Doctoral thesis

SUSTAINABLE INVESTMENT PREFERENCES AND HOW THEY ARE DELEGATED

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Chapter 1

Introduction

Concerns for sustainability have had a strong impact on the finance industry in recent years. In the United States (US) alone, at the beginning of 2022, professionally managed funds amounting to $7.6 trillion were invested under the consideration of environmental, social, and governance (ESG) criteria (USSIF, 2022). Households with sustainable investment preferences play an important role in this growth. It is increasingly common for retail investors to communicate a sustainable investment mandate to their financial advisor (USSIF, 2020). Further, Bauer et al. (2021) show that the majority of households in the Netherlands prefers its pension money to invested under the consideration of ESG criteria, even if this leads to a lower financial return.

Stating that "the financial sector has a key role to play in reaching [...] fundamental environmental and social goals" (p.13), the European Commission has formulated an action plan to further increase the volume of funds invested sustainably (European Commission, 2018). However, designing and evaluating policies to increase flows towards sustainable investments necessitates an understanding of what motivates household demand for sustainability.

Edmans and Kacperczyk (2022) identify three motivations that drive investor demand for sustainability. First, sustainable investors are financially motivated. Specifically, investors may hold the belief that sustainable business practices are related to firm profitability in a way that is currently not priced in the market. As a result, individuals may

expect higher risk-adjusted returns from sustainable investments.

Second, sustainable investments have been shown to be motivated by non-financial preferences. Specifically, investors with social preferences want to invest in a way that produces positive externalities for society.[1]

The third motivation to invest sustainably is taste, which represents an aversion to hold unsustainable investments independent of societal outcomes. As such, tastes are distinct from the non-financial preferences like social preferences, where investors care about the implications of their investment decisions for society. Sustainable investment behavior driven by taste is demonstrated, for example, in Heeb et al. (2022), who show that individuals are willing to forego financial returns to invest sustainably, independent of the magnitude of the societal benefits of these investments. Irrespective of outcomes, investors feel an improvement in mood when selecting sustainable investments and may experience a decrease in mood when selecting unsustainable investments.

Evidence on whether sustainable investments generate abnormal returns is mixed. A recent meta analysis that includes 153 empirical studies reports that, on average, sustainable investments neither outperform nor underperform the market portfolio (Hornuf & Yüksel, 2022). Moreover, in the presence of investors who enjoy holding sustainable investments, Pástor et al. (2022) predict sustainable investors to receive lower financial returns in equilibrium. This suggests that the most promising avenue for policy makers whose goal it is to increase sustainable investing may be to appeal to investors' non-pecuniary preferences, rather than their desire to make money.

Currently, these non-pecuniary preferences do not translate well into action on the stock market. In a large sample of Swedish households, Anderson and Robinson (2022) find that pro-environment households are not more likely to hold pro-environment portfolios. This can be explained by the fact that the pro-environment households have a lower average financial literacy and as a result are less likely to own stocks. Similarly, in a survey with $N = 3,098$ German retail investors, I find that sustainable investment

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[1]See for example(Riedl & Smeets, 2017; Hartzmark & Sussman, 2019; Krueger et al., 2020; Barber et al., 2021; Anderson & Robinson, 2022; Gibson Brandon et al., 2022).

knowledge among German investors is relatively low.[2] Figure 1.1 shows a striking 40.9% stating to be not at all knowledgeable about sustainable financial investments, while only 0.8% claim to be very knowledgeable. Further, more than half of the participants of the survey are not familiar with the term "ESG" in the context of sustainable investing.

Are you knowledgeable about sustainable financial investments? (N = 3,098)

Are you aware of the term ESG in the context of sustainable investing (N = 3,098)
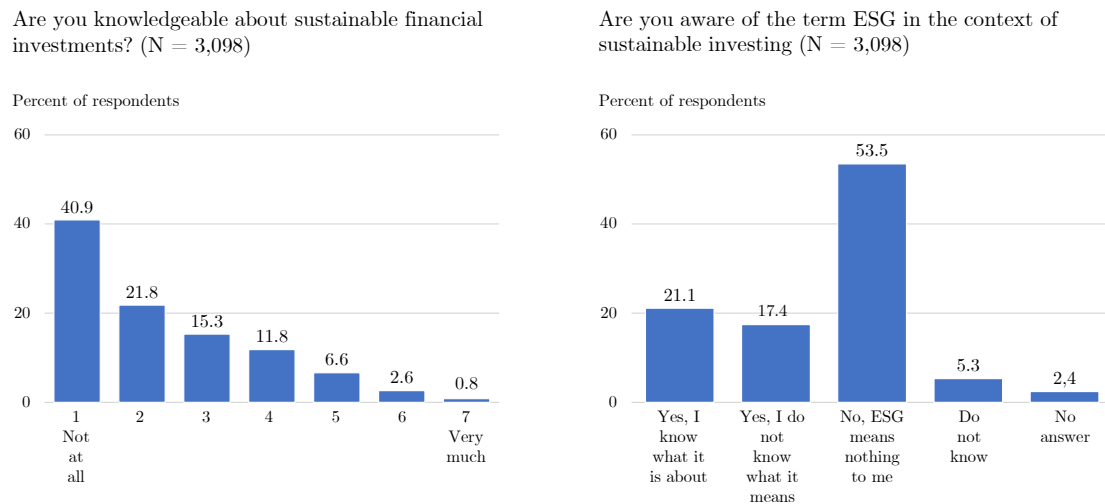
Figure 1.1: Investor knowledge about environmental, social, and governance (ESG) criteria in investing

Notes: The figure shows the outcome of a survey with German retail investors. Refer to Chapter 3 for more details on the sample.

Closing this knowledge gap should hence be an important policy goal, if the aim is to increase sustainable investments. A solution to this knowledge gap that quickly comes to mind is financial advice. Indeed, as part of their action plan to foster sustainable investments, the European Commission aims to utilize financial advisors. Specifically, the action plan includes an amendment to the Markets in Financial Instruments Directive II (MiFID II[3]), requiring financial advisors to talk to their clients about sustainability and to elicit their clients' sustainability preferences. This amendment has been heavily debated, with investor protection authorities and consumer organizations voicing concerns that financial advisors may exploit the knowledge about the sustainable investment preferences

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[2]See Chapter 3 for more information on the context of the survey, as well as characteristics of the sample.

[3]Markets in Financial Instruments Directive 2014 (2014/65/EU) commonly known as MiFID II (Markets in financial instruments directive II), is a legal act of the European Union. Together with Regulation (EU) No. 600/2014 it provides a legal framework for securities markets, investment intermediaries, and trading venues for the member states of the European Economic Area.

of their clients, for example by selling more expensive products or by charging higher fees.

In this dissertation, I address some general questions that arise from this debate. In three self-contained chapters, I contribute to the academic literature and policy debate on the merit of sustainability-related financial advice as a policy tool to better translate households' preferences for sustainability into investment behavior. On the one hand, I show that information that is provided at the right moment can increase sustainable investments. On the other hand, I show that financial advisors also turn their clients' sustainability preferences to their advantage through price discrimination that may threaten the long-term attractiveness of sustainable investments.

In Chapter 2, I address the concern of price discrimination against sustainable investors by considering two general questions. First, do financial professionals charge a premium for sustainable investment mandates? Second, if advisors charge a premium, is this compensation for the higher costs and effort that go into sustainability screening, or do advisors use knowledge about their clients' preferences to extract additional profits from sustainable investors?

I conduct two online lab-in-the-field experiments with a total of $N = 415$ professional advisors in the US and Europe. Advisors manage investment portfolios on behalf of clients with an investment budget of \$1,000. The advisors have access to basic information about their client's profile, including age, gender, income bracket, and risk appetite, as well as the client's investment mandate (conventional or socially responsible). The main outcome variable is the fee that advisors set for their service as a percentage (between 0% and 4%) of the total invested amount. In the second stage of the experiment, the clients decide whether to take the advisor's advice and pay the fee set by the advisor or to make their own investment decision. The results show that financial advisors charge a premium for sustainable investment mandates.

The experimental design rules out effort, skill, and cost differences as drivers of the observed dispersion in fees. Advisors do not spend more time or effort on selecting portfolios for sustainable investment clients versus conventional clients. Strikingly, advisors in the second experiment even spend significantly less time and click through information

significantly fewer for sustainable investment clients. Further, the within-subject experimental design rules out differences due to individual advisor skill, as every advisor in the experiment advises both types of clients in (balanced) random order. The experiment is designed such that firm-level sustainability information is free to advisors, which eliminates cost differences related to buying ESG ratings in the experiment and there are no transaction costs. Therefore, I interpret the premium as price discrimination that financial advisors use to extract additional profits from clients' sustainable investment preferences.

I also find that advisors primarily charge sustainable investment clients with low or unknown financial literacy a premium. The premium disappears when a sustainable client's financial literacy is known to be high. Finally, in the experiment, giving advice to sustainable investment clients is a realistic opportunity for advisors to earn higher fees. US sustainable investors are as likely as conventional clients to pay for advice, even if they are charged a premium. In Europe, clients with preferences for sustainability are even 30 percentage points more likely to pay for financial advice.

To get a sense of the policy implications of these results, I collect survey data from $N = 53$ professionals who work in regulation, policymaking, compliance, and supervision in the financial sector (henceforth, regulators). The regulators do not expect the findings. Once the regulators learn about the findings, they indicate that policy interventions are necessary. They provide some potential starting points for policy interventions, including standardization of fees, transparency, and consumer education.

Apart from implications for pricing, can financial advisors be utilitzed to decrease the knowledge gap of sustainably-minded households in order to foster sustainable investments? Figure 1.2 shows additional outcomes of a survey with German retail investors, revealing that only around 16.6% of investors report to have had an ESG consultation with their financial advisor since the MiFID II amendment came into effect. However, those who did have a consultation reported learning a lot about ESG, which indicates a narrowing of the knowledge gap.

In Chapter 3 of this dissertation, I collaborate with a universal bank in Germany and

Have you had an ESG consultation with your financial advisor since August 02?(N = 3,060)

Do you agree with the following statement: I learned a lot about ESG in the consultation session? (N = 749)
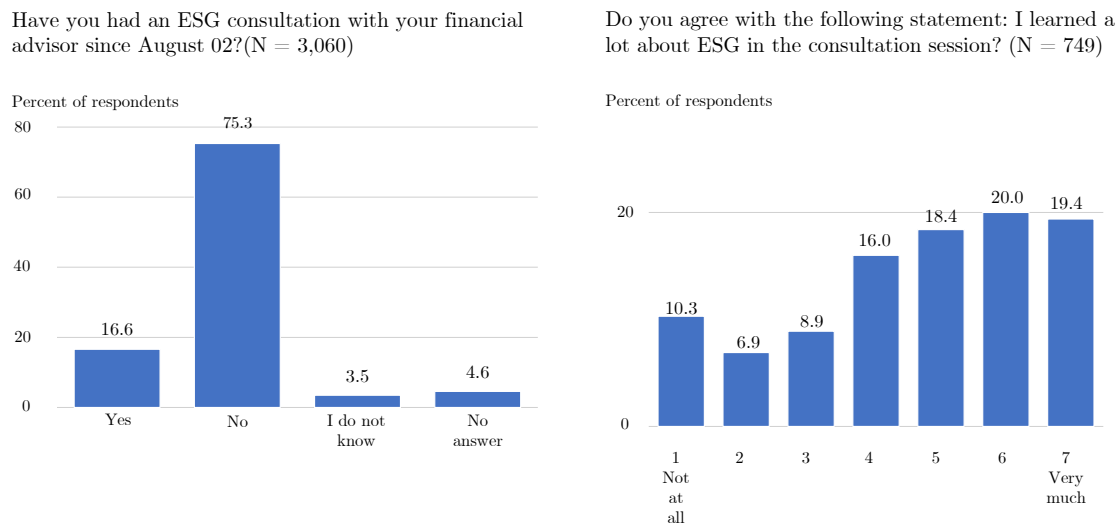
Figure 1.2: The role of financial advice to close the ESG knowledge gap

Notes: The figure shows the outcome of a survey with German retail investors. Refer to Chapter 3 for more details on the sample. The first question queries whether investors have had an ESG consultation with their financial advisor since August 2nd 2022. This day marks the point at which the MiFID II amendment came into effect, according to which financial advisors are required to elicit the sustainability preferences of their clients.

administer a field experiment with a representative sample of the bank's clients to show that information provided at the right moment can indeed increase sustainable investments. Specifically, I examine whether providing retail investors with just-in-time peer information increases the share of funds that they invest under the consideration of ESG criteria. Participants make a real investment decision, where they allocate an investment budget between a sustainable and a conventional fund. Participants are randomly allocated to either a control group or one of three treatment groups, each receiving different information about peers' behavior and attitudes towards sustainable investments. The *social treatment* group receives a message that most Germans want to invest in sustainable assets in the future. The *impact treatment* group is told that most Germans expect sustainable investments to have a positive societal impact. The *return treatment* group receives information that most German investors believe that sustainable investments yield equal or higher returns, compared to traditional investments. All treatment information that I provide is based on openly accessible information, and we provide the

source of this information to participants. The results show that, compared to the control group, retail investors in the impact, social, and return treatment groups on average allocate an additional EUR 429, EUR 293, and EUR 267, respectively, of their EUR 10,000 experimental budget to the sustainable fund. I therefore provide evidence that just-in-time peer information treatments increase sustainable investments among retail investors in a statistically and economically significant way.

Further, the social treatment successfully increases sustainable investments only among retail investors whose prior belief about peers' propensity to invest sustainably was lower than the information provided in the provided peer information. Similarly, the return treatment only increases sustainable investments among those whose prior belief regarding peers' expectations about the return of sustainable investments was lower than the provided information. For those participants in the impact treatment, the second order belief on the impact of sustainable investments does not matter for the effect of the treatment on the investment decision. Taken together, these results suggest that policymakers can use peer information, communicated through financial institutions, as a potentially cost-effective policy intervention to promote sustainable investments.

The findings presented in Chapter 3 show that providing information in the process of a buying decision may spark an increase in flows towards sustainable investments. But what about selling decisions? That is, how do investors react to news exposing unsustainable business practices of firms in their portfolios? Do retail investors sell their stocks after such scandals? According to evidence from the survey that I conducted with German retail investors, the vast majority has never sold an investment after negative ESG news, as shown in Figure 1.3.

In Chapter 4, I exploit a large dataset from a European bank to gain deeper insights into how retail investors react to negative ESG news concerning companies in their portfolios. The dataset connects investor trading records, dividend income, and consumption-saving behavior at the individual level. The sample consists of $N = 18,566$ individual investors and covers a 24-month period from July 2017 to July 2019, with information on demographics, categorized transactions, portfolio holdings, and trading

Have you ever consciously sold a financial investment
because it no longer met your sustainability requirements
(e.g. a stock after a company scandal)? (N=735)

Percent of respondents

Yes	13.2
No	78.9
I do not know	4.8
No answer	3.1
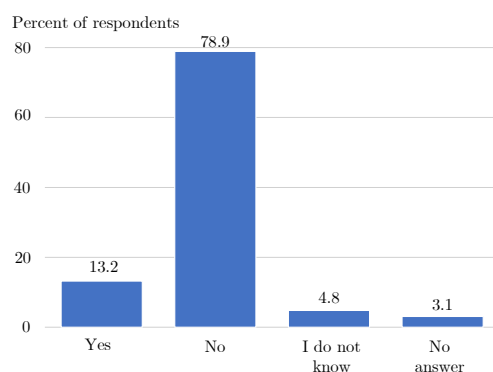
Figure 1.3: Selling behavior in response to ESG scandals

Notes: The figure shows the outcome of a survey with German retail investors. Refer to Chapter 3 for more details on the sample.

records. I merge this customer data with scores from Truvalue Labs (TVL), which uses artificial intelligence techniques to aggregate public sentiment towards firms' ESG performance. TVL uses unstructured textual data to derive daily firm-level scores. TVL does not rely on communication issued by companies, but external communication, such as local, national, and international news, reports from NGOs, trade blogs, or social media.

I find that retail investors indeed do not sell in response to scandals that expose socially irresponsible business practices of firms in their portfolio. However, investors do react to these news by showing an emotional consumption response. Specifically, investors consume approximately twice as much out of dividends associated with negative ESG news sentiment, compared to income from companies without negative ESG news. This behavior is in line with emotion regulation theory, which posits that people increase their consumption when experiencing negative emotions. In the laboratory, studies have documented an emotional consumption response, whereby people consume out of income that evokes negative emotions to improve their emotional state. Chapter 4 of this dissertation is the first study that shows behavior in line with emotion regulation theory in the financial market, which represents a real-life decision context with high stakes.

In summary, throughout the three chapters, this dissertation unveils some crucially important aspects when evaluating the efficacy of financial advice in fostering sustainable investments. First, when retail investors communicate sustainable investment preferences, financial advisors charge a premium that is not driven by additional effort, skill, or costs. I also detect a tendency of advisors to spend less time and click fewer through information, indicating that financial advisors use a smaller information set for sustainable investing mandates. When clients can signal high financial literacy, the premium is eliminated, but sustainable investment clients who cannot signal high financial literacy bear the burden of higher fees. Second, financial advisors may foster sustainable investing by providing information to clients during the buying decision. However, selling behavior is less influenced by new information on the sustainability of firms.

Chapter 2

Do financial advisors charge sustainable investors a premium?

Abstract

Regulators have voiced concerns about price discrimination against sustainable investors, but empirical evidence is lacking. We conduct two lab-in-the-field experiments with 415 US and European professional financial advisors. We find that advisors charge sustainable investors a premium compared to conventional investors. Our experiment rules out effort, skill, and cost differences as drivers of this premium. Advisors exert equal or even less effort for sustainable investors, in terms of time spent and information considered. Importantly, advisors do not charge a premium when sustainable investors signal high financial literacy. Financial regulators evaluate our results and provide policy implications.

2.1 Introduction

In the United States (US), one in three dollars of assets under management is invested according to a sustainable investing mandate (USSIF, 2020). Considering this recent surge in volume, prominent media outlets criticize asset management firms for charging sustainable investors a premium. *The Wall Street Journal* proclaimed sustainable investing the new cash cow, in which additional fees of up to 42% can be earned at no extra costs (Wursthorn, 2021). *The Economist* made similar claims that "although [sustainable investing practices] emerged in response to the preferences of investors, [...] asset managers have turned this to their advantage" (Tricks, 2022).

In the European Union (EU), a recent amendment to the Markets in Financial Instruments Directive II (MiFID II) requires financial advisors to ask clients whether they want to mandate socially responsible investing (SRI).[1] The implications of this amendment are heavily debated. In line with the criticism above, investor protection authorities, such as the European Securities and Markets Authority (ESMA), as well as consumer organizations, are concerned that financial advisors may exploit sustainable investors with high willingness to pay for sustainability by selling them more expensive products (ESMA, 2019).

In contrast, most professional asset managers claim they are not aware of conflicts of interest linked to sustainable investment preferences and that policy interventions are unnecessary. They point out that sustainable investment products can be more costly to manage than their conventional equivalents, related, for instance, to the cost of screening firms' sustainability (ESMA, 2019, p. 14). Importantly, in this debate, neither side's arguments are empirically supported. Reliable causal evidence is lacking for the presence or absence of price discrimination against clients who mandate sustainable investment.

In this paper, we investigate two general questions that arise from this debate, and that essentially apply to any mandate for sustainable investment. First, do financial professionals charge a premium for sustainable investment mandates? Second, if advisors charge this premium, is this compensation for the higher costs and effort that go into

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[1]https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018DC0097&from=EN

sustainability screening, or do advisors use knowledge about their clients' preferences to extract additional profits from sustainable investors?

To answer these questions, we administer two pre-registered online lab-in-the-field experiments with a total of 415 professional advisors in the US and Europe. The experimental design replicates the most important factors of participants' natural decision environments and allows us to disentangle possible reasons for sustainable investors being charged a premium. We replicate an advisor—client relationship with real financial advisors and real clients, who invest real money in the stock market. As advisors, we recruit financial professionals who are involved in managing or brokering financial assets on behalf of clients in their professional lives. As (retail) clients, we recruit a sample of individuals who invest money in the stock market and are not financial professionals.

We ran the first experiment in the US, and the experimental design consisted of two stages. In the first stage, advisors managed a stock portfolio for their client with an investment budget of $1,000. The advisors had access to basic information about their client's profile, including age, gender, income bracket, and risk appetite, as well as the client's investment mandate (conventional or socially responsible). The main outcome variable is the fee that advisors set for their service as a percentage (between 0% and 4%) of the total invested amount. In the second stage of the experiment, the clients decided whether to take the advisor's advice and pay the fee set by the advisor or to make their own investment decisions. We implemented the chosen portfolio by purchasing the selected stocks on the market for an investment period of one year. Clients earned either the raw portfolio return (self-selected portfolio) or a net return after fees (advisor's portfolio). Therefore, all participants' decisions were consequential.

Our results show that financial advisors charge a premium for SRI mandates. We can rule out effort, skill, and cost differences as drivers of the observed dispersion in fees. First, we detect no difference in the time or effort spent by advisors on selecting portfolios for sustainable investment clients versus conventional clients.[2] Second, the within-subject experimental design rules out differences due to individual advisor skills, because every

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[2]In our second experiment, we find that advisors even spend less effort on sustainable clients.

advisor in the experiment advised both types of clients in (balanced) random order. Third, the experiment was designed such that firm-level sustainability information was free to advisors, which eliminated cost differences related to buying ESG ratings[3] in the experiment. There were no transaction costs in the experiment. Therefore, we interpret the premium as price discrimination that extracts additional profit from clients' sustainable investment preferences.[4]

In the second experiment, we extend our main findings and provide additional robustness by investigating whether the results from the first experiment also hold (i) for European financial advisors, (ii) in a fund selection setting, and (iii) in a setting that rules out effort completely. Moreover, we test whether information about a client's financial literacy affects the premium for sustainable investing. In the second experiment, we administered an adjusted version of the original design, in which European financial advisors selected one of six pre-allocated stock funds on behalf of their client. We designed an ESG rating for the funds that was trivial to understand, ranging from one leaf (least sustainable) to five leaves (most sustainable). Thus, advisors had to count to five to satisfy clients' preferences for sustainability, which makes it hard to justify a premium. Finally, in the information shown to advisors, we added the client's performance on three financial literacy questions, which tested basic finance knowledge (Lusardi & Mitchell, 2008, 2011) and gave advisors an indication about how well their clients understood the impact of fees.

We reproduce our main finding from the original experiment. Again, advisors charge a premium for sustainable investment mandates. Strikingly, advisors spend significantly less time and click through information significantly less for SRI clients. It seems that advisors focus almost exclusively on the relatively simple leaf ratings for sustainable mandates, while they consider a broader set of financial information for conventional investment mandates. This corroborates our finding that the observed premium reflects price

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[3]The term ESG rating refers to a data-based classification of firms' sustainability in terms of their Environmental-, Social-, and Governance performance.

[4]We run several empirical robustness checks, which support the internal validity of our findings. All reported results are robust and often become even stronger when considering alternative model specifications and sub-samples. Throughout the paper, we report the most conservative results of the full sample.

discrimination to extract additional profit from sustainable investment clients. However, we also find that advisors primarily charge SRI clients with low or unknown financial literacy a premium. The premium disappears when the SRI client's financial literacy is known to be high.

Even if advisors charge a premium for SRI without exerting more effort, it is not a given that this behavior would survive in a market where clients have a choice not to take the advice. Therefore, we check how often the clients in the experiment accept the fees for their mandates. US sustainable investors are as likely as conventional clients to purchase the advice, even if they are charged a premium. In Europe, clients are 30 percentage points more likely to purchase financial advice if it is based on an SRI mandate. In the experiment, giving advice to sustainable investment clients, therefore, is a realistic opportunity for advisors to earn higher fees. This is in line with previous research showing that sustainable investors are willing to accept higher fees to invest in line with their preferences (Riedl & Smeets, 2017; Anderson & Robinson, 2022).

Advisors charge sustainable investors a premium of 5.0 to 6.6 basis points (first experiment) and between 7.7 and 8.3 basis points (second experiment). This premium is meaningful both economically and for policy. First, a back-of-the-envelope analysis suggests that individual/retail sustainable investment clients paid a premium of at least $2.275 billion in the US alone in 2020. If we apply the same premium to all US funds using sustainable investment strategies (including institutional investors), the premium in 2020 was $8.55 billion.[5] Second, experiment 2 shows that advisors spend significantly less time and effort on providing advice to sustainable clients than to conventional clients. Third, the premium is not equally divided among clients, but a subset of clients is charged a relatively high premium. In experiment 1, SRI mandates increase the probability of having to pay a premium by 6.3 percentage points. If an advisor charges an SRI client a premium, it is 47.8 basis points, on average. In experiment 2, sustainable investors are 18.5 percentage points more likely to be charged a premium, and this premium is 42.4

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[5]For this, we multiply our most conservative premium (5.0 basis points) with US SIF's 2020 estimate of SRI funds that were invested by money managers on behalf of individual/retail investors ($4.55 trillion) and on behalf of all US SRI investors ($17.1 trillion).

basis points on average. Moreover, sustainable clients with high financial literacy pay no premium at all, while sustainable investors with low or unknown financial literacy bear the burden of high fees.

Fourth, our findings are also meaningful for policy. In a separate study, we collect survey data from 53 professionals who work in regulation, policymaking, compliance, and supervision in the financial sector (henceforth, regulators). The regulators do not predict our findings. Once the regulators learn about the findings, they indicate that policy interventions are necessary. We take several additional measures to ensure the external validity of our results. We incorporated important contextual elements of advisors' natural decision-making environment, which increase the external validity of experiments (Harrison & List, 2004). We pre-tested the relevance of contextual elements with a different group of financial professionals. Recruiting financial professionals as participants also increases the external validity, as financial professionals have frequently been shown to behave differently from student participants.[6]

Our paper contributes to the growing literature on sustainable finance,[7] particularly to studies that investigate possible differences in fees between sustainable and conventional funds.[8] Investors' social preferences often translate into a willingness to pay for sustainable investment products by accepting lower expected financial returns or higher fees (Riedl & Smeets, 2017; Barber et al., 2021; Heeb et al., 2022). We show that this translates into a premium charged to sustainable investment clients, not because of higher effort, skill, or costs but because the advisors use price discrimination.

The findings also provide insights into advisor misconduct in bilateral advisor—client relationships. A range of studies have shown that clients who invest through professional money managers tend to underperform passive investors after fees (Del Guercio et al., 2010; Linnainmaa et al., 2021) and that conflicts of interest between financial advisors

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[6]See Haigh and List (2005), Alevy et al. (2007), Kaustia et al. (2008), Roth and Voskort (2014), Kirchler et al. (2018), and Weitzel et al. (2020).

[7]See Heinkel et al. (2001), Benson and Humphrey (2008), Hong and Kacperczyk (2009), Białkowski and Starks (2016), Hartzmark and Sussman (2019), Krueger et al. (2020), Bauer et al. (2021), Berk and van Binsbergen (2021), Pedersen et al. (2021), Anderson and Robinson (2022), Gibson Brandon et al. (2022), and Gollier and Pouget (2022).

[8]See Gil-Bazo et al. (2010), Shanker (2019), Aragon et al. (2022), Cao et al. (2022), and Raghunandan and Rajgopal (2022).

and their clients often benefit advisors who offer self-serving advice (Bergstresser et al., 2008; Hackethal et al., 2012; Hoechle et al., 2018; Egan, 2019; Chalmers & Reuter, 2020). As investors with low financial literacy are more likely to pay high fees (Choi et al., 2010), some financial advisors seem to specialize in misconduct that extracts additional profits from clients with low financial literacy (Egan et al., 2019). Carlin (2009) shows that asset managers charge this premium when they anticipate that retail clients do not understand how complex fee structures affect their investment outcomes. In over-the-counter financial markets, advisors have been shown to price discriminate against smaller, less sophisticated clients (Duffie et al., 2005; Osler et al., 2016; Hau et al., 2021). We add to this literature by showing that advisors discriminate with their fees, particularly when they perceive that SRI mandates come from clients with lower financial literacy.

Our work has implications for policies on the elicitation of sustainable investment preferences. The European Commission (2018) states that "the financial sector has a key role to play in reaching [...] fundamental environmental and social goals" (p.13) and formulated an action plan, which requires financial institutions to ask clients whether they want to mandate SRI (European Commission, 2018). Our results show that this regulation has a serious downside. In equilibrium, sustainable investors are already expected to receive lower financial returns (Pástor et al., 2022). The combination with higher fees threatens the long-run attractiveness of sustainable investments.

2.2 General setup

This paper is based on two lab-in-the-field delegated choice experiments[9] administered online with professional financial advisors and clients. As advisors, we recruited financial professionals, whom we selected based on two screenings. The first screening asked the participants to report the industry sector in which they were working. We included only those who selected financial services (e.g., banks and insurance companies). In the second screening, we filtered out all participants whose jobs did not involve managing

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[9]Both studies were pre-registered at the AEA RCT Registry (see https://www.socialscienceregistry.org/trials/6026) and ethically approved by the Ethical Review Committee of one of the authors' university under the reference: ERCIC 173 27 01 2020.

or brokering financial assets on behalf of clients in their professional lives. We included, for example, private bankers, investment advisors, and portfolio managers, but not IT support, auditors, or those in corporate finance. We administered the first experiment with US financial advisors who selected single stocks on behalf of their clients, which entailed either an SRI mandate or a conventional investment mandate. We administered the second experiment with European financial advisors who selected stock funds on behalf of their clients. In the following, we separately explain each experimental design, followed directly by the respective results.

2.3 US Experiment

2.3.1 Advisor stage

In this stage, the advisors saw a client profile, selected stocks on behalf of that client with an investment budget of $1,000, and set a fee for their service. The full instructions for advisors are shown in Section B.1.

Client profiles

For each client, advisors received information regarding gender, income, age, risk preferences, and investment mandate. Figure 2.1 shows an example of the information we provided for each client. As the main treatment variable, each client profile showed an investment mandate (conventional or socially responsible), which we combined with a pop-up window for more explanation. Each advisor saw the profile of one socially responsible female client, one socially responsible male client, one conventional female client, and one conventional male client. The order in which we showed the client profiles was randomized and balanced across advisors. For each client profile, the age was shown to be either between 35 and 44 years old or between 45 and 54 years old. Gross income was randomized for each client profile to be either between $40,000 and $59,999 or between $60,000 and $79,999 per year. To make sure that the advisors could allocate all funds to equity and that the advisors' assumptions about clients' risk preferences did not drive

the results, we recruited only clients who stated that they were willing to invest 100% of their experimental investment budget in stocks (which was referred to as the aggressive risk profile in our experiment).

Figure 2.1: Client profile screenshot (Advisor stage)

Stock information and selection

Below the client profile information, on the same screen, the advisors were asked to select a portfolio for the client by assigning a weight between 0% and 100% to all 30 stocks in the Dow Jones Industrial Average. For each stock, we provided the advisors with two ESG ratings, which were explained in more detail with pop-up windows (see Figure 2.2).

One ESG rating was a firm's MSCI ESG score, which is commonly used in academic publications[10] and practice. The MSCI ESG score is a letter rating ranging from AAA to CCC. In line with the classification on the MSCI ESG website, we color-coded and named the letter classifications as follows: CCC and B were shown in gray (labeled "laggard"), BB, BBB, and A were shown in yellow (labeled "average"), and AA and AAA were shown in green (labeled "leader").

We also included a binary indicator, which showed whether a firm was a participant

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[10]See for example Pedersen et al. (2021), Aragon et al. (2022), Avramov et al. (2022), Berg et al. (2022), and Pástor et al. (2022)

in the United Nations Global Compact (GC). Participants in the United Nations GC pledge to implement sustainable and socially responsible practices and to report on their progress. In addition, United Nations GC participants pledge to operate responsibly in alignment with the United Nations' sustainability principles in the areas of human rights, labor, the environment, and anti-corruption. We color-coded United Nations GC participating companies with a green letter "Y" (for yes) or a black letter "N" (for no). The ESG ratings that we show have the advantage that they are easy to understand and interpret, and advisors do not need any previous knowledge of sustainable investing to select sustainable portfolios.

Figure 2.2: Portfolio screenshot 1 (Advisor stage)

For each stock, we also provided key financial information. To create a representative decision environment and, at the same time, prevent information overflow, we ran a pre-

test to determine what financial information to show. In this pre-test, we asked financial professionals who were not part of the main experiment what information they primarily used in their decision-making processes.[11] On the decision screen, we displayed the six most important financial indicators. As an example, Figure 2.3 shows the pop-up window with the financial information that appears when clicking on *Verizon*.

Based on this information, the advisors weighted all 30 stocks in the Dow Jones Industrial Average for the client. The order in which the 30 stocks were listed was randomized across advisors. By default, the weight per stock was set as in the Dow Jones Industrial Average, which the advisors were able to adjust with a slider (or by entering the weight directly). At the bottom of the table, we displayed the total for all weights. The advisors were able to proceed only if that total was exactly 100. The example in Figure 2.3 shows the weighting of 11 stocks at the bottom of the list of 30.
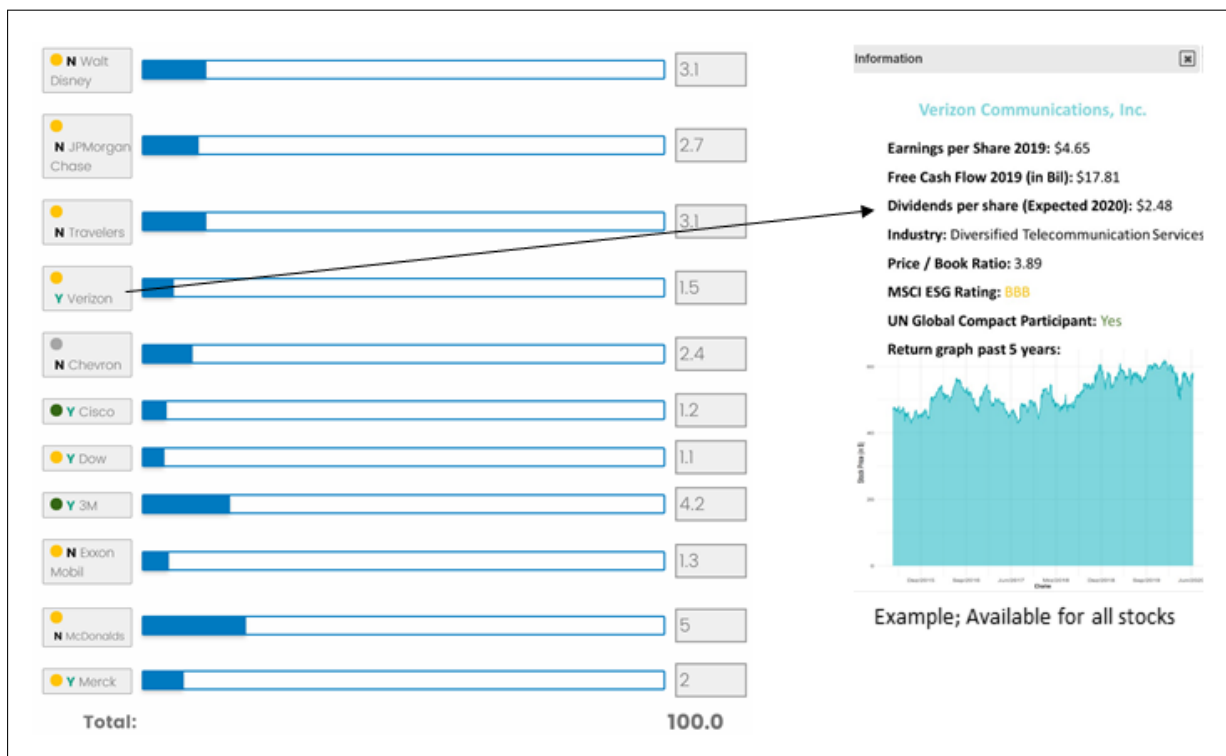
Figure 2.3: Portfolio screenshot 2 (Advisor stage)

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[11]Specifically, we asked 20 respondents to rank 22 distinct indicators that are most commonly and prominently displayed on platforms such as *Morningstar*, *Yahoo! Finance*, *Fidelity*, and *CNN Money* according to their importance in selecting portfolios of stocks. See section B.5 for full instructions and Table A1 for the importance ranking of indicators according to the financial professionals in our sample.

Fee and payment relevance

After selecting stocks for a specific client profile, the advisors were asked to set a fee for this service. They set the fee using a slider without an anchor (see Figure 2.4). They could set the fee to any percentage between 0% and 4% for each of the four client profiles. At the end of this stage, we randomly selected one of the four client profiles that was relevant for the advisor payment. The portfolio allocation and fee for this client profile were shown to a real client in the second experimental stage.

Advisory fee for your client as a percentage of the $1,000 portfolio value: Based on this fee, your client will decide whether to see your advice or to make her own investment.

| 0 | 0.4 | 0.8 | 1.2 | 1.6 | 2 | 2.4 | 2.8 | 3.2 | 3.6 | 4 |
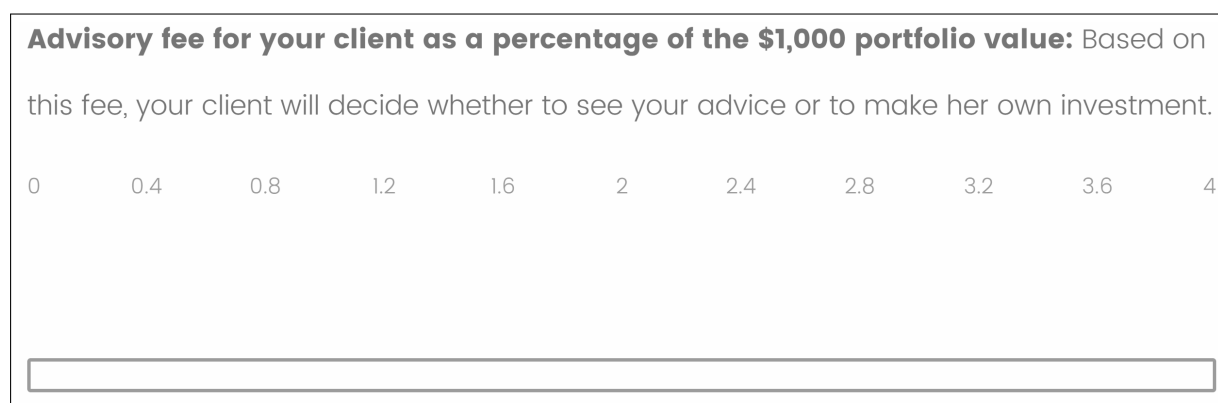
Figure 2.4: Fee setting screenshot (Advisor stage)

2.3.2   Client stage

Once the advisor stage was completed, we sampled clients who matched the randomly selected client profiles in the advisor stage. For this, we administered screening questions on age, gender, income, risk taking, and investor mandate (see Section 2.3.5 for more details). We informed participants that they would receive an experimental budget of $1,000 to invest in the stock market and that a financial advisor had selected a portfolio of stocks on their behalf. The clients saw the instructions that were given to the advisors, as well as an example portfolio selection screen from the advisor stage. We then asked the clients comprehension questions about the advisor stage.

