Beliefs About the Climate Impact of Green Investing*

Florian Heeb,† Julian F. Kölbel,‡ Camilla Weder§

January 30, 2026

[First version: December 1, 2025. Latest version available here]

Abstract

This paper surveys beliefs about the climate impact of green investing among academic experts and retail investors. Using the views of academic experts as a benchmark, we show that retail investors have overly optimistic climate impact beliefs. While most academic experts do not believe that a typical green fund has a meaningful climate impact, the vast majority of retail investors do. The median retail investor expects a €10,000 green investment to offset 10% of an average person's carbon footprint. By contrast, the median estimate among academic experts is 2%, with 0% being the most common estimate. Impact beliefs influence investment decisions: When informed of academic experts' views, retail investors reduce their climate impact beliefs and willingness to pay for the green fund. Qualitative statements suggest that retail investors' optimistic beliefs are driven by a focus on the impact of portfolio companies rather than on the impact of the investment itself.

JEL Classification: D14, G11, G41, H41, Q54
Keywords: green finance, subjective beliefs, climate change, willingness to pay, expert survey, behavioral finance

*We thank Peter André, Marco Ceccarelli, Sascha Füllbrun, Tom Gosling, Kilian Huber, Matti Keloharju, Arthur Krebbers, Augustin Landier, Markus Leippold, Marcus Opp, Lin Peng, Monika Piazzesi, Zacharias Sautner, Naciye Sekerci, Lee Seltzer, Oliver Spalt, Jan Starmanns, Tobias Wekhof, and Rolf Wüstenhagen, as well as the attendees of the Leibniz Institute for Financial Research SAFE Winter Retreat, for their helpful feedback. We acknowledge funding from the Swiss National Science Foundation [grant no. 211404]. Finally, we thank all participants of our survey for their time and valuable input.

†Leibniz Institute for Financial Research SAFE, Goethe University Frankfurt, and MIT Sloan. E-mail: heeb@safe-frankfurt.de.

‡University of St. Gallen, Swiss Finance Institute, and MIT Sloan. E-mail: julian.koelbel@unisg.ch.

§University of St. Gallen. E-mail: camilla.weder@unisg.ch.

1 Introduction

Many investors choose green investment products out of a desire to achieve positive real-world impact. In a poll of more than 14,000 European retail investors, more than half stated they wanted to achieve a pro-social impact with their investments (Koch, Moreno, & Cooke, 2025). At the same time, academic research suggests that popular green investment products may have a limited impact (e.g., Berk & Van Binsbergen, 2025; Hartzmark & Shue, 2022; Heath et al., 2023; Pedersen, 2025). This raises the question: Do investors have realistic beliefs about the pro-social impact of green investments? This is a salient question, for if pro-social investors overestimate the impact of green investment products, scarce resources needed to address societal challenges may be misallocated.

In this paper, we measure retail investors' beliefs about the climate impact of a typical green investment product and compare these beliefs with the views of academic experts. Furthermore, we examine how retail investors adjust their climate impact beliefs and investment decisions when exposed to the views of academic experts. Finally, we investigate the mental models underlying the beliefs of both retail investors and academic experts.

Method. We conduct a pre-registered survey with a representative sample of 2,101 German retail investors and a sample of 182 academic experts.[1] For both groups, we elicit beliefs about the impact of a typical green fund – namely, an ETF complying with the EU's Paris Aligned Benchmark (PAB) – in three steps. First, we query agreement with the statement that investing €10,000 in the green fund makes a relevant contribution to reducing global greenhouse gas (GHG) emissions. Second, we ask respondents to rank such an investment in the green fund compared to other actions an individual can take to reduce GHG emissions, such as flying less, purchasing green energy, or voting for political parties that prioritize climate issues. Third, we ask respondents for their estimate of the share of an average person's carbon footprint that is offset by a €10,000 investment in the green fund. We also ask respondents to explain the reasoning underlying their climate impact beliefs. Finally, we elicit retail investors' willingness-to-pay (WTP) for the green fund. A random treatment group of investors received a summary of the academic experts' impact expectations before this elicitation. We document three main results.

[1]The academic experts have published on green investing in leading finance and economics journals and/or have presented, discussed, or chaired sessions on such research at major conferences.

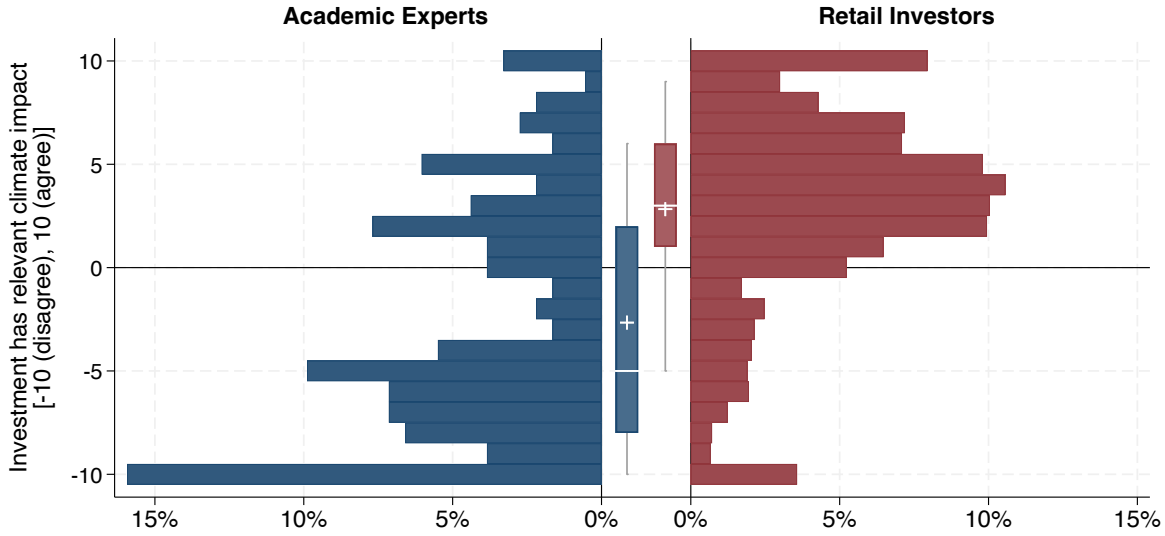


Figure 1: Does investing in the green fund have a relevant climate impact?
This figure presents histograms of respondents' agreement that a ten-year investment of €10,000 in the green fund makes a relevant contribution to reducing global GHG emissions, for academic experts and retail investors. Observations are grouped in one-scale-point bins. The vertical bars in the middle indicate the 10th, 25th, 50th, 75th, and 90th percentiles of the distribution; the "+" denotes the mean.

(1) Retail investors have overoptimistic climate impact beliefs. Using the views of academic experts as a benchmark, we show that retail investors have an overly optimistic assessment of the impact exerted by a typical green investment product (Figure 1). The majority of the surveyed academic experts are skeptical regarding the climate impact of the green fund; 62% disagree with the statement that investing in the green fund makes a relevant contribution to reducing global GHG emissions. When asked to rank individual actions that could reduce GHG emissions, on average, academic experts rank investing in the green fund as the least effective option, while they rank voting for a political party that prioritizes action on climate change as the most effective. Their median expectation is that investing €10,000 in the green fund would offset 2% of an average person's carbon footprint; however, the most frequently stated expectation is 0%. What is more, academic experts who stated the lowest emission reduction estimates were the most confident of their estimates. When asked about specific channels open to investors to make a climate impact, the academic experts indicate that shareholder engagement or providing capital to green companies facing financing frictions would be more likely to achieve a relevant climate impact.

By contrast, the large majority of retail investors hold optimistic beliefs about the climate impact of the green fund. In the sample of retail investors, 76% agree that investing in the green fund makes a relevant contribution to the reduction of global GHG emissions. Retail investors rank investing in the green fund as being less effective than actions related to personal consumption, but as more effective than voting for a political party that prioritizes action on climate change or donating to organizations engaged in climate protection. Their median belief is that investing €10,000 in the green fund offsets 10% of an average person's carbon footprint. Those retail investors who stated higher reduction estimates were more confident in their estimates.

(2) Impact beliefs have an influence on investment decisions. We show that impact beliefs have a significant influence on investment decisions. When retail investors receive the results of the expert survey as an information treatment, they update both their climate impact beliefs and their willingness to pay (WTP) for the green fund. The treatment significantly lowers the share of respondents choosing to invest in the green fund and reduces the average WTP in terms of an investment fee from 61 to 47 basis points, with the decline being most pronounced among those who initially held positive prior beliefs. Nevertheless, most retail investors prefer the green fund over a conventional alternative, even after being informed about the skeptical views of academic experts.

(3) Retail investors focus on the impact of portfolio companies rather than on the impact of the investment. We find that belief differences between academic experts and retail investors are rooted in divergent mental models about the relationship between fund investments and firm behavior. Most of the academic experts' reasoning revolves around investor impact – namely, how an investment in the green fund might (or might not) lead to changes in asset prices and cost of capital, and how this might (or might not) lead to changes in firm behavior. By contrast, the reasoning of retail investors predominantly focuses on company impact – namely, how the activities of the portfolio firms affect the climate. Often, this is combined with the assumption that an investment in the fund supports the portfolio firms in some direct way. This assumption and the focus on company impact can explain why retail investors are more optimistic about the climate effects of green investing.

Implications. We show that many retail investors hold substantially more optimistic views about the impact of green funds than academic experts. This divergence suggests that the market for green investment products may misallocate capital, for investors seeking real-

world impact may choose products that deliver relatively little of it. At the same time, we show that investors revise their beliefs when presented with credible evidence, underscoring the importance of providing reliable information on the impact of investment products.

Related literature. Our paper contributes to three streams of research. First, we expand on the literature on the behavior of pro-social investors by providing evidence that such investors hold biased beliefs about the pro-social impact of their investments. The literature documents that aside from pecuniary motives, many investors hold pro-social preferences (Barber, Morse, & Yasuda, 2021; Bauer, Ruof, & Smeets, 2021; Hartzmark & Sussman, 2019; Riedl & Smeets, 2017). Theoretical work examining how these preferences affect financial markets mostly assumes that pro-social investors either act as consequentialists, thus deriving utility from the effect their actions have on a public good (see, e.g., Broccardo, Hart, & Zingales, 2022; Green & Roth, 2025; Landier & Lovo, 2025; Oehmke & Opp, 2025), or as deontologists, thus deriving moral "warm glow" utility from investing in pro-social firms, irrespective of the effects this has on the public good (see, e.g., De Angelis, Tankov, & Zerbib, 2023; Heinkel, Kraus, & Zechner, 2001; Pástor, Stambaugh, & Taylor, 2021; Pedersen, Fitzgibbons, & Pomorski, 2021). Empirical studies support the view that green investors act from deontological motives (Bonnefon et al., 2025; Heeb et al., 2023). Our findings introduce a third interpretative view of pro-social investors' behavior: they may be consequentialists, but have incomplete or biased information about the consequences of their decisions.

Second, we contribute to the debate on the effectiveness of green investing as a tool for combating climate externalities by surveying the views of academic experts. The existing literature offers divergent perspectives on the real-world impact of green investing. Berk and Van Binsbergen (2025) argue that divestment rarely changes firms' cost of capital enough to influence investment decisions. Hartzmark and Shue (2022) argue that green investing might even be counterproductive, by making financing more expensive for the firms that have high financing needs to decarbonize. By contrast, Cheng et al. (2024) argue that the effects are non-negligible, and Pedersen (2025) concludes that while green investing is far less effective than an optimal carbon tax, it is likely to have some impact. Favilukis, Garlappi, and Uppal (2023) argue that current theory may substantially underestimate the impact of green investing mandates, while Gormsen, Huber, and Oh (2024) show that green firms perceive substantially lower costs of capital.Inderst and Opp (2025) argue that a mandatory taxonomy for green investments is needed to prevent greenwashing and to realize the real

effects of green investing. We show that, on average, academic experts do not believe that investing in a portfolio of green firms makes a meaningful contribution to reducing global GHG emissions. However, there is substantial variation between experts. Furthermore, academic experts see alternative mechanisms of green investing as substantially more promising, including shareholder engagement (as documented by Becht et al., 2023; Dimson, Karakaş, & Li, 2015; Dyck et al., 2019; Hoepner et al., 2024) and impact investing in private markets (see Flammer, Giroux, & Heal, 2024; Geczy et al., 2021; Jeffers, Lyu, & Posenau, 2024).

Third, we contribute to the literature on belief formation in financial markets, a strand in the research that has been reviewed by Giglio, Maggiori, Rillo, et al. (2025). Recent work documents that experts and non-experts reason differently about economic mechanisms when forming beliefs (Andre, Schirmer, & Wohlfart, 2023; Andre et al., 2022, 2025). Within green investing, Giglio, Maggiori, Stroebel, et al. (2025) survey investors' beliefs about the financial performance of sustainable investments, further experimental evidence is provided by Bauer, Dong, and Jiao (2025) and Bauer et al. (2024). Aron-Dine et al. (2024) show that households holding green assets have more optimistic beliefs about the returns on those assets. Ceccarelli and Ramelli (2024) examine beliefs about climate-policy paths, while Kostovetsky et al. (2024) study the role of attention to climate change. Filippini, Leippold, and Wekhof (2024) highlight the role of sustainable-finance literacy. We add to this literature by analyzing beliefs about the non-financial aspects of green investing, showing that retail investors' impact beliefs are overly optimistic, influence investment-product demand, and rest on mental models that differ substantially from those held by experts.

2 Methods

In our study, we investigate retail investors' beliefs about the climate impact of green investment products and assess the realism of these beliefs. Since there is no widely accepted measure of the climate impact of green investment products, we create an academic benchmark by surveying academic experts on their climate impact beliefs.

We proceed as follows: First, we ask academic experts who research sustainable investing to evaluate the climate impact of a typical green investment product, then follow up with a survey about their views on different impact channels and market-level climate impact expectations. Second, we survey a sample of German retail investors on their beliefs

about the climate impact of the same green investment product. For both retail investors and academic experts, we examine the rationales underlying their impact beliefs of using open-ended questions. Third, we assess the effect of impact beliefs on investment decisions by providing a randomized treatment group of retail investors with information about the academic experts' beliefs. After this information treatment, we elicit climate impact beliefs again in the treatment group, and subsequently measure the WTP for the green investment in an incentivized investment task across all retail investors. The survey was preregistered and conducted in December 2024.[2] Figure 2 provides a graphical overview of our procedures, and Table A3 defines all variables used.

