ESG and firm value effects of shareholder proposals

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Abstract

We investigate environmental, social, and governance (ESG) and firm value effects of more than 7,000 shareholder proposals submitted between 2006–2020. Using propensity score matching and a difference-in-differences setting, the results indicate that firms that receive an ESG- or carbon-related proposal have higher ESG Scores and lower carbon emission intensities than non-target firms in subsequent years. These effects are particularly pronounced for proposals sponsored by conventional investors that have no explicit sustainability agenda. We do not observe an influence on firms' absolute carbon emissions. These observations suggest that shareholder proposals have a limited effect on firms' carbon performance. With regards to financial performance, we find positive, albeit small, abnormal market reactions when information on ESG- or carbon-related proposals becomes available. This outcome may explain firms' tendencies to implement the demands of the proposal.

JEL classification: G14, G23, G34, M14

Keywords: shareholder activism, shareholder proposals, corporate social responsibility, ESG, carbon emissions

1. Introduction

For listed companies, the separation of ownership and control involves a principal-agent problem, which bears the risk of conflict between shareholders, the board of directors, and management (Gillan & Starks, 1998; Jensen & Meckling, 1976). The likelihood of shareholder activism increases when shareholders are dissatisfied with the way management is running the firm (Gillan & Starks, 2000). Shareholders can try to induce a change in business conduct through a broad spectrum of activities, such as divesting (i.e., selling their shares), engaging in negotiations with management, or submitting shareholder proposals (Admati & Pfleiderer, 2009; Becht et al., 2009; Gillan & Starks, 2000). The extant literature on the effects of shareholder activism has mainly focused on corporate governance (Aggarwal et al., 2019; Denis et al., 2020; Ertimur et al., 2010; Ertimur et al., 2011; Ferri & Sandino, 2009) and financial implications (Cuñat et al., 2012; Dimson et al., 2015; Flammer, 2015; Iliev & Lowry, 2015). Today, the requests and interests of shareholders frequently go beyond those aspects (Dikolli et al., 2021) and incorporate issues from the environmental or social domains (Boone et al., 2020).

In recent years, shareholder activism on environmental, social, and governance (ESG) issues has gained momentum (Dimson et al., 2015). For example, the percentage of ESG-related proposals of all proposals listed in the Institutional Shareholder Services (ISS) database increased from 29% in 2006 to 53% in 2020 (see Panel A of Figure 1). While prior research shows that shareholder activism can influence corporate governance structures and firm value, there is a lack of research on the effects on target firms' environmental and social performance. Rohleder et al. (2022) find that divestment – as a distinct form of shareholder activism – from carbon-intensive firms leads those firms to reduce their carbon emissions. Further, Flammer et al. (2021) find that shareholder proposals can elicit greater disclosure of climate risk information, but the authors do not analyze the effects on actual carbon emissions. Thus, the

actual effect of shareholder proposals on firms' ESG and carbon performance remains an unsolved puzzle. However, given the urgent need to address global challenges, such as meeting the Sustainable Development Goals or limiting global warming, it is important to analyze the extent to which shareholder proposals can serve as an effective mechanism for real world changes. To fill this research gap, we examine the effect of ESG- and carbon-related shareholder proposals on different measures of firms' ESG and carbon performance. Moreover, to identify possible determinants of the effects of shareholder proposals, we analyze whether the type of proposal sponsor (i.e., a conventional investor or an investor focused on socially responsible investing (SRI)) influences firms' performance.

We combine propensity score matching with a difference-in-differences approach. This setting allows us to determine a differential effect in the ESG and carbon performance of target firms and matched non-target firms, attributable to (not) receiving a respective shareholder proposal. Using the ISS database for US firms, our baseline sample consists of 7,448 ESG- and carbon-related proposals submitted between 2006 and 2020. The dependent variables are different measures of ESG performance, including an overall *ESG Score* and individual *E, S, and G Pillar Scores*, as well as different measures of carbon performance, including an *Emissions Score*, absolute carbon emissions, and carbon emission intensity. While the ESG and carbon performance is similar for target firms and matched non-target firms in the year before the annual shareholders' meeting takes place, after receiving a proposal, target firms show a greater increase in their ESG and carbon performance compared to non-target firms. Interestingly, the positive effect of carbon-related proposals on firms' carbon performance is limited to carbon emission intensity. Further, we find that the effects are particularly pronounced for proposals that are sponsored by conventional investors that have no explicit sustainability agenda.

Finally, we conduct an event study to analyze firm value effects of the submission ESG- and carbon-related proposals. For our treatment and control samples of firms, we compute average cumulative abnormal returns from one day before until one day after the release of the proposals' proxy material. While the cumulative abnormal returns do not show any significant pre- and post-event trends, we find positive, albeit small, abnormal market reactions for target firms when information on shareholder proposals becomes available. We find no significant effects for non-target firms. Overall, this indicates that investors assess ESG- and carbon-related proposals as value enhancing, which might explain firms' tendencies to implement the demands of the proposal.

We add to the literature on shareholder activism and complement recent evidence on the growing influence of shareholder proposals in the ESG context (Flammer et al., 2021). Our results provide robust evidence that firms targeted by ESG-related shareholder proposals subsequently improve their ESG performance. Similarly, carbon-related proposals have a positive, albeit limited, effect on firms' carbon performance. In this context, we contribute in particular to the growing body of literature on impact investing (Busch et al., 2021; Koelbel et al., 2020), which examines the extent to which investor activities can influence changes in corporate activities. Our results indicate that shareholder proposals are a promising approach for investors to induce an increase in firms' ESG and carbon performance, but that the extent of the effect is determined by the type of sponsor. Proposals submitted by conventional investors seem to have the greatest effect.

The results also have practical implications for both capital market participants and policymakers. On the one hand, they indicate that shareholders can pressure firms to become more sustainable without having to fear financial losses. On the other hand, they also show that the effects of shareholder activism have limits: while carbon-related proposals have an effect on firms' emission intensity, they do not have an effect on absolute emissions. However,

international climate targets aim to reduce absolute carbon emissions. Therefore, this study provides an important insight for policymakers into the limited effects of shareholder activism on real world changes.

2. Background and related literature

Disapproval of the business conduct of an investee firm can prompt shareholders to raise concerns, whereby they can voice their opinions in different ways (Iliev & Lowry, 2015; Li et al., 2021). Investors may (threaten to) sell their holdings, i.e., divest (Admati & Pfleiderer, 2009; Rohleder et al., 2022). Alternately, they can privately engage with the firm's management through meetings and discussions (Becht et al., 2009; Dimson et al., 2015) or they can express their opinions publicly by filing shareholder proposals (Gillan & Starks, 2000).

Submitting a proposal and voting at general assemblies are essential rights given to shareholders (Bach & Metzger, 2015). These are key mechanisms for investors to provide oversight of managerial behavior and communicate their views on how firms should be run (Boone et al., 2020; Prevost et al., 2016). Shareholder proposals pertain to a wide range of matters such as executive compensation or antitakeover amendments (Dikolli et al., 2021). Over the years, shareholder activism on ESG issues has become increasingly prevalent (Dimson et al., 2015).

However, research shows that the majority of shareholders tend to vote against shareholder-sponsored resolutions and, ultimately, only a few proposals pass (Li et al., 2021). In contrast to management-sponsored proposals, the resolutions of votes on shareholder-sponsored proposals are nonbinding in the United States (US) (Levit & Malenko, 2011). Even if a proposal receives majority support from shareholders, the firm's board can make its own determination of whether to adopt the proposal or not (Cuñat et al., 2012). As such, one might expect management to pay little attention to the demands of shareholders sponsoring and

supporting proposals (Flammer et al., 2021). Nevertheless, since the early 2000s, firms have taken the votes on shareholder proposals more and more seriously (Ertimur et al., 2010).

In the context of shareholder activism, one strand of literature examines the effect of shareholder activism on firms' corporate governance performance, policies, and structures. Studies indicate that shareholder proposals can be impactful and induce management to adjust business practices to be in line with the aims of the proposals (Cuñat et al., 2012; Flammer, 2015). Specifically, prior research has shown that shareholder proposals on common corporate governance issues are a driver of governance change (Ertimur et al., 2010; Ertimur et al., 2011). Aggarwal et al. (2019) find that directors who receive low shareholder support in elections are more likely to leave the board within one year. Other studies indicate that shareholder proposals related to CEO compensation ("Say on Pay") are followed by changes in the amount of CEO pay (Denis et al., 2020; Ferri & Sandino, 2009).