The clients then saw the fee that their advisor had set for selecting the portfolio (see Figure 2.5) and decided to either pay the fee and take the advice or not to pay the fee and select their own portfolio of stocks. In the latter case, the clients went through the same stock selection process as the advisors. The advisors were paid out according to the

decision of their matched client.

Figure 2.5: Investment decision screenshot (Client stage)

2.3.3 Payment

All participants received a show-up fee plus a variable payment that was contingent on their decisions in the experiment.[12] For the advisors, the additional payment depended on whether the client took the advice. Advisor j received the following:

$$\Pi_j = \begin{cases} \rho + Fee_i, & \text{if } client\ i\ selects\ the\ advisor\ portfolio \\ \rho, & \text{otherwise,} \end{cases} \tag{2.1}$$

where Π_j refers to the payoff to advisor j, and ρ refers to the show-up fee. The fee was set as a percentage of the clients' $1,000 investment budgets; thus, so a fee of 1.4% corresponded to a payment of $14. The advisor payment was sufficiently large to ensure that the advisors took the task seriously. Disregarding outliers, participants spent around 14 minutes, on average, to complete the experiment and received an average payment of

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[12]The show-up fee of $2 was equal for advisors and clients and was offered on top of an undisclosed show-up fee that the market research company pays to all its clients for completed surveys.

$12.57, which means that the average hourly payoff was $53.87. Participants reported a gross annual income of $110,637, which allows us to estimate participants' hourly net wage at $31.39.[13] This means that the experimental payoff was around 1.7 times professionals' average net income per hour.

For clients, the variable payment depended on the performance of the selected investment. Every 10th client (randomly selected) received a variable payment. Clients who were not randomly selected received the show-up fee ρ. If randomly selected, client i received the following:

$$\Pi_i = \begin{cases} \rho + \$150 - Fee_i + r_j, & \text{if } client\ i\ selects\ the\ advisor\ portfolio \\ \rho + \$150 + r_i, & \text{otherwise.} \end{cases} \qquad (2.2)$$

The variable payment included a base payment of $150. If the clients chose to view the advice, the fee was deducted from this payment. Additionally, we recorded the return of their chosen investment over the coming year. If a client took the advice, their payment depended on the performance of the advisor portfolio r_j. If a client did not take the advice, their payment depended on the performance of the portfolio they selected themselves, r_i. Although the overall earnings could not be lower than 0, the clients participated in gains as well as losses of selected stock portfolios due to the $150 base payment.

2.3.4   External consequences of decisions

We ensured that the experiment was consequential. Previous experimental studies have shown that participants' behavior differs in real versus hypothetical situations (List & Gallet, 2001). This is especially relevant in our setting, where socially responsible investors care about the societal impact of purchasing stocks. Therefore, we ensured that the participants' decisions were consequential by purchasing stocks on the market, depending on the decisions that were made by participants. For 1 in 10 participants, we purchased and held stocks according to the participant's selection until the end of the

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[13]In line with Kirchler et al. (2018), we assume an income tax of 40% and that advisors work 45 hours per week and 47 weeks per year.

investment horizon (after one year). The participants were informed about this, and that they would receive proof of all stock transactions that we made to implement their portfolios. We aggregated and anonymized all participant data to make it impossible to trace back any decisions made in the experiment.

2.3.5 Implementation

The data collection took place in the second half of 2020, with the implementation of the stock portfolios on December 11, 2020. All experimental stages were administered online with Qualtrics. We collected the data in collaboration with the market research agency Dynata.[14]

As advisors, we recruited financial professionals in the US, whom we selected based on the two screenings, as outlined in Section 2.2. As clients, we recruited a sample of individuals from the US who were not financial professionals. To match clients to the profiles that we presented to the advisors, we screened out clients whose annual household income was below \$40,000 or above \$79,999 or whose age was below 35 or above 54. In addition, we asked the clients about their risk preferences in investing and selected only those who were willing to invest their entire experimental investment budget in stocks.[15] Finally, we asked the clients about their investor mandate to create a match with the respective profile shown to the advisor. Specifically, we asked clients: "Do you want to give your advisor a mandate for socially responsible investing?"

The sample included 345 professional financial advisors from 45 different states in the US (see Figure A1). As every advisor created a portfolio and set a fee on behalf of four different clients, we observed a total of 1,380 client—advisor relationships. An overview of the characteristics of the sample is provided in Table A3.

Before we discuss the results of the experiment, we first investigate whether the treatment was successfully implemented in the sense that the advisors catered to the sustainability preferences of their clients. Table A2 shows the outcome of four OLS regressions.

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[14]Dynata has access to more than 62 million consumers and business professionals and is specialized in B2B surveys, with over 40 years of experience in this area.

[15]Clients did not know what characteristics we were screening on. Therefore, clients could not game the survey to increase their chances of being able to participate.

Each column has a different sustainability indicator as a dependent variable. The dependent variable of the first regression, *United Nations GC* of client i, is defined as follows:

$$United\ Nations\ GC_i = \sum (Weight\ of\ stock\ k\ (in\ \%)\ *\ United\ Nations\ GC_k), \quad (2.3)$$

where $United\ Nations\ GC_k \epsilon \{0;1\}$ is equal to 1 if firm k participated in the United Nations GC and 0 otherwise. Thus, the maximum value that this variable could take for a client was 100, which means that 100% of the portfolio value is invested in companies that participate in the United Nations GC. The minimum value that this variable could take for a client was 0. The MSCI ESG (Letter Coded) dependent variable of the regression shown in column 2 was defined as follows:

$$MSCI\ ESG\ (Letter\ Coded)_i = \sum (Weight\ of\ stock\ k\ (in\ \%)\ *\ MSCI\_ESG\_Letter_k),$$
$$(2.4)$$

where $MSCI\_ESG\_Letter_k \epsilon \{0; \frac{1}{6}; \frac{1}{3}; \frac{1}{2}; \frac{2}{3}; \frac{5}{6}; 1\}$. This variable represents the quantified MSCI ESG letter rating of stock k, which corresponds to CCC, B, BB, BBB, A, AA, and AAA, respectively. Similarly, MSCI ESG (Color Coded), the dependent variable of the regression shown in column 3, is defined as follows:

$$MSCI\ ESG\ (Color\ Coded)_i = \sum (Weight\ of\ stock\ k\ (in\ \%)\ *\ MSCI\_ESG\_Color_k),$$
$$(2.5)$$

where $MSCI\_ESG\_Color_k \{0; 0.5; 1\}$ corresponds to the MSCI ESG color ratings gray, yellow, and green, respectively. Both quantifications of the MSCI ESG scores take a value between 0 and 100 as the dependent variable in column 1. Finally, column 4 shows a regression with an overall ESG rating, defined as

$$Overall\ ESG\ Rating_i = \frac{United\ Nations\ GC_i + MSCI\ ESG\ (Letter\ Coded)_i}{2}. \quad (2.6)$$

Table A2 shows that irrespective of the rating considered, advisors create more sus-

tainable portfolios under an SRI mandate. Therefore, we are confident that our treatment was administered successfully.

2.3.6 Results

SRI mandates lead to a premium

Result 1: *US financial advisors charge SRI clients a premium.*

Support: We next explore whether the advisors in our sample charge SRI clients a premium. The mean fee in the entire sample charged to clients is $\mu = 1.92\%$ (SD = 0.97). This fee is slightly lower than fees reported in recent studies on retail financial advice (Foerster et al., 2017; Linnainmaa et al., 2021). The average mean adjusted fee charged by investor mandate is shown in Figure 2.6. The whiskers show that advisors charge a higher fee when a client communicates sustainable investment preferences compared to a client who communicates conventional investment preferences.

We formally test this using the following model:

$$Fee_i = \alpha + \beta_1 * \psi + \beta_2 * \theta + \beta_3 * SRI\_Mandate_i + \beta_4 * Female_i + \beta_5 * High\_Age_i$$
$$+ \beta_6 * High\_Income_i + \beta_7 * Round_i + \epsilon_i,$$

$$(2.7)$$

where client i's fee is determined by ψ (a vector of advisor fixed effects), θ (a vector of round fixed effects), $SRI\_Mandate_i \epsilon$ {1 if a client gave an SRI mandate, 0 otherwise}, $Female_i \epsilon$ {1 if a client identified as female, 0 if a client identified as male}, $High\_Age_i \epsilon$ {1 if a client was between 45 and 54 years old, 0 if a client was between 35 and 44 years old}, and $High\_Income_i \epsilon$ {1 if a client had a gross annual income between \$60,000 and \$79,999, 0 if a client had a gross annual income between \$40,000 and \$59,999}.

Table 2.1 shows the results of two Tobit regressions.[16] Column 1 shows the effect of a client's investment mandate on the fee charged by advisors, without including any

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[16]The dependent variable Fee_i is censored on the right side, as it is bound between 0 and 4%.
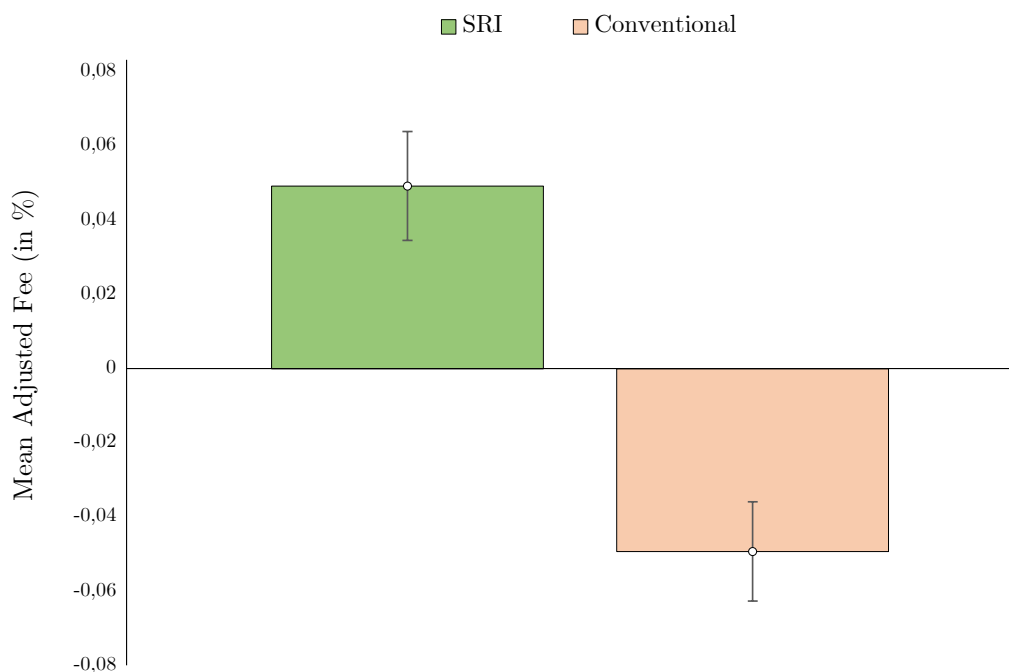
Figure 2.6: Average mean adjusted fee charged by investment mandate

Notes: The figure shows the average mean adjusted fee in % charged by investor mandate. We form pairs of clients, who have the same gender and the same advisor, but who differ in their investment mandate. For client i, the mean adjusted fee is the fee that is charged by advisor j to client i minus the average fee charged by advisor j to both clients in this client pair. The whiskers represent +/- one standard error.

controls. Advisors charge a premium of 5.1 basis points (p = 0.003) when a client mandates SRI. Column 2 shows the outcome of regression equation 2.7. The estimated effect size remains significant at 5.0 basis points (p = 0.004) when all control variables are included. Although we see that the coefficient on *Female* is negative, indicating a lower fee charged to women, this difference is not significant at conventional levels (p = 0.063). Furthermore, no other client characteristics have explanatory power in fee differences.

This shows that advisors charge sustainable investors a premium at the aggregate level. We also consider the heterogeneity of the premiums that are charged. Specifically, we investigate whether the aggregate fee difference is driven by a moderate premium for SRI clients charged by all advisors or by a large premium for SRI clients charged by only a subset of advisors. Therefore, we first investigate whether SRI mandates increase the probability of being charged a premium. For that purpose, we form pairs of clients who

Table 2.1: Advisors charge higher fees to SRI clients

Dependent Variable:	(1)	(2)
	Fee (in%)	
SRI Mandate	0.051***	0.050***
	(0.017)	(0.017)
Female		-0.032
		(0.017)
High Age		-0.001
		(0.022)
High Income		0.014
		(0.021)
α	1.975***	1.980***
	(0.015)	(0.034)
Advisor FE	Yes	Yes
Round FE	No	Yes
Observations	1,380	1,380
Uncensored Observations	1,328	1,328
Log Likelihood	-398.2	-392.4

*Notes: **p<0.05; ***p<0.01. Standard errors, clustered at the advisor level, in brackets. Column 1 and 2 show the coefficient estimates of Tobit regressions. Both regressions have the fee (in percent) charged by an advisor to a client as the dependent variable. SRI Mandate is equal to 1 if a client gives a mandate for SRI and 0 otherwise. Female is equal to 1 if a client is female and 0 if a client is male. High Age is equal to 1 if a client is between 45 and 54 years old, 0 if a client is between 35 and 44 years old. High Income is equal to 1 if a client has a gross annual income between $60,000 and $79,999, 0 if a client has a gross annual income between $40,000 and $59,999.*

have the same gender and the same advisor but whose investment mandates differ. We then assign a binary indicator to each client that is equal to 1 if this client was charged a higher fee than the other client in this pair and 0 otherwise. We then conduct a probit regression with this binary indicator as the dependent variable. Column 1 of Table 2.2 shows the marginal effects of this probit regression. The results show that SRI mandates increase the probability of being charged a premium by 6.3 percentage points. We also

Table 2.2: Fee premium to SRI clients

	(1) Probit	(2) Tobit
Dependent Variable:	Premium charged	Fee (in %)
SRI Mandate	0.063**	0.478***
	(0.089)	(0.026)
Female	0.011	-0.091**
	(0.035)	(0.042)
High Age	-0.006	0.040
	(0.073)	(0.039)
High Income	0.026	0.005
	(0.074)	(0.031)
α	-0.628***	1.937***
	(0.015)	(0.137)
Advisor FE	No	Yes
Round FE	Yes	Yes
Observations	1,380	504
Uncensored Observations		494
Pseudo-R^2	0.02	
Log Likelihood		-71.73

Notes: **p<0.05; ***p<0.01. Standard errors, clustered at the advisor level, in brackets. Column 1 shows the marginal effects of a Probit regression. We form pairs of clients, who have the same gender and the same advisor, but who differ in whether they give an SRI mandate or a conventional investment mandate. The dependent variable is a binary indicator that is equal to 1, if a client was charged a higher fee than the other client in this pair and 0 otherwise. Column 2 shows the coefficient estimates of a Tobit regression on the subset of client pairs, among which the SRI client was charged a higher fee. The dependent variable is the fee (in percent) charged by an advisor to a client. SRI Mandate is equal to 1 if a client gives a mandate for SRI and 0 otherwise. Female is equal to 1 if a client is female and 0 if a client is male. High Age is equal to 1 if a client is between 45 and 54 years old, 0 if a client is between 35 and 44 years old. High Income is equal to 1 if a client has a gross annual income between $60,000 and $79,999, 0 if a client has a gross annual income between $40,000 and $59,999.

consider the size of the premium, conditional on whether it is charged at all. For that purpose, we re-run our main model with the subset of client pairs, among whom the

SRI client was charged a higher fee. This reduces the full sample to 504 clients, which represents 36.5% of the full sample. Column 2 of Table 2.2 shows the coefficient estimates of the Tobit regression. The dependent variable is the fee (in percent) charged a client by an advisor. The coefficient estimates show that if an advisor charges an SRI client a premium, it was substantial, at 47.8 basis points.

SRI mandates do not require more time and effort

Result 2: *US financial advisors neither spend more time on nor exert more effort for SRI clients.*

Support: In this section, we consider whether advisors put more time or effort into constructing portfolios on behalf of SRI clients. This potential extra effort could justify why advisors charge those clients a premium. The results are displayed in Table 2.3. The first two columns show the outcome of OLS regressions, with the natural logarithm of the time spent constructing a client's portfolio as the dependent variable. In both specifications, we do not detect a difference in the time spent by advisors on SRI clients compared to conventional clients. Columns 3 and 4 show the outcome of OLS regressions, with the natural logarithm of the number of clicks that advisors spend on constructing a client's portfolio as the dependent variable.[17] This can be interpreted as the effort that advisors put into constructing portfolios on behalf of clients. There is no difference in how often advisors click when a client mandates SRI versus when a client mandates conventional investment. In addition, no other client characteristics can explain the number of advisor clicks once we include round fixed effects.

SRI clients are not more likely to reject advice

Result 3: *US sustainable investors are as likely (as conventional investors) to pay for advice, even when asked to pay a premium.*

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[17]One is added to the number of clicks, as it is possible to allocate a portfolio with zero clicks, in which case the default weights are applied to stocks

Table 2.3: Advisors do not exert more effort for SRI clients

Dependent Variable:	(1)	(2)	(3)	(4)
	Log(Time)		Log(Clicks+1)	
SRI Mandate	0.046	0.046	0.027	0.024
	(0.057)	(0.045)	(0.044)	(0.039)
Female	0.110	0.070	0.063	0.042
	(0.058)	(0.046)	(0.042)	(0.038)
High Age	-0.051	0.030	-0.092**	-0.042
	(0.063)	(0.054)	(0.047)	(0.041)
High Income	0.079	0.061	0.006	-0.010
	(0.072)	(0.053)	(0.052)	(0.046)
α	1.303***	2.122***	-0.023	0.461
	(0.049)	(0.055)	(0.035)	(0.051)
Advisor FE	Yes	Yes	Yes	Yes
Round FE	No	Yes	No	Yes
Observations	1,380	1,380	1,380	1,380
Adjusted R^2	0.64	0.78	0.80	0.84

Notes: **$p<0.05$; ***$p<0.01$. Standard errors, clustered at the advisor level, in brackets. All columns show the coefficient estimates of OLS regressions. The dependent variable in columns 1 and 2 is the logarithm of time in seconds that advisors take to create a portfolio for a client (Obtained from metadata). The dependent variable in columns 3 and 4 is the logarithm of the number of clicks (+1) that advisors take to create a portfolio for a client (Obtained from metadata). One is added to the number of clicks, as it is possible to allocate a portfolio with zero clicks, in which case the default weights are applied to stocks. SRI Mandate is equal to 1 if a client gives a mandate for SRI and 0 otherwise. Female is equal to 1 if a client is female and 0 if a client is male. High Age is equal to 1 if a client is between 45 and 54 years old, 0 if a client is between 35 and 44 years old. High Income is equal to 1 if a client has a gross annual income between $60,000 and $79,999, 0 if a client has a gross annual income between $40,000 and $59,999.

Support: An important question is whether SRI clients are more likely to reject advice. If this were the case, clients ultimately would not end up paying the premium. However, SRI clients are as likely to accept the advice as conventional clients were.

Overall, 66.83% of the clients took the advice, while the remaining 33.17% selected stocks for themselves. Table 2.4 shows the marginal effects of two probit regressions.

Column 1 shows a regression of client SRI preference on a binary variable indicating whether the advice was taken without including any controls. Column 2 shows the regression results of the same model, while controlling for other client characteristics, including gender, age, and income. In both model specifications, we see a tendency for SRI clients to accept advice more often, which, however, is not statistically significant. The fee charged cannot explain any variation in propensity to take advice.

Table 2.4: SRI clients are not more likely to reject advice

	(1)	(2)
Dependent Variable:	Was the Advice Taken?	
SRI Mandate	0.035	0.041
	(0.180)	(0.184)
Fee		0.018
		(0.094)
Female		0.035
		(0.183)
High Age		0.030
		(0.186)
High Income		-0.010
		(0.182)
α	0.389***	0.319
	(0.123)	(0.261)
Observations	208	208
Pseudo-R^2	0.00	0.01

*Notes: **$p<0.05$; ***$p<0.01$. Standard errors in brackets. Columns 1 and 2 show the marginal effects of probit regressions, where the dependent variable is 1 if a client took the advice and 0 otherwise. SRI Mandate is equal to 1 if a client gives a mandate for SRI and 0 otherwise. High Literacy is equal to 1 if a client answered all financial literacy questions correctly and 0 if a client has answered one or more financial literacy questions incorrectly. Fee is the fee (in %) charged by the advisor. Female is equal to 1 if a client is female and 0 if a client is male. High Age is equal to 1 if a client is between 45 and 54 years old, 0 if a client is between 35 and 44 years old. High Income is equal to 1 if a client has a gross annual income between \$60,000 and \$79,999, 0 if a client has a gross annual income between \$40,000 and \$59,999.*

Additional robustness checks

In additional analyses, we exclude all advisors who take less than five minutes to complete the experiment. We also exclude advisors whose responses throughout the experiment are inconsistent.[18] We refer to this sample as the *REDUCED sample.* Table A4 provides an overview of the characteristics of the REDUCED sample. When running our analyses with the REDUCED sample, our findings remain the same qualitatively. The effect sizes even increase. Table A5 shows that under all definitions of social responsibility, advisors in the REDUCED sample create more sustainable portfolios when a client mandates SRI. Again, the effect sizes increase and all effects are still significant. Table A6 shows an estimation of the regression equation 2.7 with the REDUCED sample. Although the results remain the same qualitatively, the effect of an SRI mandate on the charged fee increases from 5.0 basis points to 6.4 basis points (p = 0.006). Finally, Table A7 shows that in the REDUCED sample, advisors do not exert significantly more time or effort to construct portfolios for SRI clients. This is in line with our finding when using the full sample.

2.3.7   Interim conclusion

Taken together, our results from the US experiment show that US financial advisors charge sustainable investors a premium, and that this premium is also accepted and paid. Outside of our experimental setting, skill, effort, and costs could play a role and even increase fees further, but we show that even when they do not play a role, fees are higher for sustainable investors.

2.4   European Experiment

We extend our findings from the experiment in the US with a second experiment in Europe. We address some questions, the answers to which will provide a deeper insight into

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[18]We ask the respondents twice what their main occupation is, once at the beginning of the survey and once at the end of the survey. We ask this question slightly differently in the two instances. We remove advisors who give different answers to the two questions (most advisors give very similar answers, but we were very strict with this exclusion criterion).

the conditions under which financial advisors charge sustainable investors a premium..
First, do our findings hold for European financial advisors? Previous research on institu-
tional investors has suggested between-country differences in the behavior of sustainable
investors (Dyck et al., 2019; Gibson Brandon et al., 2022). Furthermore, there are reg-
ulatory differences in the extent to which advisors personally benefit from fees paid by
clients.[19] These factors justify an investigation into whether our original findings could
be reproduced with European financial advisors. Second, do our findings hold in a fund
selection setting? Instead of selecting single stocks on behalf of their clients, many fi-
nancial advisors recommend pre-allocated financial products, such as mutual funds, to
clients. Therefore, we investigate whether a premium is charged in a fund selection set-
ting. Third, do our findings hold in a setting that eliminates the additional effort of
sustainable investing? In our first experiment, we infer the effort put in by advisors by
analyzing metadata, such as the number of clicks that advisors take to put together stock
portfolios on behalf of clients, and we do not find a difference between clients by mandate.
We additionally explore whether we can detect a sustainability premium in a setting in
which we do not have to proxy for higher advisor effort but rule it out by design. Fourth,
we investigate whether financial literacy has an effect on the premium that sustainable
investors must pay. Specifically, we consider the possibility that a driver of fee differences
is that advisors assume SRI clients have lower financial literacy, which allows them to
charge a premium. This would mean that advisors do not charge SRI clients a premium
when they can signal high financial literacy.

2.4.1 Experimental setup

As in the US experiment, our experimental design consisted of two stages.[20] In the first
stage, advisors saw a client profile, invested EUR 1,000 on behalf of that client, and set
a fee for their service. We implemented two major design changes in the advisor stage.
First, we showed the clients' financial literacy to the advisors. Second, we had a fund

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[19]For example, some European countries like the Netherlands and the UK ban kickbacks to financial
advisors.
[20]We provide the full experimental instructions in Section B.3.

selection task instead of a stock selection task.

Client financial literacy

The advisors again received information about their clients' gender, income, age, risk preferences, and investment mandate. In addition, we provided information on clients' financial literacy. We defined financial literacy in terms of their clients' relative performance in the big three financial literacy questions, first suggested by Lusardi and Mitchell (2008). Advisors received information about their clients' relative scores[21] on this quiz. In total, each advisor saw six different client profiles: three SRI clients (with high financial literacy, low financial literacy, or unknown financial literacy) and three conventional clients (with high financial literacy, low financial literacy, or unknown financial literacy). The advisors first selected funds for the two clients with unknown financial literacy in random order and then for the remaining four clients in random order.

Fund information and selection

We made some adjustments to the selection task of advisors on behalf of their clients. We asked the advisors to select one of six funds and designed the fund selection task in such a way that the SRI clients would not require any additional effort.

We informed the advisors that all stocks in the funds were among the largest 200 stocks in the MSCI World index by market capitalization. We created artificial funds to have more control over their characteristics and to prevent professionals from attaching any real fee to existing funds. We gave each fund a number as an identifier, rather than naming them, to minimize noise through framing. If advisors asked for more information, they could open pop-up windows with fund-level indicators, including the portfolio beta, the forward dividend yield, the price/book value, and the fund's investment style (proportion invested in value-, core-, and growth stocks; see Figure 2.7). We slightly adapted the factors from the US experiment to those most relevant for mutual funds.

Importantly, we aggregated sustainability information into an ESG rating that was

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[21]Whether a client performed above or below the median client in the sample

trivial for advisors to understand. This form of fund-level sustainability information is common in the field. On Morningstar, mutual funds' sustainability is given in terms of sustainability globes, where between one and five globes are assigned to funds. Specifically, a fund was awarded one leaf if between 0% and 20% of companies in the fund participate in the United Nations GC. Two, three, four, and five leaves were awarded if more than 20%, 40%, 60%, and 80% of companies in the fund participate in the United Nations GC, respectively. We informed advisors how we calculated this ESG rating in a pop-up window. Figure 2.7 shows an example screen for the fund selection. Due to the aggregated ESG rating, for financial advisors, selecting a sustainable fund was as easy as counting to five. Based on this information, the advisors selected one of the six funds. We randomized and counterbalanced the order in which funds were shown.

Figure 2.7: Fund selection screenshot (Advisor stage)

2.4.2   Implementation

We administered the European experiment in the first half of 2022. We recruited only financial professionals in Europe and selected them based on the screenings outlined in Section 2.2. Our sample includes 70 advisors who passed all screenings. As every advisor selected a fund and set a fee on behalf of six different clients, our data set includes a total of 420 client—advisor relationships. As clients, we recruited a sample of individuals from

Europe who are not financial professionals in the same way as in the US experiment.

We first evaluate whether our treatment (i.e., SRI mandates) had any effect on financial advice. If advisors cater to the sustainability preferences of their clients, we expect them to select funds with higher ESG ratings on behalf of SRI clients. To assess this question, we run a set of Tobit regressions[22] with the number of leaves associated with the selected funds as the dependent variable. The results are shown in Table A9. Advisors select funds with a higher ESG rating (on average, 2.3 more leaves) for SRI mandates. Thus, we can be confident that our treatment was recognized by the advisors and translated into action.

2.4.3   Results

SRI mandates lead to a premium in a fund selection setting

Result 4: *European financial advisors charge a premium for SRI fund selection.*

Support: To investigate whether our main finding replicates in the new experimental setting, we first consider only fees for clients whose financial literacy is not given, as this was also the case in the US experiment. We run a Tobit regression with the charged fee as the dependent variable. We again control for all client characteristics that were communicated to advisors and include advisor and round fixed effects. The results are shown in Table 2.7. In both model specifications, the coefficient of SRI Mandate is positive and significant. Further, the coefficient size is larger than for US advisors, indicating that European advisors charge SRI clients between 7.7 and 8.3 basis points more. No other client characteristic has explanatory power on the charged fee.

As in Section 2.3.6, we also consider whether the probability of being charged a premium increases for SRI clients. For that purpose, we form pairs of clients who have the same financial literacy and the same advisor but who differ in their investment mandate. Each client is then assigned a binary indicator that is equal to 1 if this client was charged

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[22]The dependent variable, the amount of sustainability leaves of the selected portfolio, is censored on the right side, as it is bound between 0 and 5.

Table 2.5: Advisors charge higher fees to SRI clients

Dependent Variable:	(1)	(2)
	Fee (in%)	
SRI Mandate	0.083***	0.077***
	(0.029)	(0.028)
Female		-0.043
		(0.033)
High Age		-0.050
		(0.031)
High Income		0.004
		(0.032)
α	2.058***	2.074***
	(0.102)	(0.081)
Advisor FE	Yes	Yes
Round FE	No	Yes
Observations	140	140
Uncensored Observations	139	139
Log Likelihood	44.28	48.86

*Notes: **p<0.05; ***p<0.01. Standard errors, clustered at the advisor level, in brackets. Column 1 and 2 show the coefficient estimates of Tobit regressions. Both regressions have the fee (in percent) charged by an advisor to a client as the dependent variable. SRI Mandate is equal to 1 if a client gives a mandate for SRI and 0 otherwise. Female is equal to 1 if a client is female and 0 if a client is male. High Age is equal to 1 if a client is between 45 and 54 years old, 0 if a client is between 35 and 44 years old. High Income is equal to 1 if a client has a gross annual income between $60,000 and $79,999, 0 if a client has a gross annual income between $40,000 and $59,999.*

a higher fee than the other client in this pair and 0 otherwise. The marginal effects of a probit regression with this binary indicator as the dependent variable are shown in Column 1 of Table 2.6. The results show that SRI mandates increase the probability of being charged a premium by 18.5 percentage points.

We then estimate our main model for the subset of client pairs, among which the SRI client was charged a higher fee. This reduces the sample to 40 observations. Column 2

Table 2.6: Fee premium to SRI clients

Dependent Variable:	(1) Probit Premium charged	(2) Tobit Fee (in %)
SRI Mandate	0.185***	0.424***
	(0.068)	(0.052)
Female	-0.063	-0.086
	(0.069)	(0.054)
High Age	-0.067	-0.035
	(0.068)	(0.068)
High Income	-0.025	-0.014
	(0.067)	(0.076)
α	0.132	1.639***
	(0.083)	(0.135)
Advisor FE	Yes	Yes
Round FE	Yes	Yes
Observations	140	40
Uncensored Observations		39
Pseudo-R^2	0.12	
Log Likelihood		10.87

Notes: **p<0.05; ***p<0.01. Standard errors, clustered at the advisor level, in brackets. Column 1 shows the marginal effects of a Probit regression. We form pairs of clients, who have the same financial literacy and the same advisor, but who differ in whether they give an SRI mandate or a conventional investment mandate. The dependent variable is a binary indicator that is equal to 1, if a client was charged a higher fee than the other client in this pair and 0 otherwise. Column 2 shows the coefficient estimates of a Tobit regression on the subset of client pairs, among which the SRI client was charged a higher fee. The dependent variable is the fee (in percent) charged by an advisor to a client. SRI Mandate is equal to 1 if a client gives a mandate for SRI and 0 otherwise. Female is equal to 1 if a client is female and 0 if a client is male. High Age is equal to 1 if a client is between 45 and 54 years old, 0 if a client is between 35 and 44 years old. High Income is equal to 1 if a client has a gross annual income between $60,000 and $79,999, 0 if a client has a gross annual income between $40,000 and $59,999.

of Table 2.6 shows the coefficient estimates of the tobit regression that we run on this subset. The dependent variable is the fee (in percent) charged by an advisor to a client.

The coefficient estimates show that if an advisor charges a premium to an SRI client, this premium lies at 42.4 basis points, on average.

The role of financial literacy

Result 5: *Advisors charge sustainable investors with unknown or low financial literacy a premium, but do not charge sustainable investors with high financial literacy a premium.*

Support: We next consider how advisors set fees when they know their clients' financial literacy. Looking at descriptives, the mean fee in the entire sample charged to clients is $\mu = 1.50\%$ (SD = 0.76), in which clients with low financial literacy are charged the most ($\mu = 1.55\%$; SD = 0.78), clients with high financial literacy are charged the least ($\mu = 1.45\%$; SD = 0.74), and clients whose financial literacy is not revealed are charged a fee that lies between the two ($\mu = 1.49\%$; SD = 0.75).

Figure 2.8 graphically shows the mean fee that advisors charge by investor mandate for each financial literacy subset. The figure reveals some interesting patterns. Advisors charge the highest fee to SRI clients with low financial literacy. Furthermore, advisors charge clients with high financial literacy a relatively low fee, with no significant fee difference by investor mandate. Therefore, only those clients who cannot signal high financial literacy bear the burden of an SRI premium.

To test fee differences by client financial literacy, we run a Tobit regression for the subset of clients whose financial literacy is shown to be low (column 2 of Table 2.7), for the subset of clients whose financial literacy is shown to be high (column 3 of Table 2.7), and for a combined subset (column 1 of Table 2.7). The coefficient for High Financial Literacy in Column 1 shows that clients with low financial literacy are charged an additional 9.8 basis points. Column 2 shows that when client financial literacy is low, advisors charge a premium of around 4.8 basis points to SRI clients. Column 3 shows a coefficient that is statistically zero for SRI Mandate when client financial literacy is high.
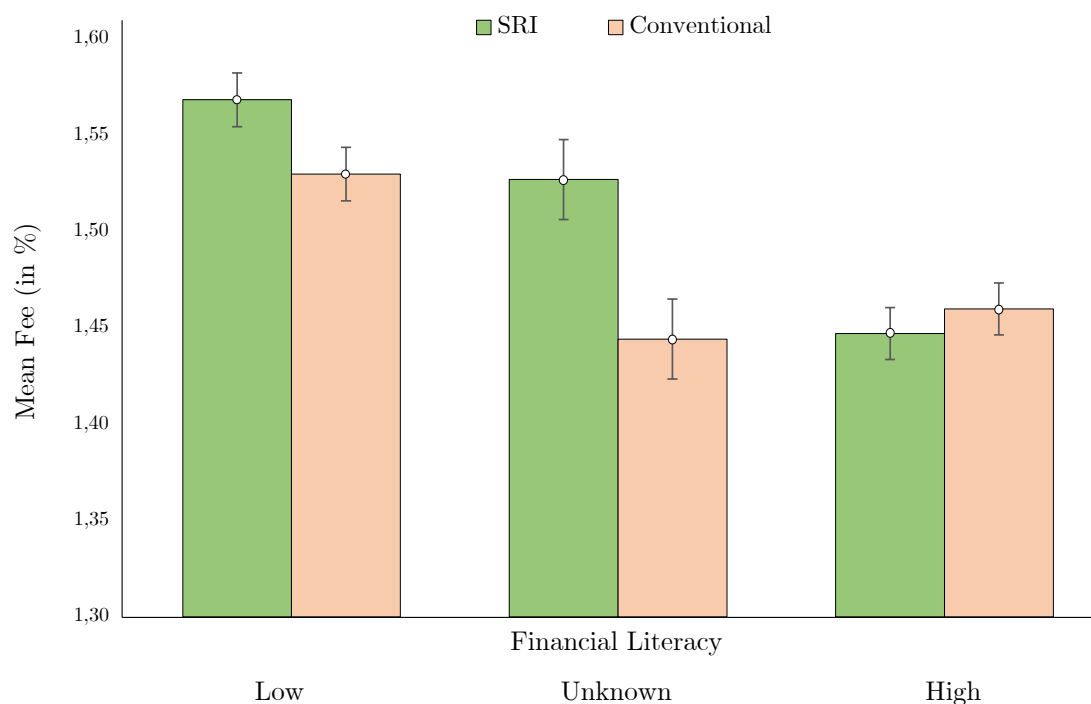
Figure 2.8: Average fee charged by investment mandate and financial literacy

Notes: The first and second bar show the average fee charged to SRI / conventional investment clients with low financial literacy, respectively. The third and fourth bar show the average fee charged to clients with unknown financial literacy who give an SRI-/ conventional mandate, respectively. The fifth and sixth bar show the average fee charged to SRI / conventional investment clients with high financial literacy, respectively. The whiskers represent +/- one standard error of the mean adjusted fee.

