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ESG Shareholder Engagement and Downside Risk

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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 thank Diego Perez Guisande for excellent research assistance. We are also very grateful to our data contributor for providing us with access to the data and to Rui Albuquerque, Marco Becht, Alon Brav, Michael Brennan, John Cotter, Craig Doidge, Alexander Dyck, Alex Edmans, 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, the 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 our manuscript the Best Quantitative Paper Award.

Abstract

We demonstrate that engagement on environmental, social and governance (ESG) issues can benefit shareholders by reducing firms' downside risks, measured using the lower partial moment of the return distribution and value at risk. We further find that the measured risk reduction effects vary across the types of engagement and their success, with no significant risk reduction for unsuccessful engagements. Engagement appears most effective in lowering downside risk when addressing environmental topics (primarily climate change). We find corroborating evidence in that successful ESG engagements reduce the firm's exposure to a downside risk factor.

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

JEL Classifications: G32, M14

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1. Introduction

Direct institutional investor engagement on environmental, social and governance (ESG) issues has become increasingly prevalent in financial markets worldwide. Several factors contribute to this trend, including the increased public interest in ESG (or corporate social responsibility, CSR), 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]

Both academics and practitioners argue that firms' risk exposures relate to their ESG profiles. For example, Albuquerque, Koskinen, and Zhang (2019) develop a theoretical model in which a firm's efforts to increase product differentiation through higher CSR investments decreases the firm's systematic risk and increases firm value. The authors also provide empirical evidence to support their theory. Ilhan, Sautner, and Vilkov (2021) show that firms with worse ESG profiles, as reflected in higher carbon emissions, have higher tail risks. These results are consistent with practitioner arguments that employing ESG considerations into investment decisions can mitigate uncompensated portfolio risks and that reducing ESG risks is a major driver of shareholder engagement (e.g., Blackrock and Ceres, 2015; Blackrock, 2017, Fortado, 2017; Jagannathan, Ravikumar, and Sammon, 2018). Thus, it is perhaps not surprising that an increasing number of institutions actively engage with their portfolio firms in order to reduce ESG exposure risks.

Generally, the goal of ESG engagement 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 firms. Often the engaging shareholders are so-called "universal owners," large institutional investors with highly diversified and long-term portfolios, who are exposed to ESG risk not

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

just because of events caused by individual portfolio firms that affect those firms, but also because of externalities from economy-wide factors, such as climate change.

In this paper we examine the relationship between investors' ESG engagements of their portfolio firms and those firms' subsequent downside risks. Downside risks can be particularly important for a number of investors, for example pension funds need to match their assets to their liabilities and, consequently, face downside risk constraints. That is, these funds face large liabilities towards their beneficiaries and failure to meet the liabilities carries significant penalties (e.g., Ang, Chen, and Sundaresan, 2013). Thus, as wealth protection becomes important, such investors prefer to avoid downside risks. Furthermore, for many banks and insurance companies, regulatory capital requirements for equity positions are calculated based on downside risk measures, for example, value at risk. Finally, while standard mean-variance investors would be more focused on volatility than downside risks, key assumptions in this framework are observed to be 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.[2]

The downside risks that engagements are designed to reduce can originate from both idiosyncratic and systemic ESG risk sources. The idiosyncratic ESG risks would matter for those institutional investors that are *not* well diversified (Merton, 1987), which is often the case for activist investors (e.g., Brav et al., 2008). Systematic ESG risks matter if—as in Albuquerque, Koskinen, and Zhang (2019) or Bénabou and Tirole (2010)—firms with better ESG profiles

[2] Asset pricing models have in turn been developed to explicitly incorporate downside risk (e.g., Harlow and Rao,1989; Harvey and Siddique 2000; 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."*

have lower systematic risk.[3]

To examine whether ESG engagements lead to downside risk reductions, we employ proprietary engagement data provided by a large institutional investor. 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 advise" of the institution exceed $1 trillion by the end of 2020. Our data include 1,712 engagements across 573 targeted firms worldwide from 2005 to 2018. 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.

In the first part of the paper, we detail the investor's engagement process to illustrate the channel through which ESG engagement can affect portfolio firms. The investor most commonly engages firms regarding governance issues, which account for 43% of the sample engagements. These governance issues frequently center on executive pay and board structure. Engagements over environmental issues constitute about 22% of the engagements. These engagements have a primary theme of climate risk, a theme that has become an important topic for engagement among many major institutional investors (Krueger, Sautner, and Starks, 2020; Ilhan et al., 2021). Climate risk engagements by the investor have increased over time and have reached more than 80% of the number of engagements on executive pay, traditionally the focus of many engagement campaigns. These figures reflect a more general trend, namely that many institutional investors find climate risks difficult to price and hedge, making engagement on climate risks an important tool of risk management. The third most common type of engagements covers social issues (20%), which primarily focus on health and

[3] For example, Albuquerque, Koskinen, and Zhang (2019) model and supporting empirical evidence assumes a lower sensitivity of profits to aggregate shocks (e.g., as customer loyalty is higher).

safety issues, supply chain topics, and illegal acts such as bribery and corruption. Finally, 16% of the engagements center on strategy topics, which are typically driven by concerns over a firm's business strategy and corporate risk management.

The investor uses four milestones to track the success of an engagement: i) whether the investor raises a concern with a target firm (Milestone 1); ii) whether the target acknowledges the concern that was raised (Milestone 2); iii) whether the target takes actions to address the concern (Milestone 3); and iv) whether the investor successfully completes the engagement (Milestone 4). Out of the engagements for which the investor raises a concern, 538 (31%) successfully achieve all four milestones by the end of the sample period, 872 (50%) achieve Milestone 2 or 3, and 522 (30%) reach Milestone 2.

The investor primarily employs a private, that is, nonpublic, approach to engage the portfolio firms, consistent with the more general evidence on institutional investor engagement in McCahery, Sautner, and Starks (2016). Among the 11,430 interactions documented in the investor's records, more than 45% take the form of private in-person meetings. The investor's preference for private negotiations over public engagements is consistent with the theoretical reasoning in Levit (2019), which demonstrates that if an activist's information becomes public, the activist can lose credibility and consequently, the ability to influence the manager's actions. Data on duration and meeting frequency confirm that engagement is costly for the investor, in terms of the time and resources needed to successfully close an ESG engagement (Gantchev, 2013).

In the second part of the paper we examine whether ESG engagement by our investor reduces the portfolio firms' downside risks. We measure downside risks in two complementary ways. Our first measure captures the distributions of returns that fall below the 0%-return-threshold. We calculate this measure as the lower partial moment (LPM) of the second order (Bawa, 1975; Fishburn, 1977), in order to capture *negative* return fluctuations and the potential wealth-protection motives of ESG engagements. As the second measure,

we calculate an investment's value at risk (VaR) (Duffie and Pan, 1997).[4]

We measure the engagement risk reduction effects by employing a difference-in-differences (DiD) approach that estimates the change in downside risk from before to after the engagement, relative to a control group of matched firms. The effects are estimated using monthly data for the risk variables over a two-sided two-year window around the investor's initial engagement. In our estimation we address the concern that the investor may invest in certain firms expecting a decline in risks for reasons *unrelated* to its engagement. We address this concern by estimating both a selection equation modelling the investor's decision to engage a target, and a DiD outcome equation relating engagement to changes in downside risk. The outcome equation in turn contains a correction factor that accounts for potential selection effects (Heckman, 1979). Further, we apply entropy balancing to align the first and second moment of the control variables between target and control firms (Hainmueller, 2012).

Across both estimation approaches we find the investor's ESG engagements to be associated with subsequent reductions in the portfolio firms' downside risk. Importantly, these effects originate from those ESG engagements that are classified as successful by our investor and the risk reductions increase in magnitude with the number of milestones achieved. Notably, we do not detect a significant risk reduction effect of ESG engagement for those targets where Milestone 2 is not achieved (the target does not acknowledge the existence of an ESG issue).[5] In contrast, for those ESG engagements in which at least

[4] The value-at-risk measure should capture ESG risk (Diemont, Moore, and Soppe, 2016) 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. However, we cannot take this approach because our international sample contains few firms for which liquid out-of-the-money puts are available.

[5] 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 Milestone 2 was achieved.

Milestone 2 is achieved, the LPM declines by 0.113 from before to after the engagement (10% relative to its standard deviation). The magnitude of the risk reduction effect increases sharply, by a factor of four, if we impose a stricter definition of engagement success and consider only engagements where at least Milestone 3 was achieved (i.e., the target management started to take actions). For these successful engagements, the LPM decreases by 0.432 from before to after the engagement, relative to control firms, which is roughly 37% of the variable's standard deviation. We further support these results in regressions that do not impose a selection model or omit the entropy balancing.

We next consider *which* engagement types are most effective in reducing downside risks by examining how the effects vary across the investor's ESG themes. Considering Milestones 2 and 3 as the success threshold, engagements over environmental topics— primarily over climate change— deliver the highest benefits in terms of downside 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.[6] As demonstrated by Dyck et al. (2019) for BP's oil spill, such incidents reminded many investors of the importance of robust environmental policies. The evidence on environmental risk reduction *during our sample period* is consistent with related evidence in the climate finance literature as detailed

[6] 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.

by the Giglio, Kelly, and Stroebel (2021) review. Specifically, Ilhan, Sautner, and Vilkov (2021) document the pricing of carbon tail risks between 2009 and 2016. Similarly, Barnett (2020) finds his climate policy event index to be more discriminating between firms with 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. (2021) show that discussions about climate risks in earnings conference calls have increased sharply since 2011.

We complement the DiD analysis with a second approach in which we explore changes in the engaged firms' stock return loadings on a downside risk factor. We test whether after the achievement of an engagement milestone, a change occurs in the relationship between a target's weekly return exposure to a factor that reflects the difference in returns between stocks with high minus low downside risk; this approach is based on a similar approach by Kelly and Jiang (2014). We demonstrate that the sensitivity to the downside risk factor significantly decreases after Milestone 2, and especially Milestone 3, are achieved. This suggests that the firms that respond to the investor subsequently become less sensitive to aggregate downside risk, indicating a downside risk factor reduction due to the ESG engagement.

