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ESG Shareholder Engagement and Downside Risk

Finance Working Paper N° 671/2020
November 2022

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ECGI Working Paper Series in Finance

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Abstract

We show that engagement on environmental, social, and governance issues can benefit shareholders by reducing firms' downside risks. We find that the risk reductions (measured using value at risk and lower partial moments) vary across engagement types and success rates. Engagement is most effective in lowering downside risk when addressing environmental topics (primarily climate change). Further, targets with large downside risk reductions exhibit a decrease in environmental incidents after the engagement. We estimate that the value at risk of engagement targets decreases by 9% of the standard deviation after successful engagements, relative to control firms.

Keywords: ESG, Shareholder Activism, Downside Risk, Corporate Governance, Climate Change

JEL Classifications: G32, M14

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We show that engagement on environmental, social, and governance issues can benefit shareholders by reducing firms' downside risks. We find that the risk reductions (measured using value at risk and lower partial moments) vary across engagement types and success rates. Engagement is most effective in lowering downside risk when addressing environmental topics (primarily climate change). Further, targets with large downside risk reductions exhibit a decrease in environmental incidents after the engagement. We estimate that the value at risk of engagement targets decreases by 9% of the standard deviation after successful engagements, relative to control firms.

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* Hoepner is from the Smurfit Graduate Business School & Quinn School of Business, University College Dublin; Oikonomou is from the ICMA Centre, Henley Business School; Sautner is from the Frankfurt School of Finance & Management; Starks is from the McCombs School of Business at the University of Texas at Austin, and Zhou is from the Smith School of Enterprise and the Environment, University of Oxford. This manuscript is dedicated to our dear friend and colleague Ioannis Oikonomou who was taken from us far too young on October 25, 2020, after a long illness. Like him, we are inspired by those *"who are truthful, passionate and will not give up in the face of adversity"* (https://www.icmacentre.ac.uk/news/2020/a-tribute-dr-ioannis-oikonomou). We are grateful to our data contributing investor for providing us with access to the data and to Alex Edmans (the Editor), an anonymous referee, two associate editors, as well as Rui Albuquerque, Marco Becht, Alon Brav, Michael Brennan, John Cotter, Craig Doidge, Alexander Dyck, Andrey Golubov, Michael Halling, Emir Ilhan, Guy Kaplanski, Oğuzhan Karakaş, Karl Lins, John McConnell, Adair Morse, Cal Muckley, Ser-Huang Poon and participants at the AFA 2018 Meetings, EFA 2019 Meetings, MFS Conference at Stockholm School of Economics, European Commission, European Science Hub, IAF 2018, Q-Group, SOAS, University College Dublin, PRI Academic Conference 2019, and the 2019 Conference on New Research on Executive Compensation and on Sustainability in Tel Aviv for comments. In addition, we thank the scientific committee of the United Nations-supported Principles for Responsible (PRI) Academic Conference 2019 for awarding an earlier version of the manuscript the Best Quantitative Paper Award. Diego Perez Guisande provided excellent research assistance. The investor studied in this paper did not influence the paper's results in any way and we did not have to ask for approval by the investor before submitting the paper for publication. We did not receive compensation from the investor for the project and the paper is neither commissioned research nor related to paid consulting work. The investor covered the travel expenses for one of the authors when presenting the paper at conferences organized by the investor for its clients. Hoepner is on the Academic Advisory Board of RepRisk.

1. Introduction

Direct institutional investor engagement on environmental, social, and governance (ESG) issues has become increasingly prevalent in financial markets. A primary goal of these engagements is to engender higher standards of corporate ESG practices that serve as an insurance mechanism against harmful, risk-inducing events as well as mitigating the likelihood of regulatory, legislative or consumer actions against the firm. Several factors contribute to this trend, including the increased public interest in ESG issues, the growing size and importance of institutional shareholdings, and the still relatively low passing rates for shareholder proxy proposals on many of the ESG issues of importance to institutional investors.[1]

In this paper we examine the relationship between investor engagement of a portfolio firm and the firm's subsequent downside risk. Downside risks can be particularly important for a number of investors. For example, pension funds face large liabilities towards their beneficiaries and the failure of their assets to meet those liabilities carries significant penalties (e.g., Ang, Chen, and Sundaresan, 2013). Thus, such investors face downside risk constraints. The importance of downside risk for banks and insurance companies is reflected in the fact that regulatory capital requirements include calculations based on downside risk measures, usually value-at-risk measures. Evidence also suggests that mutual fund managers and their shareholders consider downside risk in their investment decisions (Bodnaruk, Chokaev, and Simonov, 2019; Artavanis, Eksi, and Kadlec, 2019). Finally, while standard mean-variance investors would be more focused on volatility than downside risks, key assumptions in this framework are violated in practice. For example, although the mean-variance framework relies on the assumption that asset returns are jointly normally distributed, empirical evidence shows that returns are typically skewed, suggesting downside risk as an additional

[1] See Gillan and Starks (2000; 2007) or Grewal, Serafeim, and Yoon (2016).

consideration.[2]

To examine whether shareholder engagements on E, S and G issues can result in downside risk reductions, we employ proprietary engagement data provided by a large institutional investor based in the UK. This investor is considered to be one of the most influential activists when it comes to promoting the development of higher ESG standards at portfolio firms. The investor not only has the weight of its own holdings, but also speaks on behalf of other large institutional investors for whom it conducts engagement activities. The total assets under advisement of the institution exceed $1 trillion by the end of 2020. The investor primarily employs a private, nonpublic, approach to engage the portfolio firms, consistent with the more general evidence on institutional investor engagement in McCahery, Sautner, and Starks (2016).

Our data include 1,443 engagements across 485 targeted firms worldwide which began during the 2005 to 2018 sample period. The investor provided us with full access to the engagement database, including shareholdings, engagement activities, action reports, and the investor's measures of engagement success. The measure of engagement success consists of four milestones (MS): i) the investor raises a concern with a target (MS 1); ii) the target acknowledges the concern that was raised (MS 2); iii) the target takes actions to address the concern (MS 3); and iv) the investor successfully completes the engagement (MS 4). Out of all engagements in our sample, 33% successfully achieve all four milestones by the end of the sample period, 19% achieve MS 3, and 30% reach MS 2.

[2] See Harlow and Rao (1989), Harvey and Siddique (2000) or Ang, Chen, and Xing (2006). Even Markowitz (1959) considered investors to be mean-semi-variance rather than mean-variance optimizing. Referring to semi-variance, a downside risk measure, as "S" and to variance as "V" Markowitz (1959: 193-194) explains that *"analyses based on S tend to produce better portfolios than those based on V. Variance considers extremely high and extremely low returns equally undesirable. An analysis based on V seeks to eliminate both extremes. An analysis based on S, on the other hand, concentrates on reducing losses."*

The investor most commonly engages firms regarding governance issues, which account for 51% of the sample engagements and frequently center on executive pay and board structure. The next most common engagement type (26%) consists of those that relate to environmental issues with a primary focus on climate risk, which has become an important engagement topic among institutional investors (Krueger, Sautner, and Starks, 2020; Ilhan et al., 2022). The third most common engagement type covers social issues (23%), with three primary concerns: health and safety, supply chain, and illegal acts (e.g., bribery and corruption).

While engagements on environmental and social issues could be expected to reduce downside risk due to lower probabilities of harmful risk-inducing events, it is less obvious why engagements on governance issues should result in decreased downside risks. In fact, one may argue the opposite: engagements over governance topics could be intended to *increase* risk-taking if undiversified managers take too little risk compared to what is optimal for diversified shareholders.[3] In our setting, however, some governance engagements can reduce downside risks that originate from illegal activities or fraud, and risk reductions from such engagements are in the interest of shareholders. To illustrate, the investor's engagements to increase the independence of the audit or risk committee has the potential to reduce downside risks related to accounting fraud. Likewise, engagements to increase the holding period of equity-based pay should lower incentives to manipulate short-term earnings. However, not all governance engagements would be expected to reduce downside risk. For example, the investor's governance engagements that address issues related to increasing the CEO's pay-for-performance sensitivity do not have a clear expectation of affecting

[3] For example, Gormley and Matsa (2016) show that poor governance (the adoption of antitakeover laws in their setting) causes managers to inefficiently reduce stock volatility and the risk of distress.

downside risks.[4]

To examine whether the investor's ESG engagement activities reduce the portfolio firms' downside risks, we employ two measures that reflect the potential wealth-protection motives of ESG engagements: (1) the target firm's value at risk (VaR) (Duffie and Pan, 1997);[5] and (2) the lower partial moment (LPM) of the second order (Bawa, 1975; Fishburn, 1977), which captures *negative* return fluctuations. Using these measures we conduct difference-in-differences (DiD) analyses to estimate the changes in downside risks from before to after the engagements, relative to a control group of matched firms. We match each target firm to a control firm based on the country of the headquarters location, industry, and size. Using monthly data for the downside risk measures over two-year windows surrounding the investor's initial engagement, we find the investor's engagements to be associated with subsequent reductions in the target firms' downside risk. These effects are driven by the engagements classified as successful, i.e., at least MS 2 is achieved. We find the VaR declines by 0.24 from before to after the engagement, which is economically significant (9.3% relative to the standard deviation).[6] The magnitude of the risk reduction effect increases sharply if we impose a stricter definition of engagement success and consider only engagements where at least MS 3 has been achieved (i.e., the target management has started to take actions). For these engagements, the VaR decreases by 0.79 from before to after the engagement, relative to control firms, which is roughly 31% of the variable's standard deviation. Notably, we do not

[4] This difference in the investor's risk goals for governance engagements may explain why we do not find in the subsequent analyses that governance engagements, on average, reduce downside risks.

[5] The value-at-risk measure should capture ESG risk because firms with better ESG performance become less vulnerable to firm-specific negative events (Krueger, 2015). Ilhan, Sautner, and Vilkov (2021) use options-implied measures of tail risks to measure downside risk. We cannot take this approach because our international sample contains few firms for which liquid out-of-the-money puts are available.

[6] In case of multiple simultaneous engagements at a target, we calculate the average engagement success rate across all engagements. For such engagements, we require that *on average* at least MS 2 was achieved.

detect a significant risk reduction effect of engagement for those targets where MS 2 is not achieved (the target does not acknowledge the existence of an issue).