SRI mandates require less time and effort in a fund selection setting

Result 6: *European financial advisors spend less time and exert less effort when selecting funds for SRI clients.*

Support: As in the first study, our experimental design allows us to rule out effort, skill, and cost differences as drivers of the premium charged to sustainable clients in this setting. Nevertheless, it is interesting to explore whether any differences in time and effort exist by mandate. Table 2.8 shows that the European advisors in our sample spend significantly less time and click significantly less through fund-level information when selecting funds for sustainable clients. Specifically, the clicking behavior suggests that advisors focus almost exclusively on ESG ratings for SRI clients but consider a much broader set of

Table 2.7: Fees charged by client financial literacy

Dependent Variable:	(1)	(2)	(3)
	Fee (in %)		
Financial literacy:	Low & High	Low	High
SRI Mandate	0.018	0.048**	-0.007
	(0.026)	(0.021)	(0.019)
High Financial Literacy	-0.098***		
	(0.027)		
Female	-0.005	0.017	-0.025
	(0.033)	(0.020)	(0.023)
High Age	-0.013	0.013	-0.055**
	(0.033)	(0.023)	(0.025)
High Income	-0.025	-0.015	-0.065***
	(0.035)	(0.021)	(0.024)
α	1.933***	1.981***	2.037***
	(0.046)	(0.034)	(0.045)
Advisor FE	Yes	Yes	Yes
Round FE	Yes	Yes	Yes
Observations	280	140	140
Uncensored Observations	279	140	139
Log Likelihood	25.64	109.8	112.6

*Notes: **p<0.05; ***p<0.01. Standard errors, clustered at the advisor level, in brackets. Column 1, 2, and 3 show the coefficient estimates of Tobit regressions. All regressions have the fee (in percent) charged by an advisor to a client as the dependent variable. We run the regressions separately for client subgroups by financial literacy, as shown to advisors. SRI Mandate is equal to 1 if a client gives a mandate for SRI and 0 otherwise. High Financial Literacy is equal to 1 if a client's financial literacy was reported to be high to advisors and 0 otherwise. Female is equal to 1 if a client is female and 0 if a client is male. High Age is equal to 1 if a client is between 45 and 54 years old, 0 if a client is between 35 and 44 years old. High Income is equal to 1 if a client has a gross annual income between €60,000 and €79,999, 0 if a client has a gross annual income between €40,000 and €59,999.*

fund-level information for conventional investment mandates. This makes the premium charged to SRI clients even more noteworthy and supports the notion that the premium

can be interpreted as extraction of additional profits from clients' sustainable investment preferences.

Table 2.8: European advisors exert less effort for SRI clients

Dependent Variable:	(1)	(2)	(3)	(4)
	Log(Time)		Log(Clicks)	
SRI Mandate	-0.202***	-0.263***	-0.289***	-0.320***
	(0.068)	(0.060)	(0.068)	(0.066)
Female	-0.011	0.026	-0.043	-0.018
	(0.069)	(0.053)	(0.067)	(0.064)
High Age	-0.158**	-0.038	-0.138	-0.080
	(0.070)	(0.051)	(0.072)	(0.064)
High Income	0.054	0.020	0.021	0.007
	(0.075)	(0.059)	(0.063)	(0.063)
α	3.725***	4.554***	2.614***	3.056***
	(0.096)	(0.101)	(0.082)	(0.101)
Advisor FE	Yes	Yes	Yes	Yes
Round FE	No	Yes	No	Yes
Observations	420	420	420	420
Adjusted R^2	0.45	0.70	0.51	0.59

*Notes: **p<0.05; ***p<0.01. Standard errors, clustered at the advisor level, in brackets. All columns show the coefficient estimates of OLS regressions. The dependent variable in columns 1 and 2 is the logarithm of time in seconds that advisors take to create a portfolio for a client (Obtained from metadata). The dependent variable in columns 3 and 4 is the logarithm of the number of clicks that advisors take to create a portfolio for a client (Obtained from metadata). SRI Mandate is equal to 1 if a client gives a mandate for SRI and 0 otherwise. Female is equal to 1 if a client is female and 0 if a client is male. High Age is equal to 1 if a client is between 45 and 54 years old, 0 if a client is between 35 and 44 years old. High Income is equal to 1 if a client has a gross annual income between €60,000 and €79,999, 0 if a client has a gross annual income between €40,000 and €59,999.*

SRI clients are more likely to pay for advice

Result 7: *Sustainable investors in Europe are more likely to pay for advice, even when they are asked to pay a premium.*

Support: To test whether clients' SRI preferences affect their propensity to pay for financial advice, we run two probit regressions with a binary indicator for whether a client took the advice as the dependent variable. We report the marginal effects in Table 2.9. The results show that SRI clients are around 31 percentage points more likely to pay for advice. As in the first experiment, the fee that is charged does not have explanatory power on the propensity to take advice.

2.4.4 Interim conclusion

Our results show that European financial advisors charge SRI clients a premium in a fund selection setting while spending less time and exerting less effort. Financial advisors do not price discriminate against SRI clients who signal high financial literacy, but against SRI clients who cannot signal high financial literacy. Educating consumers may therefore be an effective policy intervention to counteract premiums charged because of SRI mandates. We discuss policy interventions in more detail in the next section.

2.5 Regulator survey

2.5.1 Setup and implementation

To derive the policy implications of our results, we administered an online survey with European regulators in the first half of 2021, after the experiment in the US. The survey included a detailed description of the main experiment (see Section B.6 for the full instructions). We then asked three sets of questions. First, we asked regulators to predict the outcome of our study (incentivized). Although lab-in-the-field experiments can be a powerful tool for informing public policy (Levitt & List, 2009; Gneezy & Imas, 2017), results are often dismissed due to hindsight bias ("I knew this already") (DellaVigna et al., 2019). By eliciting the regulators' predictions, we can get an impression of the novelty of our results for policy. Second, we asked the regulators to rate the external validity of our experiment. Third, we asked them whether they believe that our results require

Table 2.9: SRI clients are more likely to pay for advice

Dependent Variable:	(1)	(2)
	Was the advice taken?	
SRI Mandate	0.311***	0.316***
	(0.221)	(0.230)
High Financial Literacy		-0.080
		(0.262)
Fee		-0.026
		(0.128)
Female		0.070
		(0.229)
High Age		0.042
		(0.229)
High Income		-0.102
		(0.227)
α	0.086	0.145
	(0.147)	(0.371)
Observations	157	157
Pseudo-R^2	0.16	0.20

Notes: **p<0.05; ***p<0.01. Standard errors in brackets. Columns 1 and 2 show the marginal effects of probit regressions, where the dependent variable is 1 if a client took the advice and 0 otherwise. SRI Mandate is equal to 1 if a client gives a mandate for SRI and 0 otherwise. High Literacy is equal to 1 if a client answered all financial literacy questions correctly and 0 if a client has answered one or more financial literacy questions incorrectly. Fee is the fee (in %) charged by the advisor. Female is equal to 1 if a client is female and 0 if a client is male. High Age is equal to 1 if a client is between 45 and 54 years old, 0 if a client is between 35 and 44 years old. High Income is equal to 1 if a client has a gross annual income between €60,000 and €79,999, 0 if a client has a gross annual income between €40,000 and €59,999.

attention from policymakers and what a policy intervention would look like.

We distributed the survey to 53 regulators in Europe. The regulators in our sample include members of the European Commission's high-level expert group on sustainable finance, who were involved in formulating the MiFID II amendment that requires financial advisors to elicit clients' sustainability preferences. The regulators also work at the

Dutch Central Bank, the Authority for Financial Markets (AFM), and the compliance departments of several European banks.[23] We collectively refer to all survey participants as "regulators". We administered the survey to European institutions because the MiFID II amendment, which requires financial advisors to ask clients about their SRI preferences, affects European banks and insurance companies. Table A10 shows the demographics and job descriptions of the regulators in our sample. The occupation of most of the regulators in our sample is policy work. On a five-point Likert scale, the participants rated their experience in SRI at 3.15, where 3 refers to "average." Thus, the regulators in our sample have slightly above-average experience with SRI-related projects and topics. The average number of years of experience in regulation is 7.83 years.

2.5.2 Results

Result 8: *European regulators correctly (incorrectly) predict higher fees (higher effort) for SRI clients and believe that our main findings are externally valid.*

Support: We first consider whether the regulators can correctly predict the direction of our results. We asked the incentivized questions: "Who do you believe financial advisors charged a higher fee to in the research study?" as well as "Who do you believe financial advisors exerted more effort for in the research study?" Table A13 shows the results. Most regulators (92%) correctly predicted that advisors charge a higher fee to SRI clients. However, a significantly large majority of the regulators (60%) also incorrectly predicted that advisors exert more effort for SRI clients in our experiment. Therefore, regulators predicted that higher fees for sustainable clients can be explained by higher effort, contrary to our results.

We then investigate whether the regulators believe in the external validity of our results. Upon confronting the regulators with our results, we asked, "Do you believe that the findings from our research study are informative about the behavior of financial advisors in the field?" The regulators could select an answer on a five-point scale ranging

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[23]We administered the survey to European institutions, because, given the debate about the MiFID II amendment mentioned in the introduction, we hoped for a higher response rate in the EU.

from "not informative" to "very informative." We asked this question separately for the US and the EU. Table A11 shows some statistics for the responses. A total of 74% of respondents believe that our findings are "very informative," "informative," or "somewhat informative" about the behavior of financial advisors in the field in the US (83% in the EU).[24] These proportions even increase when only regulators who reported having expertise in sustainable investing are considered.[25] A significant majority of the regulators (81%) also believes that our results require attention from policymakers (see Table A12). The most frequently mentioned policy intervention was transparency (30%), followed by standardized fees (25%) and consumer education (17%).[26]

2.6 Conclusion

Despite the growth of SRI mandates in the market for financial advice and lengthy public discussions, the question of whether these mandates lead to discriminatory pricing remains unanswered. This is striking, as SRI investments are surging worldwide, which put advisor profits from such asset allocations at center stage. Specifically, as an EU-wide amendment to the MiFID II requires financial institutions to ask clients whether they want their funds to be invested sustainably. We design and execute two lab-in-the-field experiments with financial advisors, in which we control for potential reasons for fee differences. Our results consistently show that financial advisors charge clients who communicate sustainable investment preferences a premium. Based on our experimental

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[24]To confirm that the results of the regulator survey were not driven by respondents being confused or lacking information, we included comprehension questions after the description of our experiment. The strong majority (94%) of the regulators answered all of the comprehension questions correctly. Further, when we exclude regulators who answered one or more of the questions incorrectly, our results remain qualitatively unchanged.

[25]We re-ran our analyses with a sub-sample, where we removed regulators who answered "far below average" or "somewhat below average" to the question "Compared to the average colleague in your organization, how much work experience do you have with projects/topics that are related to our experiment?" Among this sub-sample ($N = 37$), 94.5% consider our experiment to be "very informative," "informative," or "somewhat informative" for the US (84% for the EU). In addition, 78% believe that our findings require attention from regulators.

[26]We asked the following open question to respondents who believed that our results require policy intervention: "What do you think would be a suitable policy intervention?" Two research assistants (RAs) categorized the responses independently into one of the following: transparency, standardized fees, consumer education, other, and not filled out. Disagreements between the RAs were resolved by the researchers.

design, we can rule out effort, skill, and cost differences as drivers of this fee dispersion. We even detect a tendency of advisors to spend less time and click less through information, indicating that financial advisors use a smaller information set for SRI mandates.

Interestingly, when clients can signal high financial literacy, the premium is eliminated, but SRI clients who cannot signal high financial literacy bear the burden of higher fees. This form of discriminatory pricing is concerning, as it could hurt consumer welfare and negatively affect the long-run attractiveness of sustainable investing.

As a result, most regulators in our survey believe that our findings require attention from policymakers. Our results offer some starting points for potential policy interventions. First, the regulators in our survey suggested transparency, standardization of fees, and consumer education. Second, and in line with the suggestion for more consumer education, our results suggest that signaling high financial literacy can act as a remedy for pricing differences. Early evidence on the impact of interventions based on consumer education on financial literacy is mixed. In a meta-analysis from 2014, Fernandes et al. (2014) report that consumer education interventions have not had an economically meaningful effect on financial literacy and downstream financial behavior. However, the field has developed over the last few years, with a significant recent increase in effective consumer education programs reported in top economics and finance journals. A more recent meta-analysis that uses 76 economics and finance publications shows an economically meaningful positive causal impact of consumer education interventions on financial literacy and behavior Kaiser et al., 2022. Building and testing field interventions based on these promising consumer education programs to reduce discriminatory pricing of sustainable preferences is an important avenue for future research.

A Appendix

Table A1: Information ranked to be most important by participants

Information	Average Rating (1-22)	Importance Ranking
Earnings per share (last year)	9.38	1
Price chart (last 5 years)	9.71	2
Free cash flow (last year)	9.71	2
Dividends (expected next year)	9.86	4
Industry	10.10	5
Price / book ratio	10.10	5
Price / Earnings Ratio (last year's earnings)	10.19	5
Volatility (last year)	10.48	6
Dividends (last year)	10.67	7
Annual Profit (last year)	10.95	8
Revenue Growth (last 3 years)	11.33	9
Earnings per share (expected next year)	11.38	10
Market Capitalization	11.57	11
Risk/return ratio, e.g., Sharpe ratio (last year)	11.76	12
Annual Revenue (last year)	12.14	13
Trade volume	12.48	14
Average price (last year)	12.52	15
Average price (expected by analysts next year)	12.71	16
Price range (last year)	13.24	17
Previous day's trading volume	13.71	18
Previous year's trading volume	14.05	19
Beta (last year)	14.95	20

Table A2: Advisors create more socially responsible portfolios for SRI clients

Dependent Variable:	(1) United Nations GC	(2) MSCI ESG (Letter Coded)	(3) MSCI ESG (Color Coded)	(4) Overall ESG Rating
SRI Mandate	4.266***	1.388***	1.351***	2.827***
	(0.814)	(0.297)	(0.342)	(0.501)
α	22.967***	60.989***	25.175***	41.978***
	(0.407)	(0.148)	(0.171)	(0.250)
Advisor FE	Yes	Yes	Yes	Yes
Observations	1,380	1,380	1,380	1,380
Adjusted R^2	0.59	0.55	0.50	0.62

Notes: $^{**}p<0.05$; $^{***}p<0.01$. Standard errors, clustered at the advisor level, in brackets. All columns show the coefficient estimates of OLS regressions. The dependent variables in column 1,2,3, and 4 are defined in equation 4.3, 2.4, 2.5, and 2.6, respectively. SRI Mandate is equal to 1 if a client gave a mandate for SRI and 0 otherwise.

Table A3: Summary statistics advisors study 1

	Mean	Median	SD	N
Age	43.51	39.50	11.00	345
Female	0.45	0.00	0.50	345
Experience	11.16	10.00	6.42	345
Annual Income	110,637	105,000	54,071.53	345

Notes: Age was given in brackets (18—24, 25—34, 35—44, 45—54, 55-64, 65 and older), which we converted to rounded midpoints per bracket (21, 29.5, 39.5, 49.5, 59.5, 65, respectively). Female is a categorical variable (1 = female, else 0) for the gender of participants. Experience was given in years, where "Less than 1 year" was re-coded to 1 and "More than 20 Years" was re-coded to 20. Annual Income (Gross in \$) was given in brackets (under 20,000, 20,000—29,999, 30,000—39,999, 40,000—49,999, 50,000—59,999, 60,000—69,999, 70,000—79,999, 80,000—89,999, 90,000—99,999, 100,000—109,999, 110,000—119,999, 120,000—129,999, 130,000—139,999, 140,000—149,999, 150,000-199,999, 200,000 or higher), which we converted to rounded midpoints per bracket (20,000; 24,999.5; 34,999.5; 44,999.5; 54,999.5; 64,999.5; 74,999.5; 84,999.5; 94,999.5; 104,999.5; 114,999.5; 124,999.5; 134,999.5; 144,999.5; 174,999.5; 200,000; respectively).

Table A4: Summary statistics advisors study 1 (REDUCED sample)

	Mean	Median	SD	N
Age	43.20	39.50	11.38	208
Female	0.49	0.00	0.50	208
Experience	10.69	10.00	6.40	208
Annual Income	108,028	100,000	56,294.35	208

Notes: Age was given in brackets (18-24, 25-34, 35-44, 45-54, 55-64, 65 and older), which we converted to rounded midpoints per bracket (21, 29.5, 39.5, 49.5, 59.5, 65, respectively). Female is a categorical variable (1 = female, else 0) for the gender of participants. Experience was given in years, where "Less than 1 year" was re-coded to 1 and "More than 20 Years" was re-coded to 20. Annual Income (Gross in $) was given in brackets (under 20,000, 20,000-29,999, 30,000-39,999, 40,000-49,999, 50,000-59,999, 60,000-69,999, 70,000-79,999, 80,000-89,999, 90,000-99,999, 100,000-109,999, 110,000-119,999, 120,000-129,999, 130,000-139,999, 140,000-149,999, 150,000-199,999, 200,000 or higher), which we converted to rounded midpoints per bracket (20,000; 24,999.5; 34,999.5; 44,999.5; 54,999.5; 64,999.5; 74,999.5; 84,999.5; 94,999.5; 104,999.5; 114,999.5; 124,999.5; 134,999.5; 144,999.5; 174,999.5; 200,000; respectively).

Table A5: Advisors create more socially responsible portfolios for SRI clients (REDUCED sample)

	(1) United Nations Global Compact	(2) MSCI (Letter Coded)	(3) MSCI (Color Coded)	(4) Overall ESG Rating
SRI Mandate	5.148***	1.497***	1.587***	3.322***
	(1.111)	(0.431)	(0.512)	(0.686)
α	23.676***	61.152***	25.619***	41.980***
	(0.555)	(0.216)	(0.256)	(0.342)
Advisor FE	Yes	Yes	Yes	Yes
Observations	832	832	832	832
Adjusted R2	0.63	0.56	0.52	0.65

*Notes: **$p<0.05$; ***$p<0.01$. Standard errors, clustered at the advisor level, in brackets. All columns show the coefficient estimates of OLS regressions. The dependent variables in column 1,2,3, and 4 are defined in equation 4.3, 2.4, 2.5, and 2.6, respectively. SRI Mandate is equal to 1 if a client gave a mandate for SRI and 0 otherwise.*

Table A6: Advisors charge higher fees to SRI clients (REDUCED sample)

	(1)	(2)
SRI Mandate	0.066***	0.064***
	(0.023)	(0.023)
Female		-0.045**
		(0.023)
High Age		0.014
		(0.029)
High Income		0.006
		(0.027)
α	2.117***	2.101***
	(0.204)	(0.191)
Advisor FE	Yes	Yes
Round FE	No	Yes
Observations	832	832
Uncensored Observations	803	803
Log Likelihood	-267.1	-259.5

Notes: **p<0.05; ***p<0.01. Standard errors, clustered at the advisor level, in brackets. Column 1 and 2 show the coefficient estimates of Tobit regressions. Both regressions have the fee (in percent) charged by an advisor to a client as the dependent variable. SRI Mandate is equal to 1 if a client gives a mandate for SRI and 0 otherwise. Female is equal to 1 if a client is female and 0 if a client is male. High Age is equal to 1 if a client is between 45 and 54 years old, 0 if a client is between 35 and 44 years old. High Income is equal to 1 if a client has a gross annual income between $60,000 and $79,999, 0 if a client has a gross annual income between $40,000 and $59,999.

Table A7: Advisors do not exert more effort for SRI clients (REDUCED sample)

Dependent Variable	(1)	(2)	(3)	(4)
	Log(Time)		Log(Clicks+1)	
SRI Mandate	0.063	0.100	0.002	0.021
	(0.077)	(0.058)	(0.060)	(0.052)
Female	0.116	0.065	0.089	0.064
	(0.080)	(0.064)	(0.058)	(0.052)
High Age	-0.067	0.046	-0.135**	-0.063
	(0.089)	(0.071)	(0.067)	(0.057)
High Income	0.076	0.036	0.026	-0.007
	(0.100)	(0.075)	(0.070)	(0.063)
α	4.338***	5.243***	3.446***	3.976***
	(0.125)	(0.096)	(0.087)	(0.093)
Advisor FE	Yes	Yes	Yes	Yes
Round FE	No	Yes	No	Yes
Observations	832	832	832	832
Adjusted R^2	0.59	0.75	0.78	0.82

Notes: **p<0.05; ***p<0.01. Standard errors, clustered at the advisor level, in brackets. All columns show the coefficient estimates of OLS regressions. The dependent variable in columns 1 and 2 is the logarithm of time in seconds that advisors take to create a portfolio for a client (Obtained from metadata). The dependent variable in columns 3 and 4 is the logarithm of the number of clicks (+1) that advisors take to create a portfolio for a client (Obtained from metadata). One is added to the number of clicks, as it is possible to allocate a portfolio with zero clicks, in which case the default weights are applied to stocks. SRI Mandate is equal to 1 if a client gives a mandate for SRI and 0 otherwise. Female is equal to 1 if a client is female and 0 if a client is male. High Age is equal to 1 if a client is between 45 and 54 years old, 0 if a client is between 35 and 44 years old. High Income is equal to 1 if a client has a gross annual income between $60,000 and $79,999, 0 if a client has a gross annual income between $40,000 and $59,999.

Table A8: Summary statistics advisors study 2

	Mean	Median	SD	N
Age	42.79	39.50	9.44	70
Female	0.04	0.00	0.20	70
Experience	14.81	16.00	5.68	70
Annual Income	121,285	115,000	503,08.46	70

Notes: Age was given in brackets (18—24, 25—34, 35—44, 45—54, 55-64, 65 and older), which we converted to rounded midpoints per bracket (21, 29.5, 39.5, 49.5, 59.5, 65, respectively). Female is a categorical variable (1 = female, else 0) for the gender of participants. Experience was given in years, where "Less than 1 year" was re-coded to 1 and "More than 20 Years" was re-coded to 20. Annual Income (Gross in EUR) was given in brackets (under 20,000, 20,000—29,999, 30,000—39,999, 40,000—49,999, 50,000—59,999, 60,000—69,999, 70,000—79,999, 80,000—89,999, 90,000—99,999, 100,000—109,999, 110,000—119,999, 120,000—129,999, 130,000—139,999, 140,000—149,999, 150,000-199,999, 200,000 or higher), which we converted to rounded midpoints per bracket (20,000; 24,999.5; 34,999.5; 44,999.5; 54,999.5; 64,999.5; 74,999.5; 84,999.5; 94,999.5; 104,999.5; 114,999.5; 124,999.5; 134,999.5; 144,999.5; 174,999.5; 200,000; respectively).

Table A9: Advisors select more socially responsible funds for SRI clients

	(1)	(2)
Dependent Variable:	Number of sustainability leaves	
SRI Mandate	2.329***	2.366***
	(0.180	(0.143)
α	2.898***	2.677***
	(0.127)	(0.552)
Advisor FE	No	Yes
Observations	420	420
Uncensored Observations	257	257
Log Likelihood	-634	-529.5

*Notes: **$p<0.05$; ***$p<0.01$. Standard errors, clustered at the advisor level, in brackets. Columns 1 and 2 show coefficient estimates from two separate Tobit regressions. The dependent variables in both columns is the number of sustainability leaves of the portfolio that was selected on behalf of a client. SRI Mandate is equal to 1 if a client gave a mandate for SRI and 0 otherwise.*
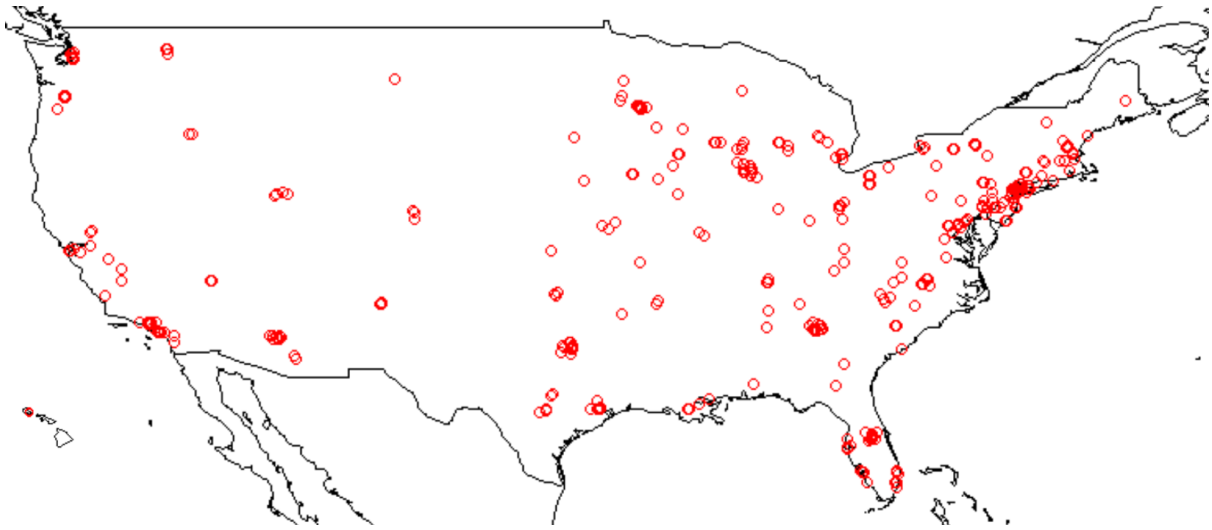
Figure A1: Location of advisors Experiment US
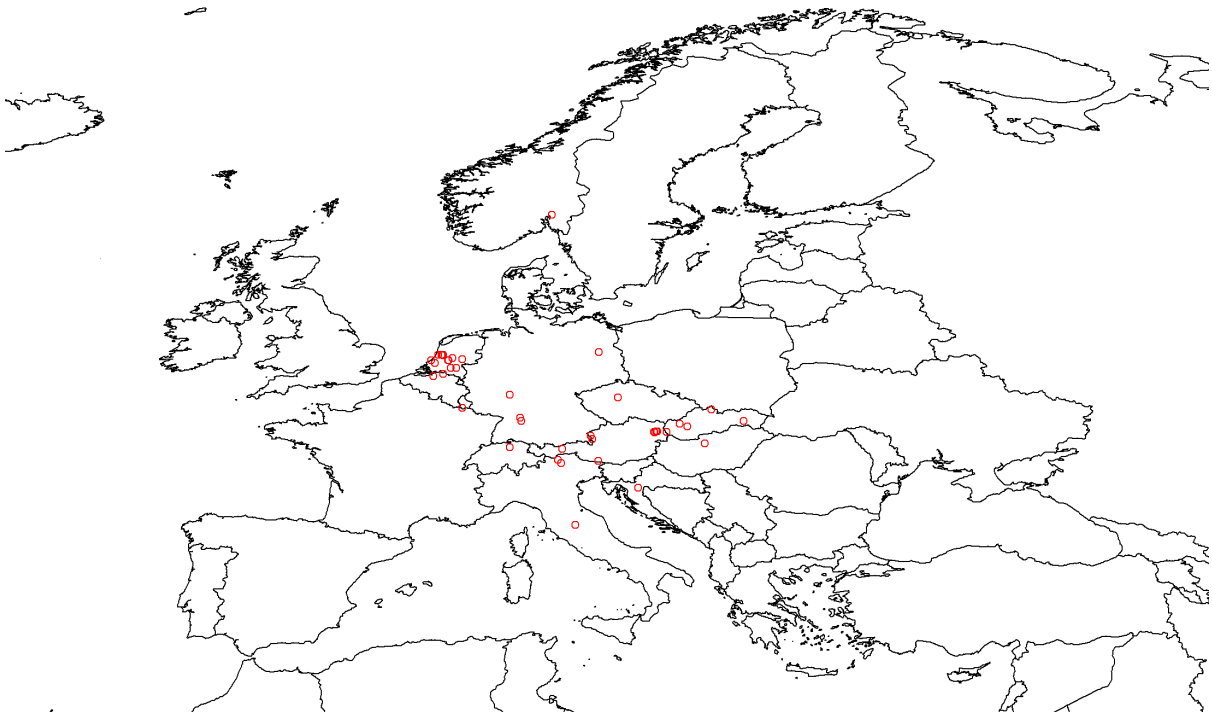
Figure A2: Location of advisors Experiment Europe

Table A10: Summary statistics regulators

	Mean	Median	SD	N
Female	0.43	0.00	0.50	53
Age	38.75	39.50	11.72	53
Experience in SRI (5-pt Likert)	3.15	3.00	1.25	53
Experience in Regulation (in Years)	7.83	5.00	8.47	53
Policy Work	0.23			53
Research	0.13			53
Supervision	0.11			53
Analysis	0.15			53
Other	0.36			53

Notes: Female is a categorical variable (1 = female, else 0) for the gender of participants. Age was given in brackets (18—24, 25—34, 35—44, 45—54, 55—64, 65 and older), which we converted to rounded midpoints per bracket (21, 29.5, 39.5, 49.5, 59.5, 65, respectively). Experience in SRI represents the response to the question: "Compared to the average colleague in your organization, how much work experience do you have with projects/topics that are related to our experiment?" (1 = "Far below average", 2 = "Somewhat below average", 3 = "Average", 4 = "Somewhat above average", 5 = "Far above average"). Experience in Regulation represents the answer given to the question: "How much work experience do you have related to regulation and/or policy work in general? (Please enter years of experience)." Policy Work, Research, Supervision, Analysis, and Other represent the current job of participants (multiple answers per participant are possible).

Table A11: External validity assessment regulators

	Mean	Median	SD	N
Assessed external validity US	3.79	4.00	0.79	53
Assessed external validity Europe	3.25	3.00	1.05	53

Notes: Regulators' responses to the questions: "Do you believe that the findings from our research study are informative about the behavior of financial advisors in the field in the US?" and "Do you believe that the findings from our research study are informative about the behavior of financial advisors in the field in the European Union?". Respondents gave an answer on a scale ranging from 1 ("not informative") to 5 ("very informative").

Table A12: Policy implications

	Share of Regulators
Do you think that the results from our research study require attention from regulators?	0.81
What do you think would be a suitable policy intervention?	
Transparency	0.30
Standardized Fees	0.25
Consumer Education	0.17
Other	0.21

Notes: The question "Do you think that the results from our research study require attention from regulators?" was asked with possible responses "Yes" or "No." The share of regulators refers to the proportion of regulators who selected "Yes." The question "What do you think would be a suitable policy intervention?" was asked as an open question. The responses given by the regulators were coded independently by two research assistants (RAs). Disagreements between the two RAs were resolved by the researchers. Some regulators' responses fit into multiple categories. A total of 21% of the respondents either did not believe that our research study requires attention from regulators or did not fill out the text box.

Table A13: Predictions by mandate

	Higher for SRI	Higher for Conventional	No Difference	p
Fee	0.92	0.02	0.06	0.00***
Effort	0.60	0.17	0.23	0.00***

Notes: The table shows the proportions of responses given to the questions: "Who do you believe financial advisors charged a higher fee to in the research study?" and "Who do you believe financial advisors exerted more effort for in the research study?," respectively. The final column shows the p-values of a χ^2 goodness-of-fit test against the null-hypothesis that all responses were given equally frequently (**p<0.05; ***p<0.01).

B   Internet appendix

B.1   Instructions advisors US Experiment

B.2   Instructions clients US Experiment

B.3   Instructions advisors European Experiment

B.4   Instructions clients European Experiment

B.5   Instructions selection survey

B.6   Instructions regulators survey

B.1 Instructions advisors study 1

Welcome

- Thank you for participating in the survey. Participation will take less than 15 minutes.
- Upon full completion of the survey, you will receive a completion fee of $2.
- In addition, depending on the decisions that you and other survey participants make, you can earn up to $45.
- All earnings will be paid out in points that correspond to the dollar value indicated in this study.
- We will depersonalize all data and will only use them for scientific purposes.

This study adheres to the principles of economic experiments: participants are not deceived and earnings are paid out for real.

- Marten Laudi (Maastricht University)
- Prof. Dr. Paul Smeets (Maastricht University)
- Prof. Dr. Utz Weitzel (VU Amsterdam, Radboud University)

*** Please click below to start. ***

Informed Consent

- Before you decide whether or not take part in the study, we will give you some information. Please take time to read the information carefully.
- What does my participation involve? Participation involves you filling out the following survey, which will take around 15 Minutes. Participation is voluntary. You can decide to quit the survey at any moment.
- What happens to the data collected in this survey? We will depersonalize all data and will only use them for scientific purposes. The anonymized research data is accessible to other scientists for a period of at least 10 years. The data cannot be traced back to you.
- Ethical assessment This research study has been approved by the Maastricht University Ethical Review Commitee Inner City Faculties (ERCIC).
- More information? Should you want more information on this research study, please contact m.laudi@maastrichtuniversity.nl

◯ I agree

◯ I do not agree

End of Block: Informed Consent

Start of Block: Screener Finance

Which industry sector are you working in?

▼ Agriculture, forestry & fishing ... Transport

End of Block: Screener Finance

Start of Block: Screener Invest

Which of the following best describes your current job? (Please select a maximum of 2)

☐   account manager

☐   accounting/controlling

☐   analysis/research/valuation

☐   area manager

☐   asset liability mgmt

☐   compliance

☐   consulting in management

☐   consulting in processes

☐   corporate finance

☐   acquisitions

☐   client advisor

☐   customer support

☐   fund management

☐   fund placement

☐   general mgmt/admin

☐   investment advisor

- ☐ investment banking

- ☐ IT-support/mgmt

- ☐ planning, financial

- ☐ portfolio management

- ☐ private equity/banking

- ☐ product manager

- ☐ project developer

- ☐ regulation, financial

- ☐ relationship manager

- ☐ risk management

- ☐ sales

- ☐ supervision, financial

- ☐ trading/brokerage

- ☐ treasury

- ☐ wealth management

- ☐ other:

———

Please provide a brief description of the main tasks in your job.

_____

Instructions (1/3)

- Please read the following instructions carefully. We will ask you to answer two questions about them afterwards.
- You have two chances to answer the comprehension questions correctly.
- If you fail to do so, you will not be able to complete the survey and you will not receive the completion fee of $2.

- In the following, you will select a portfolio of stocks on behalf of a client.

- This client is a real person, a US citizen, who is not a financial professional.
- The portfolio has a starting value of $1,000.
- For selecting stocks on behalf of your client, you can determine an advisory fee.

Your client has two options:
- Take your advice: Your client will pay the advisory fee to you and will see the stock portfolio that you selected in return.
- Not to take your advice: Your client will <u>not</u> pay the advisory fee to you and will <u>not</u> see the portfolio that you selected. The client will then select a portfolio of stocks for him-/herself.

Instructions (2/3)

Payment to your client:

- Your client's payment is based on the return of the portfolio over the coming 12 months.
- If they choose your portfolio, the fee you receive will be deducted from this payment.
- Your client will be paid out 12 months after the survey is completed.
- Every 10th client (randomly drawn) will be paid.

Payment to you:

- If your client decides to see the portfolio you created, you receive the advisory fee that you set.
- If your client decides not to see the portfolio you created, you receive no additional payment.
- You will be paid within two weeks after the survey is completed.
- Example 1: You set an advisory fee of $e{ round(e://Field/Instr_Fee ,1) }%. Your client invests in your portfolio. You will be paid $1,000*$e{ round(e://Field/Instr_Fee ,1) }% = $$e{ round(e://Field/Instr_Fee ,1) * 10}.
- Example 2: You set an advisory fee of $e{ round(e://Field/Instr_Fee ,1) }%. Your client does not invest in your portfolio. You will be paid $0.

Instructions (3/3)

- In total, you will create 4 different portfolios for 4 clients.
- You will set a fee for each of these 4 clients.
- 1 out of your 4 clients (randomly selected) will be able to invest in the portfolio that you created for them.
- The fee of this selected portfolio will then be relevant for your payment.
- The selected portfolio will be bought in real life for every 10th client.
- Proof of stock transactions and earnings calculations will be communicated by the research team to you and the client (using depersonalized data). This is to ensure that all information above is transparent and credible.

Comprehension Quiz

You have two chances to answer both comprehension questions correctly.

If you fail to do so, you will not be able to complete the survey and you will not receive the completion fee of $2.

What is not a possible investment for your clients?

○ A stock portfolio that they select themselves

○ The stock portfolio that you select on their behalf

○ A money market investment

Consider the following scenario. You set an advisory fee of \$e{ round(e://Field/Quiz_Fee ,1) }%. Your client decides to take your portfolio advice. How much will you be paid?

○ \$0

○ \$\$e{ round(e://Field/Quiz_Fee , 1) }

○ \$\$e{ round(e://Field/Quiz_Fee , 1) * 10 }

Wrong Answer (Only shown if there was a mistake in the comprehension questions)

At least one of your answers was not correct. Do you want to see the instructions again or would you like to retry answering?

○ See the instructions

○ Answer again

Wrong Answer (Only shown if there was a mistake in the comprehension questions twice → End of Survey)

At least one of the answers you gave was not correct.

[Advisors allocated stock portfolios and set fees on behalf of four different clients. Here, one example is shown]

Client 1 out of 4

Please **select a portfolio** for a client with the following profile:

- **Gender:** Female
- **Age:** 35 - 44 years old
- **Gross Income:** $60,000 - $79,999 per year
- **Risk Profile:**
  - ○ Conservative
  - ○ Moderate
  - ○ **Aggressive**

- **Investor Mandate:** [More Info]
  - ○ Conventional
  - ○ **Socially Responsible**

Client questionnaire Info ☒

We ask clients whether they want to give you, the advisor, a mandate for socially responsible investing. We tell clients that you have access to sustainability indicators for each stock.

Select stocks for your client:

- Please select your client's portfolio by weighting the 30 stocks of the Dow Jones below (*To increase the weight on one stock, <u>first</u> reduce the weight of another stock*).
- The maximum weight per stock is 25%, so the portfolio must include at least 4 stocks.
- Per default, the weights are set as in the Dow Jones Industrial Average.
- Click on a stock's name for more financial information.
- Next to each company name, you see two indicators of social responsibility:
  - ○ MSCI ESG Score (● means laggard; ● means average; ● means leader) [More Info]
  - ○ Whether the company pledged to follow the principles of the UN Global Compact (**Y if yes, N if no**)
  [More Info]

MSCI ESG Score ☒

MSCI ESG rate companies on a 'AAA to CCC' scale according to their exposure to Environmental, Social, and Governance risks and how well they manage those risks relative to peers.

United Nations Global Compact ☒

United Nations Global Compact

Participation in the UN Global Compact requires a commitment from a company's chief executive with support from the Board. This commits an organization to meet fundamental responsibilities in four areas: human rights, labour, environment and anti-corruption. All participants are required to produce an annual communication on progress that outlines a company's efforts to operate responsibly and support society.