We contribute to the literature on investor engagement, and specifically ESG engagement in three 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 ESG 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, 2018; Becht, Franks and Wagner, 2021). Second, our work relates to contemporaneous work by Akey and Appel (2020) and Naaraayanan, Sachdeva, and Sharma (2021), in which the authors demonstrate that environmental shareholder activism has real effects on targets through emission reductions. Our results complement their evidence by showing that activism can eventually benefit shareholders through the lowering of downside risks. Third, we complement studies that

provide evidence that voluntary ESG or CSR efforts by firms decrease the probability that negative events occur (Kim, Li, and Li, 2014; Krueger, 2015), and reduce firm risk more generally (Albuquerque, Koskinen, and Zhang, 2019; Jo and Na, 2012; Godfrey, Merrill, and Hansen, 2009; Luo and Bhattacharya, 2009; Oikonomou, Brooks, and Pavelin, 2012; Monti et al., 2020).

2. Engagement Data and Process

2.1 Engagement Data

We obtain the institutional engagement data from a large institutional asset manager in the United Kingdom who is considered to be highly influential through its active ownership. The aim of the investor's active ownership is to promote the development of higher ESG standards at portfolio firms. 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's team consists of more than 30 professionals who engage on behalf of its 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.

The investor's proprietary database contains 1,712 engagements targeting 573 firms worldwide, covering the period between January 2005 and April 2018. We have full access to the investor's engagement database, including the engagement reports, action reports, and success milestones. The investor states that the engagement occurs predominantly via a constructive, confidential dialogue.

2.2 ESG Engagement Process

Figure 1 displays the geographic distribution of the investor's engagements and shows that the investor engages firms across more than 30 different countries, with the largest number

of engagements targeting firms headquartered in the US (353 or 21% of the sample) and the UK (347 or 20%). These countries are followed by two large Asian economies (Japan with 139 engagements or 8%; South Korea with 84 or 5%), two continental European countries (France and Germany, each about 4%), and Brazil (4%). Apart from Brazil, the investor also engages firms in several other emerging markets.

Figure 2 illustrates that engagements occur across a number of sectors. In decreasing order of occurrence, the most prominent sectors are Financials, Basic Materials, Consumer Goods, Industrials, Oil & Gas, Industrials, and Consumer Services. Notably, the sectors less environmentally exposed (Technology and Telecoms) are less frequently targeted.

Figure 3 shows the engagements across time. The investor gradually increased the intensity of engagements from 2005, reaching a peak with 235 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 somewhat after the peak, the investor remains very active, commencing 190 and 151 engagements in 2016 and 2017, the last two complete years in our sample period.

The investor engages firms according to four themes: corporate governance; social; environmental; and strategy. In Table I, we report the frequency of engagements across each of these themes, and we also list the subthemes within each of these broader areas. Overall, the investor most commonly engages portfolio firms over governance issues, accounting for 43% of all engagements, followed by engagements on environmental (22%), social (20%), and strategy issues (16%). This distribution generally 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.

The engagement topics provide insights into the most pressing concerns of the investor within each of the more general themes. Within the governance area, 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 (Wilcox and Sodali, 2017) and in surveys (McCahery, Sautner and Starks, 2016; Edmans, Gosling and Jenter, 2021).

Among all environmental topics, the investor focuses primarily on issues related to climate change (47%). The importance of climate 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, especially long-term 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.

Given the recent focus on climate engagement by many institutional investors, we detail in I.A. Table I the specific engagement subtopics. Across the investor's 179 climate engagements, 28% target a firm's carbon strategy & 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, Table I demonstrates that 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) for an alternative investor. The primary intervention motives over strategy topics are improving business strategy (39%), risk management (35%), and accounting/auditing-related issues (19%). This observation is in line with Khorana, Shivdasani, and Shigurdsson (2017) who

find that activists are increasingly focusing on business strategy.

Figure 4 shows the distribution of engagement theme across time. Engagement on governance topics peaks around 2010-2012. In contrast, there exists a steady increase in engagement on environmental topics, which spike in 2010 (the year right after the Copenhagen Climate Summit) and 2016 (the year after the Paris Climate Agreement).

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 and dividing the sample by the last milestone reached, 30% of engagements achieve at least Milestone 2 (the target acknowledges the concern), 20% go one step further and achieve at least Milestone 3 (target takes actions to address the concern), and 31% reach Milestone 4 (engagement is successfully completed). Thus, according to these milestones, the engagements have been met with varying success rates. A total of 18% of engagements are still at the stage of raising a concern.

There is interesting heterogeneity in terms of engagement success across topics. While governance and environmental engagements are similarly successful when it comes to achieving Milestone 3, the success rates measured based on Milestone 4 diverge—a total of 39% of all governance engagement reach Milestone 4, but the corresponding numbers for environmental engagements are only 22%.

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 institutional investors on board

to lobby firm management for changes (Kedia, Starks, and Wang, 2021; Brav, Jiang, and Li, 2021). Third, ESG engagements by our investor could be less aggressive and less influential on target firms because the investor engages a wide range of firms with typically lower ownership positions compared to activist hedge funds that often take concentrated positions in fewer firms.

Table II, Panel B, shows that the investor expends considerable efforts and time in trying to engender the desired changes at the portfolio firm. It takes on average two months to complete Milestone 1, then an additional four months until a portfolio firm also acknowledges an issue raised by the investor (Milestone 2), and 18 additional months until the engagement target has also taken actions or developed a strategy to improve an issue (Milestone 3). For those targets for which all milestones are successfully completed, the process takes 35 months, on average.[7]

The statistics by engagement theme reveal differences in patterns across the engagement themes. Social issues seem to be the quickest to be acknowledged by targets (Milestone 2), but targets are then slow in defining a suitable action and implementing changes. Once acknowledged, environmental engagements lead on average to the quickest actions to be implemented in response to the investor's demands (Milestone 3). In contrast, governance engagements take the longest time when it comes to completing Milestones 2 and 3. The differences may reflect that the investor faces more difficulty in completing an engagement in which corporate boards need to address their own alleged shortcomings. However, governance engagement are on average the quickest in terms of implementation, presumably because board resistance is overcome once an action has formally been defined. Strategy engagements require a longer duration for Milestone 4 than governance or

[7] 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.

environmental engagements, probably as larger organizational changes are typically required in these types of engagements.

In Table III, Panel A, we provide information on the "actions" taken by the investor to achieve the engagement goals. Among all 11,430 actions, about 45% take the form of meetings (5,117), followed by substantive emails (2,055), and conference calls (1,748). Milestones 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 Milestone 3 and five meetings to achieve Milestone 4. Moving from Milestone 2 to 3, and especially from Milestone 3 to 4, are the more difficult steps, requiring a larger number of meetings, emails, calls, and letters.

In the engagement process, the investor contacts a variety of individuals at the portfolio firms. Table III, Panel B, demonstrates that the positions most contacted are senior executives (2,042 contacts), as would be expected, but the investor also often contacts members of the boards of directors and its committees (1,495), and separately, the chairperson of the board (1,527). Interesting heterogeneity exists on who is contacted depending on the specific engagement topic, which probably reflects the decision-making authority for a specific topic. The investor has dialogues over social, environmental and strategy topics mostly with senior executives, whereas the investor tends to communicate most with the board of directors and the chairperson over governance issues.

Actions classified by milestone show that the investor usually raises issues of concern directly with senior management (Milestone 1). Senior/middle management or the chairperson acknowledge in Milestone 2 that the raised issue is of concern to the firm. To ensure that firms take measures to address the concerns (Milestones 3 and 4), the investor then more than doubles the interactions with all relevant parties.

3. ESG Downside Risk Reduction: Evidence from Difference-in-Differences Estimates

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.[8] In 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 (Ang, Chen, and Sundaresan, 2013). 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. Our first 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.

As a second measure, we calculate a firm's value at risk (*VaR*) (Duffie and Pan, 1997). We measure *VaR* also 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.

[8] 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).

3.2 Empirical Methodology

To test whether ESG engagements are related to subsequent downside risk reduction, we implement a DiD model and compare the downside risks of engagement targets before and after the engagement, relative to a control group. We refine the standard DiD model in two ways to address concerns over estimation bias.

First, we match each target to a control firm based on headquarter country, industry, and size.[9] 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 (Dimson, Karakaş, and Li, 2021; Hoepner et al., 2016). We match by industry as engagement may be more successful in industries with recent ESG scandals,[10] 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).

Second, we overlay the DiD estimation with a Heckman (1979) selection model to address endogeneity from other variables correlated with downside risk and the likelihood of being a target. For example, a concern could be that the investor invests in those firms where it expects a decline in risks for reasons unrelated to its engagement. We estimate the

[9] 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. We replace country by region in the rare cases where a firm is unique in its industry and size bracket within its country.

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

following selection model for firm *i* in country c and year *t*:

$$Target_{i,c,t} = \Phi(\alpha + \beta \boldsymbol{X}_{i,c,t} + \mu_i + \vartheta_c + \gamma_t + \eta_{i,c,t}), \quad (1)$$

where $Target_{i,c,t}$ equals 1 if firm *i* in country *c* and year *t* has been inaugurally engaged by the investor, and 0 if it is a control firm; $\boldsymbol{X}_{i,c,t}$ is a vector of control variables including a firm's size, market-to-book ratio, leverage, investment, profit margin, dividend yield, free float, and anti-director rights index (ADRI); and μ_i, ϑ_c, and γ_t are industry, country, and year fixed effects. While we do not have exogenous drivers of engagement, the selection correction reduces bias originating from the variables in $\boldsymbol{X}_{i,c,t}$ (see Heckman, 1979). Φ(.) indicates the probability density function as we estimate the equation using a probit model.