Another strand of literature investigates the effect of ESG-related shareholder activism on firm value. Rohleder et al. (2022) show that divestment from carbon-intensive firms puts pressure on stock prices. Flammer et al. (2021) suggest that expected improvements to the ESG and carbon performance of target firms are rewarded by the market, while non-reforming firms experience declines in firm value. Similarly, Dimson et al. (2015) observe positive abnormal stock returns for successful investor engagements on ESG issues. Cuñat et al. (2012) and Flammer (2015) show that the passing of ESG-related proposals has a positive impact on shareholder value in the years following the vote. However, Gillan and Starks (2000) find that, in general, shareholder proposals are not associated with significant stock market reactions. Rather, the effect on stock prices varies according to the type of the proposal sponsor and the proposal itself (Iliev & Lowry, 2015). Overall, prior research indicates that ESG-related shareholder interventions can have financial value implications.

Studies on the effects of shareholder activism on target firms' environmental and social performance are scarce. Rohleder et al. (2022) observe that divestment from carbon-intensive firms' stocks (portfolio decarbonization) is associated with firms reducing their carbon emissions. As such, the authors provide initial evidence that shareholder activism can be effective in the climate change context. Chen et al. (2020) indicate that institutional ownership drives firms' environmental and social performance and that shareholder proposals are one possible channel for institutional investors to achieve this. Flammer et al. (2021) show that environment-related shareholder proposals increase firms' voluntary disclosure of climate change risks. Moreover, they find that environmental shareholder activism is most effective if it is initiated by institutional investors (e.g., mutual funds or public pension funds). However, while these are important contributions, there is room for further research to investigate the general effect of shareholder proposals on firms' ESG and carbon performance.

3. Hypotheses development

Investors exert pressure through shareholder activism to convey their opinions and expectations, thereby demanding managerial actions or corporate change (Flammer et al., 2021; Levit & Malenko, 2011; Shackleton et al., 2021). When pressured by their shareholders, firms may reevaluate and adjust business practices to avoid proxy fights, which might remove the current board from its position (Del Guercio & Hawkins, 1999). Indeed, prior research shows that firms are responsive to shareholder proposals and that they can influence governance structures and firm value (Cuñat et al., 2012; Ertimur et al., 2010; Ertimur et al., 2011; Flammer, 2015; Flammer et al., 2021). Moreover, recent research has emphasized that ESG aspects can be financially material (Khan et al., 2016), which might be an additional motivation for management to react on ESG-related proposals. Hence, we expect firms to respond to these types of resolutions and demonstrate appropriate actions for their

shareholders. Based on this line of argument and previous empirical evidence, we formulate the following hypothesis:

H1: Firms targeted by ESG-related shareholder proposals subsequently improve their ESG performance.

In the financial community there is growing recognition of the costs associated with climate change (TCFD, 2021). Hence, many investors incorporate climate risks into their decision-making (Flammer et al., 2021; Krueger et al., 2020). It is, therefore, not surprising that shareholders file proposals pressuring investee firms to decrease carbon emissions. Rohleder et al. (2022) find that portfolio decarbonization contributes to the reduction of divested firms' carbon emissions. Similarly, we presume that shareholder proposals, as another form of shareholder activism, may also change target firms' carbon performance. Therefore, the second hypothesis is framed as follows:

H2: Firms targeted by carbon-related shareholder proposals subsequently improve their carbon performance.

There is considerable heterogeneity among investors in terms of their investment objectives (Flammer et al., 2021; Jansson & Biel, 2011). If investors are dedicated to socially responsible investing (SRI), they are more likely to pressure their investee firms to improve their ESG and carbon performance (Dikolli et al., 2021; Li et al., 2021). Hence, we distinguish between different types of sponsors based on whether they primarily have SRI preferences or financial preferences according to Hong and Kacperczyk (2009)[1], and we focus in particular

[1] Hong and Kacperczyk (2009) argue that institutions that are exposed to public scrutiny are expected to meet social norms when they make investments. Therefore, we attribute SRI preferences primarily to pension funds, religious groups, labor unions, and SRI funds, since these investors are increasingly subject to social norms pressure. Mutual funds and hedge funds are less exposed to those expectations

on SRI funds and conventional funds, since here the distinction is unambiguous. Consequently, one can assume that investors with SRI preferences (henceforth "SRI investors"), such as SRI funds, issue and support financially immaterial ESG- and carbon-related proposals more often than conventional investors (Cotter et al., 2010; Shackleton et al., 2021). This could reduce the willingness of firms to respond to ESG- and carbon-related proposals from SRI investors. Moreover, prior research shows that shareholders are more influential when they hold a significant stake in the firm (Dyck et al., 2019; Ertimur et al., 2010; Gillan & Starks, 2000; Gordon & Pound, 1993; Li et al., 2020). On average, SRI funds tend to be smaller in size than conventional funds (Humphrey et al., 2016), which in turn means that well-diversified SRI funds have, on average, smaller stakes in firms. This could further reduce the willingness of firms to respond to ESG- and carbon-related proposals from SRI investors. Thus, we formulate our third hypothesis:

H3: Firms are more responsive to ESG- and carbon-related proposals that are sponsored by conventional investors than they are to ESG- and carbon-related proposals sponsored by SRI investors.

4. Data and methodology

4.1 Sample

For our analyses, we collect data from different sources. Our primary data source is the ISS database, from which we obtain shareholder proposals over the 2006–2020 period for US firms

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as "they are natural arbitrageurs in the marketplace" (p. 16). Hence, we attribute financial preferences primarily to conventional funds and asset management firms. In contrast to Hong and Kacperczyk (2009), we do not assign individual investors to any of these groups and exclude them from this analysis because attributing investment preferences would be too ambiguous.

that are part of the S&P 1500 or the Russell 3000 index. Panel A of Figure 1 shows the initial sample of 17,090 shareholder proposals for 1,714 unique US firms. For each resolution, ISS reports the meeting date that the proposal was voted on, a description of the proposal issue, as well as the type of the person, firm, or organization sponsoring the proposal. In our analyses, we focus on the subset of shareholder proposals related to ESG and carbon issues, which comprises 7,448 resolutions for 1,068 unique US firms. On average, 43.58% of the proposals address ESG issues. Among these, 398 shareholder proposals specifically targeted carbon emissions.

Panel B of Figure 1 shows the number of total proposals and the proportion of ESG-related proposals by sponsor type. Over our sampling period, a large share (45.58%) of non-ESG-related proposals were submitted by individuals, whereas SRI funds[2] mostly (23.44%) sponsor proposals related to ESG issues. Conventional funds sponsor almost equal percentages of ESG-related (6.71%) and non-ESG-related (7.25%) proposals.

Please insert Figure 1 about here

We use Refinitiv (formerly Thomson Reuters) as our source for financial, ESG, and carbon data. The Refinitiv database provides financial data for more than 100,000 publicly traded firms. Further, Refinitiv processes publicly available sources, such as firm websites and annual and corporate social responsibility (CSR) reports, to compile more than 500 ESG metrics for approximately 11,000 firms, with time series data going back to 2002 (Refinitiv, 2021). Due to the large sample of firms and granularity in the ratings, Refinitiv's ESG Scores are widely used in academic research (Berg et al., 2021). We chose Refinitiv as our main data

[2] Based on the classification provided by the ISS database, we can distinguish between conventional and SRI funds.

and ratings provider because it best fits our study in terms of coverage, scope, and methodology.

We also draw on Refinitiv's industry classification system, which sorts firms into 33 business sectors. Using the International Securities Identification Number (ISIN) for each firm, we then combine the financial and ESG data from Refinitiv with the shareholder proposal information from the ISS database.

4.2 Matching

Before we estimate the effect of a shareholder proposal with a difference-in-differences approach, we match our sample of firms that received a proposal (i.e., treated firms) to a group of firms that were not targeted by shareholders (i.e., control firms) by propensity score matching (PSM). Matching can prevent a selection bias and improves the balance across matching variables, ensuring that treatment and control samples are as similar as possible before the treatment (Dehejia & Wahba, 1999). This allows the effect of the treatment (i.e., receiving a proposal) to be measured unambiguously.

