Which institutional investors drive corporate sustainability?*

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Abstract

Many institutional investors publicly commit to some form of responsible investment. This raises concerns about the credibility of such claims. We use participation in collaborative engagements to identify "Leaders", i.e., institutional investors that are truly committed to improving firms' sustainability outcomes. Despite owning only 2.2% of the average firm, Leaders alone explain the positive relationship between institutional ownership and firms' environmental and social performance. In line with committed owners facilitating corporate change, engagement campaigns are successful only when firms are substantially owned by Leaders. We also find that these firms are less at risk of experiencing negative incidents.

JEL Classifications: F39, G23, G32, G40

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1 Introduction

Environmental and social (E&S) concerns are playing an increasingly important role in discussions about the appropriate objective of firms (Hart and Zingales, 2017). As a consequence, investors, policymakers, and activists are calling for institutional investors to make the firms they invest in more sustainable.[1] Several studies show this to be the case (Dyck, Lins, Roth, and Wagner, 2019; Chen, Dong, and Lin, 2020). What is less clear, however, is *which* institutions drive this association and *how* these improvements occur. Knowing this information would allow investors looking to generate a positive societal impact to allocate assets more efficiently.

Our paper argues that not all institutional investors are made equal: A small group of investors – which we call "Leaders" – are alone responsible for the positive link between institutional ownership and firms' sustainability performance. Differently from other institutions, Leaders demonstrate a strong commitment to sustainability by taking the lead role in collaborative engagements organized by the Principles for Responsible Investing (PRI).[2]

We identify two channels through which Leaders improve firms' E&S outcomes: direct engagement and incident prevention.[3] Engagements are effective in improving the sustainability performance of firms, but only for those firms that have ex-ante a large institutional ownership stake by Leaders. These firms also exhibit a smaller likelihood of experiencing negative incidents – particularly when they already experienced incidents in the past. Therefore, having Leaders as shareholders appears instrumental in nudging firms towards more sustainable business practices.

The main contribution of our paper is to show that the positive effect of institutional

[1] See respectively Bauer, Ruof, and Smeets (2020), EU (2021), and Reuters (2019) for examples where clients, policymakers, and climate activists call for institutional investors to up sustainability commitments

[2] The PRI is the largest investor association whose aim is to improve the sustainability performance of its signatories. For the purpose of this paper, we exploit their collaborative engagement platform. We describe this in more detail in the next section of the paper.

[3] We focus on engagements because prior literature has shown them to be effective measures to change firm behavior (Dimson, Karakaş, and Li, 2015, 2021; McCahery, Sautner, and Starks, 2016). We refrain from analyzing shareholder voting since such data is only available for a small set of countries, and in many cases, is self-reported. Incidents are telling as they represent *tangible* realizations of poor E&S practices.

ownership on firms' environmental and social performance hinges on a small group of investors. In line with recent survey evidence (Krueger, Sautner, and Starks, 2020), we argue that some institutional investors are more committed to sustainability than others. This can be due to pecuniary or non-pecuniary reasons (Hartzmark and Sussman, 2019; Riedl and Smeets, 2017), clientele effects (Ceccarelli, Ramelli, and Wagner, 2021b), or a mixture of these.

Measuring the degree of investors' ambition to sustainability is challenging, because self-reported data is unreliable. Suppose institutional investors believe that it is desirable to signal a strong commitment to sustainability, but that a true commitment is costly. As a result, some institutions will have an incentive to engage in cheap talk. This is particularly likely in our setting as sustainability reporting is usually voluntary, unstandardized, and unaudited. In other words, the cost of untruthful signaling is low (Ross, 1977).

A similar consideration applies to the *revealed preferences* of investors through their portfolio holdings (Gibson, Krueger, and Mitali, 2020; Starks, Venkat, and Zhu, 2020). First, asset allocation decisions might be driven by a number of factors other than investors' commitment to sustainability. Second, keeping risk and return expectations constant, ownership of sustainable firms in itself is not costly. To identify investors that are truly committed to sustainability, we need an expensive, and thus credible, signal (Spence, 1973). Participating in collaborative engagements is such a signal of commitment because it entails significant effort and responsibility (Dimson et al., 2021).[4]

We call Leaders institutions that lead a collaborative engagements during a given year. To make sure that the signal is not a one-off, Leaders also need to support at least another collaborative engagement during a given year. In support of our definition, Leaders also stand out in other ways of responsible ownership, like filing and voting in favor of environmental and social shareholder proposals or pursuing individual firm engagements outside those organized

[4]Moreover, in line with Broccardo, Hart, and Zingales (2020) and Berk and van Binsbergen (2021), we expect "voice" to be effective in driving E&S improvements, unlike a strategy based purely on selection or exclusion

by the PRI.

We divide the remaining institutional investors into two groups: *non-Leaders* and *Conventional*. The former are institutions that do not qualify as Leaders but that still are signatories of the Principles for Responsible Investment. The latter are the remaining institutions. At the start of our sample period in 2010, we classify 26 investors as Leaders. This number gradually increases to reach 109 in the last sample year of 2019. Our definition is very persistent over time, with almost 95% of the Leaders retaining their classification year-over-year.

After having divided institutional investors into three groups along their commitment to sustainability, we want to establish their relative effect on the environmental and social performance of firms in our sample. To this end, we first obtain the holdings of global institutional investors from FactSet (Lionshares). Then, for each firm-year, we compute institutional ownership measures separately for Leaders, non-Leaders, and conventional investors. Our measure of firms' sustainability performance (E&S Consensus Scores) is an average of normalized ratings from MSCI IVA, Sustainalytics, and Refinitiv Asset4. We complement this with incident data from RepRisk.

In our first set of regressions we examine the role of Leaders in explaining the association between institutional ownership and firms' environmental and social performance. To do so, we regress E&S consensus scores on our three lagged institutional ownership variables (IO Leader, IO Non-Leader, and IO Conventional), and a set of controls and fixed effects. We find that greater ownership by Leaders is significantly associated with higher firm-level E&S scores. Ownership by other institutional investors – even PRI signatories – is not. This is striking given the small size of Leaders, which hold only 2.2% of the average company.

This finding is also economically meaningful: A one standard deviation increase in Leader ownership is associated with an increase in E-Scores (S-Scores) of 7.5 (5.8) percent of a

standard deviation.[5]

We perform a battery of robustness tests. In our main specifications, we require to have E&S scores from a minimum of two rating agencies to reduce noise (Berg, Koelbel, and Rigobon, 2021b). Our results are robust when we use both more lenient or stricter consensus scores. Moreover, the findings are consistent when we look at each rating agency individually, run the regressions separately by regions, or exclude financial institutions from the sample.

After having established a positive relationship between institutional ownership by Leaders and firms' sustainability performance, we ask *how* this association occurs. We start by examining the role of Leaders in the context of collaborative engagements organized by the PRI. These firms are targeted on specific themes related to sustainability, such as fracking or labor standards. If Leaders drive corporate sustainability, then collaborative engagements should improve the sustainability performance of targeted companies more when per-existing ownership by Leaders is high. This is exactly what we find.

We estimate our results using a difference-in-differences (DID) setting with matching. To construct a control group, we first perform exact matching on region, industry, and year. Then, we choose the control firm by nearest neighbor propensity score matching (PSM) along firm characteristics.

In the years after being engaged, targeted firms significantly improve their environmental performance but only when ownership by Leaders is high. Hence, institutional investors that are committed to sustainability play a catalyzing role in improving firms' sustainability credentials.[6]

Finally, we test the influence of Leaders in preventing environmental and social incidents

[5]The magnitude of our effect is slightly larger than that documented by Dyck et al. (2019). In their paper, a one standard deviation increase in *total* institutional ownership relates to 4.5% increase in the standardized environmental score. Expressed in standard deviation units, our effect is 6.3% (=7.5% * 0.84). This also holds for social scores.

[6]We do not find significant results for firms' social performance. This is probably driven by the limited number of collaborative engagements that focus on social issues: The firms engaged specifically on the social dimension represent only 7% of the entire population of 1,238 engaged firms.

as an alternative measure of corporate sustainability.[7] We find that ownership by Leaders is associated with a significantly lower likelihood of a firm experiencing environmental incidents. This effect becomes even more pronounced for the subset of firms that have already experienced an incident in the past. This association does not exist for ownership by other institutional investors. Moreover, after incidents occur, institutional investors who are not part of the PRI tend to divest from affected companies. Leaders on the other hand tend to remain invested, reducing endogeneity concerns.

While collaborative engagements and incident prevention constitute two ways through which Leaders affect firm-level E&S outcomes, they do not fully explain our baseline association between institutional ownership by Leaders and firms' E&S performance. Ownership by Leaders is also significantly linked to corporate sustainability for firms that were never targeted by a PRI collaborative engagement and irrespective of their incident history. Therefore, we argue that parts of the effect relates to unobservable factors such as private engagement activity and different screening practices.

Identifying investors who "walk the talk" on responsible ownership is especially important today, as more than half of institutional investors by assets publicly commit to responsible investing (Brandon, Glossner, Krueger, Matos, and Steffen, 2021). This prevalence raises questions about the credibility of these commitments and therefore recognizing the real intentions and actions of active investors becomes more critical than ever. We argue that our selection measure based on engagement allows to derive a set of investors that exhibit superior practices across the full spectrum of responsible ownership.

Our paper makes two contributions to the literature. First, we contribute to the studies of the role of institutional ownership on firm behavior (see, e.g., Edmans and Holderness (2017) for a literature overview), in particular regarding firms' sustainability performance. Dyck et al. (2019) and Chen et al. (2020) find a positive relation between institutional ownership

[7]Several papers argue that reputation-damaging incidents in the E&S domains constitute an outcome-driven and perhaps more direct indicator of corporate sustainability. Some examples include Derrien, Krueger, Landier, and Yao (2021); Gantchev, Giannetti, and Li (2021); Glossner (2021); Yang (2021).

and firms' environmental and social performance. We add to these papers by showing that only a small portion of institutional investors, the Leaders, is primarily accountable for this relation.

Our second contribution is to the stream of papers that advocate for a more nuanced understanding of the effect of institutional ownership on firm-level E&S outcomes. The two most closely related to ours in this literature are Azar, Duro, Kadach, and Ormazabal (2021) and Heath, Macciocchi, Michaely, and Ringgenberg (2021). Azar et al. (2021) explore the impact of ownership by the "Big Three" (BlackRock, Vanguard, and State Street) on firms' CO_2 emissions. Differently from their paper, we focus on the entire universe of global institutional investors. Heath et al. (2021) show that there is *no* causal link between an exogenous increase in ownership by socially responsible mutual funds and a broad range of firms' sustainability metrics. We take a different approach to demonstrate that ownership by Leaders matters. Namely, we highlight concrete instances where the presence of investors that are committed to sustainability impacts firms' outcomes: ensuring that engagements are successful and preventing incidents.

We begin our paper in Section 2 where we provide a detailed outline of our definition of Leaders and summary of their characteristics. In section 3, we describe the data we use, how we construct the sample, and our measurement choices. We discuss the link between ownership by Leaders and corporate E&S performance in Section 4. Sections 5 and 6 discuss the importance of Leaders in collaborative engagements and incident mitigation. A discussion about selection and voice is provided in Section 7 and section 8 concludes.

2 Identifying sustainability Leaders

Our definition of Leaders aims to objectively identify investors with a strong commitment toward corporate sustainability . Section 2.1 describes how we identify these investors. Section 2.2 then shows summary statistics and the geographical distribution of Leaders

compared to other institutional investors. In Section 2.3 we show that our definition is consistent with other signals of commitment towards sustainability.

2.1 Defining Leaders – The role of collaborative engagements

To identify Leaders, we rely on proprietary data from the Principles for Responsible Investment (PRI). The PRI is an UN-supported investor association that seeks to "support and empower" signatories to incorporate sustainability in their investment practices. To date, more than 4,300 investors that manage over $120 trillion are PRI signatories, representing more than half of the institutional assets under management (AUM) globally (Brandon et al., 2021). Given the extensive coverage, we argue that this grants us information about most sustainability-conscious institutional investors in the world.

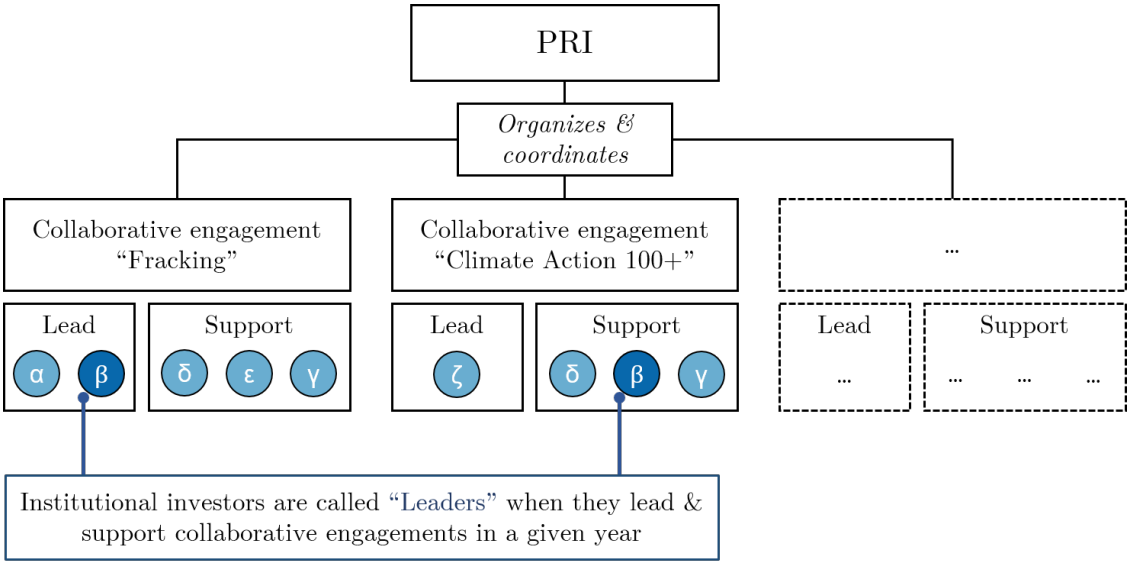
One of the main tasks of the PRI is the organization of collaborative engagements. In collaborative engagements, investors form a coalition on a specific Environmental, Social, or Governance theme and target focal companies to improve their sustainability. The PRI operates the largest platform for collaborative engagements globally, with 45 engagement campaigns in the 2007 – 2020 period. Each engagement campaign is originated and coordinated by the PRI, which selects the theme of the engagement. PRI signatories can subsequently join the engagement as leaders or supporters, where leaders bear the primary responsibility for the campaign.[8]

We use involvement in collaborative engagements as a selection criterion for Leaders, as it constitutes an objective and credible signal of commitment to sustainability. Participation in engagement campaigns is a credible signal because it is costly to investors as it requires significant resources – especially when leading the campaign (Dimson et al., 2021). Finally, we require Leaders to lead *and also support* collaborative engagements to focus on investors whose commitment is not a one-off event. Figure 1 presents a schematic illustration of our Leader definition. In this example, the institutional investor β is the only Leader, as she

[8]See Dimson et al. (2021) for a detailed study of the characters of PRI collaborative engagements

both supports and leads engagements in the respective year.

Figure 1: Leader definition
This figure provides a schematic overview of how institutional investors that qualify as Leaders are identified in the sample. This figure shows a cross-sectional snapshot of engagements that are ongoing during one year. Greek letters denote exemplary institutional investors. In this illustration, β is the only Leader.



We choose a definition based on engagement, as opposed to portfolio holdings, since recent literature has questioned the impact of approaches based on screening for the change of firms' E&S behavior (Berk and van Binsbergen, 2021; Broccardo et al., 2020). These theoretical papers argue that a strategy based on "voice" will be more effective than one based on "exit". Moreover, the choice of which firms to hold is very complex and driven by several factors. Disentangling commitment from, e.g., risk-return considerations is very challenging. Furthermore, we refrain from using voting in shareholder meetings as data on a global level is not available.[9]

[9]Proxy Insights provides voting information for a sample of international institutional investors. However, in most countries outside of the US, disclosing voting record is voluntary. Thus, using such data in our classification of Leaders would introduce selection bias.

2.2 Who are the Leaders?

Figure 2 below shows how the group of Leaders evolved over time. In the first quarter of the sample, about 25 institutional investors qualify as Leaders and this number grows to more than 105 in the last quarter. In 2019, Leaders held a combined $3.5 trillion in listed equity AUM, 15.1% of the total equities held by PRI signatories.