In our risk analysis, we exclude 68 targets in the utilities and health sectors from the full sample of 573 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 also lose 52 firms for which we cannot find a match in the FTSE All-World index and 101 firms for which there is missing data on the control variables. Our final sample for the risk analysis in turn contains 352 target firms matched to the same number of control firms. [11]

Applying these two refinements, 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. In combination with Equation (1), the DiD model in Equation (2)

[11] I.A. Table II provides estimates of Equation (1) that confirm the need to carefully address selection bias beyond simply matching firms. Specifically, some firm characteristics remain significant in explaining the investor's engagement decision *after* matching based on a target's country, industry and size: targets are larger than matched firms—despite the size matching—, they have a higher free float, and they have stronger anti-director rights. We are able to estimate a coefficient on the anti-director rights variable as we need to match some targets with firms from the same region (see footnote 9).

estimates the effect of ESG engagement on downside risk at target firms relative to control firms after including a selection correction factor (*Inverse Mills Ratio*). Hence, for each firm *i* in country *c* and month *t* we estimate the following model:

$$\begin{aligned} \textit{Downside Risk}_{i,c,t} = \alpha + \beta_1 \textit{Target}_{i,c} \times \textit{Post}_{i,c,t} + \beta_2 \textit{Target}_{i,c} + \beta_3 \textit{Post}_{i,c,t} + \\ \beta_4 \boldsymbol{X}_{i,c,t-1} + \beta_5 \textit{Inverse Mills Ratio} + \mu_i + \vartheta_c + \gamma_t + \varepsilon_{i,c,t}, \end{aligned} \quad (2)$$

where $\textit{Downside Risk}_{i,c,t}$ represents one of the two measures of downside risk ($LPM_{i,c,t}$ or $VaR_{i,c,t}$); $\textit{Target}_{i,c}$ equals 1 for all firm-month observations if firm *i* is a target, and 0 if it is a control firm; and $\textit{Post}_{i,c,t}$ equals 1 for the firm-month observations after a firm *i* has been targeted in month *t*, and 0 before. In case a target is engaged for a second time within the 24-months post window, the post-engagement window is set to end 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]

$\boldsymbol{X}_{i,c,t-1}$ is a vector of control variables that may affect downside risks beyond shareholder engagement, measured one year before the initial engagement. We control for financial leverage as more debt tends to increase firm risk, and for profitability as more profitable firms should be less risky. Further, we account for the market-to-book ratio and sales growth as growth firms may be more risky overall. We improve the covariate balance in the regression between the target and control firms by applying entropy balancing. We therefore reweight the control variables so that the control variables among the target and controls firms have the same first and second moments (Hainmueller, 2012). This approach improves the estimate of a treatment effect of engagement as the treatment status is mean-independent of the conditioning variables after weighting (I.A. Table III reports summary statistics for the target and control firms before and after entropy balancing). The regressions

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

include industry, year, and country fixed effects. In the subsequent analysis, we also provide results without the Heckman correction and without entropy balancing. Summary statistics of the variables used in the DiD analysis are reported in Table IV.

Figure 5 shows for the target and control firms the evolution of the downside risk measures (averages) over the two-year period prior to the investor's engagement. While both measures exhibit some time-series variation with a slight decline leading up to the engagement, the trends for both sets of firms are similar. This mitigates the concern that the results are affected by unobserved differences between target and control firms.

3.3 Empirical Results on Risk Reduction Effects

3.3.a Overall Effects of ESG Engagement on Downside Risk

In Table V we report the estimates of the effects of the shareholder engagement on downside risk. In Columns (1) to (4) we display results for *LPM,* and in Columns (5) to (8) we report results for *VaR.* We present in Columns (1) and (5) estimates of the overall effects of ESG engagement, and in the remaining columns results separated by engagement success. If risk changes originate from the investor's engagement and the subsequent target response, then we should observe systematic variation across targets with different engagement successes. To the contrary, if the investor's engagement itself does not drive a reduction in downside risk, then we should *not* observe differences across success rates.

The estimates demonstrate that across all engagements, whether successful or not, downside risk decreases at targets from before to after engagement, relative to the control group—the effects are significant at either the 5% or 10% significance level. In economic terms, the estimate in Column (1) for *LPM* implies that the downside risk of targets decreases by 0.074 after the engagement, relative to the control firms; these risk reductions correspond to 6% of the variable's standard deviation. As shown in Column (5) we obtain similar results with *VaR* as the measure of downside risk, both in terms of statistical and economic significance (the effect equals 5% of the standard deviation).

Importantly, the magnitude of the effects sharply increases once we condition on the engagement success in the remaining columns. We consider two definitions of engagement success. The first definition threshold classifies as successful those cases where, at the minimum, the target acknowledges an issue of concern raised by the investor (at least Milestone 2 has been achieved). The second definition threshold is stricter and requires that the target not only acknowledges the issue but takes actions to address it (at least Milestone 3). [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]

Columns (3) and (7) define success based on whether Milestone 2 has been achieved. The estimates show that ESG engagements strongly reduce downside risk among those engagements where at least Milestone 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 economic magnitudes are much larger than in Columns (1) and (4): for example, *LPM* decreases by 0.113 from before to after the ESG engagement, relative to control firms, which now equals 10% of the standard deviation.

In Columns (4) and (8) the economic significance of the effects increases further, by a factor between three and four, depending on the risk measure, if we impose a stricter

[13] The classification of success implies a reducing in the sample size used for the estimation, especially when we consider Milestone 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 Milestone 1 has been achieved, 2 for Milestone 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 Milestone 2 for one engagement and Milestone 3 for another engagement with the respective firm, the average success rate would be (Milestone) 2.5. This procedure is in line with Dimson, Karakaş, and Li (2015).

restriction and only consider as successful those engagements where at least Milestone 3 was achieved. 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) *LPM* decreases by 0.432 from before to after the engagement, relative to control firms. We find similar effects for the value at risk in Column (8).

Reassuringly, Columns (2) and (6) show no evidence for a significant reduction in downside risk among those targets where engagement has not achieved Milestone 2. This observation reduces concerns about our results being driven by a confounding mechanism (e.g., the stock picking ability of our investor).

Our results are not driven by the specific modelling choices for the DiD framework. I.A. Table IV confirms the key results in OLS regressions that do not impose a selection correction. Notably, we continue to find risk reductions among those engagements where Milestones 2 and 3 were achieved, but no effects when engagement is classified as unsuccessful. We also observe that the OLS estimates are less negative compared to the estimates in Table V, which implies that the risk reduction effects are biased upwards when target selection is unaccounted for. Such bias could arise when the error terms in the selection and outcome equations are negatively correlated, which can arise for instance from an unobserved variable that positively affects the decision to target a firm, but negatively relates to downside risk. An example may be the unobserved risk aversion of a firm's board, which should be negatively related to downside risk and make a target more attractive for engagement as the propensity to react to ESG-related risk concerns raised by the investors is likely to be higher.

I.A. Table V report estimates in in which we do not adjust for entropy balancing in the outcome equation. In this table results are similar to those in the baseline model in Table V, and we continue to find the strongest risk reduction effects using the most restrictive definition of engagement success (Milestone 3).

3.3.b Effects of ESG Engagement on Downside Risk by Engagement Theme

Next, we consider the different ESG engagement themes to determine whether some engagement areas have greater potential for reduced downside risk. In Table VI, Panel A, we employ *LPM* as the dependent variable. Columns (1) to (4) report results by engagement theme irrespective of engagement success. In these regressions we find that firms being engaged for environmental issues experience a decline in downside risk. The sign of the effects for the remaining three engagement theses is also negative but statistically insignificant. Measuring success based on Milestone 2 in Columns (5) to (8), we continue to find that only engagement on environmental topics results in a statistically significant reduction in downside risk. The same holds when we consider Milestone 3 in Columns (9) to (12) to classify success. For engagements over such topics, which as shown above primarily have the theme of climate change, *LPM* decreases by 0.832 from before to after the engagement, relative to control firms. This risk reduction roughly equals 71% of the variable's standard deviation. We should note that for governance and social engagement we find that although the magnitudes of the reductions in downside risk are large, they are (marginally) insignificant with *t*-stats of 1.7 and 1.3, respectively.

Together with evidence from prior research, the weaker results for governance topics suggest that engagements on compensation 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). The same seems to hold for engagements on strategy changes, for which the prior literature also demonstrates return improvements (see Becht et al., 2017 or Brav et al., 2018). 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) tend to 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 Milestone 2, but they are tied for slowest in Milestone 4 achievement.

In Table V, Panel B, we consider *LPM* as the downside risk measure and find results that are similar to those in Table VI, Panel A.

4. ESG Downside Risk Factor Reduction

We complement our analysis with tests that examine whether ESG engagement reduces a firm's exposure to a downside risk factor. This analysis allows us to attribute factor risk reductions to the investor's engagement. To measure systematic exposure to a downside risk factor, we calculate the factor *DOWN* as the return difference between sample stocks with high minus low downside risk: stocks with high (low) downside risk in the previous period belong to the top (bottom) 30% of the downside risk distribution. As before, we measure downside risk using alternatively, the lower partial moment or value at risk. We then use a firm's time-varying exposure to this factor to capture changes in the firm's factor risk resulting from ESG engagement. Our approach is similar to Kelly and Jiang (2014) who estimate the exposure of firms' returns to an aggregate tail risk factor derived from the cross-section of returns.

We capture the timing of the engagement by creating a two-sided dummy variable ($Post_t$) that equals 1 for return observations from the two-year period after the engagement first achieves Milestone 2; -1 for return observations from the two-year period before; and zero for all other observations. We also use a modified version of this dummy variable to consider the achievement of Milestone 3. We then run the following factor model explaining weekly excess returns ($r_{it} - r_f$) of firm *i*:

$$r_{it} - r_f = \alpha_i + \rho_i\, Post_{it} \times DOWN_t + d_i\, DOWN_t + \Theta_i\, Post_{it} \quad (3)$$

$$+ b_i\,(MKT_t - r_f) + s_i\, SMB_t + h_i\, HML_t + r_i\, RMW_t + c_i\, CMA_t + \vartheta_i + \gamma_t + \varepsilon_{it}.$$

The variable of interest in this model is ρ_i, the coefficient on the interaction term $Post_{it}$ x $DOWN_t$. A negative value of ρ_i would indicate, relative to the period before, that a target's exposure to the downside risk factor decreases after engagement by the investor. The model accounts for the five factors proposed by Fama and French (2015): the *MKT*, *SMB*, and *HML* factors from Fama and French (1993), plus a profitability (*RMW*) and investment factor (*CMA*). These five factors are constructed using the data on international factors provided on Ken French's webpage. ϑ_i and γ_t are firm and year fixed effects.