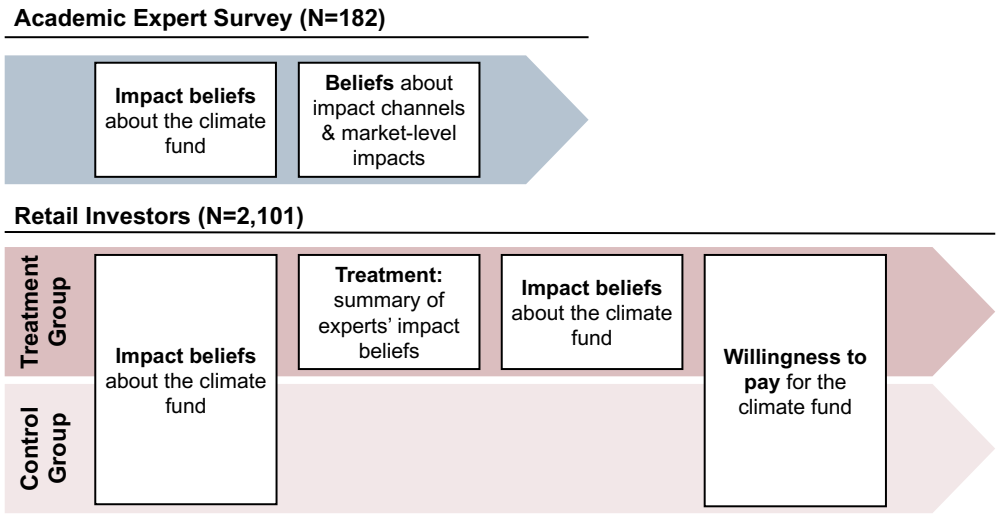


Figure 2: Overview of the survey procedures
This figure illustrates the procedures used in our surveys of academic experts and retail investors.

2.1 Samples

Academic experts (N=182). We invited 700 researchers who have published papers related to green investing in leading finance and economics journals (*Journal of Finance, Journal of Financial Economics, Review of Financial Studies, and Review of Finance, American Economic Review, Econometrica, Journal of Political Economy, Quarterly Journal of Economics,* and *Review of Economic Studies*) or who presented or discussed relevant papers or

[2]See https://aspredicted.org/rrz4-tsgd.pdf.

chaired relevant sessions at a leading finance conference between 2022 and 2024 (annual meetings of the European Finance Association, the American Finance Association, the Financial Intermediation Research Society, and the Western Finance Association as well as the SFS Cavalcade and the PRI Academic Network Conference). We identified relevant papers by first searching for keywords in the paper and session titles (biodiversity, carbon, clean, climate, decarbonize, diversity, environment, ESG, green, ideology, impact, pollution, responsibility, social, sustainability, transition, GHG) and then manually checking the retrieved papers for a clear relation to green investing.

We personally contacted all 700 potential participants via email and retrieved 182 completed surveys, yielding a response rate of 26%.[3] Among the respondents, 39% were senior faculty, 45% junior faculty, 12% graduate students, and 4% from other categories (e.g., working at research institutes or central banks). 50% were based in Europe, 32% in the USA, 14% in Asia, and 4% in other regions. The complete academic expert questionnaire is provided in Annex C.

Retail investors (N=2,101). We recruited a representative sample of German retail investors with the support of the market research agency Bilendi.[4] The survey was conducted in German. A total of 2,101 respondents provided complete responses. Demographic characteristics for the sample can be found in Tables A2. The full retail investor questionnaire is provided in Annex D.

2.2 Impact beliefs about the green fund

We measure respondents' beliefs about the climate impact of a typical green investing product (the "green fund"). First, respondents receive detailed information about the green fund. We then measure their climate impact beliefs with three subsequent questions.

Fund information. As a first step, respondents are asked to carefully review information about the green investment. The investment is a climate-themed ETF that tracks a

[3]Including incomplete surveys, we retrieved 201 responses. For our analysis, we focus on complete responses. The results remain very similar if we include all responses (See Table A1).

[4]We contacted an initial sample of the German population that is representative in terms of gender, age, and region, but only included respondents who stated that they have invested in stocks, bonds, or funds (including ETFs) within the last ten years. Of the initial respondents, 37.01% stated that they have done so. This is very close to the results of a poll by YouGov and Blackrock conducted in the same year among a representative sample of 3,084 Germans, where 38% of respondents reported that they are invested in a similar list of assets (BlackRock, 2024).

broad European stock market index and meets the EU's criteria for Paris-Aligned Benchmarks.[5] Respondents receive a summary of the fund's key characteristics, including a brief description of the fund's strategy; figures regarding the fund's size, costs, and performance; climate indicators; and top holdings (see Figure A1). The summary is based on marketing material provided by the asset manager. Additionally, respondents can review the fund's official factsheet and a summary of the index calculation methodology. For retail investors, we follow up with a simple comprehension check. Respondents who do not pass are asked to review the provided information again and are excluded from the survey if they fail on a second attempt. Respondents have the option to review the provided fund information while answering the subsequent questions regarding their impact beliefs.

Does investing in the green fund have a relevant climate impact? As a first measure of respondents' beliefs about the climate impact of the green fund, we ask them to imagine investing €10,000 in the fund over a ten-year horizon. We then elicit their agreement with the statement "Such an investment makes a relevant contribution to reducing global greenhouse gas emissions," using a scale from –10 (disagree) to 10 (agree).

How does the green funds' impact rank among other climate actions? We ask respondents to rank different actions an average German person might take, in order of their effectiveness in reducing global greenhouse gas emissions over a ten-year time span. These actions include: (1) "Investing €10,000 in the [green fund]"; (2) "Not travelling by airplane"; (3) "Consuming meat maximally once per week,"; (4) "Purchasing electricity and heating energy exclusively from renewable sources"; (5) "Donating €300 per year to organizations that engage for climate protection,"; and (6) "Voting for a political party that prioritizes action on climate change." The actions are displayed in random order. We also provide information on average air travel, meat consumption, and fossil energy use in Germany.

How much does the green fund reduce an individual's carbon footprint? We ask respondents to provide a quantitative estimate of the fund's climate impact. Specifically, we ask them to estimate the amount of CO_2 emissions that will be reduced by a €10,000 investment over ten years in the green fund, when expressed as a percentage of the CO_2 emissions caused by an average German person over that same period. We inform respondents that the average person in Germany causes around 80 tons of CO_2 emissions over a ten-year period, and that the alternative to investing in the green fund is investing in

[5] Although respondents can see the fund's name, we do not disclose it in the paper to avoid singling out any specific provider.

a passive fund that tracks the European stock market. Also, when entering their estimate as a percentage of an average German's carbon footprint, this value is converted to other measures to improve relatability (namely, tons of CO_2, the number of intercontinental flights that cause a corresponding amount of CO_2 emissions, as well as the number of trees that absorb a corresponding amount of CO_2 over ten years). After respondents have entered their estimate, we restate their entry, including the converted values, and respondents receive the option to adjust their entry.[6] Next, we ask respondents how confident they are about their estimate, on a scale from -10 (low confidence) to 10 (high confidence).

Impact rationales. We ask respondents to state the reasoning underlying their climate impact beliefs. Specifically, we display respondents' reported agreement with the statement that investment in the green fund makes a relevant contribution to reducing global GHG emissions, and invite them – via an open-ended question – to describe the rationale for their answer.

2.3 Beliefs about impact channels and market-level impact

For the academic experts, we next survey their opinions on different channels through which green investments might (or might not) have a climate impact, as well as their views on the aggregate climate impact of the current market for green investments.

Impact channels. We ask the academic experts about their views on how likely it is that investors will have a climate impact through different channels. From the literature on green investing, we identify four major impact channels. We briefly summarize each channel and ask academic experts to rate the likelihood that investors can contribute to fighting climate change through this channel, on a scale from -10 (unlikely) to 10 (likely). We denote firms with high negative climate externalities as "brown" and firms with low or positive externalities as "green." The summarized channels include: (1)"By shifting their portfolio toward green firms, investors can reduce the cost of capital of green firms and thus increase the growth of green firms relative to the growth of brown firms"; (2) "By shifting their portfolio toward green firms, investors can increase the market value of green firms and thus incentivize firms to become greener"; (3) "By voting their shares and actively engaging with firm management, investors can encourage firms to become greener"; and (4) "By

[6]Consistent with our preregistration, we winsorize the quantitative impact beliefs at the 95th percentile within each group for our analyis.

directly providing capital to green companies facing financing frictions, investors can increase their growth (e.g., young companies, small companies, or companies in immature financial markets)." Additionally, we ask academic experts if they believe additional important impact channels exist, and ask them to briefly describe such channels in an open-ended question.

Market-level climate impact. Next, we survey the views of academic experts on the aggregate impact of the market for green investments, beyond the specific fund considered in previous questions. Specifically, we ask them to state their agreement with the statement "Overall, the current market for green investing products makes a relevant contribution to fighting climate change," on a scale from –10 (disagree) to 10 (agree).

2.4 The effect of impact beliefs on investment decisions

For the retail investors, we follow up with a randomized experiment to assess how impact beliefs affect investment decisions. We randomly assign respondents to a treatment and control group. Treatment and control groups are well-balanced in terms of demographics (see Table A2). Respondents in the treatment group receive a summary of the academic experts' expectations on the climate impact of the fund, and we measure whether this information alters respondents' own impact beliefs. Finally, for both the treatment and control groups, we elicit respondents' WTP for the green fund, using a procedure similar to the one used by Heeb et al. (2023).

Information treatment and manipulation check. Retail investors in the treatment group receive a summary of the impact expectations of the academic experts (as shown in Figure A2). Experts' responses are visually illustrated in the original survey layout to increase salience. Additionally, we provide a brief summary of the academic experts' reasoning behind their replies.[7] To assess whether our information treatment affects respondents' impact beliefs, we again ask respondents in the treatment group about their agreement with the statement that investing in the green fund has a relevant climate impact.

Eliciting WTP for the green fund. As a next step, for all retail investors, we elicit their WTP for the green fund – relative to a conventional alternative – using an incentive-compatible mechanism, and subsequently debrief them about their choices.

[7]We follow up with a simple comprehension check. Respondents who do not pass are asked to review the provided information again.

We show respondents a comparison of two funds: (1) the green fund, and (2) an ETF that tracks the conventional, non-climate-focused version of the underlying index of the green fund (see Figure A3). For each fund, the comparison includes a brief description of key financial and climate indicators. We also include a chart comparing the performance of the two funds.[8] While the two funds are similar in terms of financial characteristics, the green fund showed slightly lower past returns, but a lower average carbon intensity, and a lower "Implied Temperature Rise" score.[9]

We inform respondents that ten randomly selected individuals will have €1,000 invested based on their replies, and that the value of their investment will be paid out after one year. To ensure incentive compatibility, we employ the Becker–DeGroot–Marschak mechanism (Becker, DeGroot, & Marschak, 1964). We first ask respondents in which fund they would rather invest €1,000. Next, we ask them to state the highest fee they would be willing to pay to invest in their preferred fund rather than the other fund, on a scale from €0 to €20. For respondents who state a willingness to pay of €20, we repeat the same question on a scale from €0 to €100. Finally, for each of the ten randomly selected respondents, we draw a random number between 0 and 100 and invest in the participant's preferred fund if this number is greater than their stated WTP, deducting the random amount, and in the other fund otherwise.[10]

Investment debrief. Finally, we ask all retail investors questions about their investment decisions. First, we ask them to briefly explain what has led them to prefer one fund over the other, in an open-ended question. Next, for all retail investors, we elicit their financial expectations regarding the two funds, how the funds align with their personal values, and their emotional reactions to the investment decision. We also collect demographic characteristics and preferences for all retail investors. Table A3 provides a detailed description of all variables.

[8] We randomized the left–right positioning of the funds and the colors used for the two funds on the performance chart.

[9] Implied Temperature Rise is a metric intended to reflect a fund's forward-looking climate performance. It is commonly used in fund marketing materials.

[10] We winsorize the WTP at the 5th and 95th percentiles for each group for our analysis, to reduce the influence of strategic answers. This was not preregistered; our results also hold without winsorizing (see Table A4).

3 Results

We document three main results: (1) taking the views of academic experts as a benchmark, we show that retail investors are overly optimistic about the climate impact of a typical green investment; (2) we find that investors' climate impact beliefs are relevant for investment decisions; and (3) that retail investors largely neglect financial-market transmission mechanisms when reasoning about the climate impact of an investment.

3.1 Overoptimistic climate impact beliefs

While most of the surveyed academic experts – albeit not all – are skeptical about the fund's climate impact, the large majority of retail investors are optimistic regarding potential effects. Table 1 summarizes the results for our different measures of the impact beliefs held by retail investors and academic experts; these results are detailed below.

Table 1: Impact beliefs of academic experts and retail investors

	Mean		**Difference**	***p*-value**
	Experts *(N=182)*	**Investors** *(N=2,101)*	Investor – Expert	
Agreement: relevant climate impact [-10, 10]	−2.66	2.83	5.49***	< 0.001
Impact rank [0 (lowest impact), 5 (highest impact)]	1.36	2.22	0.86***	< 0.001
Carbon-footprint reduction estimate [%]	5.84	16.72	10.88***	< 0.001
Reduction estimate confidence [-10, 10]	−1.26	1.14	2.40***	< 0.001

This table summarizes the impact beliefs of academic experts and retail investors. *Agreement: relevant climate impact* indicates respondents' agreement that investing in the green fund makes a relevant contribution to reducing global GHG emissions. *Impact rank* measures how respondents rank the climate impact of investing in the green fund among five other personal climate actions; higher numbers indicate higher impact. *Carbon-footprint reduction estimate* reports respondents' estimate of how much a €10,000 investment in the green fund reduces an average person's carbon footprint. *Reduction estimate confidence* reports respondents' confidence in this estimate. Detailed summary statistics are provided in Table A5. *p*-values are based on Mann–Whitney *U* tests on between-group differences, where ***, **, and * indicate a significant at the 1%, 5%, and 10% levels, respectively.

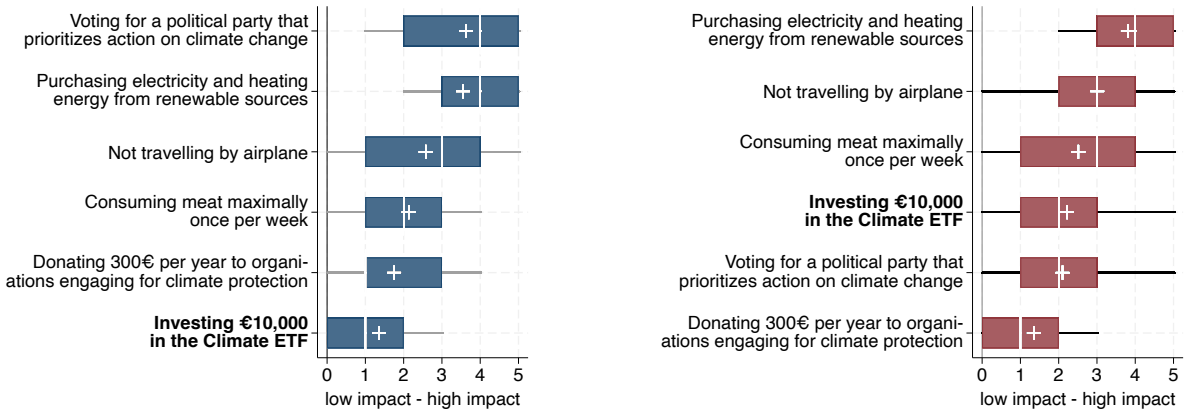
Does investing in the green fund have a relevant climate impact? Among the academic experts, 62% disagree with the statement that a ten-year investment of €10,000 in

the green fund makes a relevant contribution to reducing global GHG emissions, while 35% agree. The average level of agreement is −2.66 on a scale from −10 (disagree) to 10 (agree); −10 is by far the most often stated level of agreement. Table A6 shows that scepticism about the green fund's impact is persistent across all levels of seniority and most regions.

