CSR disclosure and investor social preferences: heterogenous investor responses to media reports on corporate greenwashing

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Abstract
Purpose – There is emerging evidence in the accounting literature that investors react negatively to corporate greenwashing. But does that hold for all investors, or do different types of investors react differently? This paper aims to study retail investors’ responses to media reports on corporate greenwashing and how these responses depend upon the investors’ social value orientation. The authors argue that media reporting on corporate greenwashing negatively affects the rationale for allocating funds to firms engaging in greenwashing. The authors also expect this reaction to be stronger for prosocial investors compared to proself investors.

Design/methodology/approach – The authors conduct an online experiment with 229 participants representing retail investors in the German-speaking countries.

Findings – The results show that retail investors who received media reports on deceptive disclosure invest more funds in the company that does not engage in greenwashing (and less in the firm that engages in greenwashing) than investors who did not receive these reports. The authors’ results provide novel evidence that this effect primarily holds for investors with a prosocial value orientation. Finally, the authors’ data show that lower trust in the firm that engages in greenwashing partially mediates the effect of media reports on investor choices.

Originality/value – The authors provide unique evidence how different types of investors react to media reports on greenwashing. The authors find that moral motives, rather than risk-return considerations, drive investor responses to greenwashing. Overall, these findings support the important function of the media as an intermediary in stock market participation and highlight the pivotal role of individual traits in investors’ responses to greenwashing.

Keywords CSR reporting, Corporate greenwashing, Media, Investor segmentation, Social value orientation

Paper type Research paper

Introduction
Research on disclosure quality of CSR performance suggests that – in connection with a growing sensitivity to environmental issues – shareholders’ expectations and firms’ CSR
performance do not always match (Elliott et al., 2014; Lyon and Montgomery, 2015). Notably, firms with poor environmental performance tend to use greenwashing as a strategy to deflect adverse market reactions and maintain their legitimacy and attractiveness to a broad clientele of investors (Borgstedt et al., 2019). Greenwashing can be defined as a symbolic rather than a substantial integration of environmental practices. This includes the opportunistic behavior of firms adopting environmental practices superficially to misguide stakeholders (Lyon and Montgomery, 2015). Intermediaries such as the media appear to play a pivotal role in discovering and providing information about such deceptive firm disclosure. In the absence of intermediary interference, investors appear to have difficulties interpreting firm disclosure, while intermediaries help in understanding its relevance and prioritizing it (Orlitzky, 2013; Cahan et al., 2015).

We examine whether and how media reports affect retail investors’ responses [1] to greenwashing and how these responses differ between proself investors (those who care primarily about their own welfare) and prosocial investors (those who care about their own and others’ welfare) [2]. We hypothesize that media reporting on corporate greenwashing leads to a de-investment in the company pursuing this strategy. Here, we built on prior accounting research on disclosure quality which suggests that investors tend to value nonfinancial information only if it is sufficiently reliable and verifiable (O’Dwyer et al., 2005; Haigh and Shapiro, 2013) and documents investors’ adverse reactions to greenwashing (Walker and Wan, 2012; Wu and Shen, 2013; Sinclair-Desgagné and Gozlan, 2003). While much research investigates the relationship between greenwashing and financial dimensions of a firm’s performance and how this financial performance affects shareholders, we examine whether engaging in greenwashing in and of itself affects (some) investors. We further investigate the role of media reports on investors’ reactions toward corporate greenwashing.

We also conjecture that retail investors’ trust perceptions of the firms mediate the effect of media reports on investment choices. Prior research suggests that trust is an important prerequisite for investment decisions (Ryan and Buchholtz, 2001; Colquitt et al., 2007) and that poor CSR performance (Lins et al., 2017) and deceptive reporting erodes trust in a firm (Zahller et al., 2015; Hewitt et al., 2020). We investigate how media reports on greenwashing affect these trust reactions and whether the reactions differ between different types of investors.

Finally, we expect these reactions to corporate greenwashing to be more pronounced for more prosocial investors. We build on a growing body of research showing that investor social and moral preferences are important in understanding investment choices (Hong and Kostovetsky, 2012; Bauer and Smeets, 2015; Niszczota et al., 2022). This literature suggests that prosocial investors generally derive utility from aligning their social and moral preferences with their decision-making and therefore prefer investing in firms that engage in prosocial activities. In contrast, proself investors care primarily about their own economic welfare and are less concerned about the non-pecuniary dimensions of their investments (De Bruin and Van Lange, 2000; Gölker and Mertins, 2018). We hypothesize that prosocial investors react more negatively to media reports on deceptive CSR disclosure than proself investors do because these reports make the incongruence with prosocial investors’ underlying moral and social preferences more salient. Here, we build on a growing body of research showing that investor social and moral preferences are important in understanding investment choices, for example investments in sin stocks, e.g. tobacco or defense industry (Hong and Kostovetsky, 2012; Bauer and Smeets, 2015; Niszczota et al., 2022). In contrast to this prior research on sin stocks, which identifies a morality versus financial return trade-off as a major driver of investing with sin industry firms, we hypothesize that, at least for
certain investors, greenwashing is not anticipated in their investment decision, even though it potentially increases risks for future financial returns not materializing.

To test our hypotheses, we conduct a 2 × 2 between-subjects experiment, where one factor is manipulated (presence or absence of critical media reports on CSR disclosure quality) and the other one is measured (participants’ social value orientation, or SVO). We first provide participants with voluntary firm disclosure on environmental performance which puts both firms in a very good light. This is followed by the manipulation. Participants in the treatment group are provided with quotes from newspapers that outline poor environmental performance and deceptive CSR disclosure practice in the industry. Participants in the control group do not receive any media reports. All participants are then provided with financial and nonfinancial performance information for both firms. We designed these performance reports in a way that one firm (high environmental performer, or HEP) outperforms the other firm (high financial performer, or HFP) on environmental performance dimensions and underperforms on the financial performance measures and vice versa [3]. This means there is a congruency between HEP voluntary disclosure of its CSR engagement and the actual performance indicators and an inconsistency for HFP, emphasizing that the latter firm engages in greenwashing. Participants then make their incentivized investment decision, where we ask them to allocate an investment budget across the two firms. We finally collect a set of demographic information, as well as participants’ SVO, their CSR attitude, their financial literacy and their trust in the two firms.

Our results support the hypotheses. Participants who receive media reports on deceptive corporate CSR disclosure invest significantly more funds in the HEP (and less in the HFP) than did those participants who did not receive the media reports. We find that the effect of media reports on investment choices is indeed partially mediated by participant perceptions of trust in the firms. Looking at the differences between prosocial and proself retail investors, our results suggest that these effects are primarily driven by prosocials. Participants with a prosocial value orientation invest more heavily in HEP in the treatment condition than in the control condition. Importantly, in the treatment condition, prosocials also invest more heavily in the HEP than proselfs do. Proself participants do not invest significantly more funds in the HEP in the treatment condition relative to the control condition. Both types of investors, however, show lower levels of trust in the HFP in the treatment condition than the absence of media reports. Apparently, for proselfs, these lower trust levels are not reflected by higher investments in the HEP, indicating that for proselfs, ethical dimensions are less relevant, and they tend to prefer investing with the firm that outperforms the other firm on financial dimensions.

These findings add to prior research on how CSR disclosure affects investment choices (Petersen and Vredenburg, 2009; Rubaltelli et al., 2015; Martin and Moser, 2016). While prior accounting literature has mostly focused on why companies engage in greenwashing (Deegan, 2002; Cho and Patten, 2007; Cho et al., 2012), our results provide new insights into how investors react to corporate greenwashing. We enhance the literature which finds that retail investors penalize firms by withholding funds if the firm does not “walk the talk” (Du, 2015; Lins et al., 2017; Berrone et al., 2017). Our results suggest that media reports foster investor reactions to greenwashing and hence contribute to the idea that media reports ease retail investors’ interpretation of (deceptive) firm disclosure. These findings add to prior literature emphasizing the crucial role of intermediaries in ensuring reliable nonfinancial disclosure (e.g. Hombach and Sellhorn, 2019; Islam et al., 2018).

Our findings add to prior research on how investor traits shape their responses to firm CSR performance and managerial misreporting (Niszczota et al., 2022; Gibson et al., 2023). Our results suggest that the financial risk of investing with firms that engage in
greenwashing alone is insufficient to explain investment choices. In contrast, the moral preferences of prosocial investors determine the investment choices in favor of the firm that truthfully reports on its CSR performance.