We report the regression results in Columns (1) to (4) of Table VII, with the *DOWN* factor in Columns (1) and (2) being constructed based on the lower partial moment and in Columns (3) and (4) based on the value at risk. Across all four columns, targeted firms generally have positive exposure to the *DOWN* factor. For engagements in which the investor achieves Milestone 2, we find weak evidence that downside risk exposure is subsequently reduced when employing the LPM-based *DOWN* factor (Column 1), but not when employing the VaR-based *DOWN* factor (Columns 3). In contrast, there exists strong evidence in Columns (2) and (4) that exposure to the downside risk factors significantly decreases after Milestone 3 has been achieved. This suggests that the portfolio of firms for which Milestone 3 has been achieved becomes less tilted towards high downside risk, reflecting a reduction in risk due to the ESG engagement. The effects are large economically as the risk exposure decreases by about 50% in both columns.

One concern may be that the results in Columns (1) to (4) partially reflect the ability of the investor to pick stocks that—independent of engagement—become less risky. To mitigate this concern in Columns (5) to (8) we replace the excess returns of the targets with the return differences between the targets and the matched firms. In these regressions engagement reduces downside risks of the targets, relative to the control firms, as soon as Milestone 2 is reached. The magnitude of the downside risk reduction roughly doubles when Milestone 3 is achieved. These results suggest that the reductions in firms' sensitivities to aggregate downside risk are due to the investor's engagement rather than stock picking.

Our research design further allows us to assess the question of whether the investor has to give up return to achieve the demonstrated reductions to the downside risk factor. The positive and significant *Alpha* coefficients in Column (1) to (4) suggests this is not the case as they imply that the investor o*n average* creates risk-adjusted outperformance from the investment strategy. The insignificant *Post* coefficients in Columns (1), (2) and (4), however, indicate that there is no evidence that outperformance is lowered after engagement.[15] When we conduct a joint significance test of the *Alpha* and the *Post* coefficients for Columns (1) to (4), all joint tests result in significant positive effects implying that the investment strategy itself yields an outperformance over the post-engagement period.

This investor outperformance in Columns (1) to (4), however, is measured against the market benchmark return (in excess of the risk free rate) rather than against the matched firms, and it may result from stock picking rather than engagement (as the lack of significance for the *Post* coefficients indicate). To ascertain if this could be the case, in Columns (5) to (8) we focus on the return differential between targeted and matched firms and examine the significance of the *Alpha* coefficient individually and of the *Alpha* and *Post* coefficients jointly. In neither of these four specifications are the *Alpha* coefficient individually, and the *Alpha* and *Post* coefficients jointly, statistically significant. This indicates that ESG engagement, when measured relative to matched firms, does *not* have a significant effect on returns, whereas it has a significant negative effect on downside risk.

5. 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, the lower partial moment and value at risk, we demonstrate that ESG shareholder engagements result in risk reductions. Further evidence in support of this

[15] The *Post* coefficient is marginally negative significant in Column (3), but this effect appears economically small compared to the *Alpha* coefficient.

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. We complement these findings through tests that examine the effects of engagement on the exposure of targeted firms' returns to a downside risk factor. Exposure to the downside risk factor significantly decreases after successful engagement. 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. Our results provide further evidence for the argument that engaged shareholders can create long-term value for shareholders by "growing the pie" as in Edmans (2020).

Data Appendix

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
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
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
MV	Market value of equity, calculated at the firm-year level.	
Market-to-book ratio	Market value of equity divided by book value of equity, calculated at the firm-year level.	Datastream
Leverage	Total debt divided by common equity, calculated at the firm-year level. Total debt is the sum of long-term and short-term debt.	Datastream
Investment	Capital expenditures over assets, calculated at the firm-year level.	Datastream
Profit margin	Operating income over total sales, calculated at the firm-year level.	Datastream
Dividend yield	Dividends per share divided by the share price, calculated at the firm-year level.	Datastream
Freefloat	Number of shares available as free float, divided by number of shares issued, calculated at the firm-year level.	Datastream
ADRI	Anti-director rights index measured based on shareholder-voting rights and minority shareholder protection, calculated at the firm-year level.	Spamann (2009)

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Figure 1. ESG Engagements by Country

This figure reports engagements by the targeted firm's country of incorporation. The sample consists of 1,712 engagements across 573 targets over the period January 2005 through April 2018.

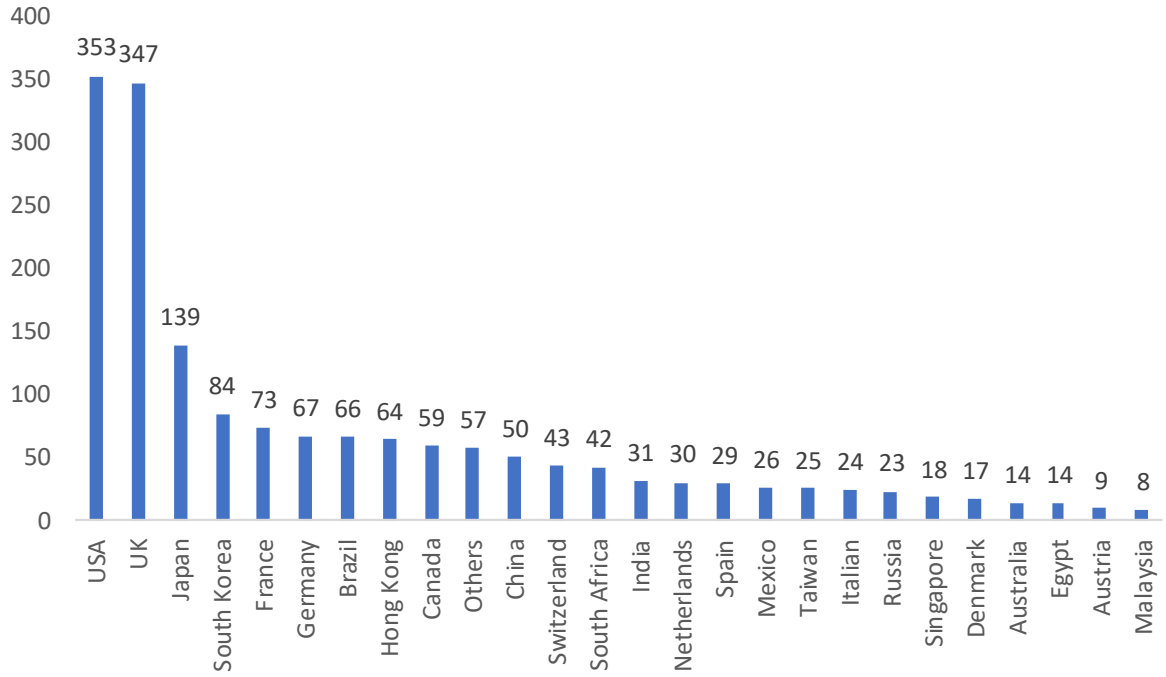


Figure 2. ESG Engagements by Industry

This figure reports engagements by the target firm's industry. The sample consists of 1,712 engagements across 573 targets over the period January 2005 through April 2018.

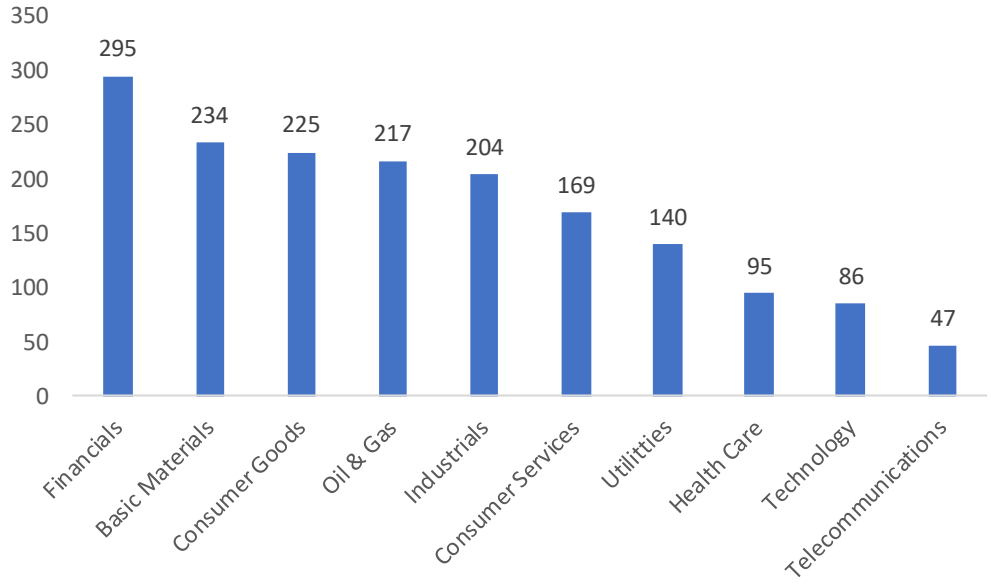


Figure 3. Total ESG Engagements by Year

This figure reports engagements by year of the initial engagement. The sample consists of 1,712 engagements across 573 targets 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.

