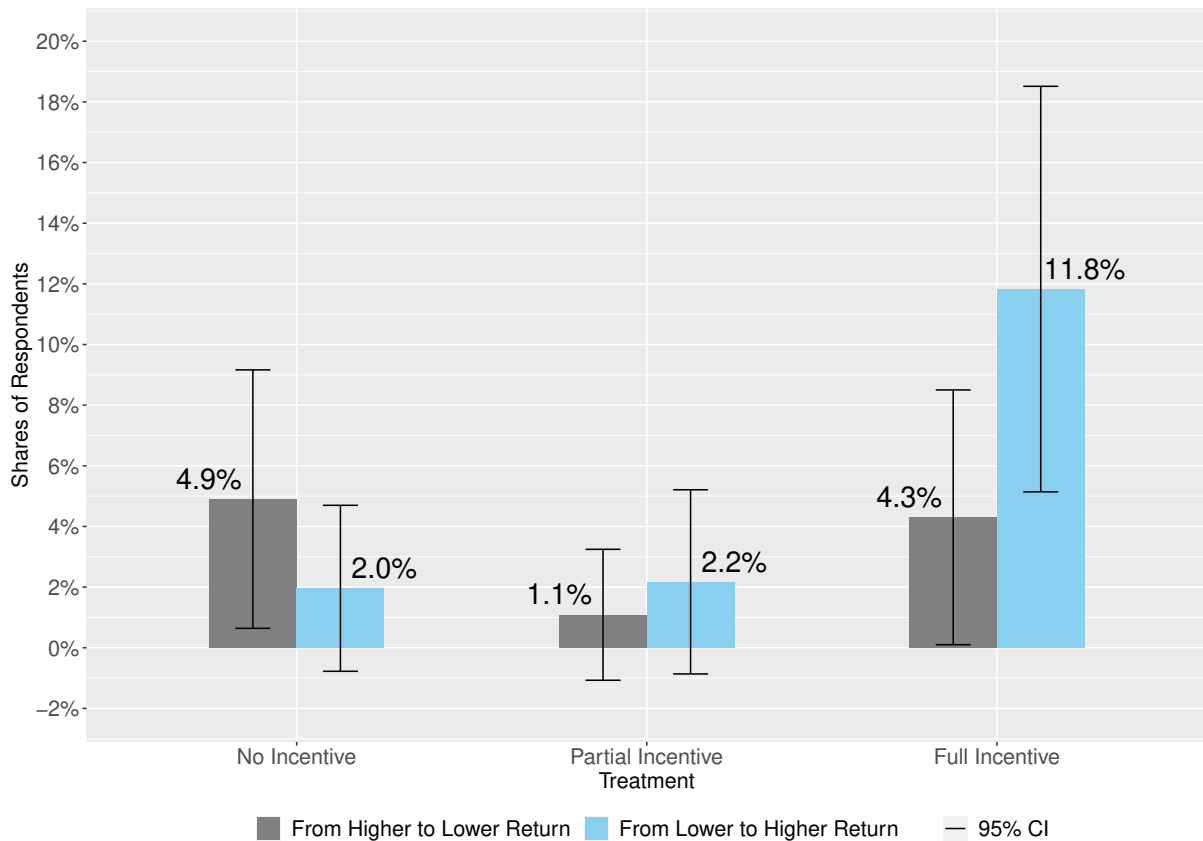


Figure 6: Return Expectation Modification by Choice Matching Method

Note: This figure depicts the distribution of modifications in return expectations for ESG funds across participants in the three incentive conditions. The bars illustrate the percentage of respondents adjusting their return expectations in the Choice Matching Method within these conditions. The grey bars depict responses where respondents shifted their return expectations towards ESG funds, transitioning from a higher return to a lower return compared to conventional funds. Conversely, the blue bars represent responses where participants adjusted their return expectations towards ESG funds, moving from a lower return to a higher return relative to conventional funds.

To further investigate modification behavior of respondents, Table 3 presents the results from Logit regressions belief modification as the dependent variable. We capture two types of modifications. One is upward modification, raising expectations from the

originally chosen level to any higher level (Column 1), and the other is modification from lower return expectations (either much lower or a bit lower) to higher (either a bit higher or much higher) (Column 2). In Column (1), respondents in the Full Incentive condition are 6 times more likely ($\exp(1.826) = 6.209$) to adjust upward compared to those in the No Incentive condition. Moreover, our findings in Column (2) suggests that the Full Incentive condition significantly increased the likelihood of modifying return expectations from lower return to higher return, whereas Partial Incentive had no effect. Specifically, respondents in the Full Incentive condition are almost 13 ($\exp(2.560) = 12.94$) times more likely to adjust from lower to higher than those in the No Incentive condition.⁵

Table 3: Modification Direction in Choice Matching Method

This table presents the marginal effects derived from binomial Logit regressions. In Column (1), the dependent variable has two distinct values: it is equal to 1 for upward shifts of return expectation (raising their expectations from the originally chosen level to any higher level), and 0 otherwise (expectation stayed the same or shifted downward). In Column (2), the dependent variable has two distinct values: it is equal to 1 for shifts from lower return expectations (either much lower or a bit lower) to higher (either a bit higher or much higher), and 0 otherwise. The marginal effects of a Logit regression on the incentives of the three conditions are presented, with the No Incentive condition serving as the baseline. Respondents who selected “I don’t know” in the Likert scale question are excluded. Demographic characteristics include gender, age, education, investing experience, occupation, income, total investment, monthly investment, portfolio size, and financial literacy (measured by correct expected return calculation). Preferences control for altruism, trust, reciprocity, negative reciprocity (Self), negative reciprocity (Others), ESG index fund preference, active ESG fund preference, and donation. For conciseness, only incentive variables are shown. Standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	<i>Dependent variable:</i>	
	<i>Upward</i>	<i>Lower to Higher</i>
	(1)	(2)
Partial Incentive	-0.594 (1.276)	0.119 (1.308)
Full Incentives	1.826** (0.927)	2.560** (1.036)
Demographics control	YES	YES
Preferences control	YES	YES
Observations	273	273
Log-Likelihood	-32.11	-34.11
AIC	116.22	120.22

3.4 Investment Allocation

In this section, we present the results from our end-of-experiment incentivized allocation task between a conventional fund and a sustainable fund, and examine how beliefs elicited in the experiment correlate with allocation decisions.

Result 4: Return expectations of ESG funds elicited through the two incentivized methods significantly positively correlate with allocations to the ESG fund, but responses in

⁵Appendix A.7 further explores the modification patterns.

the unincentivized Likert scale question do not.

We conduct OLS regression analyses with the respondents' amount allocated (out of €400) to the green fund as the dependent variable. Our main independent variables are return expectations obtained through the Exchangeability Method and the Choice Matching Method. The results are presented in Table 4. Column (1) pertains to the ESG condition with beliefs elicited from the Exchangeability Method. Columns (2) through (6) use beliefs elicited from the Choice Matching Method. Column (7) uses beliefs elicited by the unincentivized Likert Scale Method.

In Column (1) of Table 4, we show that respondents' median return expectations towards the ESG fund significantly positively correlate with their allocation to the sustainable fund ($p = 0.07$). The coefficient for beliefs elicited via the Exchangeability Method stands at 1.620. This suggests that a one percentage point increase in the respondents' beliefs about the annual return is associated with a €1.62 increase in the allocation to the green fund, which is 0.405% of the total €400 budget. In other words, taking into account the considerable heterogeneity in respondents' beliefs and allocations respectively, a one standard deviation increase in return expectations towards the ESG fund leads to a 0.156 standard deviation increase in allocation to the sustainable fund, equivalent to €23.36 (or 5.85% of the total investment amount of €400). At the beginning of the Choice Matching Method, respondents evaluated the financial performance of ESG funds relative to conventional funds by answering the Likert Scale question without any incentives nor information about incentives. In Columns (2)-(5), these beliefs also did not significantly correlate with the amount allocated to the green fund. However, in Column (6), only after the introduction of both incentives (prediction incentive and matching incentive) in the Choice Matching Method, respondents' return expectations towards ESG funds significantly increased their allocation to the sustainable fund ($p = 0.042$). Specifically, a one unit increase (in the Likert scale responses) in ESG fund return expectations relative to conventional funds results in approximately €31.23 (equivalent to 7.81% of the total investment amount of €400) increase in the ESG fund allocation. In Column (7), return expectations from the unincentivized Likert scale question in the fourth module did not significantly correlate with the amount allocated to the sustainable fund.

Therefore, compared with return expectations elicited by the unincentivized Likert Scale Method, those obtained through both of our incentivized methods consistently exert a positive influence on respondents' allocation to the sustainable fund.

3.5 Additional Results

This subsection shows additional results along two dimensions, the heterogeneity of beliefs and risk perceptions. First, we observe significant heterogeneity in respondents' median return expectations, obtained from the Exchangeability Method, stemming from their demographic characteristics and financial status. Table 5 displays the respondents' median

Table 4: Allocation on ESG Fund

This table explores the regressions of respondents' allocation decisions in the ESG fund of the allocation task at the end of the survey. The ESG fund allocation refers to the amount allocated by respondents in the allocation task of the survey. In Column (1), ESG return belief is elicited using the Exchangeability Method. In Column (2), ESG return belief is elicited using the Choice Matching Method in the No Incentive condition. In Column (3), ESG return belief is elicited at the outset without knowing incentives using the Choice Matching method in the Partial Incentive condition. In Column (4), adjusted ESG return belief is utilized after the matching incentive is offered, as obtained through the Choice Matching Method in the Partial Incentive condition. In Column (5), ESG return belief is elicited at the outset without knowing incentives using the Choice Matching Method in the Full Incentive condition. In Column (6), adjusted ESG return belief is utilized after the matching incentive is offered, as obtained through the Choice Matching Method in the Full Incentive condition. In Column (7), ESG return belief is elicited using the uncentivized Likert Scale Method in the fourth questionnaire module. Demographic characteristics include gender, age, education, investing experience, occupation, income, total investment, monthly investment, portfolio size, and financial literacy (measured by correct expected return calculation). Preferences include altruism, trust, reciprocity, negative reciprocity (Self), negative reciprocity (Others), ESG index fund preference, active ESG fund preference, and donation. Table B.1 defines the variables. Standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	<i>Dependent variable: ESG Allocation Amount</i>						
	<i>Exchangeability</i>	<i>Choice Matching</i>				<i>Likert Scale</i>	
		<i>(No Incentive)</i>	<i>(Partial Incentive)</i>		<i>(Full Incentive)</i>		
		Initial	Initial	Adjusted	Initial	Adjusted	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ESG Return Belief	1.620* (0.892)	21.080 (17.250)	0.657 (17.478)	12.041 (17.555)	22.338 (14.999)	31.230** (15.070)	13.600 (9.297)
Male	-26.130 (19.410)	-68.750* (40.110)	-54.120* (29.991)	-49.928* (29.964)	40.596 (26.507)	36.212 (30.397)	-20.930 (15.100)
Education	-21.560** (9.187)	-10.280 (11.830)	20.066 (15.182)	22.032 (15.216)	-31.490** (15.165)	-34.182** (14.874)	-11.510* (7.046)
Income	11.630*** (3.672)	2.880 (4.599)	9.625 (7.932)	8.394 (7.974)	9.375* (5.435)	9.481* (5.528)	4.837* (2.855)
Sustainability Risk	-15.340* (8.294)	12.910 (11.090)	-20.794 (14.318)	-21.634 (14.277)	-16.103 (11.774)	-15.631 (11.671)	-3.440 (6.423)
ESG Impact	17.010* (9.966)	17.480 (14.160)	38.502** (16.904)	36.297** (16.948)	15.062 (19.119)	20.353 (18.729)	22.030*** (8.085)
ESG Index Fund Preference	35.160*** (10.660)	28.360** (14.080)	4.487 (14.783)	2.016 (14.925)	33.040* (17.018)	38.137** (16.342)	24.830*** (7.888)
Demographics control	YES	YES	YES	YES	YES	YES	YES
Preferences control	YES	YES	YES	YES	YES	YES	YES
Observations	129	99	88	88	87	87	282
R^2	0.494	0.441	0.399	0.404	0.503	0.515	0.32

return expectations, summarized for different demographic and financial status subgroups respectively. In general, respondents who are younger, employed and less educated, have a lower investment amount and less investment experience, provide inaccurate return expectation calculations, are more inclined to expect that the fund with a high ESG label financially outperforms the fund without ESG rating information. These findings are consistent with existing literature (e.g., Giglio et al., 2019, 2023). For the respective complementary groups, no significant difference was observed. Meanwhile, we do not find a significant gender difference. Respondents whose monthly income aligns closely with the Netherlands' average gross monthly income (which was €2855 in 2023) expect that the fund with a high ESG label significantly outperform the fund without ESG rating

information. A more detailed analysis is presented in Section A.8 of the Appendix A.