Our results bear implications for practice. First, firms that cater to different types of retail investors need to consider that greenwashing results in adverse reactions not only due to an increased distrust in firms pursuing this strategy, but also because of perceived incongruence with investor preferences. Though our findings speak only to the case of retail investors, firms that aim to cater to a broad clientele of investors need to be aware of how their reporting decisions affect investors. Second, the results suggest that the “watchdog” role of the media is indeed pivotal for retail investors’ reactions to greenwashing. Apparently, greenwashing is only a beneficial strategy for firms to attract investors as long as investors are not (made) aware of this disclosure practice.

Theory
Deceptive CSR reporting as form of greenwashing
Investors increasingly demand and use information on firm CSR performance (Cohen et al., 2015; Martin and Moser, 2016), and multiple policy initiatives aim to strengthen the role of CSR for institutional and retail investors. For example, recent amendments of the EU Sustainable Finance Action Plan require financial advisors to ask for and include retail investors’ CSR preferences in their investment advice (European Commission, 2021). Hence, firms have an increasingly strong motivation to portray themselves in a positive light concerning their CSR performance.

The literature widely acknowledges the existence of greenwashing as a strategy for firms to embellish their CSR performance and identifies its various negative implications (Guidry and Patten, 2010; Cho et al., 2010; Lyon and Maxwell, 2011). Generally, firms with poor CSR performance have problems mimicking their superior competitors, due to e.g. insufficient resources and management capabilities (Clarkson et al., 2011). Hence, despite the mounting pressure on environmentally exposed firms to disclose their CSR performance, this does not necessarily lead to substantial improvements in long-term sustainable performance (Qian and Schaltegger, 2017). Such a decoupling of CSR performance from disclosure results in an adverse selection problem for investors (Burritt and Schaltegger, 2010) and potentially in market failure (Akerlof, 1970). Delmas and Burbano (2011) find that greenwashing systematically erodes investors’ confidence in firms and their reporting practices. Hence, on a societal level, greenwashing can undermine stakeholders’ confidence in corporate environmental impact due to difficulties in disentangling HEPs from laggards (Parguel et al., 2011; Chen and Chang, 2013).

Role of media in informing stakeholders about corporate greenwashing
The media takes an important role in discovering and reporting on greenwashing, given the motivation and means firms have to deceive stakeholders about their CSR performance. First, media intervention, often in interaction with NGOs, is a driver for higher nonfinancial disclosure quality through more comprehensiveness and additional disclosure quantity (Islam et al., 2018). Moreover, the media works as an information facilitator by processing nonfinancial information for its users and using disclosure information in campaigning to actively pressure firms into socially acceptable behavior (Dyck et al., 2008; Dyreng et al., 2016; Hombach and Sellhorn, 2022). For instance, the counter accounting literature documents how the media strategically uncovers and addresses societal problems for marginalized groups, disrupts unequal power relations, delegitimizes corporate
unsustainable practices by changing the societal discourse and shapes moral mechanisms (Vinnari and Laine, 2017; Paulo Resende de Lima et al., 2022).

Prior literature suggests that the media directs investors’ limited attention to CSR issues and helps them understand the relevance of this information and prioritize it (Orlitzky, 2013; Cahan et al., 2015). The media helps investors understand the negative implications for their investment (Reimsbach and Hahn, 2015). More importantly, the media act as information facilitators that can uncover the discrepancy of companies framing themselves as high CSR performers but withholding that they lag in other more immanent aspects of CSR (Devin, 2016). Credible CSR information is relevant for companies as many investors value high CSR performance and consider it in their investment decisions. Investors are generally willing to pay higher prices for stocks with a positive CSR performance (Elliott et al., 2014; Martin and Moser, 2016). However, investors only genuinely incorporate nonfinancial information in their investment decisions if this information is sufficiently reliable (O’Dwyer et al., 2005).

Previous literature indicates that, despite CSR being generally valued by investors, a lack of reliable and credible CSR information can lead to the exclusion of this information in assessing the market value of a firm for both professional (Haigh and Shapiro, 2013) and retail investors (Lackmann et al., 2012). Moreover, both investor groups value additional reliability through independently audited CSR information (Cohen et al., 2011; Cohen and Simnett, 2015; Rivière-Giordano et al., 2018), where the assurance of CSR reports increases stakeholders’ trust, organizational legitimacy and hence the perceived quality of these reports (Simnett et al., 2009; Zahller et al., 2015). Conversely, the failure to provide concise, complete and reliable firm disclosure is often associated with the firm’s underpricing due to the risk of uncertainty, transaction costs (Graham et al., 2005) and long-term credibility losses (Mercer, 2005; Elliott et al., 2012).

Greenwashing, as an opportunistic deviation of a substantial from a symbolic integration of environmental practices, represents an unreliable disclosure practice. Prior research has documented negative effects of corporate greenwashing on shareholder decision-making (Yang et al., 2020; Pizzetti et al., 2021). This literature has identified investors’ adverse reactions to greenwashing, such as negative effects on stock exchange ratings (Du, 2015) and lower financial performance (Testa et al., 2018; Walker and Wan, 2012; Wu and Shen, 2013). Investors tend to punish firms that purport to be good corporate citizens when they are not (Sinclair-Desgagné and Gozlan, 2003).

In contrast to these studies that mostly focus on the effect of greenwashing for firms that have already been exposed to media coverage, we study the extent to which media reports inform retail investors when making investment decisions. Specifically, we conjecture that the media helps investors detect and react to corporate greenwashing. Investors – especially retail investors – cannot observe all the types of firm misconduct because they face cognitive and resource constraints. We know from prior research that investors appear to struggle with limited attention, information overload and the obscured interaction between financial and nonfinancial information, making it difficult to interpret CSR information accurately (Pilaj, 2017; Neumann et al., 2011). Due to these limitations, investors systematically fail to discover greenwashing (Barnett, 2014; Li et al., 2023). We hypothesize that media reports on corporate greenwashing increase the investor scrutiny of firm self-description on CSR performance and help investors uncover greenwashing. Ultimately, we propose that if retail investors are better able to detect greenwashing, then they also show greater responses to greenwashing, such as de-investment in firms that engage in such deceptive disclosure practices. We state the following:
H1. Investors react to media reporting on corporate greenwashing by reducing their investments in firms that engage in greenwashing.

Investor social preferences and their reactions to corporate greenwashing

We next investigate which types of investors react negatively to media reports on greenwashing and why. Prior research challenges the standard economic assumption that self-interested investors only forgo beneficial opportunistic actions for strategic or reputational concerns. Self-interested investors may also forgo beneficial opportunistic actions for other reasons (e.g. Bénabou and Tirole, 2006). Investment decisions appear to be driven at least partially by investors’ characteristics and preferences. Indeed, prior literature suggests two mechanisms for why investors potentially care about CSR.

First, some investors appear to have a predominantly instrumental view of CSR and CSR reporting. They perceive firms’ CSR performance as a strategy to secure long-term, positive financial return (Bénabou and Tirole, 2010) and as a means to effectively reduce investment risk (Harjoto and Laksmana, 2018). Previous findings suggest that this investor clientele is sensitive to corporate fraud and deceptive reporting practices, as these practices impose a significant investment risk (Gibson et al., 2023). Greenwashing is typically a type of deceptive reporting and, hence, can lead to similar adverse reactions (Du, 2015). However, despite having an opportunistic and deceptive component, greenwashing is different from financial accounting fraud, as it typically bears less severe and less immediate reputational and legal consequences for the firm. For instance, Li et al. (2023) show that, at least for high information asymmetry markets, many firms are not affected by negative reputation despite being engaged in corporate greenwashing. To a certain degree, investors that primarily care about the financial dimensions of their investments might even expect firms to engage in symbolic disclosure practices such as greenwashing because such practices increase the firm attractiveness toward shareholders, at least in the short term (Patten, 2002; Mahoney et al., 2013). It is hence not clear ex-ante how investors who predominantly care about the financial implications of their investment react to media reports on greenwashing.