For each treated firm, we apply PSM for the end-of-year firm characteristics (i.e., matching variables) from the year prior to the annual shareholders' meeting for which a proposal was submitted. For potential control firms, we consider all publicly listed US-based firms. We perform a one-to-one matching, which means that we assign one control to every treated firm, based on the nearest neighbor method. Matching is conducted without replacement, i.e., a control firm can only be assigned to one treated firm in each year. However, the same control firm can be matched with different treated firms across years.

We include matching variables that are known to have an influence on the possibility to receive the treatment, as well as the dependent variable (firms' ESG and carbon performance). Shackleton et al. (2021) and Drempetic et al. (2020) show that firm size is associated with higher ESG Scores. Thus, we consider total revenue (*Log Revenue*) and total

assets (*Log Assets*) given in natural logarithms as measures of firm size. Further, we include a measure for financial risk, calculated as firms' *Debt-Equity-Ratio*. Hong and Kacperczyk (2009) find that firms with lower ESG performance have higher leverage ratios. For our analysis of shareholder proposals related to carbon emissions, we add property, plant, and equipment (PPE) as a matching variable. The *PPE Intensity*, measured as the ratio of PPE to total assets, indicates the extent to which a firm relies on physical assets in its business activities. A high PPE intensity is typically associated with more carbon emissions compared to a firm that requires less PPE in its production processes (Trinks et al., 2020). We also include the respective firms' ESG and carbon performance measures in the matching process. The reasoning behind this inclusion is that firms that already have high ESG ratings or carbon performances are less likely to achieve further improvements. Furthermore, it is likely that investors would submit ESG- or carbon-related proposals specifically to firms with low ESG or carbon performances, which would introduce a selection-bias in our sample. Finally, we require exact matches on the calendar year and within industry sectors, following Refinitiv's industry classification system, to control for year and industry characteristics.

Table 1 contains the mean values of the matching variables for the treatment and control samples for the matching year (t−1). All differences are statistically insignificant. This indicates that the matching is successful.

Please insert Table 1 about here

4.3 Variables

Our dependent variables are different measures of ESG performance provided by Refinitiv, including the *Environmental Pillar Score* (including themes such as resource use and environmental product innovation), the *Social Pillar Score* (including themes such as workforce, human rights, community, and product responsibility), the *Governance Pillar Score*

(including themes such as management, shareholders, and CSR strategy), and the overall *ESG Score* (an aggregation of the individual *E*, *S*, and *G Scores*). All scores are percentile rank scores, which range between 0 and 100 (Refinitiv, 2021). As a measure of carbon performance, we use the *Emissions Score*[3], which tracks a firm's commitment to and effectiveness in achieving environmental emission reductions. We also include direct carbon emissions as a dependent variable. As such, we focus on carbon emissions from sources that are owned or controlled by a firm (scope 1), operationalized as absolute carbon emissions and carbon emission intensity. Absolute emissions are measured as the natural logarithm of a firm's total scope 1 carbon emissions (*Log Scope 1*). Taking the natural logarithm allows for better comparison between firms, since, for example, firms with high emissions can also reduce their emissions more in absolute terms. *Scope 1 Intensity* is calculated as total scope 1 carbon emissions (in metric tons) divided by a firm's total revenue (in millions of US Dollars). This captures a firm's efforts to reduce carbon emissions in its operations, while controlling for changes to the amount of its operations (Busch et al., 2020a).

To estimate the effect of shareholder proposals on firms, we use a dummy variable *Treat* that equals 1 for firms that received a shareholder proposal and 0 for control firms. We create another dummy variable *Post*, which takes the value of 0 for years before the treatment and the value of 1 starting with the treatment year. For each firm in the treatment group, we define the treatment year as the year in which the annual shareholders' meeting took place when the shareholder proposal was submitted. The interaction of *Treat* with *Post* allows us to measure the difference in the ESG and carbon performance between treated and control firms after the treatment. Additionally, to control for other factors influencing firms' ESG and carbon

[3] This score evaluates firms' carbon performance (e.g., policy, reduction targets, and emission amounts), as well as measures related to waste management and biodiversity protection.

performance, we include the matching variables as control variables in our difference-in-differences approach.

4.4 Difference-in-differences model

To determine the differential effect of shareholder proposals on firms' ESG and carbon performance, we estimate specifications of the following baseline difference-in-differences model in a panel structure:

$$ESG_{i,t} = \beta_0 + \beta_1 Post_t + \beta_2 Treat_i + \beta_3 Post_t \times Treat_i + \beta_n X'_{i,t} + \alpha_i + \varepsilon_{i,t} \qquad (1)$$

where *ESG* is a measure for the ESG or carbon performance of firm *i* in year *t*. *Post* identifies the pre-treatment and treatment period, *Treat* indicates whether a firm received a shareholder proposal, and *Post* × *Treat* is the interaction term of interest. *X'* contains firm-level control variables that might affect the ESG and carbon performance of firms, including *Log Revenue*, *Log Assets*, *Debt-Equity-Ratio*, and *PPE Intensity*. Firm-fixed effects (α) control for unobserved time-invariant firm characteristics. In other specifications of our baseline model, we also include year-fixed effects and industry-year fixed effects that control for industry specific unobserved effects in each year. ε is the error term. We calculate firm-clustered standard errors.

We include up to five years before the treatment and up to ten years after the treatment in our sample. Depending on the respective model specification, our panel datasets range from roughly 500 to more than 4,000 firm-year observations.

5. Results

5.1 Descriptive statistics

Table 2 highlights the industry composition of our sample. Depending on the variables for ESG and carbon performance and the type of proposal, the models include between 20 and 23

different industries. The samples on environment- and carbon-related proposals mainly include energy and utility firms. For social proposals, we find an increased share of retailers, while financial institutions are frequently included in the sample for governance-related proposals.

Please insert Table 2 about here

Table 3 reports the Pearson correlation coefficients of our variables. While the coefficients are statistically significant at $p < 0.01$, they are mostly low and usually do not exceed 0.7, except for *Log Assets* and *Log Revenue*. Therefore, we compute variance inflation factors (VIFs) for all explanatory variables in our regression models. Values greater than 10 indicate the presence of multicollinearity and issues in estimation (Chatterjee et al., 2000). We find VIFs below 10 which suggest only very moderate correlation. Hence, we do not expect any issues with multicollinearity.

Please insert Table 3 about here

5.2 Main results

In order to test for H1, we create two model specifications for each measure of ESG performance. The columns in Panel A of Table 4 contain the estimates of the panel regressions for the specifications. Columns (1) and (2) show positive and statistically significant interaction term coefficients for the *ESG Score* (2.443, resp. 2.893, p= 0.025, resp. p = 0.005) and columns (7) and (8) for the *G Score* (4.440, resp. 3.938, p= 0.058, resp. p = 0.087), strongly indicating that treated firms improve their ESG and G performance significantly more than control firms after receiving a proposal. For example, this means that firms in the treatment sample have, on average, an *ESG Score* of 44.01 in the post-treatment period whereas firms in the control sample have an *ESG Score* of 41.11 (unreported results). For the *E Score*, we obtain a significant interaction term only for the second model specification (column (4), 2.840, p= 0.058), while the coefficient of the first model in column (3) is statistically insignificant but of

the same magnitude as in column (4). Thus, we see indications that treated firms also improve their environmental performance significantly more than control firms after receiving a proposal. However, these observations do not hold for the *S Score* of firms since the interaction term coefficients in columns (5) and (6) are close to zero and statistically insignificant.

Figure 2 demonstrates the parallel trend in the different ESG performance measures of treated and control firms prior to the event, which is followed by a differential shift in the time after the proposal, except for the *S Score*. Moreover, it demonstrates that the observed differential shifts are mainly based on an increase in the ESG performance of treated firms, while control firms remain close to their previous levels. Thus, we see strong support for H1.