Most Leaders come from Europe or North America. Investors from other geographies rarely qualify as Leaders. Over the 2009 – 2019 sample period, the number of Leaders and their AUM has steeply increased, consistent with the growing prevalence of coordinated ESG engagement activity. Still, as shown by Panel (c) of Figure 2, the average firm-level equity ownership by Leaders is only 2.2%, slightly increasing to 2.9% in 2019.

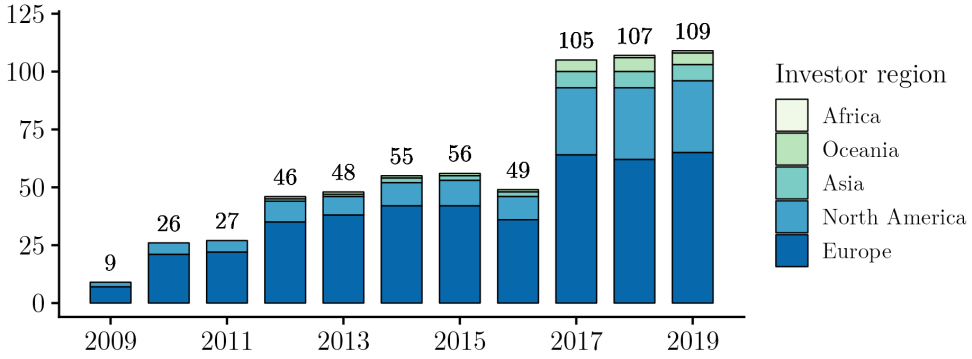
Table 1 shows summary statistics for institutional investors that are PRI signatories, separately by Leaders and non-Leaders. Compared to other PRI signatories, Leaders are smaller on average. However, median AUM is *larger*, pointing out that the largest institutional investors rarely qualify for our Leaders definition. This is consistent with large investors engaging firms individually. The average Leader joined the PRI in 2009, two years earlier than other signatories. Similar to other PRI signatories, 82% of Leaders are investment managers, while the remaining are asset owners[10].

In Appendix Table A3, we show that our Leader's definition is consistent over time. In most years, more than 90% of Leaders retain their Leader classification also in the following year.

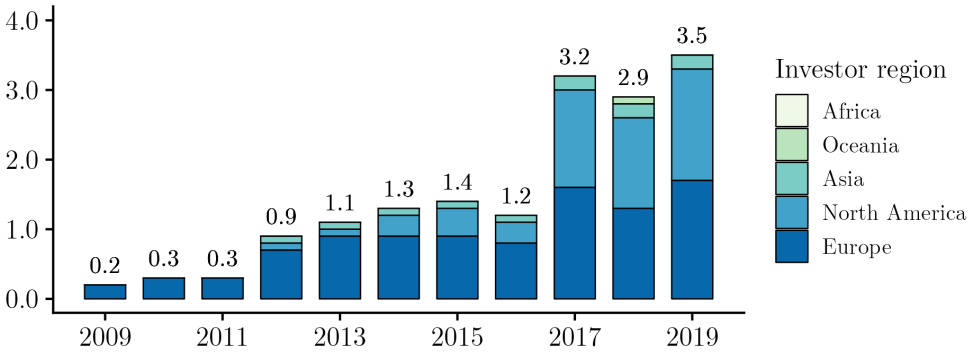
[10]Besides asset owners and investment managers, also service providers like rating agencies or firms offering proxy voting services can join the PRI. We do not use these firms since they do not manage assets by themselves

Figure 2: Prevalence of Leaders over time

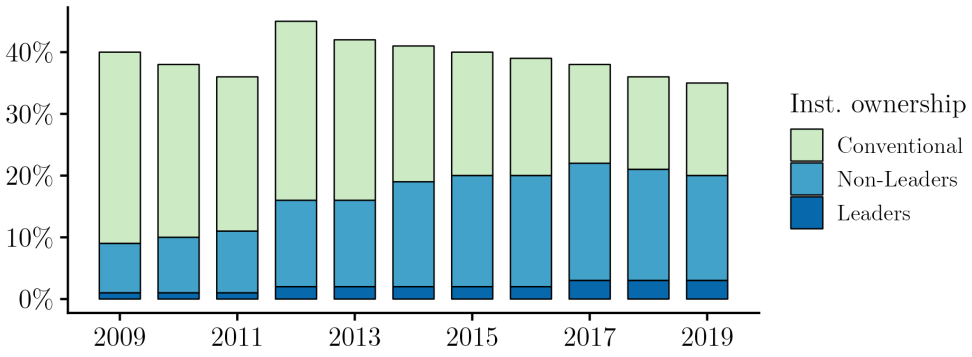
This figure illustrates how the sample of institutional investors that qualify as Leaders evolves over time. Panels (a) and (b) summarize respectively the number of PRI Leaders and their size measured by the total listed equity AUM. Panel (c) shows average institutional ownership of firms in our sample by year and investor group. Institutional ownership in figures (b) and (c) is calculated based on FactSet Ownership. Non-Leaders denote PRI signatories that do not qualify as Leaders. Conventional institutions are those that are not PRI signatories. Institutional ownership variables are defined in Appendix Table A1.



(a) Number of Leaders by year and investor region



(b) AUM of Leaders by year and investor region (in $ trillion)



(c) Average institutional ownership breakdown by year

We observe a significant spike in the number of Leaders in the years 2017 to 2019. This coincides with the largest collaborative engagement in our sample, "Climate Action 100+" (FT, 2017). We argue that – given its size – participating in this engagement is cheaper to the marginal investor, similar to a decreasing cost of monitoring with increasing stake size (Shleifer and Vishny, 1986). We make use of this feature in a later section of the paper.[11]

– Table 1 –

2.3 Validating the Leaders definition

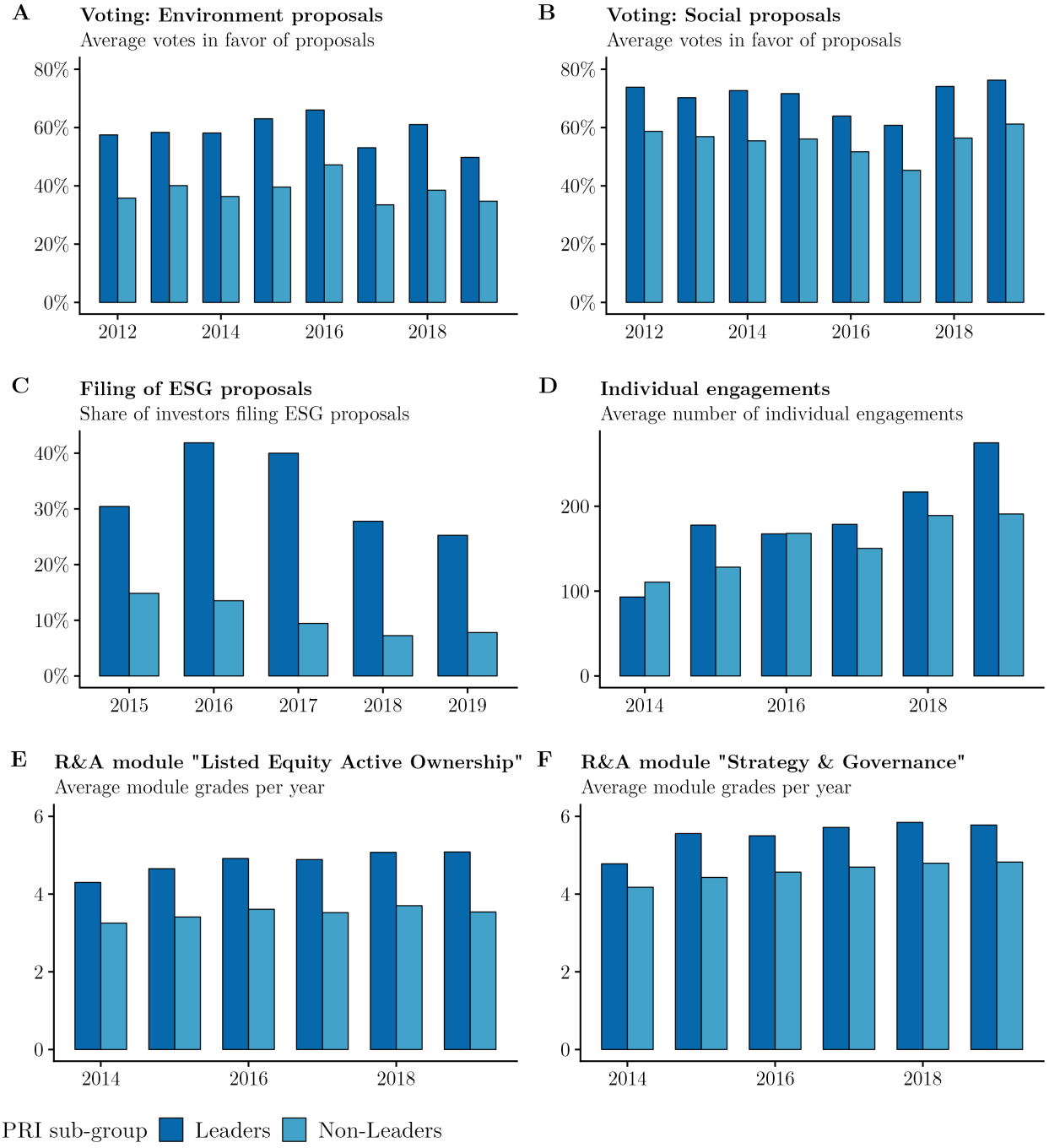
While we rely on collaborative engagements to identify the Leaders, these investors also stand out in other aspects of responsible ownership. Figure 3 below compares different ownership practices for Leaders and other PRI signatories. We show only years where we have at least 20 observations available per subgroup.

Using Proxy Insights data, we summarize investors' voting behavior in Panels A and B. Leaders are more likely to support environmental and social shareholder proposals in all sample periods. Moreover, according to the annual reporting & assessment (R&A) framework sent out by the PRI,[12] Leaders self-report a three times higher likelihood of filing shareholder proposals, and also engage with a higher number of firms individually (Panels C and D). Based on investors' responses, the PRI also awards scores on how committed institutions are to sustainability. Signatories can receive scores ranging from A+ (6) to E (1). As Panels E and F illustrate, Leaders consistently outperform other signatories, both in the "Listed Equity Active Ownership" and "Strategy & Governance" modules.

[11] Note that after Climate Action 100+, our marginal Leader changes. Beforehand, some institutions were on the margin of joining a collaborative engagement, but arguably did not do so due to high costs. Since in the Climate Action 100+ campaign engagement costs are spread over a greater pool of participants, the marginal investors more likely choose to engage.

[12] PRI signatories have to fill out a yearly survey describing their sustainable investing practices. This survey covers several modules, each relating to a specific asset class and investing practice. The PRI then gives investors scores as a function of the answers to the survey. For a more detailed description of the Reporting & Assessment framework, see Brandon et al. (2021) and Ceccarelli, Glossner, and Homanen (2021a).

Figure 3: Summary of ownership practices: Leaders & other PRI signatories
This figure illustrates ownership practices of Leaders and other PRI signatories during the sample period. Data for Panels A and B comes from Proxy Insights; data for Panels C-F comes from the PRI Reporting & Assessment (R&A) framework and is self-reported. R&A grades are calculated by the PRI and express the performance of a signatory in the respective dimension. Higher grades express better performance. The figures show only years where at least 20 observations are available per Leader/non-Leader subgroup.



Finally, we also compare our list of Leaders with a third-party approach to identifying investors with a high commitment to corporate sustainability. In May 2021, the Morningstar ESG Commitment Level report (Morningstar, 2021) rated asset managers based on a qualitative analyst assessment.[13] All five of the top-rated equity asset managers by Morningstar are also Leaders, while most of the asset managers rated "low" are neither Leaders nor PRI signatories.

Overall, we argue that our Leaders' definition is sound: First, it identifies institutions that perform well across a broad spectrum of ownership practices, and second, it is in line with alternative approaches to identifying E&S-conscious investors.

3 Data

We start this section with an exposition of data sources and sample composition. Section 3.2 shows how the main variable of interest, the environmental and social consensus scores, are computed and what controls we include in the main analyses.

3.1 Data sources and sample construction

We start our sample construction with the universe of public firms covered by at least one of the ESG rating providers Sustainalytics, MSCI IVA, and Refinitiv Asset4[14]. All three rating agencies regularly assess the environmental and social performance of a large number of international firms. When an agency provides more than one firm rating per year, we keep the most recent one.

We obtain data on institutional ownership from the FactSet Ownership database (formerly LionShares). FactSet collects institutional ownership data worldwide from different public sources, including institutional filings, investor reports, and press releases. Data is at an institutional investor-firm-year level, which allows us to calculate ownership stakes

[13]Morningstar is a large information provider for mutual fund investors. See for instance Chen, Cohen, and Gurun (2021) for an illustrative discussion.

[14]Scores for Refinitiv Asset4 are as of March 23, 2021. The date of retrieval is relevant, as Refinitiv has a history of retrospectively adjusting its firm ratings (Berg, Fabisik, and Sautner, 2021a).

separately for different groups of investors. FactSet has been widely used in previous studies (Ferreira and Matos, 2008; Bena, Ferreira, Matos, and Pires, 2017). We complement this with data on company fundamentals from FactSet Fundamentals and data on environmental and social incidents from RepRisk.[15].

Data on collaborative engagements is provided directly by the PRI. This covers all campaigns that occur between 2009 and 2019. For these campaigns, we know the institution(s) that took the role of leader or supporter, the set of targeted firms, the ESG dimensions that the campaigns seek to improve, and their respective duration.

To be included in our firm sample, we require non-missing institutional ownership and company fundamentals, as well as E&S scores from at least one rating agency. The resulting dataset consists of 67,043 firm-years from 11,352 companies between 2009 and 2019. We choose 2009 as the start of our sample as it is the first time investors could lead a collaborative engagement and, consequently, qualify as Leaders.

3.2 Measurement choices and descriptive statistics

We measure the sustainability performance of firms through E&S scores from three leading ESG rating agencies: Sustainalytics, MSCI IVA, and Refinitiv Asset4. Prior literature has documented a substantial disagreement between E&S ratings across agencies (Berg et al., 2021b; Brandon, Krueger, Riand, and Schmidt, 2019) and highlighted the importance of using a *combination* of several E&S scores (Berg, Kölbel, Pavlova, and Rigobon, 2021c).

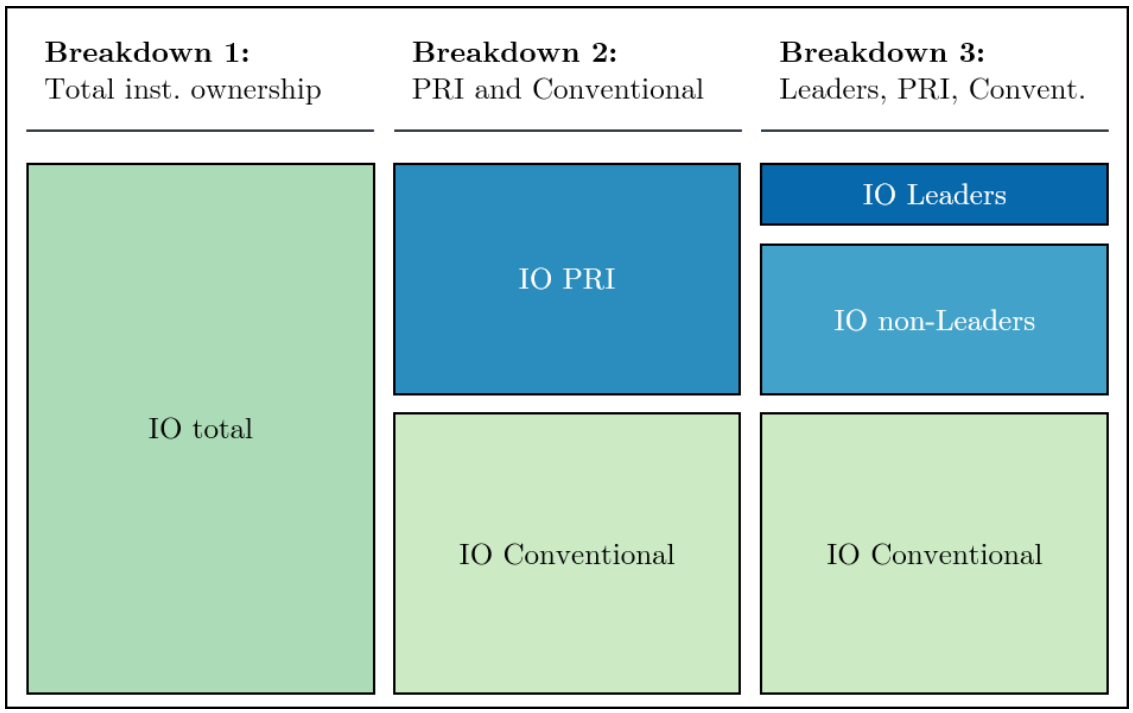
To mitigate the noise induced by this disagreement, we follow Brandon et al. (2021) and compute average E&S scores for all firm-years in our sample. As rating agencies use different rating scales, we normalize E&S scores per agency every year to a mean of zero and unit variance. We compute the average of all available E&S scores per firm-year in our sample and denote the resulting ratings *consensus scores*. Consensus scores are the primary dependent

[15]RepRisk is a data provider that identifies ESG incident news by continuously screening more than 100,000 public sources. Identified incidents are reviewed and categorized in a multi-step process and linked to affected companies. See section 5.1 for a more detailed description of RepRisk.

variables of this study. E-Score and S-Score refer to environmental and social performance, respectively. Similar to consensus earning forecasts, we argue that consensus scores represent the market view on corporate sustainability and are more reliable than individual ratings. If not stated otherwise, we require consensus scores based on at least two agency ratings per firm-year.