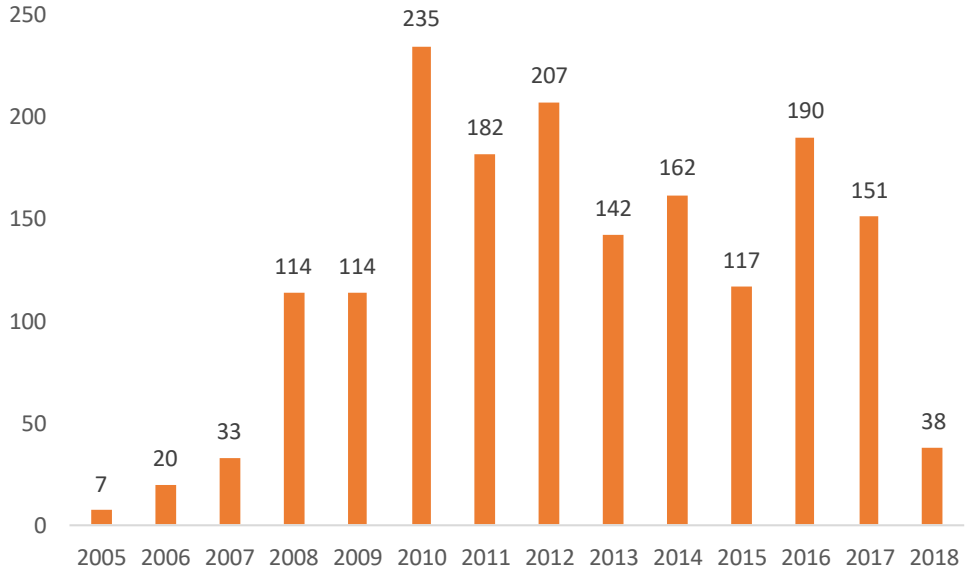


Figure 4. ESG Engagement Themes by Year

This figure reports engagements by theme and year of the initial engagement. The sample consists of 1,712 engagements across 573 targets 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.

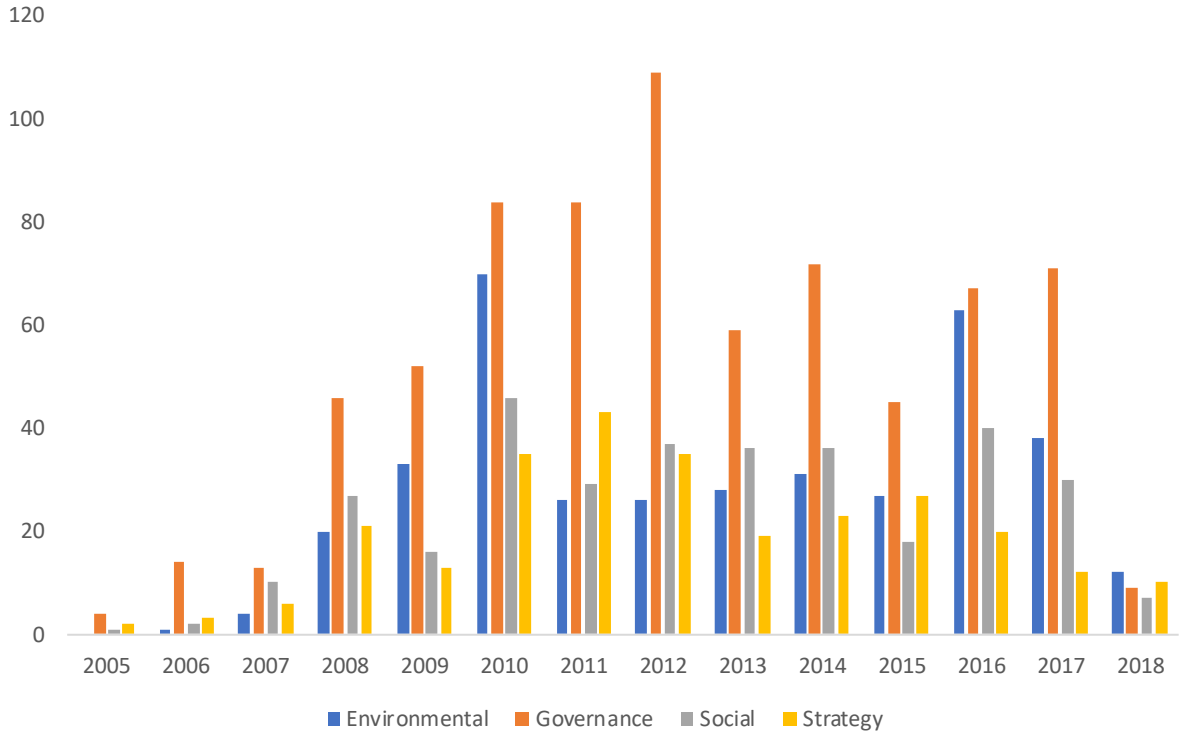
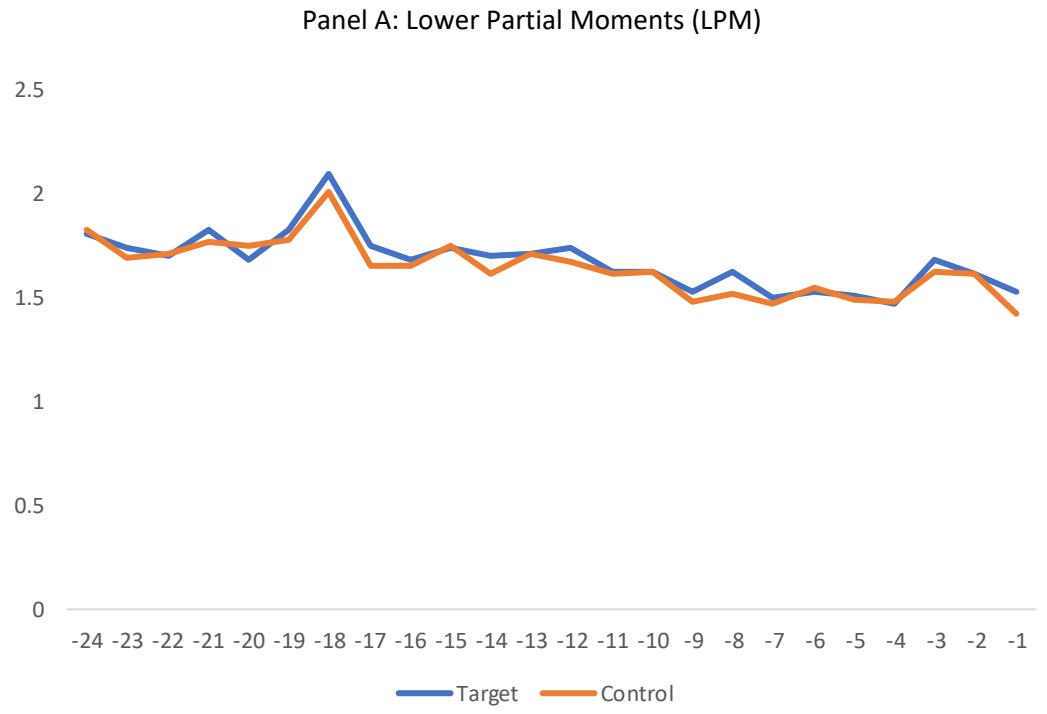


Figure 5. Evidence of Parallel Trends

This figure reports the time-series evolution of the downside risk measures, *LPM* in Panel A and *VaR* in Panel B, over the 24-month period prior to initial engagement for the target and control firms.



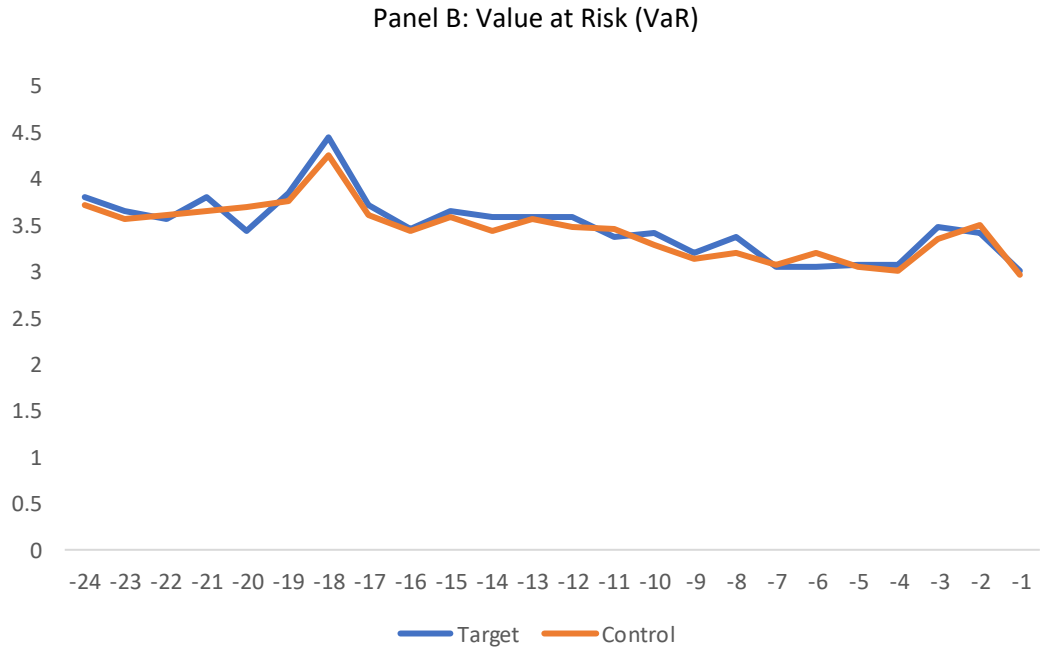


Table I. Summary Statistics on Engagement Themes

This table provides summary statistics across four general engagement themes: governance; social; environmental; and strategy. The table also breaks down these general themes into subthemes, and reports the number (percentage) of engagements within each engagement theme. The sample consists of 1,712 engagements across 573 targeted firms over the period January 2005 through April 2018.

Panel A: Governance Engagement		
Subthemes	#	%
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 = 1,712)	42.6	

Panel B: Social Engagement		
Subthemes	#	%
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 = 1,712)	19.6	

Panel C: Environmental Engagement		
Subthemes	#	%
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 = 1,712)	22.1	

Panel D: Strategy Engagement		
Subthemes	#	%
Business strategy	106	39
Risk management	94	35
Integrated reporting/disclosure	50	19
Cyber security	10	4
Audit and accounting	9	3
Total	269	100
% of Engagements (N = 1,712)	15.7	

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 and theme. In Panel A, the success percentages are relative to all engagements as well as relative to all engagements of a given theme. 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 Milestones 3 or 4 may not yet have been achieved. The sample consists of 1,712 engagements across 573 targeted firms over the period January 2005 through April 2018.