We consider *which* engagement types are most effective in reducing downside risks by examining how the effects vary across the investor's ESG themes. Considering MS 2 and MS 3 as the success threshold, engagements over environmental topics—primarily over climate change—deliver the highest benefits in terms of risk reductions. This is consistent with the survey evidence in Krueger, Sautner, and Starks (2020) that engagement over climate change is an important channel through which institutions try to tackle climate risks—our results suggest that such engagements can deliver substantial benefits for investors, by lowering the downside risk exposures. The environmental risk reductions we detect echo broader evidence that environmental risks have become salient and highly costly when they materialize. Examples illustrating the tail risk character of environmental incidents include BP's Deepwater Horizon oil spill in 2010 or PG&E's climate-related bankruptcy in 2019.[7]

A central problem with measuring downside risk reductions in response to shareholder engagements is that its main effect might be to reduce the probability of a rare disaster. In this case it could be difficult to measure any effect during our sample period because the potential disaster would not then occur. However, the implication of this issue is that the downside risk reductions we measure would be a lower bound on the total downside risk reductions. Further, our evidence on the environmental risk reductions that we are able to capture is consistent with related evidence in the climate finance literature as detailed by the Giglio, Kelly, and Stroebel (2021) review. For example, Ilhan, Sautner, and Vilkov (2021) document the pricing of carbon-related tail risks between 2009 and 2016. Similarly, Barnett (2020) finds his climate policy event index to be more discriminating between firms with

[7] See "BP Agrees to Pay $18.7 Billion to Settle Deepwater Horizon Oil Spill Claims," *Wall Street Journal*, July 2, 2015, and "PG&E: The First Climate-Change Bankruptcy, Probably Not the Last," *Wall Street Journal*, January 18, 2019.

varying degrees of climate risk for the "climate policy-focused" period from 1996 to 2017 than for his entire sample period (1973-2017). More recently, Sautner et al. (2022) show that discussions about climate risks in earnings conference calls have increased sharply since 2011.

Finally, we provide evidence on a channel through which the observed engagement activities reduce downside risk. As the risk reductions originate primarily from environmental engagements, we focus on negative outcomes related to environmental incidents, which we measure using news-based data from RepRisk. We exploit within-target variation to identify whether the engagement-induced risk reductions relate to actual changes in environmental incidents. Specifically, we contrast the change in environmental incidents around the investor's engagement between targets with large versus small reductions in downside risk. We find large and highly significant decreases in the number of environmental risk incidents at target firms that exhibit large engagement-induced downside risk reductions. For such targets, the number of incidents declines by 26% from before to after the engagement. In contrast, we find no corresponding declines in environmental incidents among engagements where downside risks did not decrease by a large amount.

We contribute to the literature on investor engagement, and specifically ESG engagement in two primary ways. First, we provide evidence to support the hypothesis that intervention over ESG topics reduces downside risk. This finding complements work that focuses primarily on the effects of shareholder engagements on first moments, that is, firm values or returns (Smith, 1996; Carleton, Nelson, and Weisbach, 1998; Becht et al., 2009; Dimson, Karakaş, and Li, 2015; Barko, Cremers, and Renneboog, 2022; Becht, Franks and Wagner, 2021). Including risk as an outcome variable, Dimson, Karakaş, and Li (2015) find that stock return volatility decreases after successful ESG engagements. Second, our evidence relates to contemporaneous work by Akey and Appel (2020), Naaraayanan, Sachdeva, and Sharma (2021), and Chu and Zhao (2019), who demonstrate that environmental shareholder activism has real effects through emission reductions. Our results complement their evidence by showing that activism can benefit shareholders through the lowering of downside risks.

2. Engagement Data and Process

2.1 Engagement Data

We obtain the engagement data from a large institutional asset manager in the UK who is considered to be highly influential through an active ownership strategy. The proprietary database contains 1,443 ESG engagements targeting 485 firms worldwide, covering the period between January 2005 and April 2018.[8] We have access to many details of the investor's engagement database, including the engagement reports, action reports, and success milestones.

Figures 1, 2, and 3 display the breakout of the engagements by geographic location, industry and year. Figure 1 shows that the investor engages firms across many countries, with the largest number of engagements targeting firms in the US (313 or 18% of the sample) and the UK (278 or 16%). These countries are followed by two large Asian economies (Japan with 104 engagements or 6%; South Korea with 70 or 4%), two continental European countries (France and Germany, each about 4%), and Brazil (3%). Figure 2 illustrates that the most prominent engagement sectors are Financials, Basic Materials, Consumer Goods, Oil & Gas, Industrials, and Consumer Services. The sectors less environmentally exposed (Technology and Telecommunications) are less frequently targeted. Figure 3 shows that the investor gradually increased the intensity of engagements from 2005, reaching a peak with 200 engagements in 2010, and then entering into slightly lower numbers of engagements in the remaining years of the sample. Although the number of engagements per year decreases after the peak, the investor remains very active, commencing 170 and 139 engagements in 2016 and 2017, the last two complete sample years.

[8] The investor also engages on "strategy" topics, which are not examined in this paper as our focus is on ESG engagements.

2.2 ESG Engagement Process

The investor has a stated goal of engaging firms to incorporate long-term sustainability and risk management into their business operations and corporate policies. The investor believes that firms with informed and involved shareholders are better able to manage risk and minimize the occurrence of tail risk events. The investor further states that the engagement process consists predominantly of a constructive, confidential dialogue, which is achieved with a team of more than 30 professionals who engage on behalf of the investor's own assets as well as on behalf of clients. These clients consist of more than 40 asset owners, the vast majority of which are public pension funds, and the assets represented by our investor exceed $1 trillion by the end of 2020.

In Table I we report the frequency of engagements across the ESG themes. The investor most commonly engages portfolio firms over governance issues, accounting for 51% of all engagements, followed by engagements on environmental (26%) and social issues (23%). This distribution mirrors the percentages of engagements by a different asset manager studied by Dimson, Karakaş, and Li (2015) who also find for their investor a greater frequency of governance engagements than engagements on environmental and social topics.

Among all environmental topics (Panel A), the investor focuses primarily on issues related to climate change (47%). The importance of climate-related topics in our sample is reflected by the fact that the number of such engagements (179) amounts to more than 85% of the number of engagements on the most common "traditional" engagement topic: executive compensation (206). This observation reflects a wider trend: Climate change has become an important engagement topic for many institutions, apparently caused by the investors' belief that climate risks have the potential to adversely affect the values of assets managed by institutional investors (Krueger, Sautner, and Starks, 2020). Additionally, many institutions find climate risks difficult to price and hedge, making direct engagement, such as demanding robust climate disclosure or a reduction in emissions, an important risk-management tool. IA Table I shows that, across the investor's 179 climate engagements, 28%

target a firm's carbon strategy and risk management, 27% aim to improve carbon disclosure, 25% strive to reduce a firm's carbon intensity, and 6% address stranded assets concerns.

In terms of social themes, as shown in Panel B of Table 1, the investor engages primarily over concerns regarding human rights (42%), labour rights (27%), and bribery and corruption (14%). These themes are similar to the social themes examined in Dimson, Karakaş, and Li (2015). Within the governance area (Panel C), the investor most frequently intervenes because of concerns over executive pay (28%), board independence (26%), board diversity (23%), and succession planning (12%). These concerns also reflect concerns of the broader institutional investor community, as shown in industry publications (e.g., Wilcox and Sodali, 2017) and in surveys (McCahery, Sautner, and Starks, 2016; Edmans, Gosling, and Jenter, 2022).

Table II, Panel A, reports the proportions of the engagements that reach each milestone by the end of the sample period. Across all categories of engagements, 30% achieve at least MS 2 (the target acknowledges the concern), 19% go one step further and achieve at least MS 3 (target takes actions to address the concern), and 33% reach MS 4 (engagement is successfully completed). Thus, according to these milestones, the engagements have been met with varying success rates.

While similar to the success rates in Dimson, Karakaş, and Li (2015), the success rates in our sample are lower than those reported by activist hedge funds, who engage in a different way and generally for different purposes (the hedge fund success rates are 60% in Brav et al., 2008 and 60% in Klein and Zur, 2011). One reason could be that it is harder to persuade top management and the board to incorporate the requested ESG changes as compared to requested financial changes (capital structure or dividend policy), which traditionally have been the focus of activist hedge funds. Second, hedge funds typically target firms that are in need of the requested financial changes, and they bring other investors on board to lobby firm management for changes (Kedia, Starks, and Wang, 2021; Brav, Jiang, and Li, 2022).

Table II, Panel B, shows that it takes on average two months to complete MS 1, then an additional four months until a portfolio firm also acknowledges an issue raised by the investor (MS 2), and 18 additional months until the engagement target has also taken actions or developed a strategy to improve an issue (MS 3). For those targets for which all milestones are successfully completed, the process takes 34 months, on average.[9] The table also shows variation across the engagement themes in the time it takes to complete the engagement milestones.

In IA Table II, Panel A, we report the "actions" taken by the investor to achieve the engagement goals. Among all actions, about 45% take the form of meetings, followed by substantive emails (18%), and conference calls (16%). MS 1 and 2 can be completed, on average, with one or two meetings per engagement, while it takes an average of three meetings to achieve MS 3 and five meetings to achieve MS 4. Moving from MS 2 to MS 3, and especially from MS 3 to MS 4, are the more difficult steps, requiring a larger number of meetings, emails, calls, and letters. IA Table II, Panel B, shows that the investor has dialogues over social and environmental topics mostly with senior executives, whereas the investor tends to communicate most with the board and the chairperson over governance issues.

3. ESG Downside Risk Reduction

3.1 Downside Risk Measures

Downside, or left-tail risk, is an important consideration in asset pricing, particularly given that the distribution of stock returns can be characterized by skewness and heavy tails.[10] In

[9] These rates can be compared to Becht et al. (2009) who find that collaborative corporate governance engagements take 16 months, whereas confrontational ones take 43 months. Brav et al. (2008) find that the average duration of an engagement undertaken by a hedge fund is 12 months.

[10] See Bawa (1975), Bawa and Lindenberg (1977), Singleton and Wingender (1986), Harlow and Rao (1989), and more recently, Harvey and Siddique (2000) or, Ang, Chen, and Xing (2006).

this case, risk measures, such as volatility that do not distinguish between positive and negative outcomes, may be uninformative, while downside risk measures better capture investors' perceptions of risk (Harlow, 1991). Moreover, as argued earlier, many institutional investors have a natural focus on left-tail risk due to their business interests or because of regulation. Thus, if downside risk is an important consideration for ESG engagement outcomes, we would expect a relationship between successful ESG engagements and subsequent changes in measures of firms' downside risks.

We employ two widely used measures to identify downside risk. As a first measure, we calculate a firm's value at risk (*VaR*) (Duffie and Pan, 1997). We measure *VaR* at the firm-month level by calculating daily return outcomes ranked in the bottom fifth percentile (5%-VaR). We use absolute values such that smaller numbers reflect less downside risk.

Our second measure, the second-order lower partial moment (*LPM*), captures the distribution of returns that fall below 0%, that is, we consider the negative return part of the distribution. *LPM* is calculated as the square root of the semi-variance below 0% (Bawa, 1975; Fishburn, 1977):

$$LPM = \sqrt{\frac{1}{N_1 - 1}\sum_{i=1}^{N_1}(r_{n,i} - \overline{r_{n,i}})^2}$$

where $r_{n,i}$ indicates the negative return of firm *i* and $\overline{r_{n,i}}$ is the mean value of $r_{n,i}$. N_1 is the number of observed *negative* returns for firm *i* during the measurement period. We calculate the measure at the firm-month level from daily (log) stock return data.