Please insert Figure 2 about here

We also investigate whether the submission of a carbon-related proposal has an effect on firms' carbon performance. Hence, we conduct the model specifications for the different measures of carbon performance, namely the *Emissions Score*, absolute carbon emissions (*Log Scope 1*), and carbon emission intensity (*Scope 1 Intensity*). In columns (1) and (2) of Panel B of Table 4, the coefficients of the interaction term *Post* × *Treat* for the *Emissions Score* are positive and statistically significant for both model specifications (6.140, resp. 4.823, p= 0.028, resp. p = 0.055). Thus, treated firms show a significantly higher commitment towards reducing carbon emissions in their production and operational processes after receiving a carbon-related proposal as compared to control firms. Moreover, for *Scope 1 Intensity*, we find that the interaction term *Post* × *Treat* in column (5) has a negative and statistically significant coefficient (-208.3, p = 0.088), while the coefficient of the other model specification in column (6) is statistically insignificant but shows in the same direction (-123.3, p= 0.182). Thus, despite a substantial decrease in observations for our carbon performance regressions compared to our ESG performance, we find indications that treated firms reduce their carbon emissions intensity significantly more than control firms after receiving a carbon-related proposal. This is also

reflected in descriptive statistics of the sample, since firms in the treatment sample have, on average, a carbon emissions intensity of 768 tons per million US Dollars in revenue in the post-treatment period, whereas firms in the control sample have a carbon emissions intensity of 976 tons per million US Dollars in revenue (unreported results). However, these observations do not hold for firms' absolute carbon emissions, as the interaction term coefficients in columns (3) and (4) are close to zero and statistically insignificant. Thus, treated firms seem to concentrate on improving their operational carbon efficiency instead of reducing absolute carbon emissions. Our findings are reinforced by Figure 3, which shows the development of the average *Emission Score*, absolute carbon emissions, and carbon emissions intensity of the treated and control samples before and after the treatment.

Please insert Figure 3 about here

With respect to H3, we test the effect of ESG-related proposals on firms' ESG performance for different subsamples of proposal sponsors. Columns (1) and (2) in Panel C of Table 4 shows that the interaction term *Post* × *Treat* has a positive and statistically significant coefficient for proposals sponsored by both SRI funds (3.541, $p = 0.062$) and conventional funds (7.119, $p = 0.095$). The treatment effect for SRI funds is about 22% larger than our baseline estimate in column (2) in Panel A of Table 4, and for conventional funds it is about 146% larger. A similar pattern emerges, when we categorize all sponsors as either SRI investors or conventional investors. From the magnitude of the interaction terms' coefficients, we infer that target firms are more responsive to proposals that are sponsored by investors who are most focused on shareholder value. Hence, we confirm H3.

Please insert Table 4 about here

Finally, we perform several robustness checks to evaluate the validity of our results. First, we estimate variations of the baseline model in Table 4 without control variables and/or

fixed effects to see if our results hold. All of these tests show similar results to our base analysis (unreported results). Second, we perform placebo tests to establish validity of inference in our difference-in-differences model (Bertrand et al., 2004; Hagemann, 2019). We drop the treatment group and randomly assign firms of the control group to a placebo treatment group. As can be seen from Panel A of Table 5, the placebo estimates do not show any significant treatment effects. Then, using the pre-treatment data, we choose different years [–1, –2] as placebo treatment dates prior to the actual treatment event. Similarly, as can be seen from Panel B of Table 5, the analysis of the placebo intervention does not show significant coefficient estimates, which implies that the treatment effect we find in our baseline model can be attributed to the shareholder intervention. In sum, this suggests that the assumptions underlying the identification strategy hold and that our difference-in-differences analysis is valid.

Please insert Table 5 about here

5.3 Firm value effects of ESG- and carbon-related proposals

In addition to the real effects of ESG- and carbon-related shareholder proposals, the question arises of whether such proposals also entail financially material effects. In order to assess the influence of ESG- and carbon-related shareholder proposals on firm value, we use an event study approach. An event study measures the impact of an event on the values (i.e., security prices) of affected firms. The rationale behind this method is that given an efficient capital market and rational expectations, new and economically relevant information will be immediately reflected in security prices.

In our analysis, one concern is to determine the appropriate event date upon which the market receives the information that shareholders are seeking to have a shareholder vote on ESG- and carbon-related issues. Information about shareholder proposals becomes public for the first time when the proxy statement is revealed to the public (Bhagat et al., 1984; Brickley

et al., 1988). Therefore, we consider the release day of the proxy material as the event date. Our source for obtaining these dates is the DEF 14A form each firm files with the SEC through the EDGAR system.

We use a three-day event window, which includes the day of the proxy release as well as the preceding and following days [t –1; t +1]. By including the preceding day, we account for potential information leakage to market participants. By including the following day, we account for the possibility that the stock market may need some time to reflect the information (Flammer et al., 2021), for example, because the stock market might have been closed before the proxy release. We include pre- [t –4; t –2] and post-event [t +2; t +4] periods in our analysis to account for possible pre-event trends in firm valuation as well as any longer-term firm value effects of the proposals, as well as effects of their implementation.

To calculate the expected return for each sample firm in the absence of the event, we use the Carhart four-factor model (1997) over an estimation window of 200 trading days. The estimation window starts 210 trading days prior to the proxy statement release date and ends 11 trading days prior to the release date. The abnormal return for each firm is calculated as the difference between the actual and expected return. Then, average cumulative abnormal returns (CARs) are obtained by summing up mean abnormal returns across firms over the event period (MacKinlay, 1997). We use a cross-sectional t-test that is robust to event-induced volatility to determine the statistical significance of CARs. Additionally, to account for non-normally distributed returns, a non-parametric Wilcoxon signed rank test is conducted.

Please insert Table 6 about here

Table 6 shows the CARs for the three-day event period as well as pre- and post-event periods. We find positive, albeit small, abnormal market reactions when information about shareholder proposals becomes available. Stock prices increase by 0.476% (p= 0.067) for environment-related proposals and by 0.442% (p= 0.038) for socially-related proposals during

the event period. While the coefficients for governance- and carbon-related proposals are positive (except for sample firms that were matched on actual emissions), they are statistically insignificant. Further, we find no evidence for pre- or post-event trends among target firms and no significant effect for our non-target firms during the event period. The results suggest that capital market participants predominantly do not expect any negative financial implications of ESG- and carbon- related shareholder proposals or their potential implementation, but rather expect neutral or positive implications.

6. Discussion and conclusion

Investors are increasingly exercising their shareholder rights to influence the way firms address ESG issues (Dimson et al., 2015). As such, shareholders have intensified their efforts to voice their opinions by divesting, engaging with firms, or filing proposals (Li et al., 2021). This is the first study examining whether shareholders can actually influence firms' ESG and carbon performance by submitting shareholder proposals. First, we compare the overall *ESG Score* and individual *ESG Pillar Scores* of target firms to a matched sample of non-target control firms. Our results suggest that target firms are associated with higher *ESG* as well as individual *E Scores* and *G Scores* after they receive a respective shareholder proposal. Therefore, our study complements previous findings on shareholder activism by showing that firms can be induced to change their ESG performance after being targeted by investors. Surprisingly, we find no statistically significant effect for the *S Score*, which leaves room for further investigations. One reason might be the range of data covered in the data aggregation process. The *S Score* captures a wide range of data points across different socially relevant topics, for instance information regarding the workforce, customers, human rights, and society. It is possible that changes to a specific social aspect might barely change the overall score.

Second, we analyze whether carbon-related proposals can influence firms' carbon performance. We find that target firms are associated with better *Emissions Scores* and lower carbon emission intensities (*Scope 1 Intensity*) after receiving a carbon-related proposal. In terms of absolute carbon emissions (*Log Scope 1*), we also note a negative but not statistically significant effect. The reason for this could be that the achieved carbon emission improvements are overcompensated for by respective growth effects. Thus, firms are either unable to decouple their emissions from production or the incentive to do so is not great enough (Bauckloh et al., 2022).

Third, we investigate whether the type of the proposal sponsor influences the effect of ESG-related proposals on firms' ESG performance. Our results show that proposals that are sponsored by conventional investors, e.g., asset managers of mainstream public equity funds, are associated with higher improvements in ESG performance than proposals submitted by sponsors with SRI preferences. One explanation for this outcome might be that firms give greater weight to shareholder proposals from conventional investors, who usually hold more stakes, because they can exert greater pressure. The exit of a large investor could potentially drive down the share price (Admati & Pfleiderer, 2009), so firms might prefer to bow to the request of shareholder proposals and change their business conduct.

Finally, we find that firms that are targeted by ESG- and carbon-related proposals experience positive, albeit small, abnormal market reactions around the release day of the proxy material. Hence, it is not only the passing (Cuñat et al., 2012; Flammer, 2015) and actual implementation (Flammer et al., 2021) of a shareholder proposal that entails a financial effect, but also the submission of the proposal itself. As a whole, our results suggest that the probability of proposals changing ESG and carbon performance in target firms is high and, hence, the market rewards the firms for making those changes.