By contrast, the large majority of retail investors hold optimistic beliefs about the climate impact of the green fund. Among the retail investors, 76% agree that a ten-year investment of €10,000 in the green fund makes a relevant contribution to reducing global GHG emissions, with an average agreement level of 2.83. The difference in the level of agreement between academic experts and retail investors is significant ($p < 0.001$, Mann–Whitney U test); see Figure 1 for a comparison of the distributions for each group.

The level of agreement is significantly higher for those retail investors who prefer the green fund in the subsequent investment decisions compared to those who do not (mean agreement of 4.09 vs. 1.03, $p < 0.001$, Mann–Whitney U test). Furthermore, in a multivariate regression analysis, we find that the level of agreement increases with retail investors' stated levels of climate concern, altruism, and investment knowledge, and is higher among investors who report allocating a substantial share of their assets to sustainable investment products (see Table A7).

How does the green fund's impact rank among other climate actions? Furthermore, among individual actions to reduce GHG emissions, retail investors rank investing in the green fund higher in terms of effectiveness than academic experts do. The academic experts rank investing in the green fund as the least effective option, while they rank voting for a political party that prioritizes action on climate change the highest (Figure 3a). In contrast, retail investors rank investing in the green fund as being less effective than actions related to personal consumption, but as more effective than voting for a political party that prioritizes action on climate change or donating to organizations engaged in climate protection (Figure 3b). The difference in how academic experts and retail investors rank a green fund investment is statistically significant ($p < 0.001$, Mann–Whitney U test); a comparison of the ranking distributions can be found in Figure A4.



(a) Academic experts **(b)** Retail investors

Figure 3: Impact ranking of personal actions to fight climate change
This figure shows how academic experts and retail investors rank the climate impact of investing in the green fund relative to five other personal climate actions. Higher values indicate greater impact, with 0 representing the lowest and 5 the highest impact rank. Horizontal bars indicate the 10th, 25th, 50th, 75th, and 90th percentiles of the distribution for each action, while the "+" markers denote the mean. Panel (a) displays the ranking among academic experts; Panel (b) among retail investors.

How much does the green fund reduce an average person's carbon footprint? When asked about the carbon-footprint reduction caused by investing €10,000 in the green fund, again, retail investors are more optimistic than academic experts. The mean estimate provided by academic experts is that such an investment would offset 5.8% of an average German person's carbon footprint. The distribution of estimates is skewed; the median is 2%, and 0% is by far the most frequently stated expectation. Retail investors, on average, believe that such an investment would offset 16.7% of an average German's carbon footprint; the median estimate is 10%. The distributions of estimates for academic experts and retail investors are shown in Figure 4; the difference between the emission reduction estimates of the two groups is statistically significant ($p < 0.001$, Mann–Whitney U test).

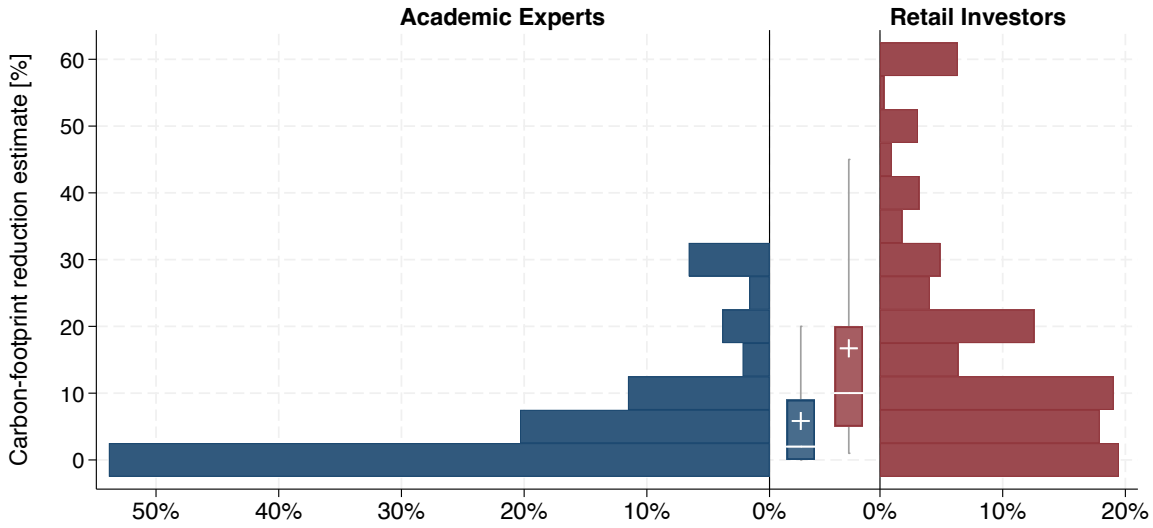


Figure 4: Carbon-footprint reduction estimates
This figure presents histograms of respondents' estimates of how much a €10,000 investment in the green fund reduces an average German's annual carbon footprint, shown separately for academic experts and retail investors. Observations are grouped in 5-percentage-point bins. Vertical bars indicate the 10th, 25th, 50th, 75th, and 90th percentiles of the distribution; the "+" markers denote the mean.

We also ask all respondents about their level of confidence in their stated carbon-footprint reduction estimate. On a scale from −10 (low confidence) to 10 (high confidence), the mean level of confidence among academic experts is −1.26. By contrast, the mean level of confidence among retail investors is 1.14 and thus significantly higher ($p < 0.001$, Mann—Whitney U test, see Figure A5 for a comparison of the distributions for the two groups). As illustrated in Figure 5, the relationship between the size of the carbon-footprint reduction estimates and respondents' confidence in those estimates varies between academic experts and retail investors. Among academic experts, the estimates decrease with increasing confidence, with very confident experts stating estimates close to zero on average. By contrast, the estimates increase with increasing confidence among retail investors (see Table A8 for a formal regression analysis). Among respondents who report a positive level of confidence, the median carbon-footprint reduction estimate is 0.05% for academic experts and 12% for retail investors.

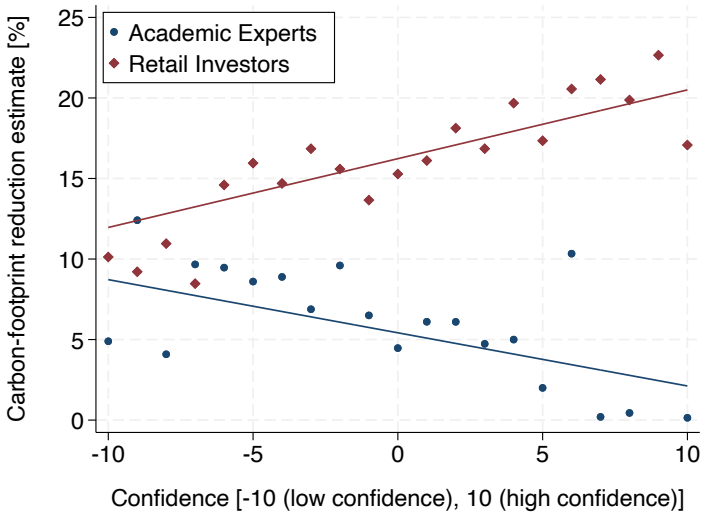


Figure 5: Confidence in carbon-footprint reduction estimates
This figure presents a binned scatterplot on the relationship between respondents' estimates of how much a €10,000 investment in the green fund offsets the average German's annual carbon footprint and their stated confidence in these estimates. Observations are grouped into bins at each scale point. Blue markers indicate the average emission-reduction estimates from academic experts, while red markers indicate those from retail investors. Linear regression lines are plotted for each group in the corresponding colors.

Survey on impact channels and market-level impact (academic experts). Next, we document a broad consensus among academic experts that investors can have a climate impact through specific channels (see Figure 6). The vast majority report a positive likelihood that investors can contribute to mitigating climate change by voting their shares and engaging with firm management (91%) or by directly providing capital to green firms facing financing frictions (89%). The average stated likelihood for these two channels is 4.38 and 4.44, respectively, on a scale from –10 (unlikely) to 10 (likely).

By contrast, the experts are divided on whether investors can contribute to fighting climate change by shifting their portfolio toward green firms. The average level of agreement that doing so can reduce the cost of capital for green firms and thus increase the growth of green firms relative to the growth of brown firms is 0.97. The average level of agreement that this shift can increase the market value of green firms and thus incentivize firms to become greener is 0.93.

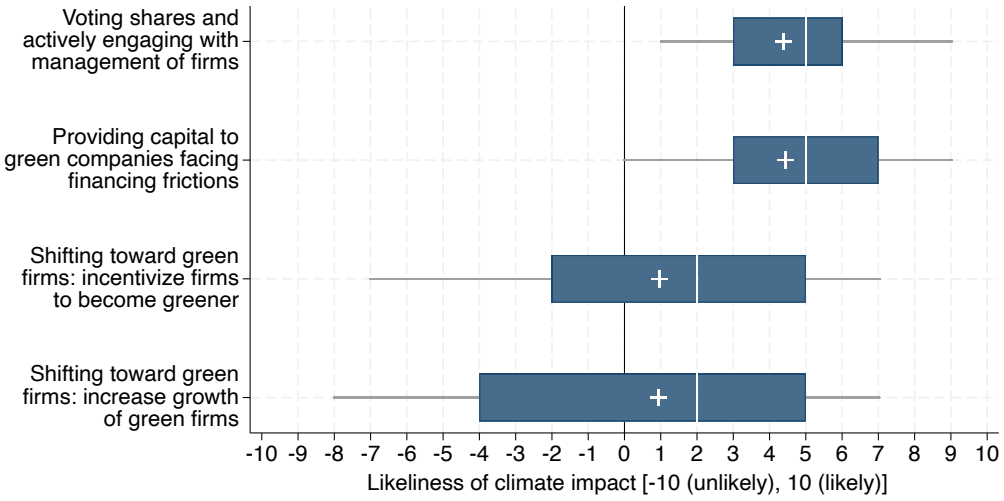


Figure 6: Academic experts' views on different impact channels
This figure illustrates academic experts' assessments of how likely it is that investors can contribute to mitigating climate change through specific channels. Horizontal bars depict the 10th, 25th, 50th, 75th, and 90th percentiles of the distribution for each channel; the "+" markers denote the mean.

Furthermore, we ask academic experts whether they believe there are additional important impact channels in an open-ended question. Several academic experts stress the importance of broader regulatory measures, such as carbon taxes, and the role of investors in advocating for them. Additionally, several replies emphasized the importance of "additionality" for the impact of green investing, i.e., the importance of mobilizing additional finance for green projects that would not otherwise receive the required capital. Further replies suggest that structured financial solutions, such as green or sustainability-linked bonds, could incentivize firms to decarbonize, or that collaboration between investors and multilateral development banks, e.g., in the form of blended finance, could boost green investment, particularly in emerging markets. Also, some experts suggest that impact is more likely for debt investments than for equity investments.

Finally, academic experts are slightly more optimistic about the aggregate, market-level climate impact of green investing than about the impact of the specific green fund we use in our survey. On a scale from -10 (disagree) to 10 (agree), academic experts report an average agreement of -1.23 with the statement that overall, the current market for green investment products makes a relevant contribution to fighting climate change (see Figure A6 for the distribution of replies).

3.2 Impact beliefs have an influence on investment decisions

The results of our randomized experiment with the retail investors show that impact beliefs matter for investment decisions. We find that retail investors reduce their expectations about the green fund's climate impact and their WTP for it after learning about the academic experts' impact expectations. The results of the randomized experiments are summarized in Table 2.

Table 2: Treatment effect on impact beliefs and investment decisions

	Mean		**Difference**	***p*-value**
	Control	**Treatment**	Treatment – Control	
Agreement: relevant climate impact [-10, 10]:				
Initial	2.71	2.94	0.23	0.447
Final (= initial for control)	2.71	−1.24	-3.95^{***}	< 0.001
Preference for green fund [%]	61.75	55.50	-6.25^{***}	0.004
WTP [€]	6.11	4.67	-1.43^{**}	0.021

This table presents the effects of the information treatment on retail investors' climate beliefs and investment preferences. *Agreement: relevant climate impact* indicates respondents' agreement that investing in the green fund makes a relevant contribution to reducing global GHG emissions. Initial values are measured prior to the information treatment; final values are measured afterward. For investors in the control group, climate-impact beliefs are measured only once, so their initial values correspond to final values. *Preference green fund* denotes the share of retail investors who prefer the green fund over the conventional fund. *WTP* measures respondents' willingness-to-pay for the green fund. *p*-values are based on Mann–Whitney *U* tests on between-group differences, except for *Preference for green fund*, where we use a chi-square test; ***, **, and * indicate a significant at the 1%, 5%, and 10% levels, respectively.

Treatment effect on climate impact beliefs. We show that our information treatment was effective in altering retail investors' beliefs about the climate impact of the green fund. The initial, pre-treatment agreement with the statement that the green fund makes a relevant contribution to reducing global GHG emissions is well balanced between the treatment and the control groups ($p = 0.447$, Mann–Whitney U test). After retail investors learn about the impact beliefs of academic experts, their mean level of agreement turns negative (-1.24, on a scale from -10 to 10). This is significantly lower than their initial impact beliefs stated before the treatment ($p < 0.001$, Wilcoxon signed-rank test), as well as the level of agreement stated by the control group ($p < 0.001$, Mann–Whitney U test).

Treatment effect on investment decisions. Treatment with information about the impact beliefs of academic experts causes a statistically significant decrease in the proportion of retail investors who prefer the green fund over a conventional alternative, while also reducing WTP for the green fund. While 62% of retail investors prefer the green fund in the control group, 56% do so in the treatment group; this difference is statistically significant ($p = 0.004$, Chi–Square test). The mean WTP in the treatment group (€4.67) is significantly lower than in the control group (€6.11, $p = 0.022$, Mann–Whitney U test). These results hold if we control for demographic characteristics and preferences in OLS regressions (see Table A9). The detailed distribution of WTP for the green fund per group can be found in Figure A7.

Examining subgroups, we only observe a treatment effect on the WTP of retail investors who have positive prior impact beliefs and who are concerned about climate change (Table 3). We find the same pattern for the treatment effect on the share of investors who prefer the green fund (see Table A10).

Table 3: Treatment effect on WTP by subgroup

	Mean WTP		**Difference**	***p*-value**
	Control	**Treatment**	Treatment – Control	
Agreement: relevant climate impact				
Positive (N=1,604)	8.46	5.99	−2.47***	0.001
Negative/neutral (N=497)	−1.11	0.19	1.30	0.402
Climate concern				
Positive (N=1,833)	7.30	5.37	−1.93***	0.008
Negative/neutral (N=268)	−1.56	−0.45	1.11	0.806

This table reports the effects of the information treatment on retail investors' WTP for the green fund across subgroups. First, treatment effects are shown separately for respondents who agree that investing in the fund makes a relevant contribution to reducing global GHG emissions and for those who disagree or express a neutral view. Second, treatment effects are reported separately for respondents who express positive levels of concern about climate change and for those who report negative or neutral levels of concern. The first two columns report the mean of the variables in each group, and the third column reports the difference between these two values. The fourth column reports the p-values of a Mann–Whitney U on this difference; ***, **, and * indicate a significant difference between the groups at the 1%, 5%, and 10% levels, respectively.