N Utd Health		7.6
Y Walgreens		1.1
Y Johnson & Johnson		3.8
N Goldman Sachs		5.5
N American Express		2.8
Y Intel		1.6
N Boeing		5.1
Y Microsoft		5
Y Nike		2.6
N Home Depot		6.4
Y Pfizer		0.9
N Walmart		3.2
N Procter & Gamble		3.1
N Visa		5.1
N IBM		3.2
Y Coca-Cola		1.2
N Raytheon Technologies		1.8
N Caterpillar		3.3

● N Walt Disney		3.1
● N JPMorgan Chase		2.7
● N Travelers		3.1
● Y Verizon		1.5
● N Chevron		2.4
● Y Cisco		1.2
● Y Dow		1.1
● Y 3M		4.2
● N Exxon Mobil		1.3
● N McDonalds		5
● Y Merck		2
Total:		**100.0**

Information ⊠

Verizon Communications, Inc.

Earnings per Share 2019: $4.65

Free Cash Flow 2019 (in Bil): $17.81

Dividends per share (Expected 2020): $2.48

Industry: Diversified Telecommunication Services

Price / Book Ratio: 3.89

MSCI ESG Rating: BBB

UN Global Compact Participant: Yes

Return graph past 5 years:

Example; Available for all stocks

Client 1 out of 4

Please **select a portfolio** for a client with the following profile:

- **Gender:** Female
- **Age:** 35 - 44 years old
- **Gross Income:** $60,000 - $79,999 per year
- **Risk Profile:**
    - ○ Conservative
    - ○ Moderate
    - ○ **Aggressive**

- **Investor Mandate:** | More Info |
    - ○ Conventional
    - ○ **Socially Responsible**

Advisory fee for your client as a percentage of the $1,000 portfolio value: Based on this fee, your client will decide whether to see your advice or to make her own investment.

0	0.4	0.8	1.2	1.6	2	2.4	2.8	3.2	3.6	4

About Your Clients
- In the following, please answer a few questions about the four different clients.
- We also ask these questions to the clients.
- We will randomly select one of the questions that you answered about one client.
- If your answer matches the answer given by the client, you get an additional $5.

Please **select a portfolio** for a client with the following profile:

- **Gender:** Female
- **Age:** 35 - 44 years old
- **Gross Income:** $60,000 - $79,999 per year
- **Risk Profile:**
  - ○ Conservative
  - ○ Moderate
  - ○ **Aggressive**

- **Investor Mandate:** [More Info]
  - ○ Conventional
  - ○ **Socially Responsible**

How willing is your client to give to good causes without expecting anything in return?

	1	2	3	4	5	6	7	8	9	10	11	
Not at all	○	○	○	○	○	○	○	○	○	○	○	Very willing

How knowledgeable do you think your client is in financial matters?

	1	2	3	4	5	6	7	
Not at all knowledgeable	○	○	○	○	○	○	○	Very knowledgeable

How much does your client enjoy to take investment decisions?

	1	2	3	4	5	6	7	
Not at all	○	○	○	○	○	○	○	A lot

How much investment experience does your client have?

	1	2	3	4	5	6	7	
None	○	○	○	○	○	○	○	A lot

What yearly gross return does your client expect to make on the selected portfolio? (In %)

▼ Less than -15 ... More than 15

Finally, last screen with questions:

What is your gender?

○ Male

○ Female

○ Other

What is your age?

▼ 18 - 24 years old ... 65 and older

What is the highest level of school you have completed or the highest degree you have received?

▼ Less than high school degree ... Professional degree (JD, MD)

Which industry sector are you working in?

○ Agriculture, forestry & fishing

○ Automotive/Aerospace

○ Business & other services

○ Communications (e.g. Telecommunications and Postal services)

○ Construction

○ Distribution (wholesale & retail trade)

○ Education

○ Financial services (e.g. Banks and Insurance companies)

○ Health and Social work

○ Hotels & Catering

○ IT services

○ Manufacture of chemical products

○ Manufacture of food products

○ Manufacturing (other)

○ Mining & Utilities (e.g. Energy companies)

○ Public administration

○ Transport

Which of the following best describes your current job?

▼ account manager ... other:

What was your gross annual household income last year?

▼ under $20,000 ... 200,000 or more

At which type of financial institution are you currently employed? (multiple answers possible)

☐ Bank

☐ Insurance

☐ Investments

☐ Pension fund

☐ Financial holding

☐ Credit and loan

☐ Mortgage

☐ Leasing

☐ Hedge fund

☐ other (please specify below)

_____

In which state do you currently reside?

▼ Alabama ... I do not reside in the United States

In general, how would you describe your own political viewpoint?

▼ Very conservative ... Not sure

How willing are you to give to good causes without expecting anything in return?

	1	2	3	4	5	6	7	8	9	10	11	
Not at all	○	○	○	○	○	○	○	○	○	○	○	Very willing

How many years of experience do you have in the financial sector?

▼ Less than 1 ... More than 20

How would you rate your willingness to take risks...

	1: Not at all willing to take risks	2	3	4	5	6	7: Very willing to take risks
... generally in life:	○	○	○	○	○	○	○
... in financial matters:	○	○	○	○	○	○	○

In about 3 weeks, you will be able to see proof of all stock transactions that we undertook to implement the portfolios. All data will be aggregated and anonymized, so that it is impossible to trace back any decision taken in the survey.

The information will be posted on this web page:

https://feedback001.wordpress.com/

Please write down the address of the web page if you want to visit it in 3 weeks.

Thank you very much for participating.

*** Please click below to complete the survey ***

B.2   Instructions clients study 1

Welcome

- Thank you for participating in the survey. Participation will take less than 10 minutes.
- Upon full completion of the survey, you will receive a completion fee of $2.
- In addition, you can earn up to $150 and more, depending on your decisions in the survey and a random draw.
- All earnings will be paid out in points that correspond to the dollar value indicated in this study.
- We will depersonalize all data and will only use them for scientific purposes.

This study adheres to the principles of economic experiments: participants are not deceived and earnings are paid out for real.

- Marten Laudi (Maastricht University)
- Prof. Dr. Paul Smeets (Maastricht University)
- Prof. Dr. Utz Weitzel (VU Amsterdam, Radboud University)

*** Please click below to start. ***

Informed Consent
- Before you decide whether or not to take part in the study, we will give you some information. Please take time to read the information carefully.
- What does my participation involve? Participation involves you filling out the following survey, which will take around 10 minutes. Participation is voluntary. You can decide to quit the survey at any moment.
- What happens to the data collected in this survey? We will depersonalize all data and will only use them for scientific purposes. The anonymized research data is accessible to other scientists for a period of at least 10 years. The data cannot be traced back to you.
- Ethical assessment This research study has been approved by the Maastricht University Ethical Review Commitee Inner City Faculties (ERCIC).
- More information? Should you want more information on this research study, please contact m.laudi@maastrichtuniversity.nl

○ I agree

○ I do not agree

What is your gender?

○ Male

○ Female

○ Other

What is your age?

▼ 18 - 24 years old ... 65 and older

What was your gross combined, annual household income last year?

▼ under $20,000 ... 200,000 or more

Which industry sector are you working in?

▼ Agriculture, forestry & fishing ... Transport

Instructions (1/3): Your task
- In this survey, you can choose a <u>portfolio of stocks.</u>
- You can select the stocks <u>yourself</u> or let a <u>financial professional</u> do this for you.
- For one out of ten participants in this survey, randomly selected, the <u>selected stocks will be purchased in real life</u>.
- We, the researchers conducting this study, <u>will invest $1,000</u> on behalf of each randomly selected participant.
- All randomly selected participants <u>will be paid in one year</u>, according to the return of the selected stock portfolio.
- On the following screen, we will explain how earnings are calculated for each randomly selected participant.
- Proof of stock transactions and earnings calculations will be communicated by the research team to the participants (using depersonalized data) after the stocks are bought and sold. This is to ensure that all information above is transparent and credible.

Do you want to see a preview of the stock selection screen? Depending on your decision later in the survey, either you or a financial professional (for you) will use such a screen to select a portfolio of stocks.

○ Yes

○ No

Stock selection (Illustration, not the actual decision screen)

- Please select your portfolio by weighting the 30 stocks of the Dow Jones below (*To increase the weight on one stock, first reduce the weight of another stock*).

- The maximum weight per stock is 25%, so the portfolio must include at least 4 stocks.

- Per default, the weights are set as in the Dow Jones Industrial Average.

- Click on a stock's name for more financial information.

- Next to each company name, you see two indicators of social responsibility:

  ○ MSCI ESG Score (● means laggard; ● means average; ● means leader) [More Info]

  ○ Whether the company pledged to follow the principles of the UN Global Compact (**Y if yes, N if no**)

  [More Info]

MSCI ESG Score [✖]

   MSCI ESG rate companies on a 'AAA to CCC' scale according to their exposure to Environmental, Social, and Governance risks and how well they manage those risks relative to peers.

United Nations Global Compact [✖]

United Nations Global Compact

Participation in the UN Global Compact requires a commitment from a company's chief executive with support from the Board. This commits an organization to meet fundamental responsibilities in four areas: human rights, labour, environment and anti-corruption. All participants are required to produce an annual communication on progress that outlines a company's efforts to operate responsibly and support society.

Stock	Weight	Value
● N Utd Health	▬▬▬▬	7.6
● Y Walgreens	▪	1.1
● Y Johnson & Johnson	▬▬	3.8
● N Goldman Sachs	▬▬▬	5.5
● N American Express	▬	2.8
● Y Intel	▪	1.6
● N Boeing	▬▬▬	5.1
● Y Microsoft	▬▬	5
● Y Nike	▬	2.6
● N Home Depot	▬▬▬	6.4
● Y Pfizer	▪	0.9
● N Walmart	▬	3.2

Stock	Value
● **N** Procter & Gamble	3.1
● **N** Visa	5.1
● **N** IBM	3.2
● **Y** Coca-Cola	1.2
● **N** Raytheon Technologies	1.8
● **N** Caterpillar	3.3
● **N** Walt Disney	3.1
● **N** JPMorgan Chase	2.7
● **N** Travelers	3.1
● **Y** Verizon	1.5
● **N** Chevron	2.4
● **Y** Cisco	1.2
● **Y** Dow	1.1
● **Y** 3M	4.2
● **N** Exxon Mobil	1.3
● **N** McDonalds	5
● **Y** Merck	2
Total:	**100.0**

Verizon Communications, Inc.

Earnings per Share 2019: $4.65
Free Cash Flow 2019 (in Bil): $17.81
Dividends per share (Expected 2020): $2.48
Industry: Diversified Telecommunication Services
Price / Book Ratio: 3.89
MSCI ESG Rating: BBB
UN Global Compact Participant: Yes
Return graph past 5 years:

Example; Available for all stocks

End of Block: Instructions 1

Start of Block: Instructions 2

Instructions (2/3): Financial Advisor

- You can either select stocks <u>yourself</u>, or you can take <u>professional advice</u>.
- If you decide for professional advice, <u>we assign a financial advisor to you</u>, who selects the stocks for you.
- The stock selection of the advisor will be based on your profile (age, income, gender) and on your investment preferences, which you can specify later.
- For constructing this stock portfolio, your financial advisor <u>has set an advisory fee</u>.

Payment to you (if randomly selected):

- You receive <u>a base payment</u> of $150.
- Over the next year we will record the <u>return of your stock portfolio</u> (with a starting value of $1000).
- This return will be added to (if positive) or deducted from (if negative) your base payment.
- If you choose to take the advice of the financial advisor, an <u>advisory fee</u> will be deducted from your payment.
- If you choose to select the stocks yourself, <u>no advisory fee</u> will be deducted from your payment.
- <u>You never owe us any money.</u> If a negative stock return and the advisory fee exceed your base payment of $150, you simply do not receive any money from us (Except for the survey completion fee).
- If you are randomly selected, you will be paid out one year after the survey is completed. Maastricht University and VU Amsterdam guarantee that all earnings will be paid out.

Payment to your advisor:

- If you <u>take the advice</u>, your advisor receives the <u>advisory fee</u> three weeks after this survey is completed
- If you choose to <u>select the stock portfolio yourself</u>, you will not receive any advice and your advisor receives <u>no fee</u>.

End of Block: Instructions 2

Start of Block: Instructions 3

Instructions (3/3): Examples

Example 1: You invest according to your advisor's suggestion. Your advisor has set an advisory fee of $e{ round(e://Field/Instr_Fee ,1) }%. After one year, the portfolio has generated a return of $e{ round(e://Field/Instr_Ret_Pos ,1) }%. If you are randomly selected, the following will be relevant for your payment:

- Your base payment of $150.
- The advisory fee: $1,000*($e{ round(e://Field/Instr_Fee ,1) }%) = $$e{ round(e://Field/Instr_Fee , 1) * 10 }
- The return of the portfolio: $1,000*($e{ round(e://Field/Instr_Ret_Pos ,1) }%) = $$e{ round(e://Field/Instr_Ret_Pos ,1) *10}.
- Hence, your total payout will be $150 - $$e{ round(e://Field/Instr_Fee , 1) * 10 } + $$e{ round(e://Field/Instr_Ret_Pos , 1) * 10 } = $$e{(15 - round(e://Field/Instr_Fee , 1) + round(e://Field/Instr_Ret_Pos , 1)) * 10 }

Example 2: You invest according to your advisor's suggestion. Your advisor has set an advisory fee of $e{ round(e://Field/Instr_Fee ,1) }%. After one year, the portfolio has generated a return of $e{ round(e://Field/Instr_Ret_Neg ,1) }%. If you are randomly selected, the following will be relevant for your payment:

- Your base payment of $150.
- The advisory fee: $1,000*($e{ round(e://Field/Instr_Fee ,1) }%) = $$e{ round(e://Field/Instr_Fee , 1) * 10 }
- The return of the portfolio: $1,000*($e{ round(e://Field/Instr_Ret_Neg ,1) }%) = $$e{ round(e://Field/Instr_Ret_Neg ,1) *10}
- Hence, your total payout will be $150 - $$e{ round(e://Field/Instr_Fee , 1) * 10 } + $$e{ round(e://Field/Instr_Ret_Neg ,1) *10} = $$e{(15 - round(e://Field/Instr_Fee , 1) + round(e://Field/Instr_Ret_Neg ,1)) *10}

Comprehension Quiz

- Please answer the questions below about the instructions on the previous screens.
- You have two chances to answer both comprehension questions correctly.
- If you fail to do so, you will not be able to complete the survey and you will not receive the completion fee of $2.

What is not a possible investment for you?

○ A stock portfolio that your advisor selects on your behalf

○ A stock portfolio that you select yourself

○ A savings account

Consider the following scenario. Your advisor set a fee of $e{ round(e://Field/Quiz_Fee ,1) }%. You decide to take the portfolio advice. The selected portfolio has a return of $e{ round(e://Field/Quiz_Ret ,1) }%. How much will you be paid? Remember: Your base payment is $150.

○ $0

○ $$e{(15 - round(e://Field/Quiz_Fee , 1) + round(e://Field/Quiz_Ret ,1))}

○ $$e{(15 - round(e://Field/Quiz_Fee , 1) + round(e://Field/Quiz_Ret ,1)) *10}

Wrong Answer (Only shown if there was a mistake in the comprehension questions)

At least one of your answers was not correct. Do you want to see the instructions again or would you like to retry answering?

◯ See the instructions

◯ Answer again

Wrong Answer (Only shown if there was a mistake in the comprehension questions twice ➔ End of Survey)

At least one of the answers you gave was not correct.

Advisor mandate
- Before you choose whether you like to receive advice, we have two questions.
- These questions will be used to match you to the right financial advisor.

Do you want to give your advisor a mandate for socially responsible investing? For all selectable stocks, your advisor will receive two indicators on the firm's social responsibility: MSCI ESG [Clickable button for more info] and the UN Global Compact [Clickable button for more info]. Should your advisor take these into account when selecting your stock portfolio?

○ Yes

○ No

How would you like your investment budget to be allocated between a savings account (0% interest rate) and a stock portfolio?

○ Aggressive (100% in stocks)

○ Moderate (50% in the savings account, 50% in stocks)

○ Conservative (100% in the savings account)

End of Block: Advisor Mandate

Start of Block: Allocation Decision

Investment Decision

A financial professional put together a portfolio for a client with your profile. He or she set the following advisory fee for creating this stock portfolio.

Advisory Fee: $${e://Field/Fee}%

Would you like to invest in the stock portfolio that your advisor constructed on your behalf?

○ Yes, I will take the advice

○ No, I will select stocks myself

[Depending on their answer, participants are then either directly sent to the exit survey, or have to allocate their own stock portfolio]

Finally, last screen, please answer the following questions:

Which industry sector are you working in?

▼ Agriculture, forestry & fishing ... Transport

How knowledgeable are you in financial matters?

○ Not knowledgeable

○ More or less knowledgeable

○ Knowledgeable

○ Very knowledgeable

What is the highest level of school you have completed or the highest degree you have received?

▼ Less than high school degree ... Professional degree (JD, MD)

In which state do you currently reside?

▼ Alabama ... I do not reside in the United States

Have you invested before, or are you planning to invest in the future (e.g., into stocks, bonds, investment funds, real estate)?

○ Yes

○ No

Have you delegated investment decisions (e.g., purchase of stocks, bonds, investment funds, real estate) to financial advisors at banks or other institutions before?

○ Yes

○ No

In general, how would you describe your own political viewpoint?

▼ Very conservative ... Not sure

How willing are you to give to good causes without expecting anything in return?

	1	2	3	4	5	6	7	8	9	10	11	
Not at all	○	○	○	○	○	○	○	○	○	○	○	Very willing

How much do you enjoy to take investment decisions?

	1	2	3	4	5	6	7	
Not at all	○	○	○	○	○	○	○	A lot

How much investment experience do you have?

	1	2	3	4	5	6	7	
None	○	○	○	○	○	○	○	A lot

What yearly gross return do you expect to make on your selected stock portfolio? (In %)

▼ Less than -15 ... More than 15

In about 3 weeks, you will be able to see proof of all stock transactions that we undertook to implement the portfolios. All data will be aggregated and anonymized, so that it is impossible to trace back any decision taken in the survey.

The information will be posted on this web page:

https://feedback001.wordpress.com/

Please write down the address of the web page if you want to visit it in 3 weeks.

Thank you very much for participating.

*** Please click below to complete the survey ***

B.3   Instructions advisors study 2

Welcome
- Thank you for participating in the survey, which will take less than 15 minutes.
- You can earn up to €40, depending on the decisions that you and other survey participants make.
- You can get exclusive early access to the results of this study and what it was about.
- We will depersonalize all data and will only use them for scientific purposes.

This study adheres to the principles of economic experiments: participants are not deceived and earnings are paid out for real.
- Marten Laudi (Maastricht University)
- Prof. Dr. Paul Smeets (Maastricht University)
- Prof. Dr. Utz Weitzel (VU Amsterdam, Radboud University)

*** Please click below to start. ***

Informed Consent
- Before you decide whether or not take part in the study, we will give you some information. Please take time to read the information carefully.
- What does my participation involve? Participation involves you filling out the following survey, which will take less than 15 Minutes. Participation is voluntary. You can decide to quit the survey at any moment.
- What happens to the data collected in this survey? We will depersonalize all data and will only use them for scientific purposes. The anonymized research data is

accessible to other scientists for a period of at least 10 years. The data cannot be traced back to you.

- How do I receive my payment and early access to the results? At the end of the survey you can *optionally* provide us with your IBAN for payment transfer and *optionally* with your email for receiving the results. Your IBAN and email will both be permanently deleted from the data once we completed the payments and sent you the results.

- Ethical assessment This research study has been approved by the Maastricht University Ethical Review Committee Inner City Faculties (ERCIC).

- More information? Should you want more information on this research study, please contact m.laudi@maastrichtuniversity.nl

○ I agree

○ I do not agree

Instructions (1/3)

- Please read the following instructions carefully. We will ask you to answer two questions about them afterwards.

Your role:

- In the following, you take on the role of a financial advisor to a client.
- You will select a portfolio of stocks on behalf of this client.
- The client is a real person, who is not a financial professional.
- The portfolio has a starting value of €1,000.
- For selecting the stock portfolio on behalf of your client, you can determine an advisory fee.

Your decisions are consequential

- For every 10th client (randomly drawn), the selected portfolio of €1,000 will be bought in real life (and the returns paid out).
- Proof of stock transactions and earnings calculations will be communicated by the research team to you and the client (using depersonalized data). This is to ensure that all information above is transparent and credible.

Do you want to see an example of the portfolio selection task? (Will be shown below)

○ Yes

○ No

Example, not the actual selection screen:

- Please select one of the portfolios below.

- All stocks in the portfolios are among the largest 200 stocks in the MSCI World, by market capitalization.

- The portfolios have numbers as identifiers. These identifiers are random and should not play a role in your selection.

- Click on a portfolio's name for more financial information.

- Next to each portfolio name, you see an indicator of social responsibility [More Info]

United Nations Global Compact   [✖]

% of Portfolio invested in Companies that participate in the UN Global Compact	Descriptive Rank	Rating Icon
80 – 100%	High	
60 – 80%	Above Average	
40 – 60%	Average	
20 – 40%	Below Average	
0 – 20%	Low	

We classify a portfolio's social responsibility according to the proportion of companies in the portfolio participating in the UN Global Compact. Participation requires a commitment from a company's chief executive with support from the Board. This commits an organization to meet fundamental responsibilities in four areas: human rights, labour, environment and anti-corruption. All participants are required to produce an annual communication on progress that outlines a company's efforts to operate responsibly and support society.

○ 🍃🍃🍃🍃🍃 Portfolio 13 (Click for more Info)

○ 🍃🍃🍃🍃🍃 Portfolio 22 (Click for more Info)

○ 🍃🍃🍃🍃🍃 Portfolio 36 (Click for more Info)

○ 🍃🍃🍃🍃🍃 Portfolio 4 (Click for more Info)

○ 🍃🍃🍃🍃🍃 Portfolio 23 (Click for more Info)

○ 🍃🍃🍃🍃🍃 Portfolio 32 (Click for more Info)

Information   [✖]

Portfolio 22

Portfolio Beta: 1.00

Forward Dividend Yield: 2.31%

Price / Book Value: 11.66

Sustainability Score: 100 / 100

Investment Style:

Value	Core	Growth
27%	47%	27%

Return graph past 5 years:

End of Block: Instructions 1

Start of Block: Instructions 2

Instructions (2/3)

- Once you finish this survey, the fee that you set for your client will be shown to this client.

Your client has two options:

- Take your advice: Your client will pay the advisory fee to you. Your client's investment budget will be invested in the stock portfolio that you selected.
- Not to take your advice: Your client will not pay the advisory fee to you and will not see the stock portfolio that you selected. The client will then select a stock portfolio for him-/herself.

End of Block: Instructions 2

Start of Block: Instructions 3

Instructions (3/3)

<u>Payment to your client:</u>

- Every 10th client is randomly selected to be eligible for payment.
- These clients receive a base payment of €150.
- The return of a client's chosen portfolio (with a starting value of €1,000) is added to (if positive) or deducted from (if negative) this base payment.
- If they choose your portfolio, your fee will be deducted from this payment/return.
- If they choose to select their own portfolio, the fee will not be deducted from this payment/return.
- Your client will be paid out 12 months after the survey is completed.

<u>Payment to you:</u>

- If your client decides to take your advice, you receive the advisory fee that you set.
- If your client decides not to take your advice (and to select his/her own portfolio), you receive no payment.
- You will be paid within twelve weeks after the study is completed.
- Example 1: You set an advisory fee of $e{ round(e://Field/Instr_Fee ,1) }%. Your client invests in your portfolio. You will be paid €1,000*$e{ round(e://Field/Instr_Fee ,1) }% = €$e{ round(e://Field/Instr_Fee ,1) * 10}.
- Example 2: You set an advisory fee of $e{ round(e://Field/Instr_Fee ,1) }%. Your client decides to select his or her own portfolio. You will be paid €0.

Comprehension Quiz

What is not a possible investment for your client?

○ The stock portfolio that you select on their behalf

○ A stock portfolio that they select themselves

○ A money market investment

- -

Consider the following scenario. After selecting a stock portfolio, you set an advisory fee of $e{ round(e://Field/Quiz_Fee ,1) }%. Your client decides to take your portfolio advice. How much will you be paid?

○ €0

○ €$e{ round(e://Field/Quiz_Fee , 1)}

○ €$e{ round(e://Field/Quiz_Fee , 1) * 10}

Wrong Answer (Only shown if there was a mistake in the comprehension questions)

At least one of your answers was not correct. Do you want to see the instructions again or would you like to retry answering?

○ See the instructions

○ Answer again

Wrong Answer (Only shown if there was a mistake in the comprehension questions twice)

At least one of your answers was not correct. Please see below for the correct answers and proceed with the survey.

What is not a possible investment for your clients?

 Correct answer: A money market investment

Consider the following scenario. After selecting a stock portfolio, you set an advisory fee of $e{ round(e://Field/Quiz_Fee ,1) }%. Your client decides to take your portfolio advice. How much will you be paid?

 Correct answer: €$e{ round(e://Field/Quiz_Fee , 1) * 10}

Start of the Portfolio Selection
- On the following 6 screens, you will select 6 different portfolios for 6 clients.
- You will be able to set a fee for each of these 6 clients.
- At the end of this survey, 1 out of your 6 clients will be randomly selected. The fee for this client will then be relevant for your payment.
- *All clients have an aggressive risk profile, which indicates that they want 100% of their experimental budget to be invested in stocks.*
- Click below to start.

End of Block: Start Portfolio Selection

Start of Block: Client Allocations

[Advisors allocated stock portfolios and set fees on behalf of six different clients. Here, one example is shown]

Client 1 out of 6

Please **select a portfolio of stocks** for client 1, who has the following profile:

- **Gender:** Male
- **Age:** 45 – 54 years old
- **Gross Income:** €40,000 – €59,999 per year
- **Risk Profile:** Aggressive
- **Financial Sophistication:** [More Info]
  - ○ Low
  - ○ High
  - ○ **Not Available**
- **Investor Mandate:** [More Info]
  - ○ Conventional
  - ○ **Socially Responsible**

Client questionnaire Info [✖]

Financial sophistication is the ability to understand and make use of a variety of financial skills, including personal financial management, budgeting, and investing. It also means comprehending certain financial principles and concepts, such as time value of money, compound interest, managing debt, and financial planning. Clients complete a validated questionnaire that has been designed to measure financial sophistication and that is frequently used in academia and also by practitioners. We report the relative performance of this client below. We report "Not Available", if the questionnaire has not been filled out.

Client questionnaire Info [✖]

We ask clients whether they want to give you, the advisor, a mandate for socially responsible investing. We tell clients that you have access to social responsibility scores.

Select a portfolio of stocks for your client:

- Please select one of the portfolios below for this client.
- All stocks in the portfolios are among the largest 200 stocks in the MSCI World, by market capitalization.
- The portfolios are given numbers as identifiers, these are random and should not play a role in your selection.
- Click on a portfolio's name for more financial information.
- Next to each portfolio name, you see an indicator of social responsibility [More Info]

○ [🌿🌿🌿🌿🌿 Portfolio 16 (Click for more Info)]

○ [🌿🌿🌿🌿🌿 Portfolio 27 (Click for more Info)]

○ [🌿🌿🌿🌿🌿 Portfolio 34 (Click for more Info)]

○ [🌿🌿🌿🌿🌿 Portfolio 19 (Click for more Info)]

○ [🌿🌿🌿🌿🌿 Portfolio 33 (Click for more Info)]

○ [🌿🌿🌿🌿🌿 Portfolio 5 (Click for more Info)]

United Nations Global Com... ✖

% of Portfolio invested in Companies that participate in the UN Global Compact	Descriptive Rank	Rating Icon
80 – 100%	High	🌿🌿🌿🌿🌿
60 – 80%	Above Average	🌿🌿🌿🌿
40 – 60%	Average	🌿🌿🌿
20 – 40%	Below Average	🌿🌿
0 – 20%	Low	🌿

We classify a portfolio's social responsibility according to the proportion of companies in the portfolio participating in the UN Global Compact. Participation requires a commitment from a company's chief executive with support from the Board. This commits an organization to meet fundamental responsibilities in four areas: human rights, labour, environment and anti-corruption. All participants are required to produce an annual communication on progress that outlines a company's efforts to operate responsibly and support society.

Information ✖

Portfolio 27

Portfolio Beta: 0.90

Forward Dividend Yield: 3.44%

Price / Book Value: 9.62

Sustainability Score: 100 / 100

Investment Style:

Value	Core	Growth
47%	27%	27%

Return graph past 5 years:
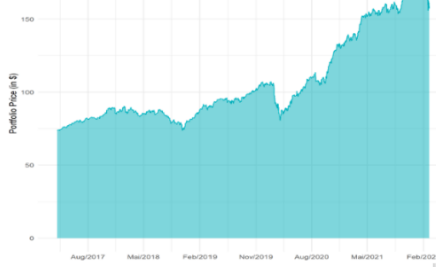
Advisory fee for your client as a percentage of the €1,000 portfolio value: Based on this fee, your client will decide whether to take your advice.

| 0 | 0.4 | 0.8 | 1.2 | 1.6 | 2 | 2.4 | 2.8 | 3.2 | 3.6 | 4 |

Finally, last screen with questions:

Gender What is your gender?

○ Male

○ Female

○ Other

Age What is your age?

▼ 18 - 24 years old ... 65 and older

Education What is the highest level of school you have completed or the highest degree you have received?

▼ Less than high school degree ... Professional degree (JD, MD)

Which industry sector are you working in?

○ Agriculture, forestry & fishing

○ Automotive/Aerospace

○ Business & other services

○ Communications (e.g. Telecommunications and Postal services)

○ Construction

○ Distribution (wholesale & retail trade)

○ Education

○ Financial services (e.g. Banks and Insurance companies)

○ Health and Social work

○ Hotels & Catering

○ IT services

○ Manufacture of chemical products

○ Manufacture of food products

○ Manufacturing (other)

○ Mining & Utilities (e.g. Energy companies)

○ Public administration

○ Transport

Which of the following best describes your current job?

○ account manager

○ accounting/controlling

○ analysis/research/valuation

○ area manager

○ asset liability mgmt

○ compliance

○ consulting in management

○ consulting in processes

○ corporate finance

○ acquisitions

○ client advisor

○ customer support

○ fund management

○ fund placement

○ general mgmt/admin

○ investment advisor

○ investment banking

○ IT-support/mgmt

○ planning, financial

○ portfolio management

○ private equity/banking

○ product manager

○ project developer

○ regulation, financial

○ relationship manager

○ risk management

○ sales

○ supervision, financial

○ trading/brokerage

○ treasury

○ wealth management

○ other:
_____
__

Please provide a brief description of the main tasks in your job.

_____
_____

Are you an independent financial advisor?

○ Yes

○ No

What was your gross annual household income last year?

▼ under €20,000 ... 200,000 or more

At which type of financial institution are you currently employed? (multiple answers possible)

- ☐ Bank

- ☐ Insurance

- ☐ Investments

- ☐ Pension fund

- ☐ Financial holding

- ☐ Credit and loan

- ☐ Mortgage

- ☐ Leasing

- ☐ Hedge fund

- ☐ other (please specify below)
  _____
  __

In which country do you currently reside?

▼ Albania ... Zimbabwe

How many years of experience do you have in the financial sector?

▼ Less than 1 ... More than 20

Does your job involve socially responsible investing?

○ Yes

○ No

We ask each client to predict how much time you, as the advisor, spent on selecting a portfolio for him or her. Which of the following client groups do you think expects a larger amount of time?

○ Clients who gave a conventional investment mandate

○ Clients who gave a socially responsible investment mandate

○ No difference

How willing are you to give to good causes without expecting anything in return?

	1	2	3	4	5	6	7	8	9	10	11	
Not at all	○	○	○	○	○	○	○	○	○	○	○	○ Very willing

In general, how would you describe your own political viewpoint?

▼ Very conservative ... Not sure

How many years of experience do you have with socially responsible investing in your work?

▼ Less than 1 ... More than 20

End of Block: Exit Survey

Start of Block: PLEASE VISIT URL

Q289 In about 3 weeks, you will be able to see proof of all stock transactions that we undertook to implement the portfolios. All data will be aggregated and anonymized, so that it is impossible to trace back any decision taken in the survey. The information will be posted on this web page:

https://feedback002.wordpress.com/

Please copy and save the address of the web page if you want to visit it in 3 weeks.

IMPORTANT FOR PAYMENT:
If you want to be eligible for payment, please enter your IBAN below (optional).

Entering your IBAN is completely voluntarily and the information will only be used for payment. Your IBAN will be deleted from the raw data once we completed the payments. After this, all data will be completely de-personalized and cannot be traced back to individuals. All data will be used for academic research purposes only. If you do

not enter your IBAN or an incorrect IBAN we assume that you do not want to be eligible for any payment.

_____
_____

IMPORTANT FOR EARLY ACCESS TO RESULTS:

If you want to receive the results of this study, please enter your email below (optional).

 Entering your email is completely voluntarily and the information will only be used for sending you the results. Your email will be deleted from the raw data once we sent you the results. After this, all data will be completely de-personalized and cannot be traced back to individuals. All data will be used for academic research purposes only. If you do not enter your email or an incorrect email we assume that you do not want to receive any results.

_____
_____

Thank you very much for participating.

 *** Please click below to complete the survey ***

End of Block: PLEASE VISIT URL

B.4 Instructions clients study 2

Welcome

- Thank you for participating in the survey. Participation will take less than 10 minutes.
- Upon full completion of the survey, you will receive a completion fee of €2 (~£1.70).
- In addition, you can earn up to €150 (~£127.50) and more, depending on your decisions in the survey and a random draw.
- All earnings will be paid out in points that correspond to the dollar value indicated in this study.
- We will depersonalize all data and will only use them for scientific purposes.

This study adheres to the principles of economic experiments: participants are not deceived and earnings are paid out for real.

- Marten Laudi (Maastricht University)
- Prof. Dr. Paul Smeets (Maastricht University)
- Prof. Dr. Utz Weitzel (VU Amsterdam, Radboud University)

*** Please click below to start. ***

Informed Consent

- Before you decide whether or not to take part in the study, we will give you some information. Please take time to read the information carefully.
- What does my participation involve? Participation involves you filling out the following survey, which will take around 10 minutes. Participation is voluntary. You can decide to quit the survey at any moment.
- What happens to the data collected in this survey? We will depersonalize all data and will only use them for scientific purposes. The anonymized research data is accessible to other scientists for a period of at least 10 years. The data cannot be traced back to you.
- Ethical assessment This research study has been approved by the Maastricht University Ethical Review Committee Inner City Faculties (ERCIC).
- More information? Should you want more information on this research study, please contact m.laudi@maastrichtuniversity.nl

○ I agree

○ I do not agree

What is your gender?

○ Male

○ Female

○ Other

What is your age?

▼ 18 - 24 years old ... 65 and older

What was your gross combined, annual household income last year?

▼ under €20,000 (~£17,000) ... €200,000 or more (-£170,000)

Which industry sector are you working in?

▼ Agriculture, forestry & fishing ... Transport

Suppose you had £100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow?

○ More than £102

○ Exactly £102

○ Less than £102

Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, with the money in this account, would you be able to buy...

○ More than today

○ Exactly the same as today

○ Less than today

Do you think the following statement is true or false?
Buying a single company stock usually provides a safer return than a stock mutual fund.

○ True

○ False

Instructions (1/3): Your task

- In this survey, you can choose a <u>portfolio of stocks.</u> You can select this portfolio <u>yourself</u> or let a <u>financial professional</u> do this for you.
- For one out of ten participants in this survey, randomly selected, the <u>selected stocks will be purchased in real life</u>.
- We, the researchers conducting this study, <u>will invest €1,000 (~£850)</u> on behalf of each randomly selected participant.
- All randomly selected participants <u>will be paid in one year</u>, according to the return of the selected stock portfolio.
- On the following screen, we will explain how earnings are calculated for each randomly selected participant.
- To make the instructions simpler, we will only give € values from here on out. After the experiment, we will use the current exchange rate to convert your earnings to £ values.
- Proof of stock transactions and earnings calculations will be communicated by the research team to the participants (using depersonalized data) after the stocks are bought and sold. This is to ensure that all information above is transparent and credible.

Do you want to see a preview of the portfolio selection screen? Depending on your decision later in the survey, either you or a financial professional (for you) will use such a screen to select a portfolio of stocks.

◯ Yes

◯ No

Example, not the actual selection screen:

- Please select one of the portfolios below.

- All stocks in the portfolios are among the largest 200 stocks in the MSCI World, by market capitalization.

- The portfolios have numbers as identifiers. These identifiers are random and should not play a role in your selection.

- Click on a portfolio's name for more financial information.

- Next to each portfolio name, you see an indicator of social responsibility [More Info]

United Nations Global Compact		
% of Portfolio invested in Companies that participate in the UN Global Compact	Descriptive Rank	Rating Icon
80 – 100%	High	
60 – 80%	Above Average	
40 – 60%	Average	
20 – 40%	Below Average	
0 – 20%	Low	

We classify a portfolio's social responsibility according to the proportion of companies in the portfolio participating in the UN Global Compact. Participation requires a commitment from a company's chief executive with support from the Board. This commits an organization to meet fundamental responsibilities in four areas: human rights, labour, environment and anti-corruption. All participants are required to produce an annual communication on progress that outlines a company's efforts to operate responsibly and support society.

○ Portfolio 13 (Click for more Info)

○ Portfolio 22 (Click for more Info)

○ Portfolio 36 (Click for more Info)

○ Portfolio 4 (Click for more Info)

○ Portfolio 23 (Click for more Info)

○ Portfolio 32 (Click for more Info)

Information

Portfolio 22

Portfolio Beta: 1.00

Forward Dividend Yield: 2.31%

Price / Book Value: 11.66

Sustainability Score: 100 / 100

Investment Style:

Value	Core	Growth
27%	47%	27%

Return graph past 5 years:

End of Block: Instructions 1

Start of Block: Instructions 2

Instructions (2/3): Financial advisor
- You can either select stocks <u>yourself</u>, or you can take <u>professional advice</u>.
- If you decide for professional advice, <u>we assign a financial advisor to you</u>, who selects the stock portfolio for you.
- The stock selection of the advisor will be based on your profile (age, income, gender, etc.) and on your investment preferences, which you can specify later.
- For constructing this stock portfolio, your financial advisor <u>has set an advisory fee</u>.