3.2 Risk Reduction Effects: Empirical Results of ESG Engagement

3.2.a Empirical Methodology

In the risk analysis we exclude 57 targets in the utilities and health sectors from the full sample of 485 firms as they operate in heavily regulated environments where activists have lower

chances to affect change over the horizon we consider in this paper (some of the engagements may require legislative changes as well). We lose 51 firms for which we cannot find a match in the FTSE All-World index and 98 firms for which there is missing data on the control variables. Our final sample for the risk analysis in turn contains 279 target firms matched to the same number of control firms.

To test whether ESG engagements are related to subsequent downside risk reduction, we implement a difference-in-differences (DiD) model and compare the downside risk of engagement targets before and after the engagement, relative to a matched control group. We estimate changes in downside risk at the firm-month level over the two-sided 24-months window around the date in which a target is first engaged by the investor.

We match each targeted firm to one control firm based on the headquarters country, industry, and size. We match one-to-one, instead of one-to-N, to avoid bias originating from risk diversification benefits of a portfolio of N control firms. To identify control firms, we use the initial engagement date and search for a control firm in the FTSE All-World index (the index covers about 95% of the world's investable market capitalization and includes more than 4,000 firms from nearly 50 countries). Matching by country is important because ESG regulations and ESG performance vary across countries. (We replace country by region in the rare cases where a firm is unique in its industry and size bracket within its country.) We match by industry as engagement may be more successful in industries with recent ESG scandals,[11] and because downside risk itself may vary across industries. Finally, we match on size as ESG incidents may have more adverse reputational effects for larger firms—they tend to be more salient to investors or customers—, and as large firms respond more positively to shareholder activists (Dimson, Karakaş, and Li, 2015).

[11] Consistent with this conjecture, Dimson, Karakaş, and Li (2021) find that the success rate in their sample varies across industries.

The DiD model estimates for each firm *i* in country *c* and month *t* the following regression:

$$Downside\ Risk_{i,c,t} = \alpha + \beta_1\, Target_{i,c} \times Post_{i,c,t} + \beta_2\, Target_{i,c} + \beta_3\, Post_{i,c,t} + \beta_4\, \boldsymbol{X}_{i,c,t-12} + \mu_i \times \gamma_t + \vartheta_c + \varepsilon_{i,c,t}, \quad (1)$$

where $Downside\ Risk_{i,c,t}$ represents one of the two measures of downside risk ($VaR_{i,c,t}$ or $LPM_{i,c,t}$); $Target_{i,c}$ equals 1 for all firm-month observations if firm *i* is a target, and 0 if it is a control firm; and $Post_{i,c,t}$ equals 1 for all firm-month observations after firm *i* has been targeted in month *t*, and 0 before. Some specifications replace $Post_{i,c,t}$ with indicator variables for the four half-year periods after an initial engagement ($Post\ HY1_{i,c,t}$ to $Post\ HY4_{i,c,t}$). If a target is engaged for a second time within the 24-months post window, the post-engagement window ends in the month prior to the second engagement (the pre-engagement window and the two-sided window of the control firm is adjusted accordingly).[12] The vector $\boldsymbol{X}_{i,c,t-12}$ contains control variables that may affect downside risks beyond shareholder engagement, measured with a lag of one year. The variables μ_i, γ_t, and ϑ_c, are industry, year, and country fixed effects. Summary statistics of the variables used in the DiD analysis are reported in Table III.

IA Table III evaluates covariate imbalance by comparing the control variables between target and control firms. Despite matching on size, target firms tend to be larger, have lower average market-to-book ratios, and have a higher free float. In terms of leverage, investments, and profitability, the two sets of firms are relatively similar. If engagements are more likely to be successful in larger firms, in firms with lower valuations, and in firms with a higher free float, then this may potentially upward-bias our results. We therefore control for these variables in the estimation to minimize any such potential bias.

[12] In a small number of cases, we shorten the engagement window due to potentially confounding, engagement-unrelated corporate events.

To further alleviate concerns about bias, Figure 4 displays for the targeted and control firms the evolution of the downside risk measures (average values) over the two-year period prior to the investor's engagement. While both measures exhibit time-series variation with a slight decline leading up to the engagement, the trends for both sets of firms are similar. This mitigates the potential concern that the results are affected by unobserved differences between target and control firms.

3.2.b Overall Effects of ESG Engagement on Downside Risk

In Table IV we report the baseline estimates of Equation (1) to understand the effects of shareholder engagement on downside risk. Columns 1 to 5 display results for *VaR* and Columns 6 to 10 report results for *LPM.* We present in Columns 1 and 6 estimates of the overall effects of ESG engagement on *VaR* and *LPM*, and in the remaining columns the results separated by engagement success. We consider two definition of engagement success. The first definition in Columns 2 to 3 and Columns 7 to 8 classifies as successful those cases where, at the minimum, the target acknowledges an issue of concern raised by the investor (i.e., at least MS 2 has been achieved). The second definition, applied in Columns 4 and 9, is stricter and requires that the target not only acknowledges the issue but takes actions to address it (at least MS 3 is reached).[13] As we estimate regressions at the firm-month level—rather than the firm-engagement-month level—, we need to create a measure of engagement success in the case of multiple overlapping engagements. In such cases, we calculate the average engagement success rate across the engagements and require the *average* milestone to exceed 2 or 3, respectively.[14]

[13] The classification of success implies a reducing in the sample size used for the estimation, especially when we consider MS 3 (at the benefit of allowing us to cleanly identify effect of successful engagements).

[14] We calculate this average success rate as the sum of the milestones achieved, coding as 1 if MS 1 has been achieved, 2 for MS 2, etc., and divide the sum of these milestones by the number of engagements. For example, in case the investor reached at one target firm MS 2 for one engagement and MS 3 for another engagement

Columns 1 and 6 demonstrate that across all engagements, whether successful or not, downside risk decreases at targeted firms from before to after the engagement, relative to the control group. However, the point estimates are noisy and statistically insignificant. Importantly, the magnitude and statistical significance of the effects sharply increases once we condition on engagement success in the remaining columns. Specifically, Columns 2 and 7 show that ESG engagements significantly reduce downside risk among those engagements where at least MS 2 is achieved, that is, among targets that acknowledged the existence of an ESG issue or responded with actions to the investor's demands. The estimate in Column 2 for *VaR* implies that the downside risk of targets decreases by 0.241 after the engagement, relative to the control firms; these risk reductions correspond to 9.3% of the variable's standard deviation. As shown in Column 7 we obtain similar results with *LPM* as the measure of downside risk, both in terms of statistical and economic significance (the effect equals 9.5% of the standard deviation).[15]

In Columns 3 and 8 we examine more closely *when* the downside risk reduction materializes. For this purpose, we replace *Target x Post* with four terms that interact *Target* with $Post\ H1_{i,c,t}$ to $Post\ H4_{i,c,t}$, respectively, in order to capture the engagement effects in each half-year period after an engagement. While downside risk does not immediately decrease in the first half year after an engagement, most of the overall risk reductions occur in the second and third half year after the engagement. These estimated timelines are plausible—one would expect it to take time until the investor's engagement successfully reduces stock price-based measures of risk. (Table 2 also demonstrates time is required until the engagement reaches a milestone indicating success.) We further observe that the downside risk measures

with the respective firm, the average success rate would be (MS) 2.5. This procedure is in line with Dimson, Karakaş, and Li (2015).

[15] Financials constitute the most frequently observed industry of the targeted firms (Figure 2). As this sector is highly regulated and special in nature, it would be implausible if our results mostly originate from such targets. Indeed, IA Table IV shows that our results are robust to excluding Financials.

in the fourth half year do not differ significantly between targeted and control firms. This indicates that some of the risk reductions are temporary, which is consistent with the observation that the investor performs repeated engagement in several target firms.

In Columns 4 and 9 we impose a stricter definition of success and only consider as successful those engagements where at least MS 3 has been achieved. The economic significance of the downside risk effects in these estimations increases further, by a factor between three and four, depending on the risk measure. The larger effects are plausible as they capture the engagements where we know that the target started to take actions to address an ESG issue of concern. In Column 4 *VaR* decreases by 0.79 from before to after the engagement, relative to control firms. We find positive and significant effects also for *LPM* in Column 9.

Reassuringly, Columns 5 and 10 show no evidence for significant reductions in downside risk among those targets where engagement has not achieved MS 2. This observation reduces potential concerns about our results being driven by a confounding mechanism (e.g., the stock-picking ability of the investor).

Using a global shareholder engagement sample, Becht et al. (2017) demonstrate that activists are most successful in reaching their engagement objectives for targeted firms located in North America. Moreover, in their study the short-run announcement returns around the disclosure of an activist's equity stake in a target are highest among North American firms, followed by targets in Asia and Europe.[16] Motivated by this evidence, we explore whether the investor's risk reduction effects vary across major world regions. We in turn re-estimate Equation (1) separately for targeted and control firms in North America,

[16] The analysis in Becht et al. (2017) does not consider ESG engagements. Note that Dimson, Karakaş, and Li (2015) are unable to explore the cross-country variation of success rates and announcement returns as their sample is restricted to targets from the United States.

Europe, and the Rest of the World.

Table V reports the corresponding results by region, both across all engagements and separated based on whether or not MS 2 was reached. Consistent with the Becht et al. (2017) results for hedge fund activism, the effects of ESG engagement on downside risks are strongest among targeted firms in North America (Panel A), while there is virtually no effect of ESG engagement on downside risk in Europe (Panel B). The estimates in Panel C for the remaining countries are closer in magnitude to those for North American firms, especially if we consider successful engagements, but still insignificant at conventional levels (*t*-statistics of 1.46 in Column 2 and 1.29 in Column 5).

Based on our conversations with the investor, favorable factors contributing to the measured risk reductions in North America include comparably strong investor rights to execute the engagements, coupled with the possibility to follow up at the annual meeting and ultimately, a possible threat to conduct a proxy fight. A further factor is the relatively high level of transparency in the United States about many aspects of the firm and its actions, including transparency regarding additional institutional investors (e.g., based on quarterly public 13f filings) who could assist in pressuring the firm for the requested changes or who could help in a proxy fight if needed.