Table 5: Median Beliefs by Demographics

This table presents respondents’ median return expectations for the fund, comparing the ESG-Info condition with the No-ESG-Info condition, categorized by age, gender, total investment, income, investing experience, education, return calculation, and occupation. Columns (1), (2), and (3) present respondents’ median return expectations for the fund in the ESG-Info condition for one-year return expectation, negative scenario return expectation, and positive scenario return expectation, respectively. Columns (4), (5), and (6) present respondents’ median return expectations for the fund in the No-ESG-Info condition for one-year return expectation, negative scenario return expectation, and positive scenario return expectation, respectively. Columns (7), (8), and (9) present the differences in median return expectations between the ESG-Info and No-ESG-Info conditions for one-year return expectation, negative scenario return expectation, and positive scenario return expectation, respectively. Table B.1 defines the variables. Standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	ESG Median Return Expectation (%)				Non-ESG Median Return Expectation (%)				ESG – Non-ESG (%)		
	1Y (1)	Negative (2)	Positive (3)	N	1Y (4)	Negative (5)	Positive (6)	N	1Y (7)	Negative (8)	Positive (9)
By Age											
≤ 40	9.470	7.159	7.879	66	6.417	6.083	8.361	90	3.053*	1.076	-0.482
41–50	9.150	5.550	7.950	25	-0.662	0.809	1.25	17	9.812*	4.741	6.700
51–60	5.662	1.250	7.426	17	1.902	4.946	9.076	23	3.760	-3.696	-1.650
61–70	2.596	5.096	3.558	13	2.361	10.139	8.472	18	0.235	-5.043	-4.915
> 70	0.625	2.188	7.500	8	4.750	6.50	7.500	10	-4.125	-4.313	0
By Gender											
Male	7.250	6.344	8.531	80	4.782	6.250	7.833	109	2.468	0.094	0.699
Female	7.750	3.806	4.750	45	3.750	5.083	7.417	45	4.000	-1.278	-2.667
By Total Investment											
< €10K	13.045	5.737	7.788	39	7.250	6.972	9.472	45	5.795**	-1.235	-1.684
€10K–€50K	8.824	8.456	8.824	34	1.523	4.114	6.659	55	7.301**	4.342	2.164
€50K–€100K	3.194	3.056	3.611	18	10.139	5.694	7.778	18	-6.944	-2.639	-4.167
€100K–€250K	2.981	3.173	5.481	13	4.083	5.417	8.750	15	-1.103	-2.244	-3.269
> €250K	3.350	4.350	8.450	25	1.85	7.95	5.85	25	1.500	-3.60*	2.600
By Income											
< €3K	4.167	3.333	4.750	30	5.927	4.879	7.782	31	-1.761	-1.546	-3.032
€3K–€5K	10.924	6.087	7.446	46	3.107	5.357	7.071	70	7.817***	0.730	0.374
€5K–€7.5K	8.182	8.182	8.182	22	6.731	7.212	7.500	26	1.451	0.970	0.682
> €7.5K	5.847	5.040	9.23	31	3.992	6.733	8.992	31	1.855	-1.694	0.242
By Investment Experience											
< 3years	12.215	5.461	7.303	57	6.091	5.179	9.187	63	6.124***	0.282	-1.884
3–6 years	10.000	8.958	9.167	24	4.297	6.328	6.875	32	5.703**	2.630	2.292
7–10 years	9.219	5.469	10.781	16	6.500	7.250	6.875	20	2.719	-1.781	3.906
>10 years	-2.969	3.203	4.453	32	1.134	5.785	6.366	43	-4.102	-2.582	-1.913
By Education											
Junior College or Lower	9.177	5.213	7.774	41	5.063	6.313	8.250	40	4.114	-1.099	-0.476
College	8.682	5.709	7.466	37	2.500	5.069	6.944	36	6.182*	0.640	0.522
University or Higher	5.71	5.71	6.985	51	4.970	5.945	7.683	82	0.741	-0.234	-0.698
By Return Calculation											
Correct	7.238	6.250	7.471	43	6.075	4.934	6.732	57	1.164	1.316	0.738
Wrong	7.878	5.203	7.326	86	3.502	6.349	8.181	101	4.375**	-1.146	-0.855
By Occupation											
Paid Work	8.947	6.081	7.879	89	5.369	6.226	7.107	105	3.578*	-0.145	0.772
Others	4.813	4.375	6.250	40	2.571	5.071	8.750	53	2.242	-0.696	-2.500

Moreover, we find that participants who believed low ESG funds come with higher risk also believed high ESG funds will have higher returns. We elicited participants’ risk perception on ESG funds compared with conventional funds using the unincentivized Likert scale question based on Riedl and Smeets (2017). Specifically, we asked participants their opinions on the following statement: Less sustainable investment funds carry more risk than sustainable investment funds. They could choose whether they “Totally disagree”, “Disagree”, “Fairly disagree”, “Average”, “Fairly agree”, “Agree”, or “Totally agree”. We then analyzed results with respect to this question in relation to their return expectations. In Figure 7, Panel (a) depicts the distribution of choices in the above question

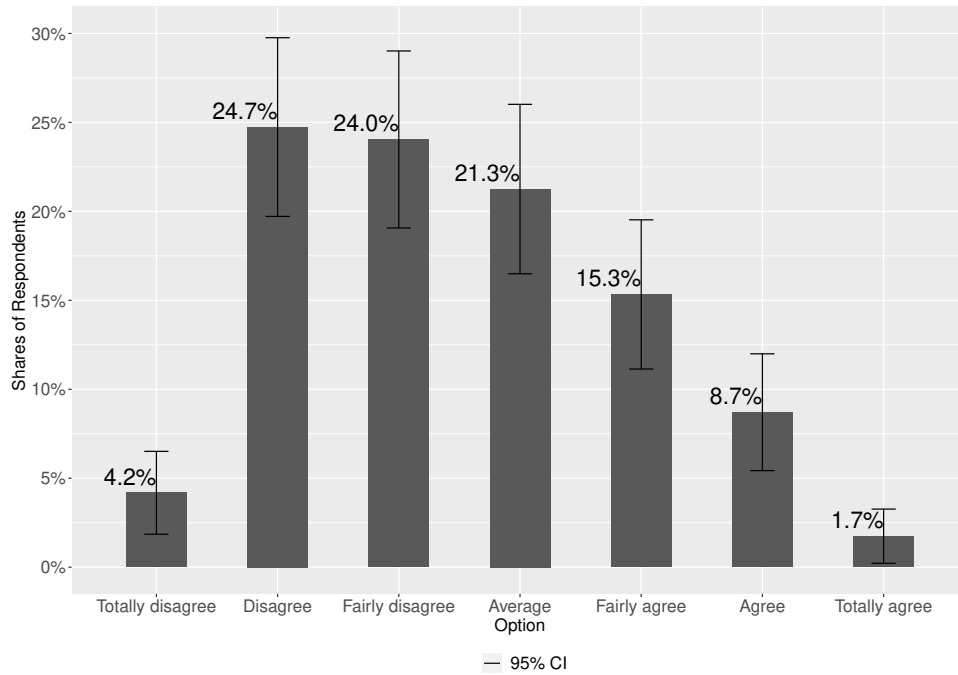
in the entire sample. Overall, 28.9% of respondents totally disagreed (4.2%) or disagreed (24.7%) with the statement, suggesting they believe less sustainable funds to be riskier. Conversely, 10.4% of respondents totally agreed (1.7%) or agreed (8.7%) with the statement, indicating less sustainable funds to be riskier, or sustainable funds to be less risky. The remaining 60.7% of respondents exhibited a moderate perception of risk concerning sustainable funds relative to less sustainable funds.⁶ Linking this with our elicited median return expectations from the Exchangeability Method, we explore how respondents perceive the risk-return trade-off of high ESG funds. Panel (b) presents the median return expectations of respondents for the fund under ESG-Info and No-ESG-Info conditions. Participants are categorized according to their risk perceptions, and their median return expectations are summarized respectively.⁷ Our findings indicate that respondents who tended to agree or totally agree with the notion that low ESG funds carry higher risk also expect higher returns from the fund with high ESG rating information compared to the identical fund without such ESG information (15.9% Vs. 5.5%, $p = 0.043$). This suggests a negative correlation between perceived risks and expected returns in the context of ESG-rated investments. On the other hand, those who disagreed or totally disagreed with the statement that low ESG funds correlate with higher risk expect a similar return from the ESG fund and its counterpart without ESG information (5.2% vs. 4.8%, $p = 0.904$). This suggests participants tend to associate lower expected return and higher risk with low/average ESG funds. This finding aligns with Hartzmark and Sussman (2019), who observe an inverse relationship between expectations of risk and returns, which could be driven more by affect heuristic than by rational analysis (e.g., Slovic et al., 2007).

4 Conclusion

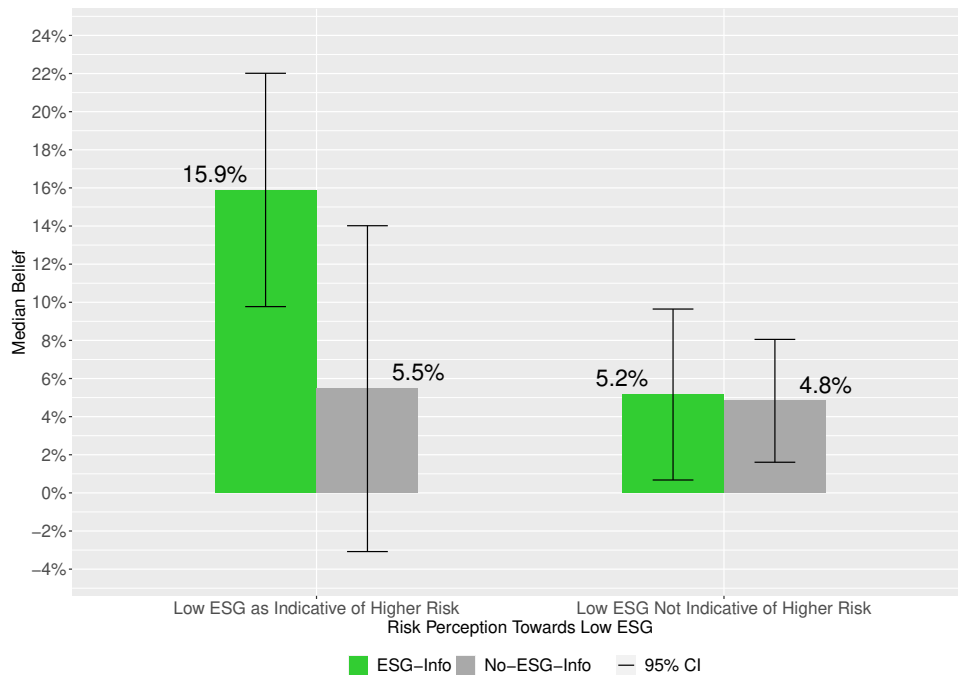
In this study, we formally investigate index fund investors' return expectations towards ESG funds through an incentivized field survey experiment. Our methodologies encompass both the widely used unincentivized Likert scale questions and the incentivized Exchangeability and Choice Matching Methods. This allows us to demonstrate a significant divergence in conclusions drawn from methodologies varying by incentive structures. Utilizing unincentivized Likert scale methods, we observe that a majority of investors expect that ESG funds financially underperform relative to conventional funds. Conversely, when applying the incentivized Exchangeability and Choice Matching methods, investors report consistent beliefs that are in contrast with their beliefs from the unincentivized Likert

⁶We categorize respondents who selected “Fairly disagree,” “Average,” or “Fairly agree” as having a moderate perception of risk regarding sustainable funds compared to less sustainable ones, reflecting an absence of strong and definitive opinions about the risks associated with sustainable investment funds.

⁷Our analysis specifically targets respondents who expressed strong and definitive opinions about the risks associated with sustainable investment funds, namely those who selected “Totally disagree,” “Disagree,” “Agree,” or “Totally agree” on the Likert scale question. When we include “Fairly agree” and “Fairly disagree”, the difference is less obvious.



