

# **Analyzing Active Fund Managers' Commitment to ESG: Evidence from the United Nations Principles for Responsible Investment**

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## **Abstract**

The United Nations Principles for Responsible Investment (PRI) is the largest global ESG initiative in the asset management industry to date. We analyze what happens after active US mutual funds sign the PRI, to assess whether they exhibit ESG implementation. We find that PRI signatories attract a large fund inflow but we do not observe improvements in fund-level ESG scores or fund returns. We consider a battery of ways to proxy for funds' ESG incorporation (e.g., entry/exit, screening, engagement, voting for pro-ESG proposals), but fail to observe evidence of meaningful follow-through, on average. Next, we explore cross-sectional fund characteristics and find that only quant-funds exhibit small improvement in ESG performance versus other funds, mainly through buying high-ESG-performing stocks. Furthermore, we note that PRI signatories are not superior performers in ESG issues prior to signing, relative to non-PRI funds, but PRI affiliation tends to be widely advertised on company websites, marketing materials, and fund documents. Overall, a reasonable reader may perceive our findings as consistent with PRI funds' greenwashing. We note, however, that what we uncover is based only on outcome-based measures and does not capture the actual efforts of signatories.

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## 1. Introduction

Environmental, social, and governance (ESG) has been one of the fastest-growing business-domain phenomena in the most recent decade, with increasing attention paid to it by academics, firm managers, investors, and policymakers. In August 2019, the Business Roundtable (BRT) 200, which represents the CEOs of 200 of America’s largest companies, committed to shift their view of the role of the corporation from serving shareholders to serving stakeholders. More recently, in 2020, BlackRock CEO Larry Fink sent a letter to investors detailing that firm’s commitment to incorporate ESG as a new standard for investing. However, these promises could be illusory, as it remains an open question whether corporate leaders would actually serve the interests of broader stakeholders. In addition, stakeholderism could make corporate leaders less accountable and more insulated, and increase slack (Bebchuk and Tallarita 2020). Overall, while statements to incorporate ESG issues seem virtuous, little effort has been made to assess their validity; as such, it remains unclear whether such commitments translate into proper follow-through.

In this paper, we examine the asset management industry’s largest initiative to incorporate ESG issues, to analyze the commitment of US active fund managers to ESG. Specifically, we examine whether signatories of the United Nations Principles for Responsible Investment (henceforth “UN PRI” or “PRI”) actually “walk the talk” and incorporate ESG into their decision-making. The UN PRI was initiated by institutional investors worldwide in 2006, and called for funds to incorporate ESG issues into their investment decisions and to actively engage in the companies in which they invest. When the PRI was launched in 2006, signatories’ total assets under management (AUM) was just a few hundred billion dollars, but by 2020 this number had grown to roughly \$120 trillion, almost four times the entire market capitalization of the US equity

market at the time. Among PRI signatories, we focus on active mutual fund managers (i.e., not ETFs or index funds) to investigate managers with the capacity to adopt ESG factors without being constrained to track a specific index.

According to the UN PRI Guidelines, signatories are publicly committing to incorporate ESG issues into investment analysis and decision-making, and to be active owners (see Appendix A1). The PRI statement is signed by senior executives of the asset management firm, and PRI affiliation is heavily advertised in company websites, marketing materials, and/or fund documents (see Appendix A2). On one hand, given that there is increasing interest in ESG issues from asset owners (i.e., pension funds), PRI affiliation could attract significant amounts of capital and benefit the signatories. At the same time, there is a potential for increased scrutiny not only from the public but also from asset owners and other parties to whom the signatory asset managers have fiduciary duty (Schanzenbach and Sitkoff 2020). In sum, asset managers likely have incentive to make significant efforts to incorporate ESG issues into portfolio decisions.

Despite the phenomenal growth in signatories' AUM noted above, however, a survey of asset managers reveals that most perceive ESG issues as financially irrelevant (CFA Institute, 2017). If so, signatories may prioritize fund returns over ESG. The same survey suggests that asset managers do not receive any ESG-related training, and that there is little guidance from asset allocators on the specifics of ESG execution. Moreover, there are substantial disagreements related to ESG ratings (Berg et al. 2019; Serafeim and Yoon 2021), which could make ESG implementation challenging (Lys et al. 2015; Friedman and Heinle 2016, 2020). Under these scenarios, we may not observe incorporation of ESG. Further, it is even possible for asset managers to use PRI status largely as a marketing tool to attract capital, especially because, ignoring

reputational concerns, the cost of joining the PRI represents a very small fraction of the signatories' AUM. In sum, how PRI funds behave after signing the initiative requires empirical investigation.

Before we dive into the ESG performance of signatories, we examine whether there are visible shifts in fund flows after signatories sign the PRI. In the mutual fund literature, a crucial equilibrating mechanism for this market is capital-allocation decisions made by fund investors (Berk and Green 2004). Furthermore, from the perspective of fund managers, what good is there in signing the PRI if those who allocate capital—their customers—do not care? So, we first compare fund flows during the six quarters pre- and post-signing, and find that PRI signatories exhibit a surprising spike in flows post-signing (i.e., 4.9% average increase per quarter for the subsequent six quarters). We note that this increase is well-distributed over the next six quarters and is robust to considering eight and twelve quarters post signing. Overall, this significant allocation of new capital to the signatory asset managers suggests that asset allocators consider PRI status an important signal.