3.2.c Effects of ESG Engagement on Downside Risk by Engagement Theme

We consider in Table VI the different ESG engagement themes to determine whether some engagement areas have greater potential for reduced downside risk. In Panel A we employ *VaR* as the dependent variable. Columns 1 to 3 report results by engagement theme irrespective of engagement success. In Column 1 we find that firms being engaged for environmental issues experience a decline in downside risk. In Columns 2 and 3 the effects for social and governance themes are not statistically different from zero. Measuring success based on MS 2 in Columns 4 to 6, we continue to find that only engagement on environmental issues results in a statistically significant reduction in downside risk. For engagements over

such topics, which as shown above primarily have the theme of climate change, *VaR* at target firms decreases by 0.297 after the engagement, relative to control firms. For social and governance engagement we find that although the magnitudes of the reductions in downside risk are large, they are insignificant. The same conclusion holds when we consider MS 3 in Columns 7 to 9 to classify success, with the reduction in *VaR* increasing by a factor of five to 1.778—we caution that the sample sizes in the regressions conditioning on MS 3 are relatively small. In Panel B we consider *LPM* as the downside risk measure and find results that are similar.

What can we conclude from the heterogeneity in results across engagement topics? Together with evidence from prior research, the weaker effects for governance topics suggest that engagements on compensation topics or board independence, the top subthemes within this area, most directly affect the first moments of the return distributions (see Becht et al., 2009; Brav et al., 2008; or Dimson, Karakaş, and Li, 2015). One reason for the lack of statistical significance in downside risk reduction for the social topics could be that such themes—or ethical and cultural aspects in general—reflect more subjective concerns. This means that it is rather easy for a target to make some verbal commitment regarding a cultural change or better gender balance, but it would be much harder to then actually define tangible actions and even implement them. This explanation could also be reflected in the time it takes to go from one milestone to the next (Table II, Panel B): social engagements are quickest when it comes to achieving MS 2, but they are tied for slowest in MS 4 achievement. Another reason for the weaker risk reduction effects for social engagements might be that investors in a target firm find it difficult to observe, measure, and price improvements related to social topics (to the contrary, environmental improvements related to emission reductions or disclosure are probably easier to objectively measure).

3.3 Risk Reduction Channel: Empirical Results on Environmental Incidents

3.3.a Empirical Methodology

One potential economic channel for our results is if the downside risk reductions relate to a decline in observable ESG risk outcomes. Given that the risk reduction results in the previous sections originate primarily from engagements over environmental topics, we focus on negative *environmental* risk outcomes. We measure such outcomes using news-based data on environmental risk incidents from RepRisk, a data provider that each day screens more than 100,000 public sources for greater than 200,000 firms globally in 23 languages (the languages of all target countries listed in Figure 1 are covered). The sources used to identify environmental incidents include print, online, and social media; government bodies, regulators, think tanks, and newsletters; and other online sources. Two benefits of a RepRisk-based measure are helpful in our setting: First, RepRisk provides global coverage and, second, the incidents that it identifies primarily reflect idiosyncratic events (Gantchev, Giannetti, and Li, 2022). To identify meaningful reductions in environmental risks, our variable measurement considers the severity of environmental incidents, with more severe incidents receiving higher weights.[17] (We alternatively use a measure reflecting the number of *novel* incidents for robustness.) IA Table V reports the distribution of environmental risk incidents across the sample target firms, showing that the incident distribution is highly skewed.

To document an ESG-incident channel underlying the downside risk reductions, for each firm *i* in country *c* and month *t* that is targeted by an environmental engagement we

[17] RepRisk determines the severity of an incident as a function of i) the consequences of the risk incident; ii) the extent of the impact; and iii) whether the risk incident was caused by an accident, by negligence, or intent, or even in a systematic way. RepRisk then classifies such incidents using three levels of severity: low, medium, and high severity. Our measure is constructed as the sum of all severe environmental incidents, whereby we weight a severe incident with 1 if it is a low severity incident, with 2 if it is a medium severity incident, and with 3 if it is a high severity incident.

estimate the following model:

$$\#\ E\ incidents_{i,c,t} = \exp(\alpha + \beta_1 Post_{i,c,t} + \beta_2 \boldsymbol{X}_{i,c,t-12} + \mu_i \times \gamma_t + \vartheta_c + \varepsilon_{i,c,t}), \quad (2)$$

where $\#\ E\ incidents_{i,c,t}$ is a measure of the number of environmental risk incidents for target *i* in month *t*, with the measure accounting for the severity of an incident. The mean of the variable equals 0.88 with a standard deviation of 1.55. $Post_{i,c,t}$ equals 1 for all firm-month observations after target *i* has been targeted in month *t*, and 0 before, and $\boldsymbol{X}_{i,c,t-12}$ contains the same control variables as in Equation (1). The variables μ_i, γ_t, and ϑ_c, are again industry, year and country fixed effects. To identify whether the engagement-induced changes in downside risk relate to actual changes in environmental incidents, we exploit within-target variation and estimate Equation (2) for targets with large versus small reductions in downside risk. For this purpose, we calculate average values for *VaR* and *LPM* separately over the two-year periods before and after the initial engagement, and then classify each target firm based on whether the respective change in *VaR* or *LPM* is above ("Large") or below ("Small") the median. Equation (2) is estimated using Poisson regressions, rather than "log1plus" models, to account for the distribution of $\#\ E\ incidents_{i,c,t}$, the count-based outcome variable.[18]

3.3.b Downside Risk Reductions and Environmental Incidents

Table VII reports the regression results obtained from estimating Equation (2). In Column 1, which includes all targets independent of the realized change in downside risk, we observe a marginally significant decline in severe environmental incidents after the investor's engagement. More importantly, in Columns 2 and 4 we consider only those target firms for which we observe large declines in *VaR* or *LPM* as a result of the investor's engagement over an environmental topic. For these subsets of targets, we find a large and highly significant

[18] Poisson models provide unbiased estimates for dependent variables with a large mass of values at 0 combined with severe skewness (Cohn, Liu, and Wardlaw, 2022).

decrease in the number of environmental risk incidents after the engagement. Column 2 implies that the severity-weighted number of environmental incidents declines by 26% from before to after the engagement. In Columns 3 and 5, we find no statistically significant decline in severe environmental incidents among engagements where downside risks did not decrease by a large amount.

IA Table VI provides alternative specifications of Equation (2) to address different potential concerns with the analysis. Columns 1 to 4 consider the subset of targets that exhibit large declines in *VaR* and *LPM*. In Columns 1 and 2 results remain negative and significant if we control for a linear time trend, in order to address that RepRisk may have screened more incidents over time. In Columns 3 and 4 we continue to find effects if we only consider those environmental incidents classified as "novel" by RepRisk (i.e., cases where it is the first time that a firm is exposed to a specific environmental issue). This implies that the engagement process reduces the occurrence of new risks, instead of only mitigating the reoccurrence of prior risk issues. Finally, in Columns 5 and 6, we estimate Equation (2) on the full sample of environmental targets and include interaction terms of *Post* with indicator variables reflecting a large decline in *LPM* or *VaR*, respectively. Also in these specifications, we find larger reductions in environmental incidents for targets experiencing large declines in downside risk.

4. Conclusions

In this paper we employ proprietary data from an influential activist investor to examine whether shareholder engagement regarding ESG topics can reduce downside risk. Using two measures of downside risk, value at risk and the lower partial moment, we demonstrate that ESG shareholder engagements result in risk reductions. Further evidence in support of this hypothesis comes from the fact that the risk-reduction effects are concentrated among the successful engagements. The risk reduction effects vary across ESG engagement themes, being driven primarily by the effects from environmental topics. The prime issue within this engagement category is climate change. Finally, we provide evidence on a channel through which the engagement activities reduce downside risk. We document a large decline in the

number of environmental risk incidents at targeted firms with large engagement-induced downside risk reductions. There is no corresponding decline among targeted firms where downside risks did not decrease by a large amount. Given the increasing engagement by institutional investors on ESG issues, our analysis contributes new insights into understanding the channel through which ESG engagement can create value for investors beyond affecting returns.

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Appendix A: Variable definitions

Variable	Definition	Data Source
Engagement Target	Dummy variable that equals 1 for all firm-month observations if a firm is an engagement target, and 0 if it is a control firm. Control firms are matched with engagement targets using country, industry, and size as matching criteria.	Self-constructed
Post	Dummy variable that equals 1 for all firm-month observations after an engagement, and 0 for all firm-month observations before an engagement.	Self-constructed
Post HY1	Dummy variable that equals 1 for all firm-month observations in the first half year after an engagement, and 0 for all other firm-month observations. Post H2 to H4 are defined accordingly, but for the second, third, and fourth half year after an engagement.	Self-constructed
VaR	Variable that measures the value at risk, calculated at the firm-month level from daily log stock returns. We measure the VaR by taking daily return outcomes ranked at the bottom fifth percentile (5%-VaR). This essentially corresponds to the worst daily return during a month. We take the absolute values of the VaR.	Datastream
LPM	Variable that measures the lower partial moment of the second order, calculated at the firm-month level from daily log stock returns. It is defined as: $$LPM\ (0,2) = \sqrt{\frac{1}{N_1 - 1}\sum_{i=1}^{N_1}(r_{n,i} - \overline{r_{n,i}})^2}$$ where $r_{n,i}$ indicates a negative daily return of firm i during a given month, and $\overline{r_{n,i}}$ is the mean value of $r_{n,i}$. N_1 is the number of observed negative daily returns for firm *i* during a given month.	Datastream
Market value	Market value of equity, calculated at the firm-month level. Winsorized at 1%/99%.	
Market-to-book ratio	Market value of equity divided by book value of equity. Market value of equity is calculated at the firm-month level, book value of equity is calculated at the firm-year level. Winsorized at 1%/99%.	Datastream
Leverage (in %)	Total debt divided by common equity, calculated at the firm-year level. Total debt is the sum of long-term and short-term debt. Winsorized at 1%/99%.	Datastream
Investment (in %)	Capital expenditures over assets, calculated at the firm-year level. Winsorized at 1%/99%.	Datastream
Profit margin (in %)	Operating income over total sales, calculated at the firm-year level. Winsorized at 1%/99%.	Datastream
Dividend yield (in %)	Dividends per share divided by the share price. Dividends are calculated at the firm-year level, the share price at the firm-month level. Winsorized at 1%/99%.	Datastream
Freefloat (in %)	Number of shares available as free float, divided by number of shares	Datastream

	issued, calculated at the firm-year level. Winsorized at 1%/99%.	
# E incidents	Measure of the number of environmental risk incidents in a firm-month. In the construction of the measure, more severe incidents receive higher weights. RepRisk determines the severity of an incident as a function of three dimensions: i) what are the consequences of the risk incident?; ii) what is the extent of the impact?; and iii) was the risk incident caused by an accident, by negligence, or intent, or even in a systematic way? RepRisk then classifies such incidents using three levels of severity: low, medium, and high severity. Our measure is constructed as the sum of all severe incidents, whereby we weight a severe incident with 1 if it is a low severity incident, with 2 if it is a medium severity incident, and with 3 if it is a high severity incident. RepRisk identifies environmental risks incidents related to the following topics: Animal mistreatment; climate change, GHG emissions, and global pollution; impacts on landscapes; ecosystems, and biodiversity; local pollution; overuse and wasting of resources; and waste issues.	RepRisk
# Novel E incidents	Measure of the number of novel environmental risk incidents in a firm-month. In the construction of the measure, more novel incidents receive higher weights. RepRisk determines the novelty (newness) of an incident based on whether it is the first time a firm is exposed to a specific environmental. RepRisk then classifies such incidents using two levels to measure the magnitude of novelty: 1 or 2. Our measure is constructed as the sum of all novel incidents, whereby we weight each incident with a 1 or 2 depending on the novelty (larger number indicate more novel incidents).	