Panel (a): Risk Perception of Non-ESG Funds Relative to ESG



Panel (b): Median Return Expectation Comparison by Risk Perception

Figure 7: Risk Perception Distribution and Return Expectation

Note: Panel (a) depicts the distribution of respondents’ perceived risk associated with less sustainable funds relative to sustainable funds in the entire participant sample. The bars illustrate participants’ responses to the statement “Less sustainable investment funds carry more risk than sustainable investment funds: 1 = Totally disagree, 2 = Disagree, 3 = Fairly disagree, 4 = Average, 5 = Fairly agree, 6 = Agree, 7 = Totally agree.” Panel (b) illustrates respondents’ median return expectations towards the fund in the ESG-Info and No-ESG-Info conditions, categorized by their risk perceptions towards low ESG funds derived from their responses to the above statement in Panel (a). The green bars represent responses from the ESG-Info condition, while the grey bars represent responses from the No-ESG-Info condition.

scale. What gives us additional confidence is that our incentivized methods elicit beliefs closer to investors' true belief is that these beliefs also have a significant and meaningful impact on investors' allocation choices.

Our study uncovers three crucial insights into the motivations behind SRIs and their implications for asset pricing. Firstly, investors are likely to understate their return expectations towards ESG funds in unincentivized surveys, possibly due to image concerns (either through social signaling or self signaling). This could result in a systematic misunderstanding of investors' true motivations for SRI, leading to unreliable conclusions regarding how investors trade-off financial performances for sustainability, potentially exaggerating the role of ESG considerations in portfolio choice decisions.

Secondly, the significant influence of investors' return expectations on their allocation to SRIs underscores the importance of financial motivations in investment decisions related to SRIs. Therefore, return expectations play an important role in investors' decisions involving SRI. This points to the necessity of having precise and reliable measures of investors' return expectations towards SRIs to accurately assess sustainability preferences, which is a combination of financial expectations and economic preferences (social preferences, risk preferences, ambiguity preferences, etc.). Without such measures, there's a risk of misinterpreting investors' true sustainability preferences, potentially leading to investment strategies that fail to accurately cater to their needs, such as risk-return balance and social preferences.

Lastly, based on the results of our incentivized methods, investors may hold systematically optimistic beliefs towards ESG funds, or generally assets with high ESG labels. This could lead to over-pricing of these assets and market inefficiency. This highlights the need for understanding the discrepancies between investor expectations and the financial realities of ESG investments, and calls for policies that directly target investor expectations.

Our study focuses on index fund investors, who represent a relatively sophisticated cohort compared to the general investor population. Investigating the significance of financial motivations among different investor types presents an intriguing avenue for subsequent research. Moreover, our survey methodology does not capture investors' beliefs regarding funds with low ESG ratings relative to those without ESG information. Future studies could adopt methodologies similar to those in our research to explore investors' return expectations towards funds with low ESG ratings. Our study introduces an innovative approach by adapting incentivized laboratory experimental methods for accurately capturing investors' beliefs through field surveys, and applying these to investigate investment decisions. Consequently, our paper makes a significant contribution to the domain of belief elicitation surrounding SRIs, engaging with debates on the challenges of incentivization and the applicability of laboratory experimental methods in practical settings.

References

- Abdellaoui, Mohammed, Aurélien Baillon, Laetitia Placido, and Peter P Wakker, 2011, The rich domain of uncertainty: Source functions and their experimental implementation, *American Economic Review* 101, 695–723.
- Aguinis, Herman, and Ante Glavas, 2012, What we know and don't know about corporate social responsibility: A review and research agenda, *Journal of management* 38, 932–968.
- Amromin, Gene, and Steven A Sharpe, 2014, From the horse's mouth: Economic conditions and investor expectations of risk and return, *Management Science* 60, 845–866.
- Apostolakis, George, Gert van Dijk, Frido Kraanen, and Robert J Blomme, 2018, Examining socially responsible investment preferences: A discrete choice conjoint experiment, *Journal of Behavioral and Experimental Finance* 17, 83–96.
- Baillon, Aurélien, 2008, Eliciting subjective probabilities through exchangeable events: An advantage and a limitation, *Decision Analysis* 5, 76–87.
- Baker, Malcolm, Mark L Egan, and Suproteem K Sarkar, 2022, How do investors value esg?, Working paper, National Bureau of Economic Research.
- Barreda-Tarrazona, Iván, Juan Carlos Matallín-Sáez, and M^a Rosario Balaguer-Franch, 2011, Measuring investors' socially responsible preferences in mutual funds, *Journal of Business Ethics* 103, 305–330.
- Battalio, Robert H, and Richard R Mendenhall, 2005, Earnings expectations, investor trade size, and anomalous returns around earnings announcements, *Journal of Financial economics* 77, 289–319.
- Bauer, Rob, Tobias Ruof, and Paul Smeets, 2021, Get real! individuals prefer more sustainable investments, *The Review of Financial Studies* 34, 3976–4043.
- Bauer, Rob, and Paul Smeets, 2015, Social identification and investment decisions, *Journal of Economic Behavior & Organization* 117, 121–134.
- Bénabou, Roland, and Jean Tirole, 2010, Individual and corporate social responsibility, *Economica* 77, 1–19.
- Braithwaite, Richard B, 1931, The foundations of mathematics and other logical essays .
- Branch, William A, and George W Evans, 2010, Asset return dynamics and learning, *The review of financial studies* 23, 1651–1680.
- Cornell, Bradford, 2021, Esg preferences, risk and return, *European Financial Management* 27, 12–19.

- Cvitanić, Jakša, Dražen Prelec, Blake Riley, and Benjamin Tereick, 2019, Honesty via choice-matching, *American Economic Review: Insights* 1, 179–192.
- Delavande, Adeline, Xavier Giné, and David McKenzie, 2011, Measuring subjective expectations in developing countries: A critical review and new evidence, *Journal of development economics* 94, 151–163.
- Dimmock, Stephen G, Roy Kouwenberg, Olivia S Mitchell, and Kim Peijnenburg, 2016, Ambiguity aversion and household portfolio choice puzzles: Empirical evidence, *Journal of Financial Economics* 119, 559–577.
- Eccles, Robert G, Ioannis Ioannou, and George Serafeim, 2014, The impact of corporate sustainability on organizational processes and performance, *Management science* 60, 2835–2857.
- Edmans, Alex, 2023, Applying economics—not gut feel—to esg, *Available at SSRN 4346646* .
- Ellsberg, Daniel, 1961, Risk, ambiguity, and the savage axioms, *The quarterly journal of economics* 75, 643–669.
- Eusepi, Stefano, and Bruce Preston, 2011, Expectations, learning, and business cycle fluctuations, *American Economic Review* 101, 2844–2872.
- Falk, Armin, Anke Becker, Thomas Dohmen, Benjamin Enke, David Huffman, and Uwe Sunde, 2018, Global evidence on economic preferences, *The Quarterly Journal of Economics* 133, 1645–1692.
- Falk, Armin, Anke Becker, Thomas Dohmen, David Huffman, and Uwe Sunde, 2023, The preference survey module: A validated instrument for measuring risk, time, and social preferences, *Management Science* 69, 1935–1950.
- Fellner, William, 1961, Distortion of subjective probabilities as a reaction to uncertainty, *The Quarterly Journal of Economics* 75, 670–689.
- Friede, Gunnar, Timo Busch, and Alexander Bassen, 2015, Esg and financial performance: aggregated evidence from more than 2000 empirical studies, *Journal of sustainable finance & investment* 5, 210–233.
- Gächter, Simon, and Elke Renner, 2010, The effects of (incentivized) belief elicitation in public goods experiments, *Experimental Economics* 13, 364–377.
- Giglio, Stefano, Matteo Maggiori, Johannes Stroebel, Zhenhao Tan, Stephen Utkus, and Xiao Xu, 2023, Four facts about esg beliefs and investor portfolios, Working paper, National Bureau of Economic Research.

- Giglio, Stefano, Matteo Maggiori, Johannes Stroebel, and Stephen Utkus, 2019, Five facts about beliefs and portfolios, Working paper, National Bureau of Economic Research.
- Giglio, Stefano, Matteo Maggiori, Johannes Stroebel, and Stephen Utkus, 2021, Five facts about beliefs and portfolios, *American Economic Review* 111, 1481–1522.
- Gneiting, Tilmann, and Adrian E Raftery, 2007, Strictly proper scoring rules, prediction, and estimation, *Journal of the American statistical Association* 102, 359–378.
- Goldstein, Itay, Alexandr Kopytov, Lin Shen, and Haotian Xiang, 2022, On esg investing: Heterogeneous preferences, information, and asset prices, Working paper, National Bureau of Economic Research.
- Grimm, Pamela, 2010, Social desirability bias, *Wiley international encyclopedia of marketing* .
- Gutsche, Gunnar, and Andreas Ziegler, 2019, Which private investors are willing to pay for sustainable investments? empirical evidence from stated choice experiments, *Journal of Banking & Finance* 102, 193–214.
- Hartzmark, Samuel M, and Abigail B Sussman, 2019, Do investors value sustainability? a natural experiment examining ranking and fund flows, *The Journal of Finance* 74, 2789–2837.
- Heeb, Florian, Julian F Kölbel, Falko Paetzold, and Stefan Zeisberger, 2023, Do investors care about impact?, *The Review of Financial Studies* 36, 1737–1787.
- Heine, Steven J, Darrin R Lehman, Kaiping Peng, and Joe Greenholtz, 2002, What’s wrong with cross-cultural comparisons of subjective likert scales?: The reference-group effect., *Journal of personality and social psychology* 82, 903.
- Hossain, Tanjim, and Ryo Okui, 2013, The binarized scoring rule, *Review of Economic Studies* 80, 984–1001.
- Humphrey, Jacquelyn, Shimon Kogan, Jacob Sagi, and Laura Starks, 2021, The asymmetry in responsible investing preferences, Working paper, National Bureau of Economic Research.
- Jiao, Peiran, 2020, Payoff-based belief distortion, *The Economic Journal* 130, 1416–1444.
- Kuhnen, Camelia M, 2015, Asymmetric learning from financial information, *The Journal of Finance* 70, 2029–2062.
- Kunda, Ziva, 1990, The case for motivated reasoning., *Psychological bulletin* 108, 480.
- Lagerkvist, Carl-Johan, AK Edenbrandt, I Tibbelin, and Y Wahlstedt, 2020, Preferences for sustainable and responsible equity funds—a choice experiment with swedish private investors, *Journal of Behavioral and Experimental Finance* 28, 100406.

- Lee, Jerry W, Patricia S Jones, Yoshimitsu Mineyama, and Xinwei Esther Zhang, 2002, Cultural differences in responses to a likert scale, *Research in nursing & health* 25, 295–306.
- Manski, Charles F, 2004, Measuring expectations, *Econometrica* 72, 1329–1376.
- Mayraz, Guy, 2011, Wishful thinking, *Available at SSRN 1955644* .
- Nilsson, Jonas, 2008, Investment with a conscience: Examining the impact of pro-social attitudes and perceived financial performance on socially responsible investment behavior, *Journal of business ethics* 83, 307–325.
- Nosić, Alen, and Martin Weber, 2010, How riskily do i invest? the role of risk attitudes, risk perceptions, and overconfidence, *Decision Analysis* 7, 282–301.
- Oehmke, Martin, and Marcus M Opp, 2024, A theory of socially responsible investment, *Review of Economic Studies* rdae048.
- Pástor, L’uboš, Robert F Stambaugh, and Lucian A Taylor, 2021, Sustainable investing in equilibrium, *Journal of Financial Economics* 142, 550–571.
- Pelozo, John, 2009, The challenge of measuring financial impacts from investments in corporate social performance, *Journal of management* 35, 1518–1541.
- Prelec, Drazen, 2004, A bayesian truth serum for subjective data, *science* 306, 462–466.
- Renneboog, Luc, Jenke Ter Horst, and Chendi Zhang, 2008, Socially responsible investments: Institutional aspects, performance, and investor behavior, *Journal of banking & finance* 32, 1723–1742.
- Riedl, Arno, and Paul Smeets, 2017, Why do investors hold socially responsible mutual funds?, *The Journal of Finance* 72, 2505–2550.
- Rossi, Mariacristina, Dario Sansone, Arthur Van Soest, and Costanza Torricelli, 2019, Household preferences for socially responsible investments, *Journal of Banking & Finance* 105, 107–120.
- Sandberg, Joakim, Carmen Juravle, Ted Martin Hedesström, and Ian Hamilton, 2009, The heterogeneity of socially responsible investment, *Journal of business ethics* 87, 519–533.
- Savage, Leonard J, 1971, Elicitation of personal probabilities and expectations, *Journal of the American Statistical Association* 66, 783–801.
- Schlag, Karl H, James Tremewan, and Joël J Van der Weele, 2015, A penny for your thoughts: A survey of methods for eliciting beliefs, *Experimental Economics* 18, 457–490.