We use the FactSet Ownership database to construct variables of institutional ownership. We distinguish between three institutional ownership breakdowns with an increasing degree of granularity. Figure 4 presents a schematic illustration of the ownership breakdowns.

Figure 4: Schematic breakdown of used institutional ownership variables
This figure provides a schematic overview of the institutional ownership variables used in this study. Breakdown 1 only accounts for total institutional ownership (IO total). Breakdown 2 explicitly accounts for ownership by PRI signatories (IO PRI). Breakdown 3 breakes down PRI ownership further to distinguish between Leaders (IO Leaders) and other PRI signatories (IO non-Leaders). All variables are defined in Appendix Table A1.



Breakdown 1 only accounts for total institutional ownership, while breakdown 2 differentiates between holdings by PRI signatories and conventional investors. Breakdown 3 is the most granular as it divides PRI signatories further into Leaders and non-Leaders. All three breakdowns collectively add up to total institutional ownership, and all variables of one breakdown are mutually exclusive. Breakdown 3 is the one used most frequently.

To measure ownership, we merge the list of 3,439 PRI signatories to FactSet. We obtain matches for 756 signatories. The low match rate stems from the high share of PRI signatories with no substantial equity holdings that are not covered in FactSet. We record equity positions as *IO PRI* when held either by a PRI signatory or an institution whose ultimate parent is a signatory. Similarly, we record equity positions as *IO Leader* when held by a PRI signatory who qualifies as Leader or whose ultimate parent is a Leader.[16]

Our empirical analyses include a vector of firm-level control variables that could influence firms' sustainability performance or shareholder structure. *Log Assets* is the natural logarithm of total assets in millions of US dollars. The variable controls for the size of business activity and external pressures over environmental and social behavior. *PPE* denotes property, plant, and equipment divided by total assets; *Leverage* represents total debt divided by total assets. PPE and Leverage measure corporate credit constraints and discretion to invest in environmental and social initiatives. *Tobin's q* is defined as total assets and market value of equity subtracted by the book value of equity, scaled by total assets. *Profitability* is EBITDA divided by total assets. Both variables capture past company performance, which could affect firms' investment into E&S. Detailed variable definitions are in Appendix Table A1. All continuous variables are winsorized at the 1^{st} and 99^{th} percentiles to mitigate the effect of outliers.

– Table 2 –

Table 2 presents descriptive statistics for the firm-level variables used in our analyses.

[16]This definition implies that PRI signatories inherit their signatory status to subsidiaries. In a few instances, both the institution and its ultimate parent have signed the PRI separately. In these cases, the institution's own status applies, and the parent does not inherit the Leader status to its subsidiary.

Average institutional ownership by Leaders is small at 2.2%, with a standard deviation of 2.9%. PRI signatories (including Leaders) hold 18.0% of the average firm, while the total average institutional ownership is 38.8%. This is in line with Bena et al. (2017) and Ferreira and Matos (2008).

Consensus scores are, on average, based on ratings from two providers. The table also documents a substantial variety of firm size, leverage, market valuation, and profitability. Appendix Table A2 shows the correlations between the variables in our main sample. E/S-Scores are positively correlated with size, profitability, and leverage.

– Table 3 –

Table 3 summarizes the geographical distribution of the firm sample. 32.1% of all observations come from firms headquartered in the United States, followed by Japan and the United Kingdom. Ownership by Leaders varies substantially across regions. It is highest in the United Kingdom and Scandinavian countries. Ownership by Leaders is relatively small in Asian countries, such as China, India, and Japan. Institutional ownership by investors other than Leaders is distributed similarly across geographies.

4 Ownership by Leaders and corporate E&S performance

This section starts with testing the empirical relationship between institutional ownership and firms' environmental and social performance. Section 4.1 shows that there is a positive relationship between the two, but that it is driven by ownership of the sustainability Leaders. Next, we show how this relationship is stronger for firms headquartered in countries with low environmental and social values (Section 4.2). Section 4.3 highlights the robustness of this finding by ruling out several alternative explanations.

4.1 Baseline results

To study the relationship between firms' environmental and social performance and institutional ownership we run the following regression:

$$E\&S\ Score_{it} = \alpha + \beta' IO^{\theta}_{it-1} + \gamma' X_{it-1} + \delta_t + \phi_i + \varepsilon_{it} \tag{1}$$

IO^{θ}_{it-1} are the institutional ownership variables for form i in year $t-1$. θ denotes the different ownership breakdowns, as outlined in Section 3.2. X_{it-1} is a vector of time-varying firm controls, including size, leverage, capital intensity, growth opportunities, and profitability. Independent variables are lagged by one year to avoid simultaneity bias. δ_t are time fixed effects and ϕ_i denotes country and industry fixed effects.[17] ε_{it} is the error term. We follow Bena et al. (2017) and and cluster standard errors at the country level[18]. In robustness analyses, we ensure that the significance of our results does not hinge on the clustering choice.

– Table 4 –

Table 4 shows our baseline regression results. We start our analyses with models (1) and (2), which show a positive, albeit insignificant, correlation between firms' total institutional ownership and environmental scores. For social scores, this relationship is positive and significant.[19] To obtain a more granular view on institutional ownership, in models (3) and (4) we differentiate between PRI signatories (*IO PRI*) and other institutional investors (*IO Conventional*). The regression coefficients show a positive relationship between sharehold-

[17] Industry fixed effects are based on SIC industries. We refrain from using firm-fixed effects to ensure sufficient variation in our variables of interest and avoid over-fitting. The empirical model is in line with other papers studying E&S ratings, e.g., Dyck et al. (2019).

[18] We refrain from additionally clustering along the time dimension, since our panel is relatively short and we would not have enough clusters (Abadie, Athey, Imbens, and Wooldridge, 2017).

[19] At first sight this result contradicts Chen et al. (2020) and Dyck et al. (2019). First, our sample period is different. Second, these papers use E&S scores from Refinitiv Asset4. The methodology used to compute these scores was recently changed and the updated scores were back-filled (Berg et al., 2021a). Instead of relying only on one rating agency, we follow the advice of (Berg et al., 2021c) and aggregate scores from several providers.

ings by PRI signatories and firms' E&S performance, each significant at the 1% level. For conventional investors, both coefficients are small and insignificant.

In the last two models, we single out ownership by Leaders, institutional owners that demonstrate a strong signal of commitment to sustainability through their active role in collaborative engagements. We expect Leaders to drive the positive association between institutional ownership and corporate sustainability. Models (5) and (6) confirm this conjecture: After accounting for IO Leaders explicitly, there is no significant link between E-Scores and other institutional ownership groups, not even for PRI signatories (*IO non-Leaders*). This is striking, as Leaders own only 2.2% of the average sample firm, a small portion of the total institutional ownership (on average 38.8%). There is a small and marginally significant residual effect of ownership by non-Leaders on firms' S-Scores.[20]

The association between ownership by Leaders and environmental and social performance is also economically meaningful: A one standard deviation increase in IO Leader correlates to an increase in E-Scores (S-Scores) of 5.3% of a standard deviation (4.9% of a standard deviation).

Climate Action 100 +

It seems that Leaders are driving the relationship between firm-level sustainability and institutional ownership, supporting the soundness of our identification mechanism based on participating in collaborative engagements. We argued that this participation is a credible signal as it entails substantial costs to the investors. However, these costs are inversely proportional to the size of the engagement. Keeping overall engagement costs constant, an increase in the pool of participating institutional investors will bring down the costs for the marginal institutional investors (Edmans and Holderness, 2017). We exploit the "Climate Action 100+" collaborative engagement as a shock to the size and thus the cost of being a Leader.

[20]This relationship is not robust to using alternative consensus scores or fixed effects and – as shown in Appendix Table A6 – mainly driven by Asian firms.

Climate Action 100+ (CA 100+) is the "largest ever global investor initiative" (Clima Action 100+, 2021). We, therefore, argue that participation should be relatively less expensive to the marginal investor, compared to other collaborative engagement campaigns. Thus, we assume that the average commitment strength within the Leaders group will decline after 2017, the first year of the CA 100+ campaign. Table 5 tests this hypothesis by interacting the institutional ownership variables with a dummy for the period after 2017, *Post 2017*.

– Table 5 –

We find a strong negative interaction effect between the Post 2017 dummy and ownership by both Leaders and non-Leaders. This is consistent with a reduction in the average sustainability commitment within the Leaders group after the start of the CA 100+ campaign. Moreover, there is positive effect of non-Leaders on E&S performance, but only in the period before 2017. This is expected, as a substantial portion of relatively committed PRI signatories became Leaders after 2017 and exited the non-Leaders subgroup. Overall, the analysis underlines the soundness of the Leaders definition.

4.2 Geographical heterogeneity

Leaders should have a stronger impact on firms' sustainability performance where social norms are weak, since these firms have a larger improvement potential. We are able to test this as our sample has a rich geographical heterogeneity.

We begin by splitting firms headquartered in countries with low or high environmental and social values. To this end, we use data from the World Value survey, which measures social norms across countries. Higher index values indicate stronger values and beliefs regarding sustainability.[21]

[21] Data from the World Value Survey has been used extensively in the literature, e.g., by La Porta, Lopez-de Silanes, Shleifer, and Vishny (1997) and Guiso, Sapienza, and Zingales (2003). We follow Dyck et al. (2019) in the choice of questions from the survey and how they are aggregated. Countries belong to the low (high) E&S group when their index values of social E&S norms are below (above) the median across countries.

Table 6 shows results of our baseline specification separately for firms headquartered in countries with low or high E&S values. Our hypothesis is confirmed: The effect of a standard deviation increase in ownership by Leaders is about 50% stronger in firms from low E&S values countries than in those from countries with high values[22].

– Table 6 –

4.3 Robustness tests

The previous section documented a positive association between institutional ownership and firms' environmental and social performance, which is solely driven by the small group of Leaders. This section rules out several alternative explanations of our findings.

In the main tests, we measure E&S performance with consensus scores based on a minimum of two rating agencies. To ensure that this measure is neither too lenient nor too strict, we re-run our main specification only with firms that are covered respectively by all three or by a minimum of one rating agency (Appendix Table A4). In both cases, our findings remain unchanged. In a similar vein, it could be that our results are driven by a single rating agency and that – since we have only data from three raters – aggregating them will not remove this bias. In Appendix Table A5 we confirm that this is not the case: Our results hold irrespective of the E&S score provider used. Moreover, we report results separately for the full sample and for the sub-sample of firms that is covered by all rating agencies. We confirm that our results are not driven by rating agencies choosing to cover specific firms.

It could be that our effect is concentrated only in firms headquartered in certain countries. To test whether this is the case, we run our tests separately by regions in Appendix Table A6.

[22]The standard deviation of IO Leaders in the low E&S values sample is slightly smaller than in the high E&S values sample (2.1% vs. 3.1%)

We do not observe significant differences in our effect across geographies.[23]

Another concern might be that, given their special structure, financial services firms can bias our estimations. We exclude these firms from our sample in Appendix Table A7 and find unchanged results. While we account for industry fixed effects, it could be that the relationship between industry and E&S Scores changes over the course of our sample period or that our definition of industry (SIC Industry Divisions) might be too broad. We account for these possibilities in Appendix Table A8, where we first add industry-times-year fixed effects and second, use a stricter definition of industry. In both cases, the results remain unchanged.

We perform a final robustness test, by looking at the relationship between changes in institutional ownership and changes in E&S performance. Doing this is important since firms might need more than one year to improve their sustainability credentials. Appendix Table A9 shows that this is indeed is the case: The effect of institutional ownership by Leaders gradually increases over time as we move from changes over one year to those occurring over four years. Moreover, changes in none of the other institutional ownership variables are significantly correlated to the E&S scores of firms.

We also verify that our results do not hinge on the choice of standard error clustering. Appendix Table A10 reports standard errors clustered by (1) firm, (2) industry, and (3) two-dimensionally by country and year. Our results are robust across specifications.

Overall, these tests underscore our main results. The small group of Leaders drives firm-level E&S performance, and this link holds for different consensus score definitions, E&S rating providers, headquarter regions, fixed effects, and regression specifications.

[23]For firms headquartered in Asia, there is also a positive effect of ownership by non-Leaders on E&S performance. First of all, since investors have a home bias (Chan, Covrig, and Ng, 2005), we expect institutional owners from Asia to tilt their portfolio towards Asian firms. Since most of the collaborative engagements we use to identify Leaders are lead by European and North American investors, Leaders will be underrepresented in Asia. This could due to Asian investors being less committed to sustainability altogether, in which case, we should see a smaller effect of overall institutional ownership in Asia. Alternatively, their level of commitment might be similar, but cultural differences make participating in collaborative engagements more expensive for such investors. This seems to be the case, since there is a spillover of our main effect from Leaders to non-Leaders in the sub-sample of Asian firms.

5 Leaders and collaborative engagements

Section 4 established a positive relationship between institutional ownership by Leaders and firms' sustainability performance. This section examines how this link materializes by focusing on a channel that could plausibly drive environmental and social firm outcomes: collaborative engagements organized by the PRI. These engagements target firms on specific sustainability-related themes, like fracking or labor standards. If Leaders drive corporate sustainability, then collaborative engagements should affect targeted companies more when ownership by Leaders is high. We start this section with a description of the collaborative engagements (Section 5.1) and empirical method (Section 5.2). We present graphical evidence that engagements drive improvements in sustainability in Section 5.3 and formalize this in a difference-in-differences setup in Section 5.4.

5.1 PRI collaborative engagements

Collaborative engagements are investor initiatives that aim to improve corporate sustainability through a targeted dialogue with firms' management. These engagements differ from traditional shareholder activism (Brav, 2009) in two ways: First, collaborative engagements focus on outcomes related to sustainability instead of seeking to improve financial performance. Second, they are a coordinated action between many shareholders (Brav, Dasgupta, and Mathews, 2021).

We analyze engagements organized by the PRI Collaboration Platform, the largest collaborative engagement forum globally, with 45 engagement campaigns in the 2007 – 2020 period (PRI, 2021). The PRI originates each engagement campaign and selects the theme, such as fracking or employee relations. Subsequently, PRI signatories can join the engagement as leaders or supporters, where the former entails a substantially higher involvement. Engagements require significant commitment and resources: Investors typically contribute with topic-specific research, letters to management, the filing of shareholder proposals, or

in-person meetings with target companies.[24]

Collaborative engagements are a compelling research setting for our channel test. First, they offer a clear-cut event around which we would expect to see improvements in the sustainability performance of firms. Second, since engagement themes are set by the PRI, the choice of which firms to engage does not primarily lie with institutional investors, alleviating selection concerns. Third, our empirical setup allows us to gauge the importance of having a strong institutional ownership base by Leaders, conditional on being targeted. In other words, we are not interested in showing that engagements are successful in improving E&S outcomes (Dimson et al., 2015). Instead we ask whether engagements are successful *conditional* on the presence of Leaders.