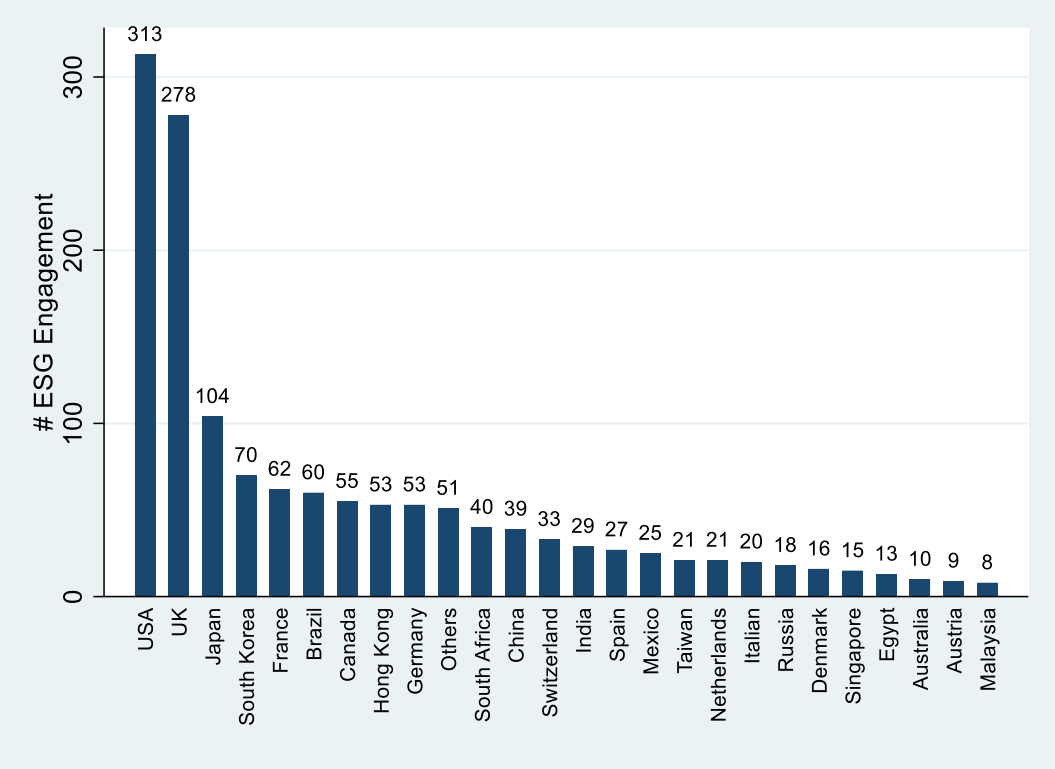


Figure 1. ESG engagements by country.

This figure reports engagements by the target firm's country of incorporation. The sample consists of 1,443 engagements across 485 targeted firms over the period January 2005 through April 2018.

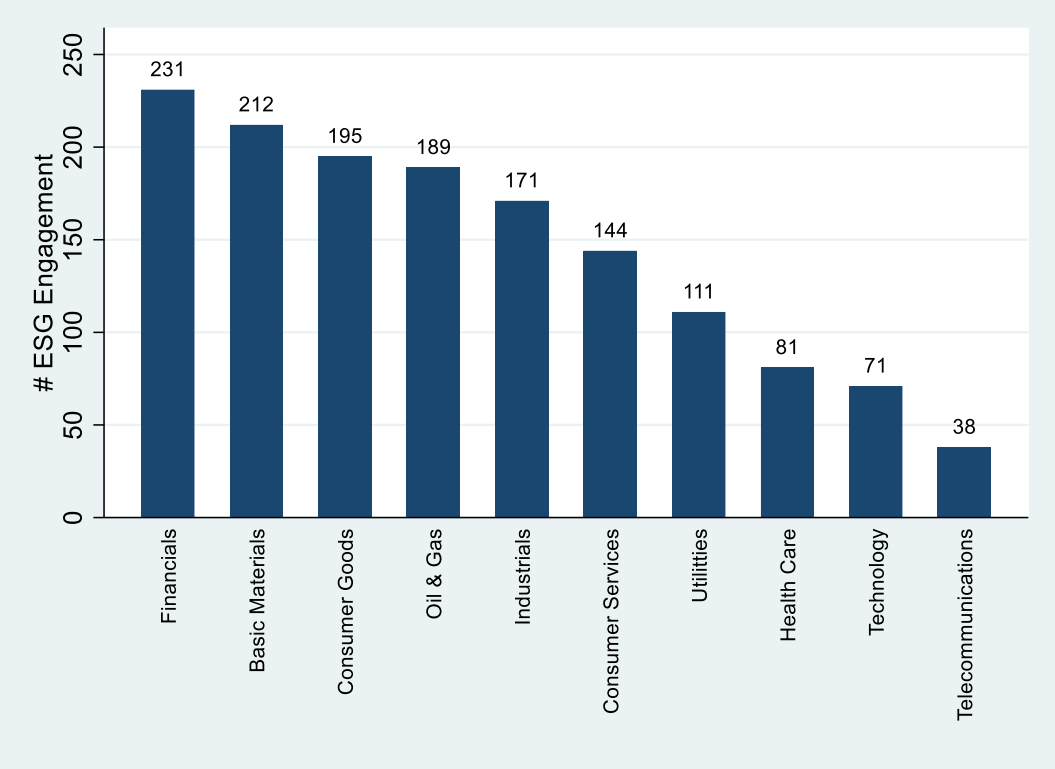


Figure 2. ESG engagements by industry.

This figure reports engagements by the target firm's industry. The sample consists of 1,443 engagements across 485 targeted firms over the period January 2005 through April 2018.

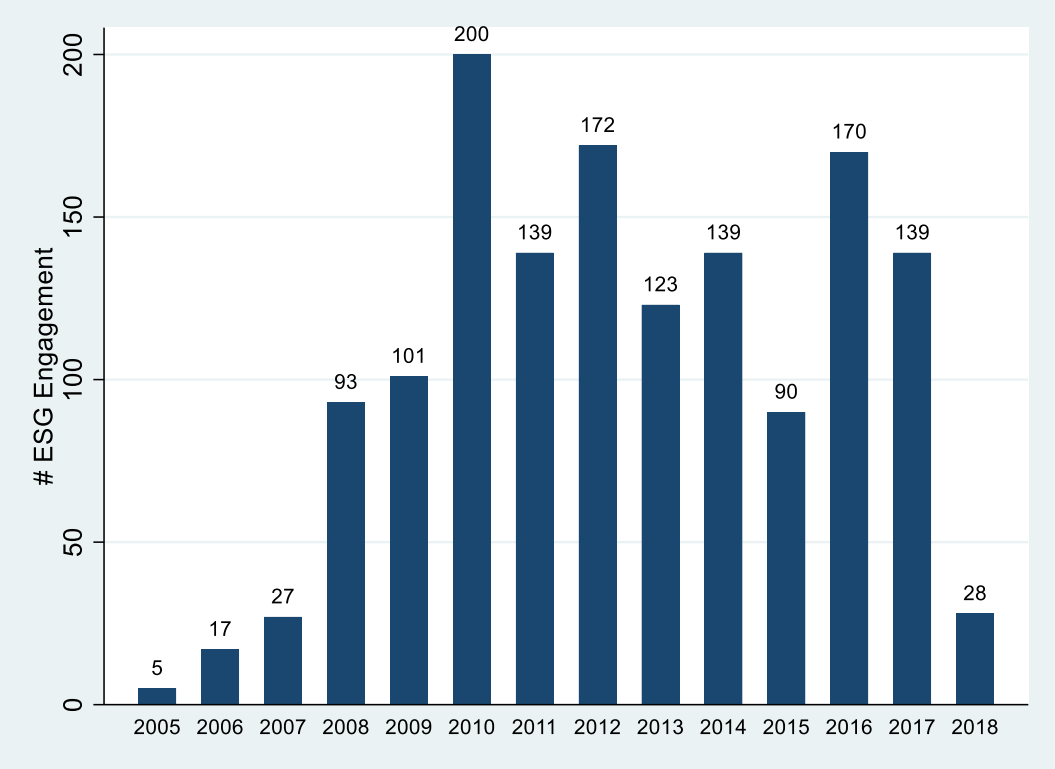
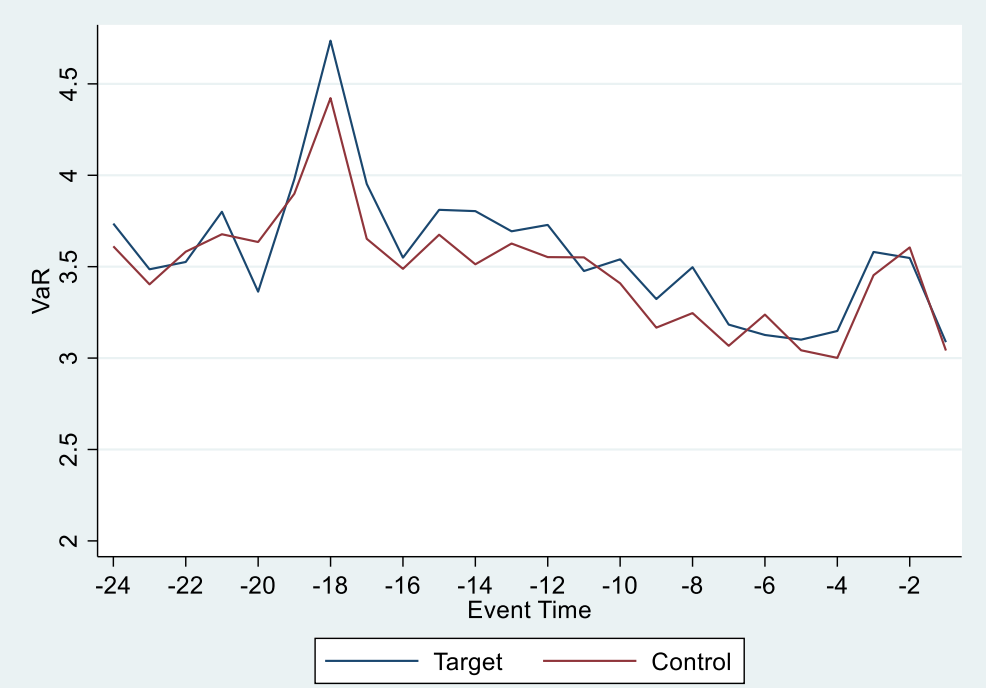


Figure 3. Total ESG engagements by year.