	Panel A: Engagement Success		Panel B: Engagement Duration (months)		
	#	%	Mean	STD	Max
Milestone 1: Concern Raised with Target					
Governance engagement	130	18	2	4	24
Social engagement	55	16	3	8	57
Environmental engagement	77	20	2	6	43
Strategy engagement	40	15	3	9	54
All engagements	302	18	2	6	57
Milestone 2: Issue Acknowledged by Target					
Governance engagement	186	26	9	17	109
Social engagement	95	28	3	6	31
Environmental engagement	152	40	4	9	62
Strategy engagement	89	33	7	13	68
All engagements	522	30	6	13	109
Milestone 3: Actions Taken by Target					
Governance engagement	126	17	27	22	98
Social engagement	84	25	24	24	101
Environmental engagement	67	18	19	16	65
Strategy engagement	73	27	23	21	90
All engagements	350	20	24	21	101
Milestone 4: Engagement Successfully Completed					
Governance engagement	287	39	32	25	119
Social engagement	101	30	41	26	118
Environmental engagement	83	22	35	27	108
Strategy engagement	67	25	41	24	109
All engagements	538	31	35	25	119

Table III. 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 1,712 engagements across 573 targeted firms over the period January 2005 through April 2018.

	Engagement Themes					Engagement Progress by Milestones				
	Governance	Social	Environ-mental	Strategy	Total	Mile-stone 1	Mile-stone 2	Mile-stone 3	Mile-stone 4	Total
Panel A: Action Types										
Meeting	2,049	1,083	1,073	912	5,117	543	714	1,012	2,848	5,117
	2.8	*3.2*	*2.8*	*3.4*	*3.0*	*1.8*	*1.4*	*2.9*	*5.3*	*3.0*
Email	838	479	413	325	2,055	189	328	441	1,097	2,055
	1.1	*1.4*	*1.1*	*1.2*	*1.2*	*0.6*	*0.6*	*1.3*	*2.0*	*1.2*
Conference call	737	399	340	272	1,748	190	277	354	927	1,748
	1.0	*1.2*	*0.9*	*1.0*	*1.0*	*0.6*	*0.5*	*1.0*	*1.7*	*1.0*
Letter	674	295	304	251	1,524	163	255	318	788	1,524
	0.9	*0.9*	*0.8*	*0.9*	*0.9*	*0.5*	*0.5*	*0.9*	*1.5*	*0.9*
Others	285	174	226	125	810	111	176	243	456	986
	0.4	*0.5*	*0.6*	*0.5*	*0.5*	*0.4*	*0.3*	*0.7*	*0.8*	*0.6*
Panel B: Positions of Targeted Individuals										
Chairman	796	267	217	247	1,527	153	212	235	927	1,527
	1.1	*0.8*	*0.6*	*0.9*	*0.9*	*0.5*	*0.4*	*0.7*	*1.7*	*0.9*
Committee member	582	150	167	121	1,020	87	120	221	592	1,020
	0.8	*0.4*	*0.4*	*0.4*	*0.6*	*0.3*	*0.2*	*0.6*	*1.1*	*0.6*
Board of directors	231	90	72	82	475	44	61	81	289	475
	0.3	*0.3*	*0.2*	*0.3*	*0.3*	*0.1*	*0.1*	*0.2*	*0.5*	*0.3*
Senior executives	775	521	361	385	2,042	212	298	360	1,172	2,042
	1.1	*1.6*	*1.0*	*1.4*	*1.2*	*0.7*	*0.6*	*1.0*	*2.2*	*1.2*
Shareholders	117	29	34	28	208	8	17	45	138	208
	0.2	*0.1*	*0.1*	*0.1*	*0.1*	*0.03*	*0.03*	*0.1*	*0.3*	*0.1*
Middle management	485	400	358	288	1,531	169	238	272	852	1,531
	0.7	*1.2*	*0.9*	*1.1*	*0.9*	*0.6*	*0.5*	*0.8*	*1.6*	*0.9*
CSR	586	459	472	241	1,758	196	261	351	950	1,758
	0.8	*1.4*	*1.2*	*0.9*	*1.0*	*0.6*	*0.5*	*1.0*	*1.8*	*1.0*
Investor relations and legal	256	123	98	124	601	83	105	110	303	601
	0.4	*0.4*	*0.3*	*0.5*	*0.4*	*0.3*	*0.2*	*0.3*	*0.6*	*0.4*
Secretary	336	96	90	70	592	69	77	116	330	592
	0.5	*0.3*	*0.2*	*0.3*	*0.3*	*0.2*	*0.1*	*0.3*	*0.6*	*0.3*
Others	136	106	69	60	371	36	55	74	206	371
	0.2	*0.3*	*0.2*	*0.2*	*0.2*	*0.1*	*0.1*	*0.2*	*0.4*	*0.2*

Table IV. Summary Statistics

This table reports summary statistics at the firm-month level of the variables used in the difference-in-differences regressions. The sample in this analysis includes 352 targeted firms and 352 matched control firms.

Variable	Mean	STD	25%	Median	75%	Obs.
LPM	1.58	1.18	0.87	1.29	1.93	32,905
VaR	3.28	2.53	1.77	2.68	4.03	32,905
Log(MV)	9.13	1.34	8.20	9.10	10.05	32,905
Market-to-book ratio	3.44	17.17	1.22	1.92	3.32	32,905
Leverage	35.02	21.16	19.77	33.61	49.24	32,905
Investment	11.27	20.60	2.85	5.59	12.67	32,905
Profit margin	15.42	15.13	6.14	12.75	20.96	32,905
Dividend	2.48	2.31	1.02	2.04	3.32	32,905
Freefloat	72.85	25.80	52.00	82.00	95.00	32,905

Table V. Effect of ESG Engagement Success on Downside Risk

This table reports difference-in-differences regressions to estimate the effect of ESG engagement on downside risk. Regressions are estimated at the firm-month level. Results are obtained from a (second-stage) outcome regression of a Heckman model, and are reported across engagement milestones and by engagement success. (The results of the engagement selection equation are reported in I.A. Table II.) Regression are estimated for the two-sided 24-month window around the month in which a target is engaged. The dependent variable is measured alternatively as *LPM* (the lower partial moment of the second order of the return distribution) or *VaR* (the 5% value at risk using absolute values such that smaller numbers reflect less downside risk). Both measures are calculated at the firm-month level from daily return data. The sample in this analysis includes 352 targeted firms and 352 matched control firms, where control firms are matched with engagement targets using country, industry, and size as matching criteria. *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. *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	*LPM*				*VaR*			
Engagement success	All	Below Milestone 2	Milestone 2 and above	Milestone 3 and above	All	Below Milestone 2	Milestone 2 and above	Milestone 3 and above
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Target x Post	-0.074**	-0.051	-0.113*	-0.432***	-0.139*	-0.081	-0.242**	-0.838**
	(-2.18)	(-1.29)	(-1.92)	(-2.73)	(-1.96)	(-0.99)	(-1.99)	(-2.66)
Target	4.359***	4.111***	4.895***	5.405***	8.794***	8.255***	10.173***	11.202***
	(11.24)	(7.99)	(9.63)	(4.10)	(11.54)	(8.42)	(9.74)	(3.96)
Post	0.112***	0.083**	0.156***	0.180*	0.204***	0.138*	0.299***	0.259
	(3.93)	(2.44)	(3.47)	(1.74)	(3.26)	(1.91)	(3.11)	(1.24)
Log(MV)	-0.634***	-0.602***	-0.708***	-0.840***	-1.277***	-1.214***	-1.451***	-1.732***
	(-14.96)	(-10.89)	(-12.55)	(-5.72)	(-15.72)	(-11.71)	(-12.57)	(-5.35)
Market-to-book ratio	-0.002***	-0.002***	-0.016**	-0.015	-0.004***	-0.004***	-0.026	-0.010
	(-3.95)	(-4.37)	(-2.10)	(-1.37)	(-3.72)	(-4.23)	(-1.55)	(-0.52)
Leverage	-0.002***	-0.002**	-0.002	0.003	-0.005***	-0.005**	-0.003	0.005
	(-2.68)	(-2.12)	(-1.22)	(1.29)	(-2.79)	(-2.36)	(-1.34)	(0.97)
Investment	-0.000	0.000	-0.002	0.014***	-0.001	0.001	-0.003	0.033***
	(-0.34)	(0.25)	(-1.45)	(3.18)	(-0.25)	(0.44)	(-1.17)	(3.63)
Profit margin	-0.000	-0.000	0.001	-0.001	-0.000	-0.000	0.002	-0.002
	(-0.47)	(-0.27)	(0.50)	(-0.57)	(-0.14)	(-0.08)	(0.75)	(-0.52)
Dividend	0.043***	0.047**	0.034**	-0.024	0.070***	0.067***	0.079**	-0.011
	(2.74)	(2.13)	(2.39)	(-0.70)	(4.66)	(3.71)	(2.58)	(-0.16)
Freefloat	-0.010***	-0.009***	-0.011***	-0.012**	-0.020***	-0.018***	-0.023***	-0.026**
	(-9.22)	(-7.29)	(-6.23)	(-2.44)	(-9.40)	(-7.71)	(-6.10)	(-2.65)
Inverse Mills Ratio	-2.570***	-2.428***	-2.880***	-3.029***	-5.194***	-4.892***	-5.989***	-6.304***
	(-10.84)	(-7.74)	(-9.24)	(-3.90)	(-11.07)	(-8.15)	(-9.37)	(-3.77)
Constant	5.824***	5.569***	6.379***	7.425***	11.940***	11.457***	13.117***	15.226***
	(21.47)	(16.25)	(16.01)	(7.24)	(22.36)	(17.17)	(16.04)	(6.98)
Model	Heckman	Heckman	Heckman	Heckman	Heckman	Heckman	Heckman	Heckman
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	32,905	21,243	11,662	2,324	32,905	21,243	11,662	2,324
Adj. R-sq.	0.337	0.313	0.409	0.424	0.308	0.278	0.391	0.419