In contrast, other investors care about CSR for moral, non-prudential reasons. These investors mainly care whether managers are truthful about their engagement and if the firms’ actions align with the investors’ social and moral preferences (Hong and Kacperczyk, 2009; Martin and Moser, 2016). These investors base their decisions not only on risk-return assumptions but also derive utility by investing in companies that engage in CSR activities, because the firm’s and the investors’ values match (Martin and Moser, 2016; Gödker and Mertins, 2018). For instance, Hong and Kostovetsky (2012) found strong evidence that political values and political affiliation influence the investment decisions of mutual fund and hedge fund managers to invest and hold socially irresponsible firms in their investment portfolios. With a focus on investment in sin stocks, Niszczota et al. (2022) found that individuals scoring high on either deontological or utilitarian response tendencies disapproved of investing in sin stocks. Specifically, the literature on sin stock identified a morality versus financial return trade-off as a primary driver of investing in such stocks. Along the same lines, Gibson et al. (2023) found that investors with strong social and moral preferences tend to prefer investing in firms with CEOs who do not engage in earnings management, even when such investments promise lower returns on their investments. Hence, certain investors derive utility from the congruence of their values and beliefs with their investment decisions.

We argue that greenwashing is a setting where mere risk-return considerations alone do not entirely explain investor responses to such symbolic CSR disclosure. We hypothesize
that non-prudential and moral reasons drive investor responses to greenwashing and, hence, we expect that investors who hold social and moral values react negatively to firms engaging in greenwashing compared to investors with purely prudential investment motives.

Here, we rely on the psychological concept of SVO. SVO is a concept that has been extensively researched in the psychological literature and recently also gained attention in the accounting literature (e.g. Cardinaels and Yin, 2015; Gibson et al., 2023). This research suggests that proself individuals tend to interpret information by considering the implications for their welfare and do not derive utility from others’ positive outcomes (De Bruin and Van Lange, 2000). In contrast, individuals with a prosocial value orientation care about how their decisions affect others. Prosocials have a genuine, intrinsic motivation rather than a financial motivation to invest with a firm they perceive as more congruent with their morals than others (Gibson et al., 2023). Prosocial investors consider moral values to which they are intrinsically committed and which they believe should be excluded from utilitarian trade-offs in their decision-making (Tetlock et al., 2000; Tanner and Medin, 2004; Tanner et al., 2022). Consequently, individuals with a high SVO pursue CSR value protection despite potential adverse financial outcomes (e.g. lower returns). Their decision is at least partially driven by non-consequentialist (deontological) principles (Baron and Spranca, 1997). Moreover, prosocials react with anger to a trade-off that affects their underlying morals and respond with denial when confronted with such a trade-off (Tetlock et al., 1996).

Prior research outlines that prosocials assign more weight to honesty than proselfs (Van Lange and Kuhlman, 1994) and react to exploitation by acting noncooperatively (Kelley and Stahelski, 1970). Prosocials are generally more willing to interact with companies with more desirable attributes, which they see as more congruent with their own morals and beliefs. Hence, we corroborate that prosocial investors view greenwashing as more negative and react more negatively to such behavior than proself investors. We hypothesize the following:

_H2._ Prosocial investors react more negatively to media reporting on greenwashing by reducing their investment with the firm engaging in greenwashing than do proself investors.

**Mediating role of trust in investor reactions toward corporate greenwashing**

Prior financial accounting literature draws a relatively clear picture of how misleading disclosure erodes trust in an organization (Catarinucci et al., 2003), which translates into adverse market reactions. Both theoretical (Mayer et al., 1995; Ryan and Buchholtz, 2001) and empirical (Colquitt et al., 2007) research identifies trust as an essential prerequisite for risk-taking behavior, such as investment under uncertainty. Hence, multiple studies point out that firms actively undertake reputation and trust-building through strategic disclosure to avoid share price turmoil and other adverse market effects (Healy and Palepu, 1995). For instance, managers systematically build trust with capital market participants by strategically releasing bad news earlier than good news (Graham et al., 2005; Mercer, 2005). In a similar vein, Elliott et al. (2012) found, with respect to firms’ restatements, that when a manager accepts responsibility (compared to a denial of responsibility) for a restatement, the willingness to invest with the firm increases. The authors find that trust mediates this process. Finally, with respect to earnings management, trust is impaired when the outcomes of earnings management suggest that managers have put their interests above shareholders’ interests and misrepresented the firm’s true economic performance (Hewitt et al., 2020).
Generally, when companies’ behavior is inconsistent with investors’ expectations, trust is damaged (Dirks and Ferrin, 2002; Kim et al., 2004). Breaking the rules or failing to keep promises are examples of behavior that damages trust (Bies and Tripp, 1996). Hence, we expect that greenwashing as an opportunistic disclosure strategy violates trust. With a focus on nonfinancial disclosure, the literature also suggests a substantial role of trust in stakeholders’ interaction with firms. Lins et al. (2017) outline the higher stock market returns and beneficial capital market effects for firms with a high CSR performance during a financial crisis. It is argued that this higher resilience toward exogenous shocks is effectively alleviated through previous investment in CSR, which counteracts the loss of general trust in the capital market through the shock. In a similar vein, Zahller et al. (2015) found that only high-quality CSR disclosures promote the level of organizational legitimacy that creates such resilience to exogenous shocks, suggesting that firms should avoid “soft talk.” Finally, Bridoux et al. (2016) show that with respect to potential trade-offs related to CSR and different stakeholder groups, stakeholders are not systematically more attracted to a firm that favors their group over another stakeholder group, and trust mediates the relationship between the trade-offs and stakeholders’ reactions. Building on the discussion on trust above, we come to our final hypothesis:

**H3.** The effect of greenwashing on investor judgments is partially mediated by investor trust in the firm.

**Methods**

**Participants and procedure**

We conduct a fully incentivized online experiment to isolate the effect of negative media reporting on corporate greenwashing and subsequent investment capital allocation. We recruited a representative sample of the German working population with the help of the panel service provider respondi. Prior research addressing the quality and generalizability of using nonprofessional investor participants from online markets found evidence that these participants replicate investment decisions of real market participants with sufficient quality (Owens and Hawkins, 2019) [5]. The sample consists of 247 participants [6]. Eighteen participants were excluded from the analyses because we were unable to assign them to one of the two SVO categories as the approach requires at least six choices for the individualistic and competitive, or the cooperative choice across the nine trials. The final sample consists of 229 participants, who are on average 46 years old (sd = 13.43) and with varying degrees of financial literacy and a sufficient degree of demographic variation. Of this sample, 55% were women (see Table 1).

In a context-rich case description, participants were asked to put themselves in the role of an investor who can invest a fixed sum across two fictional companies. Specifically, we provide the participants with a fictitious case about the investment in two German electric utility companies, an industry that is highly affected by environmental risks and therefore under great stakeholder scrutiny (Capelle-Blancard and Petit, 2019). After the case description, the participants received information about the firms’ business strategy. When designing this voluntary firm disclosure, we relied on real disclosure from two large German energy-producing companies. This voluntary disclosure highlights the firms’ pioneering role in fostering a change toward a more environmentally sustainable industry. For example, one firm described itself as follows:

Aton AG is the German market leader in sustainable development and therefore at the forefront of the energy transition. Aton AG therefore currently supports more than 170 projects in various areas of environmental protection and CO2 reduction. These include projects for education in environmental protection, nature conservation, and the protection of water ecosystems.
In a next step, participants in the treatment condition received two media quotes that emphasized greenwashing practices in the German electric utilities industry. Though we acknowledge the heterogeneity of media reports on greenwashing in practice, we made sure that the two media quotes used were very similar to ensure a sufficient degree of control in the experiment. More importantly, the media quotes do not simply reflect that the firms of our case engage in greenwashing but raise general awareness that greenwashing is a problem in the industry among some companies. When designing the manipulation, we relied on real media reports from German newspapers:

Some companies in the German electricity sector are masters of deception, portraying themselves as climate champions while lobbying to continue business as usual.

Compared to other countries, some German electric supplier sector firms are lagging behind in fighting climate change. The vast majority of energy production remains coal based.