– Table 7 –

Table 7 lists the 22 PRI collaborative engagements in our analyses, including start years, the number of targeted firms, and focal E&S dimensions. The sample spans the 2011 – 2017 period and accounts for engagements focusing on environmental (E), social (S), or both dimensions.[25] The table also shows that there is large variation in he number of targeted firms. The median campaign in our sample has a duration of 2 years and targets 39 companies.

[24] We refer to Dimson et al. (2021) for a detailed description of collaborative engagements.

[25] The PRI assigns campaigns to the E and S sub-dimension. The sample period is shorter than in Section 4 (2009 – 2019), since our empirical setup requires at least two years of of pre- and post-engagement periods.

Figure 5: Firms targeted by PRI collaborative engagements over time
This figure illustrates the number firms targeted by PRI collaborative engagements by year, separately by environmental (E) and social (S) dimension. Firms targeted by several campaigns in a given year are counted only once per dimension. Targeted firms are counted in every year in which the engagement is ongoing. Only firms which could be matched to FactSet are counted.

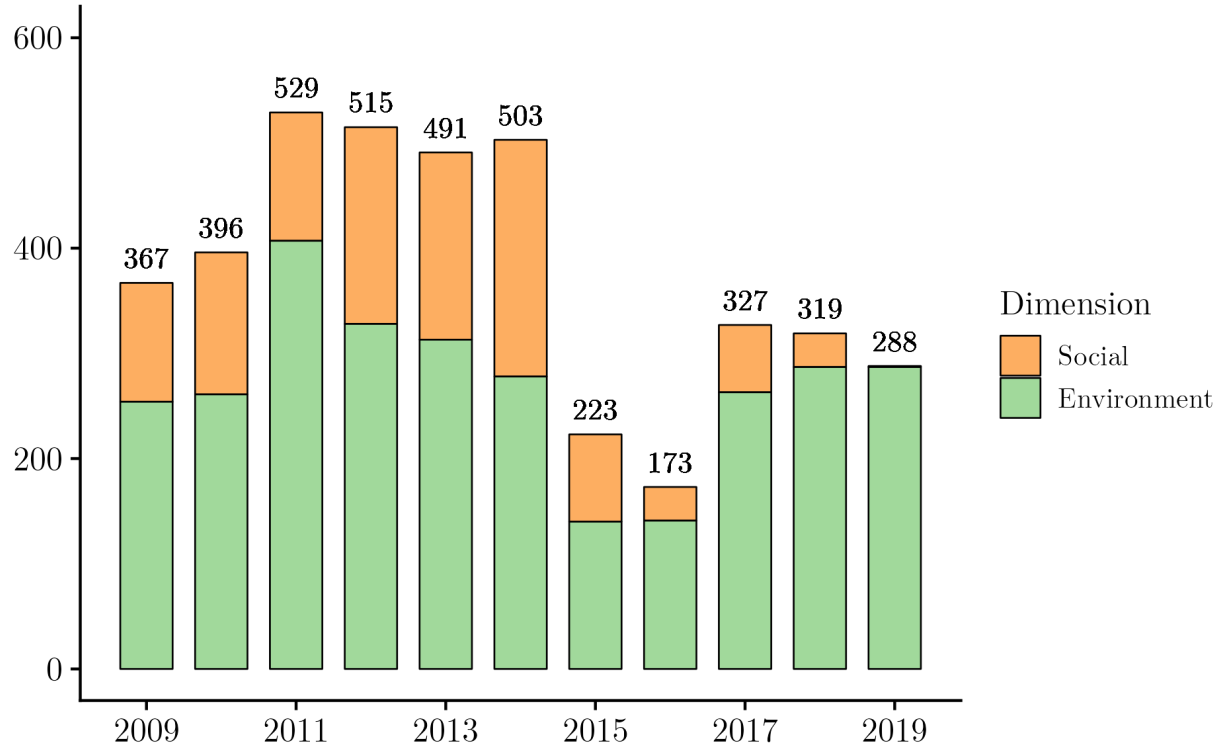


Figure 5 shows the yearly number of targeted firms by PRI collaborative engagements in our sample. We state annual numbers for E&S dimensions separately, where we count a firm only once when targeted by more than one campaign of the same dimension. The yearly number of targeted firms ranges from 173 firms in 2016 to 529 firms in 2011. There are substantially more observations for environmental than for social engagements: Firms explicitly engaged on the social dimension represent only 7% of the entire population of 1,238 targeted firms. The low number of social engagements also translates into a very small social

dimension sub-sample in our empirical tests. Therefore, for the remainder of this section, we will focus exclusively on firms engaged on environmental themes.

5.2 Empirical setting

We are interested in measuring the incremental impact of ownership by Leaders on the efficacy of collaborative engagement campains. However, since being targeted by an engagement campaigns is unlikely to be random, we need to build a control group with similar characteristics to the group of engaged companies. Treated firms are targeted by one or more collaborative engagements, have non-missing E-Scores over the entire event period, and have not been targeted by collaborative engagements in the past. Eligible control firms are also never targeted by collaborative engagements and must have non-missing E-Scores for the entire event period. From the set of eligible control firms, we choose the nearest neighbor – within industry, year, and region – on total assets, profitability, Tobin's q, PPE, and Leverage based on propensity score matching (Rosenbaum and Rubin, 1983)[26]. All matching variables are measured one year before the engagement starts. We can match 105 out of 329 treated firms. The loss of observations occurs due to the limited availability of E-Scores for entire event periods and a lack of suitable matches for some treated firms.

Appendix Table A11 reports the means of matching covariates in the treatment and control samples, together with a test for differences. After matching, treatment and control firms are indistinguishable along observables.

5.3 Graphical evidence

Figure 6 plots environmental firm performance around collaborative engagements. The event period ranges from two years before to three years after the launch of the campaign. Engagements start in year 0, the first period in which we consider targeted firms as treated.

[26]We define industries based on SIC Industry Sectors. We group countries into North America, Latin America, Europe, Asia, Oceania, and Africa. We apply a caliper of 0.1 to improve matching quality (Cochran and Rubin, 1973). We match without replacement.

Consensus E-Scores are expressed in differences to the first year before treatment.[27] The consensus scores used in this sections require only one or more firm ratings. We use a lenient version of consensus scores to ensure a sufficient sample size.

In line with Dimson et al. (2015), we expect to find a positive effect of engagement campaigns on firms' E-Scores. Panel 6a plots average E-Scores of treated and control firms in the event period. The figure shows comparable development of environmental performance for both subgroups. Whereas treated firms have higher E-Scores overall, the difference to control firms is small and begins to increase only three years after the end of an engagement.

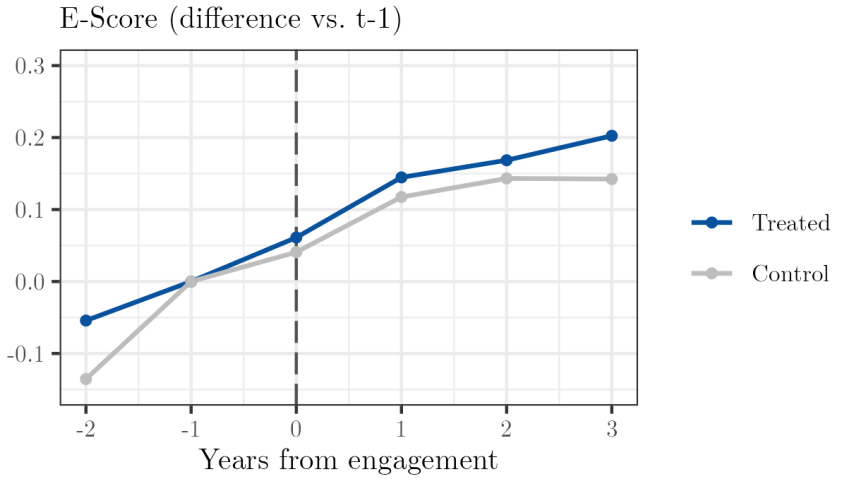
On aggregate, the graph suggests PRI collaborative engagements have moderate effects on environmental firm performance, as measured in E-Scores. One reason for this could be that, in order to be effective, engagements require that the targeted firm has a substantial ownership by Leaders.

Panel 6b shows only treated companies, separated into subgroups with high or low ownership by Leaders.[28] The visual evidence is compelling: Targeted companies substantially improve their environmental performance in response to collaborative engagements, but only when ownership by Leaders is high. As a falsification test, Appendix Figure 7 also plots E-Scores of control firms separately for high and low ownership by Leaders. There is no meaningful divergence in either of the two sub-groups after the start of the engagement.

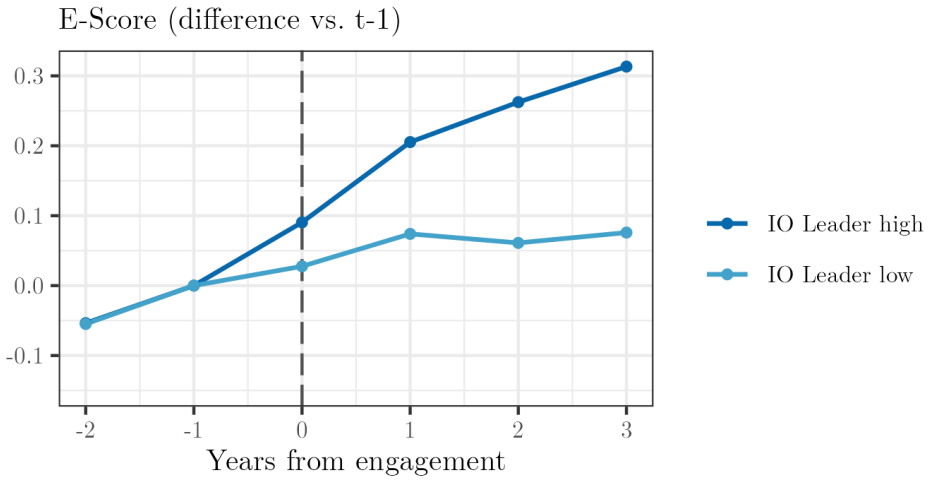
[27] Suppose a firm has an absolute E-Scores of 0.7 one year before treatment which increases to 1.3 two years after treatment. In t=-1, the relative score will be 0.0 (0.7 - 0.7) and in t+2 it will be 0.6 (1.3 - 0.7).

[28] Indicators for high and low Leader ownership are computed as follows. First, we calculate average IO Leaders for each calendar year over all sample firms. Second, we compute demeaned ownership values for firms that are engaged and average this over our DID sample. This step makes sure that we are classifying assessing the level of institutional ownership within the firms that are targeted by engagements. In the third and final step we split the firms in the DID sample into two groups along the median IO Leader

Figure 6: Environmental performance around PRI collaborative engagements
This figure summarizes environmental firm performance around environmental collaborative engagements. The plots report average consensus E-Scores, expressed in differences to the first year before the engagement starts (year -1). The sample period spans from two years before to three years after the start of the engagement. Year 0 is the year in which the respective engagement starts. In Panel (a), treated firms are companies targeted by a collaborative engagement while control firms are never targeted, but have similar firm characteristics. Panel (b) only shows firms that are targeted, separately for those with below- and above-median ownership by Leaders ("IO Leader low" and "IO Leader high"). The sample consists of 205 individual firms in the 2009 - 2017 period.



(a) E-Scores around engagements for treatment/control firms



(b) E-Scores around engagements for treated firms with high/low IO Leaders

5.4 Empirical tests

To test formally if firms targeted by PRI collaborative engagements improve their environmental performance when ownership by Leaders is high, we run the following interacted DID regression:

$$\begin{aligned} \textit{E-Score}_{i\tau} = \alpha + \beta_1\, \textit{Treated}_i \times \textit{Post}_\tau \times \textit{IO Leaders}_{i\tau-1} + \\ \beta_2\, \textit{Treated}_i \times \textit{Post}_\tau + \beta_3 \textit{Treated}_\tau \times \textit{IO Leaders}_{i\tau-1} + \\ \beta_4\, \textit{Post}_\tau \times \textit{IO Leaders}_{i\tau-1} + \beta_5\, \textit{IO Leaders}_{i\tau-1} + \beta_6\, \textit{Post}_\tau + \\ \gamma'\, X_{i\tau-1} + \zeta_i + \delta_t + \varepsilon_{i\tau} \end{aligned} \tag{2}$$

$\textit{E-Score}_{i\tau}$ is the environmental score of firm i, τ years from treatment. β_1 is the main coefficient of interest. It captures the effect of IO Leaders on E-Scores for engaged firms in periods following the launch of engagements. To ease interpretation, we demean IO Leaders. If Leaders drive the success of engagement campaigns, we expect β_1 to be positive and significant. This coefficient captures the efficacy boost in engagements of having higher ownership by Leaders. β_2 on the other hand, captures the average effect of being targeted in the post treatment period, for firms with average ownership by Leaders. We expect this to be insignificant or weakly positive. $\textit{Treated}_i$ is an indicator variable equal to 1 when firm i is targeted by a collaborative engagement, and 0 otherwise. $\textit{Post}_\tau$ is an indicator variable equal to 1 for the years after the engagement starts and 0 for all prior periods. $\textit{IO Leaders}_{i\tau-1}$ denotes institutional ownership by Leaders, and $X_{i\tau-1}$ are the same time-varying firm controls used in our main specification in Section 4.1. ζ_i represents firm fixed effects while δ_t denotes year fixed effects for calendar year t. $\varepsilon_{i\tau}$ is the error term clustered at the firm level. We include firm fixed effects in this specification since we are interested in the firm-level *change* that the engagement event causes in a firms' environmental performance.

– Table 8 –

Table 8 shows the estimation results for different event windows around the year when

engagements start: [-1,+2], [-1,+3], and [-2,+3]. The coefficient of the DID interaction term is positive and significant in each of the three models. Treated firms have significantly higher environmental scores in the years following the engagement, conditional on institutional ownership by Leaders being high. The association is economically meaningful: For engaged firms, a one standard deviation increase in ownership by Leaders is associated with 0.097 higher E-Scores, 11.6% of a standard deviation.[29] The association is more than twice as pronounced compared to the baseline regressions in Section 4.1. Economic magnitudes are similar for models 2 and 3.

While ownership by Leaders has a strong positive impact on the efficacy of engagements, this is not the case for the other types of institutional investors. None of the other interactions with institutional ownership by non-Leaders and Conventional investors are significant. This highlights the importance of treating institutional ownership in a differentiated manner.

One concern of our empirical setup is that Leaders might hold firms that they expect to improve when targeted. While we cannot control for expectations, we include ownership by Leaders in our set of matching covariates in Appendix Table A12. A second concern might be that the engagement itself is changing the relationship between our set our firm-level controls and the environmental scores. We account for this in Appendix Table A13 by running a fully interacted model. A third concern is that we are not explicitly accounting for institutional ownership by other investors (non-Leaders and Conventional). Appendix Table A14 includes the other two types of institutional ownership variables and their interactions with the Post and Treated dummies. In all cases, our results remain virtually unchanged.

Overall, these results confirm the observations in the graphical representations of section 5.3: Firm-level environmental improvements in response to PRI collaborative engagement are contingent on ownership by Leaders.

[29]The calculation of the economic magnitude also accounts for the other coefficients involving the IO Leader variable: 0.097 = 0.029 (SD IO Leader) x (6.11 + 1.04 – 0.55 – 3.25). The calculation is based on model (1).

6 Leaders and incidents prevention

In this section, we test the relationship between ownership by Leaders and the likelihood of experiencing incidents. Several papers argue that firms' exposure to reputation-damaging events in the E&S domains constitutes an outcome-driven and perhaps more direct indicator of corporate sustainability.[30] We describe this data in Section 6.1. If ownership by Leaders positively drives corporate sustainability, we expect this to materialize not only in higher E&S-Scores but also in a lower risk of company incidents. Section 6.2 shows this to be the case. To address endogeneity concerns, Section 6.3 shows that Leaders remain invested in firms that experienced incidents in the past.

6.1 Empirical setting

We use incident data from RepRisk, a data provider that uses machine learning techniques to identify and measure ESG risks from public news sources.[31] Unlike traditional ESG rating agencies, RepRisk does not rely on self-reported company data.

Each incident identified by the screening algorithm undergoes a three-step process before it is added to the sample: First, an analyst reviews the incident to ensure it is ESG-related, meets a severity threshold, and does not duplicate an older incident. A second analyst performs quality assurance and approves the incident. In a third step, the risk of the incident is quantified according to RepRisk's methodology (RepRisk, 2021). Essential to our study, RepRisk's data is available in a format that measures risks separately in the environmental and social domains.