Table VI. Effect of ESG Engagement Themes on Downside Risk

This table reports difference-in-differences regressions to estimate the effect of ESG engagement on downside risk. Regressions are estimated at the firm-month level. Results are obtained from a (second-stage) outcome regression of a Heckman model, and are reported across engagement milestones and by engagement success. (The results of the engagement selection equation are reported in I.A. Table II.) The outcome regression is estimated for the two-sided 24-month window around the month in which a target is engaged. In Panel A, *LPM* is the lower partial moment of the second order, calculated at the firm-month level from daily return data. In Panel B, *VaR* is the 5% value at risk, calculated at the firm-month level from daily return data (using absolute values such that smaller numbers reflect less downside risk). The sample in this analysis includes 352 targeted firms and 352 matched control firms, where control firms are matched with engagement targets using country, industry, and size as matching criteria. *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. *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 Lower Partial Moment

Dependent variable	*LPM*				*LPM*				*LPM*			
Engagement success	All				Milestone 2 and above				Milestone 3 and above			
Engagement topic	Governance	Environment	Social	Strategy	Governance	Environment	Social	Strategy	Governance	Environment	Social	Strategy
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Target x Post	-0.065	-0.147**	-0.010	-0.041	-0.071	-0.164*	-0.110	-0.151	-0.478	-0.832**	-0.673	-0.126
	(-1.24)	(-2.16)	(-0.13)	(-0.56)	(-0.70)	(-1.66)	(-0.65)	(-1.27)	(-1.70)	(-3.37)	(-1.17)	(-1.31)
Target	4.153***	6.672***	4.273***	2.590***	5.531***	5.776***	5.867***	5.690***	9.915***	14.254*	2.598*	8.537***
	(8.08)	(8.17)	(4.68)	(3.09)	(5.69)	(7.07)	(5.27)	(4.14)	(3.89)	(2.13)	(1.87)	(5.48)
Post	0.114***	0.186***	0.078	0.029	0.147*	0.109*	0.100	0.084	0.034	0.340	0.101	0.171
	(2.88)	(3.51)	(1.08)	(0.45)	(1.96)	(1.87)	(0.70)	(0.86)	(0.20)	(1.88)	(0.29)	(0.95)
Model	Heckman	Heckman	Heckman	Heckman	Heckman	Heckman	Heckman	Heckman	Heckman	Heckman	Heckman	Heckman
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	11,012	9,286	5,736	6,871	3,656	4,418	2,171	1,417	996	372	478	478
Adj. R-sq.	0.380	0.386	0.314	0.351	0.459	0.425	0.402	0.514	0.500	0.503	0.430	0.424

Table VI (continued)

Panel B: Effect of ESG Engagement Themes on Value at Risk												
Dependent variable	*VaR*				*VaR*				*VaR*			
Engagement success	All				Milestone 2 and above				Milestone 3 and above			
Engagement topic	Governance	Environment	Social	Strategy	Governance	Environment	Social	Strategy	Governance	Environment	Social	Strategy
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Target x Post	-0.123	-0.283**	0.041	-0.135	-0.165	-0.395*	-0.159	-0.330	-0.936*	-1.734**	-1.182	-0.256
	(-1.14)	(-2.03)	(0.23)	(-0.93)	(-0.83)	(-1.94)	(-0.43)	(-1.33)	(-1.78)	(-3.24)	(-1.07)	(-1.33)
Target	8.312***	13.821***	9.046***	5.076***	10.672***	12.138***	14.271***	12.327***	21.002***	32.029*	5.155	16.577***
	(8.01)	(8.69)	(4.87)	(3.13)	(5.32)	(7.19)	(7.42)	(3.61)	(3.33)	(2.16)	(1.61)	(5.19)
Post	0.191**	0.355***	0.121	0.042	0.258*	0.224*	0.154	0.207	-0.117	0.605	0.060	0.331
	(2.25)	(3.44)	(0.74)	(0.32)	(1.69)	(1.77)	(0.49)	(1.16)	(-0.32)	(1.58)	(0.09)	(1.14)
Model	Heckman	Heckman	Heckman	Heckman	Heckman	Heckman	Heckman	Heckman	Heckman	Heckman	Heckman	Heckman
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	11,012	9,286	5,736	6,871	3,656	4,418	2,171	1,417	996	372	478	478
Adj. R-sq.	0.356	0.346	0.277	0.324	0.438	0.408	0.384	0.497	0.486	0.481	0.474	0.396

Table VII. Effect of ESG Engagement on the Stock-Return Exposure to a Downside Risk Factor

This table shows in Columns (1) through (4) results from regressions of engagement targets' weekly excess stock returns (stock return minus risk-free rate) on a downside risk factor, the *Post* dummy, and an interaction of the two. Columns (5) through (8) replace the returns of engagement targets with the return difference between each engagement target and its matched control firm. The downside risk factor (*DOWN*) is the difference between the returns of portfolios of stocks with high versus low downside risk. Sample stocks with high (low) downside risk are in the highest (lowest) 30% of the respective downside risk distribution. The *DOWN* factor is based on *LPM*, the lower partial moment of the second order or on the *VaR*, the value at risk (indicated accordingly). In Columns (1), (3), (5), and (7) the dummy variable *Post* equals 1 for stock-return observations from the two-year period after milestone 2 has been inaugurally achieved, -1 for stock-return observations from the two-year period before, and zero for all other observations. In Columns (2), (4), (6), and (8) the *Post* dummy takes the value 1 in the two-year period after Milestone 3 has been inaugurally achieved, -1 in the two-year period before, and zero otherwise. All regressions include the five factors proposed by Fama and French (2015), i.e., the market (*MKT*), size (*SMB*), value (*HML*), profitability (*RMW*), and investment (*CMA*) factors with Alpha being the intercept and prominent investment performance measure. These factors are constructed using all FTSE All World constituent firms in country, sector and size brackets equivalent to at least one target and following the method described in Ken French's webpage. The regressions include firm and year fixed effects. The sample in Columns (1) to (4) includes 352 targets and in Columns (5) to (8) 352 targets and 352 matched control firms. *, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

	LPM		*VaR*		*LPM*		*VaR*	
Post dummy:	Milestone 2	Milestone 3	Milestone 2	Milestone 3	Milestone 2	Milestone 3	Milestone 2	Milestone 3
	Excess Return		Excess Return		Excess Return		Excess Return	
	Target		Target		Target - Control		Target - Control	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
*Post * DOWN*	-0.015*	-0.055***	-0.014	-0.055***	-0.036***	-0.066***	-0.034***	-0.066***
	(-1.77)	(-4.25)	(-1.63)	(-4.31)	(-3.78)	(-4.70)	(-3.62)	(-4.73)
DOWN	0.101***	0.101***	0.111***	0.110***	0.026***	0.026***	0.028***	0.028***
	(14.44)	(14.39)	(15.48)	(15.43)	(3.29)	(3.34)	(3.53)	(3.57)
Post	-0.0003	0.0001	-0.0004*	0.0001	-0.0001	0.001	-0.0001	0.001*
	(-1.59)	(0.26)	(-1.83)	(0.23)	(-0.27)	(1.58)	(-0.34)	(1.69)
Alpha	0.002***	0.002***	0.002***	0.002***	-0.000	-0.000	-0.001	-0.000
	(3.33)	(3.33)	(4.30)	(4.29)	(-0.71)	(-0.69)	(-0.83)	(-0.82)
MKT	1.006***	1.006***	1.002***	1.002***	-0.008	-0.008	-0.010	-0.009
	(140.22)	(140.24)	(139.75)	(139.76)	(-1.03)	(-1.00)	(-1.20)	(-1.18)
SMB	0.366***	0.366***	0.362***	0.363***	-0.192***	-0.192***	-0.191***	-0.191***
	(22.92)	(22.94)	(22.73)	(22.75)	(-10.86)	(-10.86)	(-10.84)	(-10.83)
HML	0.191***	0.190***	0.178***	0.177***	0.109***	0.109***	0.105***	0.104***
	(13.93)	(13.89)	(12.94)	(12.89)	(7.18)	(7.18)	(6.90)	(6.90)
RMW	0.168***	0.168***	0.169***	0.169***	0.053***	0.054***	0.055***	0.056***
	(11.72)	(11.70)	(11.76)	(11.73)	(3.37)	(3.40)	(3.48)	(3.51)
CMA	-0.001	-0.001	0.001	0.001	0.009	0.009	0.008	0.008
	(-0.11)	(-0.09)	(0.08)	(0.11)	(1.17)	(1.17)	(1.01)	(1.00)
Obs.	191,154	191,154	191,816	191,816	188,025	188,025	188,700	188,700
Adj. R-sq.	0.279	0.279	0.280	0.280	0.001	0.001	0.001	0.001

Internet Appendix

for

ESG Shareholder Engagement and Downside Risk

I.A. 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 1,712 engagements across 573 targeted firms 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

I.A. Table II. Determinants of Engagement: Selection Equation

This table reports probit regressions of the engagement selection equation, that is, the likelihood of a firm being engaged by the investor. Regressions are estimated at the firm-firm level. The sample in this analysis includes 352 targeted firms and 352 matched control firms, where control firms are matched with engagement targets using country, industry, and size as matching criteria. *Target* equals 1 for all firm-year observations if a firm is an engagement target, and 0 if it is a control firm. *t*-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Dependent variable	*Target*			
	(1)	(2)	(3)	(4)
Log(MV)	0.276***	0.326***	0.379***	0.496***
	(6.89)	(7.44)	(7.95)	(9.04)
Market-to-book ratio	0.005	0.006	0.006	0.007
	(0.61)	(0.67)	(0.69)	(0.86)
Leverage	0.002	-0.000	-0.001	0.001
	(0.62)	(-0.17)	(-0.20)	(0.28)
Investment	0.002	0.004	0.004	0.005
	(0.79)	(1.18)	(1.21)	(1.27)
Profit margin	0.001	0.000	0.000	0.001
	(0.20)	(0.03)	(0.03)	(0.35)
Dividend	-0.029	-0.029	-0.033	-0.079**
	(-1.18)	(-1.12)	(-1.23)	(-2.54)
Freefloat	0.006***	0.006***	0.006***	0.010***
	(2.85)	(2.77)	(2.63)	(3.82)
ADRI	0.119**	0.113*	0.105*	-0.180
	(2.02)	(1.89)	(1.71)	(-0.54)
Constant	-3.436***	-4.202***	-3.829***	-3.541
	(-6.85)	(-7.21)	(-3.47)	(-1.54)
Model	Probit	Probit	Probit	Probit
Industry FE	No	Yes	Yes	Yes
Year FE	No	No	Yes	Yes
Country FE	No	No	No	Yes
Obs.	704	704	704	704
pseudo R-sq.	0.071	0.081	0.092	0.126