Our findings have practical implications for both capital market participants and policymakers. On the one hand, the results show that shareholder activism can influence the ESG and carbon performance of firms. Hence, investors who wish to contribute to a more sustainable economy can either exercise their shareholder rights on ESG topics themselves or request that asset managers represent their interests in proxy voting activities. This finding is also highly relevant for the impact investing debate, since there is frequent discussion of whether investments in certain assets classes, such as public equities, can generate any impact at all. Public equity investments are (mostly) secondary market transactions, usually without a direct flow of capital into firms, because investors buy shares, but the respective firm does not receive more funding for new investments or projects. As such, there would be no investor impact. Our findings show that in fact there is such an investor impact: shareholders can encourage firms to make improvements in ESG and carbon performance through shareholder proposals.

On the other hand, our results also show that while carbon-related proposals have an effect on emission intensities, they do not have an effect on absolute emissions. However, in order to meet the Paris Agreement's temperature goal of limiting global warming to 1.5°C, absolute emission reductions are essential, globally as well as for individual firms. As such, this finding constitutes clear limitations of the effects of shareholder proposals: they do not, yet, lead to absolute emission reductions. Thus, policymakers need to be vigilant about whether financial markets can contribute via shareholder proposals to effective climate change mitigation without further regulatory intervention.

Our research design has some limitations. First, we cannot be certain that the submission of a shareholder proposal to firms is randomly assigned. Since we are dealing with real empirical data, it is almost impossible to create a perfect experimental setting. Nevertheless, we address this issue by using a strict matching procedure to ensure that treated

and control firms are as identical as possible before the treatment. Further, we include the matching variables as control variables in the regression analysis. Second, we base our analysis on firm-reported carbon emissions and, thus, rely on firms' abilities to correctly measure, collect, and report their carbon emissions. However, it is a well-documented limitation that self-reported carbon emission data is often flawed (Busch et al., 2020b). Moreover, a reduction of firms' direct emissions (scope 1) might also be attributed to the outsourcing of carbon-intensive processes (scopes 2 or 3), which we do not record in our analysis.

Based on our findings and the study's limitations, we propose future research could examine how shareholder proposals influence firms' carbon emissions further upstream or downstream (e.g., in the supply chain), since our study focuses on emissions that are directly influenced by firms (scope 1 emissions). Moreover, further research could evaluate which forms of shareholder activism are most effective. With shareholder proposals, we have considered a public form of shareholder activism, and it would be worthwhile to assess whether private engagement via meetings and discussions have a similar effect.

Appendix

List of variables

Variable	Description	Source
ESG Score	An overall firm score based on self-reported information in the Environmental, Social, and Corporate Governance pillars	Refinitiv
E Score	The Environmental Pillar measures a firm's impact on living and non-living natural systems, including the air, land, and water, as well as complete ecosystems. It reflects how well a firm uses best management practices to avoid environmental risks and capitalize on environmental opportunities in order to generate long-term shareholder value	Refinitiv
S Score	The Social Pillar measures a firm's capacity to generate trust and loyalty with its workforce, customers, and society, through its use of best management practices. It is a reflection of the firm's reputation and the health of its license to operate, which are key factors in determining its ability to generate long-term shareholder value	Refinitiv
G Score	The Corporate Governance Pillar measures a firm's systems and processes, which ensure that its board members and executives act in the best interest of its long term shareholders. It reflects a firm's capacity, through its use of best management practices, to direct and control its rights and responsibilities through the creation of incentives, as well as checks and balances in order to generate long-term shareholder value	Refinitiv
Emissions Score	The Emissions Category Score measures a firm's commitment to and effectiveness in reducing environmental emissions in the production and operational processes	Refinitiv
Log Scope 1	Scope 1 CO_2 and CO_2 equivalents, i.e., carbon emissions (in metric tons) given in natural logarithms	Refinitiv
Scope 1 Intensity	The ratio of total scope 1 carbon emissions (in metric tons) divided by a firm's total revenue (in US dollars in millions)	Refinitiv
Log Revenue	Total revenue from business activities given in natural logarithms	Refinitiv
Log Assets	The sum of a firm's total current and non-current assets given in natural logarithms	Refinitiv
Debt-Equity-Ratio	The ratio of total liabilities divided by the value of total shareholder equity	Refinitiv
PPE Intensity	The ratio of property, plant, and equipment less accumulated depreciation divided by total assets	Refinitiv

Notes: The table contains the descriptions and sources of the variables that are used for the analyses.

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Figures and tables

Table 1: Matching statistics

Panel A: ESG performance measures

	ESG Score			E Score			S Score			G Score		
	Treated	Control	t-value	Treated	Control	t-value	Treated	Control	t-value	Treated	Control	t-value
Score	38.61	36.81	1.220	40.563	40.581	-0.010	43.249	40.933	1.190	56.036	58.156	-0.730
			(0.223)			(0.994)			(0.234)			(0.467)
Log Revenue	21.95	21.92	0.330	22.732	22.687	0.400	22.444	22.406	0.430	23.443	23.221	1.500
			(0.740)			(0.688)			(0.667)			(0.135)
Log Assets	22.62	22.54	0.890	23.266	23.240	0.210	22.989	22.939	0.390	23.954	23.748	1.030
			(0.376)			(0.838)			(0.699)			(0.303)
Debt-Equity-Ratio	2.38	2.90	-0.430	3.329	4.401	-0.430	2.739	3.003	-0.490	1.484	-6.573	0.830
			(0.670)			(0.664)			(0.622)			(0.406)
Observations	293	293		203	203		195	195		99	99	

Panel B: Carbon performance

	Treated	Control	t-value	Treated	Control	t-value
Emissions Score	46.27	48.04	-0.450			
			(0.655)			
Log Scope 1				1.20e+07	8.40e+06	0.890
						(0.377)
Emission Intensity				1010.70	937.58	0.210
						(0.831)
Log Revenue	22.84	22.88	-0.250	23.29	23.04	0.990
			(0.801)			(0.325)
Log Assets	23.48	23.47	0.080	23.96	23.73	0.870
			(0.938)			(0.388)
Debt-Equity-Ratio	4.37	2.51	1.410	3.44	3.40	0.030
			(0.159)			(0.978)
Observations	102	102		46	46	

Notes: This table shows the mean values of the matching variables for the treatment and control samples for the matching year (t−1). T-tests are conducted to identify statistically significant differences between both samples. P-values of the t-tests are presented in parentheses.

Table 2: Industry composition of matched proposal samples

	ESG proposals	E proposals	S proposals	G proposals	Carbon proposals[a]	Carbon proposals[b]
Applied Resources	2.52 (116)	2.62 (85)	1.29 (47)	0.85 (16)	2.05 (32)	3.28 (22)
Automobiles & Auto Parts		1.67 (54)	1.40 (51)	0.95 (18)	2.75 (43)	3.73 (25)
Banking & Investment	6.36 (293)	5.67 (184)	9.09 (331)	10.45 (197)	1.54 (24)	2.39 (16)
Chemicals	4.76 (219)	4.72 (153)	5.87 (214)	4.67 (88)	1.67 (26)	2.24 (15)
Consumer Goods		0.34 (11)		3.08 (58)	1.02 (16)	2.39 (16)
Cyclical Consumer Products	5.10 (235)	3.52 (114)	5.65 (206)	1.96 (37)	6.34 (99)	1.94 (13)
Cyclical Consumer Services	6.04 (278)	6.32 (205)	5.44 (198)	8.54 (161)	3.72 (58)	4.48 (30)
Energy - Fossil Fuels	8.82 (406)	11.96 (388)	5.76 (210)	6.26 (118)	17.36 (271)	14.03 (94)
Food & Beverages	3.87 (178)	8.94 (290)	5.02 (183)	6.68 (126)	3.84 (60)	3.13 (21)
Food & Drug Retailing		2.31 (75)		3.18 (60)	1.41 (22)	
Healthcare Services & Equip.	7.80 (359)	2.71 (88)	8.13 (296)	10.24 (193)	2.11 (33)	
Industrial & Comm. Services	5.36 (247)	4.50 (146)	4.14 (151)	2.44 (46)	2.11 (33)	2.09 (14)
Industrial Goods	7.28 (335)	4.35 (141)	6.62 (241)	3.77 (71)	6.98 (109)	8.51 (57)
Insurance	3.30 (152)	3.39 (110)	5.24 (191)	4.24 (80)	2.82 (44)	
Mineral Resources	1.56 (72)	2.37 (77)	1.54 (56)	2.07 (39)	1.54 (24)	1.19 (8)
Personal & Household P&S	1.78 (82)	3.67 (119)	2.58 (94)	3.82 (72)	0.58 (9)	
Pharma & Medical Research	0.87 (40)	1.82 (59)	1.40 (51)	2.23 (42)	0.45 (7)	1.04 (7)
Real Estate	10.34 (476)	2.53 (82)	2.03 (74)	2.49 (47)	6.53 (102)	1.34 (9)
Retailers	8.82 (406)	6.88 (223)	10.60 (386)	6.05 (114)	2.50 (39)	5.07 (34)
Software & IT Services	5.08 (234)	1.30 (42)	5.71 (208)	3.87 (73)	3.65 (57)	2.84 (19)
Technology Equipment	4.76 (219)	2.13 (69)	4.91 (179)	2.02 (38)	1.02 (16)	9.25 (62)
Telecommunications Services						2.24 (15)
Transportation	0.50 (23)	4.19 (136)	1.67 (61)	5.25 (99)	5.77 (90)	6.12 (41)
Utilities	5.08 (234)	12.09 (392)	5.90 (215)	4.88 (92)	22.23 (347)	22.69 (152)
Sum	**100 (4,604)**	**100 (3,243)**	**100 (3,643)**	**100 (1,885)**	**100 (1,561)**	**100 (670)**