Payment to you (if randomly selected):
- You receive <u>a base payment</u> of €150
- Over the next year we will record the <u>return of your stock portfolio</u> (with a starting value of €1000).
- This return will be added to (if positive) or deducted from (if negative) your base payment.
- If you choose to take the advice of the financial advisor, an <u>advisory fee</u> will be deducted from your payment.
- If you choose to select the stocks yourself, <u>no advisory fee</u> will be deducted from your payment.
- <u>You never owe us any money.</u> If a negative stock return and the advisory fee exceed your base payment of €150, you simply do not receive any money from us (Except for the survey completion fee).
- If you are randomly selected, you will be paid out one year after the survey is completed.
- Maastricht University and VU Amsterdam guarantee that all earnings will be paid out.

Payment to your advisor:
- If you <u>take the advice</u>, your advisor receives the <u>advisory fee</u> three weeks after this survey is completed.
- If you choose to <u>select the stock portfolio yourself</u>, you will not receive any advice and your advisor receives <u>no fee</u>.

Instructions (3/3): Examples

Example 1: You invest according to your advisor's suggestion. Your advisor has set an advisory fee of $e{ round(e://Field/Instr_Fee ,1) }%. After one year, the portfolio has generated a return of $e{ round(e://Field/Instr_Ret_Pos ,1) }%. If you are randomly selected, the following will be relevant for your payment:
- Your base payment of €150.
- The advisory fee: €1,000*($e{ round(e://Field/Instr_Fee ,1) }%) = €$e{ round(e://Field/Instr_Fee , 1) * 10 }
- The return of the portfolio: €1,000*($e{ round(e://Field/Instr_Ret_Pos ,1) }%) = €$e{ round(e://Field/Instr_Ret_Pos ,1) *10}.
- Hence, your total payout will be €150 - €$e{ round(e://Field/Instr_Fee , 1) * 10 } + €$e{ round(e://Field/Instr_Ret_Pos , 1) * 10 } = €$e{(15 - round(e://Field/Instr_Fee , 1) + round(e://Field/Instr_Ret_Pos , 1)) * 10 }

Example 2: You invest according to your advisor's suggestion. Your advisor has set an advisory fee of $e{ round(e://Field/Instr_Fee ,1) }%. After one year, the portfolio has generated a return of $e{ round(e://Field/Instr_Ret_Neg ,1) }%. If you are randomly selected, the following will be relevant for your payment:
- Your base payment of €150.
- The advisory fee: €1,000*($e{ round(e://Field/Instr_Fee ,1) }%) = €$e{ round(e://Field/Instr_Fee , 1) * 10 }
- The return of the portfolio: $1,000*($e{ round(e://Field/Instr_Ret_Neg ,1) }%) = €$e{ round(e://Field/Instr_Ret_Neg ,1) *10}
- Hence, your total payout will be €150 - €$e{ round(e://Field/Instr_Fee , 1) * 10 } + €$e{ round(e://Field/Instr_Ret_Neg ,1) *10} = €$e{(15 - round(e://Field/Instr_Fee , 1) + round(e://Field/Instr_Ret_Neg ,1)) *10}

Comprehension Quiz
- Please answer the questions below about the instructions on the previous screens.
- You have two chances to answer both comprehension questions correctly.
- If you fail to do so, you will not be able to complete the survey and you will not receive the completion fee of €2.

What is not a possible investment for you?

○ A stock portfolio that your advisor selects on your behalf

○ A stock portfolio that you select yourself

○ A savings account

Consider the following scenario. Your advisor set a fee of $e{ round(e://Field/Quiz_Fee ,1) }%. You decide to take the portfolio advice. The selected portfolio has a return of $e{ round(e://Field/Quiz_Ret ,1) }%. How much will you be paid? Remember: Your base payment is €150.

○ €0

○ €$e{(15 - round(e://Field/Quiz_Fee , 1) + round(e://Field/Quiz_Ret ,1))}

○ €$e{(15 - round(e://Field/Quiz_Fee , 1) + round(e://Field/Quiz_Ret ,1)) *10}

Wrong Answer (Only shown if there was a mistake in the comprehension questions)

At least one of your answers was not correct. Do you want to see the instructions again or would you like to retry answering?

◯ See the instructions

◯ Answer again

Wrong Answer (Only shown if there was a mistake in the comprehension questions twice ➔ End of Survey)

 At least one of the answers you gave was not correct.

Advisor mandate
- Before you choose whether you like to receive advice, we have two questions.
- These questions will be used to match you to the right financial advisor.

Do you want to give your advisor a mandate for socially responsible investing? For all selectable stocks, your advisor will receive an indicator of social responsibility [Clickable button for more info]. We classify a portfolio's social responsibility according to the

proportion of companies in the portfolio participating in the UN Global Compact. Participation requires a commitment from a company's chief executive with support from the Board. This commits an organization to meet fundamental responsibilities in four areas: human rights, labour, environment and anti-corruption. All participants are required to produce an annual communication on progress that outlines a company's efforts to operate responsibly and support society.

○ Yes

○ No

How would you like your investment budget to be allocated between a savings account (0% interest rate) and a stock portfolio? Note: You will only be able to continue with the survey if you agree to have your experimental budget invested in stocks (Aggressive risk profile).

○ Aggressive (100% in stocks)

○ Moderate (50% in the savings account, 50% in stocks)

○ Conservative (100% in the savings account)

End of Block: Advisor Mandate

Start of Block: Allocation Decision

Investment Decision

A financial professional selected a portfolio for a client with your profile. He or she set the following advisory fee for creating this stock portfolio.

Advisory Fee: $${e://Field/Fee}%

Would you like to invest in the stock portfolio that your advisor selected on your behalf?

○ Yes, I will take the advice

○ No, I will select stocks myself

[Depending on their answer, participants are then either directly sent to the exit survey, or have to allocate their own fund]

Finally, last screen, please answer the following questions:

Which industry sector are you working in?

▼ Agriculture, forestry & fishing ... Transport

How knowledgeable are you in financial matters?

○ Not knowledgeable

○ More or less knowledgeable

○ Knowledgeable

○ Very knowledgeable

What is the highest level of school you have completed or the highest degree you have received?

▼ Less than high school degree ... Professional degree (JD, MD)

In which country do you currently reside?

▼ Albania ... Zimbabwe

Have you invested before, or are you planning to invest in the future (e.g., into stocks, bonds, investment funds, real estate)?

○ Yes

○ No

Have you delegated investment decisions (e.g., purchase of stocks, bonds, investment funds, real estate) to financial advisors at banks or other institutions before?

○ Yes

○ No

In general, how would you describe your own political viewpoint?

▼ Very conservative ... Not sure

How willing are you to give to good causes without expecting anything in return?

	1	2	3	4	5	6	7	8	9	10	11	
Not at all	○	○	○	○	○	○	○	○	○	○	○	Very willing

How much do you enjoy to take investment decisions?

	1	2	3	4	5	6	7	
Not at all	○	○	○	○	○	○	○	A lot

How much investment experience do you have?

	1	2	3	4	5	6	7	
None	○	○	○	○	○	○	○	A lot

What yearly gross return do you expect to make on your selected stock portfolio? (In %)

▼ Less than -15 ... More than 15

In about 3 weeks, you will be able to see proof of all stock transactions that we undertook to implement the portfolios. All data will be aggregated and anonymized, so that it is impossible to trace back any decision taken in the survey.

The information will be posted on this web page:

https://feedback002.wordpress.com/

Please write down the address of the web page if you want to visit it in 3 weeks.

Thank you very much for participating.

*** Please click below to complete the survey ***

B.5   Instructions selection survey

Welcome

Thank you for participating in the survey. Participation will take less than 10 minutes. Upon full completion of the survey you will receive a participation fee of $10. You will receive your participation fee in points. All data will be depersonalized and will exclusively be used for the purpose of academic research.

*** Please click below to start. Note that you will not be able to go back to previous pages throughout the whole study. ***

Which industry sector are you working in?

▼ Agriculture, forestry & fishing ... Transport

Which of the following best describes your current job?

Imagine that you are considering purchasing stocks today, which you would like to sell twelve months from now. Please indicate how important each of the following

information is for you when deciding on particular companies to invest in.

Please rank the following pieces of information, depending on how important they are in your decision process to invest in a particular stock. Drag the most important indicators to the top of the list and the least important indicators to the bottom.

_____ Price range (last year)

_____ Price chart (last 5 years)

_____ Average price (expected by analysts next year)

_____ Average price (last year)

_____ Volatility (last year)

_____ Dividends (last year)

_____ Dividends (expected next year)

_____ Industry

_____ Previous day's trading volume

_____ Previous year's trading volume

_____ Market Capitalization

_____ Price / Earnings Ratio (last year's earnings)

_____ Earnings per share (last year)

_____ Earnings per share (expected next year)

_____ Price / Book Ratio

_____ Annual Revenue (last year)

_____ Revenue Growth (last 3 years)

_____ Annual Profit (last year)

_____ Free Cash Flow (last year)

_____ Beta (last year)

_____ Trade volume

_____ Risk/return ratio, e.g., Sharpe ratio (last year)

Please specify any other indicators that we may have missed and that you consider to be part of the five most important pieces of information for your decision process to invest in a particular stock.

_____

_____

_____

_____

In your investment decisions, do you consider any indicators on firms' abilities to meet environmental, social, and governance criteria?

▼ Definitely yes ... Definitely not

How important are the following indicators in your decision-making?

	Not at all important	Unimportant	More or less unimportant	Neither important nor unimportant	More or less important	Important	Very important
Thompson Reuters ESG Scores (Asset4)	○	○	○	○	○	○	○
MSCI ESG Rating	○	○	○	○	○	○	○
MSCI KLD Scores	○	○	○	○	○	○	○
Sustainalytics ESG Rating	○	○	○	○	○	○	○

Please answer the following questions:

How would you rate your willingness to take risks ...

	1: Not at all willing to take risks	2	3	4	5	6	7: Very willing to take risks
... generally in life:	○	○	○	○	○	○	○
... in financial matters:	○	○	○	○	○	○	○

How important is it for you to be the best at what you do?

	1	2	3	4	5	6	7	
Not important	○	○	○	○	○	○	○	Very important

Social status is primarily defined by financial success.

	1	2	3	4	5	6	7	
Fully agree	○	○	○	○	○	○	○	Completely disagree

How important is it for you what others think about you?

	1	2	3	4	5	6	7	
Not important	○	○	○	○	○	○	○	Very important

How willing are you to give to good causes without expecting anything in return?

	1	2	3	4	5	6	7	
Not at all	○	○	○	○	○	○	○	Very important

In general, how would you describe your own political viewpoint?

▼ Very conservative ... Not sure

What is your present religion, if any?

▼ Protestant ... Other

How important is religion in your life?

▼ Very important ... Not at all important

In our society there are groups which tend to be towards the top and groups which tend to be towards the bottom of the income scale.

If 1 equaled the bottom of the scale and 100 equaled the top of the scale, where would you put yourself now on this scale?

_____

And where would you put the household you grew up in on the same scale?

_____

What has been the main source of your household's wealth?

○ Inheritance or family assets

○ Salary

○ Income from own business

○ Property

○ Lottery

○ Other (please specify)
_____

Finally, last screen, please answer the following questions:

What is your gender?

○ Male

○ Female

○ Other

What is your age?

▼ 18 - 24 years old... 65 and older

What is the highest level of school you have completed or the highest degree you have received?

▼ Less than high school degree... Professional degree (JD, MD)

At which type of financial institution are you currently employed? (multiple answers possible)

What is the total amount your household donated to charitable causes last year (in $)?
If you are unsure, please make an estimate.

_____
_____

What was your gross combined, annual household income last year?

▼ under $20,000 ... 200,000 or more

How important are concerns for sustainability in your work?

▼ Not at all important ... Very important

Does your current work contract include a bonus clause?

○ Yes

○ No

Did you receive a bonus in the last three years?

○ Yes

○ No

In relation to your fixed income, how large was the bonus payment? (If you received several bonuses, please state the average annual bonus payment.)

▼ less than 10% of fixed income... more than 500% of fixed income

End of Block: Exit survey demographics

Start of Block: Thank you

Thank you very much for participating.

*** Please click below to complete the survey ***

End of Block: Thank you

B.6   Instructions regulators survey

Welcome

Thank you very much for participating.

A few months ago we completed a <u>research study with professional financial advisors</u> in the United States.

- The research study investigated what fees advisors require
    - o   for socially responsible and for conventional investment mandates
    - o   from male and from female clients.

<u>In this survey</u> we are interested in *your opinion about our research study*.

- Upon full completion of this survey (less than 11 minutes), you will
    - o   receive early, preferential access to our research study results;
    - o   you can earn €20, depending on the answers you give in this survey;

    - o   make an important contribution to research.

All data will be depersonalized and will only be used for scientific purposes.

Thank you very much for participating!
- Marten Laudi (Maastricht University)
- Prof. Dr. Paul Smeets (Maastricht University)
- Prof. Dr. Utz Weitzel (VU Amsterdam, Radboud University)

    *** *Please click below to start.* ***

Description of the RESEARCH STUDY

First, we will briefly describe the RESEARCH STUDY that we completed with financial advisors. You don't need to take any decisions in this part.

The <u>goal</u> of the RESEARCH STUDY was to find out:
- Whether financial advisors charge a different fee to clients who give them a <u>mandate for socially responsible investing (SRI)</u>, than to clients who give them a <u>conventional investing mandate</u>.
- Whether financial advisors charge a different fee to <u>female</u> clients than to <u>male</u> clients.

<u>Background</u> of the RESEARCH STUDY:
- For that purpose, we ran an <u>online experiment</u> in which we matched real financial advisors with real clients, who invested real money to buy real stocks.
- We recruited 345 financial advisors in the US who are involved in managing or brokering financial assets on behalf of clients in their professional life.
- We included, for example, private bankers, investment advisors, and portfolio managers, but not IT support, auditors, or those working in corporate finance.
- We also recruited 345 individual clients in the US (not financial professionals), who <u>were willing to invest $1000 each (which we provided) in the stock market</u>.
- We randomly matched each client with one financial advisor.

Description of the RESEARCH STUDY

Portfolio task for the financial advisor:
- In the experiment, each advisor was asked to manage the $1000 stock portfolio of the matched client by weighting 30 stocks in the Dow Jones Industrial Average.
- Advisors saw some information about the client, including gender and a mandate from the client: (either a socially responsible investing (SRI) mandate, or a conventional mandate).
- We also provided the advisor with financial and SRI information for each stock.

Please click below to see an example of the client information and the portfolio task of the advisor.

○ Show an example of the portfolio allocation screen (Will be shown below)

Description of the RESEARCH STUDY

After the portfolio task, each advisor was asked to set a fee for his/her service.

The advisor knew that clients were not obliged to accept the fee, because the clients could also choose to build their own portfolio.

EXAMPLE SCREEN for setting a fee by advisors: (Feel free to click on all buttons in the example)

[EXAMPLE SCREEN WAS DISPLAYED HERE]

Description of the RESEARCH STUDY

Client decision:
- After the advisor had built a portfolio and set a fee, the matched client made a simple decision:
  - o Either: pay the fee as set by the advisor and use the advisor's portfolio.

  - o Or: do not pay the fee and build their own portfolio (without seeing the advisor's portfolio).
- In both cases the chosen portfolio was bought for real on the stock market and held for one year by the research team.

Payouts:
- <u>If the client decided to pay a fee,</u>
  - o the advisor received the fee as a real payment,
  - o and the client received the portfolio returns after one year after deduction of the fee.
- <u>If the client decided against paying a fee,</u>
  - o the advisor received nothing,
  - o and the client received the raw portfolio returns after one year.

In all cases, the lowest possible payout for the client was 0.

Comprehension Quiz RESEARCH STUDY
- Please answer the two questions on the RESEARCH STUDY below:

What is <u>not</u> a possible investment for clients?

○ A stock portfolio that they select themselves

○ The stock portfolio that the advisor selects on their behalf

○ A savings account

Which was <u>not</u> a potential investment mandate that could be given by the client to the advisor?

○ A conventional investment mandate

○ A socially responsible investing mandate

○ A low-turnover investment mandate

[ON THIS PAGE, PARTICIPANTS RECEIVED FEEDBACK ON WHETHER THEY ANSWERED THE QUESTION CORRECTLY]

You have now finished the explanation, which is the largest part of the completion time.

Lets now start with your predictions.

When you finish this survey, we will randomly select one of your predictions.
If your prediction matches the actual findings from our study, you will receive €20.

[NOTE: THE ORDER OF THE QUESTIONS, AS WELL OF THE ORDER OF THE ANSWERS WERE RANDOMIZED]

Prediction: Fees by Gender

- In the RESEARCH STUDY, the clients differed in terms of their gender.
- Who do you believe financial advisors charged a higher fee to in the RESEARCH STUDY?

○ Higher fee charged to male clients

○ Higher fee charged to female clients

○ No difference in fees

Prediction: Fees by Mandate

- In the RESEARCH STUDY, the clients were able to give their advisor a mandate for socially responsible investing.
- Who do you believe financial advisors charged a higher fee to in the RESEARCH STUDY?

○ Higher fee charged to clients who gave a mandate for socially responsible investing

○ Higher fee charged to clients who gave a conventional investment mandate

○ No difference in fees

In the RESEARCH STUDY, we also measured advisors' effort exerted to construct a portfolio for each client.

Effort includes the time, as well as the number of clicks an advisor spent to construct a portfolio for a client.

[NOTE: THE ORDER OF THE QUESTIONS, AS WELL OF THE ORDER OF THE ANSWERS WERE RANDOMIZED]

Prediction: Effort by Gender
- Who do you believe financial advisors exerted more effort for in the RESEARCH STUDY?

  ○ Higher effort exerted for male clients

  ○ Higher effort exerted for female clients

  ○ No difference in effort

Prediction: Effort by Mandate
- Who do you believe financial advisors exerted more effort for in the RESEARCH STUDY?

  ○ Higher effort exerted for clients who gave a mandate for socially responsible investing

  ○ Higher effort exerted for clients who gave a conventional investment mandate

  ○ No difference in effort

End of Block: Prediction Effort

Start of Block: External Validity of Findings

Do you believe that the findings from our RESEARCH STUDY are informative about the behavior of financial advisors in the field?

...in the United States?

○ Not informative

○ Hardly informative

○ Somewhat informative

○ Informative

○ Very informative

...in the European Union?

○ Not informative

○ Hardly informative

○ Somewhat informative

○ Informative

○ Very informative

Implications of our results

Suppose the results of our RESEARCH STUDY would show that advisors charge higher fees to clients with a socially responsible investment mandate (vis-a-vis conventional mandates) without exerting any extra effort.

Do you think that such results from our RESEARCH STUDY would require attention from regulators?

○ Yes

○ No

What do you think would be a suitable policy intervention? [ONLY SHOWN IF THE RESPONSE TO THE PREVIOUS QUESTION WAS YES]

_____
_____

In the European Union, a forthcoming amendment to the Markets in Financial Instruments Directive II (MiFID II) will require financial advisors to ask clients whether they want to give an SRI mandate. Do you think that this regulation will be costly to asset managers?

○ No, asset managers will save money

○ No, it will not be costly

○ Yes, it will be costly

○ Yes, it will be very costly

If the MiFID II amendment turns out to be costly, who do you think should bear these additional costs?

○ Clients who give an SRI mandate

○ All clients

○ No client should bear these costs

Finally, last screen, please answer the following questions:

What is your gender?

○ Male

○ Female

○ Other

Is socially responsible investing the main focus of your current work/function?

○ Yes

○ No

What is your age?

▼ 18 - 24 years old ... 65 and older

Compared to the average colleague in your organization, how much work experience do you have with projects/topics that are related to our experiment?

○ Far below average

○ Somewhat below average

○ Average

○ Somewhat above average

○ Far above average

What is the highest level of school you have completed or the highest degree you have received?

▼ Less than high school degree ... Professional degree (JD, MD)

Which of the following best describes your current job? (Multiple answers possible)

- ☐ Regulation

- ☐ Supervision

- ☐ Policy work

- ☐ Analysis

- ☐ Research

- ☐ Management

- ☐ Teaching

- ☐ Other (please specify below)

_____

How much work experience do you have related to regulation and/or policy work in general? (Please enter years of experience)

_____
_____

If you want to receive early access to the results of the research study and be eligible for payment, please enter you email address below (optional).

Entering your email is completely voluntarily and the information will only be used for sending you early results and for payment. Your email address will be deleted from the raw data once we sent the results and completed the payments. After this, all data will be completely de-personalized and cannot be traced back to individuals. All data will be used for academic research purposes only. If you do not enter your email address we

assume that you do not want to receive early results and that you also do not want to be eligible for any payment.

_____

Would you like to donate your earnings from this survey to a charitable organization?

◯ Yes

◯ No

Which organization would you like to donate to? [ONLY SHOWN IF THE RESPONSE TO THE PREVIOUS QUESTION WAS YES]

▼ The Albert Schweitzer Foundation (Animal Welfare) ... Give Directly

End of Block: Exit survey

Start of Block: Thank You

Thank you very much for participating.

*** Please click below to complete the survey ***

End of Block: Thank You

Chapter 3

Peer information increase sustainable investments

Abstract

Peer information has been shown to increase pro-environmental behavior. We test the efficacy of peer information to increase sustainable investments. We collaborate with a German universal bank and administer a field experiment with German retail investors, who make consequential investment decisions. We inform investors about (a) peers' propensity to invest sustainably (social treatment), (b) peers' beliefs regarding the impact (impact treatment) or (c) peers' beliefs regarding the expected return (return treatment) of sustainable investments. We find that investors in all three treatment groups invest more sustainably than investors in a control group that is not exposed to peer information. Importantly, we show that the treatments only alter behavior among those who initially underestimated their peers' inclination towards sustainable investments, as compared to the peer information provided. The mechanism driving the increased sustainable investments differs between treatments. Relative to the control group, participants in the impact treatment group are more likely to state that having an impact motivated their investment decisions, while those in the social treatment group are more likely to state that warm glow motivated their investment decisions. Participants in the return treatment group remain focused on maximizing the return of their investment, indicating that they form more optimistic expectations about the return of sustainable investments, compared to the control group.

1   Introduction

Increasing the amount invested according to environmental, social, and governance (ESG) criteria is an important objective for policy makers. Achieving net-zero emissions in Europe by 2050 requires investments of approximately EUR 28 trillion from households, governments, and the industry (D'Aprile et al., 2020). In this paper, we test the efficacy of providing peer information to retail investors to increase sustainable investments. Previous research has shown that peer information (information about beliefs and behavior of related others) motivates individuals to act more sustainably and adjust their behavior as a result. Allcott (2011) and Allcott and Rogers (2014) show that informing households in the US about their energy consumption, relative to peers, causes an increase in overall energy conservation levels. As such, the authors identify peer information as a cost-effective policy intervention to combat climate change. These studies have been replicated outside of the US, even though lower treatment effects are reported, casting doubt on the cost-effectiveness (Andor et al., 2020).

We collaborate with a German universal bank and administer a field experiment with a sample of German retail investors who make a consequential[1] investment decision. In our experiment, we first elicit participants' prior beliefs and knowledge about sustainable investments. We find that participants believe that sustainable investments can have a positive impact and evoke a good conscience. Yet, only roughly a quarter of the respondents consciously holds or has held sustainable investments. More than 50% of participants do not know what the term 'ESG' means and less than 10% state to be knowledgeable about sustainable investing. Further, participants in our sample assume that returns of sustainable investments are lower than returns of traditional investments, while exposing investors to similar or higher risk levels.

After assessing participants' prior beliefs and knowledge, we allocate them to either a control group, or to one of three treatment groups, in which we expose them to peer information. The social treatment group receives a message that most Germans want to invest

---

[1]We inform subjects that we buy equity funds on the market according to the allocation decision of one randomly selected participant.

in sustainable assets in the future. The impact treatment group receives the information that most Germans have the opinion that sustainable investments can have a positive impact, and the return peer treatment group is exposed to the information that most German investors believe that sustainable investments yield the same or higher returns, compared to traditional investments. Since most investors in our sample expect the returns of sustainable investments to be low but expect the impact of sustainable investing to be high, it could be the case that investors react more strongly to peers' optimism on the returns of sustainable investments than to peer's optimism about sustainable investments' impact. All treatment information that we provide is based on openly accessible information and we provide the source of this information to participants. The peer group that we use are Germans, as the universe of the bank's clients consist of Germans and the average participant in our sample is comparable to the average German investor in terms of demographics.

After receiving the information treatment (except for the control group), participants make a consequential investment decision where we ask them to allocate an experimental budget of EUR 10,000 between two globally investing equity funds. While both funds are comparable in terms of investment style, the first invests conventionally without restrictions in its investment universe and the second screens out equities with low ESG ratings. To avoid the effects of framing and participants conducting online searches for more information of the funds, we do not provide the real names of the funds during the allocation decision, but give them generic names (Fund 1 and Fund 2). Thereafter, we ask the participants about the reasons for their allocations.

Our results show that peer information influences investor behavior at the aggregate level. Controlling for a wide range of demographics, preferences, and beliefs, we find that compared to the control group, retail investors in the impact, social, and return treatment groups allocate an additional EUR 429, EUR 293, and EUR 267 of their EUR 10,000 experimental budget to the sustainable fund, respectively. We therefore provide evidence that just-in-time peer information increases sustainable investments among retail investors in a statistically and economically significant way. However, the

treatment effects do not differ from each other at any conventional significance levels. In summary, investors react to peer information while the content of these information treatments does not matter.

We rule out experimenter demand effects (participants inferring the purpose of the study, biasing their behavior) and attention to sustainability as alternative mechanisms of the increased allocation to the sustainable fund in the treatment groups. We provide all participants, including those in the control group with an explanation of the concept of sustainable investing, and ask about their general experience, knowledge, and beliefs regarding sustainable investments.   Therefore, all participants receive information on sustainable investing, which shows that it is indeed the peer information component that drives the differences in allocations that we observe.

Next, we consider heterogeneity between investors to gain deeper insights into the mechanisms behind treatment effects. Andre et al. (2021) show that peer information interventions only encourage pro-environmental behavior, when the provided information changes the prior of the receiver. To test whether prior beliefs affect the participants' response to the treatments, we ask participants to predict peers' propensity to invest sustainably, peers' beliefs about the return of sustainable investments, and peers' beliefs about the impact of sustainable investments. We find that the social treatment successfully increases sustainable investments only among retail investors who estimated peers' propensity to invest sustainably to be lower than stated in the provided peer information. Similarly, the return treatment only increases sustainable investments among those whose prior belief regarding peers' expectations about the return of sustainable investments was lower than the provided information. For those participants in the impact treatment, the second order belief on the impact of sustainable investments does not matter for the effect of the treatment on the investment decision.

Further, we ask participants about the ex-post rationalizations of their allocation decision in the experiment. Investors in the impact treatment group are more likely to state that having a positive impact is important to them when making their investment decision. Participants in the social treatment group are more likely to list an emotional

reward, or warm glow (Andreoni, 1989, 1990) as a motivation for their allocation. Participants in the return treatment group rationalize their investment decision in the same way as participants in the control group, where high returns are stated to be the most important factor. The fact that participants in the return treatment group still allocate a larger share to the sustainable fund indicates that they expect higher returns from this fund.

Our results have implications for theory and practice. First, we contribute to the literature on sustainable investor behavior. A growing stream of literature identifies non-pecuniary factors as drivers of sustainable investments, where retail investors derive utility from investing in line with their social preferences (Białkowski & Starks, 2016; Riedl & Smeets, 2017; Humphrey et al., 2020; Bauer et al., 2021; Heeb et al., 2022). Investors are willing to pay more for sustainable investments, by accepting higher fees (Riedl & Smeets, 2017; Anderson & Robinson, 2022; Laudi et al., 2022) or by accepting lower expected returns (Barber et al., 2021; Pástor et al., 2022). We show that simple just-in-time peer information treatments increase sustainable investments. Depending on information provided, these treatments either increase the importance of non-pecuniary factors in individual investment decisions, or change investors' return expectations about sustainable investments.

Second, we contribute to the literature on peer information treatments. Individuals have been shown to react to information about what related others do or think. In addition, there is evidence that people derive negative utility from acting against social norms (Levitt & List, 2007). As a result, researchers have explored to what extent peer information can be used to alter financial behavior, such as retirement saving (Duflo & Saez, 2002, 2003; Beshears et al., 2015; Carter & Skimmyhorn, 2018; Lieber & Skimmyhorn, 2018; Bauer et al., 2022), as well as non-financial behavior, such as energy conservation (Allcott, 2011), offsetting the CO_2 output of a flight (Bernard et al., 2022), provision of useful reviews to retailers (Burtch et al., 2018), and voting (Gerber & Rogers, 2009). We show that peer information treatments alter behavior in the domain of sustainable investing. Disclosing related others' tendencies to invest sustainably, as well as peers' beliefs

on the impact and return of sustainable investments increases retail investors' likelihood to invest more sustainably themselves.

As such, our study is closely related to that of Gutsche et al. (2022), who find that those with moderate or low financial literacy respond to descriptive social norms with an increased willingness to pay for sustainable investment products. We add to this study, by providing more fine-grained evidence on the effect of peer information on sustainable investing, by varying its content and observing the conditions under which they alter behavior. Our study is also closely related to that of Døskeland and Pedersen (2016), who show that Norwegian bank clients' sustainable investment behavior is influenced when the wealth benefits are communicated, rather than the moral benefits. In contrast, investors in our sample react to both the impact and the return peer information.

Finally, our results have implications for practice and policy making. Specifically, our results provide simple methods for financial advisors to overcome clients' impediments towards investing more sustainably. Following a recent amendment to MiFID II,[2] financial advisors are already required to talk to their clients about the sustainability of their investments and peer information can be integrated in this conversation. In this context, we identify low knowledge as a main reason why sustainable investments are not chosen, and that simple peer information can be used to overcome this.

2 Experimental design

2.1 Invitation to our experiment

We cooperate with a large German universal bank that offers the full range of retail products and services. We invite approximately 200,000 individuals via e-mail into our online experiment who are randomly selected from a representative pool of the bank's clients. To be invited to our study, participants (i) must be clients at the bank, (ii)

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[2]Markets in Financial Instruments Directive 2014 (2014/65/EU) commonly known as MiFID II (Markets in financial instruments directive II), is a legal act of the European Union. Together with Regulation (EU) No. 600/2014 it provides a legal framework for securities markets, investment intermediaries, and trading venues for the member states of the European Economic Area. Its main objectives are to increase competition and investor protection, and level the playing field for market participants in investment services.

have to be older than 18 years, and (iii) must have given permission to be contacted for research purposes. Before being administered between November 9, 2022 and December 4, 2022, the study was pre-registered[3] and granted ethics approval.[4]

The survey contains two monetary incentives to increase participation rates and simulate a real investment decision. The first incentive is constituted by a EUR 5 Amazon voucher which every participant received upon survey completion. The second is constituted by the chance to receive the proceeds of the EUR 10,000 investment allocation decision after a pre-determined investment period of six months.

The invitation e-mail includes a direct link to the survey. After clicking on the link, participants are directed to the welcome screen of the survey.[5]

2.2 Experimental setup

The study starts with some general questions about the participants' prior knowledge about investing, investment preferences, and investment behavior. We then provide all participants with an explanation of the concept of sustainable investing and elicit participants' experience, knowledge, and beliefs regarding sustainable investments.

We then randomly allocate participants to one of three treatment groups or a control group. The treatment groups see one of the following three peer information:

- Social treatment: "About 70 percent of Germans want to invest into sustainable financial assets in the future."

- Impact treatment: "About 70 percent of Germans are of the opinion that sustainable financial assets have an impact."

- Return treatment: "About 70 percent of Germans are of the opinion that sustainable financial assets yield the same or a higher financial performance compared to conventional investments."

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[3]At the AEA RCT registry under the ID AEARCTR-0010353.

[4]At the Joint Ethics Committee of the Faculty of Economics and Business Administration of Goethe University Frankfurt and the Gutenberg School of Management & Economics of the Faculty of Law, Management and Economics of Johannes Gutenberg University Mainz.

[5]On the welcome screen, clients were prompted to digitally consent to our data privacy regulations before starting the study.
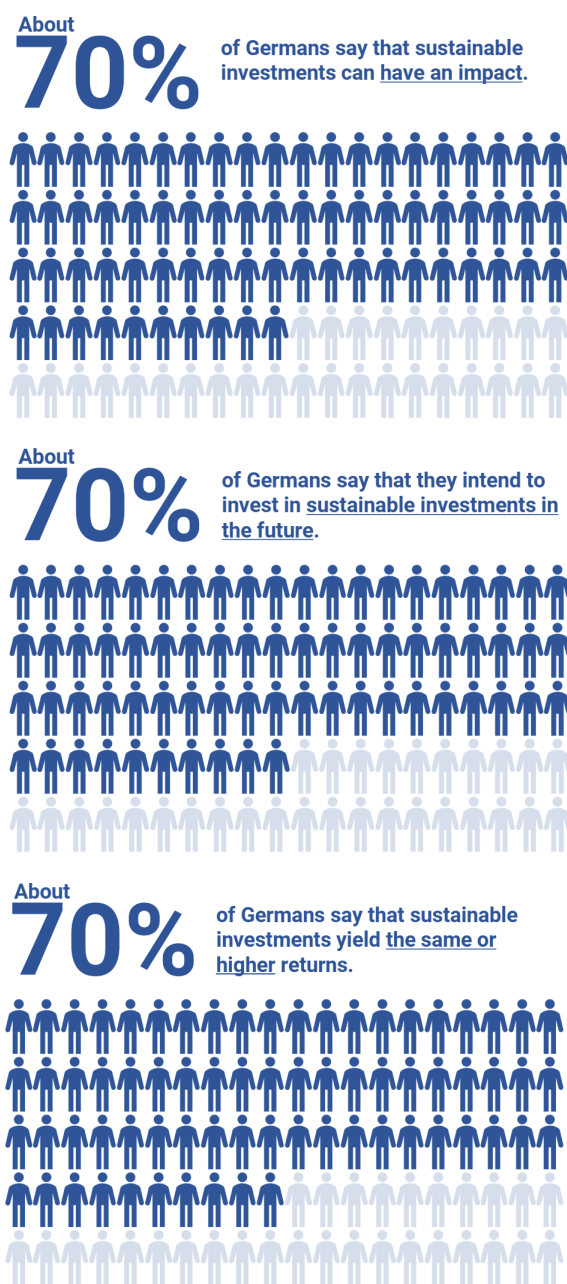
Figure 3.1: Peer information treatments

Notes: This figure shows the peer information treatments (impact, social, and return). Participants in the control treatment did not see any of the messages. The peer information treatments are based on openly available results from surveys conducted by Allianz Global Investors (2019), Forsa (2015), and LBBW Research (2021), which are disclosed to the treated participants.

That is, while all participants receive information on sustainable investments, all participants, except for those in the control group are additionally exposed to peer information with varying content. The peer information is provided in a single sentence, which has been shown to be sufficient to alter individual financial behavior (Bott et al., 2020). Further, the information that is provided is based on openly available results from surveys conducted by Allianz Global Investors (2019), Forsa (2015), and LBBW Research (2021) and the participants have access to these sources if they wish to verify the information that we provide them with. As shown in Figure 3.1, the wording and appearance of the peer information messages is consistent, allowing us to isolate the effect of the content of the provided information, similar to Andre et al. (2021).

Before showing the treatments, we elicit participants' priors about the provided information. That is, we ask those in the impact treatment group: "What percentage of respondents do you think indicated that sustainable investments make an important contribution, e.g., to environmental and climate protection?", those in the social treatment group: "What percentage of respondents do you think indicated that they would like to invest in sustainable investments in the future?", and those in the return treatment group: "What do you estimate, what percentage of respondents indicated that you would get the same or higher returns with sustainable investments?".

2.3 Fund allocation lottery

Our primary outcome variable is a consequential investment decision. Participants allocate an experimental investment budget of EUR 10,000 between two funds. We select both funds such that they differ solely in their sustainability orientation. Both funds invest globally in high-dividend-yield stocks, belong to the same risk class, and are managed by the same firm. However, while the conventional fund considers all companies world-wide, the sustainable fund only invests in companies that have an above-average profile from an environmental and social perspective as well as in terms of good corporate governance. Further, certain industries that do not meet the sustainability criteria, such as arms manufacturers or tobacco companies, are excluded.

With the aforementioned selection criteria of the two funds, we ensure that investors are guided to take an allocation decision only based on two dimensions, i.e., expected return on principal endowment in 6 months from survey submission and sustainability. Fees and other costs,[6] are deliberately rendered irrelevant by design of our survey.

In experimental studies, participants' behavior has been shown to differ when making real versus hypothetical decisions (List & Gallet, 2001). Since having a positive impact is an important decision criterion to sustainable investors, we make the investment decision consequential. Specifically, we invest the amount of EUR 10,000 for one randomly selected participant after the closure of the survey according to his/her allocation choice in the lottery question for a 6-month period. We pay out any positive return on investment at the end of the holding period net of the principal endowment. In case of a negative return, the payout to the randomly selected participant is zero such that participants only have the chance to financially gain from their participation.

After the allocation decision, we ask participants about the ex-post rationalizations of their allocation decisions. In particular, we ask how much their allocation decision was driven by the desire for high returns, low risk, high impact, good conscience (warm glow), or acknowledgement by peers. Also, participants can choose to see the real names of the selectable funds after they have completed the allocation decision. Finally, the survey concludes by eliciting the participants' demographic characteristics. For a detailed description of variables, please refer to Table C1.