- Slovic, Paul, Melissa L Finucane, Ellen Peters, and Donald G MacGregor, 2007, The affect heuristic, *European journal of operational research* 177, 1333–1352.
- Sultana, Sayema, Norhayah Zulkifli, and Dalilawati Zainal, 2018, Environmental, social and governance (esg) and investment decision in bangladesh, *Sustainability* 10, 1831.
- Trautmann, Stefan T, and Gijs van de Kuilen, 2015, Belief elicitation: A horse race among truth serums, *The Economic Journal* 125, 2116–2135.
- Tsakas, Elias, 2021, Identification of misreported beliefs, *arXiv preprint arXiv:2112.12975*.
- Wallsten, Thomas S, David V Budescu, Amnon Rapoport, Rami Zwick, and Barbara Forsyth, 1986, Measuring the vague meanings of probability terms., *Journal of Experimental Psychology: General* 115, 348.
- Wang, Stephanie W, 2011, Incentive effects: The case of belief elicitation from individuals in groups, *Economics Letters* 111, 30–33.
- Wu, Huiping, and Shing-On Leung, 2017, Can likert scales be treated as interval scales?—a simulation study, *Journal of social service research* 43, 527–532.

A Appendix A

A.1 Ambiguity Perception Elicitation

The second module assesses participants' domain-specific ambiguity attitudes, specifically employing an adapted version of the Ellsberg urns (e.g. Ellsberg, 1961) as proposed by Dimmock et al. (2016). In this module, every choice made by the participants carries an incentive.

As illustrated in Figure A.1, participants were tasked with choosing between two boxes, each containing exactly 100 balls labeled with either a positive sign (purple balls, indicating positive return funds) or a negative sign (orange balls, indicating negative return funds). Their choices were between an ambiguous Box U, with an undisclosed number of purple balls, and an unambiguous Box K, where the quantity of purple balls was clearly indicated. This decision-making process involved up to five incentivized questions, each building on the previous responses, and aimed at pinpointing the participant's threshold of indifference. If participants found no discernible difference between the two boxes, they could opt for the "I don't see the difference" choice and proceed to the next module. Furthermore, participants had the opportunity to win €100 if they were randomly selected for the reward and a purple ball was drawn from their chosen box.

You now have a chance to win **€100** with the guessing game below.

Your task is to choose between Box K and Box U, both of which contain 100 mutual funds with either a positive annual return in 2022 ("+" or greater than 0) or a negative annual return in 2022 ("—" or less than 0). The computer will randomly select a ball from the box you choose. You win 100 euros if an investment fund with a positive return ("+") is selected.

What is the difference between the two boxes?

Box K contains a precise mix of 100 mutual funds with positive returns ("+") and negative returns ("—"). For example, Box K below contains 50 mutual funds with a positive return ("+") and 50 mutual funds with a negative return ("—"). Note: The mix in Box K may be different for different questions (for example, 60 mutual funds with a positive return and 40 mutual funds with a negative return).

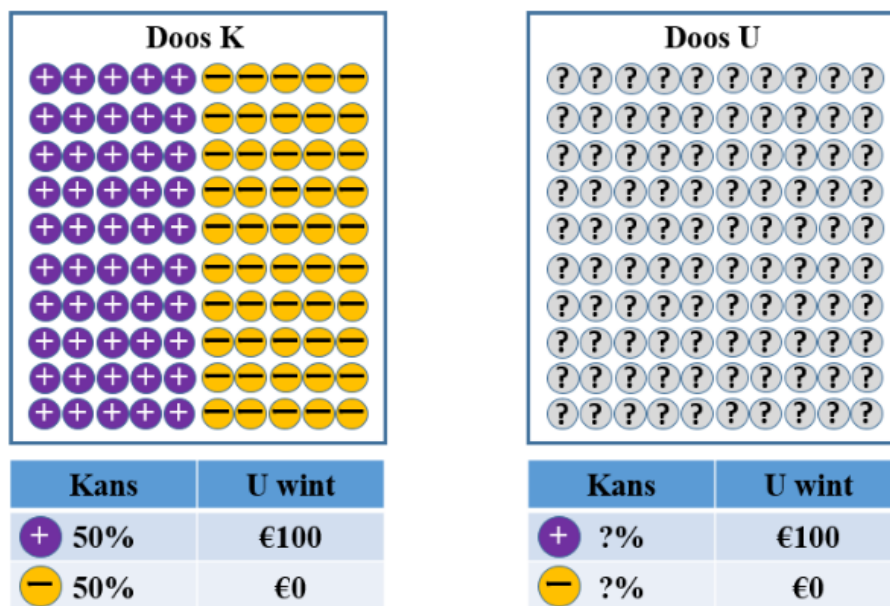
Box U contains 100 mutual funds randomly selected from all mutual funds on the market, so the precise mix of mutual funds with a positive return ("+") and a negative return ("—") is not known.

How do you choose?

Please indicate your preferred box below and we will select a mutual fund from the box of your choice.

If you find both boxes equally attractive, you may choose the option "I don't see the difference". Then the computer will randomly choose a box for you and select a mutual fund from it.

Remember: You win 100 euros if an investment fund with positive returns ("+") is selected. Think carefully about your choice.



Box K I don't see the difference Box U

Figure A.1: An Exemplary Domain-specific Ambiguity Attitudes Elicitation Task

Note: This figure displays a screenshot depicting the task designed to elicit domain-specific ambiguity attitudes.

A.2 Respondent Number

Throughout the duration between June 9 and August 31, 2023, we sent out two reminders on June 26 and August 23, 2023, respectively. After the two reminders until August 31,

2023, we had totally 901 participants who started the survey, and 287 finally completed the survey. The average completion time was approximately 25 minutes.

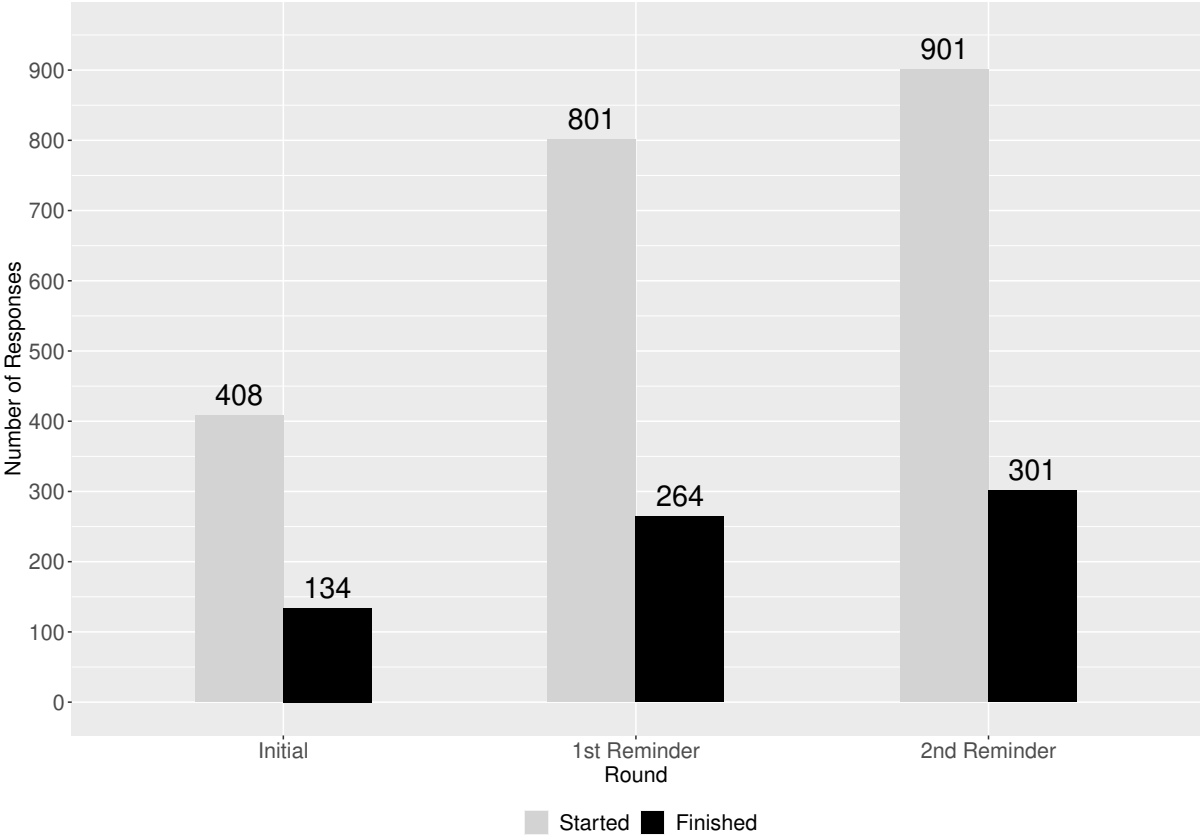


Figure A.2: Respondent Number

Note: The figure presents the count of respondents who initiated and completed our survey, respectively, over the period from June 9 to August 31, 2023.

A.3 Median Belief in Laboratory Experiment

The laboratory experiment was conducted at the Behavioral & Experimental Economics Laboratory (BEELab), School of Business and Economics, Maastricht University. A total of 335 subjects participated, comprising 59% females and an average age of 22 years (199 females and 136 males, aged between 19 and 36 years). The experiment was conducted in October and November 2021. The No-ESG-Info condition included 171 subjects, with 61.4% being female, while the ESG-Info condition consisted of 164 subjects, of which 58.5% were female. The majority of participants were students from economics and management (283 participants) or social sciences (20 participants) at the School of Business and Economics, Maastricht University. For our laboratory experiment, the fund rated as having the highest ESG was randomly selected from Morningstar. We implemented the same Exchangeability Method as in the field survey to assess subjects’ median beliefs about the fund’s return in the forthcoming year, following observation of its returns in the previous six years.

Figure A.3 in the Appendix displays the subjects’ average median return expectation

about the fund in both the ESG-Info and No-ESG-Info conditions. Over both short-term (one-year) and long-term (three-year) investment horizons, the subjects' median return expectation towards the fund is significantly higher in the ESG-Info condition compared to the No-ESG-Info condition (2.8% and 1.9% higher respectively; p -value = 0.02 and p -value = 0.08). Additionally, we find that subjects' median belief is significantly higher in the ESG-Info condition compared to the No-ESG-Info condition when they observe a negative return of the fund in the previous year (2.2% higher; p -value = 0.07).

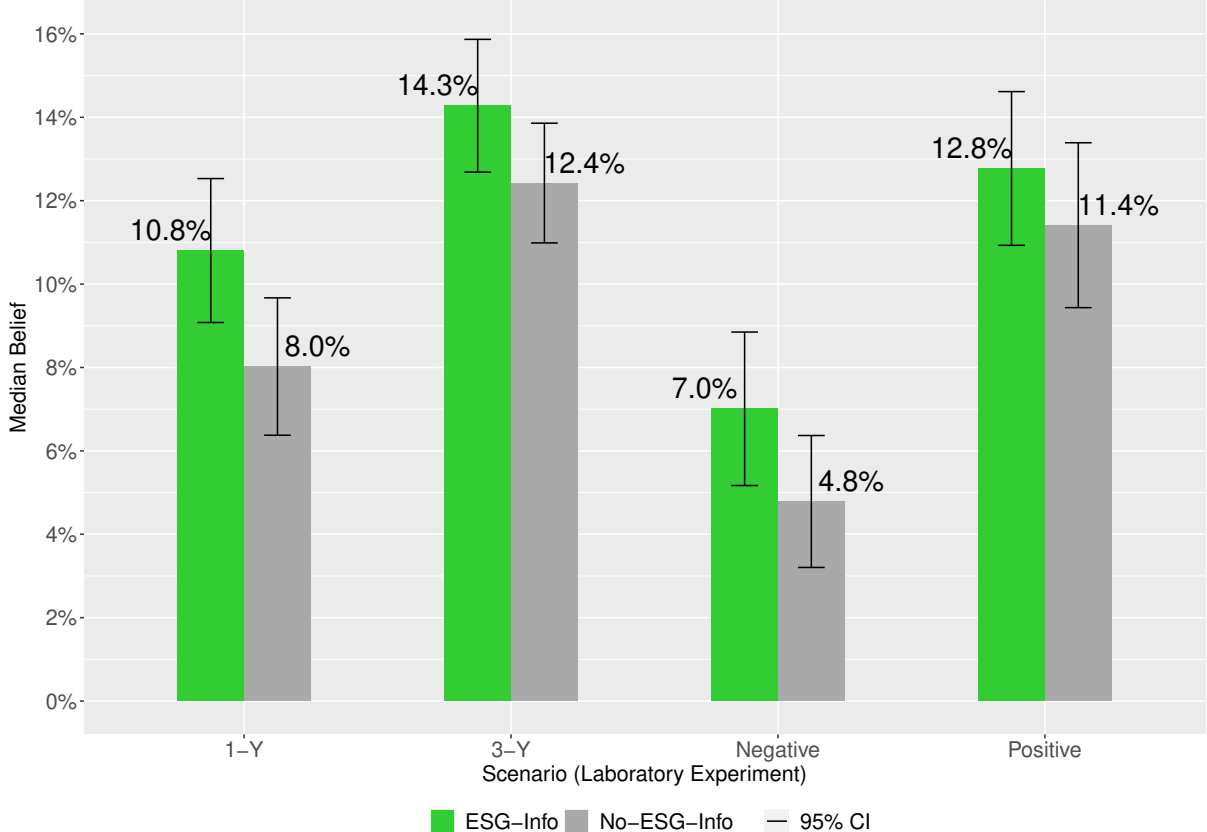


Figure A.3: Median Return Expectation Comparison in Laboratory Experiment

Note: This figure plots the comparison of subjects' median return expectation towards the fund between the ESG-Info and No-ESG-Info conditions in the four scenarios, respectively (i.e., the one-year and the three-year investment horizons, a positive and a negative return in the previous year). The green bars depict responses from the ESG-Info condition, while the grey bars represent responses from the No-ESG-Info condition.