This figure reports engagements by year of the initial engagement. The sample consists of 1,443 engagements across 485 targeted firms over the period January 2005 through April 2018. The 2018 year is partial year; thus, the 2017 year is the last year with complete engagement data in our sample.

Panel A: Value at Risk (VaR)



Panel B: Lower Partial Moments (LPM)

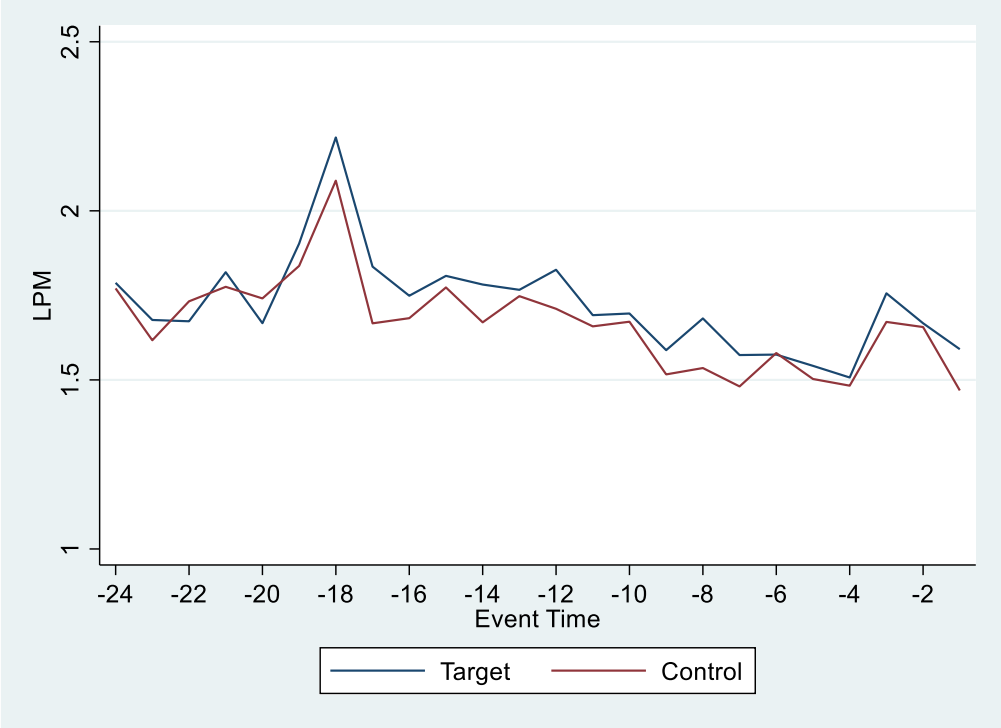


Figure 4. Evidence of parallel trends.

This figure reports the time-series evolution of the downside risk measures, *VaR* in Panel A and *LPM* in Panel B, over the 24-month period prior to initial engagement. The figure compares target and control firms. The sample in this analysis includes 279 targeted firms and 279 matched control firms, where control firms are matched with engagement targets using country, industry, and size as matching criteria. Variable definitions are provided in Appendix A.

Table I. Summary statistics on engagement themes

This table provides summary statistics across three engagement themes: environmental; social; and governance. The table also breaks down these themes into subthemes, and reports the number (percentage) of engagements within each engagement theme. The sample consists of 1,443 engagements across 485 targeted firms over the period January 2005 through April 2018.

Panel A: Environmental engagement		
Sub-themes	#	%
Climate change	179	47
Environmental policy and strategy	51	13
Supply chain management	44	12
Water	40	11
Pollution and waste management	38	10
Forestry and land use	27	7
Total	379	100
% of engagements (N = 1,443)	26.3	
Panel B: Social engagement		
Sub-themes	#	%
Human rights	142	42
Labour rights	91	27
Bribery and corruption	47	14
Conduct and culture	39	12
Other social	16	5
Total	335	100
% of engagements (N = 1,443)	23.2	
Panel C: Governance engagement		
Sub-themes	#	%
Executive remuneration	206	28
Board independence	193	26
Board diversity skills and experience	165	23
Succession planning	84	12
Shareholder protection and right	81	11
Total	729	100
% of engagements (N = 1,443)	50.5	

Table II. Summary statistics on engagement success and duration

This table displays descriptive statistics on measures of engagement success ("milestones") (in Panel A) and on engagement durations (in months) (in Panel B), reported by milestone (MS) and engagement theme. In Panel A, the success percentages are relative to all engagements as well as relative to all engagements of a given theme (E, S, or G). As the average engagement duration equals 35 months and our data end in early 2018, some engagements are still work-in-progress or pending by the end of the sample period, implying that MS 3 or 4 may not yet have been achieved. The sample consists of 1,443 engagements across 485 targeted firms over the period January 2005 through April 2018.

	Panel A: Engagement success		**Panel B: Engagement duration (months)**		
	#	% E, S, G, or all Engagements	Mean	STD	Max
MS 1: Concern raised with target					
E engagement	77	20	2	6	43
S engagement	55	16	3	8	57
G engagement	130	18	2	4	24
All engagements	262	18	2	6	57
MS 2: Issue acknowledged by target					
E engagement	152	40	4	9	62
S engagement	95	28	3	6	31
G engagement	186	26	9	17	109
All engagements	433	30	6	13	109
MS 3: Actions taken by target					
E engagement	67	18	19	16	65
S engagement	84	25	24	24	101
G engagement	126	17	27	22	98
All engagements	277	19	24	21	101
MS 4: Engagement successfully completed					
E engagement	83	22	35	27	108
S engagement	101	30	41	26	118
G engagement	287	39	32	25	119
All engagements	471	33	35	25	119
All engagements	1,443				

Table III. Summary statistics

This table reports summary statistics at the firm-month level of the variables used in the DiD regressions. The sample in this analysis includes 279 targeted firms and 279 matched control firms. Variable definitions are provided in Appendix A.

Variable	Mean	STD	25%	Median	75%	Obs.
VaR	3.33	2.58	1.80	2.71	4.08	26,034
LPM	1.60	1.20	0.88	1.30	1.95	26,034
Target	0.50					26,034
Post	0.50					26,034
Log(Market value)	9.07	1.32	8.16	9.01	9.99	26,034
Market-to-book ratio	2.97	3.05	1.24	1.94	3.34	26,034
Leverage (in %)	34.09	21.08	19.21	32.37	47.91	26,034
Investment (in %)	11.17	15.86	2.84	5.57	12.63	26,034
Profit margin (in %)	15.61	13.27	6.37	12.60	20.71	26,034
Dividend yield (in %)	2.47	2.10	1.02	2.07	3.32	26,034
Freefloat (in %)	71.88	25.87	50.00	80.00	94.00	26,034

Table IV. Effect of ESG engagement on downside risk: Baseline results

This table reports DiD regressions at the firm-month level to estimate the effect of ESG engagement on downside risk. Regressions are estimated for the two-sided 24-month window around the month in which a target is engaged. The dependent variable is measured as *VaR* or *LPM*. *VaR* is the 5% value at risk using absolute values such that smaller numbers reflect less downside risk. *LPM* is the lower partial moment of the second order of the return distribution. Both measures are calculated at the firm-month level from daily return data. *Target* equals 1 for all firm-month observations if a firm is an engagement target, and 0 if it is a control firm. *Post* equals 1 for all firm-month observations after the initial engagement, and 0 before. *Post HY1* equals 1 for all firm-month observations in the first half year after an engagement, and 0 for all other firm-month observations. *Post HY2 to HY4* are defined accordingly, but for the second, third, and fourth half year after an engagement. Engagement success is measured based on whether certain milestones have been achieved. In case of multiple engagements at a target, an average success rate (in terms of milestones achieved) is calculated across all engagements at the firm. The sample in this analysis includes 279 targeted firms and 279 matched control firms, where control firms are matched with engagement targets using country, industry, and size as matching criteria. Variable definitions are provided in Appendix A. *t*-statistics, calculated based on robust standard errors clustered by firm, are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Table IV (continued)

Dependent variable:	*VaR*					*LPM*				
Engagement success:	All	MS 2 and above	MS 2 and above	MS 3 and above	Below MS 2	All	MS 2 and above	MS 2 and above	MS 3 and above	Below MS 2
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Target x Post	-0.089	-0.241**		-0.790**	0.000	-0.051	-0.114**		-0.432**	-0.015
	(-1.20)	(-2.07)		(-2.59)	(0.00)	(-1.50)	(-2.03)		(-2.62)	(-0.40)
Target x Post HY1			-0.099					-0.051		
			(-0.61)					(-0.65)		
Target x Post HY2			-0.351**					-0.178**		
			(-1.98)					(-2.13)		
Target x Post HY3			-0.339**					-0.159**		
			(-2.37)					(-2.34)		
Target x Post HY4			-0.169					-0.063		
			(-1.03)					(-0.78)		
Target	0.491***	0.628***	0.626***	1.344***	0.437***	0.249***	0.297***	0.296***	0.671***	0.237***
	(5.44)	(4.51)	(4.50)	(3.17)	(4.12)	(5.62)	(4.36)	(4.36)	(3.17)	(4.45)
Post	0.195***	0.271***		-0.191	0.169**	0.107***	0.148***		-0.015	0.087**
	(3.03)	(2.79)		(-0.84)	(2.12)	(3.50)	(3.06)		(-0.11)	(2.44)
Log(Market value)	-0.558***	-0.655***	-0.654***	-1.193***	-0.544***	-0.275***	-0.324***	-0.323***	-0.588***	-0.266***
	(-12.74)	(-9.28)	(-9.27)	(-6.33)	(-9.73)	(-12.72)	(-9.14)	(-9.12)	(-6.45)	(-9.90)
Market-to-book ratio	-0.080***	-0.081***	-0.081***	-0.128***	-0.086***	-0.037***	-0.041***	-0.041***	-0.074***	-0.037***
	(-6.67)	(-5.01)	(-4.96)	(-3.55)	(-5.88)	(-6.27)	(-5.22)	(-5.18)	(-3.83)	(-4.77)
Leverage	0.006***	0.006*	0.006*	0.027***	0.007***	0.003***	0.003*	0.003*	0.014***	0.004***
	(3.14)	(1.96)	(1.97)	(3.69)	(2.79)	(3.21)	(1.91)	(1.91)	(3.35)	(2.89)
Investment	0.003	0.004	0.004	0.036***	0.004	0.001	0.002	0.002	0.016***	0.001
	(0.95)	(1.01)	(1.00)	(3.58)	(0.81)	(0.49)	(0.83)	(0.82)	(3.22)	(0.24)
Profit margin	0.009**	0.012**	0.012**	0.021*	0.006	0.004**	0.005**	0.005**	0.008	0.002
	(2.47)	(2.13)	(2.15)	(1.72)	(1.48)	(2.24)	(1.99)	(2.01)	(1.62)	(1.23)
Dividend yield	0.060***	0.078*	0.078*	-0.010	0.067***	0.025**	0.031	0.031	-0.031	0.028**
	(2.65)	(1.96)	(1.95)	(-0.11)	(2.84)	(2.25)	(1.63)	(1.62)	(-0.65)	(2.40)
Freefloat	-0.003	-0.001	-0.001	0.002	-0.002	-0.001	-0.000	-0.000	0.001	-0.000
	(-1.34)	(-0.34)	(-0.32)	(0.21)	(-0.77)	(-0.87)	(-0.06)	(-0.04)	(0.20)	(-0.36)
Constant	7.304***	7.462***	7.414***	11.186***	7.135***	3.564***	3.703***	3.678***	5.585***	3.446***
	(11.83)	(10.28)	(10.13)	(6.95)	(9.68)	(13.38)	(9.54)	(9.53)	(6.83)	(10.94)
Model	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
HY1 to HY4 dummies	No	No	Yes	No	No	No	No	Yes	No	No
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	26,034	10,245	10,245	1,846	15,789	26,034	10,245	10,245	1,846	15,789
Adj. R-sq.	0.291	0.362	0.362	0.405	0.265	0.324	0.381	0.381	0.408	0.308