Furthermore, we find that our results are unlikely to be driven by experimenter-demand effects. Such effects have been found less likely in anonymous online panel settings (De Quidt, Haushofer, & Roth, 2018) and when monetary incentives are involved (Haaland, Roth, & Wohlfart, 2023; Stantcheva, 2023). We explicitly test for potential experimenter demand effects, following Allcott and Taubinsky (2015). We measure respondents' tendency to adjust their behavior to meet others' expectations using the self-monitoring scale introduced by Snyder (1974). We would expect that potential experimenter-demand effects would lead to a stronger treatment effect for individuals who score high on self-monitoring. However, in OLS regressions of the WTP for the green fund on the treatment indicator, we do not find any significant interactions between the treatment and our measures of self-monitoring (see Table A11).

Finally, we document that the climate attributes of the green fund were foremost in the minds of most retail investors who chose it. We find that, while the treatment had a clear effect on the climate impact beliefs of retail investors, it also led to a significant – albeit less pronounced – reduction in investors' return expectations for the green fund (see Table A12). This indicates that retail investors, to some degree, draw inferences about the green fund's financial performance based on the impact beliefs of academic experts. Yet we find that according to their own statements, climate considerations were predominant in the decisions of investors, both in the treatment and control groups, with no significant increase in financial considerations caused by the treatment. After the WTP elicitation, we ask retail investors about the reason for their fund choice in an open-ended question. We hand-code responses as motivated by climate or financial considerations. In the control group, 56% of the reported reasons were related to climate, compared to 53% in the treatment group; the difference is not statistically significant ($p = 0.570$, Chi-Square test; see Table A13).

3.3 Retail investors focus on company impact rather than investor impact

Analyzing respondents' explanations for their impact beliefs, we find that retail investors' optimism is likely driven by a focus on the impacts made by companies in the portfolio, rather than by the investment itself. To better understand the mental models retail investors use when assessing the climate impact of green investments and how these models might differ from those used by academic experts, we ask both groups to explain their reasoning for their

climate impact beliefs. The responses to this open-ended question reveal stark differences in how academic experts and retail investors think about the climate impact of investments.

To analyze respondents' rationales, we hand-code their arguments and order them into three overarching categories. Following Kölbel et al. (2020), we differentiate between company-impact arguments (arguments focusing on the climate impact of firms) and investor-impact arguments (arguments concerning the effect an investment has on the climate impact of firms). Arguments that do not match these two categories are subsumed under other arguments. Detailed coding procedures can be found in Annex B; Table B1 summarizes the detailed categories we used.

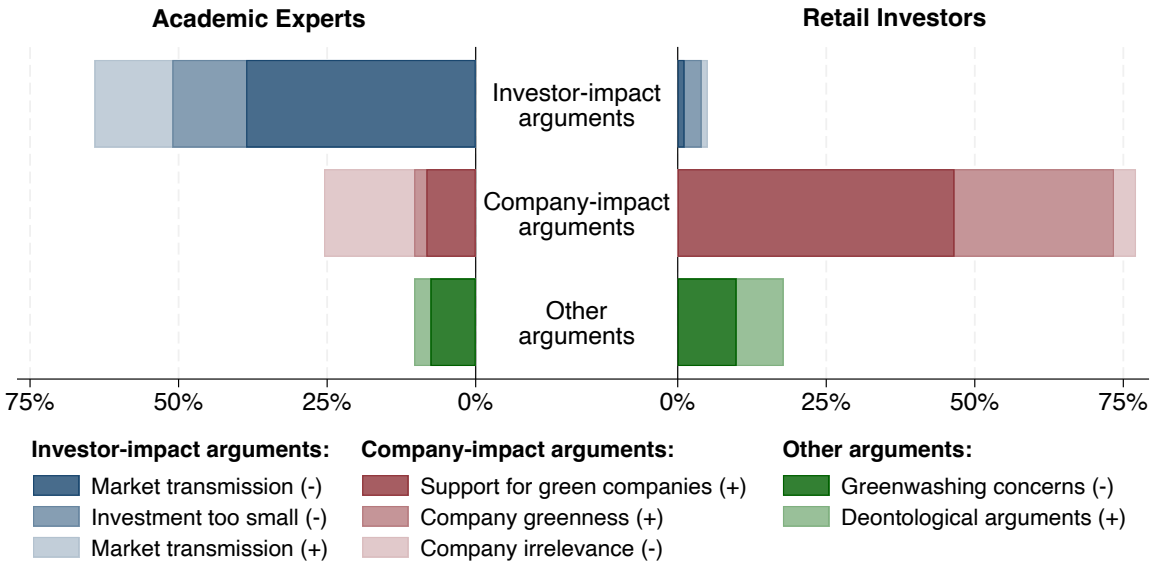


Figure 7: Impact rationales of academic experts and retail investors
This figure displays the distribution of rationales offered by retail investors and academic experts regarding why they believe investing in the green fund does or does not generate real-world impact. Rationales are grouped into three categories: investor-impact arguments, company-impact arguments, and other arguments. Bars to the left represent responses of academic experts, while those to the right represent responses of retail investors. Arguments marked with (+) speak in favour of a climate impact, arguments marked with (−) speak against it. Detailed descriptions of each argument are provided in Table B1. Responses that could not be classified are excluded.

We find that investor-impact arguments account for the majority of rationales provided by academic experts (64%). Within this category, statements arguing against the notion that the investment has a relevant impact on firm behavior are dominant; in this connection, inefficient market transmission is primarily cited as a reason. Many academic experts emphasize the

indirect nature of a potential causal effect, which requires a chain of effects running through a firm's stock price, cost of capital, and ultimately, its financing decisions and investment activities. Many arguments highlight that all of these steps are uncertain or even unlikely, especially when considering equilibrium effects in efficient financial markets, as illustrated by the following statement:

> When I invest in an ETF, I am buying a basket of stocks from another investor in the market, not directly from the companies in the ETF. For my investment to influence the companies' decisions, it needs to impact their cost of capital. This involves several steps: (1) My investment increases overall demand for the ETF. (2) Authorized participants engage in arbitrage, causing the stock prices of the companies in the ETF to rise. (3) Higher stock prices reduce the companies' cost of capital in future financing activities. Each step in this chain involves uncertainty, making the link between my investment and the companies' decisions indirect and uncertain.

To a lesser extent, academic experts wage company-impact arguments, predominantly stressing that the fund's holdings are largely irrelevant for reducing greenhouse gas emissions, as they are in sectors with low climate relevance or are otherwise unlikely to reduce their emissions. Often, these arguments point out that the funds' top holdings are in the technology, insurance, or luxury-goods sectors, which are not very emission-intensive to start with, as exemplified by the following statement:

> Mostly, however, the companies in the fund are financial companies, insurance companies, IT, and luxury brands. I am doubtful that they will contribute significantly to a reduction in climate change.

By contrast, company-impact arguments dominate in the rationales provided by retail investors (77%). Within this category, most statements show support for a positive climate impact. As a justification for this belief, many retail investors cite "greenness," i.e., the positive climate impact of portfolio companies, without accounting for how a fund investment affects these firms. This is illustrated by the following statement:

> Because investments are only made in companies that contribute to climate protection.

Furthermore, many retail investors provide arguments implying that investing in the green fund supports green firms, without explaining how this support is actually achieved. The following statement provides an example:

> I hope that this will support companies that produce in a climate-friendly manner or contribute to climate protection in some other way.

Finally, for both academic experts and retail investors, we find a smaller share of arguments citing greenwashing or deontological concerns. Arguments concerning greenwashing primarily cite a lack of trust – e.g., in the intentions of the asset manager, the metrics used, or the firm's intention to follow through with climate commitments – as a reason for respondents' skepticism about the fund's climate impact. This is exemplified by the following retail investor statement:

> What companies write or do on paper is still different from what actually happens.... It's a great back-and-forth calculation, but I don't think it really leads to significant savings.

Deontological arguments emphasize that investing in the green fund is important or morally right, without providing any reasoning as to how an impact is achieved. The following statement provides an example:

> Everyone must contribute to climate protection. We urgently need action instead of just talking about climate change.

In summary, when we compare the climate impact rationales provided by academic experts and retail investors, we find that the latter's optimistic beliefs about the green fund's climate are driven by a neglect for financial-market transmission mechanisms, in addition to a focus on the impact exerted by portfolio companies rather than the investment itself.

4 Conclusion

This paper documents a substantial divergence between the beliefs of retail investors and academic experts regarding the climate impact that can be expected from a green investment product. While most academic experts are skeptical that typical green funds meaningfully reduce global greenhouse gas emissions, retail investors tend to hold optimistic views. Our evidence suggests that these beliefs have significant behavioral effects – specifically, investors' willingness to pay for the green fund correlates with their beliefs about climate impact, and information about academic experts' impact beliefs causes retail investors to revise their assessments, lowering demand for the green fund. Qualitative analysis suggests that the observed divergence in beliefs between the surveyed groups is rooted in distinct mental models regarding how investments can (or cannot) have an impact. Academic experts primarily consider the effect an investment will have on firm behavior, while retail investors focus predominantly on the climate impact achieved by portfolio companies.

Overall, our results suggest that there is a discrepancy between what retail investors aim to achieve and what green investment products actually accomplish. This may lead to mis-selling or to the misallocation of scarce resources required to address societal challenges.

References

Allcott, H., & Taubinsky, D. (2015). Evaluating behaviorally motivated policy: Experimental evidence from the lightbulb market. *American Economic Review*, *105*(8), 2501–2538.

Andre, P., Schirmer, P., & Wohlfart, J. (2023). Mental models of the stock market. *Working Paper*.

Andre, P., Pizzinelli, C., Roth, C., & Wohlfart, J. (2022). Subjective models of the macroeconomy: Evidence from experts and representative samples. *The Review of Economic Studies*, *89*(6), 2958–2991.

Andre, P., Haaland, I., Roth, C., Wiederholt, M., & Wohlfart, J. (2025). Narratives about the macroeconomy. *The Review of Economic Studies*, accepted.

Aron-Dine, S., Beutel, J., Piazzesi, M., & Schneider, M. (2024). Household climate finance: Theory and survey data on safe and risky green assets. *Working Paper*.

Barber, B. M., Morse, A., & Yasuda, A. (2021). Impact investing. *Journal of Financial Economics*, *139*(1), 162–185.

Bauer, R., Dong, B., & Jiao, P. (2025). Sustainability preferences: The role of beliefs. *Working Paper*.

Bauer, R., Ruof, T., & Smeets, P. (2021). Get real! Individuals prefer more sustainable investments. *The Review of Financial Studies*, *34*(8), 3976–4043.

Bauer, R., Gödker, K., Smeets, P., & Zimmermann, F. (2024). Mental models in financial markets: How do experts reason about the pricing of climate risk? *Working Paper*.

Becht, M., Franks, J. R., Miyajima, H., & Suzuki, K. (2023). Does paying passive managers to engage improve ESG performance?

Becker, G. M., DeGroot, M. H., & Marschak, J. (1964). Measuring utility by a single-response sequential method. *Behavioral Science*, *9*(3), 226–232.

Berk, J. B., & Van Binsbergen, J. H. (2025). The impact of impact investing. *Journal of Financial Economics*, *164*, 103972.

BlackRock. (2024). People & Money: Trends, die das Investieren in Deutschland prägen.

Bonnefon, J.-F., Landier, A., Sastry, P., & Thesmar, D. (2025). The moral preferences of investors: Experimental evidence. *Journal of Financial Economics*, *163*, 103955.

Broccardo, E., Hart, O., & Zingales, L. (2022). Exit versus voice. *Journal of Political Economy*, *130*(12), 3101–3145.

Ceccarelli, M., & Ramelli, S. (2024). Climate transition beliefs. *Working Paper*.

Cheng, G., Jondeau, E., Mojon, B., & Vayanos, D. (2024). The impact of green investors on stock prices. *Review of Finance*, forthcoming.

De Angelis, T., Tankov, P., & Zerbib, O. D. (2023). Climate impact investing. *Management Science*, *69*(12), 7669–7692.

De Quidt, J., Haushofer, J., & Roth, C. (2018). Measuring and bounding experimenter demand. *American Economic Review*, *108*(11), 3266–3302.

Dimson, E., Karakaş, O., & Li, X. (2015). Active ownership. *Review of Financial Studies*, *28*(12), 3225–3268.

Dyck, A., Lins, K. V., Roth, L., & Wagner, H. F. (2019). Do institutional investors drive corporate social responsibility? International evidence. *Journal of Financial Economics*, *131*(3), 693–714.

Favilukis, J. Y., Garlappi, L., & Uppal, R. (2023). How effective are portfolio mandates? *Working Paper*.

Filippini, M., Leippold, M., & Wekhof, T. (2024). Sustainable finance literacy and the determinants of sustainable investing. *Journal of Banking Finance*, *163*, 107167.

Flammer, C., Giroux, T., & Heal, G. (2024). Blended finance. *Working Paper*.

Geczy, C., Jeffers, J. S., Musto, D. K., & Tucker, A. M. (2021). Contracts with (social) benefits: The implementation of impact investing. *Journal of Financial Economics*, *142*(2), 697–718.

Giglio, S., Maggiori, M., Rillo, J., Stroebel, J., Utkus, S. P., & Xu, X. (2025). Investor beliefs and expectation formation. *Annual Review of Financial Economics,* forthcoming.

Giglio, S., Maggiori, M., Stroebel, J., Tan, Z., Utkus, S., & Xu, X. (2025). Four facts about ESG beliefs and investor portfolios. *Journal of Financial Economics*, *164*, 103984.

Gormsen, N. J., Huber, K., & Oh, S. S. (2024). Climate capitalists. *Working Paper*.

Green, D., & Roth, B. N. (2025). The allocation of socially responsible capital. *The Journal of Finance*, *80*(2), 755–781.

Haaland, I., Roth, C., & Wohlfart, J. (2023). Designing information provision experiments. *Journal of Economic Literature*, *61*(1), 3–40.

Hartzmark, S. M., & Shue, K. (2022). Counterproductive sustainable investing: The impact elasticity of brown and green firms. *Working Paper*.

Hartzmark, S. M., & Sussman, A. B. (2019). Do investors value sustainability? A natural experiment examining ranking and fund flows. *The Journal of Finance*, *74*(6), 2789–2837.

Heath, D., Macciocchi, D., Michaely, R., & C. Ringgenberg, M. (2023). Does socially responsible investing change firm behavior? *Review of Finance*, *27*(6), 2057–2083.

Heeb, F., Kölbel, J. F., Paetzold, F., & Zeisberger, S. (2023). Do investors care about impact? *The Review of Financial Studies*, *36*(5), 1737–1787.

Heinkel, R., Kraus, A., & Zechner, J. (2001). The effect of green investment on corporate behavior. *Journal of Financial and Quantitative Analysis*, *36*(4), 431–449.

Hoepner, A. G., Oikonomou, I., Sautner, Z., Starks, L. T., & Zhou, X. Y. (2024). ESG shareholder engagement and downside risk. *Review of Finance*, *28*(2), 483–510.

Inderst, R., & Opp, M. M. (2025). Sustainable finance versus environmental policy: Does greenwashing justify a taxonomy for sustainable investments? *Journal of Financial Economics*, *163*, 103954. https://doi.org/10.1016/j.jfineco.2024.103954

Jeffers, J., Lyu, T., & Posenau, K. (2024). The risk and return of impact investing funds. *Journal of Financial Economics*, *161*, 103928.