To measure incident exposure in our sample firms, we define separate E&S indicators

[30] Some examples include Derrien et al. (2021); Gantchev et al. (2021); Glossner (2021); Yang (2021)

[31] As of 2021, an algorithm screens more than 100,000 public sources in 23 languages daily. RepRisk reviews a wide array of channels, among others, from local and international print- and online media, government agencies, and social media. RepRisk maintains to operate the world's largest and most comprehensive database of ESG risks (RepRisk, 2021).

that take a value of 1 in firm-years with one or more incidents.[32] RepRisk coverage starts in 2007 and thereby spans our full 2009 - 2019 sample period. RepRisk covers every firm for which it identified at least one incident. For sample firms not covered in RepRisk, we assume they never experienced an incident.

6.2 Likelihood of incidents

To test the empirical relationship between ownership by Leaders and the probability of firms to experience environmental and social incidents, we estimate the following Probit model using OLS.

$$Incident\ E\&S_{it} = \alpha + \beta' IO^{\theta}_{it-1} + \gamma' X_{it-1} + \delta_t + \phi_i + \varepsilon_{it} \tag{3}$$

$Incident\ E\&S_{it}$ is an indicator variable set to 1 if firm i experiences an incident in year t. Environmental and social incidents are measured separately. IO^{θ}_{it-1} are the institutional ownership variables *IO Leaders*, *IO non-Leaders*, and *IO Conventional*. X_{it-1} is a vector of time-varying firm controls, as defined in Section 3.2. Independent variables are lagged by one year to avoid simultaneity bias. δ_t represents year fixed effects while ϕ_i denotes industry and country fixed effects. ε_{it} is the error term clustered at the country level.

We estimate the risk of environmental and social incidents for two sub-samples, once for all firm-years and once only for companies that have already experienced one or more incidents in the past three years. We differentiate between the two groups to gauge the role of Leaders in firms that are known to be problematic and in need of monitoring by shareholders. Given investors limited attention (Kempf, Manconi, and Spalt, 2017), it is especially for such firms where ownership by Leaders should matter most.

– Table 9 –

[32] More specifically, RepRisk data allows to compute the RepRisk Index (RRI), a firm-specific index measuring exposure to E&S risks. We calculate this measure separately for the E and S subdimensions. The RRI increases in response to incidents and otherwise gradually decays to a value of zero. We register a company incident when the RRI experienced an increase during a given firm-year.

Table 9 presents the regression results. Models (1) and (2) present regression estimates for all firm-years. For the environmental dimension (model (1)), we find a negative relationship between ownership by Leaders and the probability of a company experiencing an incident: A one standard deviation increase in IO Leaders reduces the probability of experiencing an incident by 0.6 percentage points (about 4% of the unconditional probability). A similar relationship also exists for ownership by conventional institutional investors. For social incidents (model 2), only conventional institutional ownership is marginally significantly related to the likelihood of incidents.

In models (3) and (4) we focus only on firms that already had an incident in the past. aMong such firms, the effect of ownership by Leaders on the probability of experiencing environmental incidents is almost three times larger than in the full sample. This finding is in line with investors monitoring a firm more strongly when it had incidents in the past. Notably, no significant link exists for the other ownership groups. As presented in Appendix Table A15, the results in model (3) are robust to different definitions of firms with previous incidents, i.e., accounting for prior incidents in the last one, two, or four firm years.[33] We continue to find no significant coefficients for social incidents (model (4)).

6.3 Post-incident response

One could assume that Leaders screen out holding firms that are at risk of experiencing incidents and, in the case this risk materializes, divest from such firms. We perform several tests to see whether this is the case.

First, in Appendix Table A16 we verify that ownership by Leaders does not significantly differ for firms that experienced incidents in the past. If investors were to select out of such firms, we would instead expect a negative relationship between IO Leaders and experiencing multiple incidents. Models (2) and (3) also control for environmental and social ratings of firms to make sure that our results hold when controlling for the observable sustainability

[33] In all specifications, the coefficient of interest is significant at the 5% level. The coefficients for *IO non-Leader* and *IO Conventional* are always insignificant.

performance of firms.

Next, we test whether the different institutional ownership categories change after a firm experiences an incident. If Leaders use their voice in affected companies to mitigate the risk of repeated incidents, we expect them to also stay invested after the incident strikes. To test this, we construct a panel of firm-years around each incident, from two years before to two years after the incident. For each institutional ownership variable, we estimate the following OLS regression, separately for environmental and social incidents:

$$IO^{\theta}_{i\tau} = \alpha + \beta Post_{i\tau} + \gamma_i + \delta_t + \varepsilon_{i\tau} \tag{4}$$

$IO^{\theta}_{i\tau}$ is the institutional ownership variable of the respective regression for firm i in relative year τ. $Post_{i\tau}$, is an indicator variable equal to 1 for years after the company incident (starting in year zero) and 0 for all prior periods. γ_i represents firm-fixed effects for company i and δ_t represents year-fixed effects for calendar year t. $\varepsilon_{i\tau}$ is the error term clustered at the firm level. β is the main coefficient of interest and captures the average change in institutional ownership in the years after the incident occurs. If Leaders remain invested in firms affected by adverse incidents, we expect β to be insignificant in regressions where the dependent variable is *IO Leaders*.

We estimate our regressions for three different sub-samples: *All incidents* contains all E/S incidents in our sample; *50th percentile* and *75th percentile*, respectively, use only the most severe 50% and 25% of incidents, as quantified by RepRisk.[34]

– Table 10 –

Table 10 presents the regression results, for environmental ((1) to (3)) and social incidents ((4) to (5)) separately. estimating institutional ownership in response to environmental and social incidents. Columns (1) – (3) and (4) – (6) show regressions for environmental and

[34]The number of observations is not proportional to the percentile threshold, as one firm can experience more than one incident in a given year.

social incidents, respectively. The dependent variable of each regression, i.e., the institutional ownership subgroup of interest, is stated in each column title.

For environmental incidents, the coefficient of *Post* in regressions of *IO Leaders* is insignificant (model (1)), irrespective of the incident severity. These results are similar for the remaining PRI investors (*IO non-Leaders* in model (2)). Thus, there seems to be no significant divestment by Leaders or non-Leaders in response to environmental incidents. This is different for conventional institutional ownership (model (3)): Following environmental incidents, we find a significant decrease in ownership. This link holds for the *all incidents* and the 50^{th} *percentile* sub-samples. We loose power in the 75^{th} *percentile* subsample.[35]

Models (4) to (6) show regression estimates for social incidents. In the *All incidents* sample, both Leaders and Conventional investors exit incident firms. This is consistent with the previous section, where we document no significant relationship between ownership by Leaders and the prevention of repeated incidents in the social dimension. The coefficient for non-Leaders (model (5)), on the other hand, is positive and significant. In the other sub-samples where we use a stricter definition of social incidents (50^{th} and 75^{th} percentile), the coefficient on *Post* is insignificant across specifications.

Overall, we document that ownership by Leaders is correlated with a lower likelihood of environmental incidents. While this is also the case for IO Conventional in the full sample, only the presence of Leaders is significantly related to the prevention of repeated incidents. This finding does not align with a selection-based interpretation of our results. While in the full sample, Leaders could plausibly invest in firms with an ex-ante low risk of environmental incidents, this appears less plausible for firms that already have a history of adverse incidents. Moreover, Leaders stay invested in affected companies. In contrast, non-Leaders play no role in preventing incidents, and Conventional investors significantly divest from affected firms.

[35]The last finding is in line with (Gantchev et al., 2021) who show that institutional investors exit firms after they experience incidents. We show that mainly conventional investors behave in this manner.

7 Selection vs. Voice

In the previous two sections we established two ways through which Leaders drive environmental and social outcomes: collaborative engagements and incident prevention. What is less clear however, is the extent to which these channels explain our baseline results.

Table 11 shows regression estimates of our baseline specification for two subsample splits. First, models (1) to (4) distinguish between firms that are targeted by collaborative engagements and those that are not. If the positive relationship between ownership by Leaders and firms' E&S scores is entirely driven by engagements, we expect to find no relationship between IO Leaders and E&S scores in firms that are never targeted. In a similar spirit, models (5) to (8) differentiate between firms that are affected by E&S incidents and those that are not.

– Table 11 –

We find that ownership by Leaders is positive and significant across specifications – also for firms not affected by collaborative engagements or incidents. In other words, both channels do not fully explain the positive relationship between Leaders and E&S performance. Therefore, part of our baseline effect relates to unobservable factors, such as private engagements (McCahery et al., 2016) or screening practices. Leaders presumably exert a substantial part of their influence in a private setting, which is not observable by researchers. Also, we cannot rule out that Leaders exhibit stricter screening practices. If Leaders invest in firms with a higher E&S Scores ex-ante, this reinforces the relationship between Leaders and corporate sustainability.

While we emphasize the essential role of Leaders in explaining firm-level E&S performance, we refrain from denoting our baseline effects as causal. Previous studies commonly exploited exogenous variation in institutional ownership variables to sharpen identification, mainly using stock index membership as an instrumental variable (e.g., Bena et al. (2017); Dyck et al. (2019); Chen et al. (2020)). The setting of our study poses challenges to this type

of approaches: Since average ownership by Leaders is only 2.2%, the exogenous variation that, for instance, the addition to a stock index causes on the IO Leader variable is very small. It is questionable that changes of this magnitude can exert a plausible influence on individual firms' E&S performance.[36]

8 Conclusion

Today, more than half of all institutional investors publicly commit to responsible investing (Brandon et al., 2021). Our paper focuses on the subset of institutional investors, denoted as *Leaders*, with an exceptionally strong commitment to sustainability and examines their influence on corporate environmental and social performance.

The positive link between institutional ownership and corporate sustainability is driven by the small group of Leaders alone. This finding is notable, as Leaders only own 2.2% of the average firm in our sample, a twentieth of the average total institutional ownership. We identify two channels through which the presence of Leaders aids to the improvement of firms' environmental and social performance: direct engagement and incident prevention. Only firms with high ownership by Leaders respond positively to collaborative engagements. Moreover, ownership by Leaders is also associated with a lower risk of reputation-damaging company incidents, particularly for firms with an existing history of such incidents.

The interpretation of our results is subject to at least two limitations. First, while suggestive, our evidence is not enough to demonstrate a causal effect of Leaders on corporate sustainability. The channels outlined in this paper only explain part of the Leaders effect and more research is needed to examine the underlying mechanisms, such as individual engagement and ex-ante screening practices. Second, our results make no statement about the motives of Leaders. A high commitment to corporate sustainability can be driven by

[36] In unreported tests, we use company membership to the MSCI All Country World Index (ACWI) as an instrument for ownership by Leaders. While we find a strong and significant positive relationship between IO Leaders and firms' E/S-Scores, the coefficients appear implausibly inflated. See **?** for a discussion of these issues in the context of the Russell recomposition.

pecuniary, non-pecuniary, or clientele-related reasons (Hartzmark and Sussman, 2019; Riedl and Smeets, 2017; Ceccarelli et al., 2021b), and further research is warranted to differentiate between these motivations.

Our findings highlight that not all institutional investors are equally committed to sustainability. While the majority of institutional investors advertises such a commitment, only a minority positively drives corporate sustainability. This has meaningful implications for investors who want to make an impact through their investments: The choice of the financial intermediary is instrumental to establish the efficacy of such an investment.

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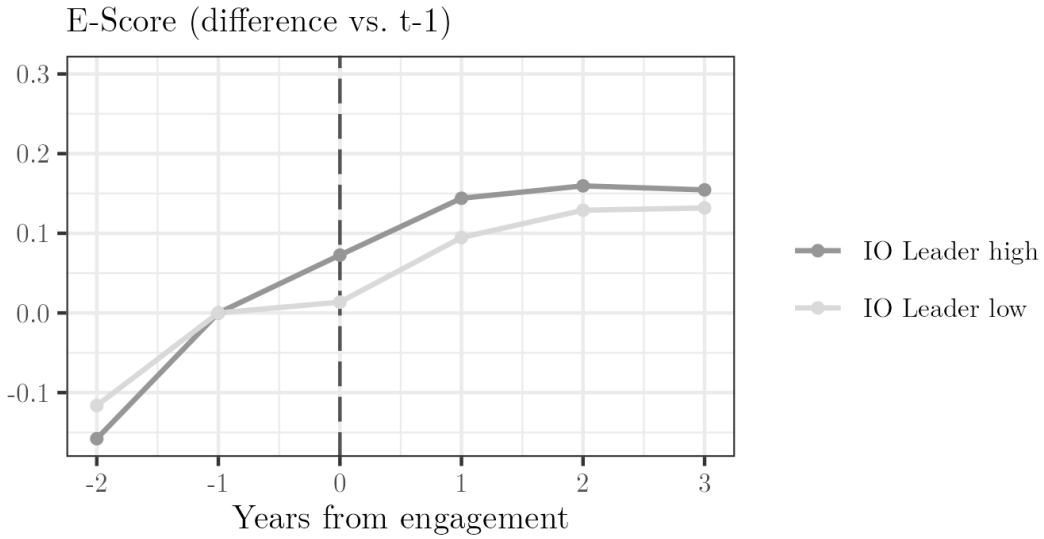
Figures

Figure 7: Environmental performance around PRI collaborative engagements – Control firms with high/low IO Leader

This figure shows the environmental performance of control firms in figure 6, separately for those with below- and above-median ownership by Leaders ("IO Leader low" and "IO Leader high"). The plot reports average consensus E-Scores relative to the first year before the engagement starts (year -1). The event period spans from two years before to three years after the start of the engagement. Year 0 is the year in which the respective engagement starts.



Tables

Table 1: Summary statistics – Institutional investor level
This table shows descriptive statistics of the size, geographical distribution, and type of PRI signatories, separately for Leaders and non-Leaders. The sample covers signatories with available ownership data in FactSet Ownership. AUM statistics account for listed positions held by investors directly or through subsidiaries. Investors without listed equity holdings in given year are excluded from the AUM calculations. The list of signatories, including regions and categories, was provided by the PRI. The sample is at the institution-year level and covers the 2009 to 2019 period.

Variable	Leaders	PRI non-Leaders
Signatory characteristics		
Average equity AUM ($ billion)	28.38	37.97
Median equity AUM ($ billion)	10.03	2.12
Average year joined	2009	2011
Included investor years	637	3,792
Signatory regions		
Africa	0%	5%
Asia	5%	6%
Europe	67%	51%
Latin America	0%	3%
North America	24%	28%
Oceania	3%	7%
Signatory categories		
Asset owner	18%	14%
Investment manager	82%	86%

Table 2: Summary statistics – Firm level

This table shows summary statistics of institutional ownership, environmental & social (E&S) performance, and firm fundamentals. Consensus scores are computed as the average across all available E&S ratings, which have been normalized to ensure comparability. *# Scores/Consensus* denotes the number of individual E/S scores used to compute consensus scores. All continuous variables are winsorized at the 1st and 99th percentiles. The sample is at the firm-year level and covers the years 2009 to 2019. We include only public firms for which both ownership information and at least one ESG rating are available. All variables are defined in Appendix Table A1.