Table V. Effect of ESG engagement on downside risk: US, Europe, and Rest of World

This table reports DiD regressions at the firm-month level to estimate the effect of ESG engagement on downside risk. Panel A reports results for targeted firms in North America, Panel B for targeted firms in Europe, and Panel C for targeted firms in the Rest of World. Regressions are estimated at the firm-month level. Regression are estimated for the two-sided 24-month window around the month in which a target is engaged. The dependent variable is measured as *VaR* or *LPM*. *VaR* is the 5% value at risk using absolute values such that smaller numbers reflect less downside risk. *LPM* is the lower partial moment of the second order of the return distribution. Both measures are calculated at the firm-month level from daily return data. *Target* equals 1 for all firm-month observations if a firm is an engagement target, and 0 if it is a control firm. *Post* equals 1 for all firm-month observations after the initial engagement, and 0 before. Engagement success is measured based on whether certain milestones have been achieved. In case of multiple engagements at a target, an average success rate (in terms of milestones achieved) is calculated across all engagements at the firm. The sample in this analysis includes 279 targeted firms and 279 matched control firms, where control firms are matched with engagement targets using country, industry, and size as matching criteria. Variable definitions are provided in Appendix A. *t*-statistics, calculated based on robust standard errors clustered by firm, are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Panel A: Engagement in North America						
Dependent variable:	*VaR*			*LPM*		
Engagement success:	All	MS 2 and above	Below MS 2	All	MS 2 and above	Below MS 2
	(1)	(2)	(3)	(4)	(5)	(6)
Target x Post	-0.224*	-0.351**	-0.084	-0.117**	-0.170**	-0.058
	(-1.83)	(-2.00)	(-0.57)	(-2.02)	(-2.02)	(-0.82)
Target	0.593***	0.956***	0.435**	0.286***	0.467***	0.209**
	(3.38)	(3.78)	(2.47)	(3.31)	(3.70)	(2.56)
Post	0.195*	0.229	0.219	0.101**	0.117*	0.114*
	(1.91)	(1.63)	(1.62)	(2.19)	(1.82)	(1.87)
Obs.	7,022	3,602	3,420	7,022	3,602	3,420
Adj. R-sq.	0.435	0.454	0.453	0.442	0.465	0.454
Panel B: Engagement in Europe						
Dependent variable:	*VaR*			*LPM*		
Engagement success:	All	MS 2 and above	Below MS 2	All	MS 2 and above	Below MS 2
	(1)	(2)	(3)	(4)	(5)	(6)
Target x Post	0.036	-0.019	0.072	0.008	-0.028	0.032
	(0.26)	(-0.10)	(0.46)	(0.12)	(-0.25)	(0.46)
Target	0.460***	0.615**	0.396***	0.238***	0.288**	0.220***
	(2.99)	(2.33)	(2.86)	(3.23)	(2.19)	(3.26)
Post	0.107	0.226	0.166	0.051	0.141	0.077
	(0.89)	(1.06)	(1.07)	(0.87)	(1.11)	(1.10)
Obs.	6,998	2,725	4,273	6,998	2,725	4,273
Adj. R-sq.	0.398	0.435	0.403	0.410	0.431	0.428
Panel C: Engagement in Rest of World						
Dependent variable:	*VaR*			*LPM*		
Engagement success:	All	MS 2 and above	Below MS 2	All	MS 2 and above	Below MS 2
	(1)	(2)	(3)	(4)	(5)	(6)
Target x Post	-0.054	-0.262	0.044	-0.032	-0.105	0.003
	(-0.52)	(-1.46)	(0.40)	(-0.67)	(-1.29)	(0.06)
Target	0.443***	0.367**	0.467***	0.237***	0.169**	0.263***
	(3.37)	(2.13)	(2.92)	(3.63)	(2.01)	(3.31)
Post	0.224*	-0.174	0.224	0.133**	-0.028	0.115*
	(1.91)	(-1.12)	(1.63)	(2.40)	(-0.39)	(1.87)
Obs.	12,014	3,918	8,096	12,014	3,918	8,096
Adj. R-sq.	0.217	0.294	0.201	0.260	0.327	0.254
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Model	OLS	OLS	OLS	OLS	OLS	OLS
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Table VI. Effect of ESG engagement on downside risk: Engagement themes

This table reports DiD regressions at the firm-month level to estimate the effect of ESG engagement on downside risk. Results are reported based on the initial engagement theme. Panel A reports result for *VaR* and Panel B for *LPM*. Regressions are estimated for the two-sided 24-month window around the month in which a target is engaged. The dependent variable is measured as *VaR* or *LPM*. *VaR* is the 5% value at risk using absolute values such that smaller numbers reflect less downside risk. *LPM* is the lower partial moment of the second order of the return distribution. Both measures are calculated at the firm-month level from daily return data. *Target* equals 1 for all firm-month observations if a firm is an engagement target, and 0 if it is a control firm. *Post* equals 1 for all firm-month observations after the initial engagement, and 0 before. Engagement success is measured based on whether certain milestones have been achieved. In case of multiple engagements at a target, an average success rate (in terms of milestones achieved) is calculated across all engagements at the firm. The sample in this analysis includes 279 targeted firms and 279 matched control firms, where control firms are matched with engagement targets using country, industry, and size as matching criteria. Variable definitions are provided in Appendix A. *t*-statistics, calculated based on robust standard errors clustered by firm, are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Panel A: Effect of ESG engagement themes on *VaR*									
Dependent variable:	*VaR*			*VaR*			*VaR*		
Engagement success:	All			MS 2 and above			MS 3 and above		
Engagement topic:	E	S	G	E	S	G	E	S	G
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Target x Post	-0.227**	0.061	-0.048	-0.297*	-0.175	-0.235	-1.778***	-1.191	-0.990
	(-2.04)	(0.41)	(-0.46)	(-1.97)	(-0.76)	(-1.28)	(-5.84)	(-1.79)	(-1.67)
Target	0.599***	0.450**	0.517***	0.449***	0.855**	0.880***	1.213***	2.206**	1.253**
	(4.67)	(2.03)	(4.22)	(3.12)	(2.39)	(3.79)	(4.35)	(2.84)	(2.52)
Post	0.311***	0.298*	0.217**	0.020	0.078	0.228	0.689	0.375	-0.006
	(2.88)	(1.88)	(2.41)	(0.17)	(0.26)	(1.57)	(1.37)	(0.93)	(-0.01)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Model	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	9,286	5,736	11,012	4,418	2,171	3,656	372	478	996
Adj. R-sq.	0.315	0.257	0.344	0.377	0.379	0.439	0.502	0.484	0.450
Panel B: Effect of ESG engagement themes on *LPM*									
Dependent variable:	*LPM*			*LPM*			*LPM*		
Engagement success:	All			MS 2 and above			MS 3 and above		
Engagement topic:	E	S	G	E	S	G	E	S	G
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Target x Post	-0.118**	0.016	-0.030	-0.111	-0.111	-0.123	-0.856***	-0.579	-0.535
	(-2.28)	(0.26)	(-0.56)	(-1.54)	(-1.16)	(-1.24)	(-6.65)	(-1.54)	(-1.60)
Target	0.304***	0.238**	0.263***	0.201***	0.430**	0.425***	0.530***	1.269**	0.583**
	(4.66)	(2.25)	(4.31)	(2.88)	(2.45)	(3.67)	(4.19)	(2.83)	(2.70)
Post	0.168***	0.140**	0.133***	0.013	0.042	0.133	0.402	0.176	0.189
	(3.20)	(2.08)	(2.95)	(0.25)	(0.33)	(1.57)	(1.63)	(0.62)	(0.74)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Model	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	9,286	5,736	11,012	4,418	2,171	3,656	372	478	996
Adj. R-sq.	0.353	0.297	0.367	0.395	0.418	0.450	0.524	0.442	0.467

Table VII. Effect of environmental engagement on environmental incidents

This table reports Poisson regressions at the firm-month level to estimate the effect of environmental engagement on subsequent environmental incidents. Regressions are estimated for the two-sided 24-month window around the month in which a target is engaged. We separate the sample based on whether the decrease in downside risk, measured using *VaR* or *LPM*, from before to after an environmental engagement is above (Large) or below (Small) the median. The dependent variable is measured as *# E incidents*, which is a measure of the number of environmental risk incidents in a firm-month. In the construction of the measure, more severe incidents receive higher weights. *Post* equals 1 for all firm-month observations after the initial engagement, and 0 before. The sample in this analysis includes 99 targeted firms with environmental engagements. Variable definitions are provided in Appendix A. *t*-statistics, calculated based on robust standard errors clustered by firm, are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Dependent variable:	*# E incidents*				
Downside risk measure:		*VaR*		*LPM*	
Δ Downside risk$_{Pre\ vs\ Post}$:	All	Large	Small	Large	Small
	(1)	(2)	(3)	(4)	(5)
Post	-0.224*	-0.330***	0.130	-0.309***	-0.036
	(-1.88)	(-2.79)	(0.85)	(-2.60)	(-0.26)
Log(Market value)	0.474***	0.551***	0.255**	0.408***	0.213**
	(5.43)	(4.07)	(2.31)	(3.83)	(2.08)
Market-to-book ratio	-0.055	-0.105	-0.015	-0.008	-0.147**
	(-1.15)	(-1.10)	(-0.21)	(-0.12)	(-2.49)
Leverage	0.004	0.018*	-0.014*	0.010	-0.007
	(0.63)	(1.76)	(-1.90)	(1.31)	(-1.06)
Investment	-0.004	-0.010	-0.013	-0.008	-0.025**
	(-0.61)	(-1.07)	(-1.06)	(-1.06)	(-2.33)
Profit margin	-0.018***	-0.023**	0.021	-0.025***	0.053***
	(-2.70)	(-2.52)	(1.23)	(-3.05)	(3.97)
Dividend yield	0.059**	0.080*	0.073**	0.108**	0.056
	(2.20)	(1.80)	(1.99)	(2.46)	(1.56)
Freefloat	0.009**	0.011***	0.003	0.014***	-0.017**
	(2.11)	(3.17)	(0.28)	(3.90)	(-1.98)
Constant	-5.020***	-6.505***	-20.527***	-5.210***	-19.005***
	(-3.22)	(-4.00)	(-4.62)	(-3.76)	(-4.64)
Model	Poisson	Poisson	Poisson	Poisson	Poisson
Country fixed effects	Yes	Yes	Yes	Yes	Yes
Industry x Year fixed effects	Yes	Yes	Yes	Yes	Yes
Obs.	4,428	2,217	2,211	2,266	2,162
Ps. R-sq.	0.312	0.432	0.279	0.410	0.315

Internet Appendix

for

ESG Shareholder Engagement and Downside Risk

IA Table I. Summary statistics on climate change engagement themes

This table provides summary statistics across 179 climate change engagements. The table also breaks down general climate change themes into subthemes, and the table reports the number (percentage) of engagements within each engagement subtheme. The sample consists of engagements over the period January 2005 through April 2018.