Notes: This table shows the industry composition as percentages of the full samples. The number of firm-year observations are written in parentheses. For the carbon proposal samples, the variables used for carbon performance are (a) Emissions Score and (b) actual emissions.

Table 3: Correlations of regression variables

Panel A: ESG proposals (N=4,604)

Variables	VIF	ESG Score	Log Revenue	Log Assets	Debt-Equity-R
ESG Score		1.000			
Log Revenue	3.94	0.339***	1.000		
Log Assets	4.55	0.269***	0.543***	1.000	
Debt-Equity-R	1.08	-0.020	0.076***	0.118***	1.000

Panel B: E proposals (N=3,243)

Variables	VIF	E Score	Log Revenue	Log Assets	Debt-Equity-R
E Score		1.000			
Log Revenue	5.70	0.416***	1.000		
Log Assets	6.37	0.329***	0.714***	1.000	
Debt-Equity-R	1.09	-0.002	0.000	-0.014	1.000

Panel C: S proposals (N=3,643)

Variables	VIF	S Score	Log Revenue	Log Assets	Debt-Equity-R
S Score		1.000			
Log Revenue	3.58	0.315***	1.000		
Log Assets	5.16	0.236***	0.575***	1.000	
Debt-Equity-R	1.11	-0.028*	0.114***	0.194***	1.000

Panel D: G proposals (N=1,885)

Variables	VIF	G Score	Log Revenue	Log Assets	Debt-Equity-R
G Score		1.000			
Log Revenue	4.94	0.198***	1.000		
Log Assets	6.79	0.122***	0.640***	1.000	
Debt-Equity-R	1.19	-0.048**	0.086***	0.157***	1.000

Panel E: Emissions Score (N=1,561)

Variables	VIF	Emissions Score	Log Revenue	Log Assets	PPE Intensity	Debt-Equity-R
Emissions Score		1.000				
Log Revenue	2.90	0.504***	1.000			
Log Assets	2.61	0.553***	0.776***	1.000		
PPE Intensity	1.24	0.007	-0.303***	-0.045*	1.000	
Debt-Equity-R	1.02	0.000	0.046*	0.036	-0.038	1.000

Panel F: Actual emissions (N=670)

Variables	VIF	Log Scope 1	Em. Intensity	Log Revenue	Log Assets	PPE Intensity	Debt-Equity-R
Log Scope 1		1.000					
Em. Intensity		0.700***	1.000				
Log Revenue	3.02	0.150***	-0.156***	1.000			
Log Assets	2.90	0.299***	0.091**	0.788***	1.000		
PPE Intensity	1.13	0.653***	0.438***	-0.175***	0.006	1.000	
Debt-Equity-R	1.05	-0.020	0.035	-0.068*	-0.015	-0.008	1.000

Notes: This table shows pairwise correlation coefficients of the regression variables as well as the variance inflation factors (VIFs) for the explanatory variables in the regression model. *, ** and *** indicate statistical significance at the 0.1, 0.05 and 0.01 levels.

Table 4: Regression results

Panel A: ESG performance

Variables	(1) ESG Score	(2) ESG Score	(3) E Score	(4) E Score	(5) S Score	(6) S Score	(7) G Score	(8) G Score
Log Revenue	3.968***	3.189***	2.654	0.877	4.610***	4.177***	7.646**	6.500*
	(1.229)	(1.209)	(1.815)	(1.845)	(1.490)	(1.575)	(3.131)	(3.917)
Log Assets	0.446	0.384	3.978**	4.779***	1.450	0.199	-3.075	-0.828
	(1.178)	(1.204)	(1.785)	(1.839)	(1.289)	(1.277)	(2.761)	(2.971)
Debt-Equity-Ratio	-0.0144***	-0.0137***	-0.00109	-0.000670	-0.0341**	-0.0267**	-0.000279	-0.00520
	(0.00490)	(0.00469)	(0.00112)	(0.00106)	(0.0146)	(0.0116)	(0.00627)	(0.00648)
Treat#Post	**2.443****	**2.893*****	**2.468**	**2.840***	**-0.0225**	**0.0127**	**4.440***	**3.938***
	(1.084)	**(1.029)**	**(1.682)**	**(1.495)**	**(1.536)**	**(1.445)**	**(2.329)**	**(2.289)**
Constant	-76.31***	-58.44***	-147.8***	-118.4***	-113.8***	-73.93**	-57.09	-75.69
	(20.37)	(21.46)	(38.02)	(34.95)	(28.05)	(30.16)	(60.08)	(74.07)
Observations	4,604	4,604	3,243	3,243	3,643	3,643	1,885	1,885
R-squared	0.467	0.535	0.414	0.522	0.405	0.500	0.158	0.366
Firms	577	577	400	400	388	388	198	198
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	-	Yes	-	Yes	-	Yes	-
Industry-Year FE	-	Yes	-	Yes	-	Yes	-	Yes
Cluster	Firms	Firms	Firms	Firms	Firms	Firms	Firms	Firms

Notes: This table presents the estimates of the regression models for H1. We measure ESG performance by the overall ESG Score (1)-(2) as well as the E (3)-(4), S (5)-(6), and G (7)-(8) Pillar Scores. Total revenue and total assets are given in natural logarithms. Robust standard errors, clustered at firm level, are in parentheses. *, ** and *** indicate statistical significance at the 0.1, 0.05 and 0.01 levels.

Panel B: Carbon performance

Variables	(1) Emissions Score	(2) Emissions Score	(3) Log Scope 1	(4) Log Scope 1	(5) Scope 1 Intensity	(6) Scope 1 Intensity
Log Revenue	3.526	6.050**	0.602***	0.546***	-181.9	-507.7**
	(2.494)	(2.917)	(0.178)	(0.159)	(150.2)	(212.3)
Log Assets	6.332*	7.197*	0.230	0.121	-97.50	167.6
	(3.499)	(3.690)	(0.149)	(0.140)	(139.4)	(161.3)
PPE Intensity	4.167	12.00	-0.0764	-0.203	-720.3**	-589.1**
	(6.596)	(7.902)	(0.216)	(0.208)	(343.2)	(266.8)
Debt-Equity-Ratio	-0.0172**	-0.0157*	-0.000300	-0.000863**	1.563***	0.110
	(0.00710)	(0.00821)	(0.000599)	(0.000380)	(0.584)	(0.411)
Treat#Post	**6.140****	**4.823***	**-0.0675**	**-0.0463**	**-208.3***	**-123.3**
	(2.768)	**(2.501)**	**(0.0905)**	**(0.0727)**	**(120.8)**	**(91.61)**
Constant	-200.2***	-289.2***	-4.885	-0.949	7,762**	8,856***
	(72.39)	(75.13)	(4.541)	(2.716)	(3,024)	(2,913)
Observations	1,561	1,561	670	670	670	670
R-squared	0.271	0.445	0.294	0.722	0.174	0.516
Firms	202	202	92	92	92	92
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	-	Yes	-	Yes	-
Industry-Year FE	-	Yes	-	Yes	-	Yes
Cluster	Firms	Firms	Firms	Firms	Firms	Firms

Notes: This table presents the estimates of the regression models for H2. We measure carbon performance by the Emissions Score (1)-(2) as well as absolute carbon emissions (3)-(4) and carbon emission intensity (5)-(6). Total revenue, total assets, and absolute carbon emissions are given in natural logarithms. Robust standard errors, clustered at firm level, are in parentheses. *, ** and *** indicate statistical significance at the 0.1, 0.05 and 0.01 levels.