A.4 Belief Updating

Respondents may update their beliefs regarding the financial performance of the fund based on their prior beliefs upon observing the realized return of the fund in the seventh year. In Table A.1, we explore respondents' belief updating by controlling their prior beliefs.

Table A.1: Belief Updating by Controlling Prior Belief

This table presents the regression results concerning respondents’ belief updating about the financial performance of the fund after observing its realized return in the previous year (7th year). The dependent variable is the median return expectation for the fund in the 8th year. Demographic characteristics include gender, age, education, investing experience, occupation, income, total investment, monthly investment, portfolio size, and financial literacy (measured by correct expected return calculation). Preferences include altruism, trust, reciprocity, negative reciprocity (Self), negative reciprocity (Others), ESG index fund preference, active ESG fund preference, and donation. Table B.1 defines these variables. Standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	<i>Dependent variable:</i> <i>Fund’s Return Expectation Updating</i>			
	Negative		Positive	
	(1)	(2)	(3)	(4)
High ESG Info	−1.615 (1.334)	−1.380 (1.460)	−1.840 (1.368)	−0.733 (1.488)
Prior Return Expectation (7th-Year)	0.285*** (0.048)	0.302*** (0.065)	0.419*** (0.050)	0.500*** (0.066)
High ESG Info × Prior Return Expectation (7th-Year)		−0.037 (0.093)		−0.175* (0.095)
Investing Experience	0.546 (0.634)	0.530 (0.636)	0.497 (0.650)	0.424 (0.648)
Correct Return Calculation	−0.424 (1.443)	−0.462 (1.448)	−0.656 (1.479)	−0.833 (1.476)
Sustainability Risk	0.421 (0.461)	0.429 (0.462)	0.481 (0.473)	0.521 (0.471)
ESG Impact	−1.114* (0.628)	−1.117* (0.629)	−0.556 (0.644)	−0.573 (0.641)
Donation	−0.009** (0.004)	−0.009** (0.004)	−0.007* (0.004)	−0.007* (0.004)
Observations	287	287	287	287
R^2	0.197	0.197	0.306	0.315
Demographics control	YES	YES	YES	YES
Preferences control	YES	YES	YES	YES

A.5 Sub-group Analysis: Median Belief Grouping by Return Expectation in Unincentivized Likert Scale

The regressions reported in Table A.2 compare median beliefs regarding the fund return among respondents who express that ESG funds financially underperform conventional funds with those expressing the opposite view—namely, that conventional funds financially underperform ESG funds. The analysis examines the impact of high ESG rating information on respondents’ median beliefs toward the fund return by categorizing respondents based on their answers to ESG funds’ financial performance in the unincentivized Likert scale question.

Table A.3 explores this discrepancy by regressions. Note that we exclude respondents who selected “I don’t know” in the Likert scale question. In Column (1), we regress respondents’ median return expectations from the Exchangeability Method under the ESG-Info condition on belief elicited from the Likert Scale Method and other control variables. Our

Table A.2: Sub-group Analysis: Median Belief Grouping by Return Expectation in Unincentivized Likert Scale

This table presents regression analyses on respondents' median beliefs regarding fund returns, elicited through the Exchangeability Method, across sub-group analyses. The median beliefs towards fund returns of respondents who indicated that ESG funds financially underperform/outperform conventional funds in the unincentivized Likert scale question are compared under both the ESG-Info and No-ESG-Info conditions. Columns (1), (2), and (3) examine the impact of high ESG rating information on respondents' median beliefs, elicited by the Exchangeability Method, towards fund returns among those who stated that ESG funds financially underperform conventional funds in the unincentivized Likert scale question. These columns correspond to the one-year return expectation, negative scenario return expectation, and positive scenario return expectation, respectively. Columns (4), (5), and (6) examine the impact of high ESG rating information on respondents' median beliefs, elicited by the Exchangeability Method, towards fund returns among those who stated that ESG funds financially outperform conventional funds in the unincentivized Likert scale question. These columns also correspond to the one-year return expectation, negative scenario return expectation, and positive scenario return expectation, respectively. Demographic characteristics include gender, age, education, investing experience, occupation, income, total investment, monthly investment, portfolio size, and financial literacy (measured by correct expected return calculation). Preferences include altruism, trust, reciprocity, negative reciprocity (Self), negative reciprocity (Others), ESG index fund preference, active ESG fund preference, and donation. Table B.1 defines these variables. Standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	<i>Dependent variable:</i>					
	<i>Fund's return expectation</i>					
	<i>ESG Underperforms Non-ESG</i> <i>(by Unincentivized Likert Scale)</i>			<i>ESG Outperforms Non-ESG</i> <i>(by Unincentivized Likert Scale)</i>		
	1-Y	Negative	Positive	1-Y	Negative	Positive
	(1)	(2)	(3)	(4)	(5)	(6)
High ESG Rating	5.402*	-1.196	3.139	1.162	-0.296	-4.633
	(3.219)	(2.953)	(3.434)	(3.645)	(3.181)	(3.364)
Investing Experience	-2.113	-2.065	-1.824	-4.487**	-1.684	-2.755
	(1.614)	(1.481)	(1.722)	(2.153)	(1.879)	(1.987)
ESG Return by Likert Scale	-6.035	-1.608	-8.203	22.170**	-3.211	10.750
	(5.014)	(4.599)	(5.348)	(9.038)	(7.888)	(8.342)
Sustainability Risk	-1.930	-0.524	-0.187	0.631	-0.484	-2.152
	(1.188)	(1.090)	(1.267)	(1.376)	(1.201)	(1.270)
ESG Social Impact	-2.860**	-2.147*	-1.956	-1.488	-2.792	1.690
	(1.353)	(1.241)	(1.444)	(2.565)	(2.238)	(2.367)
ESG Investment Amount	0.008	0.020*	0.005	0.041**	0.010	-0.016
	(0.011)	(0.011)	(0.012)	(0.018)	(0.016)	(0.017)
Observations	98	98	98	59	59	59
R ²	0.320	0.325	0.230	0.603	0.372	0.460
Demographics control	YES	YES	YES	YES	YES	YES
Preferences control	YES	YES	YES	YES	YES	YES

analysis suggests that return expectations for ESG funds, as measured by the unincentivized Likert Scale Method, exhibit a negative and statistically insignificant correlation with the median return expectations elicited through the Exchangeability Method. This disparity underscores the inconsistency in results yielded by these two different belief elicitation methods when assessing respondents' return expectations. Consistent with the findings presented in Column (1) of Table 2, Column (2) of Table A.3 confirms the robust and strong positive influence of high ESG rating information on respondents' median

return expectations for the fund. This impact is strong even after controlling for their responses to the unincentivized Likert scale question regarding the comparison of financial performance between ESG and conventional funds.

Table A.3: Comparison Between Exchangeability Method and Likert Scale Method

This table presents the regression results of participants' return expectations for the fund in the survey. Column (1) investigates the correlation between respondents' return expectations towards ESG funds obtained from the unincentivized Likert Scale question and those derived from the Exchangeability Method in the ESG-Info condition. Column (2) examines respondents' one-year median return expectations towards the fund by controlling their return expectations elicited by the unincentivized Likert Scale question in the ESG-Info and No-ESG-Info conditions. Respondents who express "I do not know" in the unincentivized Likert scale question concerning the financial performance of ESG funds compared to conventional funds are excluded from the analysis. The dependent variable is the median return expectation elicited by the Exchangeability Method. Demographic characteristics include gender, age, education, investing experience, occupation, income, total investment, monthly investment, portfolio size, and financial literacy (measured by correct expected return calculation). Preferences include altruism, trust, reciprocity, negative reciprocity (Self), negative reciprocity (Others), ESG index fund preference, active ESG fund preference, and donation. Table B.1 defines the variables. Standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	<i>Dependent variable:</i>	
	<i>Fund's Return Expectation</i>	
	1-Y ESG-Info (1)	1-Y ESG-Info and No-ESG-Info (2)
High ESG Rating Info		3.606** (1.688)
ESG Return by Likert Scale	-0.683 (1.294)	0.132 (0.892)
ESG Knowledge	-0.007 (0.050)	
Investing Experience	-4.086*** (1.256)	-2.735*** (0.785)
Investing Amount in Index Fund	0.001*** (0.000)	0.001** (0.000)
Correct Expected Return Calculation	-4.333 (2.772)	0.769 (1.851)
Sustainability Risk	-0.848 (0.880)	-0.801 (0.614)
ESG Impact	-1.763* (1.021)	-1.912** (0.788)
Negative Reciprocity (Others)	1.608 (1.021)	1.371** (0.654)
ESG Investment Amount	0.016* (0.010)	0.011* (0.006)
Observations	126	282
R^2	0.383	0.183
Demographics control	YES	YES
Preferences control	YES	YES

A.6 Sub-group Analysis: Median Belief Grouping by ESG Social Impact Expectations

Figure A.4 presents the distribution of respondents' perceptions of ESG positive social impact. The bars illustrate investor responses to the statement "Investment funds with ESG integration (environmental, social, governance) have a positive impact on society: 1 = Strongly disagree, 2 = Disagree, 3 = Moderately disagree, 4 = Average, 5 = Fairly agree, 6 = Agree, 7 = Totally agree." Panel (a) depicts responses from the entire sample of participants. In panel (b), the green bars depict responses from the ESG-Info condition, while the grey bars represent responses from the No-ESG-Info condition.

Figure A.5 depicts a comparison of median beliefs towards the fund return between respondents who believe that ESG funds positively impact society and those who do not hold this belief.

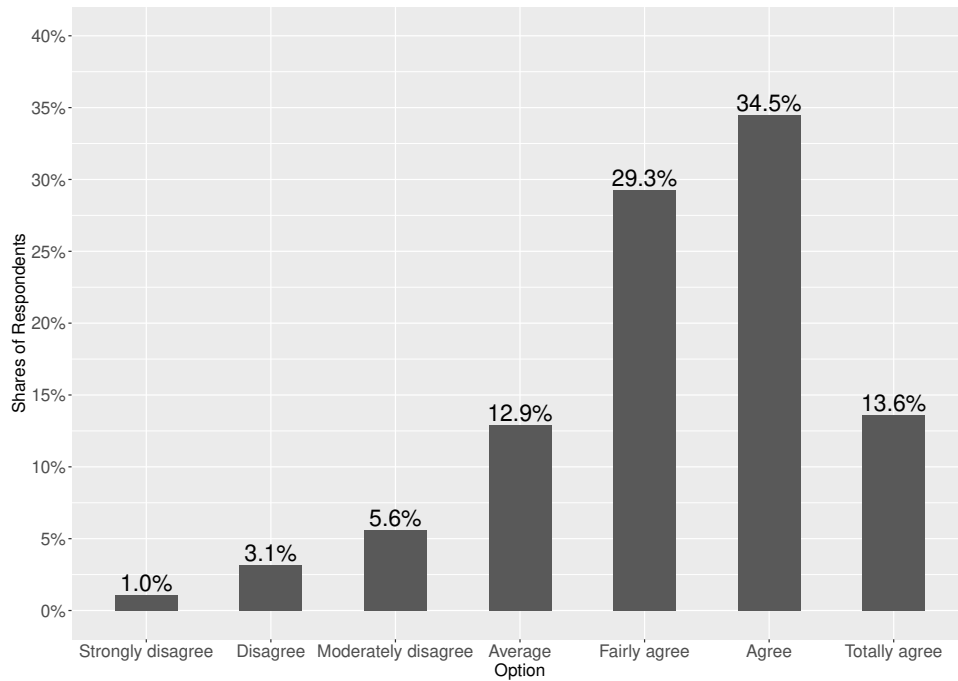
The regressions reported in Table A.4 compare median beliefs regarding the fund return among respondents who express that ESG funds have a positive social impact with those who do not hold this belief. The analysis examines the impact of high ESG rating information on respondents' median beliefs toward the fund return by categorizing respondents based on their perceptions on ESG social impact in the unincentivized Likert scale question.