Variable	Obs.	Min	p25	Median	Mean	p75	Max	SD
Inst. Ownership								
IO Total	66,471	0.2%	11.2%	26.4%	38.8%	68.7%	100.0%	32.7%
IO PRI	66,471	0.0%	5.2%	12.9%	18.0%	27.1%	62.5%	16.1%
IO Leaders	66,471	0.0%	0.3%	1.0%	2.2%	2.9%	14.4%	2.9%
IO non-Leaders	66,471	0.0%	4.4%	10.9%	15.8%	23.3%	56.8%	14.6%
IO Conventional	66,471	0.0%	4.0%	11.6%	20.7%	34.0%	90.7%	21.3%
E&S Performance								
Consensus E-Score	67,043	-1.68	-0.78	-0.19	-0.11	0.51	2.00	0.84
Consensus S-Score	67,043	-1.85	-0.66	-0.11	-0.07	0.49	2.03	0.83
# Scores/Consensus	67,043	1.00	1.00	2.00	2.03	3.00	3.00	0.87
Sustain. E-Score	38,338	32.00	43.00	52.00	53.96	64.00	88.00	13.74
Sustain. S-Score	38,338	34.00	48.00	56.00	56.59	64.00	85.00	11.20
MSCI E-Score	53,160	0.30	3.20	4.60	4.74	6.20	10.00	2.13
MSCI S-Score	53,169	0.20	3.40	4.50	4.49	5.60	8.80	1.69
Asset4 E-Score	44,859	0.00	4.89	30.07	34.16	58.84	92.37	29.14
Asset4 S-Score	44,859	2.01	23.78	40.66	43.01	61.23	92.69	23.81
Incident E	67,043	0.00	0.00	0.00	0.14	0.00	1.00	0.35
Incident S	67,043	0.00	0.00	0.00	0.19	0.00	1.00	0.40
Fundamentals								
Log assets	67,023	4.00	6.88	8.05	8.14	9.28	13.27	1.85
PPE	66,376	0.00	0.05	0.18	0.26	0.41	0.89	0.24
Leverage	67,007	0.00	0.08	0.22	0.24	0.36	0.85	0.19
Tobin's q	64,814	0.62	1.02	1.28	1.75	1.92	8.25	1.30
Profitability	59,703	-0.49	0.06	0.10	0.10	0.15	0.42	0.12

Table 3: Sample composition by country

This table shows the geographical distribution of our sample. The first three columns summarize the number of firms while the last three show average institutional ownership, separately by Leaders, PRI signatories (non-Leaders), and conventional investors. The sample is at the firm-year level and covers the years 2009 to 2019. We include only public firms for which both ownership information and at least one ESG rating is available. All variables are defined in Appendix Table A1.

	Firms by country			Average Inst. Ownership		
Country	Obs.	% of total	Unique firms	Leaders	Non-Leaders	Conventional
United States of America	21,553	32.1%	3,684	2.4%	29.9%	43.9%
Japan	5,576	8.3%	870	1.2%	9.2%	5.4%
United Kingdom	4,014	6.0%	626	5.8%	17.7%	17.1%
Canada	3,392	5.1%	509	2.0%	13.1%	24.5%
China	3,223	4.8%	859	0.8%	3.1%	5.3%
Australia	2,922	4.4%	453	1.0%	6.1%	6.1%
Hong Kong	1,772	2.6%	341	1.4%	5.6%	5.6%
Germany	1,757	2.6%	266	2.4%	9.6%	11.2%
France	1,498	2.2%	207	2.5%	9.9%	10.6%
Taiwan	1,479	2.2%	192	1.4%	7.6%	5.7%
India	1,472	2.2%	310	1.3%	5.1%	9.3%
South Korea	1,459	2.2%	214	1.1%	5.7%	5.0%
Sweden	1,255	1.9%	250	7.9%	16.4%	10.3%
Switzerland	1,202	1.8%	170	1.9%	11.9%	13.6%
Brazil	1,056	1.6%	186	1.9%	9.8%	8.7%
South Africa	980	1.5%	141	1.4%	9.3%	8.7%
Italy	866	1.3%	143	1.5%	7.7%	7.0%
Malaysia	797	1.2%	157	0.9%	3.5%	3.0%
Netherlands	696	1.0%	100	3.3%	14.2%	18.0%
Spain	661	1.0%	97	1.5%	8.5%	8.0%
Indonesia	638	1.0%	116	1.2%	4.0%	3.3%
Singapore	570	0.9%	97	1.9%	5.7%	7.5%
Thailand	553	0.8%	127	1.3%	4.8%	4.1%
Norway	545	0.8%	103	4.8%	9.4%	10.1%
Russian Federation	502	0.7%	68	1.1%	4.5%	4.5%
Others	6,605	9.9%	1,066	1.7%	8.2%	9.1%
Total	67,043	100.0%	11,352	2.2%	15.8%	20.7%

Table 4: Institutional ownership and E&S performance

This table reports OLS regression estimates of environmental and social consensus scores on institutional ownership and control variables. Consensus scores are defined as average normalized environmental (E) and social (S) scores by the rating agencies MSCI IVA, Sustainalytics, and Refinitiv Asset4. Models (1) and (2) use total institutional ownership (IO Total) as independent variable. Models (3) and (4) differentiate between ownership by PRI signatories and conventional investors. Models (5) and (6) brake down PRI ownership further to differentiate between Leaders and non-Leaders. Leaders are institutions that lead and support a collaborative engagement during a given year. All regressions control for industry, year, and country fixed effects and lag independent variables by one year. Continuous variables are winsorized at the 1st and 99th percentiles. The sample consists of firm-years for which ratings by at least two agencies are available and covers the years 2010 to 2019. All variables are defined in Appendix Table A1. Robust standard errors are clustered at the country level and reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	IO overall		IO PRI		IO Leaders	
	E-Score	S-Score	E-Score	S-Score	E-Score	S-Score
	(1)	(2)	(3)	(4)	(5)	(6)
IO Total	0.08	0.20**				
	(0.08)	(0.09)				
IO PRI			0.27***	0.34***		
			(0.10)	(0.10)		
IO Leaders					1.62***	1.42***
					(0.34)	(0.23)
IO non-Leaders					0.08	0.18*
					(0.08)	(0.10)
IO Conventional			-0.06	0.09	-0.07	0.09
			(0.09)	(0.09)	(0.10)	(0.10)
Log assets	0.25***	0.18***	0.25***	0.18***	0.25***	0.18***
	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)
PPE	-0.11	0.16***	-0.12	0.16***	-0.12	0.16***
	(0.07)	(0.04)	(0.07)	(0.04)	(0.07)	(0.04)
Leverage	-0.22***	-0.26***	-0.22***	-0.26***	-0.21***	-0.26***
	(0.05)	(0.06)	(0.05)	(0.06)	(0.05)	(0.06)
Tobin's q	0.03***	0.02***	0.03***	0.02***	0.03***	0.02***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Profitability	0.28**	0.06	0.26*	0.04	0.23*	0.02
	(0.13)	(0.18)	(0.13)	(0.18)	(0.13)	(0.18)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Min. # of ratings	2	2	2	2	2	2
Observations	35,026	35,026	35,026	35,026	35,026	35,026
Adjusted R^2	0.36	0.28	0.37	0.28	0.37	0.28

Table 5: Institutional ownership and E&S performance – Climate Action 100+
This table reports OLS regression estimates of environmental and social consensus scores on institutional ownership, its interaction with a dummy variable for the period after 2017 when Climate Action 100+ started, and control variables. Consensus scores are defined as average normalized environmental and social scores by the rating agencies MSCI IVA, Sustainalytics, and Refinitiv Asset4. The regression sample consists of firm-years for which ratings by at least two (models 1 and 3) or three (models 2 and 4) agencies are available. All models differentiate between ownership by Leaders, other PRI signatories, and conventional investors. All regressions control for industry, year, and country fixed effects and lag independent variables by one year. Continuous variables are winsorized at the 1st and 99th percentiles. All variables are defined in Appendix Table A1. Robust standard errors are clustered at the country level and reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Environment		Social	
	(1) E-Score	(2) E-Score	(3) S-Score	(4) S-Score
IO Leaders	2.21***	2.81***	1.98***	2.10***
	(4.73)	(3.90)	(5.51)	(4.14)
Post 2017 × IO Leaders	-1.03***	-0.59	-1.05**	-0.19
	(-2.97)	(-1.49)	(-2.43)	(-0.39)
IO non-Leaders	0.22**	0.26*	0.25**	0.32**
	(2.42)	(1.85)	(2.34)	(2.32)
Post 2017 × IO non-Leaders	-0.32***	-0.36***	-0.09	-0.12
	(-3.89)	(-3.69)	(-1.15)	(-0.95)
IO non-PRI	-0.11	-0.13	0.09	0.10
	(-1.07)	(-0.83)	(0.97)	(0.87)
Post 2017 × IO non-PRI	0.05	-0.11	-0.11	-0.39**
	(0.59)	(-0.66)	(-1.31)	(-2.01)
Firm Controls	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Min. # of ratings	2	3	2	3
Observations	35,026	21,940	35,026	21,940
Adjusted R^2	0.37	0.39	0.28	0.33

Table 6: Institutional ownership and E&S performance – Results for firms in countries with high/low E&S values

This table reports OLS regression estimates of environmental and social consensus scores on institutional ownership and control variables. Consensus scores are defined as average normalized environmental (E) and social (S) scores by the rating agencies MSCI IVA, Sustainalytics, and Refinitiv Asset4. Institutional ownership is divided between holdings by Leaders, i.e., institutions that lead and support collaborative engagements, Non-Leaders, i.e., PRI signatories that are not involved in collaborative engagements, and other institutions. Country E&S values are measured with World Values Survey data as presented in Dyck et al. (2019). Regression models (1) and (2) account for firms headquartered in countries with below-median E&S values, while models (3) and (4) account for firms with above-median E&S values. All regressions control for industry, year, and country fixed effects and lag independent variables by one year. Control variables include the natural logarithm of total assets (million US dollars), profitability, Tobin's q, PPE, and leverage. Continuous variables are winsorized at the 1st and 99th percentiles. The sample consists of firm-years for which ratings from two or more agencies are available and covers the years 2010 to 2019. All variables are defined in Appendix Table A1. Robust standard errors are clustered at the country level and reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Low E&S values		High E&S values	
	E-Score	S-Score	E-Score	S-Score
	(1)	(2)	(3)	(4)
IO Leaders	2.87***	2.13**	1.38***	1.20***
	(0.74)	(0.84)	(0.32)	(0.19)
IO non-Leaders	0.36	0.81	0.20**	0.22**
	(0.37)	(0.52)	(0.07)	(0.09)
IO Conventional	0.16	0.17	-0.18*	0.001
	(0.21)	(0.26)	(0.09)	(0.11)
Firm Controls	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Min. # of ratings	2	2	2	2
Observations	9,153	9,153	24,271	24,271
Adjusted R^2	0.38	0.36	0.39	0.25

Table 7: Overview of included collaborative engagements
This table lists the environmental (E) and social (S) collaborative engagements used in our sample. Collaborative engagements are thematic engagement campaigns organized by the PRI and led by signatories. Based on the theme, engagements are assigned to an environmental or social dimension, or both. Engagement data and E/S assignments come directly from the PRI. Targeted firms denotes the number of affected companies which could be matched to FactSet. As the analyses of this study require several pre- and post periods relative to the start of the engagement, campaigns starting prior to 2011 or after 2017 are excluded from the sample.

		Dimension		
Campaign	Year started	E	S	Targeted firms
CDP Water Disclosure 2011	2011	x		118
COP4 - Fourth annual engagement with UNGC Companies	2011	x	x	91
Carbon Disclosure Leadership Index (CDLI 2011)	2011	x		84
Forest Footprint Disclosure 2011	2011	x		27
Sustainable fisheries	2011	x		40
CDP Carbon Action	2012	x		24
CDP Water Disclosure 2012	2012	x		39
COP5 - Fifth annual engagement with UNGC Companies	2012	x	x	106
Carbon Disclosure Leadership Index (CDLI 2012)	2012	x		60
Employee relations	2012		x	26
Forest Footprint Disclosure 2012	2012	x		9
Fracking	2012	x		36
Labour standards in the agricultural supply chain (phase 1)	2012		x	34
Water risks in agricultural SC (Phase 1)	2012	x		49
PRI Investor Working Group on Sustainable Palm Oil (buyers)	2013	x		51
COP6 - Sixth annual engagement on UN Global Compact companies	2014	x	x	153
Human rights in extractives	2014		x	32
PRI Investor Working Group on Sustainable Palm Oil (producers)	2014	x		14
Corporate climate lobbying	2015	x		21
Climate Action 100+	2017	x		161
PRI-coord. collab. engagem. on labour practices in ag SC (Phase 2)	2017		x	32
PRI-coord. collab. engagem. on methane risk	2017	x		31

Table 8: Difference-in-differences (DID) regressions of environmental performance during PRI collaborative engagements

This table reports DID regression estimates for the effect of collaborative engagements on environmental performance and the mediating role of ownership by Leaders. Consensus scores require ratings by at least one rating agency. Each regression sample is restricted to firm-year observations in the time window indicated in the column titles. *Treated* is a dummy set to one for firms targeted by a collaborative engagement and zero otherwise. Control firms have similar characteristics but are never targeted by a PRI collaborative engagement on the respective dimension. *Post* is set to one for firm-years after the start of the engagement. Control variables include the natural logarithm of total assets (in USD), PPE, leverage, Tobin's q, and profitability. Independent variables are lagged by one year. Continuous variables are winsorized at the 1st and 99th percentiles. All variables are defined in Appendix Table A1. Robust standard errors are clustered at the firm level and reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Dependent variable: E-Score		
	[-1, +2]	[-1, +3]	[-2, +3]
	(1)	(2)	(3)
IO Leaders x Treated x Post	6.11***	6.43***	5.29**
	(2.21)	(2.18)	(2.08)
Treated x Post	0.03	0.04	0.05
	(0.06)	(0.06)	(0.06)
Post	-0.10*	-0.07	-0.05
	(0.05)	(0.05)	(0.05)
IO Leaders	1.04	1.54	-1.75
	(1.88)	(1.80)	(1.92)
Post x IO Leaders	-0.55	-1.04	-0.57
	(1.40)	(1.44)	(1.39)
Treated x IO Leaders	-3.25	-4.36*	-0.12
	(2.70)	(2.53)	(2.44)
Firm controls	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	835	1,044	761
Adjusted R^2	0.88	0.87	0.90

Table 9: Institutional ownership and likelihood of E&S incidents

This table reports OLS regression estimates of an incident indicator variable on institutional ownership and controls. *Incident E* and *Incident S* are dummy variables set to one for firms experiencing an environmental (E) or social (S) incident during a given fiscal year. Incidents are reputation-damaging news events according to the methodology of the data provider RepRisk. Models 1 and 2 include all firm-years in our sample. Models 3 and 4 include only observations of firms that experienced an E or S incident at least once in the previous three years. All regressions account for industry, country, and year fixed affects. Control variables include the natural logarithm of total assets (in million US dollars), PPE, leverage, Tobin's q, and profitability. Independent variables are lagged by one year. Continuous variables are winsorized at the 1st and 99th percentiles. Incidents data is obtained from RepRisk. The sample spans the 2010 - 2019 period. All variables are defined in Appendix Table A1. Robust standard errors are clustered at the country level and reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	All firm-years		Prior incident	
	Incident E	Incident S	Incident E	Incident S
	(1)	(2)	(3)	(4)
IO Leaders	-0.21**	0.06	-0.58**	-0.23
	(0.08)	(0.09)	(0.29)	(0.24)
IO non-Leaders	-0.04	-0.00	-0.08	-0.01
	(0.03)	(0.02)	(0.07)	(0.04)
IO Conventional	-0.09***	-0.09*	0.00	0.05
	(0.03)	(0.05)	(0.05)	(0.08)
Firm controls	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	55,054	55,054	10,581	13,867
Adjusted R^2	0.20	0.21	0.17	0.18

Table 10: Institutional ownership response to E&S incidents

This table reports regression estimates for the effect of environmental and social incidents on institutional ownership. For each incident in the 2009 - 2019 sample period, we include observations from two years before to two years after the incident. *POST* is set to one for firm-years after the incident (starting in the year of the incident) and captures the change in institutional ownership following the event. Regression models (1) and (4), (2) and (5), and (3) and (6) measure the effect on IO Leaders, IO non-Leaders, and IO Conventional, respectively. The first set of models, *All incidents* includes all incidents in the sample period. The models under *50th percentile* and *75th percentile* include only the most severe 50% and 25% of incidents. All regression models account for firm and year fixed effects. Institutional ownership variables are winsorized at the 1st and 99th percentiles. Incident data is obtained from RepRisk. All variables are defined in Appendix Table A1. Robust standard errors are clustered at the firm level and reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Environment			Social		
	Leaders	Non-Leaders	Convent.	Leaders	Non-Leaders	Convent.
	(1)	(2)	(3)	(4)	(5)	(6)
All incidents						
Post	-0.0002	0.0008	-0.0017**	-0.0003**	0.0010**	-0.0013**
	(0.0001)	(0.0006)	(0.0007)	(0.0001)	(0.0005)	(0.0006)
Observations	30,605	30,605	30,605	41,609	41,609	41,609
Adjusted R^2	0.6914	0.8941	0.9204	0.7052	0.8926	0.9233
50th percentile						
Post	-0.0000	0.0013	-0.0024***	-0.0003	0.0008	-0.0011
	(0.0002)	(0.0008)	(0.0009)	(0.0002)	(0.0007)	(0.0008)
Observations	23,388	23,388	23,388	31,935	31,935	31,935
Adjusted R^2	0.6975	0.8934	0.9215	0.7054	0.8936	0.9257
75th percentile						
Post	0.0001	0.0014	-0.0015	0.0001	0.0009	-0.0013
	(0.0003)	(0.0014)	(0.0015)	(0.0003)	(0.0012)	(0.0014)
Observations	13,086	13,086	13,086	17,525	17,525	17,525
Adjusted R^2	0.7127	0.8917	0.9269	0.7073	0.8916	0.9292
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Table 11: Institutional ownership and E&S performance – Results for firms affected/not affected by PRI collaborative engagements and E&S incidents