Then, participants received information on the actual financial and nonfinancial performance of the two companies through performance indicators that cover the financial performance and environmental, social and governance (ESG) areas. The actual performance was displayed as the percentage change compared to the average performance over the past three years. A symbolic, opportunistic disclosure strategy was proxied by the discrepancy between disclosed environmental strategy and actual nonfinancial environmental performance depicted by the key performance indicators (KPIs). We designed the performance of the two companies so that Firm A outperforms Firm B on the short-term financial performance, while Firm B outperforms its counterpart regarding its environmental performance. We provided participants with KPIs regarding financial, ESG performance, representing the main sections of a financial and nonfinancial report. Specifically, participants were provided with information on how the company performed relative to the past three years. In addition, all participants received information on how both companies performed in comparison with their industry peers to better identify poor financial, or nonfinancial, performance (Table 2).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Media intervention</th>
<th>No media intervention</th>
<th>Overall</th>
<th>T-test</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>115</td>
<td>114</td>
<td>229</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>Mean (sd)</td>
<td>46.23 (12.89)</td>
<td>46.58 (14.00)</td>
<td>46.41 (13.43)</td>
<td>0.19</td>
<td>0.84</td>
</tr>
<tr>
<td>Sex</td>
<td>f/m/d in %</td>
<td>52.2/47.8</td>
<td>58.8/41.2</td>
<td>55.5/44.5</td>
<td>-1.00</td>
<td>0.32</td>
</tr>
<tr>
<td>Fin_Lit1</td>
<td>Yes/no in %</td>
<td>53.9/46.1</td>
<td>50.0/50.0</td>
<td>52.0/48.0</td>
<td>-0.59</td>
<td>0.56</td>
</tr>
<tr>
<td>Fin_Lit2</td>
<td>Mean (sd)</td>
<td>3.48 (1.22)</td>
<td>3.48 (1.29)</td>
<td>3.48 (1.25)</td>
<td>0.03</td>
<td>0.98</td>
</tr>
<tr>
<td>SVO</td>
<td>Proself/Prosocial in %</td>
<td>37.4/62.6</td>
<td>39.5/60.5</td>
<td>38.4/61.6</td>
<td>-0.32</td>
<td>0.75</td>
</tr>
<tr>
<td>CSR_Att</td>
<td>Mean (sd)</td>
<td>18.75 (3.01)</td>
<td>18.8 (2.58)</td>
<td>18.77 (2.80)</td>
<td>0.14</td>
<td>0.89</td>
</tr>
<tr>
<td>CSR_Pers</td>
<td>Mean (sd)</td>
<td>9.3 (1.76)</td>
<td>9.12 (1.93)</td>
<td>9.21 (1.85)</td>
<td>-0.71</td>
<td>0.48</td>
</tr>
</tbody>
</table>

**Notes:** The table presents descriptive statistics among all variables of interest (between the media and the no media intervention condition) and the result of a two-tailed t-test. Sex = distribution in percentage female; male; age (in years); financial literacy 1 (Fin_Lit1 = true-false question about the availability of financial investments in percentage); financial literacy 2 (Fin_Lit2 = mean on a five-item Likert scale measuring how often participant reads financial news); social value orientation; (SVO = percentage of investors with a proself, or a prosocial value orientation); attitude toward CSR (CSR_Att = mean over six questions measured on a four-item scale); personal CSR behavior; (CSR_Pers = mean over three questions measured on a four-item scale).

**Source:** Table created by authors

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Corporate greenwashing
<table>
<thead>
<tr>
<th>Measure</th>
<th>Explanation</th>
<th>(% \text{ change compared to the average of the past three years})</th>
<th>(% \text{ change compared to the average of the past three years})</th>
<th>Industry average (% change to the average of the past three years)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Financial</strong></td>
<td></td>
<td><strong>Aton AG</strong></td>
<td><strong>Emos AG</strong></td>
<td></td>
</tr>
<tr>
<td>Revenue</td>
<td>Total products and services sold in the fiscal year</td>
<td>+5</td>
<td>+1</td>
<td>+1</td>
</tr>
<tr>
<td>Net profit</td>
<td>Profit of the company after the deduction of all operating costs and taxes</td>
<td>+6</td>
<td>+2</td>
<td>+2</td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total GHG emissions</td>
<td>Greenhouse gas emissions of a company (e.g. (-2) corresponds to a reduction of (2) in the company)</td>
<td>-1</td>
<td>-6</td>
<td>-5</td>
</tr>
<tr>
<td>Activities with significant negative impacts on local communities</td>
<td>Number of corporate operations, such as opencast brown coal mining, with negative impacts on the local population (e.g. (-2) corresponds to a reduction of (2))</td>
<td>-0.5</td>
<td>-3.5</td>
<td>-3</td>
</tr>
</tbody>
</table>

**Notes:** Please assume that both companies are comparable in terms of company size and market share in the German energy market. All of the following information has been externally verified. You can therefore assume that it is correct. The original experiment was conducted in German.

**Source:** Table created by authors
We stressed that these performance indicators were taken from the annual corporate report. Furthermore, we explained to participants that these performance indicators were audited and represent the true economic and environmental performance of the firms.

The financial performance of Firm A was depicted as relatively higher compared to Firm B, while Firm B had a higher environmental performance, contributing to the fact that to achieve higher environmental performance, short-term financial disadvantages need to be taken into account (Cappucci, 2018). Hence, we refer to Firm A as HFP and Firm B as HEP. This setting allows us to investigate whether participants consider the fact that the HFP claims to be a superior environmental performer despite this claim not being confirmed by its actual nonfinancial performance in their investment allocation decision. The nonfinancial performance of the social and governmental section is held constant for both companies. This experimental design that includes trade-offs between different performance dimensions builds on prior research using a comparable setting (e.g. Lindermüller et al., 2021; Libby et al., 2004).

The participants were then asked to allocate a fixed sum to one of the two fictitious companies. They were instructed that the success of their investment decision, and hence their performance-based renumeration in the experiment, depends on the firms’ future performance. Specifically, participants were told that the success of the investment would depend on various factors, such as future sales, environmental incidents and reputational and legal risks. Moreover, they were informed that the financial and nonfinancial KPIs that can be assessed prior to their investment decision can be used to assess the likelihood of these events materializing. Participants received a fixed amount of EUR 1 (approximately US$ 1) for their participation and a variable amount up to EUR 1.50, depending on their choices and the success of their investment. After deciding to allocate capital to one of the two fictitious companies, the participants conducted a comprehension check and answered post-experimental questions. We assess participants’ trust in the two firms using a three-item Likert scale. Trust is calculated as the average score across these items. Specifically, we ask participants whether they perceive the firms as “trustworthy,” “honest” and “credible.” Moreover, we measure participants’ general attitude toward the social responsibility of a business based on a six-item scale (Kolodinsky et al., 2010; Singhapakdi et al., 1996). We also measure participants’ personal attitudes toward environmentally responsible behavior in their everyday lives (Singh, 2016), as well as demographic variables.

**Manipulations**

We conducted a $2 \times 2$ online experiment. As a between-subjects factor, the experiment used a treatment and a control condition for testing the effect of media reports and poor, symbolic disclosure on the subsequent investment allocation. The participants were randomly assigned to one of the two groups. Participants in the treatment condition ($n = 115$) received media quotes that emphasized the poor environmental performance within the German electric utilities industry, despite presenting itself as environmental leaders. More importantly, we did not simply specify that one firm engaged in greenwashing. In a more subtle way, the presented media quotes raise general awareness about firms engaging in greenwashing in the German electric utilities industry. In the control group ($n = 114$), no such information was provided. When designing our media reports, we based our description on real media reports and thereby referred to the current public and academic debate on companies not showing sufficient effort to pursue a real change in their environmental strategy (e.g. Hummel and Schlick, 2016).

As the second between-subjects factor, we measured participants’ SVO, a concept that has demonstrated excellent psychometric qualities (Van Dijk et al., 2004) and is
consequently widely applied in psychological literature and various accounting research contexts (e.g. Cardinaels and Yin, 2015; Gibson et al., 2023). We measured SVO by the Decomposed Game Measure (Van Lange et al., 1997), a task that consists of nine trials in which each participant was asked to choose between three combinations of outcomes for themselves and one hypothetical other person. We categorized participants as prosocial investors \((n = 141)\) when they chose the cooperative alternative in six out of nine SVO trials. In contrast, participants who selected the individual or competitive alternative in six or more trials were grouped as proself investors \((n = 89)\) \([9]\). Because this approach requires at least six consistent choices, we were unable to assign 18 participants to either category \([10]\).

Dependent variable
As the dependent variable, we measure participants’ willingness to allocate an investment budget (100,000 EUR) across the two firms. To create a realistic setting, we pointed out that the participant’s performance-based remuneration is dependent on the outcome of their investment decision, which in turn depends on the presented financial and nonfinancial information. As the participants had the possibility to allocate the available 100,000 EUR completely as percentages over the two companies, while ensuring that the total always adds up to 100\%, a higher investment in one company inevitably implies a reduced investment in the other company. For example, if participants choose to invest 60\% (equivalent to 60,000 EUR) in one firm, it automatically implies an investment of 40\% (or 40,000 EUR) in the other firm. Figure 1 summarizes the experimental procedure.