Koch, N. S., Moreno, A. R., & Cooke, D. (2025). *Mind the gap: Why European retail investors don't get what they want: A summary of our market research in 14 EU countries*. Sustainable Finance Observatory.

Kölbel, J. F., Heeb, F., Paetzold, F., & Busch, T. (2020). Can sustainable investing save the world? Reviewing the mechanisms of investor impact. *Organization & Environment*, *33*(4), 554–574.

Kostovetsky, L., Peng, L., Rauh, C., & Yönaç, M. (2024). Measuring local climate change attention: Does it affect investors and firms? *Working paper*.

Landier, A., & Lovo, S. (2025). Socially responsible finance: How to optimize impact. *The Review of Financial Studies*, *38*(4), 1211–1258.

Oehmke, M., & Opp, M. M. (2025). A theory of socially responsible investment. *Review of Economic Studies*, *92*(2), 1193–1225.

Pástor, L., Stambaugh, R. F., & Taylor, L. A. (2021). Sustainable investing in equilibrium. *Journal of Financial Economics*, *142*(2), 550–571.

Pedersen, L. H. (2025). Can sustainable finance save the planet? *Journal of Finance: Insights and Perspectives*, forthcoming.

Pedersen, L. H., Fitzgibbons, S., & Pomorski, L. (2021). Responsible investing: The ESG-efficient frontier. *Journal of Financial Economics*, *142*(2), 572–597.

Riedl, A., & Smeets, P. (2017). Why do investors hold socially responsible mutual funds? *The Journal of Finance*, *72*(6), 2505–2550.

Snyder, M. (1974). Self-monitoring of expressive behavior. *Journal of Personality and Social Psychology*, *30*(4), 526–537.

Stantcheva, S. (2023). How to run surveys: A guide to creating your own identifying variation and revealing the invisible. *Annual Review of Economics*, *15*, 205–234.

A Additional Figures and Tables

Fund

[redacted]EMU Paris-Aligned Climate UCITS ETF

Fund Description

The Fund invests in European companies committed to reducing their carbon emissions in line with the Paris Climate Agreement's goal of limiting global warming to below 2°C. It is designed for investors looking to reduce exposure to climate risks and excludes businesses involved in fossil fuel production or environmental or social controversies. It is a diversified fund that passively tracks an EU Paris-Aligned benchmark.

Key Facts

Asset Class:	Equity Europe
Net Assets:	1,063.04 Million EUR
Total Expense Ratio:	0.15%
Benchmark:	[redacted] EMU Climate Paris Aligned Benchmark Select Index

Performance	Year-to-date	1 year	3 years
Return:	+8.65%	+23.13%	+3.27%

Climate Indicators	**Fund**	[redacted] EMU Index
Implied Temperature Rise:	**1.5° - 2.0°C**	2.0 - 2.5°C
Weighted Average Carbon Intensity: (tCO_2/Mil. USD Sales)	**60.71**	87.88

Top-Ten Fund Holdings	**%**		**%**
SAP	5.16	Allianz	2.57
ASML Holding NV	4.93	Sanofi SA	2.32
Schneider Electric	4.04	Iberdrola SA	2.01
LVMH	3.43	AXA SA	1.92
Siemens N AG	2.78	Munich Re	1.90

Explanations

Implied Temperature Rise: Measures how well a fund's holdings align with the Paris Agreement's goal of limiting global warming to below 2°C.
Weighted Average Carbon Intensity: Measures how much a fund is exposed to carbon-intensive companies. It estimates the carbon emissions per $1 million in sales for the fund's holdings.
[redacted]**:** Name of the Index Provider. **EMU:** European Economic and Monetary Union, including Austria, Belgium, Finland, France, Germany, Ireland, Italy, the Netherlands, Portugal and Spain. **UCITS:** Fund that meets the EU's UCITS requirements intended to protect investors. [redacted]
EMU Index: Comparable European equity index without climate focus.

Figure A1: Fund information shown to respondents

The figure displays the information respondents received about the green fund before stating their impact beliefs. Respondents see the fund information prior to providing their beliefs and investment preferences in the survey. Additionally, they have the option to review the full fund factsheet, as well as a summary of the index methodology.

[Back to main text]

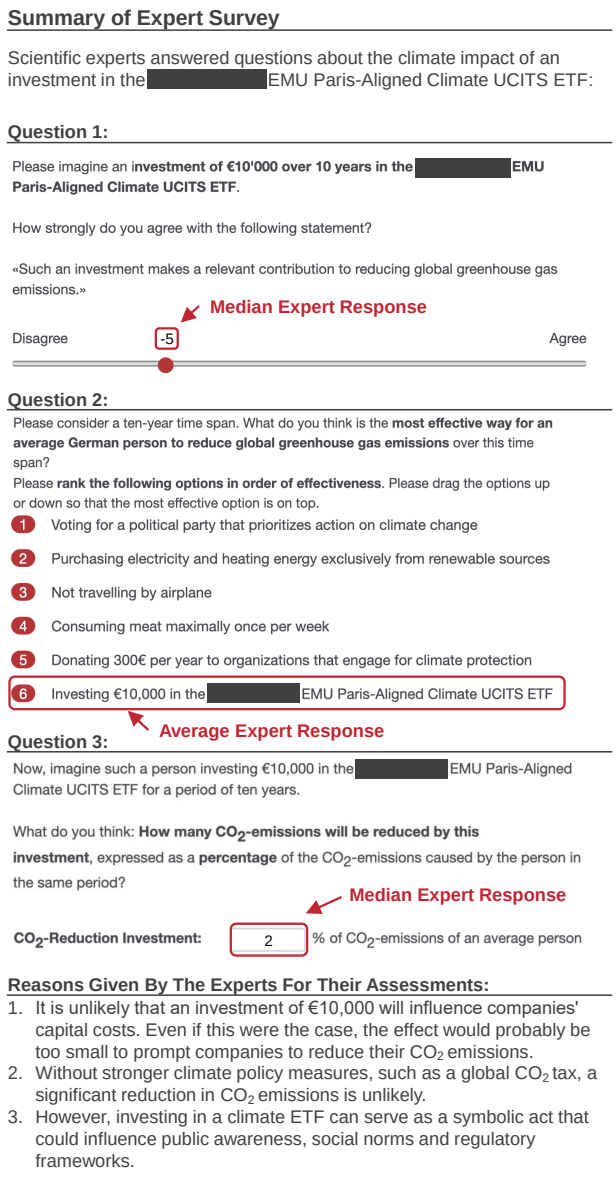


Figure A2: Information treatment summarizing experts impact beliefs
The figure shows the information presented to retail investors in the treatment group prior to the elicitation of their WTP for the green fund.

[Back to main text]

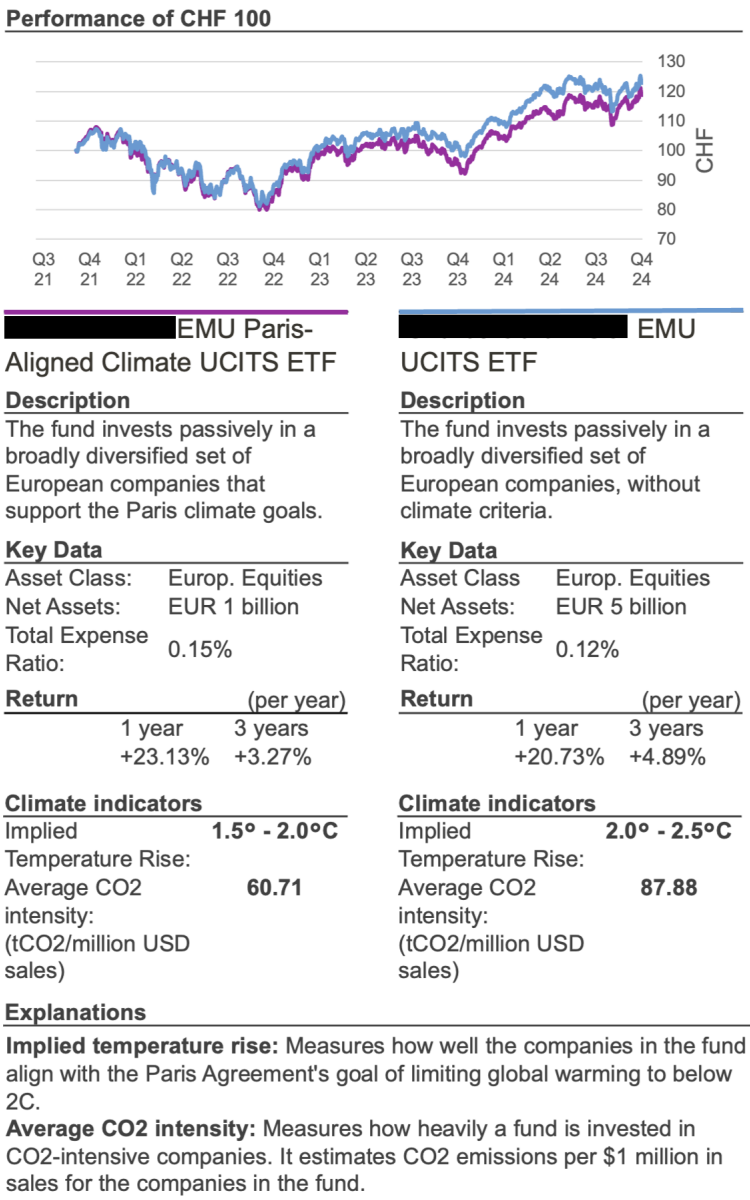


Figure A3: Fund summary shown in the WTP elicitation
The figure shows the fund information retail investors see during the WTP elicitation.

[Back to main text]

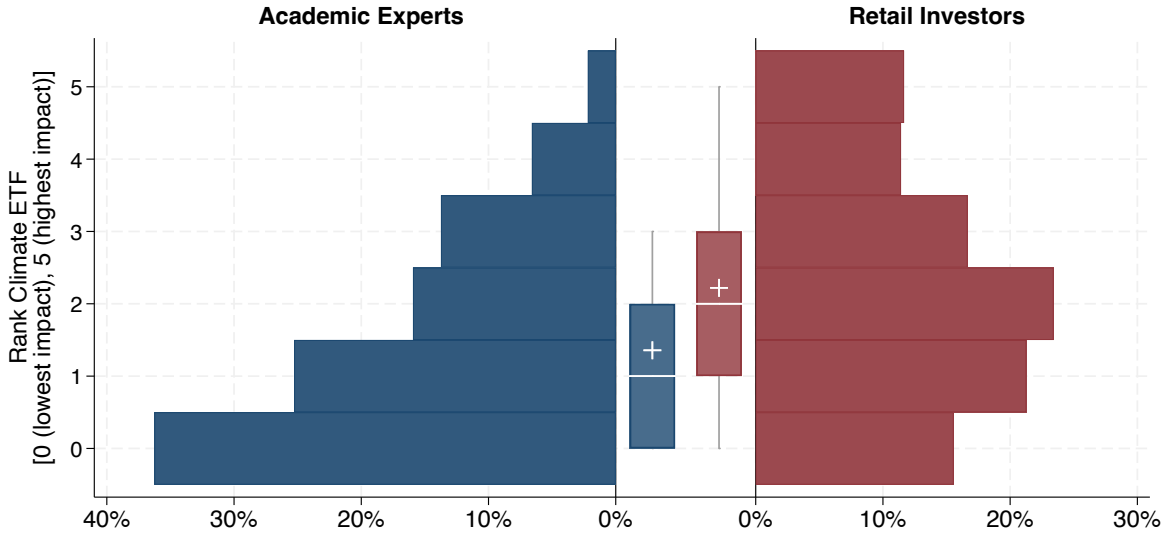


Figure A4: Impact rank of the green fund among other climate actions
This figure presents histograms of how academic experts and retail investors rank the green fund's impact relative to five other personal climate actions. Higher values indicate greater perceived impact, with 0 representing the lowest and 5 the highest impact. Observations are grouped in one-scale-point bins. The vertical bar indicates the 10th, 25th, 50th, 75th, and 90th percentiles of the distribution; the "+" markers denote the mean.

[Back to main text]

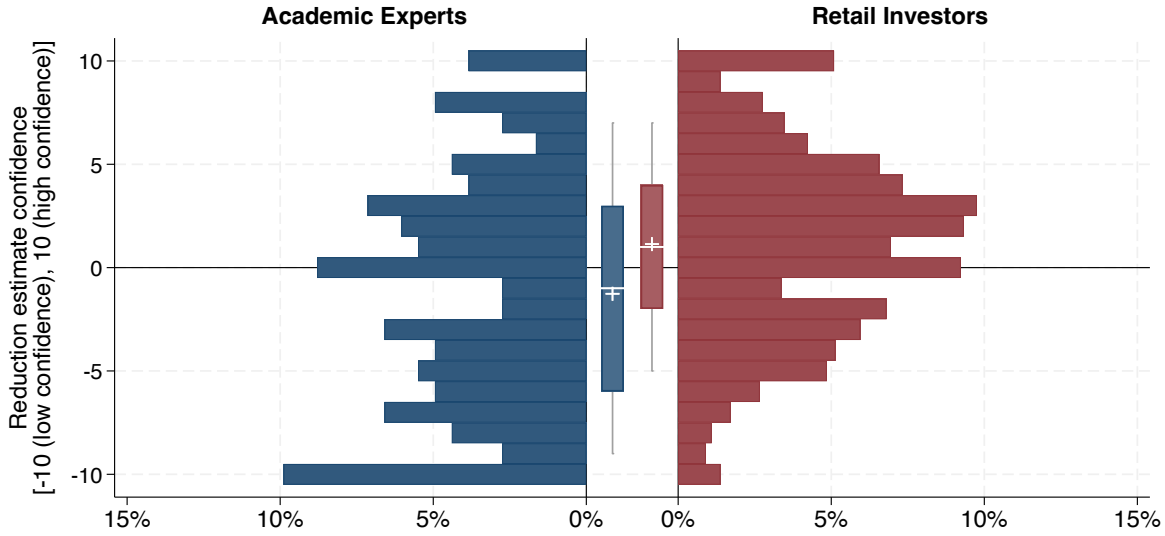


Figure A5: Confidence in carbon-footprint reduction estimates
This figure presents histograms of respondents' confidence in their stated carbon-footprint reduction estimates, shown separately for academic experts and retail investors. Observations are grouped in one-scale-point bins. The vertical bars indicate the 10th, 25th, 50th, 75th, and 90th percentiles of the distribution; the "+" markers denote the mean.