Next, we move to the paper's main focus and examine whether and how signatory asset managers incorporate ESG issues. First, we create a value-weighted average ESG score at the fund-quarter level and compare the six quarters before and after signing the PRI. Because a fund is a basket of individual assets, we view our measure as a natural metric to examine whether a fund incorporates ESG. We use firm-level ESG scores from MSCI, Sustainalytics, and TruValue Labs to create fund-level ESG scores, but do not observe notable improvements post-signing. This finding is robust to considering various sub-scores (i.e., those related to environment, social, or governance separately, or to financial materiality). Moreover, our results also remain valid when we identify a matched group of non-PRI funds and use a difference-in-differences specification.

The value-weighted fund-level ESG score above has three components (i.e., firm-level ESG score, share value, and fund holdings), and the score itself does not reveal which of the three is driving the change. To address this, we examine the two main ways in which funds implement ESG: (1) changing holdings (i.e., buying/selling) and (2) engaging companies. To test how PRI funds use entry and/or exit strategies, we first examine whether the funds buy (sell) high- (low-) ESG performers. Second, we examine whether PRI funds unload stocks associated with greater ESG-related controversy. Third, we examine the trend in ESG scores of firms that are in the bottom of PRI funds' portfolios, to account for potential screening. None of these analyses reveals meaningful evidence of ESG incorporation.

Next, we examine whether funds engage firms and induce improvements in ESG, using the following methodology. First, we restrict our analysis to the firms held in signatories' portfolios at the time of signing, and examine whether these firms improve ESG performance. Second, we examine the stocks in which signatories are major shareholders (i.e., more likely to exert influence) and test whether the firms in question improve ESG performance. Again, we find no meaningful evidence of ESG incorporation. Finally, we consider signatory funds' proxy voting behavior. We examine how PRI funds vote on pro-ESG shareholder proposals and find that PRI managers do not increase supporting (i.e., vote for) these issues. Interestingly, they *decrease* their support of pro-governance proposals compared to the pre-signing period.

As the results so far return no evidence of meaningful ESG incorporation, we conduct a series of robustness tests to further corroborate our findings. First, we compare signatories' fund-level ESG scores to those of non-signatory active funds and propensity-score-matched control funds at the time of signing, to dismiss the possibility that signatories may already be superior performers on ESG issues. Second, we use placebo pre periods and define the pre periods to end

one year and two years before the signing, to rule out the story that PRI funds could have already improved fund-level ESG performance in anticipation of joining. Third, we examine longer pre- and post-PRI-signing windows (8 and 12 quarters rather than 6), as some ESG implementation may need a longer-term horizon to bear fruit. None of the analyses above provide evidence of ESG incorporation. Fourth, we examine how fund returns change after the PRI is signed, to address the possibility that PRI funds may have prioritized generating fund returns over ESG performance. Such an argument has merit because, as mentioned above, not all ESG issues are perceived to be value-relevant and fund managers are bound by fiduciary duty to put clients' financial interests first. If so, the lack of evidence for ESG follow-through may not be a surprise because PRI funds may be prioritizing their efforts to generate fund returns. Interestingly, however, we find that PRI signatories exhibit a slight decrease in fund returns after signing the PRI.

Overall, our initial analyses document that funds enjoy a higher aggregate revenue from capital inflow after joining the PRI, but we fail to observe meaningful follow-through. However, we note that this is only an aggregate, on-average effect, and thus explore cross-sectional fund characteristics that may influence funds' ESG incorporation. We consider fund characteristics such as quant-fund status, size, fee, team-managed status, and pre-signing ESG scores, but find only that quant-fund status is associated with higher fund-level ESG scores versus non-quant funds. We view this result as plausible because ESG implementation is easier for quant funds, which typically use signals to create long-short portfolios, rather than using traditional fundamental analysis (e.g., Khan et al. 2016). As such, we explore all the implementation strategies that we have considered so far and find that quant funds buy stocks that score high on ESG issues.

Our findings are subject to the following caveats. First, while we consider many different dimensions of ESG implementation, we cannot capture every channel that asset managers use (e.g.,

private engagements; see Grewal et al. 2016). Second, at least in more recent years, some asset managers may have their own proprietary ESG scoring system and methodologies to evaluate firms' ESG efforts. Unfortunately, our empirical design cannot capture such efforts, as they are not disclosed. Third, we acknowledge that the UN PRI is voluntary and aspirational, and that the principles therein are vague. We consider as many observable outcomes as possible, along with potential channels through which to assess PRI funds' follow-through, but acknowledge that PRI funds are not legally bound to incorporate ESG even if PRI affiliation is heavily advertised. Fourth, some of our null results could be explained by the ineffectiveness of funds' ESG-related efforts. For example, PRI funds may be engaging firms to induce ESG improvements, but firms may choose not to follow through (especially if funds' requests are not in line with preferences of major shareholders). In addition, given the nascent nature of ESG and lack of training for fund managers on ESG issues, managers' efforts, while genuine, may not have observable impact. Hence, overall we caution that our findings are based on ESG outcomes and cannot capture PRI funds' ESG inputs or willingness to implement. Finally, as the current literature points out, our measures are subject to noise and disagreement (e.g., Berg et al. 2020). We consider a wide variety of ESG scores from different vendors to address this issue, but acknowledge the limitations.