Results
Investor reactions to media reports on corporate greenwashing
In \(H1\), we propose that media reporting on corporate greenwashing leads, on average, to higher investment in the HEP (and hence, a de-investment in the HFP). To test the hypothesis, we compared participants’ investments in HEP and HFP between the two experimental conditions. Table 3 panel A provides the descriptive statistics. In the no media intervention condition, the participants invested significantly more funds in HFP (55.55\%) than in HEP (44.45\%), \(t = 3.64, p < 0.01\) (one-tailed). That means that in the absence of media reports on corporate greenwashing, the firm that engages in greenwashing and outperforms on financial performance receives more funds. This picture reverses in the presence of media reports. In this condition, participants invested 44.43\% in the HFP and 55.57\% in the HEP. This difference is significant, \(t = -3.57, p < 0.01\) (one-tailed). The presence of media reports leads to an average investment increase in the HEP of 11,120 EUR. These results suggest that greenwashing is successful for firms as long as investors are not aware of the deceptive CSR disclosure. In the presence of media reports, however, investors react more negatively toward greenwashing and prefer to invest with the company that delivers substantial CSR performance. This provides support for \(H1\).

Heterogeneous investor reactions to media reports on corporate greenwashing
We expect these negative reactions to greenwashing to differ between prosocial and proself investors. Figure 2 presents the graphical results of the investment in the HEP separately for proself and prosocial participants in the presence and absence of media reports. The Figure 2 highlights an ordinal interaction between participant SVO and media intervention. Both types of investors react to the media reports by investing more funds in the HEP relative to HFP. However, the Figure 2 also shows that the effect is much more prominent for prosocial investors. Simple effects presented in Table 4 illustrate that in the absence of media reports, the investment choices do not differ between proself and prosocial investors,
Recruitment
Participants (n = 229) were invited to the online questionnaire via a panel service provider response.

Case description
The participants were asked to cast the role of an investor who is required to invest a fixed amount in one of the two fictional German electric utility companies. Moreover, participants received information about the firms’ business strategy, highlighting themselves as environmental leaders.

Treatment Condition (Media Intervention)
Participants were provided with media reporting about firms of electric utility companies engaging in Greenwashing (n = 115).

Control Condition (No Media Intervention)
Participants were not provided with media reporting about firms of electric utility companies engaging in Greenwashing (n = 114).

Random assignment to the between-subjects manipulation

Judgements
- Participants received financial and non-financial information about the two companies.
- One firm (HEP) consistently outperforms the other firm (HFP) on environmental performance dimensions and underperforms on financial dimensions and vice versa.
- Participants had to indicate how to spend a fixed sum as percentage shares to the two companies while one company outperforms short-term financial performance but underperforms its counterpart regarding its environmental performance.

Post-experimental questions
- Comprehension Checks
- Measurement Social Value Orientation (SVO), Trust

Source: Figure created by authors

$t = -1.060, p = 0.1457$ (one-tailed). However, with media intervention, prosocial participants invest more heavily in the HEP than prosocial investors do, $t = -3.248, p < 0.01$ (one-tailed). In fact, the media reports positively affect the investment in the HEP for prosocial investors ($t = -3.807, p < 0.01$, one-tailed), while proself investors do not invest significantly more funds in the HEP in the presence of media reports vs in their absence ($t = -1.021, p = 0.155$, one-tailed). In the presence of media reports, prosocial investors, on average, invest 14,250 EUR more in the HEP compared to their proself counterparts.

Finally, we use a contrast-coded ANOVA comparing the media intervention and prosocial investors cell with all the other cells. Specifically, we compared the media intervention and prosocial investors cell against the other three cells using the contrast weights $-1, -1, -1$ and 3 and find that this contrast is indeed significant ($F = 8.362, p < 0.01$, two-tailed). We conducted a one-way ANOVA for the remaining three cells to test whether any significant variation remains among those cells. We found no significant difference between these cells ($F = 0.699, p = 0.499$), confirming the finding that only prosocial investors significantly differ in their investment behavior in the presence of media reporting on greenwashing. Taken together, these results suggest that the effect of the media reports on the investment in the HEP is essentially driven by the group of investors with a prosocial value orientation, thereby providing evidence for $H2$. 
Table 3. Participant investment decision (H1)\textsuperscript{a}

<table>
<thead>
<tr>
<th>Media intervention\textsuperscript{b}</th>
<th>Willingness to invest in HFP</th>
<th>Willingness to invest in HEP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Media intervention</td>
<td>44.43 (23.70)</td>
<td>55.57 (23.70)</td>
</tr>
<tr>
<td>No media intervention</td>
<td>55.55 (23.03)</td>
<td>44.45 (23.03)</td>
</tr>
</tbody>
</table>

Panel A: Average willingness to invest in HFP and HEP by condition

Panel B: Pairwise comparisons\textsuperscript{d}

<table>
<thead>
<tr>
<th>Comparison</th>
<th>d.f.</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Media intervention (HFP) vs Media intervention (HEP)</td>
<td>228</td>
<td>−3.57</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>No media intervention (HFP) vs no media intervention (HEP)</td>
<td>226</td>
<td>3.64</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

Notes: \textsuperscript{a}The dependent variable is the percentage investment of funds participants invest in one of the two companies. \textsuperscript{b}We manipulated the two companies on two levels: Media Intervention (negative media reports) and No Media Intervention (no media reports). \textsuperscript{c}We manipulated company performance on two levels: A company with comparatively higher financial performance and comparatively lower environmental performance (HFP) and the other with comparatively lower financial performance and comparatively higher environmental performance (HEP). \textsuperscript{d}We report one-tailed \textit{p}-values for the pairwise comparisons.

Source: Table created by authors

Figure 2. Means participant investment dependent on SVO

Source: Figure created by authors

Table 4. Pairwise comparisons investment in HEP based on participant’s SVO\textsuperscript{a}

<table>
<thead>
<tr>
<th>Comparison</th>
<th>d.f.</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prosocial investment in HEP in the presence vs absence of media intervention</td>
<td>139</td>
<td>−3.807</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Proself investment in HEP in the presence vs absence of media intervention</td>
<td>86</td>
<td>−1.021</td>
<td>0.155</td>
</tr>
<tr>
<td>Prosocial investment vs proself investment in HEP in the absence of media intervention</td>
<td>112</td>
<td>−1.060</td>
<td>0.1457</td>
</tr>
<tr>
<td>Prosocial investment vs proself investment in HEP in the presence of media intervention</td>
<td>113</td>
<td>−3.248</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

Notes: \textsuperscript{a}The dependent variable is the percentage of investment of all available money in HEP. We report one-tailed \textit{t}-tests for the pairwise comparisons.

Source: Table created by authors
To confirm these results and test whether these findings survive when controlling for various (demographic) variables, we conduct regression analyses. First, Table 5 provides the correlation statistics for our full sample. As expected, media intervention correlates positively with investment in HEP. We further find that SVO correlates positively with investing in HEP, suggesting that prosocials invest on average more funds in HEP than their proself counterparts. Finally, the Table 5 shows that ΔTrust (by ΔTrust, we denote the difference in perceived trust between the HEP and the HFP) correlates positively with the investment in HEP.

We now turn to the regression results (see Table 6), where the investment in HEP is our dependent variable. We control for participants’ gender (Male), Age and financial literacy (Fin_Lit1 and Fin_Lit2) in all regressions. Because prior research observed that individuals’ attitudes toward CSR affect their investment choice (Gödker and Mertins, 2018), we also control for CSR attitude (CSR_Att) and their attitude toward acting environmentally responsibly (CSR_Pers) and ΔTrust. This allows us to tease out the effect of SVO net of any other potentially confounding factors [11].