Panel C: Sponsor types

Variables	(1) ESG Score SRI funds	(2) ESG Score Conventional funds	(3) ESG Score Other sponsors	(4) ESG Score SRI preferences	(5) ESG Score Financial preferences
Log Revenue	2.858	4.904	3.874***	4.144***	1.725
	(2.854)	(4.690)	(1.484)	(1.463)	(4.559)
Log Assets	-1.318	-3.625	1.106	0.0326	-2.151
	(2.232)	(4.662)	(1.486)	(1.467)	(3.624)
Debt-Equity-Ratio	-0.0166***	0.113**	-0.0171***	-0.0237***	0.119**
	(0.00586)	(0.0468)	(0.00631)	(0.00596)	(0.0487)
Treat#Post	**3.541***	**7.119***	**1.927**	**2.206***	**5.519***
	(1.885)	**(4.208)**	**(1.378)**	**(1.254)**	**(3.299)**
Constant	-7.333	-4.552	-89.14***	-69.78***	29.55
	(43.53)	(85.97)	(26.72)	(25.18)	(79.97)
Observations	1,395	502	2,707	3,189	612
R-squared	0.641	0.699	0.450	0.559	0.695
Firms	199	71	347	417	91
Firm FE	Yes	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes	Yes
Cluster	Firms	Firms	Firms	Firms	Firms

Notes: This table presents the estimates of the regression models for H3. We use the ESG Score as the dependent variable and we analyze different subsamples of proposal sponsors. We focus on SRI funds (1), conventional funds (2), and other sponsors (3), and we cluster different sponsors according to whether they primarily pursue SRI preferences (4) or financial preferences (5). Revenue and total assets are given in natural logarithms. Robust standard errors, clustered at firm level, are in parentheses. *, ** and *** indicate statistical significance at the 0.1, 0.05 and 0.01 levels.

Table 5: Placebo regression results

Panel A: Placebo treatment group randomly identified from control group

Variables	(1) ESG Score	(2) E Score	(3) S Score	(4) G Score	(5) Emissions Score	(6) Log Scope 1	(7) Scope 1 Intensity
Treat#Post	**-0.900**	**-0.012**	**-1.632**	**1.627**	**1.447**	**0.094**	**128.188**
	(1.854)	**(3.160)**	**(2.552)**	**(5.842)**	**(4.406)**	**(0.070)**	**(98.165)**
Observations	1,594	1,267	1,493	866	664	311	311
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	Firms	Firms	Firms	Firms	Firms	Firms	Firms

Panel B: Placebo treatment taking place one (two) year(s) before actual treatment

Variables	(1) ESG Score	(2) E Score	(3) S Score	(4) G Score	(5) Emissions Score	(6) Log Scope 1	(7) Scope 1 Intensity
Treat#Post [-1]	**0.112**	**0.231**	**-2.240**	**-3.598**	**2.437**	**-0.070**	**-4.657**
	(1.180)	**(1.775)**	**(1.417)**	**(2.472)**	**(2.618)**	**(0.064)**	**(102.850)**
Treat#Post [-2]	**-0.693**	**-0.798**	**-1.880**	**-4.398**	**0.320**	**-0.097**	**-16.153**
	(1.479)	**(1.818)**	**(1.421)**	**(2.889)**	**(2.546)**	**(.070)**	**(116.102)**
Observations	2,290	1,767	1,784	1,289	925	416	416
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	Firms	Firms	Firms	Firms	Firms	Firms	Firms

Notes: This table presents the placebo estimates of the regression models for H1-H2. We measure ESG and carbon performance by the overall ESG Score (1), the E (2), S (3), and G (4) Pillar Scores, the Emissions Score (5), absolute carbon emissions (6), and carbon emission intensity (7). Robust standard errors, clustered at firm level, are in parentheses. *, ** and *** indicate statistical significance at the 0.1, 0.05 and 0.01 levels.

Table 6: Firm value effects

Panel A: ESG-related proposals

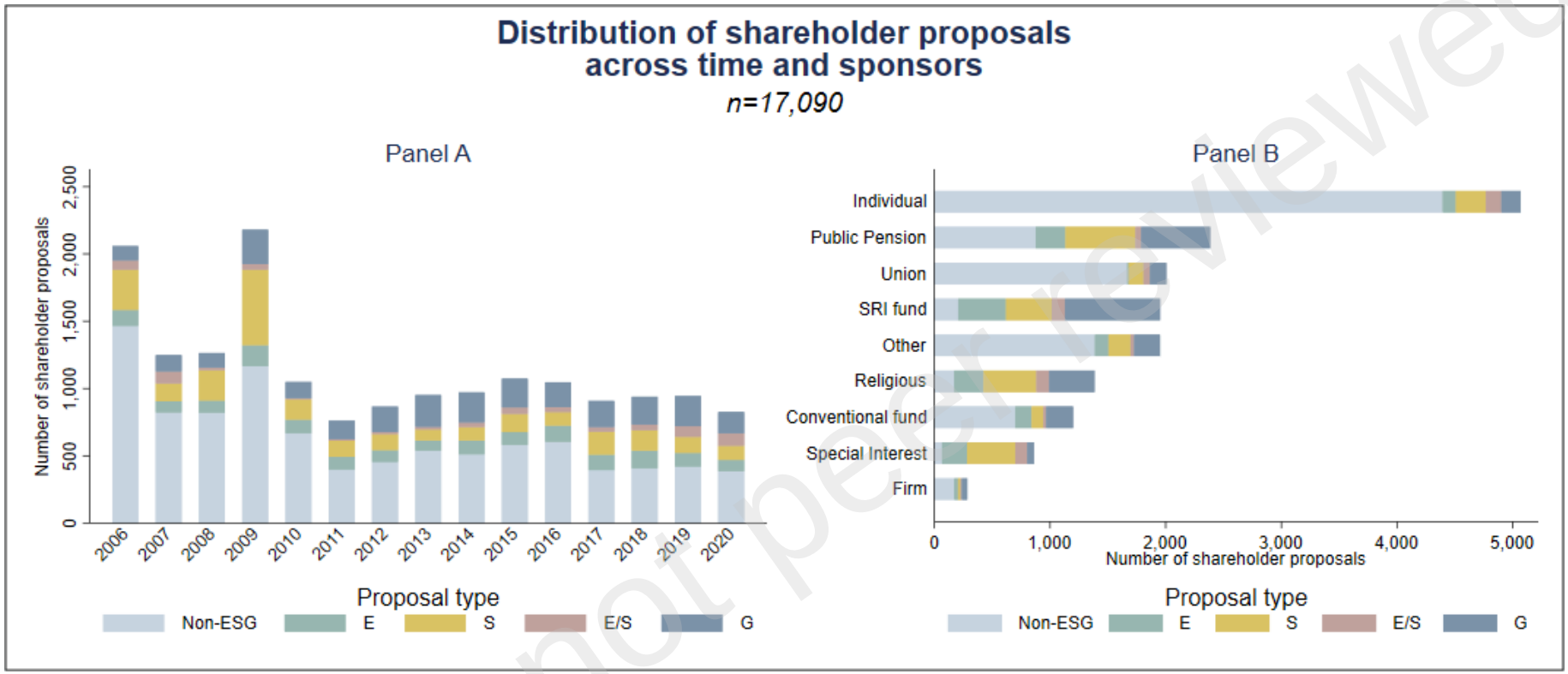
	CAR (%)							
	ESG		E		S		G	
	Treated	Control	Treated	Control	Treated	Control	Treated	Control
Event period								
[t−1; t+1]	**0.332***	0.287	**0.476***	0.512	**0.442****	0.270	**0.182**	0.243
	(0.170)	(0.205)	**(0.258)**	(0.326)	**(0.211)**	(0.219)	**(0.234)**	(0.317)
Pre- and post-event periods								
[t−4; t−2]	0.080	0.294	0.373	-0.126	-0.345	0.012	-0.676*	-0.194
	(0.177)	(0.206)	(0.425)	(0.225)	(0.242)	(0.207)	(0.405)	(0.430)
[t+2; t+4]	-0.095	0.899***	0.091	0.495*	-0.402	0.030	0.125	0.072
	(0.258)	(0.265)	(0.196)	(0.291)	(0.385)	(0.351)	(0.216)	(0.239)