[Back to main text]

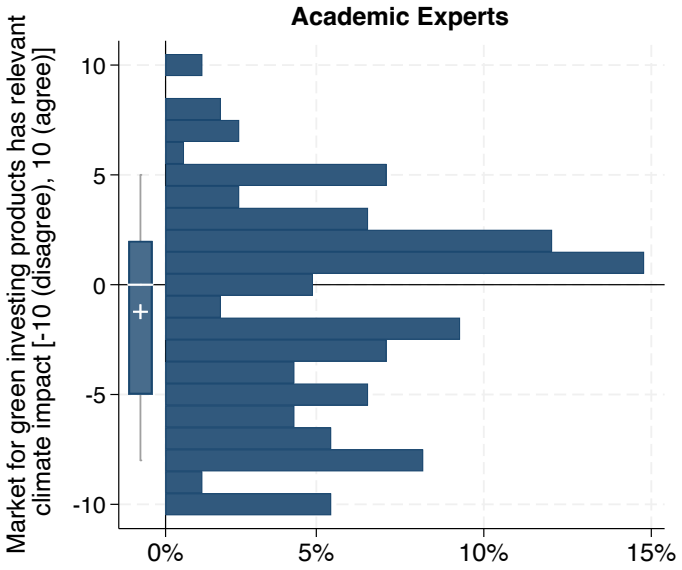


Figure A6: Academic experts' views on the market-level climate impact of green investing

This figure presents a histogram of academic experts' level of agreement with the statement that the current market for green investing products makes a relevant contribution to fighting climate change. Observations are grouped in one-scale-point bins. The vertical bar indicates the 10th, 25th, 50th, 75th, and 90th percentiles of the distribution, while the "+" marker denotes the mean.

[Back to main text]

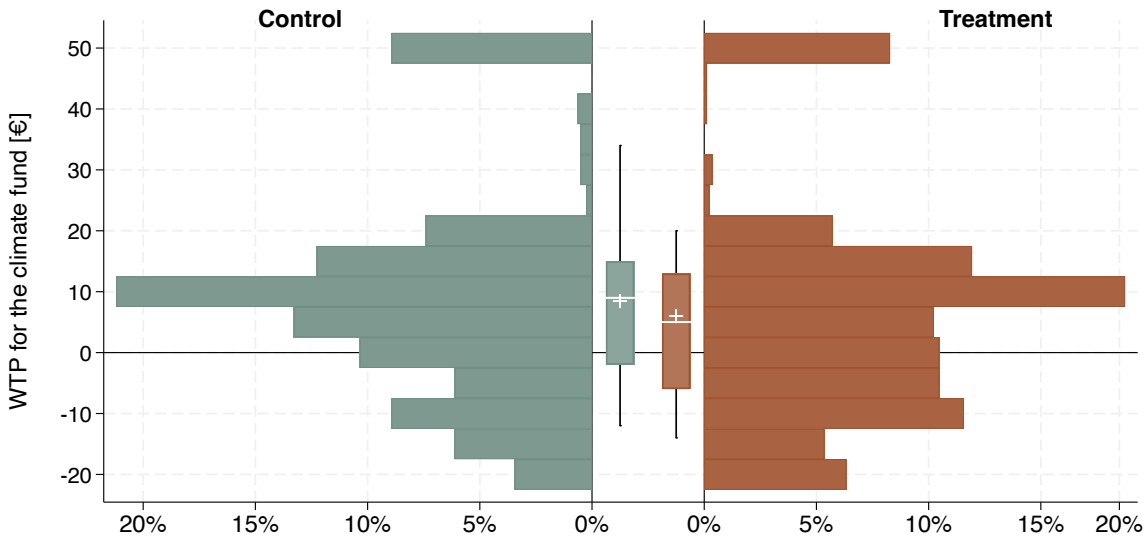


Figure A7: WTP for the green fund in the treatment and control groups
This figure presents histograms of retail investors' WTP for the green fund, shown separately for the treatment and control groups. Observations are grouped in 5-€-point bins. Vertical bars indicate the 10th, 25th, 50th, 75th, and 90th percentiles of the distribution; the "+" markers denote the mean.

[Back to main text]

Table A1: Summary statistics including incomplete expert responses

Variable	N	min	p25	mean	p50	p75	max	sd
Academic experts								
Agreement: relevant climate impact [-10, 10]	201	−10.00	−8.00	−2.50	−4.00	2.00	10.00	5.96
Impact rank [0: lowest, 5: highest]	198	0.00	0.00	1.39	1.00	2.00	5.00	1.37
Carbon-footprint reduction estimate [%]	190	0.00	0.01	5.84	2.25	9.75	30.00	8.39

This table reports summary statistics for our main variables for academic experts, including observations from incomplete survey responses. Variable definitions are provided in Table A3.

[Back to main text]

Table A2: Retail investors' demographics in the treatment and control groups

	Mean		**Difference**	***p*-value**
	Control	**Treatment**	Treatment – Control	
Education	Technical College	Technical College	0.07	0.375
Politics	Center	Center	0.00	0.968
Male [%]	66.09%	66.70%	0.61	0.803
Age [years]	45.75	45.07	0.68	0.279
Income [€1,000/y]	60-75	60-75	0.08	0.464
Net worth [€1,000]	100-200	100-200	−0.06	0.524
Climate concern [-10, 10]	5.19	5.38	−0.18	0.374
Self-monitoring [-10, 10]	−0.11	−0.20	0.09	0.309
Investment knowledge [-10, 10]	0.84	0.85	−0.01	0.990
Altruism [-10, 10]	3.06	2.99	0.07	0.741

This table summarizes the demographic characteristics for retail investors in the control and treatment groups. A detailed description of the demographic variables is provided in Table A3. *p*-values are based on Mann–Whitney *U* tests on between-group differences, except for *male*, where we use a chi-square test; ***, **, and * indicate a significant at the 1%, 5%, and 10% levels, respectively.

[Back to main text]

Table A3: Variable descriptions

Variable	Description
Climate impact perceptions	
Agreement: relevant climate impact	Respondents' level of agreement with the statement that a ten-year investment of €10,000 in the green fund makes a relevant contribution to reducing global GHG emissions. Responses are recorded on a scale from −10 (disagree) to 10 (agree).
Impact rank	Respondents' ranking of the climate impact of a ten-year €10,000 investment in the green fund relative to five other personal climate actions. Higher values indicate greater impact, with 0 representing the lowest and 5 the highest impact rank.
Carbon-footprint reduction estimate	Respondents' estimates of the share of CO_2 emissions generated by an average German over a ten-year period that would be offset by investing €10,000 in the green fund for the same duration. Respondents report their estimates as a percentage.
Reduction estimate confidence	Respondents' stated level of confidence in their carbon-footprint reduction estimates. Responses are recorded on a scale from −10 (low conficence) to 10 (high confidence).
Financial and impact expectations	
Preference for green fund	Indicator equal to 1 for respondents who prefer to invest in the green fund and 0 for those who prefer to invest in the conventional fund.
WTP	Respondents' willingness to pay for the green fund.
Return expectations	Expected return difference between the green fund and the conventional alternative. Responses are recorded on a scale ranging from −10 (indicating a higher expected return for the conventional fund) to 10 (indicating a higher expected return for the green fund).
Risk expectations	Expected risk difference between the green fund and the conventional alternative. Responses are recorded on a scale ranging from −10 (indicating a higher risk expectation for the green fund) to 10 (indicating a higher risk expectation for the conventional fund).
Positive emotions	Answer to the question "Which fund feels better to invest in?". Responses are recorded on a scale ranging from −10 (indicating a better feeling for the conventional fund) to 10 (indicating a better feeling for the green fund).
Personal values	Answer to the question "Which of the two funds better reflects your personal values?". Responses are recorded on a scale ranging from −10 (indicating better value alignment for the conventional fund) to 10 (indicating better value alignment for the green fund).
Preferences and behavioural attributes	
Climate concern	Respondents' level of agreement with the statement that greater efforts are needed to reduce global GHG emissions. Responses are recorded on a scale from −10 (disagree) to 10 (agree).
Investment knowledge	Answer to the question "How would you rate your knowledge of investment products and financial markets?"' on a scale from −10 (superficial) to 10 (in-depth).
Green investing experience	Indicator equal to 1 for respondents who report that they invest a large part of their assets in sustainable investment products.

Altruism	Respondents' stated willingness to share resources without expecting any return. Responses are recorded on a scale from −10 (not at all willing) to 10 (fully willing).
Social belonging	Agreement with the statement, "It is important for me to fit into the group I belong to." Responses are recorded on a scale from −10 (disagree) to 10 (agree).
Social influence on behavior	Agreement with the statement, "My behavior is often influenced by how I think others want me to behave." Responses are recorded on a scale from −10 (disagree) to 10 (agree).
Empathic intuition	Agreement with the statement, "I have good intuition when it comes to understanding the feelings and motives of others." Responses are recorded on a scale from −10 (disagree) to 10 (agree).
Authenticity of behavior	Agreement with the statement, "My behavior is usually an expression of my true inner feelings, attitudes, and beliefs." Responses are recorded on a scale from −10 (disagree) to 10 (agree).
Adaptive behavior	Agreement with the statement, "As soon as I know what the situation requires, it's easy for me to adapt my behavior accordingly." Responses are recorded on a scale from −10 (disagree) to 10 (agree).
Consistency in opinions	Agreement with the statement, "I would NOT change my mind to please someone or win their favour." Responses are recorded on a scale from −10 (disagree) to 10 (agree).
Demographics	
Age	Self-reported age in full years.
Gender	Self-reported gender.
Gender: male	Binary indicator equal to 1 for male respondents.
Highest education	Self-reported level of highest achieved education.
Higher education	Binary indicator equal to 1 for respondents with a tertiary education.
Income	Self-reported annual gross household income, before taxes and social security contributions.
High income	Binary indicator equal to 1 for respondents with above-median income.
Net worth	Self-reported total net household worth.
High net worth	Binary indicator equal to 1 for respondents declaring above-median net worth.
Political preference	Answer to the question "Where do you place yourself on the political spectrum from left to right?" measured on a 7-point scale ranging from 1 (strongly left) to 7 (strongly right).
Politics: left	Binary indicator equal to 1 for respondents declaring a political preference below 4.
Politics: right	Binary indicator equal to 1 for respondents declaring a political preference above 4.

This table provides the definitions of the main variables used in the paper.

[Back to main text]

Table A4: Treatment effect on unwinzorized WTP

	Mean		**Difference**	p**-value**
	Control	**Treatment**	**Treatment − Control**	
WTP [€]	6.55	5.24	-1.31^{**}	0.022

This table presents the effects of the information treatment on retail investors' unwinzorized WTP. Retail investors' *WTP* for the green fund is measured in euros. p-values are based on Mann-–Whitney U tests on between-group differences, where ***, **, and * indicate a significant at the 1%, 5%, and 10% levels, respectively.

[Back to main text]

Table A5: Summary statistics

Variable	N	min	p25	mean	p50	p75	max	sd
Retail investors								
Agreement: relevant climate impact [-10, 10]	2,101	−10.00	1.00	2.83	3.00	6.00	10.00	4.87
Impact rank [0: lowest, 5: highest]	2,101	0.00	1.00	2.22	2.00	3.00	5.00	1.57
Carbon-footprint reduction estimate [%]	2,101	0.00	5.00	16.72	10.00	20.00	60.00	16.86
WTP [€]	2,101	-	−5.00	5.38	4.00	12.00	50.00	16.82
Academic experts								
Agreement: relevant climate impact [-10, 10]	182	−10.00	−8.00	−2.66	−5.00	2.00	10.00	5.98
Carbon-footprint reduction estimate [%]	182	0.00	0.01	5.84	2.00	8.75	30.00	8.51
Impact rank [0: lowest, 5: highest]	182	0.00	0.00	1.36	1.00	2.00	5.00	1.38

This table provides summary statistics for our main variables, with retail investors and academic experts reported separately. Variable definitions are provided in Table A3.

[Back to main text]

Table A6: Academic experts' impact beliefs by subgroup

	Agreement: relevant climate impact	**Carbon-footprint reduction estimate**	**Climate concern**
Seniority			
Senior faculty (N=71)	−2.45	4.99	8.27
Junior faculty (N=81)	−2.78	5.84	8.51
Graduate student (N=22)	−3.14	8.43	6.73
Other (N=8)	−2.00	6.13	7.88
Region			
Asia (N=26)	1.12	9.15	8.08
Europe (N=91)	−3.41	4.44	8.21
USA (N=58)	−3.12	5.64	8.09
Other (N=7)	−3.14	13.29	8.71

This table summarizes academic experts' impact beliefs as well as their level of climate concern, broken down into subgroups by seniority (Senior Faculty, Junior Faculty, Graduate Student, Other) and regions (Asia, EU, USA, Other). The first column reports the mean values for academic experts' agreement with the statement that investing in the green fund makes a relevant contribution to reducing global GHG emissions; the second column reports their estimates of how much a €10,000 investment in the green fund reduces an average German's annual carbon footprint.

[Back to main text]

Table A7: Climate impact beliefs and retail investor characteristics

	Agreement: relevant climate impact	Carbon-footprint reduction estimate
Age	-0.01	0.01
	(0.01)	(0.03)
Gender: Male	-0.77***	-2.49***
	(0.18)	(0.83)
Higher education	-0.27	-0.97
	(0.18)	(0.75)
High income	-0.17	-1.60**
	(0.20)	(0.76)
High net worth	-0.32*	-1.60**
	(0.19)	(0.76)
Politics: left	-0.40*	-0.57
	(0.21)	(0.92)
Politics: right	-0.27	-0.16
	(0.23)	(0.90)
Climate concern	0.46***	0.28***
	(0.02)	(0.09)
Altruism	0.19***	0.41***
	(0.03)	(0.09)
Investment knowledge	0.07***	0.19**
	(0.02)	(0.08)
Green investing experience	0.94***	-0.97
	(0.33)	(1.58)
Constant	1.17***	17.21***
	(0.36)	(1.50)
Observations	2101	2101
R^2	0.312	0.037

This table reports OLS regressions of retail investors' climate impact beliefs on demographic characteristics, preferences, and investment knowledge. Column (1) reports the results for respondents' agreement with the statement that investing in the green fund makes a relevant contribution to reducing global GHG emissions; column (2) reports their estimates of how much a €10,000 investment in the green fund offsets an average German's annual carbon footprint. Variable definitions are provided in Table A3. ***, **, and * indicate that the parameter estimate differs significantly from zero at the 1%, 5%, and 10% levels, respectively.

[Back to main text]

Table A8: Regression of carbon-footprint reduction estimate on certainty

	Academic experts	Retail investors
Certainty	-0.33^{***}	0.43^{***}
	(0.096)	(0.082)
Constant	5.42^{***}	16.23^{***}
	(0.598)	(0.363)
Observations	182	2,101
R^2	0.050	0.014

This table reports OLS regressions of the reported carbon-footprint reduction estimates on the stated confidence in these estimates, with results provided separately for academic experts and retail investors. ***, **, and * indicate that the parameter estimate differs significantly from zero at the 1%, 5%, and 10% levels, respectively.

[Back to main text]

Table A9: Treatment effect on investment preferences with controls

	(1) WTP	(2) WTP	(3) Preference for green fund	(4) Preference for green fund
Treatment	-1.43^{*}	-1.41^{**}	-0.16^{***}	-0.18^{***}
	(0.73)	(0.71)	(0.06)	(0.06)
Age		0.07^{***}		0.00^{**}
		(0.02)		(0.00)
Gender: male		-1.61^{**}		-0.17^{***}
		(0.78)		(0.06)
Higher education		-0.74		0.02
		(0.72)		(0.06)
High income		0.74		0.01
		(0.81)		(0.06)
High net worth		-1.11		-0.11^{*}
		(0.76)		(0.06)
Politics: left		2.65^{***}		0.15^{**}
		(0.90)		(0.07)
Politics: right		-0.49		-0.15^{**}
		(0.87)		(0.07)
Climate concern		0.45^{***}		0.06^{***}
		(0.08)		(0.01)
Altruism		0.62^{***}		0.04^{***}
		(0.08)		(0.01)
State fixed effects	No	Yes	No	Yes
R^2/pseudo-R^2	0.002	0.096	0.004	0.093
N	2,101	2,101	2,101	2,101

This table reports regressions of retail investors' investment preferences on the treatment indicator, estimated with and without controls for investors' demographics and preferences. Columns (1) and (2) present OLS estimates of retail investors' WTP for the green fund. Columns (3) and (4) report probit regressions of an indicator variable equal to 1 for investors who prefer the green fund and 0 otherwise. The specifications in columns (1) and (2) include only the treatment indicator, whereas those in columns (3) and (4) additionally control for demographics, preferences, and fixed effects at the federal-state level. Variable definitions are provided in Table A3. ***, **, and * indicate that the parameter estimate differs significantly from zero at the 1%, 5%, and 10% levels, respectively.