3   Sample and methodology

3.1   Sample

We reached out to approximately 200,000 customers of the collaborating German universal bank to participate in our survey. We invited both clients who already invested in the stock market and those who expressed interest in investing in the stock market to the bank. 5,198 started our survey and 3,586 (69.0%) completed it.

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[6]As we cover all transaction and fund administrative and management costs, costs do not play a role in their allocation decisions.

We exclude 375 participants who failed to answer both comprehension questions correctly.[7] Further, we exclude 66 survey respondents from our sample that belong to either the fastest or slowest 1% of respondents to complete the survey. Finally, we exclude 148 survey respondents who take less than 25 seconds on the fund allocation survey question. Our final sample comprises 3,089 complete survey responses.

Table C2 reflects the summary statistics of the final sample after the aforementioned exclusions. On average, participants allocate more than half of the EUR 10,000 principal endowment to the sustainable fund in the corresponding allocation decision question. The average participant is 49 years old. 63% of the participants are male and 55% are married. 47% of the participants hold a college degree, 33% have children, 19% are retired, and 2% are unemployed. The mean household size amounts to roughly 2.4 people.

3.2   Empirical strategy

To test whether our treatments affect retail investors' allocation decisions, we estimate a set of three OLS regression models in the following form:

$$Allocation\ to\ sustainable\ fund_i = \alpha + \beta_i * Treatment\ Group_i + \gamma_{i,j} * \chi_{i,j} + \epsilon_i \quad (3.1)$$

Where $Allocation\ to\ sustainable\ fund_i$ represents the EUR value which participant i allocates to the sustainable fund. $Treatment\ Group_i$ is one of three dummy variables which is equal to one if respondent i is in the (i) impact, (ii) social, or (iii) return treatment group and zero for a member of the control group.

$\chi_{i,j}$ represents a vector of control variables. First, we include a comprehensive set of the participants' preferences that have been shown to be related to individual (sustainable) investment decisions. In particular, we include measures for the participants', investment horizon, risk attitude (Dohmen et al., 2010), general trust (Guiso et al., 2008), patience (Becker et al., 2012), altruism (Falk et al., 2018; Falk et al., 2022), self-control

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[7]See Table C1 for the description and wording of the comprehension questions.

(Falk et al., 2018; Falk et al., 2022), and a dummy that indicates whether an individual engages in charitable behavior. Further, we include a set of investment motives, i.e., what participants look for when conducting investment decisions. Here, we include measures on how important high returns, diversification, dividends, low risk, low fees, and sustainability are for the participants' investment decisions. Finally, we add a comprehensive set of demographic variables, i.e., the participants' age, age^2, gender, marital status, household size, parental status, education level, and employment status. For variable definitions, please refer to Table C1.

4   Results

4.1   General ESG knowledge and beliefs among participants

In a first descriptive analysis, we examine the level of participants' knowledge around sustainable investments. Figure 3.2 shows the respondents' answers to two corresponding questions. The first question is placed at the beginning of the survey and elicits whether respondents know the term 'ESG'. 53.5% of the respondents are not familiar with it while 17.4% have heard it but do not know its meaning and only 21.4% state that they know what it means. The second question elicits how participants rate their own knowledge of sustainable investments. While most respondents consider their knowledge to be poor, only around 10.0% consider themselves familiar with sustainable investments. This is concerning from a policy-maker perspective, as this lack in knowledge may lead to low investor participation in sustainable investments.

Figure 3.3 presents respondents' prior beliefs about their peers' attitudes towards sustainable investments. On average, members of the impact treatment group estimate that about 55.7% of their peers believe that sustainable investments can have an impact. Similarly, members of the social treatment group underestimate the share of their peers' willingness to invest into sustainable investments at 55.4%. Members of the return treatment group underestimate their peers' assessment of sustainable investment returns even more intensely. On average, participants believe that only 49.3% of their peers believe
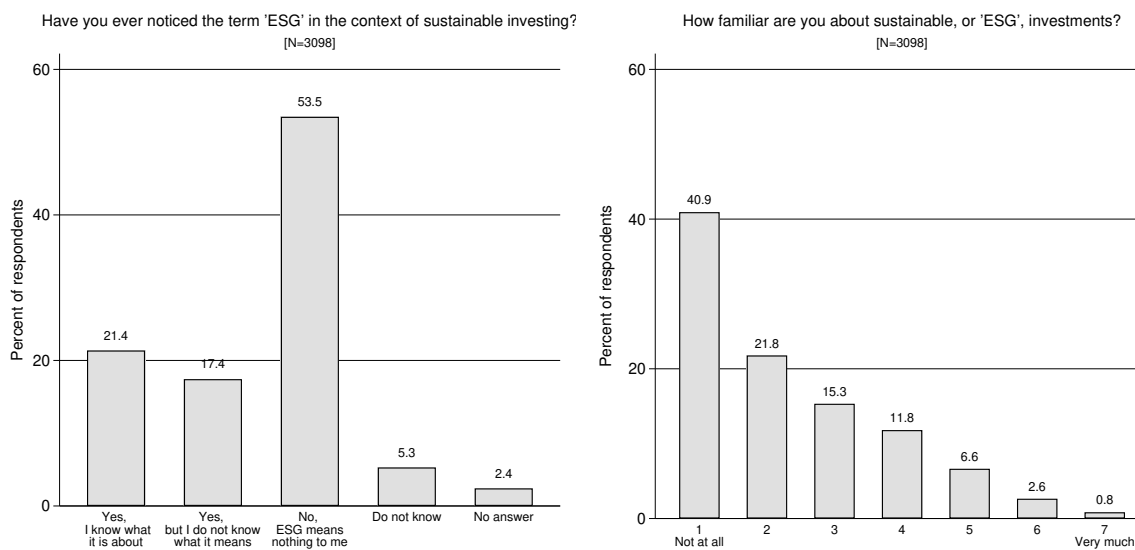
Figure 3.2: Respondents' ESG knowledge

Notes: This figure shows the results of two survey questions which assess the respondents' knowledge of the term 'ESG and sustainable investments.

that sustainable investments yield the same or even higher returns. Hence, participants in all three treatments on average underestimate their peers' beliefs about sustainable investments, where the difference to the true value of 70% is statistically significant at the 0.1% level in all cases. This indicates that participants on average underestimate others' propensity to invest sustainably, which we predict will result in an increase in the average amount allocated to the sustainable fund in the allocation decision.

4.2 Peer information increase sustainable investments

We now investigate whether the treatments have the predicted effect on investor behavior. Overall, investors in our sample allocate EUR 5,816 of their EUR 10,000 experimental budget to the sustainable fund (see Table C2). We run a series of two-sided t-tests where we compare the allocations to the sustainable fund across the three treatment groups with the corresponding allocations in the control group. Figure 3.4 presents the results and shows that on average all three treated groups allocated more of the EUR 10,000 principal endowment to the sustainable fund than the control group. The observation of higher allocations compared with the control group is most pronounced
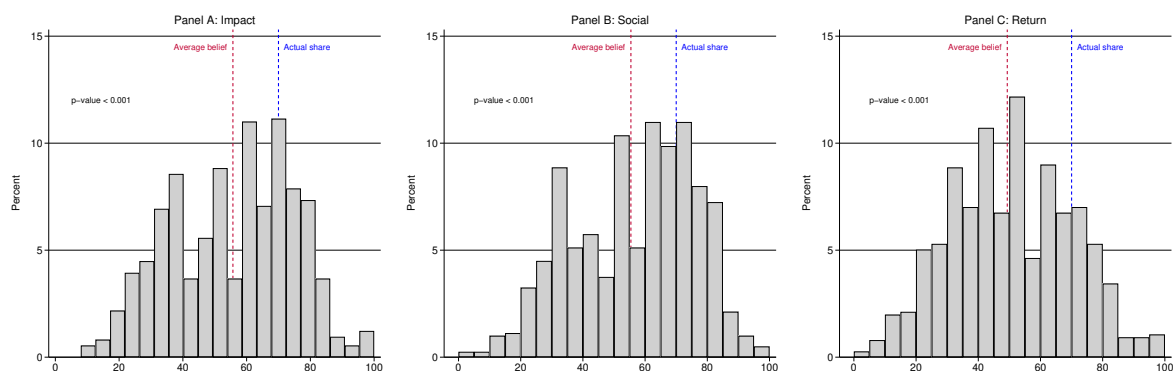
Figure 3.3: Respondents' priors in sustainable investments

Notes: The red dotted lines in this figure shows the results of our survey questions assessing the respondents' priors with respect to the impact, social and return treatment dimensions. Panel A shows the average response of those in the impact treatment group to the question "What percentage of respondents do you think indicated that sustainable investments make an important contribution, e.g., to environmental and climate protection?". Panel B shows the average response of those in the social treatment group to the question "What percentage of respondents do you think indicated that they would like to invest in sustainable investments in the future?". Panel C shows the average response of those in the return treatment group to the question "What do you estimate, what percentage of respondents indicated that you would get the same or higher returns with sustainable investments?". All information treatments indicate a percentage of 70% in all three cases, which is indicated by the blue dotted line.

for the impact treatment group followed by the social treatment group and the return treatment group. To check the statistical significance of the deltas vis-à-vis the control group, we conduct a series of two-tailed t-tests. The results are documented in Table 3.1. Participants in the "impact", "social", and "return" treatment groups invested significantly higher amounts in the sustainable fund compared to the control group, whereby the differences are statistically significant at the 1% level for the impact treatment group and at the 5% level for the latter two.
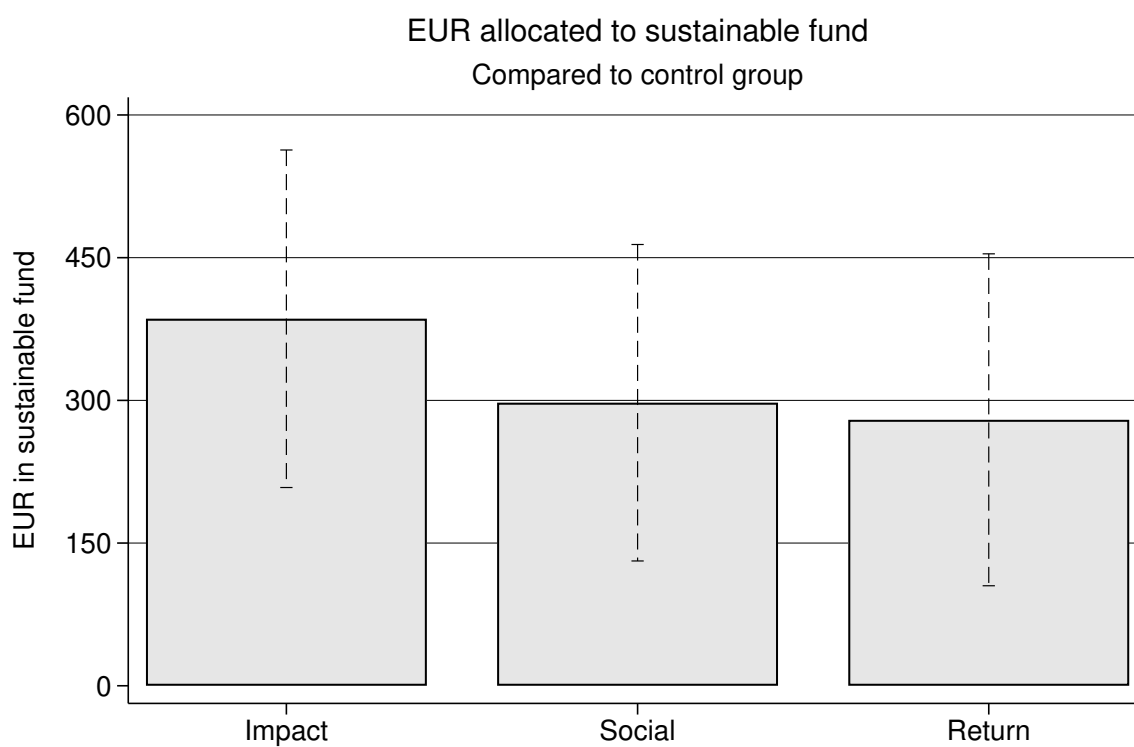
Figure 3.4: Allocation to the sustainable fund, by treatment

Notes: This figure shows the EUR amount allocated to the sustainable fund, relative to the control group for all three treatment groups ("impact", "social" or "return"). The error bars represent the 95% confidence intervals.

Table 3.1: Allocation to the sustainable fund, by treatment

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Allocation to the Sustainable Fund	Treatment		Control		Diff	t-Stat	p
in EUR	Mean	SD	Mean	SD			
Impact Treatment	5,964.67	2,451.46	5,578.88	2,604.59	385.79	2.99	0.00***
Social Treatment	5,876.40	2,398.11	5,578.88	2,604.59	297.52	2.38	0.02**
Return Treatment	5,858.47	2,443.50	5,578.88	2,604.59	279.58	2.18	0.03**

Notes: This table shows the average EUR amount allocated to the sustainable fund out of the principal endowment of EUR 10,000, by treatment group. Columns 1 and 2 show the mean and standard deviation of the allocation to the sustainable fund in EUR, by treatment. Columns 3 and 4 show the mean and standard deviation of the control group's allocation to the sustainable fund in EUR. Column 5 reports the allocation to the sustainable fund in EUR, relative to the control group, by treatment. Columns 6 and 7 show the outcome of a t-test that reports whether the EUR differences shown in column 5 are significantly different from 0. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

To check whether our results hold in a multivariate setup, we run a series of linear regressions where we employ the EUR amount allocated to the sustainable fund as the dependent variable as described in section 3.2. Table 3.2 presents the results of these regressions and confirms the univariate results. The positive coefficients imply that all three treated groups of participants invested a larger proportion of the EUR 10,000 principal endowment in the sustainable fund than members of the control group. Members of the impact treatment group invested EUR 429 more in the sustainable fund than members of the control group, members of the social treatment group EUR 293 and members of the return treatment group EUR 267. Altogether, the results show that peer information treatments increase allocations to sustainable investments.

Examining the remaining coefficient estimates allows an insight into the preferences and investment motives of participants who allocated a larger share to the sustainable fund. First, more trusting participants allocate more to the sustainable fund. Sustainable investors need to trust that fund-level sustainability ratings are truthful and low trust in these ratings may be a factor limiting willingness to invest in these funds. Second, investors who give money to charity invest a larger share in the sustainable fund, which is in line with findings from Riedl and Smeets (2017). Third, those who report that paying low fees is an important aspect of their investment decisions allocate a lower amount to the sustainable fund. Even though fees were not payoff-relevant in our setup, this is in line with findings from Laudi et al. (2022) or Baker et al. (2022), who show that sustainable investments are associated with higher fees.

4.3 The efficacy of peer information treatments depends on investors' priors

Peer information interventions have been shown to encourage pro-environmental behavior only when the provided information changes the prior of the receiver (Andre et al., 2021). In our case, if participants' beliefs about related others are in line with the information provided as part of the intervention, the information treatment is unlikely to change

Table 3.2: Peer information increase sustainable investments

Dependent Variable:	(1)	(2)	(3)
	Allocation to the Sustainable Fund in EUR		
Treatment: Impact	429.187***		
	(116.721)		
Treatment: Social		293.257***	
		(112.366)	
Treatment: Return			267.045**
			(118.617)
Preference: Investment Horizon	18.230	-5.087	25.652
	(41.424)	(39.376)	(39.809)
Preference: Risk Attitude	-176.789***	-172.470***	-184.553***
	(48.774)	(47.547)	(48.801)
Preference: Trust	105.477***	148.644***	125.652***
	(40.844)	(40.181)	(42.296)
Preference: Patience	84.471**	55.092	25.772
	(41.572)	(37.644)	(38.958)
Preference: Altruism	60.139	89.182**	82.632*
	(49.087)	(44.104)	(46.247)
Preference: Self Control	-30.397	-94.024*	-48.825
	(50.935)	(48.444)	(52.595)
Preference: Charity (d)	393.344***	243.883**	295.935**
	(130.921)	(123.555)	(127.658)
Investment Motive: High Return	41.421	5.014	25.654
	(54.303)	(53.320)	(53.460)
Investment Motive: Diversification	-40.849	-55.427	-46.856
	(45.809)	(45.459)	(46.887)
Investment Motive: Dividends	-125.272**	-115.603**	-158.299***
	(49.508)	(46.789)	(46.897)
Investment Motive: Low Risk	-47.482	-99.352*	-31.197
	(53.060)	(53.057)	(56.052)
Investment Motive: Low Fees	-93.711**	-75.781*	-97.402**
	(42.494)	(40.858)	(44.876)
Investment Motive: Sustainability	556.973***	585.287***	533.072***
	(36.939)	(35.232)	(36.153)
Age	71.590**	64.880**	88.372***
	(29.452)	(26.624)	(28.982)
Age^2	-0.832***	-0.712**	-1.029***
	(0.317)	(0.283)	(0.309)
Male (d)	-214.324*	-179.908	-157.853
	(129.907)	(124.773)	(128.899)
Married (d)	-14.502	-98.849	-11.611
	(144.631)	(138.933)	(148.059)
Household Size	69.224	98.902	63.876
	(86.814)	(86.666)	(85.544)
Children (d)	-95.250	-160.339	-177.862
	(190.874)	(189.354)	(189.810)
College Degree (d)	407.558***	542.196***	534.218***
	(127.519)	(120.004)	(125.380)
Retired (d)	260.314	-98.686	318.271
	(235.089)	(215.207)	(223.201)
Self-Employed (d)	156.676	241.112	-159.566
	(298.027)	(279.790)	(313.993)
Unemployed (d)	-751.150**	-171.048	-459.065
	(347.394)	(338.011)	(351.705)
α	2,441.652***	3,051.300***	2,608.077***
	(803.385)	(757.741)	(803.038)
Observations	1,471	1,531	1,485
R^2	0.243	0.253	0.223

Notes: This table shows the outcome of three iterations of regression specification 3.1. The EUR amount (out of the principal endowment of EUR 10,000) allocated to the sustainable fund constitutes the dependent variables. Dummy variables that are equal to 1 if a participant is in the "impact", "social", or "return" treatment group and 0 if a participant is in the control group represent our main explanatory variables. We add control variables on preferences, investment motives and participant demographics. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Robust standard errors are given in parentheses.

individual behavior. When participants have overestimated the propensity of related others to invest sustainably, the treatment may even work in the opposite direction, as investors decrease the share invested sustainably to conform to a social norm.

To test whether the treatment works differently for participants with different prior beliefs, we re-run our main regression analyses after splitting the sample of respondents into sub samples. Specifically, we define participants in the impact treatment group as having a low prior if they believe that less than 70% of their peers believe that sustainable investments can have an impact. The remaining participants in the impact treatment group are defined as having a high prior. We split the sample of participants in the social and return treatment groups in a similar way.

The results are shown in Table 3.3. The most pronounced coefficient difference by prior group can be observed for the return treatment group. For investors with a low prior belief regarding peers' return expectations on sustainable investments, the provided information increases the allocated amount to the sustainable fund by EUR 314. For investors who already had a high prior belief about peers' return expectations on sustainable funds, the peer information treatment does not change the allocation. Similarly, for those with a low prior belief, the social treatment significantly increases the amount allocated to the sustainable fund by EUR 283, while the treatment does not influence the allocation of those with a high prior belief. For those in the impact treatment group, the prior does not matter for the effectiveness of the treatment.

Table 3.3: The efficacy of peer information treatments depends on investors' priors

Dependent Variable:	(1)	(2)	(3)	(4)	(5)	(6)
	Allocation to the Sustainable Fund in EUR					
	Prior < 70			Prior >= 70		
Treatment: Impact	392.754***			507.633***		
	(126.799)			(182.935)		
Treatment: Social		282.679**			259.502	
		(124.522)			(165.887)	
Treatment: Return			313.684**			59.874
			(125.214)			(220.010)
Preferences	Yes	Yes	Yes	Yes	Yes	Yes
Investment Motives	Yes	Yes	Yes	Yes	Yes	Yes
Demographics	Yes	Yes	Yes	Yes	Yes	Yes
α	2,474.867***	2,992.256***	2,271.431***	2,004.533**	2,332.009**	2,475.878**
	(839.898)	(803.968)	(830.363)	(1,013.875)	(983.010)	(1,039.290)
Observations	1,255	1,303	1,352	983	995	900
R^2	0.256	0.259	0.223	0.263	0.276	0.283

Notes: This table shows the outcome of six iterations of regression specification 3.1. We split participants in the treatment groups into sub-samples, according to their predictions of the outcome of a survey with Germans. Those in the impact treatment group were asked: "What percentage of respondents do you think indicated that sustainable investments make an important contribution, e.g., to environmental and climate protection?" and were categorized into the low prior (response < 70) or into the high prior (response >= 70). Those in the social treatment group were asked: "What percentage of respondents do you think indicated that they would like to invest in sustainable investments in the future?" and were categorized into the low prior (response < 70) or into the high prior (response >= 70). Those in the return treatment group were asked: "What do you estimate, what percentage of respondents indicated that you would get the same or higher returns with sustainable investments?" and were categorized into the low prior (response < 70) or into the high prior (response >= 70). Columns 1, 2, and 3 includes participants categorized into the low prior of the impact, social, and return treatments, respectively, as well as participants in the control group. Columns 4, 5, and 6 includes participants categorized into the high prior of the impact, social, and return treatments, respectively, as well as participants in the control group. The EUR amount (out of the principal endowment of EUR 10,000) allocated to the sustainable fund constitutes the dependent variable. Dummy variables that indicate whether participant is in the "impact", "social", or "return" treatment group represent our main explanatory variables. We add control variables on personal preferences, investment motives and participant demographics. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Robust standard errors are given in parentheses.

4.4 How do investors rationalize their investment decision?

Our results show that all three peer information treatments on average increase sustainable investments. However, it may be the case that they work through different mechanisms. To shed light on this, we compare participants' ex-post rationalizations for their investment decisions (high return, low risk, high impact, warm glow, peer driven decisions). Participants rate the importance of each of these factors for their investment decision on a Likert scale between one and five (Table C1). We first compare the average importance of all factors, as reported by respondents, between those who allocate less than EUR 5,000 to the sustainable fund and those who allocate more than EUR 5,000 to the sustainable fund in Table 3.4. We find that investors who allocate less than half of their budget to the sustainable fund report a higher importance of high return and low risk in their investment decision. Investors who allocate more than half of their experimental budget to the sustainable fund report a higher average importance of high impact and warm glow. Hence, conventional investors in our sample are more financially motivated, while sustainable investors have more non-pecuniary motivations in their investment decisions.

Table 3.4: Ex-post rationalization of the allocation decision

Ex-post Rationalization	(1) ESG < EUR 5,000	(2)	(3) ESG = EUR 5,000	(4)	(5) ESG > EUR 5,000	(6)	(7) Diff	(8) t-Stat	(9) p
	Mean	SD	Mean	SD	Mean	SD			
Maximize Profit	0.792	0.406	0.530	0.499	0.429	0.495	-0.36	-17.37	0.00***
Minimize Risk	0.467	0.499	0.537	0.499	0.363	0.481	-0.10	-4.82	0.00***
Maximize Impact	0.117	0.321	0.343	0.475	0.743	0.437	0.63	34.75	0.00***
Warm Glow	0.183	0.387	0.370	0.483	0.630	0.483	0.45	22.01	0.00***
Appeal to Peers	0.139	0.346	0.181	0.385	0.156	0.363	0.02	1.12	0.26
Observations	736		764		1,598				

*Notes: This table compares the ex-post rationalizations of the investment decisions among those participants who allocated less than EUR 5,000, exactly EUR 5,000, or more than EUR 5,000 to the sustainable fund. We asked participants the following question: "How important were the following reasons to you in dividing the EUR 10,000 between the two funds" after the allocation decision. Participants rated the relevance of five different motives for their allocation choice on a from 1 (Not at all important) to 5 (Very important) Likert scale. The motives to be valued are "Achieving the highest possible profit" (Maximize Profit), "Taking as little risk as possible" (Minimize Risk), "Achieving as much impact as possible, e.g., for the environment" (Maximize Impact), "Having a good conscience" (Warm Glow), and "My social environment would also have decided like this" (Appeal to Peers). Responses were coded into binary variables that are equal to 1 if a respondent stated a value of 4 or 5 and 0 otherwise. Columns 1 and 2 give the mean and standard deviation of the responses given by participants who allocated less than EUR 5,000 to the sustainable fund. Columns 3 and 4 give the mean and standard deviation of the responses given by participants who allocated exactly EUR 5,000 to the sustainable fund. Columns 5 and 6 give the mean and standard deviation of the responses given by participants who allocated more than EUR 5,000 to the sustainable fund. Column 7 reports the difference in the average response given by those who allocated more than EUR 5,000 to the sustainable fund and those who allocated less than EUR 5,000 to the sustainable fund. Columns 8 and 9 show the outcome of a t-test that reports whether the differences shown in column 7 are significantly different from 0. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.*

In the next step, we consider whether the information treatments influence the importance of the different factors for participants' allocation decisions, including high return, low risk, high impact, warm glow, and peer driven decisions. For that purpose, we run five sets of OLS regressions, with the different factors as the dependent variables and treatment dummies as the main independent variables. The corresponding results are presented in Table 3.5. We find that participants in the impact treatment group are more likely to state that having an impact is a dominant reason for their investment decisions. Analogously, participants in the social treatment are more likely to rate warm glow to be a dominant reason for their investment decision. Participants in the return treatment are not more likely to state generating a high return as a main reason for their investment decision. This is because a high return is stated to be a dominant reason for the investment decision for investors in all groups and the treatment does not change this. The fact that investors still allocate a larger amount to the sustainable fund hints towards the notion that investors change their return expectations about the sustainable fund. Taken together, our results show that while all peer information treatments lead to the same behavior change, the mechanism differs.

Table 3.5: The content of peer information treatments affects the ex-post rationalization of allocation decisions

Dependent Variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	Ex-post rationalization of the allocation decision														
	Maximize Profit			Minimize Risk			Maximize Impact			Warm Glow			Appeal to Peers		
Treatment: Impact	0.020			0.005			0.049**			0.021			-0.017		
	(0.025)			(0.025)			(0.023)			(0.024)			(0.018)		
Treatment: Social		0.031			-0.025			0.038*			0.049**			0.028	
		(0.024)			(0.024)			(0.022)			(0.023)			(0.019)	
Treatment: Return			0.009			-0.022			0.036			0.011			-0.008
			(0.024)			(0.024)			(0.023)			(0.024)			(0.019)
Preferences	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Investment Motives	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
α	0.635***	0.422***	0.424***	0.437**	0.102	0.319**	-0.324**	-0.437***	-0.383**	0.135	0.044	0.088	0.327***	0.115	0.260**
	(0.166)	(0.161)	(0.162)	(0.170)	(0.159)	(0.160)	(0.153)	(0.146)	(0.149)	(0.158)	(0.153)	(0.153)	(0.123)	(0.126)	(0.126)
Observations	1,471	1,531	1,485	1,471	1,531	1,485	1,471	1,531	1,485	1,471	1,531	1,485	1,471	1,531	1,485
R^2	0.136	0.141	0.164	0.115	0.117	0.135	0.259	0.256	0.243	0.194	0.210	0.189	0.062	0.060	0.074

Notes: This table shows linear probability regression models with participants' ex-post rationalizations of the investment decisions as dependent variables. Specifically, we asked participants the following question: "How important were the following reasons to you in dividing the EUR 10,000 to the two funds?" after the allocation decision. Participants rated the relevance of five different motives for their allocation choice on a from 1 (Not at all important) to 5 (Very important) Likert scale. The motives to be valued are "Achieving the highest possible profit" (Maximize Profit; outcome variable in columns 1, 2, and 3), "Taking as little risk as possible" (Minimize Risk; outcome variable in columns 4, 5, and 6), "Achieving as much impact as possible, e.g., for the environment" (Maximize Impact; outcome variable in columns 7, 8, and 9), "Having a good conscience" (Warm Glow; outcome variable in columns 10, 11, and 12), and "My social environment would also have decided like this" (Appeal to Peers; outcome variable in columns 13, 14, and 15). Responses were coded into binary variables that are equal to 1 if a respondent stated a value of 4 or 5 and 0 otherwise. We add control variables on preferences, investment motives and demographics. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Robust standard errors are given in parentheses.

5 Conclusion

We conduct a field study with a sample of German retail investors. Respondents in our sample report having little knowledge about sustainable investing. Exposing investors to peer information leads to more sustainable investments in a consequential investment decision. This is the case when providing investors with information about (a) peers' propensity to invest sustainably (social treatment), (b) peers' beliefs regarding the impact (impact treatment) and (c) peers' beliefs regarding the expected return (return treatment) of sustainable investments.

For respondents in the social and the return treatment groups, the information treatment is only effective when the reported share of investors with a positive attitude towards sustainable investing is higher than participants' prior expectations. For participants in the impact treatment group, the prior beliefs do not matter for the effectiveness of peer information in changing investor behavior.

Finally, we explore the mechanism why peer information treatments increase sustainable investments. Our results show that the mechanism underlying increased allocations to sustainable investments differs between treatments. Participants in the impact treatment group are more likely to state that having an impact motivated their investment decisions, while those in the social treatment group are more likely to report warm glow as a main motivation for their investment decision. Participants in the return treatment group are not more likely to change the ex-post rationalization of their investment decisions but seem to alter their return expectations of sustainable investments upwards.

Our results create a starting point for the design of interventions intended to break down obstacles to invest in sustainable investments. Investors in our sample report having low knowledge about sustainable investing and we find that simple information treatments are sufficient to increase investments into sustainable funds. Further, investors tend to see a trade-off in sustainable investments, where non-pecuniary factors, such as having an impact or warm glow form the upside and a lower risk-adjusted return forms the downside. Simply informing investors about others' return expectations concerning sustainable investments seems to be sufficient to change this notion. Taken together, our findings

suggest that retail investors in our sample are susceptible to simple peer information on sustainable investments and ready to change their behavior as a response. This indicates that the MiFID II amendment that requires financial institutions to talk to their clients about the sustainability of their investments may be an effective way to change behavior in line with the policy goal of increasing the sustainability of investments if executed correctly and with the right information. Our results show, however, that not all investors respond equally to peer information treatments, and skeptical investors' behavior is changed the most. Hence, our findings can be useful for financial advisors to help their clients overcome obstacles to invest into sustainable financial assets in a targeted and customer-specific approach.

Further, our results open interesting avenues for future research. While the interventions that we use affect investor behavior at the point of decision, it is not clear whether they have a long-term impact on investor behavior – i.e., do peer information treatments increase individuals' propensity to acquire and apply additional information on sustainable investing? Previous research on peer information interventions suggests little success for long-term behavior change (see e.g., Bauer et al. (2022)). This may be different in our setting, where sustainability is an ever-present topic, which serves as a constant reminder of the information provided in the intervention. Therefore, it is an interesting question whether peer information on sustainable investing may change investor knowledge and behavior in the long-term.

C   Appendix

Table C1: List of variables

Variable name	Description
Age	Participants' self-reported age.
Allocation to the Sustainable Fund in EUR	The EUR amount invested in the ESG fund by survey participants when given the choice to allocate EUR 10,000 in (a) a sustainable fund or (b) an alternative conventional fund. Corresponding instructions and survey question: "Please read the following information carefully. From all participants, we will choose one at random. If you are selected, your decision in the next question will be a real decision. That is, EUR 10,000 will be invested for six months according to your selection. At the end of the six months, the investment will be sold and you will receive the profit from the sale (including accrued dividends). You will not be charged any taxes or fees. An example: If you are drawn and the value of your investment increases by 5% in the six months, you will receive EUR 500 from us. If the price stays the same or falls below EUR 10,000, you receive EUR 0. You can divide the EUR 10,000 between two funds. We have selected the funds so that they differ only in their sustainability orientation. Both funds invest globally in equities, primarily in highly capitalized stocks that are expected to have a higher dividend yield than the market average. • Fund 1 considers all companies worldwide. • Fund 2 only considers sustainable companies. This means that Fund 2 excludes stocks of firms with very low ESG scores. Further, certain industries that do not meet the sustainability criteria, such as arms manufacturers or tobacco companies, are excluded. Please choose how you want to divide the EUR 10,000 between the two funds."
Comprehension question 1	Dummy variable that is equal to 1 if a respondent answered attention question 1 correctly and 0 otherwise. Corresponding survey question: "Who was interviewed in the survey described above? Please select only one of the following answers: ☐ Participants from Germany [correct] ☐ Participants from all over Europe ☐ Participants from all over the world"
Comprehension question 2	Dummy variable that is equal to 1 if a respondent answered attention question 2 correctly and 0 otherwise. Corresponding survey question: Participants of the just mentioned survey were asked... ☐ ...how they assess the impact of sustainable investments, for example on the environment (impact treatment group), whether they want to invest in sustainable investments in the future (social treatment group), about their expectations concerning the return of sustainable investments (return treatment group). [correct] ☐ ... how they assess the impact of risky assets, for example on the environment (impact treatment group), whether they want to invest in risky assets in the future (social treatment group), about their expectations concerning the return of risky assets (return treatment group). ☐ ... how they assess the impact of short-term investments, for example on the environment (impact treatment group), whether they want to invest in short-term investments in the future (social treatment group), about their expectations concerning the return of short-term investments (return treatment group)."
Household Size	Number of people living in the participant's household.
Children (d)	Dummy variable that equals one if children live in the participant's household, zero otherwise.
Male (d)	Dummy variable that equals one if the respondent is male, zero otherwise.
Married (d)	Dummy variable that equals one if the respondent is married, zero otherwise.
College degree (d)	Dummy variable that equals one if the respondent has a college degree, zero otherwise.
Ex-post Rationalization: Maximize Profit (d)	A dummy variable that is drawn from the response to the question "How important were the following reasons to you in dividing the EUR 10,000 between the two funds? – Achieving the highest possible profit", which was asked after the allocation decision. It equals one if a participant chose a value of 4 or 5 on the Five-Point Likert scale from 1 (Not at all important) to 5 (Very important), else zero.
Ex-post Rationalization: Minimize Risk (d)	A dummy variable that is drawn from the response to the question "How important were the following reasons to you in dividing the EUR 10,000 between the two funds? – Taking as little risk as possible", which was asked after the allocation decision. It equals one if a participant chose a value of 4 or 5 on the Five-Point Likert scale from 1 (Not at all important) to 5 (Very important), else zero.
Ex-post Rationalization: Maximize Impact (d)	A dummy variable that is drawn from the response to the question "How important were the following reasons to you in dividing the EUR 10,000 between the two funds? – Achieving as much impact as possible, e.g., for the environment", which was asked after the allocation decision. It equals one if a participant chose a value of 4 or 5 on the Five-Point Likert scale from 1 (Not at all important) to 5 (Very important), else zero.
Ex-post Rationalization: Warm Glow (d)	A dummy variable that is drawn from the response to the question "How important were the following reasons to you in dividing the EUR 10,000 between the two funds? – Having a good conscience", which was asked after the allocation decision. It equals one if a participant chose a value of 4 or 5 on the Five-Point Likert scale from 1 (Not at all important) to 5 (Very important), else zero.

Variable name	Description
Ex-post Rationalization: Appeal to Peers (d)	A dummy variable that is drawn from the response to the question "How important were the following reasons to you in dividing the EUR 10,000 between the two funds? – My social environment would also have decided like this", which was asked after the allocation decision. It equals one if a participant chose a value of 4 or 5 on the Five-Point Likert scale from 1 (Not at all important) to 5 (Very important), else zero.
Investment Motive: High Return	An ordinal variable that is drawn from the response to the question: "How important are the following aspects to you when making investment decisions? – High return". The response was given on a scale from 1 (Not at all important) to 7 (Very important).
Investment Motive: Diversification	An ordinal variable that is drawn from the response to the question: "How important are the following aspects to you when making investment decisions? – Diversification". The response was given on a scale from 1 (Not at all important) to 7 (Very important).
Investment Motive: Dividends	An ordinal variable that is drawn from the response to the question: "How important are the following aspects to you when making investment decisions? – Dividends". The response was given on a scale from 1 (Not at all important) to 7 (Very important).
Investment Motive: Low Risk	An ordinal variable that is drawn from the response to the question: "How important are the following aspects to you when making investment decisions? – Low risk". The response was given on a scale from 1 (Not at all important) to 7 (Very important).
Investment Motive: Low Fees	An ordinal variable that is drawn from the response to the question: "How important are the following aspects to you when making investment decisions? – Low fees". The response was given on a scale from 1 (Not at all important) to 7 (Very important).
Investment Motive: Sustainability	An ordinal variable that is drawn from the response to the question: "How important are the following aspects to you when making investment decisions? – sustainability". The response was given on a scale from 0 (Not at all important) to 7 (Very important).
Preference: Investment Horizon	An ordinal variable that is drawn from the response to the question: "When you make investment decisions, for example, when investing in stocks or funds: How would you describe your investment horizon?" The response was given on a scale from 1 (Very short-term) to 7 (Very long-term).
Preference: Risk Attitude	An ordinal variable that is drawn from the response to the question: "How would you rate your willingness to take risks in financial matters" The response was given on a scale from 1 (Not at all willing to take risks) to 7 (Very willing to take risks).
Preference: Trust	An ordinal variable that is drawn from the response to the question: "Generally speaking, would you say that most people can be trusted or that you have to be very careful in dealing with people?" The response was given on a scale from 1 (People cannot be trusted) to 7 (People can be trusted).
Preference: Patience	An ordinal variable that is drawn from the response to the question: "Are you generally an impatient person, or someone who always shows great patience?" The response was given on a scale from 1 (Very impatient) to 7 (Very patient).
Preference: Altruism	An ordinal variable that is drawn from the response to the question: "How willing are you to give to good causes without expecting anything in return?" The response was given on a scale from 1 (Not at all willing) to 7 (Very willing).
Preference: Self-control	An ordinal variable that is drawn from the response to the question: "How willing are you to give up something that is beneficial for you today in order to benefit more from that in the future?" The response was given on a scale from 1 1 (Not at all willing) to 7 (Very willing).
Preference: Charity (d)	A dummy variable that is drawn from the response to the question "Do you donate to charity on a regular basis?" It equals one if a participant responded "yes", else zero.
Prior: Impact	The response given to the following question: "In a large-scale study, over 1,000 people were surveyed on the subject of sustainable financial investments. The aim of the survey was to understand what Germans think about sustainable financial investments. The respondents come from all over Germany and thus reflect the views and attitudes of Germans well. Among other things, participants were asked how they assess the positive impact of sustainable investments, for example on the environment. What percentage of respondents do you think indicated that sustainable investments make an important contribution, e.g., to environmental and climate protection?" The response was given on a scale from 0 to 100 in one-unit steps.
Prior: Social	The response given to the following question: "In a large-scale study, over 1,000 people were surveyed on the subject of sustainable financial investments. The aim of the survey was to understand what Germans think about sustainable financial investments. The respondents come from all over Germany and thus reflect the views and attitudes of Germans well. Among other things, participants were asked whether they would like to invest in sustainable investments in the future. What percentage of respondents do you think indicated that they would like to invest in sustainable investments in the future?" The response was given on a scale from 0 to 100 in one-unit steps.
Prior: Return	The response given to the following question: "In a large-scale study, over 1,000 people were surveyed on the subject of sustainable financial in-vestments. The aim of the survey was to understand what Germans think about sustainable financial investments. The respondents come from all over Germany and thus reflect the views and attitudes of Germans well. Among other things, participants were asked how they assess the return opportunities of sustainable investments. What do you estimate, what percentage of respondents indicated that you would get the same or higher returns with sustainable investments?" The response was given on a scale from 0 to 100 in one-unit steps.
Retired (d)	Dummy variable that equals one if the respondent is in retirement, zero otherwise.
Self-employed (d)	Dummy variable that equals one if the respondent is self-employed, zero otherwise.
Treatment: Impact	Dummy variable that equals one for the respondent in the "impact" treatment group. It equals zero for the respondents in the control group. Members of the "impact" treatment group are provided with the "impact" information treatment as depicted in Figure 3.1 before conducting the allocation decision.
Treatment: Social	Dummy variable that equals one for the respondent in the "social" treatment group. It equals zero for the respondents in the control group. Members of the "social" treatment group are provided with the "social" information treatment as depicted in Figure 3.1 before conducting the allocation decision.
Treatment: Return	Dummy variable that equals one for the respondent in the "return" treatment group. It equals zero for the respondents in the control group. Members of the "return" treatment group are provided with the "return" information treatment as depicted in Figure 3.1 before conducting the allocation decision.
Unemployed (d)	Dummy variable that equals one if the respondent is unemployed, zero otherwise.