This table reports OLS regression estimates of environmental and social consensus scores on institutional ownership and control variables. Consensus scores are defined as average normalized environmental (E) and social (S) scores by the rating agencies MSCI IVA, Sustainalytics, and Refinitiv Asset4. The table reports two subsample splits: Models (1) - (4) distinguish between firms affected/non-affected by PRI collaborative engagements in the sample period, while models (5) - (8) distinguish between firms that experienced/did not experience reputation-damaging incidents in the respective E&S dimension. Institutional ownership is divided between holdings by Leaders, i.e., institutions that lead and support collaborative engagements, non-Leaders, i.e., PRI signatories that are not involved in collaborative engagements, and other institutions. All regressions control for industry, year, and country fixed effects and lag independent variables by one year. Control variables include the natural logarithm of total assets (million US dollars), profitability, Tobin's q, PPE, and leverage. Continuous variables are winsorized at the 1st and 99th percentiles. The sample consists of firm-years for which ratings from two or more agencies are available and covers the years 2010 to 2019. All variables are defined in Appendix Table A1. Robust standard errors are clustered at the country level and reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Targeted by PRI engagements				Experienced E&S incidents			
	Yes		No		Yes		No	
	E-Score	S-Score	E-Score	S-Score	E-Score	S-Score	E-Score	S-Score
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IO Leaders	2.94***	1.57	1.44***	1.40***	2.18***	1.66***	1.31**	1.27**
	(0.84)	(0.94)	(0.39)	(0.21)	(0.39)	(0.42)	(0.52)	(0.53)
IO non-Leaders	0.18	0.42	0.10	0.18**	-0.11	0.09	0.17*	0.25***
	(0.18)	(0.32)	(0.09)	(0.09)	(0.12)	(0.13)	(0.10)	(0.08)
IO Convent.	-0.05	0.83**	-0.04	0.07	-0.22	0.17	0.05	-0.02
	(0.25)	(0.37)	(0.09)	(0.08)	(0.22)	(0.12)	(0.06)	(0.08)
Firm Controls	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
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Min. # ratings	2	2	2	2	2	2	2	2
Observations	5,559	2,512	29,467	32,514	15,275	19,529	19,751	15,497
Adjusted R^2	0.43	0.42	0.31	0.24	0.43	0.30	0.28	0.23

Appendix

Table A1: Variable definitions

Variable	Description
Institutional ownership	
IO Total	Holdings (end of fiscal year) by all institutional investors as a fraction of market capitalization. Source: FactSet Ownership
IO PRI	Holdings (end of fiscal year) by all institutional investors that are PRI signatories as a fraction of market capitalization. Source: FactSet Ownership and PRI
IO Leaders	Holdings (end of fiscal year) by all institutional investors that are PRI signatories that qualify as "Leaders" as a fraction of market capitalization. Leaders are institutions that lead and support a collaborative engagement during a given year. Source: FactSet Ownership and PRI
IO non-Leaders	Holdings (end of fiscal year) by all institutional investors that are PRI signatories but do *not* qualify as "Leaders" as a fraction of market capitalization. Source: FactSet Ownership and PRI
IO Conventional	Holdings (end of fiscal year) by all institutional investors which are not PRI signatories as a fraction of market capitalization. Source: FactSet Ownership and PRI
E & S Scores	
Consensus E-Score	Average of the normalized environmental scores from the rating agencies MSCI IVA, Sustainalytics, and Refinitiv Asset4, using all available scores per firm-year. Scores are normalized – each year and separately for every rating agency – to have a mean of zero and unit variance. Source: MSCI IVA, Sustainalytics, Refinitiv Asset4
Consensus S-Score	Average of the normalized social scores from the rating agencies MSCI IVA, Sustainalytics, and Refinitiv Asset4, using all available scores per firm-year. Scores are normalized – each year and separately for every rating agency – to have a mean of zero and unit variance. Source: MSCI IVA, Sustainalytics, Refinitiv Asset4
#Scores/Consensus	Number of environmental or social scores that are available to compute the consensus score in a given year. Source: MSCI IVA, Sustainalytics, Refinitiv Asset4
Sustainalytics E-Score	Environmental score from the rating agency Sustainalytics. Source: Sustainalytics
Sustainalytics S-Score	Social score from the rating agency Sustainalytics. Source: Sustainalytics
MSCI E-Score	Environmental score from the rating agency MSCI IVA. Source: MSCI
MSCI S-Score	Social score from the rating agency MSCI IVA. Source: MSCI
Asset4 E-Score	Environmental score from the rating agency Refinitiv Asset4. Source: Refinitiv Asset4
Asset4 S-Score	Social score from the rating agency Refinitiv Asset4. Source: Refinitiv Asset4
Incident E	Indicator variable with a value of one in firm-years with one or more reputation-damaging environmental incidents, and zero otherwise. Source: RepRisk
Incident S	Indicator variable with a value of one in firm-years with one or more reputation-damaging social incidents, and zero otherwise. Source: RepRisk

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Firm fundamentals	
Log assets	Natural logarithm of total assets in million of US dollars (FactSet item FF_ASSETS). Source: FactSet Fundamentals
PPE	Property, plant, and equipment (FactSet item PPE_NET) divided by total assets (FactSet item FF_ASSETS). Source: FactSet Fundamentals
Leverage	Total debt (FactSet item FF_DEBT) divided by total assets (FactSet item FF_ASSETS). Source: FactSet Fundamentals
Tobin's q	Total assets (FactSet item FF_ASSETS) plus market value of equity (FactSet item FF_MKT_VAL) minus book value of equity (FactSet item FF_COM_EQ) divided by total assets. Source: FactSet Fundamentals
Profitability	Earnings before interest, taxes, depreciation, and amortization (FactSet item FF_EBITDA_OPER) divided by total assets (FactSet item FF_ASSETS). Source: FactSet Fundamentals

Table A2: Correlation between variables

This table shows the correlations between variables for the sample period from 2010 through 2019. * indicates that the parameter estimate is significantly different from zero at the 1% level.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) Consensus E-Score	1.00											
(2) Consensus S-Score	0.51*	1.00										
(3) IO Total	-0.02*	0.04*	1.00									
(4) IO PRI	0.06*	0.10*	0.81*	1.00								
(5) IO Leaders	0.15*	0.16*	0.28*	0.54*	1.00							
(6) IO non-Leaders	0.03*	0.08*	0.83*	0.98*	0.38*	1.00						
(7) IO Conventional	-0.07*	-0.02*	0.91*	0.50*	0.04*	0.54*	1.00					
(8) Log Assets	0.26*	0.24*	-0.03*	0.04*	0.04*	0.04*	-0.08*	1.00				
(9) PPE	0.02*	0.00	-0.08*	-0.09*	-0.09*	-0.08*	-0.05*	-0.01	1.00			
(10) Leverage	0.06*	0.04*	-0.00	0.00	-0.02*	0.01	-0.00	0.19*	0.26*	1.00		
(11) Tobin's q	-0.03*	-0.05*	0.14*	0.11*	0.08*	0.10*	0.13*	-0.38*	-0.13*	-0.23*	1.00	
(12) Profitability	0.09*	0.07*	0.07*	0.11*	0.13*	0.09*	0.03*	0.16*	0.14*	-0.02*	0.13*	1.00

Table A3: Consistency of Leaders subgroup across years

This table shows how the group of institutional investors defined as Leaders evolves over time. *#Leaders* shows the number of institutions that lead and support a collaborative engagement during a given year. *#Additions* and *#Deletions* show the number of institutions that join or leave the Leaders group in a given year. *Retention probability* is the likelihood of Leaders from the previous period to retain their Leader status also in the current year. The sample is at the institutional investor-year level and covers the years 2009 to 2019.

Year	# Leaders	# Additions	# Deletions	Retention probability
2009	9	-	-	-
2010	26	17	0	100%
2011	27	1	0	100%
2012	46	23	4	85%
2013	48	6	4	91%
2014	55	12	5	90%
2015	56	2	1	98%
2016	49	0	7	88%
2017	105	57	1	98%
2018	107	8	6	94%
2019	109	4	2	98%

Table A4: Institutional ownership and E&S performance – Different numbers of ratings

This table reports OLS regression estimates of environmental and social consensus scores on institutional ownership and control variables. Consensus scores are defined as average normalized environmental (E) and social (S) scores by the rating agencies MSCI IVA, Sustainalytics, and Refinitiv Asset4. Models and (1) and (2) account for firm-years for which ratings by all three agencies are available. Models (3) and (4) include firm year with one or more available ratings. All regressions differentiate between ownership by Leaders, non-Leaders, and conventional investors. Leaders are institutions that lead and support a collaborative engagement during a given year. All regressions control for industry, year, and country fixed effects and lag independent variables by one year. Control variables are as described in section 3.1. Continuous variables are winsorized at the 1st and 99th percentiles. The sample covers the 2010 to 2019 period. All variables are defined in Appendix Table A1. Robust standard errors are clustered at the country level and reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	3 Ratings		1+ Ratings	
	E-Score	S-Score	E-Score	S-Score
	(1)	(2)	(3)	(4)
IO Leaders	2.28***	1.73***	1.29***	0.94***
	(0.57)	(0.35)	(0.27)	(0.25)
IO non-Leaders	0.10	0.20	-0.02	-0.001
	(0.13)	(0.14)	(0.05)	(0.07)
IO Conventional	-0.09	0.10	0.03	0.14**
	(0.15)	(0.12)	(0.08)	(0.07)
Firm Controls	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Observations	21,940	21,940	55,054	55,054
Adjusted R^2	0.39	0.32	0.26	0.18

Table A5: Institutional ownership and E&S performance – Results per rating agency

This table reports OLS regression estimates of environmental (E) and social (S) scores on institutional ownership and control variables. The regressions are run separately by rating agency, i.e., Sustainalytics, MSCI IVA and Refinitiv Asset4. Institutional ownership is divided between holdings by Leaders, i.e., institutions that lead and support collaborative engagements, non-Leaders, i.e., PRI signatories that are not involved in collaborative engagements, and other institutions. All regressions control for industry, year, and country fixed effects and lag independent variables by one year. Continuous variables are winsorized at the 1st and 99th percentiles. *Full sample* covers all firm-years where the respective E&S rating is available. *Common sample* is restricted to observations where ratings from all three agencies are available. For both panels, the sample covers the years 2010 to 2019. All variables are defined in Appendix Table A1. Robust standard errors are clustered at the country level and reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Sustainalytics		MSCI IVA		Asset4	
	E-Score	S-Score	E-Score	S-Score	E-Score	S-Score
	(1)	(2)	(3)	(4)	(5)	(6)
Full sample						
IO Leaders	34.93***	22.25***	2.64***	1.82***	59.98***	42.53***
	(5.61)	(3.59)	(0.86)	(0.65)	(12.31)	(8.71)
IO non-Leaders	2.03	0.81	0.41***	0.18	-3.53	4.15
	(1.87)	(1.56)	(0.09)	(0.16)	(3.88)	(3.74)
IO Conventional	0.73	0.99	-0.02	0.02	-6.36*	6.07**
	(1.67)	(1.24)	(0.12)	(0.13)	(3.31)	(2.33)
Observations	31,824	31,824	43,859	43,862	36,337	36,337
Adjusted R^2	0.34	0.26	0.19	0.11	0.46	0.40
Common sample						
IO Leaders	41.91***	22.97***	3.47**	2.25**	69.36***	45.01***
	(6.58)	(4.62)	(1.66)	(1.00)	(17.52)	(11.89)
IO non-Leaders	0.38	0.78	0.41	0.15	0.23	9.79**
	(2.19)	(1.65)	(0.27)	(0.35)	(4.61)	(4.21)
IO Conventional	1.10	0.41	-0.02	0.08	-7.55	5.55*
	(2.28)	(1.68)	(0.33)	(0.22)	(5.83)	(3.19)
Observations	21,940	21,940	21,940	21,940	21,940	21,940
Adjusted R^2	0.35	0.28	0.23	0.15	0.39	0.37
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes

Table A6: Institutional ownership and E&S performance – Results by geography

This table reports OLS regression estimates of environmental and social consensus scores on institutional ownership and control variables. Consensus scores are defined as average normalized environmental (E) and social (S) scores by the rating agencies MSCI IVA, Sustainalytics, and Refinitiv Asset4. Institutional ownership is divided between holdings by Leaders, i.e., institutions that lead and support collaborative engagements, non-Leaders, i.e., PRI signatories that are not involved in collaborative engagements, and other institutions. All regressions control for industry, year, and country fixed effects and lag independent variables by one year. Control variables include the natural logarithm of total assets (million US dollars), profitability, Tobin's q, PPE, and leverage. Regressions are carried out separately by geographical region, where North America includes only firms from the USA or Canada and Rest of world includes firms from Oceania, Africa, and Latin America. Continuous variables are winsorized at the 1st and 99th percentiles. The sample consists of firm-years for which ratings from two or more agencies are available and covers the years 2010 to 2019. All variables are defined in Appendix Table A1. Robust standard errors are clustered at the country level and reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	North America		Europe		Asia		Rest of world	
	E-Score	S-Score	E-Score	S-Score	E-Score	S-Score	E-Score	S-Score
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IO Leaders	1.91**	1.55*	1.48**	1.76***	2.31**	2.39**	2.06**	2.03
	(0.10)	(0.22)	(0.55)	(0.32)	(1.02)	(0.95)	(0.65)	(1.24)
IO non-Leaders	0.19	0.33	0.13	-0.08	0.98***	1.61***	0.24	0.33
	(0.07)	(0.11)	(0.23)	(0.28)	(0.32)	(0.47)	(0.37)	(0.19)
IO Convent.	-0.23	-0.02	-0.26	-0.17	0.03	0.07	0.22	0.05
	(0.17)	(0.24)	(0.20)	(0.15)	(0.28)	(0.30)	(0.30)	(0.29)
Firm Controls	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
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Min. # ratings	2	2	2	2	2	2	2	2
Observations	12,572	12,572	8,796	8,796	10,014	10,014	3,644	3,644
Adjusted R^2	0.29	0.13	0.36	0.27	0.33	0.24	0.31	0.23

Table A7: Institutional ownership and E&S performance – Excluding financial firms

This table reports OLS regression estimates of environmental and social consensus scores on institutional ownership and control variables in the 2010 - 2019 period. Consensus scores are defined as average normalized environmental and social scores by the rating agencies MSCI IVA, Sustainalytics, and Refinitiv Asset4. The regression sample consists of firm-years of non-financial firms (excluding SIC codes 6000–6999) for which ratings by at least two agencies are available. Models (1) and (2) use total institutional ownership as independent variable. Models (3) and (4) differentiate between ownership by PRI signatories and conventional investors. Models (5) and (6) differentiate between ownership by Leaders, other PRI signatories (non-Leaders) and conventional investors. All regressions control for industry, year, and country fixed effects and lag independent variables by one year. Continuous variables are winsorized at the 1st and 99th percentiles. All variables are defined in Appendix Table A1. Robust standard errors are clustered at the country level and reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	IO overall		IO PRI		IO Leaders	
	E-Score	S-Score	E-Score	S-Score	E-Score	S-Score
	(1)	(2)	(3)	(4)	(5)	(6)
IO Total	0.07	0.20**				
	(0.07)	(0.09)				
IO PRI			0.25***	0.33***		
			(0.08)	(0.10)		
IO Leaders					1.44***	1.24***
					(0.32)	(0.23)
IO non-Leaders					0.09	0.21*
					(0.08)	(0.11)
IO Conventional			-0.07	0.10	-0.07	0.09
			(0.09)	(0.10)	(0.10)	(0.10)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Min. # of ratings	2	2	2	2	2	2
Observations	31,983	31,983	31,983	31,983	31,983	31,983
Adjusted R^2	0.38	0.28	0.38	0.28	0.38	0.29

Table A8: Institutional ownership and E&S performance – Industry-by-year fixed effects