Column (1) of Table 6 shows that some control variables indeed affect the investment in HEP. Specifically, we find that female participants invest more heavily in HEP than do male participants (we discuss these findings in the additional results section). Not surprisingly, ΔTrust positively affects investment in HEP, suggesting that the more participants trust HEP relative to HFP, the more they invest with HEP. In Column (2), we include Media Intervention in the model and find a positive effect of the media intervention on the investment in the HEP. This supports the results we obtain in the ANOVA analyses and confirms H1. Column (3) shows the positive direct effect of the second main variable SVO. The results suggest that prosocial (proself) participants invest more (less) in HEP. In Column (4), we include both main predictors in a single model; both positive direct effects remain significant. In Column (5), we test the interaction between Media Intervention and SVO. H2 holds that prosocial investors react more negatively to the media intervention on greenwashing than proself investors. The interaction between SVO and Media Intervention is indeed positive and significant and echoes the effects shown in Table 4 and Figure 2. The results suggest that the positive effect of the media intervention on the investment in the HEP is mainly driven by investors with a prosocial value orientation. These findings support H2.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Invest in HEP</th>
<th>Media intervention</th>
<th>Age</th>
<th>Sex</th>
<th>Fin_Lit1</th>
<th>Fin_Lit2</th>
<th>SVO</th>
<th>CSR_Att</th>
<th>CSR_Pers</th>
<th>ΔTrust</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invest in HEP</td>
<td>1.00</td>
<td>0.23*</td>
<td>0.01</td>
<td>-0.13</td>
<td>0.06</td>
<td>-0.09</td>
<td>0.21*</td>
<td>0.16*</td>
<td>0.15*</td>
<td>0.52*</td>
</tr>
<tr>
<td>Media Intervention</td>
<td>0.23*</td>
<td>1.00</td>
<td>-0.01</td>
<td>0.07</td>
<td>0.04</td>
<td>0.01</td>
<td>0.02</td>
<td>0.00</td>
<td>0.06</td>
<td>0.15*</td>
</tr>
<tr>
<td>Age</td>
<td>0.00</td>
<td>-0.01</td>
<td>1.00</td>
<td>0.27*</td>
<td>-0.07</td>
<td>0.11</td>
<td>-0.07</td>
<td>-0.09</td>
<td>0.00</td>
<td>-0.07</td>
</tr>
<tr>
<td>Sex</td>
<td>-0.13*</td>
<td>0.07</td>
<td>0.28*</td>
<td>1.00</td>
<td>0.16*</td>
<td>0.26*</td>
<td>0.09</td>
<td>-0.16*</td>
<td>-0.13</td>
<td>-0.06</td>
</tr>
<tr>
<td>Fin_Lit1</td>
<td>0.07</td>
<td>0.04</td>
<td>-0.07</td>
<td>0.16*</td>
<td>1.00</td>
<td>0.34*</td>
<td>0.08</td>
<td>0.08</td>
<td>0.07</td>
<td>0.02</td>
</tr>
<tr>
<td>Fin_Lit2</td>
<td>-0.08</td>
<td>0.00</td>
<td>0.13</td>
<td>0.27*</td>
<td>0.35*</td>
<td>1.00</td>
<td>0.07</td>
<td>0.02</td>
<td>0.12</td>
<td>-0.08</td>
</tr>
<tr>
<td>SVO</td>
<td>0.20*</td>
<td>0.02</td>
<td>-0.07</td>
<td>0.09</td>
<td>0.08</td>
<td>0.07</td>
<td>1.00</td>
<td>0.26*</td>
<td>0.11</td>
<td>0.16*</td>
</tr>
<tr>
<td>CSR_Att</td>
<td>0.14*</td>
<td>-0.01</td>
<td>-0.10</td>
<td>-0.16*</td>
<td>0.08</td>
<td>0.03</td>
<td>0.27*</td>
<td>1.00</td>
<td>0.52*</td>
<td>0.09</td>
</tr>
<tr>
<td>CSR_Pers</td>
<td>0.12</td>
<td>0.06</td>
<td>-0.02</td>
<td>-0.13*</td>
<td>0.06</td>
<td>0.13*</td>
<td>0.11</td>
<td>0.52*</td>
<td>1.00</td>
<td>0.05</td>
</tr>
<tr>
<td>ΔTrust</td>
<td>0.48*</td>
<td>0.15*</td>
<td>-0.09</td>
<td>-0.06</td>
<td>0.02</td>
<td>-0.09</td>
<td>0.12</td>
<td>0.08</td>
<td>0.04</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Notes: The table present the Spearman above and the Pearson correlations below the diagonal; *indicates significance at the 5% level
Source: Table created by authors

Table 5. Correlation matrix for main experiment
## Table 6.
Investment choices in HEP and investor SVO

<table>
<thead>
<tr>
<th>Variable</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SVO</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Media intervention</td>
<td></td>
<td></td>
<td>7.259** (0.02)</td>
<td>7.284** (0.01)</td>
<td>1.977 (0.62)</td>
</tr>
<tr>
<td>Media Intervention x SVO</td>
<td></td>
<td>8.162*** (0.00)</td>
<td></td>
<td>8.181*** (0.00)</td>
<td>1.410 (0.73)</td>
</tr>
<tr>
<td>CSR_Att</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fin_Lit1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fin_Lit2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ΔTrust</td>
<td>11.222*** (0.00)</td>
<td>10.590*** (0.00)</td>
<td>10.840*** (0.00)</td>
<td>10.205*** (0.00)</td>
<td>10.192*** (0.00)</td>
</tr>
<tr>
<td>Observations</td>
<td>229</td>
<td>229</td>
<td>229</td>
<td>229</td>
<td>229</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.261</td>
<td>0.289</td>
<td>0.280</td>
<td>0.308</td>
<td>0.321</td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.237</td>
<td>0.263</td>
<td>0.254</td>
<td>0.280</td>
<td>0.289</td>
</tr>
</tbody>
</table>

**Notes:** The table shows the results of the OLS regressions on the investment choices in the HEP. The dependent variable is the percentage investment in the HEP. Participants were required to allocate a fixed sum on a percentage basis to either the HFP or the HEP. SVO represents the social value orientation of the participants. We categorized participants as prosocial when they chose the cooperative alternative in six out of the nine SVO items. We include SVO as a dichotomous variable (proself = 0, prosocial = 1). Media Intervention (0 = no media, 1 = media reports) represents the treatment condition where participants receive media reports. P-values are reported in parentheses; ***1% significance, ** 5% significance and *10% significance.

**Source:** Table created by authors
Mediating role of trust in relationship between media reporting and investments

Overall, in our experiment, participants invested 55.57% of their funds in the HEP when media reports were present. In contrast, when these reports were absent, investors invested only 45.45% of their funds in the HEP. In what follows, we want to understand the processes that drive investor reactions to media reports on greenwashing. Specifically, H3 holds that trust mediates the relationship between media reports on corporate greenwashing and investment choices. The descriptive results for participants’ trust in the firms, as shown in Figure 3, support our assumption. The Figure 3 shows that the media intervention affects participants’ perceived trust by reducing trust in the HFP. Pairwise comparisons in Table 7 confirm these results. While perceived trust levels do not significantly differ between both firms without the media intervention, \( t = -0.22, p = 0.41 \) (one-tailed), they do significantly differ in the media intervention condition, \( t = -2.25, p = 0.01 \). We find that this is because trust in the HFP in the presence of media reports is lower than in the absence of media reports, \( t = 1.42, p = 0.07 \) (one-tailed). The media intervention does not materialize in a greater trust toward the HEP, \( t = -0.44, p = 0.67 \) (one-tailed).

We next conduct a mediation analysis using the PROCESS macro for R (Hayes, 2017). For our mediation analysis, we make use of our computed summary variable \( \Delta Trust \) depicting the comparative perceived trust between the two companies, HEP and HFP.

![Figure 3. Trust in HFP and HEP](image)

Source: Figure created by authors

<table>
<thead>
<tr>
<th>Pairwise comparisons</th>
<th>d.f.</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No media intervention (HEP) vs Media intervention (HEP)</td>
<td>227</td>
<td>-0.44</td>
<td>0.67</td>
</tr>
<tr>
<td>No media intervention (HFP) vs Media intervention (HFP)</td>
<td>227</td>
<td>1.42</td>
<td>0.07</td>
</tr>
<tr>
<td>Media intervention (HFP) vs Media intervention (HEP)</td>
<td>228</td>
<td>-2.25</td>
<td>0.01</td>
</tr>
<tr>
<td>No media intervention (HFP) vs No Media intervention (HEP)</td>
<td>226</td>
<td>-0.22</td>
<td>0.41</td>
</tr>
</tbody>
</table>

Notes: “The dependent variable is Trust in HEP and in HFP, respectively. Trust is the mean of a summary variable depicting participants’ perceived honesty of the respective two companies. We report one-tailed p-values for the pairwise comparisons. We manipulated the two companies on two levels: media intervention (negative media reports) and no media intervention (no negative media reports). We manipulated company performance on two levels: a company with comparatively higher financial performance and comparatively lower environmental performance (HFP) and its counterpart (HEP).

Source: Table created by authors
Figure 4 depicts the paths of the respective coefficients and p-values. Figure 4 shows that the mediation model strongly supports a mediating role of ΔTrust in the media reports and participants’ investment choices relationship. The positive and significant path coefficient between Media Intervention and ΔTrust (path a = 0.28; p = 0.022) shows that when media intervention is present, investors perceive HEP as relatively more trustworthy compared to the HFP. Moreover, the significant path coefficient between ΔTrust and the investment in the HEP suggests that the higher the relative trust between HEP and HFP, the more the participants invest with HEP (path b = 0.450, p < 0.001). A significant direct effect remains between the intervention and the investment in HEP (path c = 0.328, p = 0.005). These results support H3.