I.A. Table III. Summary Statistics Before and After Entropy Balancing

This table reports summary statistics of the control variables used in the difference-in-differences regressions before and after entropy balancing. The sample in this analysis includes 352 targeted firms and 352 matched control firms, where control firms are matched with engagement targets using country, industry, and size as matching criteria

Panel A: Summary Statistics of Control Variables before Entropy Balancing				
	Target		Control	
Entropy balancing	Mean	STD	Mean	STD
Log(MV)	9.49	1.37	8.77	1.21
Market-to-book ratio	3.47	20.36	3.40	13.26
Leverage	35.32	20.99	34.73	21.33
Investment	11.77	23.48	10.77	17.25
Profit margin	15.82	13.83	15.03	16.31
Dividend	2.40	2.28	2.56	2.33
Freefloat	76.11	24.06	69.63	27.04
Panel B: Summary Statistics of Control Variables after Entropy Balancing				
	Target		Control	
Entropy balancing	Mean	STD	Mean	STD
Log(MV)	9.49	1.37	9.49	1.20
Market-to-book ratio	3.47	20.36	3.47	10.37
Leverage	35.32	20.99	35.32	20.42
Investment	11.77	23.48	11.77	17.91
Profit margin	15.82	13.83	15.82	14.68
Dividend	2.40	2.28	2.40	1.90
Freefloat	76.11	24.06	76.11	25.31

I.A. Table IV. Effect of ESG Engagement on Downside Risk: OLS Model without Selection Correction Factor

This table reports difference-in-differences regressions to estimate the effect of ESG engagement on downside risk. Regressions are estimated without the selection correction factor at the firm-month level. Results are reported from OLS regressions, across all engagement milestones and by engagement success. Regression are estimated for the two-sided 24-month window around the month in which a target is engaged. The dependent variable is measured alternatively as *LPM* (the lower partial moment of the second order of the return distribution) or *VaR* (the 5% value at risk using absolute values such that smaller numbers reflect less downside risk). Both measures are calculated at the firm-month level from daily return data. The sample in this analysis includes 352 targeted firms and 352 matched control firms, where control firms are matched with engagement targets using country, industry, and size as matching criteria. *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 a firm has been targeted, and 0 before. Engagement success is measured based on whether certain milestones have been achieved. 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. *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	*LPM*				*VaR*			
	All	Below Milestone 2	Milestone 2 and above	Milestone 3 and above	All	Below Milestone 2	Milestone 2 and above	Milestone 3 and above
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Target x Post	-0.038	-0.011	-0.096*	-0.337**	-0.067	-0.000	-0.205*	-0.641**
	(-1.20)	(-0.30)	(-1.79)	(-2.43)	(-1.00)	(-0.00)	(-1.85)	(-2.32)
Target	0.206***	0.202***	0.242***	0.510***	0.399***	0.379***	0.497***	1.012***
	(5.46)	(4.49)	(4.31)	(3.13)	(5.09)	(4.06)	(4.37)	(3.13)
Post	0.070**	0.052	0.105**	0.029	0.119*	0.076	0.193*	-0.054
	(2.49)	(1.58)	(2.33)	(0.34)	(1.91)	(1.08)	(1.96)	(-0.32)
Log(MV)	-0.225***	-0.217***	-0.271***	-0.401***	-0.451***	-0.439***	-0.542***	-0.818***
	(-13.03)	(-10.25)	(-9.64)	(-4.99)	(-13.39)	(-10.51)	(-9.57)	(-4.87)
Market-to-book ratio	-0.001**	-0.001***	-0.023***	-0.023***	-0.002**	-0.002**	-0.041***	-0.027
	(-2.30)	(-2.91)	(-3.88)	(-2.79)	(-2.06)	(-2.48)	(-2.90)	(-1.43)
Leverage	0.001	0.001	0.002**	0.008***	0.002	0.002	0.005**	0.015***
	(1.48)	(1.37)	(2.04)	(3.29)	(1.44)	(1.24)	(1.99)	(3.06)
Investment	0.001*	0.002	0.001	0.011**	0.003**	0.004*	0.002	0.026***
	(1.87)	(1.61)	(0.51)	(2.26)	(2.07)	(1.92)	(0.76)	(2.69)
Profit margin	0.000	0.000	0.001	0.000	0.001	0.001	0.003	0.001
	(0.06)	(0.16)	(0.69)	(0.24)	(0.40)	(0.35)	(0.90)	(0.35)
Dividend	0.036**	0.042*	0.023	-0.028	0.056***	0.056***	0.056*	-0.020
	(2.11)	(1.80)	(1.46)	(-0.75)	(3.29)	(2.88)	(1.68)	(-0.27)
Freefloat	-0.002*	-0.002**	-0.001	-0.003	-0.004**	-0.004**	-0.003	-0.007
	(-1.94)	(-2.04)	(-0.63)	(-0.73)	(-2.30)	(-2.31)	(-0.87)	(-0.76)
Constant	3.471***	3.385***	3.908***	5.033***	7.183***	7.057***	7.979***	10.249***
	(21.44)	(16.46)	(14.42)	(6.69)	(22.00)	(16.68)	(14.60)	(6.62)
Model	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	32,905	21,243	11,662	2,324	32,905	21,243	11,662	2,324
Adj. R-sq.	0.308	0.289	0.374	0.396	0.282	0.257	0.357	0.390

I.A. Table V. Effect of ESG Engagement on Downside Risk: No Entropy Balancing

This table reports difference-in-differences regressions to estimate the effect of ESG engagement on downside risk. Regressions are estimated at the firm-month level. Results are obtained from a (second-stage) outcome regression of a Heckman model, and are reported across engagement milestones and by engagement success. (The results of the engagement selection equation are reported in I.A. Table II.) The outcome regression is estimated for the two-sided 24-month window around the month in which a target is engaged. The dependent variable is measured alternatively as *LPM* (the lower partial moment of the second order of the return distribution) or *VaR* (the 5% value at risk using absolute values such that smaller numbers reflect less downside risk). Both measures are calculated at the firm-month level from daily return data. The sample in this analysis includes 352 targeted firms and 352 matched control firms, where control firms are matched with engagement targets using country, industry, and size as matching criteria. *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 a firm has been targeted, and 0 before. Engagement success is measured based on whether certain milestones have been achieved. 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. *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	*LPM*				*VaR*			
Engagement success	All	Below Milestone 2	Milestone 2 and above	Milestone 3 and above	All	Below Milestone 2	Milestone 2 and above	Milestone 3 and above
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Target x Post	-0.063*	-0.023	-0.130**	-0.413**	-0.123*	-0.039	-0.273**	-0.752**
	(-1.77)	(-0.57)	(-2.13)	(-2.64)	(-1.67)	(-0.45)	(-2.20)	(-2.55)
Target	4.488***	4.062***	5.277***	6.135***	9.102***	8.224***	10.859***	11.965***
	(10.76)	(7.69)	(9.66)	(4.93)	(11.01)	(8.03)	(9.90)	(5.21)
Post	0.100***	0.053	0.187***	0.169	0.185***	0.093	0.353***	0.206
	(3.27)	(1.45)	(3.97)	(1.59)	(2.83)	(1.19)	(3.64)	(1.07)
Log(MV)	-0.647***	-0.591***	-0.751***	-0.926***	-1.310***	-1.200***	-1.532***	-1.843***
	(-13.92)	(-10.46)	(-12.40)	(-6.86)	(-14.41)	(-11.00)	(-12.75)	(-7.19)
Market-to-book ratio	-0.002***	-0.002***	-0.016**	-0.013	-0.004***	-0.003***	-0.029	-0.009
	(-2.98)	(-3.90)	(-2.17)	(-1.15)	(-2.78)	(-3.83)	(-1.65)	(-0.36)
Leverage	-0.002**	-0.001	-0.002	0.004	-0.004**	-0.003	-0.004	0.007
	(-2.11)	(-1.33)	(-1.27)	(1.33)	(-2.23)	(-1.52)	(-1.36)	(1.36)
Investment	-0.001	-0.000	-0.001	0.018***	-0.001	0.000	-0.002	0.039***
	(-0.53)	(-0.01)	(-0.94)	(4.50)	(-0.38)	(0.20)	(-0.68)	(4.93)
Profit margin	0.000	0.001	0.001	0.000	0.001	0.002	0.003	0.000
	(0.27)	(0.31)	(0.80)	(0.07)	(0.58)	(0.56)	(0.98)	(0.17)
Dividend	0.043***	0.050**	0.033**	-0.018	0.078***	0.077***	0.079***	-0.005
	(3.19)	(2.52)	(2.36)	(-1.24)	(4.97)	(4.47)	(2.76)	(-0.17)
Freefloat	-0.010***	-0.009***	-0.011***	-0.010**	-0.021***	-0.019***	-0.023***	-0.021**
	(-8.02)	(-6.50)	(-6.07)	(-2.23)	(-8.33)	(-6.76)	(-6.19)	(-2.46)
Inverse Mills Ratio	-2.649***	-2.406***	-3.105***	-3.473***	-5.385***	-4.893***	-6.383***	-6.773***
	(-10.33)	(-7.43)	(-9.23)	(-4.77)	(-10.53)	(-7.75)	(-9.45)	(-5.07)
Constant	5.882***	5.469***	6.561***	7.552***	12.074***	11.293***	13.467***	15.257***
	(19.15)	(15.15)	(15.85)	(8.77)	(19.89)	(15.69)	(16.40)	(9.01)
Model	Heckman	Heckman	Heckman	Heckman	Heckman	Heckman	Heckman	Heckman
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	32,905	21,243	11,662	2,324	32,905	21,243	11,662	2,324
Adj. R-sq.	0.331	0.305	0.409	0.444	0.301	0.270	0.389	0.435

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