A.7 Choice Matching Method: Upward Modification

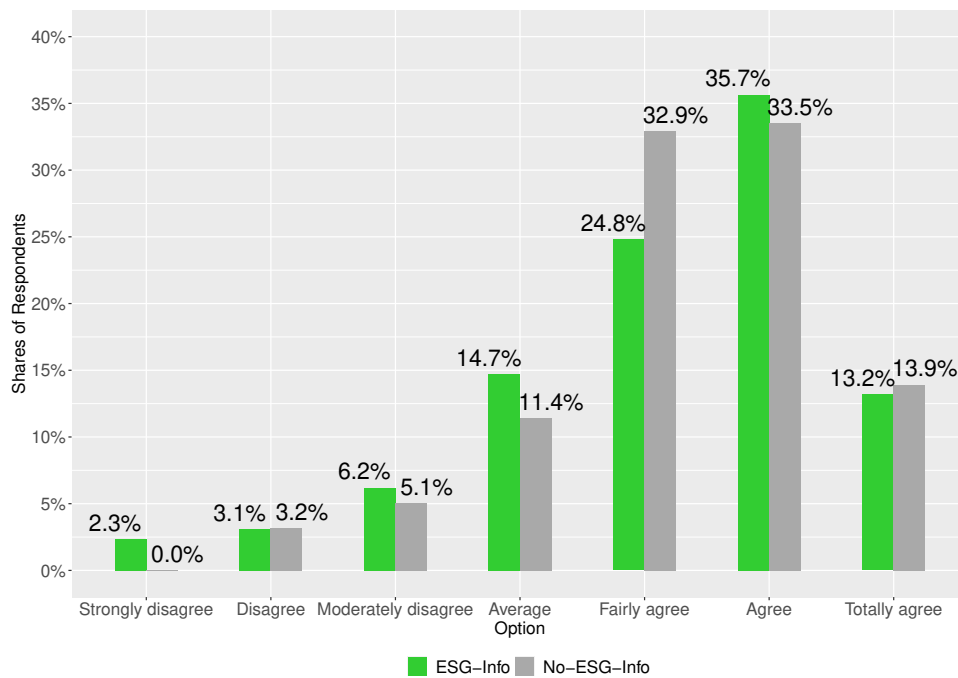
Figure A.6 displays the patterns of modifications in expectations, categorized as either upward or downward shifts, across three different incentive treatments. The grey bars on the left side represent instances where respondents decreased their expectations from their initial ones, indicating downward shifts. On the other hand, the blue bars on the right side illustrate instances where respondents increased their expectations from their initial ones, indicating upward shifts. Overall, within the Full Incentive treatment, there is no statistically significant difference observed between downward and upward return modifications ($p - value = 0.65$). However, the upward return modification observed in the Full Incentive treatment group is significantly higher than those seen in both the No Incentive ($p - value = 0.006$) and Partial Incentive ($p - value = 0.026$) treatments.

A.8 Investor Belief Heterogeneity

In our analysis spanning from Table A.5 to Table A.12, we estimate the coefficients of respondents' demographics, taking into account their preferences and the treatment of the high ESG rating information. Our findings reveal a notable heterogeneity in respondents' median beliefs about the fund return, which is significantly influenced by demographic factors.



Panel (a): All Sample Distribution



Panel (b): Comparison between Conditions

Figure A.4: ESG Social Impact Perception Distribution

Note: This figure presents the distribution of respondents' perceptions of ESG positive social impact. The bars illustrate investor responses to the statement "Investment funds with ESG integration (environmental, social, governance) have a positive impact on society: 1 = Strongly disagree, 2 = Disagree, 3 = Moderately disagree, 4 = Average, 5 = Fairly agree, 6 = Agree, 7 = Totally agree." Panel (a) depicts responses from the entire sample of participants. In panel (b), the green bars depict responses from the ESG-Info condition, while the grey bars represent responses from the No-ESG-Info condition.

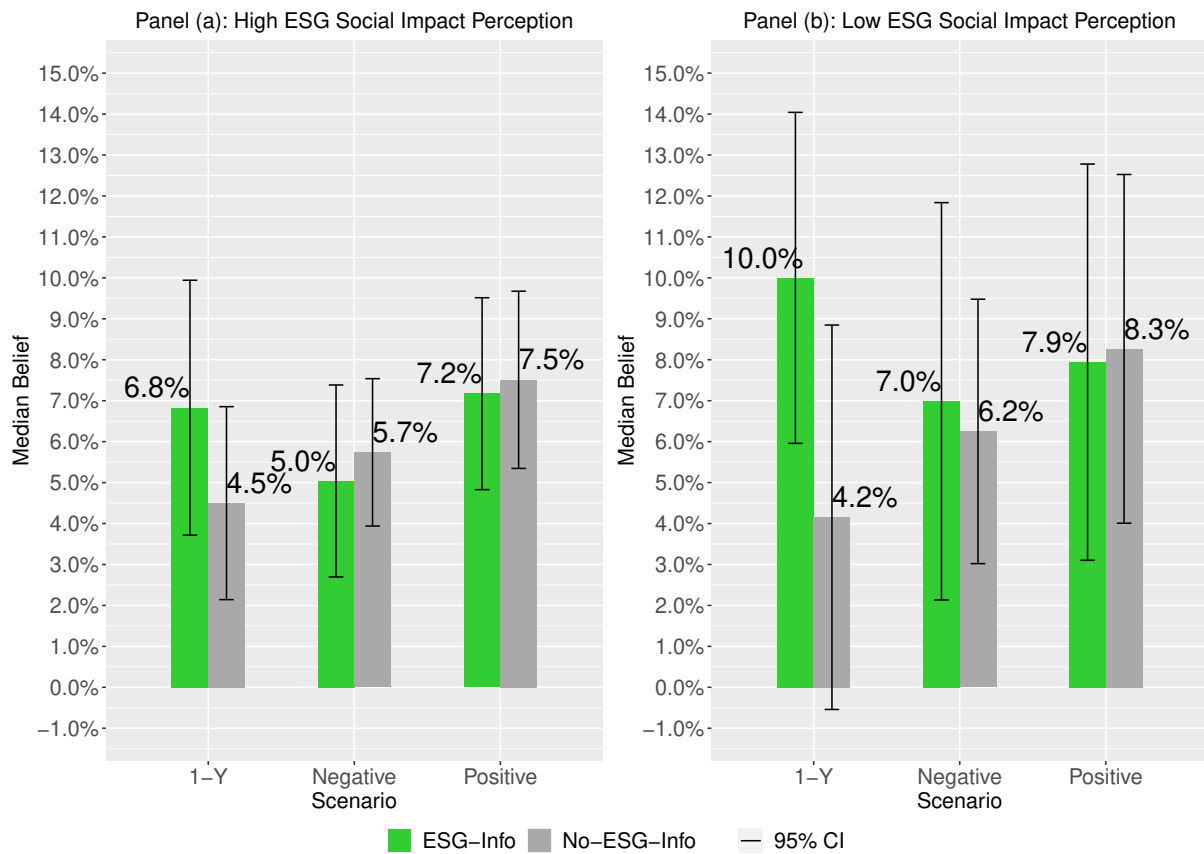


Figure A.5: Median Belief Comparison by ESG Impact Perception

Note: This figure illustrates the comparisons of respondents’ median beliefs towards the fund return elicited by the Exchangeability Method, in the ESG-Info and No-ESG-Info conditions, categorized by their responses to the unincentivized Likert scale question regarding ESG social impact. The green bars depict responses from the ESG-Info condition, while the grey bars represent responses from the No-ESG-Info condition. Panel (a) displays the median beliefs of respondents who indicate that ESG funds have a positive social impact, while Panel (b) displays the median beliefs of respondents who do not think that ESG funds have a positive social impact.

Table A.4: Sub-group Analysis: Median Belief by ESG Social Impact Perception

This table presents regression analyses on respondents' median beliefs regarding fund returns, elicited through the Exchangeability Method, using sub-group analyses. The median beliefs towards fund returns of respondents who indicated that ESG funds have a positive social impact and those who indicated that ESG funds do not have a positive social impact are compared under both the ESG-Info and No-ESG-Info conditions. Demographic characteristics include gender, age, education, investing experience, occupation, income, total investment, monthly investment, portfolio size, and financial literacy (measured by correct expected return calculation). Preferences include altruism, trust, reciprocity, negative reciprocity (Self), negative reciprocity (Others), ESG index fund preference, active ESG fund preference, and donation. Table B.1 defines these variables. Standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	<i>Dependent variable:</i>					
	<i>Fund's return expectation</i>					
	<i>High ESG Impact Perception</i>			<i>Low ESG Impact Perception</i>		
	1-Y	Negative	Positive	1-Y	Negative	Positive
	(1)	(2)	(3)	(4)	(5)	(6)
High ESG Rating	2.854 (1.996)	-1.427 (1.631)	-0.556 (1.731)	10.470** (4.062)	4.381 (4.053)	2.566 (4.477)
Investing Experience	-2.473** (0.895)	-0.483 (0.731)	-1.073 (0.776)	-0.958 (2.125)	1.972 (2.121)	4.349 (2.343)
ESG Return by Likert Scale	1.095 (1.118)	1.251 (0.914)	0.652 (0.970)	0.903 (1.918)	3.627* (1.914)	1.419 (2.115)
Sustainability Risk	-0.894 (0.714)	-0.256 (0.583)	-0.501 (0.619)	1.605 (1.779)	-1.056 (1.776)	-0.093 (1.961)
ESG Investment Amount	0.006 (0.007)	0.008 (0.006)	0.001 (0.006)	0.011 (0.018)	-0.005 (0.018)	0.004 (0.020)
Observations	222	222	222	65	65	65
R^2	0.254	0.129	0.201	0.427	0.353	0.337
Demographics control	YES	YES	YES	YES	YES	YES
Preferences control	YES	YES	YES	YES	YES	YES

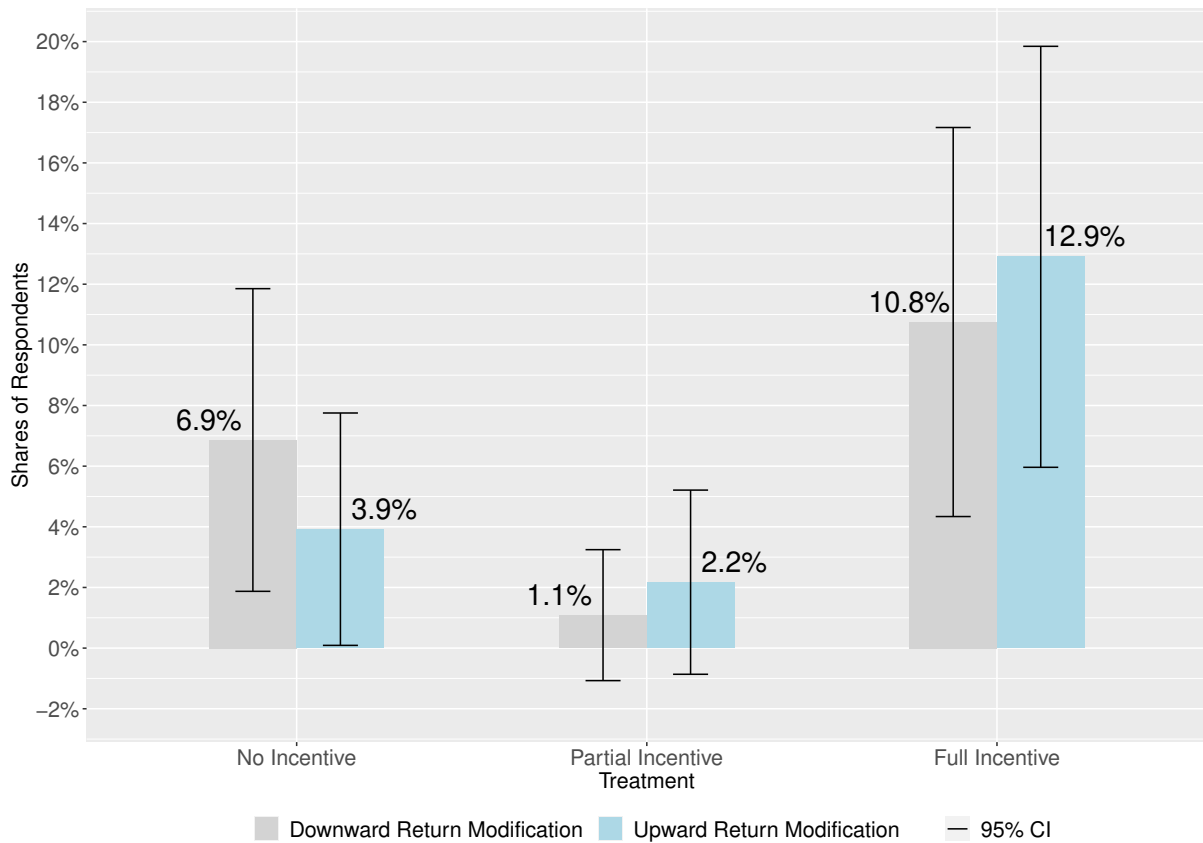


Figure A.6: Choice Matching Method: Upward and Downward Modification

Note: This figure depicts the distribution of modifications in return expectations for ESG funds across participants in the three incentive conditions in the Choice Matching Method. The bars illustrate the percentage of respondents adjusting their return expectations in the Choice Matching Method within these conditions. The grey bars on the left side represent instances where respondents decreased their expectations from their initial ones, indicating downward shifts. On the other hand, the blue bars on the right side illustrate instances where respondents increased their expectations from their initial ones, indicating upward shifts.