In additional analyses, we do not find that the effects differ between prosocial and proself participants. In Figure 5, we make use of the computed summary variable ΔTrust depicting perceived trust between both companies and separate proself and prosocial investors.

**Notes:** Dependent variable: percentage investment in the HEP. Independent variable: media intervention (0 = no media intervention, 1 = media intervention). Mediator: ΔTrust (Likert scale from 1 – 6, 1 = strongly disagree, 6 = strongly agree)

**Source:** Figure created by authors
Figure 5 shows that media reports increase the trust in HEP relative to HFP. This finding holds for both types of investors. We also calculate a moderated mediation model with PROCESS (not tabulated) and do not find that the path between \( \Delta Trust \) and investment in HEP is moderated by SVO. This suggests that proselfs react in the same way as prosocials in terms of their trust perceptions, i.e. \( \Delta Trust \) increases in the condition with media reports for both types of investors. However, this increase in \( \Delta Trust \) does not translate into the same investment behavior for proselfs as it does for prosocial investors.

Additional results and robustness analyses
In the main regression analysis (Table 6), we observe a gender effect in that female participants generally invest more in HEP than their male counterparts. We do not find that women react more or less strongly to media intervention than men but prefer to invest more heavily in HEP than male participants across both conditions (see Figure A1 in the Appendix). This is particularly interesting given that we control for both social preferences (SVO) and CSR attitude. In fact, we find that women and men do not differ in their SVO (see Table A1 in the Appendix). Obviously, it is not the potential differences in social preferences that drive the effect. Hence, a more likely explanation for this gender effect is that we know that women are less risk-tolerant than men (Sundén and Surette, 1998; Olsen and Cox, 2001; Charness and Gneezy, 2012; Carter et al., 2017) and might put more weight on the potential CSR-related risk that goes along with investing in HFP.

Second, given the SVO classification approach by Van Lange and Kuhlman (1994), we are not able to classify 19 participants in either category. We also use a median split classification of SVO to test in the regression analysis. We find that all effects hold using this median split SVO variable (see Table A2 in the Appendix).

Discussion and conclusion
In this paper, we investigate retail investors’ responses to media reports on corporate greenwashing and examine how these responses differ between investors with a prosocial and a proself value orientation. We find that retail investors react to corporate greenwashing by reducing their investment in the company engaging in greenwashing, but only in the presence of media reporting emphasizing potential deceptive nonfinancial disclosure in the industry. Thereby, we add to prior findings that investors penalize firms by withholding funds if a company engages in greenwashing (Du, 2015; Lins et al., 2017; Berrone et al., 2017). Here, our results align with findings from prior literature suggesting that investors value higher quality assurance over lower quality assurance, suggesting that CSR reporting quality plays a crucial role in investment decisions (Rivière-Giordano et al., 2018). However, our results support the idea that greenwashing is often difficult for many retail investors to detect, highlighting the pivotal role of media with its information processing capacities in this process. Our findings add to prior literature outlining the crucial role of intermediaries, such as media and NGOs, in ensuring reliable nonfinancial disclosure (e.g. Hombach and Sellhorn, 2019; Islam et al., 2018). Our results also contribute to prior findings from Lyon and Maxwell (2011), who found that greenwashing firms might curtail CSR disclosure when exposed to NGO and activist pressure due to a higher risk of discovery. We add to this by showing that this pressure indeed negatively affects these firms and gets (some) investors to allocate more funds to the non-greenwashing firm. Understanding the role of the media in helping investors uncover and react to greenwashing is important; greenwashing is widely used by firms in various contexts, and only a few firms are subject to relevant public scrutiny (Delmas and Burbano, 2011; Seele and Gatti, 2017). Our results call for greater
media scrutiny, given that at least some investors consider these reports when making investment decisions.

Moreover, our results show that adverse reactions to greenwashing are mainly driven by investors with a prosocial value orientation, suggesting that these investors actively respond to the media intervention and consider deceptive disclosure in the form of greenwashing in their subsequent investment decision. In that vein, we contribute to prior literature suggesting that capital allocation decisions are driven by investors’ financial and nonfinancial considerations and that these motives largely depend on stable investor traits. Prior literature emphasized the intrinsic costs in decisions that deviate from individuals’ social norms and values (Gibson et al., 2013) and how these traits influence investment choices (Hong and Kostovetsky, 2012). Our findings add to prior research on how stable investor traits shape investor responses to firm CSR performance and managerial misreporting (Niszczota et al., 2022; Gibson et al., 2023) and embed these findings in a greenwashing context. Specifically, our results show that prosel investors do not consider or put less weight on a greenwashing-induced financial risk in their investment decision.

In addition, we find that the effect of greenwashing on investment choices is partially mediated by trust in the respective firm. We also find that prosel and prosocial investors react similarly to the media intervention with respect to their trust perception of the two firms. However, the relative increase in perceived trust in the company not pursuing the greenwashing strategy does not translate into increased investments of prosel investors in this company. This means retail investors with a prosel value orientation are aware of the deceptive disclosure strategy through the media intervention, and they react with lower trust in the company pursuing this strategy. However, this investor group puts less weight on these trust considerations in the actual investment decision relative to their prosocial counterparts. Our results suggest that CSR and firm credibility risks and the resulting trust in the firm alone do not sufficiently explain investor responses, at least for more prosel-oriented investors. Our results for the prosel investors suggest that whereas trust is an important prerequisite, it does not necessarily mean that increased trust automatically translates into higher investment in the respective firm. We thereby extend the findings from prior literature emphasizing the relevance of trust as an essential prerequisite for risk-taking investment behavior (Ryan and Buchholtz, 2001; Zahller et al., 2015; Lins et al., 2017).

We also contribute to business practice. First, firms that cater to different types of investors need to consider that if they engage in greenwashing, this practice can result in adverse investor reactions not only due to an increase in distrust in firms pursuing the strategy but also because of perceived incongruence with investors’ social and moral values. Firms that cater to a broad investment clientele need to be aware that deceptive or poor-quality CSR reporting can deter certain investors. Second, especially for firms in industries under greater stakeholder scrutiny, the “watchdog” role of the media is indeed pivotal for private investors to react toward firm deceptive reporting. That means greenwashing is only a beneficial strategy for firms as long as investors are unaware of this practice. Firms should be aware that investors react to negative media coverage, and that has direct negative implications for the firm.

Our research comes with limitations. First, we conducted our experiment with a representative sample of the German population as a proxy for retail investors. Hence, it is unclear whether our sample replicates investment decisions of more experienced investors. The findings might indeed differ for institutional investors due to their investment skills, horizons and experience (Barber and Odean, 2008; Cho et al., 2013). However, prior literature indicates that nonprofessional investors from online labor markets proxy retail investor examples with sufficient quality (Owens and Hawkins, 2019). Moreover, online labor market
samples generally provide results similar to retail investor samples with respect to investment decisions (Krische, 2019). However, it is important to note that our results do not speak for professional investors. Although retail investors represent a significant group of investors in the capital markets and are supposed to be one of the primary addressees of most of the recent mandated nonfinancial disclosure regulations, it remains unclear how more financially educated institutional investors might have reacted to poor, deceptive disclosure in a setting similar to ours. Future research should address that issue and examine how financial experience and education can help investors detect deceptive CSR reporting.

Second, although our experimental setup has several advantages, especially when investigating investors’ stable personality traits (which would probably not be possible using archival data), conducting experiments means that one needs to abstract from reality. Our experimental setup is abstract in that it does not provide the option to choose not to invest in either company. It also does not consider that investors usually have a number of alternative information sources at their disposal. Future archival research could address that issue and examine whether retail investors weigh various sources of financial information indicating corporate greenwashing similarly and how far this information is incorporated into their investment decisions. Moreover, in our experimental setting, media reports are simplified as a homogenous construct, whereas media reports in practice exhibit greater heterogeneity (e.g. the type of media outlet, its reputation, the political affiliation of the journalists). Investors might differ in their trust toward different sources. In a similar vein, negative narratives about firms engaging in greenwashing can stem from various other sources such as NGOs. Hence, it would be interesting for future research to examine how the effect of media reports on investment decisions depends upon the investors’ perception of the media outlet or alternative sources of information.