This table reports OLS regression estimates of environmental and social consensus scores on institutional ownership and control variables in the 2010 - 2019 period. Consensus scores are defined as average normalized environmental and social scores by the rating agencies MSCI IVA, Sustainalytics, and Refinitiv Asset4. All regressions account for industry-by-year fixed effects, where models (1) - (4) use SIC Industry Divisions and models (5) - (8) use SIC2 industries. All regressions account for country fixed effects and control variables as outlined in section 3.1. Independent variables are lagged by one year. Continuous variables are winsorized at the 1st and 99th percentiles. All variables are defined in Appendix Table A1. Robust standard errors are clustered at the country level and reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	SIC Industry Divisions				SIC2 Industries			
	E-Score	S-Score	E-Score	S-Score	E-Score	S-Score	E-Score	S-Score
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IO Leaders	1.65***	1.44***	2.33***	1.78***	1.43***	1.23***	2.02***	1.56***
	(0.35)	(0.23)	(0.59)	(0.36)	(0.31)	(0.23)	(0.55)	(0.29)
IO non-Leaders	0.12	0.18*	0.13	0.21	-0.01	0.13	-0.07	0.13
	(0.08)	(0.10)	(0.12)	(0.14)	(0.06)	(0.09)	(0.10)	(0.13)
IO Conventional	-0.08	0.08	-0.10	0.09	-0.14*	0.06	-0.17	0.07
	(0.10)	(0.10)	(0.16)	(0.12)	(0.08)	(0.09)	(0.15)	(0.11)
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Min. # of ratings	2	2	3	3	2	2	3	3
Observations	35,026	35,026	21,940	21,940	35,026	35,026	21,940	21,940
Adjusted R^2	0.37	0.28	0.39	0.33	0.41	0.31	0.43	0.36

Table A9: Changes in institutional ownership and E&S performance

This table reports OLS regression estimates of changes in environmental and social consensus scores on changes in institutional ownership and control variables in the 2010 - 2019 period. s is the number of years upon which the changes are computed. For example, in model (1), ΔE-Score = E-Score$_{t-1}$ - E-Score$_t$ and ΔIO Leaders = IO Leaders$_{t-2}$ - IO Leaders$_{t-1}$. Consensus scores are defined as average normalized environmental and social scores by the rating agencies MSCI IVA, Sustainalytics, and Refinitiv Asset4. The regression sample consists of firm-years for which ratings by at least two agencies are available. All regressions account for industry, year, and country fixed effects and control variables as outlined in section 3.1. Continuous variables are winsorized at the 1st and 99th percentiles. All variables are defined in Appendix Table A1. Robust standard errors are clustered at the country level and reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	ΔE-Score (t-s,t)				ΔS-Score (t-s,t)			
	(1) s=1	(2) s=2	(3) s=3	(4) s=4	(5) s=1	(6) s=2	(7) s=3	(8) s=4
ΔIO Leaders (t-s-1,t-1)	0.34***	0.40***	0.46***	0.54***	0.34***	0.40***	0.46***	0.54***
	(4.59)	(2.98)	(3.06)	(2.70)	(4.59)	(2.98)	(3.06)	(2.70)
ΔIO non-Leaders (t-s-1,t-1)	-0.01	-0.02	0.06	0.12	-0.01	-0.02	0.06	0.12
	(-0.31)	(-0.30)	(0.62)	(0.98)	(-0.31)	(-0.30)	(0.62)	(0.98)
ΔIO Conventional (t-s-1,t-1)	-0.01	-0.04	0.02	0.00	-0.01	-0.04	0.02	0.00
	(-0.23)	(-0.58)	(0.23)	(0.01)	(-0.23)	(-0.58)	(0.23)	(0.01)
Firm Controls	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
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Min. # of ratings	2	2	2	2	2	2	2	2
Observations	30,122	24,760	20,173	16,070	30,122	24,760	20,173	16,070
Adjusted R^2	0.01	0.04	0.06	0.08	0.01	0.04	0.06	0.08

Table A10: Institutional ownership and E&S performance – Alternative standard error clusterings

This table reports OLS regression estimates of environmental and social consensus scores on institutional ownership and control variables in the 2010 - 2019 period. Consensus scores are defined as average normalized environmental and social scores by the rating agencies MSCI IVA, Sustainalytics, and Refinitiv Asset4. Robust standard errors are clustered at the firm level in models (1) and (2), at the industry level (SIC2 industries) in models (3) and (4), and two-dimensionally at the country and year level in models (5) and (6). All regressions account for country fixed effects and control variables as outlined in section 3.1. Independent variables are lagged by one year. Continuous variables are winsorized at the 1st and 99th percentiles. All variables are defined in Appendix Table A1. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Firm level		Industry level		Country and year level	
	E-Score	S-Score	E-Score	S-Score	E-Score	S-Score
	(1)	(2)	(3)	(4)	(5)	(6)
IO Leaders	2.28***	1.73***	2.28***	1.73***	2.28***	1.73***
	(0.37)	(0.37)	(0.50)	(0.48)	(0.52)	(0.34)
IO non-Leaders	0.10	0.20*	0.10	0.20	0.10	0.20
	(0.11)	(0.11)	(0.13)	(0.14)	(0.13)	(0.14)
IO Conventional	-0.09	0.10	-0.09	0.10	-0.09	0.10
	(0.09)	(0.09)	(0.10)	(0.10)	(0.15)	(0.12)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Min. # ratings	2	2	2	2	2	2
Observations	21,940	21,940	21,940	21,940	21,940	21,940
Adjusted R^2	0.39	0.32	0.39	0.32	0.39	0.32

Table A11: Pre-engagement characteristics of treatment and control firms
This table provides mean comparisons of treated and control firms in our difference-in-differences (DID) test. Mean values of the covariates used for matching are computed one year before the engagement starts. The control group is identified based on exact matching on region, industry, and year and then using nearest neighbor propensity score matching (PSM). Firms are matched based on the natural logarithm of total assets (million US dollars), profitability, Tobin's q, PPE, and leverage. Eligible matches require E-score coverage throughout the respective event window and a propensity score no larger than 0.1 standard deviations. The sample spans the 2009 - 2019 period. All variables are defined in Appendix Table A1.

Variable	Treated firms	Control firms	t statistic
Log Assets	8.82	8.83	-0.06
Profitability	0.14	0.12	1.59
Tobin's q	1.71	1.63	0.65
PPE	0.35	0.34	0.20
Leverage	0.25	0.25	0.29
N firms	105	104	
Industry FE	Yes	Yes	
Region FE	Yes	Yes	
Year FE	Yes	Yes	

Table A12: DID regressions of environmental performance during collaborative engagements – Matching incl. IO Leaders as covariate

This table reports DiD regression estimates for the effect of collaborative engagements on environmental performance and the mediating role of ownership by Leaders. Consensus scores require ratings by at least one rating agency. Each regression sample is restricted to firm-year observations in the time window indicated in the column titles. *Treated* is a dummy set to one for firms targeted by a collaborative engagement and zero otherwise. Control firms have similar characteristics but are never targeted by a PRI collaborative engagement on the respective dimension. Different to Table 8, the matching covariates include *IO Leaders*. *Post* is set to one for firm-years after the engagement started. Control variables include the natural logarithm of total assets (in USD), PPE, leverage, Tobin's q, and profitability. Independent variables are lagged by one year. Continuous variables are winsorized at the 1st and 99th percentiles. All variables are defined in Appendix Table A1. Robust standard errors are clustered at the firm level and reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Dependent variable: E-Score		
	[-1, +2]	[-1, +3]	[-2, +3]
	(1)	(2)	(3)
IO Leaders x Treated x Post	4.12*	4.45*	5.33**
	(2.22)	(2.31)	(2.48)
Treated x Post	0.06	0.07	0.06
	(0.05)	(0.06)	(0.06)
Post	-0.08	-0.07	-0.06
	(0.05)	(0.05)	(0.06)
IO Leaders	1.36	0.83	-0.50
	(1.54)	(1.42)	(1.88)
Post x IO Leaders	-0.14	-0.27	-0.14
	(1.03)	(1.08)	(1.39)
Treated x IO Leaders	-2.22	-2.78	-1.24
	(2.65)	(2.64)	(2.77)
Firm controls	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	820	1,025	752
Adjusted R^2	0.88	0.88	0.90

Table A13: DID regressions of Environmental performance during collaborative engagements – Fully interacted model

This table reports DID regression estimates for the effect of collaborative engagements on environmental performance and the mediating role of ownership by Leaders. Consensus scores require ratings by at least one rating agency. Each regression sample is restricted to firm-year observations in the time window indicated in the column titles. *Treated* is a dummy set to one for firms targeted by a collaborative engagement and zero otherwise. Control firms have similar characteristics but are never targeted by a PRI collaborative engagement on the respective dimension. *Post* is set to one for firm-years after the engagement started. Different to Table 8, also all control variables are interacted with the Post dummy. Control variables are as outlined in section 3.1. Independent variables are lagged by one year. Continuous variables are winsorized at the 1st and 99th percentiles. All variables are defined in Appendix Table A1. Robust standard errors are clustered at the firm level and reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Dependent variable: E-Score		
	[-1, +2]	[-1, +3]	[-2, +3]
	(1)	(2)	(3)
IO Leaders x Treated x Post	5.67***	5.85***	4.89**
	(2.14)	(2.16)	(2.15)
Treated x Post	0.04	0.05	0.05
	(0.05)	(0.06)	(0.06)
Post	0.55*	0.50*	0.16
	(0.29)	(0.30)	(0.34)
IO Leaders	0.65	1.23	-2.03
	(1.87)	(1.91)	(2.01)
Post x IO Leaders	-0.55	-1.03	-0.47
	(1.54)	(1.60)	(1.47)
Treated x IO Leaders	-3.29	-4.15	-0.04
	(2.63)	(2.52)	(2.57)
Log assets	0.03	0.10	0.19**
	(0.08)	(0.08)	(0.09)
Profitability	0.68	0.75	-0.28
	(0.58)	(0.64)	(0.46)
Tobin's q	-0.02	-0.04	0.04
	(0.05)	(0.05)	(0.04)
PPE	-0.15	-0.22	0.17
	(0.34)	(0.30)	(0.28)
Leverage	0.50	0.22	0.06
	(0.35)	(0.33)	(0.32)
Log assets x Post	-0.06**	-0.05*	-0.02
	(0.03)	(0.03)	(0.03)
Profitability x Post	-0.83	-0.68	0.33
	(0.54)	(0.56)	(0.54)
Tobin's q x Post	0.05	0.05	-0.01
	(0.04)	(0.05)	(0.04)
PPE x Post	-0.09	-0.10	-0.09
	(0.12)	(0.12)	(0.12)
Leverage x Post	-0.30	-0.33	-0.08
	(0.20)	(0.21)	(0.21)
Firm controls	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	835	1,044	761
Adjusted R^2	0.88	0.88	0.90

Table A14: DID regressions of Environmental performance during collaborative engagements – inclusion of all interacted IO variables

This table reports DID regression estimates for the effect of collaborative engagements on environmental performance and the mediating role of ownership by Leaders. Consensus scores require ratings by at least one rating agency. Each regression sample is restricted to firm-year observations in the time window indicated in the column titles. *Treated* is a dummy set to one for firms targeted by a collaborative engagement and zero otherwise. Control firms have similar characteristics but are never targeted by a PRI collaborative engagement on the respective dimension. *Post* is set to one for firm-years after the engagement started. Different to Table 8, also the ownership variables *IO non-Leader* and *IO Conventional* are interacted with the *Treated* and *Post* dummies. Control variables are as outlined in section 3.1. Independent variables are lagged by one year. Continuous variables are winsorized at the 1st and 99th percentiles. All variables are defined in Appendix Table A1. Robust standard errors are clustered at the firm level and reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Dependent variable: E-Score		
	[-1, +2]	[-1, +3]	[-2, +3]
	(1)	(2)	(3)
IO Leaders x Treated x Post	5.12**	5.28**	4.27**
	(2.18)	(2.13)	(2.01)
IO non-Leaders x Treated x Post	1.22	1.41	0.35
	(1.05)	(1.05)	(1.08)
IO Conventional x Treated x Post	0.08	-0.08	0.06
	(0.34)	(0.33)	(0.33)
IO Leaders x Treated	-2.54	-3.83	-0.55
	(2.75)	(2.57)	(2.48)
IO non-Leaders x Treated	-1.48	-1.44	-0.08
	(1.29)	(1.25)	(1.12)
IO Conventional x Treated	0.14	-0.16	0.23
	(0.87)	(0.68)	(0.80)
IO Leaders x Post	-0.19	-0.55	0.15
	(1.34)	(1.38)	(1.48)
IO non-Leaders x Post	-0.50	-0.67	-0.57
	(0.65)	(0.67)	(0.58)
IO Conventional x Post	-0.08	0.04	0.10
	(0.25)	(0.24)	(0.20)
IO Leaders	0.81	1.30	-1.56
	(1.82)	(1.79)	(1.99)
IO non-Leaders	0.18	0.08	-0.89
	(0.84)	(0.87)	(0.69)
IO Conventional	-0.22	-0.10	-1.11**
	(0.60)	(0.49)	(0.54)
Treated x Post	0.09	0.09	0.07
	(0.06)	(0.06)	(0.07)
Post	-0.12**	-0.09*	-0.08
	(0.05)	(0.05)	(0.06)
Firm controls	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	835	1,044	761
Adjusted R^2	0.88	0.87	0.90

Table A15: Institutional ownership and likelihood of E&S incidents – Different definitions of firms affected by prior incidents

This table reports OLS regression estimates of an indicator variable for firms that experience a reputation-damaging incident on institutional ownership and controls. *Incident E* and *Incident S* are dummy variables set to one for firms experiencing an environmental (E) or social (S) incident during a given fiscal year. Incidents are reputation-damaging news events according to the methodology of the data provider RepRisk. All reported models contain firm-years of companies that experienced an E or S incident at least once in the previous years. Models (1) and (2) account for prior E/S incidents in the previous year, while models (3) - (6) account for the previous two and four years. Results for a definition based on the previous three years is presented in Table 9. All regressions account for industry, country, and year fixed affects. Control variables are as described in section 3.1. Independent variables are lagged by one year. Continuous variables are winsorized at the 1st and 99th percentiles. Incidents data is obtained from RepRisk. The sample spans the 2010 - 2019 period. All variables are defined in Appendix Table A1. Robust standard errors are clustered at the country level and reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Prior Year		Two prior years		Four prior years	
	Incident E	Incident S	Incident E	Incident S	Incident E	Incident S
	(1)	(2)	(3)	(4)	(5)	(6)
IO Leaders	-0.74**	-0.33	-0.73**	-0.25	-0.63**	-0.30
	(0.32)	(0.29)	(0.27)	(0.23)	(0.27)	(0.24)
IO non-Leaders	-0.01	0.03	-0.07	-0.02	-0.08	-0.00
	(0.06)	(0.05)	(0.06)	(0.05)	(0.06)	(0.04)
IO Conventional	0.06	0.05	0.03	0.04	0.00	0.04
	(0.05)	(0.09)	(0.05)	(0.08)	(0.06)	(0.08)
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,969	9,432	9,319	12,315	11,303	14,717
Adjusted R^2	0.16	0.15	0.17	0.17	0.17	0.18

Table A16: Institutional ownership by Leaders in firms after E&S incidents
This table reports regression estimates of institutional ownership by Leaders for firms that experienced E&S incidents. Prior Incident E/S are dummy variables with a value of 1 for firms that experienced and environmental/social incident in the prior three years. E/S-Scores are defined as average normalized environmental and social scores by the rating agencies MSCI IVA, Sustainalytics, and Refinitiv Asset4. Included firm-years are rated by at least two rating agencies. All regression models account for control variables as defined in section 3.1, as well as firm and year fixed effects. All continuous variables are winsorized at the 1st and 99th percentiles. Incident data is obtained from RepRisk. All variables are defined in Appendix Table A1. Robust standard errors are clustered at the firm level and reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Environment		Social	
	IO Leaders			
	(1)	(2)	(3)	(4)
Prior Incident E	0.001	0.001		
	(0.001)	(0.001)		
E-Score		0.0000		
		(0.001)		
Prior Incident S			0.0000	0.0000
			(0.0005)	(0.0005)
S-Score				-0.001***
				(0.0004)
Firm controls	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Min. # of ratings	2	2	2	2
Observations	34,943	34,943	34,943	34,943
Adjusted R^2	0.71	0.71	0.71	0.71