Panel B: Carbon-related proposals

	CAR (%)			
	Carbon[a]		Carbon[b]	
	Treated	Control	Treated	Control
Event period				
[t−1; t+1]	**0.469**	-0.341	**-0.098**	0.108
	(0.340)	(0.292)	**(0.301)**	(0.358)
Pre- and post-event periods				
[t−4; t−2]	0.816	0.102	-0.019	-0.884*
	(0.777)	(0.284)	(0.282)	(0.495)
[t+2; t+4]	-0.011	0.449	0.058	-0.149
	(0.275)	(0.277)	(0.337)	(0.315)

Notes: This table presents the average CARs of firms over specific sub-periods: before [t−4; t−2], during [t−1; t+1], and after the event [t+2; t+4]. For the carbon proposal samples, the variables used for carbon performance are (a) Emissions Score and (b) actual emissions. Standard errors are in parentheses. *, ** and *** indicate statistical significance at the 0.1, 0.05 and 0.01 levels.

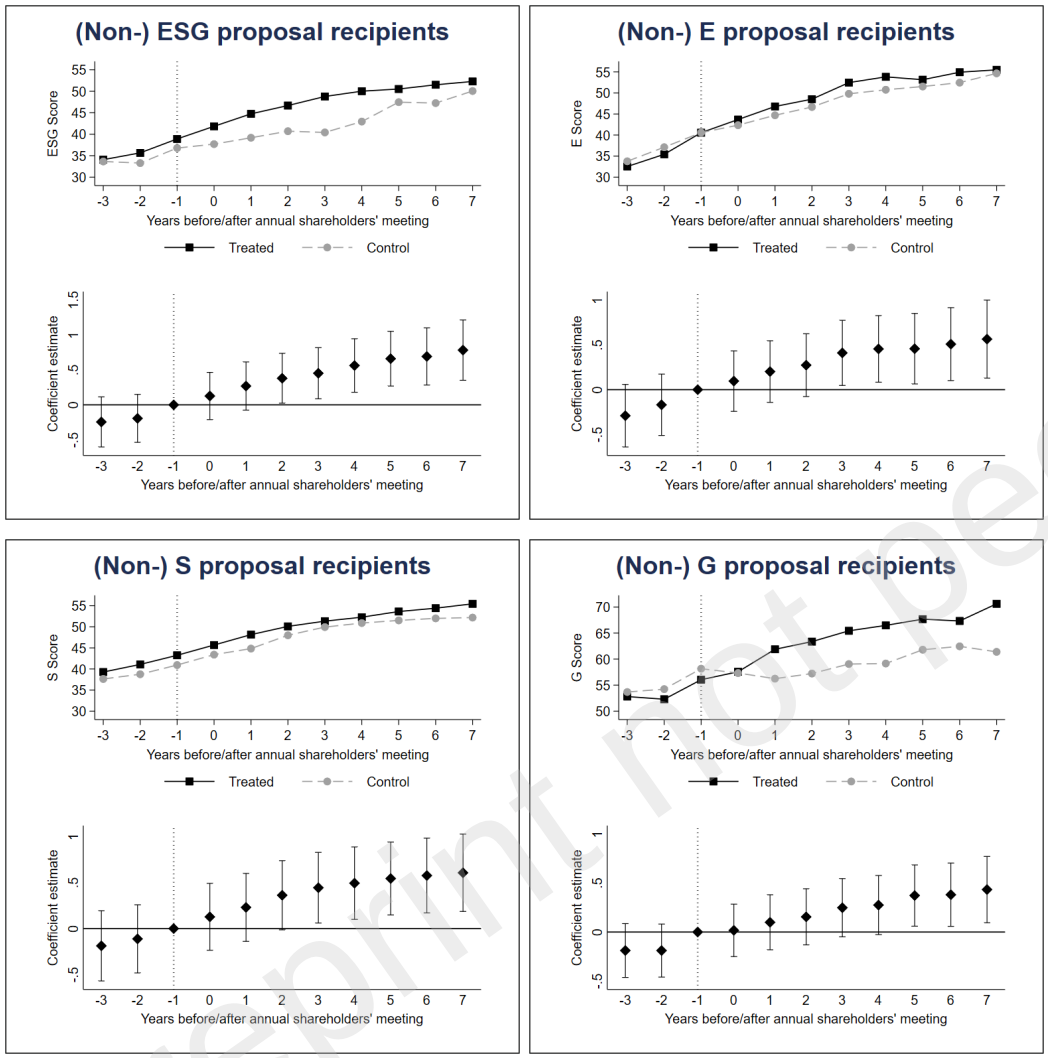
Figure 1: Sample composition



Notes: This figure shows the distribution of proposals across ESG[4] categories per year and sponsor type for the total 2006–2020 period.

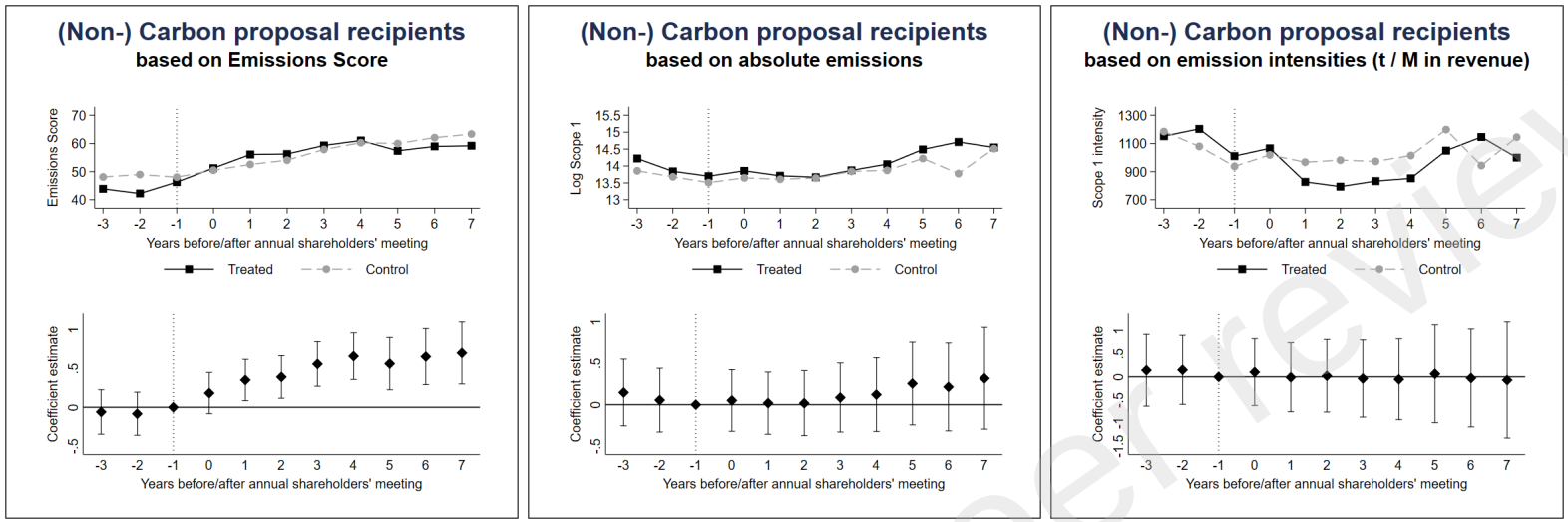
[4] In the ISS database, shareholder proposals that cannot be uniquely assigned to either the environmental or social dimension are, therefore, grouped together.

Figure 2: ESG performance effects over time



Notes: This figure shows the development of the ESG, E, S, and G Scores of treated and control firms before and after the annual shareholders' meeting for which a proposal was submitted.

Figure 3: Carbon performance effects over time



Notes: This figure shows the development of the Emissions Score, absolute carbon emissions (given in natural logarithms), and carbon emissions intensity (calculated as scope 1 emissions in metric tons divided by total revenue in US dollars in millions) of treated and control firms before and after the annual shareholders' meeting for which a proposal was submitted.