Climate change subtopics	#	%
Carbon strategy & risk management	51	28
Carbon disclosure/reporting	48	27
Carbon intensity reduction	45	25
Stranded assets	10	6
Others (methane, gas flaring)	25	14
Total	179	100

IA Table II. Summary statistics of engagement actions and targeted individuals

This table reports summary statistics on different engagement actions (Panel A) as well as the positions of the individuals that were targeted by the investor (Panel B). The statistics are reported by engagement themes and milestones achieved (in total and, in italics, per engagement). The sample consists of 1,443 engagements across 485 targeted firms over the period January 2005 through April 2018.

	Engagement themes				Engagement progress by milestones				
	E	S	G	Total	MS 1	MS 2	MS 3	MS 4	Total
Panel A: Action types									
Meeting	1,073	1,083	2,049	4,205	457	588	856	2,304	4,205
	2.8	*3.2*	*2.8*	*2.9*	*1.7*	*1.4*	*3.1*	*4.9*	*2.9*
Email	413	479	838	1,730	161	283	380	906	1,730
	1.1	*1.4*	*1.1*	*1.2*	*0.6*	*0.7*	*1.4*	*1.9*	*1.2*
Conference call	340	399	737	1,476	166	237	309	764	1,476
	0.9	*1.2*	*1.0*	*1.0*	*0.6*	*0.5*	*1.1*	*1.6*	*1.0*
Letter	304	295	674	1,273	136	218	282	637	1,273
	0.8	*0.9*	*0.9*	*0.9*	*0.5*	*0.5*	*1.0*	*1.4*	*0.9*
Others	226	174	285	685	94	157	222	356	829
	0.6	*0.5*	*0.4*	*0.5*	*0.4*	*0.4*	*0.8*	*0.8*	*0.6*
Panel B: Targeted individuals									
Chairman	217	267	796	1,280	128	179	204	769	1,280
	0.6	*0.8*	*1.1*	*0.9*	*0.5*	*0.4*	*0.7*	*1.6*	*0.9*
Committee member	167	150	582	899	76	104	204	515	899
	0.4	*0.4*	*0.8*	*0.6*	*0.3*	*0.2*	*0.7*	*1.1*	*0.6*
Board of directors	72	90	231	393	36	50	64	243	393
	0.2	*0.3*	*0.3*	*0.3*	*0.1*	*0.1*	*0.2*	*0.5*	*0.3*
Senior executives	361	521	775	1,657	175	237	301	944	1,657
	1.0	*1.6*	*1.1*	*1.1*	*0.7*	*0.5*	*1.1*	*2.0*	*1.1*
Shareholders	34	29	117	180	7	15	41	117	180
	0.1	*0.1*	*0.2*	*0.1*	*0.03*	*0.03*	*0.1*	*0.2*	*0.1*
Middle management	358	400	485	1,243	149	205	222	667	1,243
	0.9	*1.2*	*0.7*	*0.9*	*0.6*	*0.5*	*0.8*	*1.4*	*0.9*
CSR	472	459	586	1,517	178	232	305	802	1,517
	1.2	*1.4*	*0.8*	*1.1*	*0.7*	*0.5*	*1.1*	*1.7*	*1.1*
Investor relations and legal	98	123	256	477	68	79	88	242	477
	0.3	*0.4*	*0.4*	*0.3*	*0.3*	*0.2*	*0.3*	*0.5*	*0.3*
Secretary	90	96	336	522	64	63	104	291	522
	0.2	*0.3*	*0.5*	*0.4*	*0.2*	*0.1*	*0.4*	*0.6*	*0.4*
Others	69	106	136	311	32	45	62	172	311
	0.2	*0.3*	*0.2*	*0.2*	*0.1*	*0.1*	*0.2*	*0.4*	*0.2*

IA Table III. Balance of covariates in DiD analysis

This table reports summary statistics at the firm-month level of the variables used in the difference-in-differences regressions separately for targeted firms and matched control firms. The sample includes 279 targeted firms and 279 matched control firms. Variable definitions are provided in Appendix A.

	Target			Control		
Variable	Mean	STD	Median	Mean	STD	Median
Log(Market value)	9.41	1.37	9.41	8.73	1.18	8.72
Market-to-book ratio	2.79	2.59	2.02	3.15	3.43	1.86
Leverage (in %)	34.60	20.88	32.59	33.58	21.27	32.03
Investment (in %)	11.33	15.86	5.80	11.01	15.85	5.33
Profit margin (in %)	15.76	13.23	12.23	15.45	13.30	13.44
Dividend yield (in %)	2.35	1.99	2.01	2.59	2.19	2.13
Freefloat (in %)	74.96	24.62	85.00	68.82	26.71	74.00

IA Table IV. Effect of ESG engagement on downside risk: Excluding financials

This table reports DiD regressions at the firm-month level to estimate the effect of ESG engagement on downside risk after excluding financial firms. Regression are estimated for the two-sided 24-month window around the month in which a target is engaged. The dependent variable is measured as *VaR* or *LPM*. *VaR* is the 5% value at risk using absolute values such that smaller numbers reflect less downside risk. *LPM* is the lower partial moment of the second order of the return distribution. Both measures are calculated at the firm-month level from daily return data. *Target* equals 1 for all firm-month observations if a firm is an engagement target, and 0 if it is a control firm. *Post* equals 1 for all firm-month observations after the initial engagement, and 0 before. Engagement success is measured based on whether certain milestones have been achieved. In case of multiple engagements at a target, an average success rate (in terms of milestones achieved) is calculated across all engagements at the firm. The sample in this analysis includes 255 targeted firms and 255 matched control firms, where control firms are matched with engagement targets using country, industry, and size as matching criteria. Variable definitions are provided in Appendix A. *t*-statistics, calculated based on robust standard errors clustered by firm, are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Dependent variable:	*VaR*			*LPM*		
Engagement success:	All	MS 2 and above	Below MS 2	All	MS 2 and above	Below MS 2
	(1)	(2)	(3)	(4)	(5)	(6)
Target x Post	-0.083	-0.286**	0.036	-0.048	-0.135**	0.003
	(-1.06)	(-2.23)	(0.42)	(-1.34)	(-2.20)	(0.07)
Target	0.467***	0.592***	0.431***	0.239***	0.281***	0.234***
	(4.91)	(4.02)	(3.97)	(5.11)	(3.92)	(4.29)
Post	0.183***	0.279***	0.137	0.102***	0.155***	0.072*
	(2.68)	(2.70)	(1.62)	(3.17)	(2.99)	(1.89)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	23,773	9,197	14,576	23,773	9,197	14,576
Adj. R-sq.	0.285	0.359	0.260	0.319	0.378	0.304

IA Table V. Summary statistics for environmental incidents

This table reports at the firm-month level a measure of the number of environmental risk incidents *(# Environmental incidents*). In the construction of the measure, more severe incidents receive higher weights. The sample in this analysis includes 279 targeted firms. Variable definitions are provided in Appendix A.

# E incidents	Obs.	%
0	7,928	64.29
1	1,958	15.88
2	1,508	12.23
3	409	3.32
4	189	1.53
5	96	0.78
6	96	0.78
7	32	0.26
8	24	0.19
9	26	0.21
10	11	0.09
>10	54	0.44

IA Table VI. Effect of environmental engagement on environmental incidents: Robustness

This table reports Poisson regressions at the firm-month level to estimate the effect of environmental engagement on environmental incidents. Regressions are estimated for the two-sided 24-month window around the month in which a target is engaged. In Columns 1 to 4, we consider targets where the decrease in downside risk, measured using *VaR* or *LPM*, from before to after an environmental engagement is above (Large) the median. The dependent variable in Columns 1 and 2 and 5 and 6 is *# E incidents*, which is a measure of the number of severe environmental risk incidents in a firm-month. In the construction of the measure, more severe incidents receive higher weights. The dependent variable in Columns 3 and 4 is *# Novel E incidents*, which is a measure of the number of novel environmental risk incidents in a firm-month. In the construction of the measure, with more novel incidents receive higher weights. *Post* equals 1 for all firm-month observations after the initial engagement, and 0 before. *Large Decrease VaR* equals one if the decrease in *VaR* from before to after an environmental engagement is above the median, and 0 otherwise. *Large Decrease LPM* is defined accordingly using *LPM* instead of *VaR*. The sample in this analysis includes 99 targeted firms with environmental engagements. Variable definitions are provided in Appendix A. *t*-statistics, calculated based on robust standard errors clustered by firm, are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Dependent variable:	*# E incidents*		*# Novel E incidents*		*# E incidents*	
Downside risk measure:	*VaR*	*LPM*	*VaR*	*LPM*	*VaR*	*LPM*
Δ Downside risk$_{Pre\ vs\ Post}$:	Large	Large	Large	Large	All	All
	(1)	(2)	(3)	(4)	(5)	(6)
Post	-0.401***	-0.380***	-0.233*	-0.243**	-0.062	-0.080
	(-2.78)	(-2.95)	(-1.96)	(-2.16)	(-0.46)	(-0.59)
Large Decrease VaR					0.398**	
					(2.14)	
Post x Large Decrease VaR					-0.348**	
					(-2.02)	
Large Decrease LMP						0.651***
						(3.27)
Post x Large Decrease LPM						-0.281*
						(-1.66)
Time Trend	0.001*	0.001*				
	(1.71)	(1.83)				
Model	Poisson	Poisson	Poisson	Poisson	Poisson	Poisson
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	2,217	2,266	2,217	2,266	4,428	4,428
Ps. R-sq.	0.432	0.410	0.358	0.345	0.315	0.319

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