Additionally, as with any experimental research that uses variable compensation, we cannot fully rule out that experimenter demand effects influenced our results. Specifically, participants in our experiment could have guessed that investing with the firm that does not engage in greenwashing increases their variable remuneration. Consequently, participants could have chosen to invest with the HEP in the media condition as a strategic means of profit maximization. Despite this possibility, our findings, especially concerning the proself participants who predominantly invested with the HFP in the media condition, do not indicate the presence of such experimenter demand effects. Instead, our results show that the media intervention enhances investors’ capacity to discern greenwashing, consequently bolstering their trust in the HEP. However, we cannot fully rule out the potential impact of experimenter demand effects, as they might have influenced certain participants to favor the HEP in the media condition.

Finally, our study focused on the effect of a nonfinancial shock on retail investors’ choices. Although, by outlining the financial impact of greenwashing, our setting takes into account investors’ financial considerations, it remains unclear whether participants would react differently to a purely financial shock. Further research can address this issue and provide more accentuated insight into the underlying motives of different investor types.

Notes

1. We acknowledge that firm CSR disclosure today primarily addresses institutional investors due to their capital market relevance. However, as the Eurosif (2018) study suggests, the retail investor market for socially responsible investment (SRI) has grown exponentially from 2014 to 2018. Today, retail investors hold 40% of total financial assets in the EU and SRIs become more
important to this investor clientele. Accordingly, firms will need to cater to this investor clientele, and we deem it important to investigate how retail investors react to greenwashing.

2. We specifically focus on retail investors since these investors are increasingly concerned about CSR and, hence, care about the reliability of CSR disclosure (Madsbjerg, 2019; European Sustainable Investment Forum, 2018).

3. The discrepancy in the firms’ financial performance depicts the real-world problem that a substantial CSR strategy entails certain costs, at least in the short term (Cappucci, 2018). It further makes our manipulation conservative to make sure one firm is not simply a poor performer across all dimensions.

4. We see greenwashing as a special form of violation of the integrity dimension of trust. Prior literature has identified integrity trust as major characteristic of a company-stakeholder relationship. In such a relationship, integrity-based trust violation, such as manipulation, fraud and corruption are considered as a serious breach of trust (Brühl et al., 2018; Ferrin et al., 2007).

5. Our sample represents non-professional retail investors. The German working population is a suitable participant pool, given that many German employees invest – through, e.g. pension plans – in the stock market (in our sample, on average 52% of participants reported being invested in the capital market). We also ask participants how often they read the financial news (on a Likert scale from 1 to 5) and find that participants scored on average 3.48, which suggests a high level of interest in financial news.

6. 440 participants completed our study; we excluded 192 participants from the sample because they did not answer test questions correctly. In line with best practice, we used test questions to make sure participants carefully read the case and excluded those participants who failed two or more of three comprehension check questions.

7. We designed participants’ variable performance-based remuneration in a way that for investing in both firms, the expected return would be, on average, equal. However, to consider the higher risk structure of the HFP due to not addressing environmental risks and higher short-term returns in the performance-based variable remuneration, we allocated higher outcome probabilities to both very high and very low returns.

8. Various studies demonstrate that different levels of the participants’ remuneration do not interfere with their behavior if the participants are compensated proportionately to the opportunity cost of their time (see Davis and Holt, 1992, for an overview).

9. Our data are consistent with prior findings that the fraction of individuals with prosocial value orientation is about 60%–65% (Van Dijk et al., 2004). We also tested whether women significantly differ from men in their prosociality and could not find any significant difference in gender in our results (see Appendix Table A1 for further results).

10. As a further robustness check, we performed our main analysis with SVO as a median split. Using SVO median split as independent variable, our results remain robust across all analyses and tests. For further details, see Appendix Table A2.

11. Importantly, we conduct the regression analysis as shown in Table 6 without controlling for these variables and find that all effects hold.

References


Table A1.
Distribution of participants dependent on social value orientation

<table>
<thead>
<tr>
<th></th>
<th>Proself value orientation</th>
<th>Investor SVO value orientation</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Panel A</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>34</td>
<td>68</td>
<td>102</td>
</tr>
<tr>
<td>Female</td>
<td>54</td>
<td>73</td>
<td>127</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>88</td>
<td>141</td>
<td>229</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Panel B</strong></th>
<th>d.f.</th>
<th>$\chi^2$-value</th>
<th>$p$-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-square test for difference</td>
<td>2</td>
<td>2.0175</td>
<td>0.199235</td>
</tr>
</tbody>
</table>

**Notes:** The table shows the number of participants in each combination of social value orientation and gender. We categorized participants as prosocial ($N = 141$) when they chose the cooperative alternative in six out of the nine Investor_SVO items. They were categorized as proself ($N = 88$) when they chose the self-maximizing alternative in six out of the nine items.

**Source:** Table created by authors

Figure A1.
Investment in HEP dependent on gender

**Source:** Figure created by authors
Corresponding author
Matthias Sohn can be contacted at: sohn@europa-uni.de

Table A2: Investment choices in HEP and participants’ social value orientation (median split)

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SVO</strong></td>
<td>6.034*** (0.03)</td>
<td>8.191*** (0.00)</td>
<td>0.279 (0.94)</td>
<td>8.366*** (0.00)</td>
<td>5.763*** (0.03)</td>
</tr>
<tr>
<td><strong>Media intervention</strong></td>
<td>8.366*** (0.00)</td>
<td>5.763*** (0.03)</td>
<td>3.039 (0.38)</td>
<td>11.453*** (0.03)</td>
<td></td>
</tr>
<tr>
<td><strong>Media intervention x SVO</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CSR_Att</strong></td>
<td>0.703 (0.21)</td>
<td>0.784 (0.15)</td>
<td>0.380 (0.50)</td>
<td>0.478 (0.40)</td>
<td>0.350 (0.53)</td>
</tr>
<tr>
<td><strong>CSR_Pers</strong></td>
<td>0.699 (0.41)</td>
<td>0.546 (0.51)</td>
<td>-0.711 (0.40)</td>
<td>0.561 (0.50)</td>
<td>0.478 (0.56)</td>
</tr>
<tr>
<td><strong>Male</strong></td>
<td>-5.377* (0.06)</td>
<td>-5.843** (0.04)</td>
<td>-5.966** (0.04)</td>
<td>-6.396** (0.02)</td>
<td>-7.196*** (0.01)</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>0.160 (0.13)</td>
<td>0.160 (0.117)</td>
<td>0.175* (0.09)</td>
<td>0.175* (0.09)</td>
<td>0.168* (0.09)</td>
</tr>
<tr>
<td><strong>Fin_Lit1</strong></td>
<td>3.850 (0.18)</td>
<td>3.583 (0.201)</td>
<td>3.966 (0.16)</td>
<td>3.698 (0.18)</td>
<td>3.932 (0.15)</td>
</tr>
<tr>
<td><strong>Fin_Lit2</strong></td>
<td>-1.093 (0.35)</td>
<td>-0.996 (0.38)</td>
<td>-1.148 (0.31)</td>
<td>-1.051 (0.35)</td>
<td>-1.087 (0.33)</td>
</tr>
<tr>
<td><strong>ΔTrust</strong></td>
<td>11.618*** (0.00)</td>
<td>10.831*** (0.00)</td>
<td>11.315*** (0.00)</td>
<td>10.558*** (0.00)</td>
<td>10.530*** (0.00)</td>
</tr>
<tr>
<td><strong>Observations</strong></td>
<td>248</td>
<td>248</td>
<td>248</td>
<td>248</td>
<td>248</td>
</tr>
<tr>
<td><strong>R-squared</strong></td>
<td>0.296</td>
<td>0.324</td>
<td>0.310</td>
<td>0.337</td>
<td>0.351</td>
</tr>
<tr>
<td><strong>Adjusted R-squared</strong></td>
<td>0.275</td>
<td>0.302</td>
<td>0.286</td>
<td>0.312</td>
<td>0.323</td>
</tr>
</tbody>
</table>

Notes: The table shows the results of the OLS regressions on the investment choices in the HEP. The dependent variable is the percentage investment in the HEP. Participants were required to allocate a fixed sum on a percentage basis to either the HFP or the HEP. SVO represents the social value orientation of the participants. We categorized participants as prosel when they chose more than the median number of self-maximizing choices in the SVO task. Conversely, we categorized participants who chose less than the median number of self-maximizing choices in the SVO task as prosel investors. Media intervention represents the treatment condition where participants receive Media reports. p-values are reported in parentheses; ***1% significance; **5% significance and *10% significance

Source: Table created by authors

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