[Back to main text]

Table A10: Preferences for the green fund in the treatment and control groups

	Fraction		**Difference**	p**-value**
	Control	**Treatment**	Treatment – Control	
Agreement: relevant climate impact				
Positive (N=1,604)	0.71	0.62	-0.09^{***}	< 0.001
Negative/neutral (N=497)	0.35	0.33	-0.02	0.661
Climate concern				
Positive (N=1,833)	0.66	0.60	-0.06^{**}	0.002
Negative/neutral (N=268)	0.32	0.27	-0.05	0.318

This table reports the effects of the information treatment on the share of respondents who prefer the green fund. First, treatment effects are shown separately for respondents who agree that the fund makes a relevant contribution to reducing global GHG emissions and for those who disagree or express a neutral view. Second, treatment effects are reported separately for respondents who express positive levels of concern about climate change and for those who report negative or neutral levels of concern. p-values are based on chi-square tests on between-group differences, where ***, **, and * indicate a significant at the 1%, 5%, and 10% levels, respectively.

[Back to main text]

Table A11: Treatment effect on WTP and self-monitoring

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Treatment	−1.47**	−1.45*	−1.58**	−1.08	−1.21	−1.65*	−1.90*
	(0.73)	(0.77)	(0.74)	(0.93)	(0.95)	(0.97)	(0.98)
Average self-monitoring	−0.16						
	(0.24)						
Treatment × Average self-monitoring	−0.12						
	(0.35)						
Social belonging		0.33***					
		(0.11)					
Treatment × Social belonging		0.07					
		(0.16)					
Social influence on behavior			−0.21**				
			(0.10)				
Treatment × Social influence on behavior			−0.07				
			(0.14)				
Empathic intuition				0.40***			
				(0.14)			
Treatment × Empathic intuition				−0.09			
				(0.19)			
Authenticity of behavior					−0.63***		
					(0.13)		
Treatment × Authenticity of behavior					0.04		
					(0.19)		
Adaptive behavior						0.19	
						(0.14)	
Treatment × Adaptive behavior						0.07	
						(0.20)	
Consistency in opinions							−0.25**
							(0.12)
Treatment × Consistency in opinions							−0.11
							(0.16)
Constant	6.09***	5.30***	5.80***	4.64***	3.50***	5.42***	4.91***
	(0.52)	(0.55)	(0.53)	(0.68)	(0.65)	(0.67)	(0.71)
Observations	2101	2101	2101	2101	2101	2101	2101
R^2	0.003	0.012	0.008	0.009	0.021	0.004	0.009

This table reports OLS regressions of retail investors' WTP for the green fund on the treatment indicator, their level of self-monitoring, as well as the interaction of these terms. We measure self-monitoring using the scale introduced by Snyder (1974). Column (1) reports the results for the average across the six self-monitoring measures; columns (2)–(8) report the results for the individual self-monitoring measures. Variable definitions are provided in Table A3. Robust standard errors are reported in parentheses. ***, **, and * indicate that the parameter estimate differs significantly from zero at the 1%, 5%, and 10% levels, respectively.

[Back to main text]

Table A12: Treatment effects on retail investors' fund perceptions and preferences

	Mean		**Difference**	***p*-value**
	Control	**Treatment**	Treatment – Control	
Risk expectations [-10, 10]	0.12	0.20	0.08	0.754
Return expectations [-10, 10]	−1.09	−1.79	−0.70***	0.003
Positive emotions [-10, 10]	2.89	2.14	−0.75***	< 0.001
Personal values [-10, 10]	2.36	1.56	−0.80***	< 0.001

This table presents the effects of the information treatment on retail investors' expectations regarding the financial performance of the green fund, their emotional responses to the fund, and the degree to which they perceive the fund to be aligned with their personal values. Variable definitions are provided in Table A3. *p*-values are based on Mann–Whitney *U* tests on between-group differences, where ***, **, and * indicate a significant at the 1%, 5%, and 10% levels, respectively.

[Back to main text]

Table A13: Investment reasons by treatment group

	Control		Treatment	
Investment reason	**Count**	**Share (%)**	**Count**	**Share (%)**
Climate-related reasons	436	56.18	399	53.48
Financial reasons	340	43.82	347	46.52

This figure summarizes retail investors' stated reasons for their investment choices in the treatment and control groups. We hand-code responses to an open-ended question asking investors to explain their choices, categorizing them as based on climate or financial concerns. Reasons not related to these two categories are excluded from this analysis. A chi-square test indicates no significant difference in the distribution of reasons between the treatment and control groups ($p = 0.314$).

[Back to main text]

B Categorizing impact arguments

To explore the mental models that retail investors and academic experts apply when evaluating the climate impact of green investments, we ask respondents to explain the reasoning that informs their climate impact beliefs. To this end, we display respondents' reported agreement with the statement that investments in the green fund make a relevant contribution to reducing global GHG emissions, and ask them to state their reasoning for this answer in an open-ended question. Responses to this question were optional. All replies were hand-coded following the procedures described below.

As a first step, based on an initial screening of the replies, we developed a set of eight argument categories. We then grouped these categories into three broader themes – investor-impact arguments; company-impact arguments; and other arguments – drawing on the conceptual framework posited by Kölbel et al. (2020). Table B1 summarizes these categories and provides illustrative examples.

In a second step, we hand-coded each respondent's arguments, assigning them to the eight categories. Each reply was independently coded by two co-authors, and individual replies could include multiple arguments. We excluded unintelligible replies and arguments that did not directly address the question. Inter-coder reliability was high, with a Krippendorff's alpha of 0.83. For cases in which coders disagreed, the final coding was jointly reconciled.

We obtained 1,133 valid arguments from retail investors, of which 92% could be assigned to one of the eight categories. From the academic experts, we obtained 168 valid arguments, 97% of which could be categorized accordingly.

Table B1: Impact argument categories

Category	Explanation	Example response
Investor-impact arguments		
Effective market transmission (+)	Investing green lowers these firms' cost of capital, encouraging greener growth and innovation.	"I believe the investment can contribute to reducing global greenhouse gas emissions because this ETF is designed to track companies that are actively working to reduce their carbon footprint, by, for example, investing in energy efficiency, renewable energy, or other low-carbon technologies. Even though an individual investment of 10,000 euros may seem small, by allocating capital to these companies, investors can help reduce their cost of capital, encouraging the implementation of more emission reduction strategies." (academic expert)
Ineffective market transmission (–)	Green investments don't change prices or behavior due to efficient markets or firm-level irrelevance.	"My read of the research on green investments is that there is not a robust cost of capital effect. In the absence of such an effect, the projects financed by ESG funds would have probably been financed through regular capital in their absence." (academic expert)
Investment too small (–)	One person's investment is too small to make any real difference.	"10,000 euros is a small amount in European capital markets. It is difficult to imagine that this investment will change the cost of capital and consequently the actions of companies in any meaningful way." (academic expert)
Company-impact arguments		
Company greenness (+)	Green investments fund companies that directly reduce emissions or support the green transition.	"The fund only contains stocks that adhere most closely to the Paris Agreement and reduce their CO2 emissions or obtain their energy from renewable sources, which is an outstanding achievement." (retail investor)
Company irrelevance (–)	The firms in climate funds don't actually reduce emissions or aren't in climate-relevant sectors.	"Companies such as Allianz, Munich Re, and especially LVMH are not actively contributing to saving the climate. I think there are companies that would contribute significantly more." (retail investor)

Support for green companies (+)	Investing in green firms helps them succeed, simply by backing their mission with money.	"I support companies that are verifiably committed to and involved in reducing greenhouse gas emissions." (retail investor)
Other arguments		
Deontological arguments (+)	Investing green is the morally right thing to do, regardless of the actual impact.	"Everyone's contribution to environmental protection, even if it is only a small part, will make a big difference." (retail investor)
Greenwashing concerns (–)	Even if the theory holds, impact is undermined by misleading practices and lack of transparency.	"This greenwashing is just annoying and I actively avoid such products." (retail investor)

This table provides an overview of the argument categories we assigned to the open-text responses from academic experts and retail investors to the question: "You have indicated that you think that investing in the Climate ETF [makes/does not make] a relevant contribution to reducing global GHG emissions. What is your reasoning leading to this answer?". Some of the responses were originally in German. They were translated into English using the translation tool DEEPL in combination with human post-editing.

[Back to main text]

C Academic Expert Survey

Thanks a lot for participating in our expert survey!

This survey is part of a research project that studies beliefs about the impact of green investing on the real economy. The survey has two parts:

1. We will ask about your impact expectations for a specific green investment product.
2. We will ask you a few more general questions about your assessment of the impact of green investment products.

We are running the first part of the survey also with a representative sample of German retail investors.

Thanks a lot for contributing to our research!

Florian, Julian, and Camilla

Declaration of Consent
By clicking on the arrow below, I consent to the processing of my data, to the privacy policy below, and to participate in the study on green investment products.

Your data will be stored under a pseudonym. When analyzing your survey data, the researchers will only know your pseudonym and cannot draw any conclusions about your person. You can withdraw your consent at any time.

▶ *Click on the triangle to display the full privacy policy.*

→

How strongly do you agree with the following statement?

«More efforts are needed to reduce global greenhouse gas emissions.»

Disagree Agree



→

Next, we will show you information on a green investment product. It is the largest European equity ETF that complies with the EU's Paris-Aligned Benchmark regulation. We have chosen a Europe-focused product, as we will also run the survey with German retail investors. All information is sourced from the fund manager or the index provider.

Please take some time to familiarize yourself with the product. After that, **we will ask you questions regarding your expectations of the fund's climate impact.**

Note: While we want to be specific in our questions, it is not our aim to make statements about this specific product. We will not disclose the product's or the asset manager's name when publishing our results.

→

Please familiarize yourself with the following investment product and then select "Continue" at the bottom.

Fund

[redacted]EMU Paris-Aligned Climate UCITS ETF

Fund Description

The Fund invests in European companies committed to reducing their carbon emissions in line with the Paris Climate Agreement's goal of limiting global warming to below 2°C. It is designed for investors looking to reduce exposure to climate risks and excludes businesses involved in fossil fuel production or environmental or social controversies. It is a diversified fund that passively tracks an EU Paris-Aligned benchmark.

Key Facts

Asset Class:	Equity Europe
Net Assets:	1,063.04 Million EUR
Total Expense Ratio:	0.15%
Benchmark:	[redacted] EMU Climate Paris Aligned Benchmark Select Index

Performance	Year-to-date	1 year	3 years
Return:	+8.65%	+23.13%	+3.27%

Climate Indicators	**Fund**	[redacted] EMU Index
Implied Temperature Rise:	**1.5° - 2.0°C**	2.0 - 2.5°C
Weighted Average Carbon Intensity: (tCO_2/Mil. USD Sales)	**60.71**	87.88

Top-Ten Fund Holdings	**%**		**%**
SAP	5.16	Allianz	2.57
ASML Holding NV	4.93	Sanofi SA	2.32
Schneider Electric	4.04	Iberdrola SA	2.01
LVMH	3.43	AXA SA	1.92
Siemens N AG	2.78	Munich Re	1.90

Explanations

Implied Temperature Rise: Measures how well a fund's holdings align with the Paris Agreement's goal of limiting global warming to below 2°C.
Weighted Average Carbon Intensity: Measures how much a fund is exposed to carbon-intensive companies. It estimates the carbon emissions per $1 million in sales for the fund's holdings.
[redacted]**:** Name of the Index Provider. **EMU:** European Economic and Monetary Union, including Austria, Belgium, Finland, France, Germany, Ireland, Italy, the Netherlands, Portugal and Spain. **UCITS:** Fund that meets the EU's UCITS requirements intended to protect investors. [redacted]
EMU Index: Comparable European equity index without climate focus.

→

▶ *Click on the triangle to display a summary of the index methodology.*

▶ *Click on the triangle to display the full fund factsheet.*

Please imagine an **investment of €10,000 over 10 years in the [redacted] EMU Paris-Aligned Climate UCITS ETF**.

How strongly do you agree with the following statement?

«Such an investment makes a relevant contribution to reducing global greenhouse gas emissions.»

Disagree — Agree

→

▶ *Click on the triangle to display the fund information.*

Please consider a ten-year time span. What do you think is the most effective way for an average German person to reduce global greenhouse gas emissions over this time span?

Please **rank the following options in order of effectiveness.** Please **drag the options up or down** so that the most effective option is on top.

- Not travelling by airplane
- Donating 300€ per year to organizations that engage for climate protection
- Voting for a political party that prioritizes action on climate change
- Purchasing electricity and heating energy exclusively from renewable sources
- Investing €10,000 in the [redacted] EMU Paris-Aligned Climate UCITS ETF
- Consuming meat maximally once per week

- *An average German travels once a year by air and eats meat six times per week.*
- *In Germany, about 45% of electricity and 80% of heating come from fossil fuels.*

→

▶ *Click on the triangle to display the fund information.*

Over a period of ten years, the average person in Germany causes around 80 tons of CO_2 emissions.

Now, imagine such a person investing €10,000 in the [redacted] EMU Paris-Aligned Climate UCITS ETF for a period of ten years.

What do you think: **How many CO_2 emissions will be reduced by this investment**, expressed as a **percentage** of the CO_2 emissions caused by the person in the same period?

Please enter your best estimate below:

CO_2 reduction investment: [ ] % of avg. person's CO_2 emissions

This corresponds to around:

CO_2 emissions	[ ]	tons
Number of intercontinental flights	[ ]	flights
CO_2 uptake of trees over 10 years	[ ]	trees

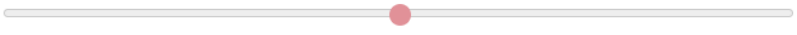
Assumption: The alternative to investing in the [redacted] EMU Paris-Aligned Climate UCITS ETF is investing in a passive fund replicating the European stock market.

→

▶ *Click on the triangle to display the fund information.*

How confident are you about your estimate?

Low confidence — High confidence



→

You have indicated that you think that investing in the [redacted] EMU Paris-Aligned Climate UCITS ETF makes a relevant contribution to reducing global greenhouse gas emissions.

What is your reasoning leading to this answer? How do you think such an investment reduces global greenhouse gas emissions?

We would strongly appreciate it if you can share your reasoning with us.

→

The literature on sustainable investing has identified different **channels through which investors might contribute to fighting climate change**.

For each of the following channels, what is your estimate of **how likely** it is that investors can do so?

Note: We denote firms with high negative climate externalities as "brown" and firms with low or positive externalities as "green." The channels might not be mutually exclusive.