Table A.5: Heterogeneity – Age

This table presents coefficient estimates for age while controlling for respondents’ preferences and the high ESG rating information, instead of solely categorizing them based on demographics. Demographic characteristics include gender, age, education, investing experience, occupation, income, total investment, monthly investment, portfolio size, and financial literacy (measured by correct expected return calculation). Preferences include altruism, trust, reciprocity, negative reciprocity (Self), negative reciprocity (Others), ESG index fund preference, active ESG fund preference, and donation. Table B.1 defines the variables. Standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	<i>Dependent variable:</i> <i>Fund’s Return Expectation</i>		
	1-Y	Negative	Positive
	(1)	(2)	(3)
High ESG Rating Info	3.667** (1.709)	−0.328 (1.370)	−0.257 (1.522)
Age ∈ (40, 50]	−2.122 (2.440)	−2.066 (1.957)	−1.537 (2.173)
Age ∈ (50, 60]	−3.384 (2.484)	2.334 (1.992)	1.224 (2.212)
Age ∈ (60, 70]	−6.225** (2.780)	2.037 (2.230)	−1.705 (2.476)
Age > 70	−6.593* (3.613)	−2.260 (2.898)	−1.024 (3.218)
Observations	287	287	287
R^2	0.135	0.113	0.102
Demographics control	YES	YES	YES
Preferences control	YES	YES	YES

Table A.6: Heterogeneity – Gender

This table presents coefficient estimates for gender while controlling for respondents’ preferences and the high ESG rating information, instead of solely categorizing them based on demographics. Demographic characteristics include gender, age, education, investing experience, occupation, income, total investment, monthly investment, portfolio size, and financial literacy (measured by correct expected return calculation). Preferences include altruism, trust, reciprocity, negative reciprocity (Self), negative reciprocity (Others), ESG index fund preference, active ESG fund preference, and donation. Table B.1 defines the variables. Standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	<i>Dependent variable:</i> <i>Fund’s Return Expectation</i>		
	1-Y	Negative	Positive
	(1)	(2)	(3)
High ESG Rating Info	3.774** (1.714)	−0.420 (1.367)	−0.198 (1.505)
Male	0.964 (1.430)	0.838 (1.140)	1.866 (1.255)
Observations	287	287	287
R^2	0.112	0.113	0.104
Demographics control	YES	YES	YES
Preferences control	YES	YES	YES

Table A.7: Heterogeneity – Total Investment

This table presents coefficient estimates for total investment while controlling for respondents' preferences and the high ESG rating information, instead of solely categorizing them based on demographics. Demographic characteristics include gender, age, education, investing experience, occupation, income, total investment, monthly investment, portfolio size, and financial literacy (measured by correct expected return calculation). Preferences include altruism, trust, reciprocity, negative reciprocity (Self), negative reciprocity (Others), ESG index fund preference, active ESG fund preference, and donation. Table B.1 defines the variables. Standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	<i>Dependent variable:</i> <i>Fund's Return Expectation</i>		
	1-Y	Negative	Positive
	(1)	(2)	(3)
High ESG Rating Info	3.492** (1.698)	-0.487 (1.372)	-0.383 (1.516)
Total Investment \in (10K, 50K]	-4.474** (2.142)	-0.489 (1.731)	-0.914 (1.913)
Total Investment \in (50K, 100K]	-3.685 (2.820)	-2.593 (2.278)	-3.082 (2.517)
Total Investment \in (100K, 250K]	-5.934** (3.039)	-1.963 (2.455)	-1.330 (2.713)
Total Investment > 250K	-7.154*** (2.661)	-0.585 (2.150)	-1.674 (2.375)
Observations	287	287	287
R^2	0.139	0.104	0.102
Demographics control	YES	YES	YES
Preferences control	YES	YES	YES

Table A.8: Heterogeneity – Education

This table presents coefficient estimates for education background while controlling for respondents' preferences and the high ESG rating information, instead of solely categorizing them based on demographics. Demographic characteristics include gender, age, education, investing experience, occupation, income, total investment, monthly investment, portfolio size, and financial literacy (measured by correct expected return calculation). Preferences include altruism, trust, reciprocity, negative reciprocity (Self), negative reciprocity (Others), ESG index fund preference, active ESG fund preference, and donation. Table B.1 defines the variables. Standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	<i>Dependent variable:</i> <i>Fund's Return Expectation</i>		
	1-Y	Negative	Positive
	(1)	(2)	(3)
High ESG Rating Info	3.524** (1.721)	-0.553 (1.375)	-0.501 (1.518)
Education (College)	-1.566 (2.261)	0.096 (1.807)	-0.292 (1.995)
Education (University Level or Above)	-2.229 (1.991)	-0.286 (1.591)	-1.022 (1.757)
Observations	287	287	287
R^2	0.114	0.099	0.098
Demographics control	YES	YES	YES
Preferences control	YES	YES	YES

Table A.9: Heterogeneity – Investing Experience

This table presents coefficient estimates for investing experience while controlling for respondents' preferences and the high ESG rating information, instead of solely categorizing them based on demographics. Demographic characteristics include gender, age, education, investing experience, occupation, income, total investment, monthly investment, portfolio size, and financial literacy (measured by correct expected return calculation). Preferences include altruism, trust, reciprocity, negative reciprocity (Self), negative reciprocity (Others), ESG index fund preference, active ESG fund preference, and donation. Table B.1 defines the variables. Standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	<i>Dependent variable:</i> <i>Fund's Return Expectation</i>		
	1-Y	Negative	Positive
	(1)	(2)	(3)
High ESG Rating	3.218*	-0.511	-0.486
	(1.658)	(1.371)	(1.515)
Investing Experience $\in (4, 6]$	-1.439	1.645	-0.036
	(2.195)	(1.814)	(2.006)
Investing Experience $\in (6, 10]$	-2.101	-0.397	-0.243
	(2.634)	(2.177)	(2.407)
Investing Experience > 10	-9.316***	-0.870	-2.104
	(2.077)	(1.717)	(1.898)
Observations	287	287	287
R^2	0.177	0.105	0.101
Demographics control	YES	YES	YES
Preferences control	YES	YES	YES

Table A.10: Heterogeneity – Income

This table presents coefficient estimates for income while controlling for respondents' preferences and the high ESG rating information, instead of solely categorizing them based on demographics. Demographic characteristics include gender, age, education, investing experience, occupation, income, total investment, monthly investment, portfolio size, and financial literacy (measured by correct expected return calculation). Preferences include altruism, trust, reciprocity, negative reciprocity (Self), negative reciprocity (Others), ESG index fund preference, active ESG fund preference, and donation. Table B.1 defines the variables. Standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	<i>Dependent variable:</i> <i>Fund's Return Expectation</i>		
	1-Y	Negative	Positive
	(1)	(2)	(3)
High ESG Rating Info	3.884**	-0.426	-0.381
	(1.722)	(1.373)	(1.516)
Income $\in (3K, 5K]$	2.283	1.078	1.509
	(2.301)	(1.834)	(2.024)
Income $\in (5K, 7.5K]$	2.703	2.557	1.319
	(2.716)	(2.166)	(2.390)
Income $> 7.5K$	0.688	0.557	3.877
	(2.956)	(2.357)	(2.600)
Observations	287	287	287
R^2	0.116	0.104	0.104
Demographics control	YES	YES	YES
Preferences control	YES	YES	YES

Table A.11: Heterogeneity – Financial Literacy

This table presents coefficient estimates for expected return calculation ability while controlling for respondents' preferences and the high ESG rating information, instead of solely categorizing them based on demographics. Demographic characteristics include gender, age, education, investing experience, occupation, income, total investment, monthly investment, portfolio size, and financial literacy (measured by correct expected return calculation). Preferences include altruism, trust, reciprocity, negative reciprocity (Self), negative reciprocity (Others), ESG index fund preference, active ESG fund preference, and donation. Table B.1 defines the variables. Standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	<i>Dependent variable:</i> <i>Fund's Return Expectation</i>		
	1-Y	Negative	Positive
	(1)	(2)	(3)
High ESG Rating Info	3.710** (1.706)	-0.508 (1.363)	-0.407 (1.505)
Correct Return Calculation	1.884 (1.738)	0.139 (1.389)	-0.344 (1.534)
Observations	287	287	287
R^2	0.114	0.099	0.096
Demographics control	YES	YES	YES
Preferences control	YES	YES	YES

Table A.12: Heterogeneity – Occupation

This table presents coefficient estimates for employment status while controlling for respondents' preferences and the high ESG rating information, instead of solely categorizing them based on demographics. Demographic characteristics include gender, age, education, investing experience, occupation, income, total investment, monthly investment, portfolio size, and financial literacy (measured by correct expected return calculation). Preferences include altruism, trust, reciprocity, negative reciprocity (Self), negative reciprocity (Others), ESG index fund preference, active ESG fund preference, and donation. Table B.1 defines the variables. Standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	<i>Dependent variable:</i> <i>Fund's Return Expectation</i>		
	1-Y	Negative	Positive
	(1)	(2)	(3)
High ESG Rating Info	3.579** (1.699)	-0.530 (1.362)	-0.378 (1.505)
Occupation (Paid work)	3.258* (1.747)	0.685 (1.401)	-0.796 (1.548)
Observations	287	287	287
R^2	0.122	0.100	0.097
Demographics control	YES	YES	YES
Preferences control	YES	YES	YES

A.9 Respondents' Risk Perceptions Towards Low ESG in Field Survey

To investigate respondents' perceptions of the risk return trade-off regarding ESG funds, we correlate their risk perceptions with their return expectations. These return expectations are obtained from responses to the unincentivized Likert scale question in section 2.3 of our study. Respondents who selected "I don't know" in the Likert scale question are excluded from the sample in the analysis. Figure A.7 presents the correlation between the respondents' return expectations and their perceptions of risk in relation to low ESG funds. Our findings suggest that respondents perceiving low ESG as indicative of higher risk tend to expect a higher expected return for the fund labeled as high ESG compared to the one without such label, according to the Exchangeability Method.