Table C2: Descriptive summary statistics on final participant sample after exclusions

Variable	mean	sd	min	p50	max	N
Age	48.76	15.62	18	49	82	3,098
Allocation to the Sustainable Fund in EUR	5,816	2,48	0	6	10	3,098
Children (d)	0.327	0.469	0	0	1	3,098
College Degree (d)	0.468	0.499	0	0	1	3,098
Household Size	2.358	1.122	1	2	5	3,098
Investment Motive: High Returns	5.356	1.396	1	5	7	3,098
Investment Motive: Diversification	4.521	1.539	1	4	7	3,098
Investment Motive: Dividend	4.682	1.507	1	5	7	3,098
Investment Motive: Low Risk	5.530	1.391	1	6	7	3,098
Investment Motive: Low Fees	5.427	1.526	1	6	7	3,098
Investment Motive: Sustainability	4.397	1.920	1	5	7	3,098
Male (d)	0.629	0.483	0	1	1	3,098
Married (d)	0.546	0.498	0	1	1	2,953
Preference: Investment Horizon	4.931	1.548	1	5	7	3,098
Preference: Risk Attitude	3.547	1.500	1	4	7	3,098
Preference: Trust	2.997	1.561	1	3	7	3,098
Preference: Patience	4.454	1.587	1	5	7	3,098
Preference: Altruism	4.792	1.407	1	5	7	3,098
Preference: Self-control	5.037	1.382	1	5	7	3,098
Preference: Charity (d)	0.501	0.500	0	1	1	3,098
Prior: Impact	55.70	19.21	8	60	100	736
Prior: Social	55.43	19.46	0	60	100	801
Prior: Return	49.32	19.62	0	50	100	756
Retired (d)	0.189	0.392	0	0	1	3,098
Self-employed (d)	0.0468	0.211	0	0	1	3,098
Unemployed (d)	0.0210	0.143	0	0	1	3,098

Chapter 4

Dirty Money. The impact of negative ESG news on dividend consumption

Abstract

Emotion regulation theory posits that people increase consumption after receiving "dirty" income that evokes negative emotions. We test this theory in an important real-world context, financial markets. We analyze a large European bank dataset of individual investor trades and spending. Our results indicate that investors consume twice as much from dividend income after negative ESG news that exposes controversial business practices of the dividend-paying firm, compared to dividends from non-controversial firms. This increased consumption happens already on the dividend payout day. We control for selection effects and rule out alternative mechanisms like attention.

1 Introduction

Negative emotional states are often resolved with an increase in consumption. The terms *retail therapy* or *comfort buy* have established themselves to describe consumption behavior as a tool to regulate our mood. This behavior is documented in emotion regulation theory, which is a large and growing literature stream throughout many subareas of psychology with thousands of papers published each year on the topic (Gross, 2015). This literature posits that people have a strong tendency to alleviate negative mood states (Lazarus & Folkman, 1984) and hence use coping strategies, such as consumption when experiencing negative emotions (Tice et al., 2001; Goldsmith et al., 2012). In line with emotion regulation theory, laboratory studies have documented an emotional consumption response, whereby people use income that evokes negative emotions to improve their emotional state (Gneezy et al., 2014; Park & Meyvis, 2019). For example, in hypothetical decision scenarios in the laboratory, people report that a disappointingly low lottery win evokes negative emotions, which is why they are more likely to use this income on consumption that improves their mood (Levav & McGraw, 2009).

While the role of emotion regulation theory in individual consumption behavior has been studied in the laboratory, field evidence is sparse. We study emotional consumption responses in an important real world setting, financial markets. Specifically, we examine whether investors consume more from stock market income that is generated by firms that have recently been subject to negative environmental, social, and governance (ESG) news. Heeb et al. (2022) show that many individual investors choose socially responsible investments based on their emotions, experiencing a mood improvement when selecting responsible investments. On the other hand, investors could experience negative emotions when profiting from socially controversial business activities. In line with the evidence for emotional consumption responses in the laboratory, we predict that investors who receive dividend income that can trigger negative emotions, i.e. from companies with negative recent ESG news coverage, have a heightened propensity to consume out of this income to regulate their emotions.

We consider dividend payments as a measure of stock market income.[1] According to standard finance models, dividend income should have no effect on individuals' consumption. However, empirical evidence shows that household consumption strongly responds to income from dividends (Baker et al., 2006; Hartzmark & Solomon, 2019; Bräuer et al., 2022). Further, a survey with investors in our sample confirms that they closely monitor their dividend payments, know which company they come from, and actively follow the latest news about companies in their portfolio.

We use a large dataset from a European bank, connecting investor trading records, dividend income, and consumption-saving behavior at the individual level. The sample consists of $N = 18,566$ individual investors and covers a 24-month period from July 2017 to July 2019, with information on demographics, categorized transactions, portfolio holdings, and trading records. The data enables us to determine who received dividends, from which company, and how they responded with consumption-saving decisions.

We merge this customer data with scores from Truvalue Labs (TVL). TVL uses artificial intelligence techniques to aggregate public sentiment towards firms' ESG performance. They use unstructured textual data to derive daily firm-level scores. TVL does not rely on communication issued by companies, but external communication, such as, for example, local, national, and international news, reports from NGOs, trade blogs, or social media.[2] TVL considers not only the direction of ESG related news, but also the importance of the news, so that more impactful controversies (car manufacturer cheating on emissions test) affect a firm's score more than less impactful controversies (employee strikes for higher wages). This allows us to quantify media sentiment, which investors have been shown to react to (Tetlock, 2007; Engelberg & Parsons, 2011; Dougal et al., 2012). TVL scores have been used in some recent studies, including Chen et al. (2020) and Serafeim (2020), Cheema-Fox et al. (2021), Kim and Yoon (2023). Further, we

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[1]We focus on dividend income, because other forms of stock market income are not suitable for our purposes. Proceeds from stock sales are not suitable, because selling decisions might be driven by unobserved factors that also influence consumption-saving decision in response to the proceeds from the sale. Unrealized capital gains have also been shown to affect household consumption behavior (Di Maggio et al., 2020; Andersen et al., 2021). However, when capital gains are not realized, we cannot causally link consumption-saving decisions to price movements of specific stocks.

[2]For more information, please refer to https://www.factset.com/marketplace/catalog/product/sasb-scores-datafeed.

cross-validate our results by using data from *Google Trends* as an alternative measure to capture ESG news sentiment. *Google Trends* is commonly used in the literature.[3]

In our main analyses, we estimate individuals' marginal propensity to consume (MPC) in a narrow window around the receipt of dividends, in line with Parker (2017) and Bräuer et al. (2022). We categorize the sentiment of ESG news coverage on dividend-paying firms as negative or non-negative, in terms of TVL scores.

Our main result shows that, in line with emotion regulation theory, investors consume approximately twice as much out of dividends associated with negative ESG news sentiment than income from companies without negative ESG news. This translates into additional spending of about EUR 12.81 on days when dividends that are associated with negative ESG news sentiment are paid out, compared to days when other dividends are paid out (The average daily consumption in our sample is EUR 106.26). This increased consumption response already happens on the day the dividend is paid out, as illustrated in Figure 4.1.

We run a series of analyses to test the robustness of our main finding and to gain insights into the mechanism. First, we address potential endogeneity concerns. By exploiting the panel structure of our data and running all our analyses with investor (and time) fixed effects, we eliminate all time-invariant differences between investors that may be correlated with both responsible investment behavior and consumption. Further, we show that investors in our sample do not re-balance their portfolios after ESG scandals, indicating that ESG news sentiment does not influence individual holding probability. Finally, we show that ESG news events do not systematically affect the size of dividends that are paid out.

Second, we test for an attention-driven consumption response as an alternative to an emotional consumption response as a driver of the higher MPC coefficients that we observe. We show that there is no difference in login behavior on days when investors receive dividends from firms with negative or non-negative ESG news coverage. Further, investors do not increase their spending after positive ESG news, indicating that we have

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[3]See for example (Kostopoulos et al., 2020)

Figure 4.1: Cumulated consumption responses to dividends

Notes: The figure displays the cumulated marginal propensity to consume coefficient estimates 5 days before until 5 days after a dividend pay date. The coefficients are taken from our main regression specification 4.1, which includes day-of-week fixed effects, week-of-month fixed effects, month-year fixed effects, holiday fixed effects, individual fixed effects. The ESG news sentiment of a dividend inflow is defined as negative, if the TVL score of the issuing company was in the lowest 30th percentile in terms of TVL score on the day the dividend was paid out. TVL scores capture public sentiment towards a company's environmental, social, and governance (ESG) matters from, for example, local, national, and international news, reports from NGOs, trade blogs, or social media.
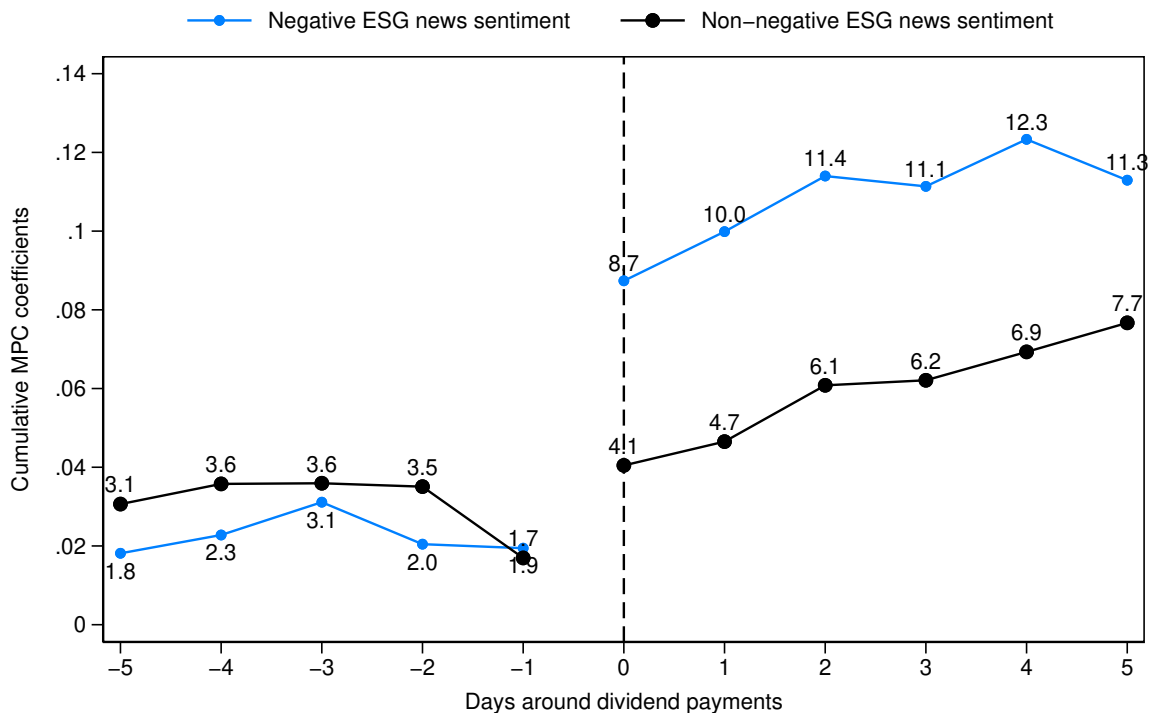
not captured an attention effect.

Third, to cleanly estimate within-investor differences in dividend consumption after non-/negative ESG news, we only include investors who received both types of dividend during the sample period in an additional analysis.

Fourth, we test our main model with several variations of our definition of non-/negative ESG news sentiment. In our main regression specification, a dividend inflow is defined as being associated with negative ESG news sentiment, if the TVL score of the issuing company was in the lowest 30th percentile in terms of TVL score on the day the dividend was paid out. We further consider how investors respond to changes in ESG

news sentiment over time. In additional analyses, we define negative sentiment if the issuing company's TVL score decreased in the top 30th percentile over the past month, 3 months, 6 months, and 1 year before the dividend was paid out. We also conduct robustness checks using alternative cutoff values including the 20th and 40th percentiles. Our results remain qualitatively the same in all these alternative specifications.

Fifth, when using *Google Trends* data as an alternative measure of ESG news sentiment, the results remain qualitatively the same and become even stronger compared to our results with the TVL scores.

Sixth, we show that our main result is not driven by only a few stocks by testing our main model without the stocks that are responsible for the highest dividend income among investors in our sample and without the stocks that are most commonly held among investors in our sample. Our main result is robust against running our analyses on this reduced sample.

We contribute to several streams of literature. First, we contribute to literature on the influence of emotions and affect on financial behavior[4] and to literature on emotion regulation theory (Goldsmith et al., 2012; Gneezy et al., 2014; Park & Meyvis, 2019). While previous work shows that induced negative emotions affect consumption behavior in laboratory experiments, we take these findings to the field. Specifically, we show that information related to the social responsibility of investments, which have been shown to affect investors' mood (Heeb et al., 2022), affect how individuals consume from dividend income.

Second, we add to the literature on socially responsible investing.[5] Individuals increasingly no longer invest only for a financial return, but also for a social return. A growing stream of literature documents that investors driven by social preferences have an aversion to buy stocks of companies that produce negative externalities for society.[6] In

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[4]See for example Finucane et al. (2000), Slovic et al. (2007), Kuhnen and Knutson (2011), and Griffith et al. (2020).

[5]See Heinkel et al. (2001), Benson and Humphrey (2008), Hong and Kacperczyk (2009), Białkowski and Starks (2016), Pedersen et al. (2021), Baker et al. (2022), Gollier and Pouget (2022), and Laudi et al. (2022).

[6]See Riedl and Smeets (2017), Hartzmark and Sussman (2019), Krueger et al. (2020), Barber et al. (2021), Bauer et al. (2021), Anderson and Robinson (2022), and Gibson Brandon et al. (2022).

this paper, we show that the current news sentiment towards a firms' ESG performance influences how stock market income is spent.

Third, we add to the literature on the relation between earnings from the stock market and household consumption. A common assumption in financial economic theory is that dividends do not affect individual consumption behavior. In particular, individuals should not consume differently from dividends than from other sources of income. However, Graham and Kumar (2006), Baker et al. (2006), Hartzmark and Solomon (2019), and Bräuer et al. (2022) find that consumption strongly responds to income from dividends. We add to this by finding and explaining heterogeneity in dividend consumption. Specifically, we show that the magnitude of the consumption response depends on current news coverage about the ESG performance of the dividend-paying company.

2   Data and variable definitions

In the following, we document how we arrive at our final sample of retail investors and how we construct our panel by combining data from different sources. Further, we define our variables. Specifically, we first explain how we define our consumption variable, which is the main outcome variable throughout our analyses. We then ellaborate on how we identify dividend payments, as well as our classification of dividends as those associated with negative ESG news sentiment and those associated with non-negative ESG news sentiment.

2.1   Sample

We cooperate with a German universal bank offering a large spectrum of financial products to retail investors with several million clients in Germany. This allows us to access a wide range of demographic characteristics of investors, where our entire sample comprises 55,173 clients. We exclude clients who have less than four consumption days per month on average and who are younger than 18 years old. We windsorize clients in the top and bottom 1% consumption percentiles. Furthermore, as we investigate consumption

from dividend income, we exclude clients who do not receive any dividend in our sample period. Finally, we can only observe TVL scores for direct stock holdings. Thus, we exclude clients who do not receive any dividend from a single stock. Our final sample includes 18,566 clients. Table B3 shows descriptive statistics for the clients in our final sample.

Overall, characteristics of investors in our sample are comparable to those shown in related studies on dividend consumption, such as Bräuer et al. (2022). Around 70% of investors in our final sample are male and have a relationship of over 20 years with their bank. Investors on average own EUR 125,843 in total assets, hold 5.4 different stocks and receive on average EUR 68.9 of dividends per month.

2.2 Panel construction

For each individual, the bank provides anonymized administrative and transaction data at the account level, which allows a comprehensive picture on the client. Data contains sociodemographic characteristics, products usage, account balances, as well as end-of-month portfolio holdings and individual trading records. Further, we draw on current account transactions data, categorized into 87 spending- and income categories. Our data range a period of 24 months, from July 2017 to July 2019.

2.3 Consumption variable definition

We estimate clients' daily consumption using the data provided by the bank. The dataset comprises the date, amount, and the category of each transaction, whereby inflows and outflows are categorized into 87 categories which can be summarized into 12 main categories. The categories are based on classifications by the German National Bureau of Statistics. The main categories are 'Living', 'Housing', 'Leisure and Traveling', 'Mobility', 'Health', 'Children', 'Career and education', 'Saving and Investing', 'Income', 'Insurance', 'Loans', and 'Other Outflows'. For our measure of consumption, we only consider outflows and exclude 'Income' transactions (12 categories). Further, we exclude transactions from the categories 'Saving and Investing' (6 categories), 'Insurances' (10 categories) and

'loans' (5 categories).

We want to measure the self-initiated consumption response to dividend payments and exclude recurring expenses from our analyses to avoid that recurring transactions fall on the same day as a dividend payment by coincidence (13 categories).[7] Table B4 presents a comprehensive overview over the consumption categories and the construction of our consumption variable.

Transactions are categorized by the bank's categorization tool. If a transaction cannot be categorized, it will be left 'uncategorized'. In our sample, about 78% of the outflow transactions could be classified by the categorization tool. Obviously, the categorization tool most easily identifies frequent transactions with common transaction partners such as, for example, large supermarket chains or restaurant franchises. As a result, the uncategorized transactions are likely to be infrequent transactions with unique transfer descriptions, such as peer-to-peer transactions or transactions with smaller partners such as, for example, small local or foreign shops. We exclude uncategorized outflow transactions that are multiples of EUR 100 in our analyses, since such round transactions often are peer-to-peer transfers.[8]

It is important to note that we observe booking dates in our data which might differ from the actual payment-date if the booking process is delayed. Based on information provided by our cooperating bank, most transactions are booked on the same day the payment was made and only few transactions are delayed. If the booking of a transaction is delayed, the booking date differs about one to two days from the payment-date. However, discussing delayed transactions in our data with the cooperating bank, we find no indication that bookings are delayed in a systematic manner and in particular, we have no reason to believe that dividends with negative ESG news sentiment might be systematically (un-)affected by delays, compared to dividends with non-negative ESG news sentiment.

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[7]Note that credit card transactions are typically settled at the end of the month and as such appear as recurring expenses in our data.

[8]As a robustness check, we also built a second consumption measure which includes all uncategorized transactions. The untabulated results are qualitatively the same as our reported main result.

2.4 Identification of dividend payments

To identify, who receives a dividend, we check whether an investor owns the stock of a dividend-paying company on the day of a firm's annual general meeting (AGM). Further, to measure the timing and size of investor-level income from dividends, we download dividend payment dates from Datastream and match them with the clients' portfolio holdings. In a second step, we verify whether clients receive an inflow that is labeled as "Dividends/Interest/Distributions" by the categorization tool on the dividend payment date. This cross check minimizes potential measurement error that is caused by, for example, misclassifications in the categorization tool or errors in Datastream's dividend payment date information.

As we observe the amount of money which is actually transferred on clients' current accounts, we do not have to rely on assumptions regarding individual tax rates, currency exchange rates or individual banking fees and commissions. Finally, as we cross verify the data provided by the bank with payment-dates from Datastream, we ensure that dividend payments match the actual days that the income is booked to a client's account.

2.5 ESG news sentiment definition

We use Factset's Truvalue Labs (TVL) scores to measure the social responsibility of dividend-paying firms. We specifically consider a news-based ESG sentiment measure, as it offers several key advantages for our setting, compared to ESG scores that are commonly used in the literature. TVL does not rely on annual ratings and periodic corporate disclosure, but grasps the textual sentiment from non-firm sources such as, for example, analyst reports or (social) media articles using natural language processing and AI methodologies in eleven languages (including German, the native language of most respondents in our sample).

The AI algorithm has been trained on a dataset, where ESG experts have classified the valence of ESG news. The score is normalized to lie on a scale between 0 and 100. Importantly, the score is updated daily, which allows us to pinpoint the ESG a a firm on the exact day a dividend is paid out. To ensure that firms have enough news coverage, we

follow Chen et al. (2020) and require firms to have at least one score change per quarter.

Figure 4.2: TVL score of Daimler AG

Notes: This figure shows the daily Truvalue Labs (TVL) score of Daimler AG for 2018. The gray vertical dashed lines mark noteworthy negative ESG-related news events.
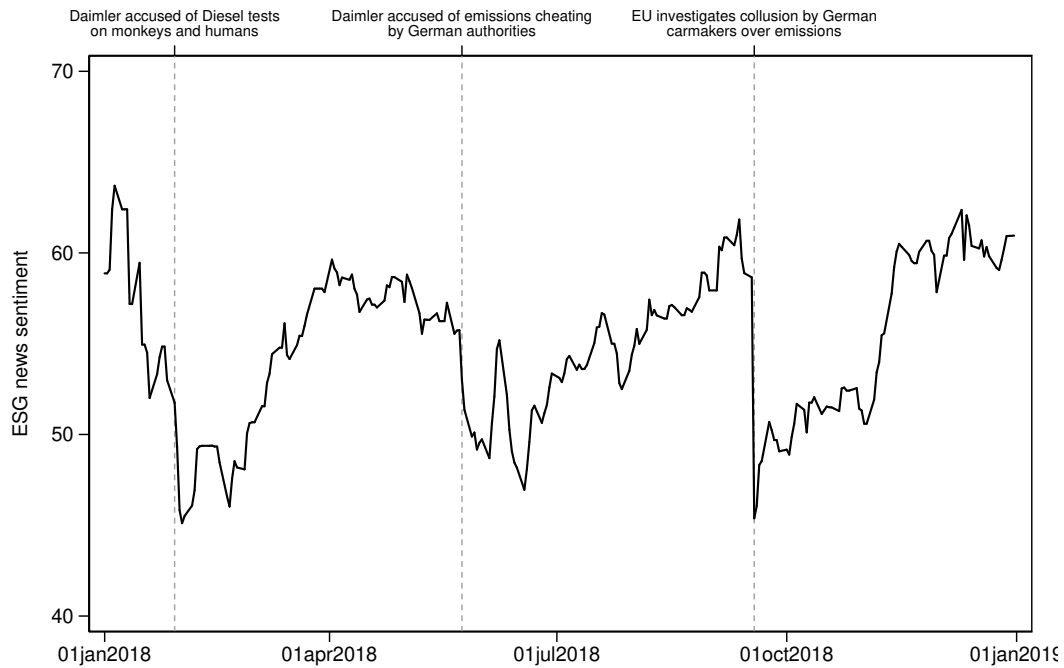
Figure 4.2 illustrates an example for the TVL score development for the most held single stock in our sample, Daimler AG, for 2018. Noteworthy negative ESG-related news events in that time period are marked by the grey dashed lines. The first noteworthy negative ESG-related news event occured on January 29th, when reports accused Daimler of diesel tests on monkeys and humans. The other two noteworthy negative ESG-related news events are related to the diesel emissions scandal, in which Daimler was involved. On May 24th, Daimler was accused of emissions cheating by the German authorities and on the September 18th The EU started investigating collusion by German carmakers over emissions. As Figure 4.2 shows, all three events led to a stark decrease in Daimler's TVL score.

For our main analysis, we define the ESG news sentiment of a dividend inflow as negative, if the TVL score of the issuing company was in the lowest 30th percentile in terms of TVL score i) on the day the dividend was paid out. However, investors may not

only respond to the current TVL score at the payout day, but also to changes of this score over time. Thus, we additionally consider ESG news sentiment changes. Specifically, in further model specifications, we define the ESG news sentiment of a dividend inflow as negative, if the decrease of the issuing company's TVL score was in the highest 30th percentile over the time period of ii) one month before the dividend was paid out, iii) three months before the dividend was paid out, iv) half a year before the dividend was paid out, and v) one year before the dividend was paid out. In further robustness checks, we also consider alternative cutoff values, including the 20th and the 40th percentile.

3 Empirical strategy

3.1 Regression specification

In our main analysis, we estimate individuals' MPC in a narrow window around the receipt of dividends, in line with Parker (2017) and Bräuer et al. (2022). Thereby, we differentiate between dividends associated with negative ESG news sentiment and dividends associated with non-negative ESG news sentiment by estimating the following model:

$$C_{i,t} \quad = \quad \sum_{k=-5}^{5} \beta_{b,k}(Dividends_{b,i,t+k}) \quad + \quad TimeFE_t \quad + \quad IndFE_i \quad + \quad \epsilon_{i,t} \quad (4.1)$$

where $C_{i,t}$ refers to the euro amount of spending of individual i on day t. $Dividends_{b,i,t+k}$ describes the EUR amount of dividends received by individual i on day $t+k$, whereby b is a binary indicator that is equal to 1, if a dividend is defined associated with negative ESG news sentiment, according to the definition in section 2.5 and 0 otherwise. Consequently, $\beta_{b,k}$ measures the amount of consumption on k days before/after a dividend payment, relative to one EUR received in dividends associated with non-/negative ESG news sentiment.

We include a comprehensive set of fixed effects, including time fixed effects that control for potential cyclical consumption patterns and individual fixed effects, which absorb

time-invariant heterogeneity across individuals. Specifically, $TimeFE_t$ represents a vector containing day-of-week, week-of-month and month-of-year fixed effects. Thereby, day-of-week fixed effects capture potential patterns of consumption within weekdays, whereby week-of-month and month-of-year fixed. $TimeFE_t$ further includes bank-holiday fixed effects as well as fixed effects for the day after the bank-holiday. The reason is that account transactions are not processed at bank holidays and therefore booked at the day after the bank holiday. $IndFE_i$ represents the individual fixed effects. In all our regression models, we double-clustered standard errors at the individual-date level.

3.2 Investors keep track of dividend payments

When interpreting the outcome of our main regression specification 4.1, we make several assumptions. First, we assume that investors are aware of dividends they receive and that the consumption effect is a response to this inflow. Second, we assume that investors follow the news on firms that they hold. In the following, we provide evidence which supports these assumptions.

We conducted a survey with investors in our sample together with our cooperating bank. The survey took about 10 minutes and was incentivized with a EUR 5 Amazon voucher for completion. 27,382 investors in our sample were invited to our survey via email in May 2021. Of those, 1,504 followed the bank's invitation and started the survey (response rate: 5.5%). This response rate is slightly higher than that reported in related studies with bank retail clients, such as Giglio et al. (2021). Eventually, 1,408 clients fully completed the survey (attrition rate: 6.3%). We summarize the results in Figure 4.3. Among the investors in our sample, 86.1% state that they "somewhat agree", "agree" or "fully agree" with the statement: "When I receive a dividend payment, I always know which company it comes from" and 73.1% state that they "somewhat agree", "agree" or "fully agree" with the statement "I always actively follow the latest news about companies in which I am invested".

While this is an indication that our assumption holds, this is only reported and not revealed behavior. Therefore, we additionally check login behavior of investors in

Figure 4.3: Survey on investor attention

Notes: This figure displays survey responses from $N = 1,408$ investors in our sample who completed our survey conducted in May 2021. The responses were given on a 7-point Likert scale from 1 "Fully disagree" to 7 "Fully agree".

To what extent do you agree with the following statement?
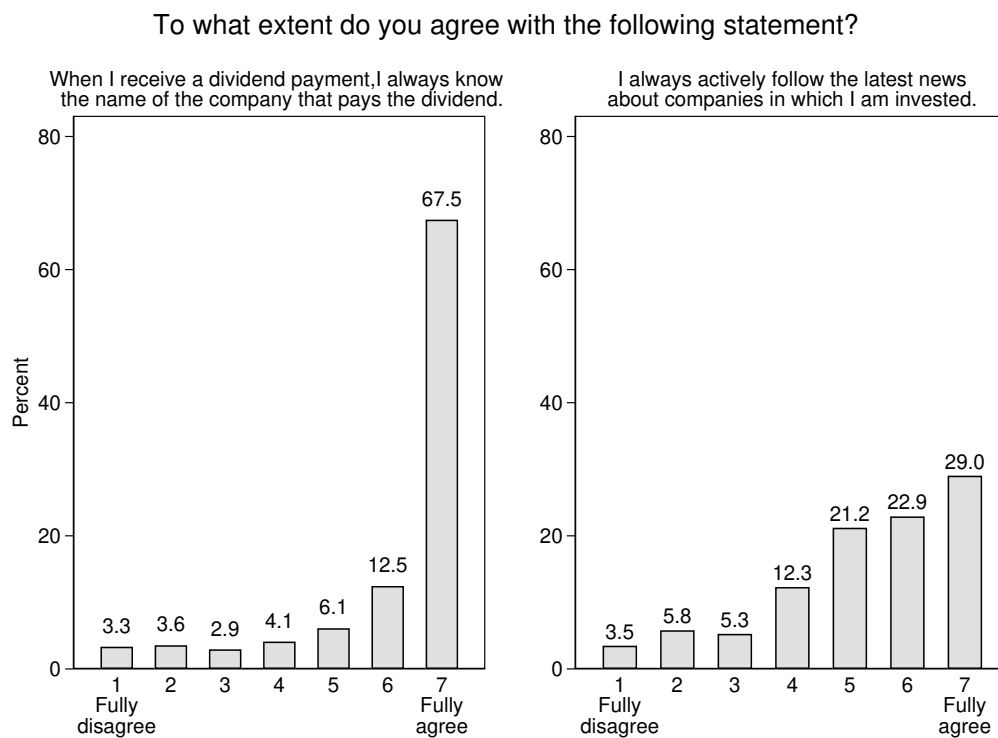
our sample. Specifically, we draw on login data from our users and alter regression specification 4.1 to the following form:

$$dLogin_{i,t} = \sum_{k=-5}^{5} \beta_k(dDividend_{i,t+k}) + TimeFE_t + IndFE_i + \epsilon_{i,t} \quad (4.2)$$

Thereby, in comparison to equation 4.1, the left-hand variable is replaced by a dummy variable which indicates whether a user logged into his or her online banking and the right hand variable is replaced by a dummy variable that indicates whether an individual i receives a dividend on day t. The regression includes day-of-week fixed effects, week-of-month fixed effects, month-year fixed effects, holiday fixed effects, individual fixed effects. Robust standard errors are individual-date double clustered. Figure 4.4 presents

Figure 4.4: Login behavior on dividend pay dates

The figure shows regression coefficients where the dependent variable is a dummy variable indicating whether a client logged into his or her bank account on day t. The regression sample comprises 18,550 investors. The regression includes day-of-week fixed effects, week-of-month fixed effects, month-year fixed effects, holiday fixed effects, individual fixed effects. Robust standard errors are individual-date double clustered. 95%-intervals are displayed around coefficient estimates.
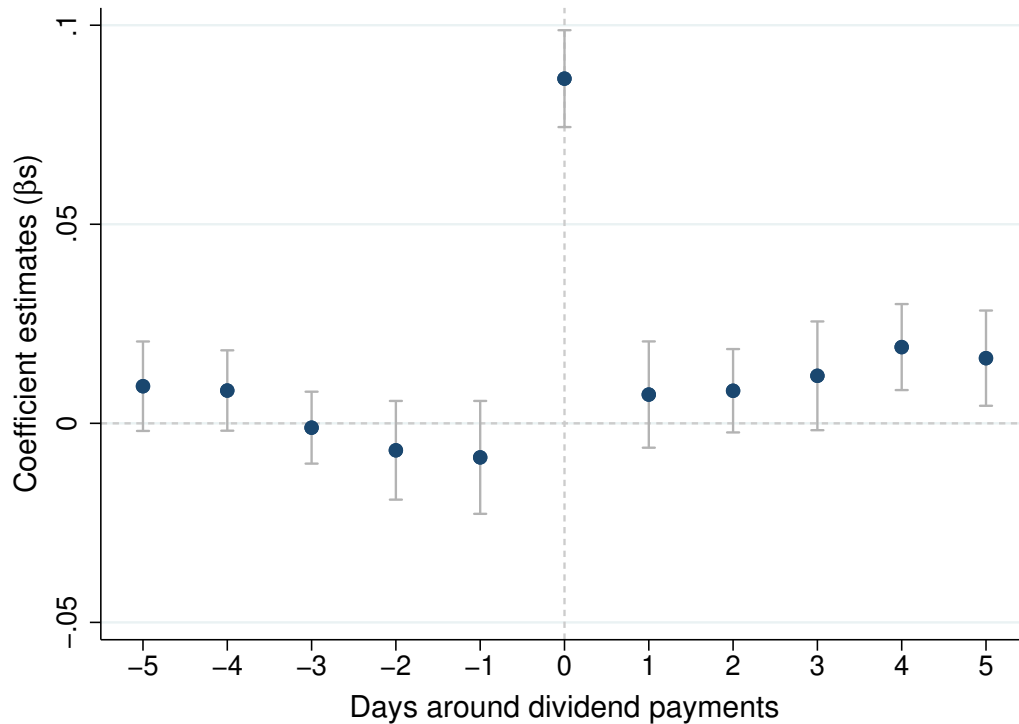
the regression coefficients from five days before to five days after the dividend payout date. Investors log in significantly more to their account on the dividend payout day than on other days. This provides additional evidence for our assumption that investors take note of dividend inflows.

4 Main result

Main result: *Investors show a larger marginal propensity to consume out of dividend income after negative ESG-related news.*

Support: We first evaluate the outcome of our main regression equation 4.1. The

results are shown in Table 4.1. The coefficients represent day-zero MPCs, which refer to the individual consumption response on the day a dividend is received ($k = 0$).[9]

Table 4.1: Consumption responses to dividends

ESG News Sentiment	(1) At the Day	(2) -1 Month	(3) -3 Months	(4) -6 Months	(5) -1 Year
Negative	0.0874***	0.0698***	0.1002***	0.0654***	0.0605***
	(0.0264)	(0.0130)	(0.0151)	(0.0107)	(0.0176)
Non-negative	0.0405***	0.0420***	0.0318***	0.0404***	0.0422***
	(0.0078)	(0.0089)	(0.0061)	(0.0095)	(0.0088)
Negative - Non-negative	0.0469*	0.0278*	0.0684***	0.025**	0.0183
P-value	0.0899	0.0577	0.0000	0.0450	0.3395
R^2	0.0709	0.0709	0.0709	0.0709	0.0709
Individual FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Observations	9,388,265	9,388,265	9,388,265	9,388,265	9,388,265
Clients	18,566	18,566	18,566	18,566	18,566

*Notes: The table shows marginal propensity to consume coefficient estimates taken from five iterations of regression specification 4.1 (by column). The ESG news sentiment of a dividend inflow is defined as negative, if the TVL score of the issuing company was in the lowest 30th percentile in terms of TVL score on the day the dividend was paid out (column 1). In the remaining columns, the ESG news sentiment of a dividend inflow is defined as negative, if the decrease of the issuing company's TVL score was in the highest 30th percentile over the time period of one month before the dividend was paid out (column 2), three months before the dividend was paid out (column 3), half a year before the dividend was paid out (column 4), or one year before the dividend was paid out (column 5). We perform Wald tests to determine whether the Negative and Non-negative coefficients are statistically significantly different from each other, by column. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Robust, individual-date double clustered standard errors are given in parentheses.*

The data show a general positive consumption response (MPC) on a day of dividend payout. This is in line with prior findings that investors consume from dividends (Baker

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[9]To increase readability of the tables, we omit the MPCs on the 5 weekdays before and after the dividend payout dates and focus on MPCs on the day on which dividends are paid out ($\beta_{Negative,0}$ and $\beta_{Non-negative,0}$). All interpretations that we make here hold when considering the 5 weekdays before and after the dividend payout dates.

et al., 2006; Hartzmark & Solomon, 2019; Bräuer et al., 2022).