By shifting their portfolio toward green firms, investors can reduce the cost of capital of green firms and thus increase the growth of green firms relative to the growth of brown firms.

Unlikely Likely

By shifting their portfolio toward green firms, investors can increase the market value of green firms and thus incentivize firms to become greener.

Unlikely Likely

By voting their shares and actively engaging with firms' management, investors can encourage firms to become greener.

Unlikely Likely

By directly providing capital to green companies facing financing frictions, investors can increase their growth (e.g., young companies, small companies, or companies in immature financial markets).

Unlikely Likely

If you believe additional important impact channels exist, we would be grateful if you could briefly describe them below.

→

How strongly do you agree with the following statement?

«Overall, the current market for green investing products makes a relevant contribution to fighting climate change.»

Disagree Agree

→

What is the region of your academic institution?

- Africa
- Asia
- Central America
- Europe
- Middle East
- North America
- Pacific
- South America

→

Thanks a lot for taking the time to participate in our survey!

We highly appreciate your contribution to our research and will keep you updated on our findings.

If you have any further comments or feedback, please let us know below. Otherwise, please click on the arrow below to complete the survey.

→

D Retail Investor Survey

[Translation, original survey in German]

Dear Participant,

This survey is part of a research project on sustainable investment products at the Leibniz Institute for Financial Research SAFE in Frankfurt and the University of St. Gallen.

In this survey, you can win an investment of €1,000. It is therefore worth answering all questions carefully. Please behave as you would in real life! This will help us collect meaningful data.

The survey takes 15-20 minutes to complete on average.

Declaration of consent
By clicking on the arrow below, I agree to the processing of my data, the privacy policy and participation in the study on green investment products.

No conclusions will be drawn about your person. You can revoke your consent at any time.

Thank you for supporting our research!

▶ *Click on the triangle to view the full privacy policy.*

→

How strongly do you agree with the following statement?

"More effort is needed to reduce global greenhouse gas emissions."

Disagree Agree

Info: Greenhouse gas emissions, e.g. CO2, CH4 or N2O, contribute to climate change.

→

In the next step, we will show you information about an investment fund. All information comes from the fund or index provider.

Please take **a few minutes** to familiarise yourself with the fund.

We will then ask you a few simple comprehension questions. After that, we would like to hear **your opinion on the fund's climate impact**.

→

Please familiarize yourself with the following investment product and then select "Continue" at the bottom.

Fund

[redacted]EMU Paris-Aligned Climate UCITS ETF

Fund Description

The Fund invests in European companies committed to reducing their carbon emissions in line with the Paris Climate Agreement's goal of limiting global warming to below 2°C. It is designed for investors looking to reduce exposure to climate risks and excludes businesses involved in fossil fuel production or environmental or social controversies. It is a diversified fund that passively tracks an EU Paris-Aligned benchmark.

Key Facts

Asset Class:	Equity Europe
Net Assets:	1,063.04 Million EUR
Total Expense Ratio:	0.15%
Benchmark:	[redacted] EMU Climate Paris Aligned Benchmark Select Index

Performance	Year-to-date	1 year	3 years
Return:	+8.65%	+23.13%	+3.27%

Climate Indicators	**Fund**	[redacted] EMU Index
Implied Temperature Rise:	**1.5° - 2.0°C**	2.0 - 2.5°C
Weighted Average Carbon Intensity: (tCO_2/Mil. USD Sales)	**60.71**	87.88

Top-Ten Fund Holdings	**%**		**%**
SAP	5.16	Allianz	2.57
ASML Holding NV	4.93	Sanofi SA	2.32
Schneider Electric	4.04	Iberdrola SA	2.01
LVMH	3.43	AXA SA	1.92
Siemens N AG	2.78	Munich Re	1.90

Explanations

Implied Temperature Rise: Measures how well a fund's holdings align with the Paris Agreement's goal of limiting global warming to below 2°C.
Weighted Average Carbon Intensity: Measures how much a fund is exposed to carbon-intensive companies. It estimates the carbon emissions per $1 million in sales for the fund's holdings.
[redacted]**:** Name of the Index Provider. **EMU:** European Economic and Monetary Union, including Austria, Belgium, Finland, France, Germany, Ireland, Italy, the Netherlands, Portugal and Spain. **UCITS:** Fund that meets the EU's UCITS requirements intended to protect investors. [redacted]
EMU Index: Comparable European equity index without climate focus.

→

▶ *Click on the triangle to display a summary of the index methodology.*

▶ *Click on the triangle to display the full fund factsheet.*

What is the net asset value of the fund?

34.43 million EUR

583.59 million EUR

1'063.04 million EUR

What is the implied temperature rise of the fund?

1.5° - 2.0°C

2.0 - 2.5°C

Greater than 3°C

What is the fund's return over 1 year?

-5.45%

+7.54%

+23.13%

→

Please imagine an **investment of €10'000 over 10 years in the** [redacted] **EMU Paris-Aligned Climate UCITS ETF**.

How strongly do you agree with the following statement?

«Such an investment makes a relevant contribution to reducing global greenhouse gas emissions.»

Disagree Agree



→

▶ *Click on the triangle on the left to display the fund information.*

Please consider a ten-year time span. What do you think is the **most effective way for an average German person to reduce global greenhouse gas emissions** over this time span?

Please **rank the following options in order of effectiveness**. Please drag the options up or down so that the most effective option is on top.

Voting for a political party that prioritizes action on climate change

Not travelling by airplane

Purchasing electricity and heating energy exclusively from renewable sources

Investing €10,000 in the [redacted]EMU Paris-Aligned Climate UCITS ETF

Consuming meat maximally once per week

Donating 300€ per year to organizations that engage for climate protection

---

- *An average German travels once a year by air and eats meat six times per week.*
- *In Germany, about 45% of electricity and 80% of heating come from fossil fuels.*

→

▶ *Click on the triangle on the left to display the fund information.*

Over a period of ten years, the average person in Germany causes around 80 tons of CO2 emissions.

Now, imagine such a person investing €10,000 in the [redacted] EMU Paris-Aligned Climate UCITS ETF for a period of ten years.

What do you think: **How many CO_2-emissions will be reduced by this investment**, expressed as a **percentage** of the CO_2-emissions caused by the person in the same period?

Please enter your estimate here:

CO_2-Reduction Investment: [ ] % of CO_2-emissions of an average person

This corresponds to approx.:

CO_2-emissions	[ ]	Tonnes
Number of intercontinental flights	[ ]	Flights
CO_2-absorbtion trees over 10 J.	[ ]	Trees

Assumption: The alternative to investing in the [redacted] EMU Paris-Aligned Climate UCITS ETF is to invest in a passive fund that tracks the European stock market.

→

▶ *Click on the triangle on the left to display the fund information.*

Your estimate is:

An investment of €10,000 over 10 years in the [redacted] EMU Paris-Aligned Climate UCITS ETF causes reductions in CO2-emissions CO_2-emissions that correspond to **5%** of the emissions caused by an average German person over the same time span.

This reduction corresponds to:

- 4 tons of CO_2.
- The CO_2-emissions caused by roughly 2 intercontinental flights.
- The CO_2 that around 10 trees absorb over 10 years

Are you satisfied with your estimate, or would you like to adjust it?

I am satisfied.

I would like to adjust the estimate.

→

How confident are you about your estimate?

Low Confidence High Confidence

→

You have indicated that you think that investing in the [redacted] EMU Paris-Aligned Climate UCITS ETF makes a relevant contribution to reducing global greenhouse gas emissions.

What is your reasoning leading to this answer? How do you think such an investment reduces global greenhouse gas emissions?

We would strongly appreciate it if you can share your reasoning with us.

→

Thank you for your answers!

We asked the **same questions** about the climate impact of the investment to **182 academic experts** who research sustainable investments.

Next, we will show you a summary of the experts' opinions.

Please read the summary carefully; then we will ask you a simple comprehension question.

→

Summary of Expert Survey

Scientific experts answered questions about the climate impact of an investment in the [redacted] EMU Paris-Aligned Climate UCITS ETF:

Question 1:

Please imagine an **investment of €10'000 over 10 years in the [redacted] EMU Paris-Aligned Climate UCITS ETF**.

How strongly do you agree with the following statement?

«Such an investment makes a relevant contribution to reducing global greenhouse gas emissions.»

Median Expert Response

Disagree -5 Agree

Question 2:

Please consider a ten-year time span. What do you think is the **most effective way for an average German person to reduce global greenhouse gas emissions** over this time span?

Please **rank the following options in order of effectiveness**. Please drag the options up or down so that the most effective option is on top.

1. Voting for a political party that prioritizes action on climate change
2. Purchasing electricity and heating energy exclusively from renewable sources
3. Not travelling by airplane
4. Consuming meat maximally once per week
5. Donating 300€ per year to organizations that engage for climate protection
6. Investing €10,000 in the [redacted] EMU Paris-Aligned Climate UCITS ETF

Average Expert Response

Question 3:

Now, imagine such a person investing €10,000 in the [redacted] EMU Paris-Aligned Climate UCITS ETF for a period of ten years.

What do you think: **How many CO_2-emissions will be reduced by this investment**, expressed as a **percentage** of the CO_2-emissions caused by the person in the same period?

Median Expert Response

CO_2-Reduction Investment: 2 % of CO_2-emissions of an average person

Reasons Given By The Experts For Their Assessments:

1. It is unlikely that an investment of €10,000 will influence companies' capital costs. Even if this were the case, the effect would probably be too small to prompt companies to reduce their CO_2 emissions.
2. Without stronger climate policy measures, such as a global CO_2 tax, a significant reduction in CO_2 emissions is unlikely.
3. However, investing in a climate ETF can serve as a symbolic act that could influence public awareness, social norms and regulatory frameworks.

→

Comprehension question:

What do experts think, on average, is the **most effective way** for a German person to reduce global greenhouse gas emissions?

- Invest €10,000 in the [redacted] EMU Paris-Aligned Climate UCITS ETF.
- Avoid air travel.
- Consume meat no more than once a week.
- Obtain electricity and heating energy from renewable sources.
- Donate €300 per year to organisations that are committed to climate protection.
- Vote for a party that prioritises measures against climate change.

→

After reading the summary of the experts' opinions, how would you answer the question below?

Please imagine **investing €10'000 over 10 years in the [redacted] EMU Paris-Aligned Climate UCITS ETF**.

How strongly do you agree with the following statement?

«Such an investment makes a significant contribution to reducing global greenhouse gas emissions.»

Disagree Agree



→

▶ *Click on the triangle to display the fund information.*

Investment decision

In the next step, we ask you to make an **investment decision regarding €1,000**. We will then ask you about your **willingness to pay** for your preferred fund.

You can choose between two funds:

1. The [redacted] **EMU Paris-Aligned Climate UCITS ETF**, which we have already asked you about.
2. The [redacted] **EMU UCITS ETF**, a comparable alternative without climate criteria.

It is worth giving carefully considered answers:
We will **randomly select 10 participants and make a real investment of €1,000** for each of them based on your decision. After one year, the total value of this investment will be paid out to the participants. When investing, we use a mechanism that ensures that it is always worthwhile for you to indicate your real willingness to pay.

Important: We have no opinion on which option is better. We are only interested in **which fund you personally prefer.**

▼ *Detailed explanation of the mechanism*
Basically, the mechanism works like an auction in which you bid against a random generator.
We ask you how much you are willing to pay for your preferred fund, in euros.
We then draw a random amount between 0 and 100. There are two possible outcomes:
Your willingness to pay is greater than the random amount: you get your preferred fund. We invest €1,000 in this fund, minus the random amount.
Your willingness to pay is less than the random amount: you do not get your preferred fund. We invest €1,000 in the other fund.

→

Below you will find a comparison of the two funds:

Performance of CHF 100



[redacted] EMU Paris-Aligned Climate UCITS ETF

Description

The fund invests passively in a broadly diversified set of European companies that support the Paris climate goals.

Key Data

Asset Class:	Europ. Equities
Net Assets:	EUR 1 billion
Total Expense Ratio:	0.15%

Return (per year)

1 year	3 years
+23.13%	+3.27%

Climate indicators

Implied Temperature Rise:	**1.5° - 2.0°C**
Average CO2 intensity: (tCO2/million USD sales)	**60.71**

[redacted] EMU UCITS ETF

Description

The fund invests passively in a broadly diversified set of European companies, without climate criteria.

Key Data

Asset Class	Europ. Equities
Net Assets:	EUR 5 billion
Total Expense Ratio:	0.12%

Return (per year)

1 year	3 years
+20.73%	+4.89%

Climate indicators

Implied Temperature Rise:	**2.0° - 2.5°C**
Average CO2 intensity: (tCO2/million USD sales)	**87.88**

Explanations

Implied temperature rise: Measures how well the companies in the fund align with the Paris Agreement's goal of limiting global warming to below 2C.
Average CO2 intensity: Measures how heavily a fund is invested in CO2-intensive companies. It estimates CO2 emissions per $1 million in sales for the companies in the fund.

Which of the two funds would you rather invest €1,000 in?

[redacted] EMU Paris-Aligned Climate UCITS ETF

[redacted] EMU UCITS ETF

→

Willingness to pay:

You have indicated that you prefer the .

If you are selected, we will make an investment of €1,000 on your behalf. We will pay you the value of this investment after one year. However, we will deduct a fee depending on your answer.

What is the **maximum fee you would be willing to pay to ensure that we invest in the** on your behalf and not in the other fund?

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Willingness to pay (in euros)

→

You have indicated that you prefer [redacted] EMU Paris-Aligned Climate UCITS ETF.

Please briefly describe **what led you to this decision** in the text box below.

→

What do you think about the two funds?

- [redacted]EMU Paris-Aligned Climate UCITS ETF (**Climate ETF**)
- [redacted]EMU UCITS ETF (**Core ETF**)

Which of the two funds will generate a **higher return?**

Climate ETF Core ETF

Which of the two funds has a **higher risk?**

Climate ETF Core ETF

Which fund **feels better to invest in?**

Climate ETF Core ETF

Which of the two funds better reflects your **personal values?**

Climate ETF Core ETF

→

How would you rate your willingness to share with others without expecting anything in return when it comes to charitable causes?

Not ready at all — Very ready

How strongly do you agree with the following statements?

«It is important to me to fit in with the group I am in.»

Disagree — Agree

«My behaviour is often influenced by how I think others want me to behave.»

Disagree — Agree

«I have good intuition when it comes to understanding other people's feelings and motives.»

Disagree — Agree

«My behaviour is usually an expression of my true inner feelings, attitudes and beliefs.»

Disagree — Agree

«Once I know what the situation requires, it's easy for me to adjust my behaviour accordingly»

Disagree — Agree

«I would NOT change my opinion to please someone or win their favour.»

Disagree — Agree

→

Demographics

How would you rate your knowledge of investment products and financial markets?

Superficial — In-depth

Have you ever invested in sustainable investment products? (E.g. products with a climate, ESG, environmental or social focus)

- No
- Yes, a small portion of my investments.
- Yes, a big portion of my investments.

What is your highest level of education? (If you are currently attending school, please indicate the highest level you have achieved).

What is your household income before taxes and social security contributions per year?

What is the net worth of your household?

Where do you place yourself on the political spectrum from left to right?

Strongly Left	Left	Centre-Left	Centre	Centre-Right	Right	Strongly Right

→