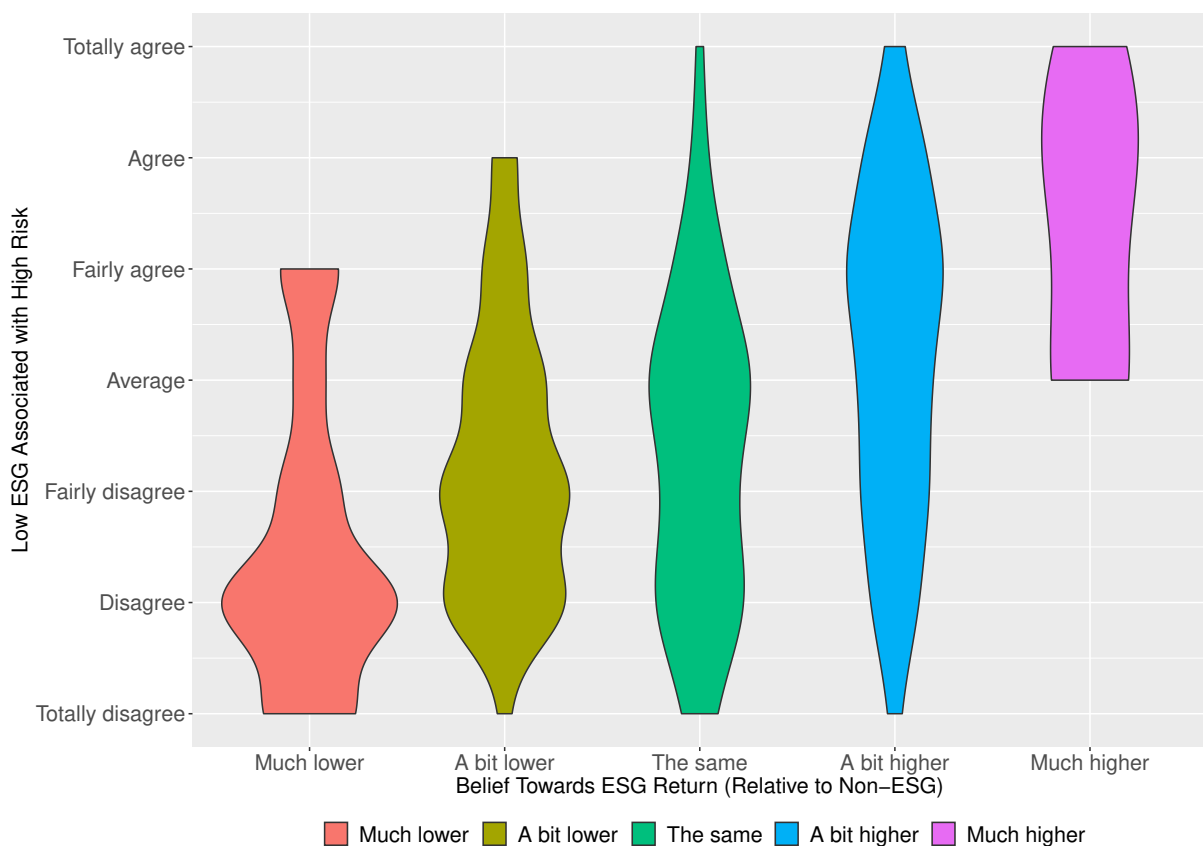


Figure A.7: Risk-return Perception towards ESG funds

Note: This figure depicts the correlation between respondents' return expectations and their risk perceptions regarding low ESG funds. Respondents' return expectations are derived from the unincentivized Likert scale question concerning the performance of ESG funds relative to conventional funds. Respondents who selected "I don't know" in the Likert scale question are excluded from the sample in the analysis. Additionally, respondents' risk perceptions towards low ESG funds are obtained from their responses to the statement "Less sustainable investment funds carry more risk than sustainable investment funds: 1 = Totally disagree, 2 = Disagree, 3 = Fairly disagree, 4 = Average, 5 = Fairly agree, 6 = Agree, 7 = Totally agree."

B Appendix B

Table B.1: Variable Definition

<i>Variable</i>	<i>Description</i>	<i>Measurement</i>
High ESG Info	High ESG rating information treatment	In the ESG condition, High ESG rating information about the fund is provided, whereas in the non-ESG condition, no ESG-related information about the fund is offered
ESG Return Belief	The participant's response to the question "I expect that the returns of index mutual funds that exclude companies with a low ESG score, compared to index mutual funds that do not exclude companies with a low ESG score:"	0, I do not know; 1, Much lower; 2, A bit lower; 3, The same; 4, A bit higher; 5, Much higher;
Male	Dummy variable for participant gender	Equal to one if the participant reports being a man
Age	The participant's self-reported age	
Origin	The participant's response to the question "Your origin:"	0, Dutch background; 1, First generation foreign, Western background; 2, First generation foreign, non-Western background; 3, Second generation foreign, Western background; 4, Second generation foreign, non-Western background; 5, Origin unknown, or part of the information unknown (missing values);
Investing Experience	The participant's response to the question "Please state the number of years that you have experience with investing:"	0, no or less than 1 year; 1, 1 year – 3 years; 2, 4 years – 6 years; 3, 7 years – 10 years; 4, more than 10 years;
Income	The participant's response to the question "Your personal gross monthly income in categories:"	0, No income; 1, 500 euros or less; 2, 501 euros to 1000 euros; 3, 1001 euros to 1500 euros;

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Table B.1 – *Continued from previous page*

<i>Variable</i>	<i>Description</i>	<i>Measurement</i>
Education	The participant's response to the question "We request that you state your highest education:"	0, Primary school; 1, VMBO (Preparatory secondary vocational education, US: Junior High School); 2, HAVO/VWO (Higher General Secondary Education/Preparatory Scientific Education, US: Senior High School); 3, MBO (secondary vocational education, US: Junior College); 4, HBO (Higher Vocational Education, US: College); 5, WO (University); 6, Other; 7, Not (yet) completed education; 8, No education started yet;
ESG Knowledge	The participant's response to the question "I think that my knowledge about ESG (Environment, Social, Governance: an English-language designation for investing with an eye for the environment, society and good corporate governance) in the investment context is better than ... of the respondents to this survey."	A value between 0% and 100%
Total Investment	The participant's response to the question "How much money do you currently invest (in shares/mutual funds)?"	0, I'd rather not say; 1, 4999 euros or less; 2, 5000 euros to 9999 euros; 3, 10000 euros to 24999 euros; 4, 25000 euros to 49999 euros; 5, 50000 euros to 99999 euros; 6, 100000 euros to 249999 euros; 7, More than 250,000 euros;
Monthly Investment	The participant's response to the question "How much do you invest on a monthly basis?"	0, 0; 1, 100 euros or less; 2, 101 euros to 300 euros; 3, 301 euros to 500 euros; 4, 501 euros to 1000 euros; 5, 1001 euros to 1500 euros; 6, 1501 euros to 2000 euros; 7, 2001 euros to 2500 euros; 8, 2501 euros to 3000 euros; 9, 3001 euros to 4000 euros; 10, 4001 euros to 5000 euros; 11, More than 5000 euros; 12, I'd rather not say;

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Table B.1 – *Continued from previous page*

<i>Variable</i>	<i>Description</i>	<i>Measurement</i>
Occupation	The participant's response to the question "We request that you indicate your main occupation:"	1, Paid work; 2, Works or assists in the family business; 3, Independent professional, freelancer, or independent; 4, Job seeker due to loss of job; 5, New jobseeker; 6, Except for searching for work as a result of loss of job; 7, Goes to school or study; 8, Takes care of the household; 9, Is retired (voluntary), early pension, pension scheme; 10, Has (partial) incapacity for work; 11, Does unpaid work while using unemployment benefits; 12, Does volunteer work; 13, Does something else; 14, Is too young to have a job;
Portfolio Size	The participant's response to the question "Suppose you have 10,000 euros in a savings account. You can leave this money in the savings account for the coming year and will then receive 5% interest with certainty. You will then receive 500 euros. Or you can invest the amount in an investment fund that tracks the performance of the stock market based on a stock index, with a 50% chance of a return of +40% (+4,000 euros) and a 50% chance of a return of -20% (-2,000 euros). Given this information, how much of the 10,000 euros will you invest in this equity investment fund?"	Investment Amount in the Index Fund
ESG Return by Likert Scale	The participant's response to the question "I expect that the returns of sustainable investment funds compared to less sustainable investment funds:"	0, I do not know; 1, Much lower; 2, A bit lower; 3, The same; 4, A bit higher; 5, Much higher;
Index Fund Return	The participant's response to the question "In general, I expect the returns of index mutual funds compared to active mutual funds to be:"	0, I do not know; 1, Much lower; 2, A bit lower; 3, The same; 4, A bit higher; 5, Much higher;

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Table B.1 – *Continued from previous page*

<i>Variable</i>	<i>Description</i>	<i>Measurement</i>
Trust	The participant's response to the question "I assume that people only have the best intentions."	1, Totally disagree; 2, Disagree; 3, Fairly disagree; 4, Average; 5, Fairly agree; 6, Agree; 7, Totally agree;
Sustainability Risk	The participant's response to the question "Less sustainable investment funds carry more risk than sustainable investment funds."	1, Totally disagree; 2, Disagree; 3, Fairly disagree; 4, Average; 5, Fairly agree; 6, Agree; 7, Totally agree;
ESG Impact	The participant's response to the question "Investment funds with ESG integration (environmental, social, governance) have a positive impact on society."	1, Totally disagree; 2, Disagree; 3, Fairly disagree; 4, Average; 5, Fairly agree; 6, Agree; 7, Totally agree;
Positive Reciprocity	The participant's response to the question "When someone does me a favor, I am willing to return the favor."	1, Totally disagree; 2, Disagree; 3, Fairly disagree; 4, Average; 5, Fairly agree; 6, Agree; 7, Totally agree;
Negative Reciprocity (Self)	The participant's response to the question "If I am treated very unfairly, I will take revenge at the first opportunity, even if there are costs involved."	1, Totally disagree; 2, Disagree; 3, Fairly disagree; 4, Average; 5, Fairly agree; 6, Agree; 7, Totally agree;
Negative Reciprocity (Others)	The participant's response to the question "I am willing to punish someone who treats others unfairly, even if it may come at a cost to myself."	1, Totally disagree; 2, Disagree; 3, Fairly disagree; 4, Average; 5, Fairly agree; 6, Agree; 7, Totally agree;
ESG Index Fund Preference	The participant's response to the question "I would like to invest in an index investment fund that excludes companies that do not sufficiently take into account the environment, society, and corporate governance, even if this investment strategy is at the expense of the financial performance of the investment fund."	1, Totally disagree; 2, Disagree; 3, Fairly disagree; 4, Average; 5, Fairly agree; 6, Agree; 7, Totally agree;

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Table B.1 – *Continued from previous page*

<i>Variable</i>	<i>Description</i>	<i>Measurement</i>
Active ESG Fund Preference	The participant's response to the question "I would like to invest in an actively managed investment fund that excludes companies that do not sufficiently take into account the environment, society, and corporate governance, even if this investment strategy is at the expense of the financial performance of the investment fund."	1, Totally disagree; 2, Disagree; 3, Fairly disagree; 4, Average; 5, Fairly agree; 6, Agree; 7, Totally agree;
Energy Transition Preference	The participant's response to the question "To what extent are you prepared to invest part of your invested capital in an investment fund that focuses purely on companies that directly contribute to the energy transition (for example by devising solutions that lead to higher energy efficiency or the development of renewable energy)?"	A value between 0 and 100
Energy Efficiency Engagement	The participant's response to the question "To what extent do you think it is important that asset managers address companies in their voting policy (voting at remote shareholder meetings) or their engagement policy (private dialogue with companies) on their energy efficiency and contribution to the energy transition?"	A value between 0 (Not important) and 6 (Very important)
Donation	The participant's response to the question "Imagine the following situation: You have unexpectedly received 1000 euros today. How much of this amount would you donate to charity? (Values between 0 and 1000 are allowed.)"	A value between 0 and 1000

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Table B.1 – *Continued from previous page*

<i>Variable</i>	<i>Description</i>	<i>Measurement</i>
ESG Investment Amount	The participant's response to the question "Meesman has two types of investment funds. Equity investment funds for the growth of your assets. Worldwide Total Shares is the ultimate share index investment fund for passive investors and Shares Sustainable Future is suitable for investors looking for an index investment fund with a more pronounced sustainable character. Please indicate how much you would like to invest in Worldwide Total Shares using your Meesman Credits. The rest will be automatically invested in Shares Sustainable Future."	A value between 0 and 400
Altruism	The participant's response to the question "How willing are you to give to charities without expecting anything in return?"	A value between 1 (Definitely not willing) and 7 (Very willing)

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Table B.1 – *Continued from previous page*

<i>Variable</i>	<i>Description</i>	<i>Measurement</i>
Correct Return Calculation	The participant's response to the question "Suppose that when answering the previous question you decided to invest X euros of the amount of €10000 in the stock index investment fund and you are one of the selected winners and therefore you have (10,000 – you have put. Remember that the return of the stock index mutual fund in the coming year will be either +40% or –20% with equal probability. The return for the savings account is guaranteed at 5%. How much money do you expect to have at the end of this one-year investment period? Please choose one of the answers below. If you choose the correct answer, you will receive a bonus of €50 on top of your payout for this experiment"	0, $0.5 \times (0.4X - 0.2X) + 0.05 \times (10000 - X)$; 1, $1.4X + 0.8X + 1.05 \times (10000 - X)$; 2, $0.4 \times (10.000 - X) - 0.2 \times (10.000 - X) + 0.05X$; 3, $0.5 \times [0.4 \times (10000 - X) - 0.2 \times (10000 - X)] + 0.05X$; 4, $0.4X - 0.2X + 0.05 \times (10000 - X)$; 5, $0.5 \times (1.4X + 0.8X) + 1.05 \times (10000 - X)$; 6, $1.4 \times (10000 - X) + 0.8 \times (10000 - X) + 1.05X$; 7, $0.5 \times [1.4 \times (10000 - X) + 0.8 \times (10000 - X)] + 1.05X$; 8, I'd rather not answer that;