In line with emotion regulation theory, investors consume twice as much from dividend income related to a company with negative ESG news than from dividend income of a company without negative ESG news. This result is based on the TVL score on the dividend payout date (column 1).

When we consider the development of TVL scores over the previous 1, 3 and 6 months before dividend payout for our measure of ESG news sentiment (columns 2, 3, and 4), the difference of consumption responses to non-/negative dividends is economically significant in all columns and statistically significant at the 1% and 5% level, respectively in columns 3 and 4. The difference of consumption responses to non-/negative dividends is not statistically significant when defining ESG news sentiment in terms of the development of TVL scores 1 year before dividend payout (column 5). Taken together, our results show a larger consumption response to dividends when they are paid out by firms with negative ESG news sentiment.

5   Results are not driven by attention

In this section, we test whether increased investors attention that is caused by negative ESG news drives the higher MPC coefficients for dividends associated with negative ESG news. Attention has been identified in prior studies as an important factor influencing financial decisions (Bordalo et al., 2020; Hartzmark et al., 2021; Hartzmark & Solomon, 2022).

As a first test for attention as a driver of our main effect, we re-estimate our model from equation 4.2 but differentiate between dividends with negative and non-negative ESG news sentiment according to our measures described in section 2.5. Table 4.2 presents the regression results and shows that investors do not pay more attention to dividends with negative ESG news sentiment, compared to dividends with non-negative ESG news sentiment, as the coefficients are close in economic and statistical terms. This provides evidence against attention as a driver of our main result.

Table 4.2: Login behavior on dividend pay dates

ESG News Sentiment	(1) At the Day	(2) -1 Month	(3) -3 Months	(4) -6 Months	(5) -1 Year
Negative	0.0983***	0.0921***	0.0794***	0.0755***	0.0805***
	(0.0103)	(0.0122)	(0.0095)	(0.0087)	(0.0114)
Non-negative	0.0822***	0.0842***	0.0890***	0.0900***	0.0879***
	(0.0066)	(0.0058)	(0.0070)	(0.0065)	(0.0068)
Negative - Non-negative	0.0162	0.0079	-0.0095	-0.0145	-0.0074
P-value	0.1441	0.4976	0.3839	0.1047	0.5641
R^2	0.1789	0.1788	0.1789	0.1789	0.1788
Individual FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Observations	3,628,964	3,628,964	3,628,964	3,628,964	3,628,964
Clients	18,550	18,550	18,550	18,550	18,550

Notes: The table shows user login probability estimates taken from five iterations of regression specification 4.2 (by column) as described in section 5. Here, the left-hand variable is a dummy variable indicating whether a user logged into his or her online banking account on day t. The ESG news sentiment of a dividend inflow is defined as negative, if the TVL score of the issuing company was in the lowest 30th percentile in terms of TVL score on the day the dividend was paid out (column 1). In the remaining columns, the ESG news sentiment of a dividend inflow is defined as negative, if the decrease of the issuing company's TVL score was in the highest 30th percentile over the time period of one month before the dividend was paid out (column 2), three months before the dividend was paid out (column 3), half a year before the dividend was paid out (column 4), or one year before the dividend was paid out (column 5). We perform Wald tests to determine whether the Negative and Non-negative coefficients are statistically significantly different from each other, by column. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Robust, individual-date double clustered standard errors are given in parentheses.

We further test whether investors in our sample react to positive ESG-related news events. If attention to news events drives our main result, we would also expect higher MPC coefficients after positive ESG news. Our definitions of positive dividend payouts are analogous to the definitions of negative dividend payouts. That is, in our first specification we define the ESG news sentiment of a dividend inflow as positive, if the TVL score of the

Table 4.3: Consumption responses to dividends after positive ESG news

ESG News Sentiment	(1) At the Day	(2) -1 Month	(3) -3 Months	(4) -6 Months	(5) -1 Year
Negative	0.0884***	0.0696***	0.1003***	0.0658***	0.0606***
	(0.0264)	(0.0128)	(0.0151)	(0.0106)	(0.0175)
Neutral	0.0372***	0.0339**	0.0300***	0.0407***	0.0389***
	(0.0102)	(0.0134)	(0.0074)	(0.0129)	(0.0114)
Positive	0.0444***	0.0491***	0.0368***	0.0419***	0.0482***
	(0.0109)	(0.0109)	(0.0108)	(0.0117)	(0.0126)
Diff Negative - Neutral	0.0512*	0.0357**	0.0704***	0.0251*	0.0217
P-value	0.0714	0.0348	0.0000	0.0993	0.3118
Diff Positive - Neutral	0.0073	0.0152	0.0068	0.0012	0.0093
P-value	0.6093	0.3500	0.6034	0.9439	0.5686
R^2	0.0709	0.0709	0.0709	0.0709	0.0709
Individual FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Observations	9,388,265	9,388,265	9,388,265	9,388,265	9,388,265
Clients	18,566	18,566	18,566	18,566	18,566

Notes: The table shows marginal propensity to consume coefficient estimates taken from five iterations of regression specification 4.1 (by column). The ESG news sentiment of a dividend inflow is defined as negative, if the TVL score of the issuing company was in the lowest 30th percentile in terms of TVL score on the day the dividend was paid out (column 1). In the remaining columns, the ESG news sentiment of a dividend inflow is defined as negative, if the decrease of the issuing company's TVL score was in the highest 30th percentile over the time period of one month before dividend was paid out (column 2), three months before dividend was paid out (column 3), half a year before dividend was paid out (column 4), or one year before dividend was paid out (column 5). The ESG news sentiment of a dividend inflow is defined as positive, if the TVL score of the issuing company was in the highest 30th percentile in terms of TVL score on the day the dividend was paid out (column 1). In the remaining columns, the ESG news sentiment of a dividend inflow is defined as positive, if the increase of the issuing company's TVL score was in the highest 30th percentile over the time period of one month before the dividend was paid out (column 2), three months before the dividend was paid out (column 3), half a year before the dividend was paid out (column 4), or one year before the dividend was paid out (column 5). The ESG news sentiment of the remaining dividends that are not classified as positive or negative are classified as neutral. We perform Wald tests to determine whether the difference between the Negative and Neutral coefficients, as well as the difference between the Positive and Neutral coefficients is statistically significant, by column. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Robust, individual-date double clustered standard errors are given in parentheses.

issuing company was in the highest 30th percentile in terms of TVL score on the day the dividend was paid out. In our further specifications, we define the ESG news sentiment of a dividend as positive, if the decrease of the issuing company's TVL score was in the highest 30th percentile over the time period of ii) one month, iii) three months, iv) half a year, and v) one year before dividend-payout.

The results are shown in Table 4.3. The insignificant coefficient difference between positive and neutral TVL scores shows that investors do not spend more out of dividend income after positive ESG news coverage of dividend-paying firms. However, consistent with previous specifications, investors spend significantly more out of dividend income after negative ESG news coverage on the social responsibility of the dividend-paying firm.

6 Investors do not re-balance their portfolios after negative ESG news

In our analyses, we include individual fixed effects to rule out any between-investor differences that may affect both the individual propensity to hold scandalous stocks, as well as individual MPC from dividend income. To completely rule out these concerns, we check investors' trading behavior in response to corporate scandals. If investors do not rebalance their portfolios after a change in firms' ESG news sentiment, then we can regard the ESG news sentiment of firms in investors' portfolios as quasi-random. We conduct regression analyses in the following form:

$$Trade_{c,t} = \beta_{c,t}(TVLScore_{c,t}) + \gamma_{c,t}(Price_{c,t}) + TimeFE_t + FirmFE_c + \epsilon_{c,t}, \quad (4.3)$$

where $Trade_{c,t}$ represents a vector of three different dependent variables: The i) logged number of shares of company c bought, ii) the logged number of shares of company c sold, and iii) the logged number of shares of company c traded by investors in our sample. $TVLScore_{c,t}$ represents a vector of i) the TVL ESG score of company c on day t, as well

as the TVL score of company c on day t, relative to the TVL score of company c ii) one day before, iii) one week before, iv) two weeks before, and v) one month before. $Price_{c,t}$ represents a vector of i) the stock price of company c on day t, as well as the stock price of company c on day t, relative to the stock price of company ii) one day before, iii) one week before, iv) two weeks before, and v) one month before. Further, we include day-of-week fixed effects, week-of-month fixed effects, month-year fixed effects, holiday fixed effects, as well as firm fixed effects and double clustered standard errors at the firm and date level. Table B1 shows the respective regression results.

None of the $TVLScore_{c,t}$ coefficients are significantly different from zero, indicating that investors in our sample do not rebalance their portfolios after ESG scandals. This reinforces our assumption that there is no different pool of investors who hold scandalous companies than those who do not and that investors in our sample do not actively select into or out of scandalous companies.

7 Negative ESG-related news do not affect dividend size

In this section, we address another potential concern that may bias our interpretation of the main result, namely that ESG-related news systematically affect the size of dividends that are paid out. To test whether this is the case, We conduct regression analyses in the following form:

$$Dividend\ Size_{c,t} = \beta_{c,t}(TVLScore_{c,t}) + \gamma_{c,t}(Price_{c,t}) + TimeFE_t + FirmFE_c + \epsilon_{c,t},$$

$$(4.4)$$

where $DividendSize_{c,t}$ represents a vector of four different dependent variables: The i) dividend amount (in EUR) that is determined by company c on the day of the company's AGM t, ii) a binary indicator of whether the size of the dividend has increased, compared

to the last dividend that was paid out by company c, iii) a binary indicator of whether the size of the dividend has decreased, compared to the last dividend that was paid out by company c, and iv) a binary indicator of whether the size of the dividend has changed, compared to the last dividend that was paid out by company c.

$TVLScore_{c,t}$ represents a vector of i) the TVL ESG score of company c on day t, as well as the TVL score of company c on day t, relative to the TVL score of company c ii) one month before, iii) three months before, iv) six months before, and v) one month before. $Price_{c,t}$ represents a vector of i) the stock price of company c on day t, as well as the stock price of company c on day t, relative to the stock price of company ii) one day before, iii) one week before, iv) two weeks before, and v) one month before. Further, we include day-of-week fixed effects, week-of-month fixed effects, month-year fixed effects, holiday fixed effects, as well as firm fixed effects and double clustered standard errors at the firm and date level. Table B2 shows the respective regression results.

With one exception, none of the $TVLScore_{c,t}$ coefficients are significantly different from zero, indicating that the ESG news events do not systematically affect dividend size. In alternative untabulated regression specifications, we separately consider dividends that are paid out quarterly and those that are paid out annually and arrive at the same results.

8   Additional robustness checks

8.1   Restricting the sample to investors who receive both negative and non-negative dividends

Including fixed effects in our analyses allows us to eliminate all time-invariant differences between investors. To provide a cleaner analysis of within-advisor differences in MPC to consume from socially (ir)responsible dividend income, we re-run our analysis with a subset of investors who receive both negative and non-negative dividends during our observation period. This decreases our sample size to 9,025 investors. The results are shown in Table 4.4. Again, all estimated coefficient differences are positive and most coefficient differences are statistically significant.

Table 4.4: Consumption responses to dividends among clients who receive both negative and non-negative dividends

ESG News Sentiment	(1) At the Day	(2) -1 Month	(3) -3 Months	(4) -6 Months	(5) -1 Year
Negative	0.0818***	0.0687***	0.0984***	0.0653***	0.0613***
	(0.0252)	(0.0125)	(0.0140)	(0.0104)	(0.0177)
Non-negative	0.0430***	0.0386***	0.0320***	0.0367***	0.0431***
	(0.0079)	(0.0068)	(0.0066)	(0.0075)	(0.0087)
Negative - Non-negative	0.0388	0.03**	0.0664***	0.0286**	0.0182
P-value	0.14	0.03	0.00	0.01	0.34
R²	0.0719	0.0708	0.0710	0.0715	0.0715
Individual FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Observations	4,572,689	6,057,724	6,559,812	6,204,904	6,320,543
Clients	9,025	11,951	12,963	12,252	12,479

*Notes: The table shows marginal propensity to consume coefficient estimates taken from five iterations of regression specification 4.1 (by column). Only clients, who receive both negative and non-negative dividends, in terms of ESG news sentiment, during our observation period are included in our sample. The ESG news sentiment of a dividend inflow is defined as negative, if the TVL score of the issuing company was in the lowest 30th percentile in terms of TVL score on the day the dividend was paid out (column 1). In the remaining columns, the ESG news sentiment of a dividend inflow is defined as negative, if the decrease of the issuing company's TVL score was in the highest 30th percentile over the time period of one month before the dividend was paid out (column 2), three months before the dividend was paid out (column 3), half a year before the dividend was paid out (column 4), or one year before the dividend was paid out (column 5). We perform Wald tests to determine whether the Negative and Non-negative coefficients are statistically significantly different from each other, by column. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Robust, individual-date double clustered standard errors are given in parentheses.*

8.2 Varying the definition of negative ESG news sentiment

In our main regression, we define the ESG news sentiment of dividend-paying firms in terms of their TVL scores. We decided on a cutoff at the 30th percentile, whereby the ESG news sentiment of a dividend inflow is defined as negative, if the TVL score of the

issuing company was in the lowest 30th percentile in terms of TVL score on the day the dividend was paid out. We ensure that the cutoff that we use does not drive our finding and that results do not change with different cutoff values. Therefore, in Tables 4.5 and 4.6 we alter the threshold to the 20th percentile and 40th percentile, respectively.

Table 4.5: Consumption responses to dividends with the the lowest 20th percentile in terms of TVL score defined as negative

ESG News Sentiment	(1) At the Day	(2) -1 Month	(3) -3 Months	(4) -6 Months	(5) -1 Year
Negative	0.0809***	0.0721***	0.0999***	0.0591***	0.0754***
	(0.0145)	(0.0150)	(0.0115)	(0.0119)	(0.0220)
Non-negative	0.0452***	0.0425***	0.0402***	0.0456***	0.0413***
	(0.0083)	(0.0086)	(0.0081)	(0.0090)	(0.0082)
Negative - Non-negative	0.0357**	0.0296*	0.0596***	0.0135	0.0341
P-value	0.0200	0.0659	0.0000	0.3026	0.1430
R^2	0.0709	0.0709	0.0709	0.0709	0.0709
Individual FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Observations	9,388,265	9,388,265	9,388,265	9,388,265	9,388,265
Clients	18,566	18,566	18,566	18,566	18,566

Notes: The table shows marginal propensity to consume coefficient estimates taken from five iterations of regression specification 4.1 (by column). The ESG news sentiment of a dividend inflow is defined as negative, if the TVL score of the issuing company was in the lowest 20th percentile in terms of TVL score on the day the dividend was paid out (column 1). In the remaining columns, the ESG news sentiment of a dividend inflow is defined as negative, if the decrease of the issuing company's TVL score was in the highest 20th percentile over the time period of one month before the dividend was paid out (column 2), three months before the dividend was paid out (column 3), half a year before the dividend was paid out (column 4), or one year before the dividend was paid out (column 5). We perform Wald tests to determine whether the Negative and Non-negative coefficients are statistically significantly different from each other, by column. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Robust, individual-date double clustered standard errors are given in parentheses.

The results show that the valence of all coefficients remains the same for both alter-

Table 4.6: Consumption responses to dividends with the the lowest 40th percentile in terms of TVL score defined as negative

ESG news sentiment	(1) At the day	(2) -1 month	(3) -3 months	(4) -6 months	(5) -1 year
Negative	0.0760***	0.0713***	0.0782***	0.0708***	0.0611***
	(0.0197)	(0.0118)	(0.0185)	(0.0102)	(0.0133)
Non-negative	0.0398***	0.0409***	0.0323***	0.0342***	0.0379***
	(0.0082)	(0.0091)	(0.0066)	(0.0093)	(0.0094)
Negative - non-negative	0.0362*	0.0304**	0.0459**	0.0367***	0.0232
P-value	0.0862	0.0253	0.0160	0.0025	0.1434
R²	0.0709	0.0709	0.0709	0.0709	0.0709
Individual FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Observations	9,388,265	9,388,265	9,388,265	9,388,265	9,388,265
Clients	18,566	18,566	18,566	18,566	18,566

Notes: The table shows marginal propensity to consume coefficient estimates taken from five iterations of regression specification 4.1 (by column). The ESG news sentiment of a dividend inflow is defined as negative, if the TVL score of the issuing company was in the lowest 40th percentile in terms of TVL score on the day the dividend was paid out (column 1). In the remaining columns, the ESG news sentiment of a dividend inflow is defined as negative, if the decrease of the issuing company's TVL score was in the highest 40th percentile over the time period of one month before the dividend was paid out (column 2), three months before the dividend was paid out (column 3), half a year before the dividend was paid out (column 4), or one year before the dividend was paid out (column 5). We perform Wald tests to determine whether the Negative and Non-negative coefficients are statistically significantly different from each other, by column. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Robust, individual-date double clustered standard errors are given in parentheses.

native cutoff values and the statistical significance remains the same for most coefficients.

Therefore, our results are not sensitive to a specific cutoff value that we choose.

Table 4.7: Consumption responses to dividends with the the top dividend-paying stocks removed

ESG News Sentiment	(1) At the Day	(2) -1 Month	(3) -3 Months	(4) -6 Months	(5) -1 Year
Negative	0.0925***	0.0780***	0.1014***	0.0694***	0.0677***
	(0.0284)	(0.0161)	(0.0156)	(0.0119)	(0.0195)
Non-negative	0.0403***	0.0419***	0.0322***	0.0405***	0.0418***
	(0.0076)	(0.0085)	(0.0061)	(0.0090)	(0.0084)
Negative - Non-negative	0.0522*	0.0362**	0.0692***	0.029**	0.0259
P-value	0.0746	0.0358	0.0000	0.0227	0.2134
R^2	0.0709	0.0709	0.0709	0.0709	0.0709
Individual FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Observations	9,388,265	9,388,265	9,388,265	9,388,265	9,388,265
Clients	18,566	18,566	18,566	18,566	18,566

Notes: The table shows marginal propensity to consume coefficient estimates taken from five iterations of regression specification 4.1 (by column), whereby we exclude the Top 50 stocks with the highest dividend yields from our sample as described in section 8.3. The ESG news sentiment of a dividend inflow is defined as negative, if the TVL score of the issuing company was in the lowest 30th percentile in terms of TVL score on the day the dividend was paid out (column 1). In the remaining columns, the ESG news sentiment of a dividend inflow is defined as negative, if the decrease of the issuing company's TVL score was in the highest 30th percentile over the time period of one month before the dividend was paid out (column 2), three months before the dividend was paid out (column 3), half a year before the dividend was paid out (column 4), or one year before the dividend was paid out (column 5). We perform Wald tests to determine whether the Negative and Non-negative coefficients are statistically significantly different from each other, by column. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Robust, individual-date double clustered standard errors are given in parentheses.

8.3   Removing top dividend stocks

Our results might be biased by investors actively investing in stocks aiming for high dividends. We grasp the stocks' dividend yield from *Factset* and exclude the 50 stocks with the highest dividend yields. Those stocks account for 7.8% of the holdings in our

sample. As shown in Table 4.7, our main result is robust against removing the stocks with the highest dividend yields.

8.4 Removing mostly held stocks

To rule out the possibility that our main results are driven by only a few stocks, which would reduce the generalizability of our findings, we re-run our main regression without the top two held stocks in our sample. Together, these stocks account for around 13.0% of the holdings in our sample.[10] Table 4.8 shows the results of our main regression specification when only considering this sub-sample. The results are consistent with our main result that investors show a larger MPC out of dividend income after negative ESG-related news.

8.5 Implementing an alternative measure of ESG news sentiment

To ensure that we capture ESG-related news sentiment, we re-run our main regressions with an alternative measure. Specifically, we use *Google Trends* data. *Google Trends* provides the relative search volume on *Google* scaled between 0 and 100. Thereby, indexation depends on the time period chosen, as the lowest search volume in the chosen time period equals 0 and the highest equals 100, representing the lowest and highest relative search popularity of the specified search term, respectively.

We download weekly data from *Google Trends* for the 500 most held companies[11] in our sample, the search term being a respective company's name and the word 'scandal'.[12]

We define the ESG news sentiment of a dividend inflow as negative, if a company's *Google Trends* score exceeds the level of 50 within a time period of i) 1 month, ii) 3 months, iii) 6 months, and iv) 1 year, respectively. To avoid that a company's *Google Trends* score exceeds the level of 50 due to a generally higher or lower search volume, we

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[10]We estimate the share by combining the total Euro amount held by all clients in the first and last month in our sample

[11]We estimate the 500 most held companies by combining the total Euro amount held by all clients in the first and last month in our sample. Those 500 companies account for 96.4 percent of the holdings in our sample. We were able to download the respective data for 482 companies.

[12]We use the German term "Skandal", since our investor population is German.

Table 4.8: Consumption responses to dividends with the most-held stocks removed.

ESG News Sentiment	(1) At the Day	(2) -1 Month	(3) -3 Months	(4) -6 Months	(5) -1 Year
Negative	0.0809***	0.0712***	0.1019***	0.0580***	0.0728***
	(0.0235)	(0.0131)	(0.0203)	(0.0095)	(0.0200)
Non-negative	0.0405***	0.0418***	0.0365***	0.0446***	0.0406***
	(0.0081)	(0.0089)	(0.0072)	(0.0096)	(0.0084)
Negative - Non-negative	0.0404	0.0294**	0.0654***	0.0135	0.0322
P-value	0.1030	0.0457	0.0019	0.2415	0.1323
R^2	0.0709	0.0709	0.0709	0.0709	0.0709
Individual FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Observations	9,388,265	9,388,265	9,388,265	9,388,265	9,388,265
Clients	18,566	18,566	18,566	18,566	18,566

*Notes: The table shows marginal propensity to consume coefficient estimates taken from five iterations of regression specification 4.1 (by column), whereby we exclude the top two held stocks as described in section 8.4. The ESG news sentiment of a dividend inflow is defined as negative, if the TVL score of the issuing company was in the lowest 30th percentile in terms of TVL score on the day the dividend was paid out (column 1). In the remaining columns, the ESG news sentiment of a dividend inflow is defined as negative, if the decrease of the issuing company's TVL score was in the highest 30th percentile over the time period of one month before the dividend was paid out (column 2), three months before the dividend was paid out (column 3), half a year before the dividend was paid out (column 4), or one year before the dividend was paid out (column 5). We perform Wald tests to determine whether the Negative and Non-negative coefficients are statistically significantly different from each other, by column. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Robust, individual-date double clustered standard errors are given in parentheses.*

only consider scandals where the company's score has been below the threshold for the preceding six months.[13]

Table 4.9 shows the results. The *Google Trends* ESG news sentiment measure gives

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[13]As robustness, we also consider i) all scores above 50 and ii) only scandals where the company's score has been below the threshold for the preceding 12 months. The untabulated results remain qualitatively the same.

Table 4.9: Consumption responses to dividends with ESG news sentiment defined in terms of *Google Trends*

ESG News Sentiment	(1) -1 Month	(2) -3 Months	(3) -6 Months	(4) -1 Year
Negative	0.0968***	0.0924***	0.1081***	0.0729***
	(0.0128)	(0.0125)	(0.0281)	(0.0219)
Non-negative	0.0448***	0.0449***	0.0411***	0.0397***
	(0.0081)	(0.0081)	(0.0070)	(0.0065)
Negative - Non-negative	0.052***	0.0475***	0.067**	0.0332
P-value	0.0003	0.0008	0.0189	0.1315
R^2	0.0709	0.0709	0.0709	0.0709
Individual FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Observations	9,388,265	9,388,265	9,388,265	9,388,265
Clients	18,566	18,566	18,566	18,566

*Notes: The table shows marginal propensity to consume coefficient estimates taken from five iterations of regression specification 4.1 (by column). The ESG news sentiment of a dividend inflow is defined as negative, if the Google Trends score indicated that the issuing company faced a scandal in the month before the dividend was paid out (column 1), three months before dividend was paid out (column 2), six months before dividend was paid out (column 3), or the year before dividend was paid out (column 4) as described in section 8.5. We perform Wald tests to determine whether the Negative and Non-negative coefficients are statistically significantly different from each other, by column. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Robust, individual-date double clustered standard errors are given in parentheses.*

similar results to the analyses with TVL scores.Consistent with the TVL results, a scandal in terms of our *Google Trends* measure has a significant effect on consumption, when it was within one month ($p < 0.01$), three months ($p < 0.01$), or six months ($p < 0.05$). If we define dividends' ESG news sentiment in terms of search volume within the past year, the coefficient differences are in the expected direction but not statistically significant. All of these results are in line with our results in Table 4.1. This gives us confidence that we have correctly identified firms' ESG news sentiment, as both measures give consistent

results.

9   Conclusion

Emotion regulation theory predicts that individuals respond to income that elicits negative emotions like guilt with heightened consumption. We provide evidence for an emotional consumption response among retail investors in the field, by analyzing a large European bank dataset.

Specifically, we find that investors consume more out of dividend income when it is received from a company that has recently been subject to news coverage exposing negative ESG performance. On average, investors spend twice as much out of dividend income, when it is received from a company with negative ESG news sentiment compared to dividend income from a company without negative ESG news sentiment. Our results are robust against different model specifications and we rule out attention as a mechanism of the observed effect.

We are the first to show that behavior consistent with emotion regulation theory can be observed in the field. We do so in a market with high stakes, the financial market. Specifically, our results show that individuals do not treat all stock market income equally, but that current ESG news sentiment influences how this income is consumed.

We demonstrate that emotional consumption responses can be measured in the field, which opens interesting avenues for future research beyond the domain of financial markets. For example, individuals have been shown to have a preference to work for a company whose business practices are in line with their social preferences, for which they are willing to accept 9% lower wages (Krueger et al., 2021). It would, for example, be interesting to see whether individuals spend wages paid by a firm with negative ESG performance differently than wages paid by a firm with positive ESG performance.

D Appendix

Table B1: Investors do not re-balance their portfolios after negative ESG news

Dependent Variable:	(1) Long Trades (Log)	(2) Short Trades (Log)	(3) Trades (Log)
TVL at the Day	-0.001	-0.000	-0.000
	(0.001)	(0.000)	(0.001)
TVL Change 1 Day	-0.002	-0.001	-0.002
	(0.004)	(0.004)	(0.005)
TVL Change 1 Week	0.006	0.002	0.006
	(0.005)	(0.004)	(0.006)
TVL Change 2 Weeks	0.001	-0.004	-0.004
	(0.002)	(0.004)	(0.004)
TVL Change 1 Month	0.002	0.004	0.003
	(0.003)	(0.004)	(0.004)
α	-6.972***	-7.235***	-6.476***
	(0.036)	(0.027)	(0.034)
R-squared	0.468	0.419	0.520
Stock Price Controls	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Time FE	Yes	Yes	Yes
Observations	547,195	547,195	547,195
Companies	974	974	974

Notes: This table gives regression coefficient estimates taken from three iterations of regression specification 4.3 (by column) as described in section 6. As right hand variables, we use the logged number of shares bought (column 1), the logged number of shares sold (column 2), and the logged number of shares traded (column 3) on day t. As right hand variables, we derive several variables from the stocks' TVL ESG score and stock price. Further, we add firm fixed effects, day-of-week fixed effects, week-of-month fixed effects, month-year fixed effects, holiday fixed effects, and individual fixed effects. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Robust, firm-date level double clustered standard errors are given in parentheses.

Table B2: Negative ESG-related news do not affect dividend size

Dependent Variable:	(1) Amount	(2) Increase	(3) Decrease	(4) No Change
TVL at the Day	-0.002	0.000	0.000	0.000
	(0.003)	(0.001)	(0.000)	(0.001)
TVL Change 1 Month	-0.033	0.015	-0.006	0.010
	(0.045)	(0.011)	(0.006)	(0.010)
TVL Change 3 Months	-0.005	-0.002	0.007	0.004
	(0.019)	(0.009)	(0.005)	(0.009)
TVL Change 6 Months	-0.025	0.008	-0.004	0.003
	(0.025)	(0.008)	(0.003)	(0.006)
TVL Change 1 Year	0.009	0.003	-0.006*	-0.004
	(0.019)	(0.006)	(0.003)	(0.005)
α	3.289***	0.311***	0.114***	0.391***
	(0.177)	(0.036)	(0.020)	(0.029)
R-squared	0.958	0.287	0.412	0.493
Stock Price Controls	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Observations	6,070	6,061	6,061	6,457
Companies	858	857	857	900

Notes: This table gives regression coefficient estimates taken from four iterations of regression specification 4.4 (by column) as described in section 7. As left hand variables, we use the dividend amount (in EUR) that is determined by company c on the day of the company's AGM t (column 1), a binary indicator of whether the size of the dividend has increased, compared to the last dividend that was paid out by company c (column 2), a binary indicator of whether the size of the dividend has decreased, compared to the last dividend that was paid out by company c (column 3), and a binary indicator of whether the size of the dividend has changed, compared to the last dividend that was paid out by company c (column 4). As right hand variables, we derive several variables from the stocks TVL ESG score and stock price. Further, we add firm fixed effects, day-of-week fixed effects, week-of-month fixed effects, month-year fixed effects, and holiday fixed effects. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. Robust, firm-date level double clustered standard errors are given in parentheses.

Table B3: Sample descriptives

	Mean	SD	5th perc.	30th perc.	Median	70th perc.	95th perc.
Panel A: Demographics							
Male	0.697	0.459	0.000	0.000	1.000	1.000	1.000
Age	51.1	14.7	29.0	42.5	50.0	57.0	78.5
Married	0.466	0.499	0.000	0.000	0.000	1.000	1.000
Years with Bank	20.4	11.4	4.9	12.5	19.2	24.2	44.5
Employed	0.541	0.498	0.000	0.000	1.000	1.000	1.000
Civil Servant	0.020	0.142	0.000	0.000	0.000	0.000	0.000
Manager	0.029	0.169	0.000	0.000	0.000	0.000	0.000
Retired	0.082	0.274	0.000	0.000	0.000	0.000	1.000
Panel B: Financial Assets and Transactions							
Total Assets (EUR)	125,843	356,343	704	6,343	21,503	72,755	570,306
Stocks (EUR)	62,916	228,417	469	3,559	9,681	28,623	270,962
Funds (EUR)	47,437	160,362	0	0	482	17,929	236,792
Other Assets (EUR)	15,490	82,009	0	0	0	0	75,000
Assets (#)	8.6	14.4	1.0	2.0	4.4	8.8	31.9
Stocks (#)	5.4	11.2	1.0	1.0	2.5	5.0	19.0
Funds (#)	2.4	4.4	0.0	0.0	0.5	2.0	11.0
Monthly Trades (#)	1.3	3.8	0.0	0.1	0.4	1.0	5.2
Monthly Buy Transactions (#)	0.9	2.3	0.0	0.1	0.2	0.6	3.6
Monthly Sell Transactions (#)	0.4	1.6	0.0	0.0	0.1	0.2	1.9
Panel C: Dividends and Consumption (Monthly Average)							
Consumption	3,234.4	2,591.5	699.7	1,778.4	2,558.7	3,654.0	8,055.1
No of Consumption Days	9.6	4.1	3.0	7.0	9.5	12.0	16.6
Dividend Inflows	68.9	162.0	0.6	6.8	18.1	46.2	298.3
No of Dividend Days	0.3	0.3	0.1	0.1	0.2	0.3	0.8
Panel D: Spending Transactions (Monthly Average)							
Living	294.9	271.9	27.4	129.6	214.9	343.2	842.8
Housing	535.8	567.9	1.3	174.3	367.1	654.8	1,671.6
Leisure & Traveling	141.4	197.4	2.6	43.9	85.7	152.1	444.2
Mobility	95.2	129.8	0.0	24.3	57.8	105.3	310.6
Health	64.7	134.1	0.0	7.3	22.5	55.2	260.2
Children	54.1	212.9	0.0	0.0	0.0	1.7	337.5
Career & Education	21.6	62.6	0.0	0.0	2.5	12.8	97.5
Saving and Investing	2,727	13,441	0	59	391	1,339	12,182
Insurance	513.6	586.4	0.0	135.0	299.7	619.6	1,690.4
Loans	384.3	840.5	0.0	0.0	25.2	323.8	1.739.5
Other	48.9	121.3	0.4	8.0	16.0	32.5	206.0
Uncategorized	3,757.8	4,436.0	330.8	1,369.3	2,375.0	3,962.9	11,915.0
Investors				18,566			

Notes: This table presents summary statistics for the investors in our sample. Panel A shows the investors' demographic information. Panel B focuses on the investors' financial assets and financial transactions. Panel C presents information on the investors' dividends and consumption. Finally, panel D provides information on the investors' outflow transactions.

Table B4: Consumption variable

Category	Included in Consumption Variable?	Comment
1. Living		
Food and Drink	Yes	
Clothing	Yes	
Telecommunication	No	Recurring
Cosmetics	Yes	
Drugstore	Yes	
Pets	Yes	
Canteen	Yes	
Gifts	Yes	
Other	Yes	
2. Housing		
Rent	No	Recurring
Power and Energy	No	Recurring
Home Accessories	Yes	
Condo Fee	No	Recurring
Domestic Help	No	Recurring
Property Taxes	No	Recurring
Renovation and Maintenance	Yes	
Other	Yes	
3. Leisure and traveling		
Eat Out	Yes	
Events	Yes	
Sports	No	Recurring
Hobbies and Clubs	No	Recurring
Traveling	Yes	
Media (Books, Movies...)	Yes	
Electronics	Yes	
Subscriptions	No	Recurring
Other	Yes	
4. Mobility		
Cars	Yes	
Bicycle	Yes	
Motorcycle	Yes	
Public Transportation	Yes	
Taxi	Yes	
Refueling	Yes	
Other	Yes	

Category	Included in Consumption Variable?	Comment
5. Health		
Pharmacy	Yes	
Doctor	Yes	
Glasses	Yes	
Hospital	Yes	
Other	Yes	
6. Children		
Toys	Yes	
Children's Clothing	Yes	
Childcare	No	Recurring
School Fees	No	Recurring
Alimony Payments	No	Recurring
Other	Yes	
7. Career and Education		
Office Supplies	Yes	
Business Travel	Yes	
Tuition Fee	No	Recurring
Continuing Education	Yes	
Other	Yes	
8. Saving and Investing	No	Financial
9. Insurance	No	Financial
10. Loans	No	Financial
11. Other Outflows		
Donations	No	Recurring
Cash Withdrawals	Yes	
Internet Purchases	Yes	
Other	No	Recurring

Notes: This table shows various transaction categories used by the bank's categorization tool and indicates whether the respective categories are included in our measure of consumption as described in section 2.3. "Uncategorized spending" refers to spending that could not be categorized by the bank's categorization tool.

Chapter 5

Valorization

The studies presented in this dissertation contribute to our understanding of how concerns for sustainability influence individual decision-making in financial markets. As such, the studies have implications for practitioners in different sectors.

First, the dissertation has implications for policy makers. It is a pressing concern for policy makers to increase the amount of funds that are invested under the consideration of ESG criteria. As part of the action plan to promote sustainable investments, the European Commission has put in place a policy amendment to the MiFID II, which requires financial advisors to elicit their clients' sustainability preferences in their investments. In Chapter 2 of this dissertation, I identify a potential unintended side consequence of this policy amendment. Specifically, financial advisors may take knowledge about their clients' sustainability preferences in order to extract additional profits from those who do communicate these preferences. When clients can signal high financial literacy, the premium is eliminated, but sustainable investment clients who cannot signal high financial literacy bear the burden of higher fees. This form of discriminatory pricing is concerning, as it could hurt consumer welfare and negatively affect the long-run attractiveness of sustainable investing.

In a separate survey with financial regulators, I show that these results are a surprise to the majority of policy makers. When confronted with the results, a significant majority (81%) also believes that attention from policy makers is necessary. Regulators suggest

policy interventions, such as transparency (30%), standardized fees (25%) and consumer education (17%).

In addition, Chapter 3 shows that if conflicts of interest that potentially lead to price discrimination can be resolved, financial advice may be a useful tool to increase households' propensity to invest sustainably. Investors in my sample report a lack of knowledge about sustainable investing and tend to view sustainable investments as a trade-off between non-pecuniary benefits, such as having an impact or feeling good, and a lower risk-adjusted return. However, investors are receptive to new information concerning sustainable investing and change their investment behavior accordingly. Specifically, I show that peer information provided at the buying decision increases the proportion of funds that flow into sustainable investments. Importantly, this information only alters behavior, when it changes investors' prior beliefs.

Chapter 4 gives an indication that the buying decision is indeed the point in time when investors are most susceptible to new information on sustainable investments. After this decision, my results show that retail investors' portfolios are relatively sticky, which leads them to do few adjustments their portfolios, even after news of ESG scandals concerning companies in their portfolios.

What is important to mention at this point is of course that policy makers should supervise that investment clients are not manipulated into sustainable investments. The financial advice should be utilized to close the knowledge gap of investors, in order to better align sustainability-minded households' investments with their preferences.

This dissertation also has implications for financial institutions catering to retail investors. Chapter 2 shows that clients with a preference for sustainability have a higher willingness to pay for advice. Since financial advice represents a credence good, where clients cannot fully assess the quality, even ex-post, this may be exploited by financial advisors. At least in the short run, this dissertation shows that it is a profitable strategy for financial advisors to use discriminatory pricing, where higher fees are charged and more expensive products are sold to sustainable investors. However, these implications should be taken with caution. Despite moral considerations related to price discrimination, my

results cannot make any claims on the long-term profitability of such a strategy. For example, there may be potential negative shocks to profitability if this price discrimination is uncovered and made public.

Next to implications for pricing, the results presented in this dissertation may help finance professionals better understand how retail investors react to sustainability information. As shown in Chapter 3, investors are influenced by new information that change their prior beliefs related to sustainable investments at the point of purchase, however, as shown in Chapter 4 their trading behavior is less influenced by new information about the sustainability of companies that they already hold in their portfolios. This provides an insight about when sustainability information should be shown to investors, in order to help them align their portfolios with their sustainability preferences.

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