Notwithstanding those caveats, our paper makes the following meaningful contributions to the literature. First, extant research has devoted most of its attention to assessing firm-level ESG efforts. For example, many papers have examined whether ESG is related to shareholder value, and why firms engage in ESG (e.g., Khan et al. 2016; Welch and Yoon 2020). In addition, recent working papers such as Bebchuk and Tallarita (2020) caution regarding agency issues among firm managers (e.g., BRT CEOs) who make illusory promises, and Raghunandan and Rajgopal (2021) show that BRT signatories exhibit higher labor violations. We, on the other hand, shift our focus

to fund-level ESG follow-through, a much more recent phenomenon. While we acknowledge the possibility of genuine ESG incorporation from some signatories, we believe that our findings call on regulators to direct more scrutiny to asset managers' ESG execution, on asset owners to gain more awareness of the capital allocation process, and on asset managers to provide more transparent communications on their ESG incorporation.

As to research context, we note there are at least a handful of working papers on fund-level ESG. Liang et al. (2020) classify hedge funds with low value-weighted ESG scores and returns as those that are engaging in greenwashing. We believe that their work complements ours because they show that greenwashing is not limited to active mutual funds. In addition, Gibson et al. (2020) describe the ESG footprint of funds worldwide. In particular, using survey data on various ESG implementation strategies, they examine whether a specific ESG implementation strategy yields good ESG performance. Our research question is fundamentally different from theirs in several aspects. First, we are interested in assessing whether funds with the discretion to exercise stock picks and engage companies around ESG actually walk the talk. More importantly, we document what characteristics drive improvements in ESG performance, and explore specific channels through which funds can engage (i.e., exercise entry/exit strategies, induce firms to make improvements, engage companies through voting, and screen poor ESG performers). Also, Raghunandan and Rajgopal (2021) find that firms held by funds that Morningstar classifies as ESG funds exhibit more labor violations. In addition, Dikolli et al. (2021) find that funds identified by Morningstar as ESG funds are more likely to support E&S shareholder proposals. In contrast, we find that PRI funds do not increase supporting pro-ESG proposals. The difference in findings may

be because we use a setting where active asset managers *voluntarily commit* to ESG, rather than examining the funds that an external data vendor classifies as ESG funds.<sup>1</sup>

Finally, our paper is related to work that examines fund flows and ESG. Hartzmark and Sussman (2019) show that Morningstar ratings on ESG funds cause an increase in fund flows. They find that a fund with the highest rating experiences 4% greater inflow than the lowest over the subsequent 11 months (i.e., 1.1% greater inflow per quarter). We acknowledge that the larger increase documented in our paper (i.e., 4.9% per quarter post-signing) may be so because our setting is not as well-identified as theirs. At the same time, we interpret the strong inflow as an indication of the strong expectation for the UN PRI. It is not surprising that investors are more responsive to the UN PRI, because it is the largest global initiative on ESG, rather than a rating provided by a single data vendor. We view that our paper complements their work by reconfirming investors' positive response to ESG information.

The remainder of the paper is as follows. Section 2 explains the institutional background and motivates our findings in relation to assessing ESG follow through. Section 3 describes the data. Section 4 sets forth the research design and results. Section 5 concludes.

## **2. Institutional Setting and Conceptual Underpinnings**

### **2.1 Institutional Setting**

The PRI was initiated in 2005 by then-United Nations Secretary-General Kofi Annan, who invited an international group of institutional investors to develop initiatives reflecting the increasing relevance of ESG issues to investment practices. In 2006, 20 asset-management professionals were drawn from 12 countries and supported by a 70-member group of experts from

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<sup>1</sup> See Morningstar's "Quintessential List of Sustainable Funds." Morningstar. April 2020.

the investment industry and intergovernmental organizations. By 2020, the number of PRI signatories had grown consistently from 100 around launch time to over 2,300 globally, and the total AUM grew from a few hundred billion to over \$120 trillion.

The PRI classifies its signatories into three types: (1) investment management firms (e.g., Blackrock), (2) asset owners (e.g., California Public Employees' Retirement System), and (3) data service providers (e.g., MSCI). According to the UN, the PRI's mission is to promote an economically efficient, sustainable global financial system necessary for long-term value creation. As presented in Appendix A1, the PRI's goal is to encourage voluntary adoption of the following six principles: (1) incorporate ESG issues into investment analysis and decision-making processes, (2) be active owners and incorporate ESG issues into ownership policies and practices, (3) seek appropriate disclosure on ESG issues by the entities in which they invest, (4) promote acceptance and implementation of the Principles within the investment industry, (5) work together to enhance effectiveness in implementing the Principles, and (6) report on activities and progress toward implementing the Principles.

The CEO or other senior executive of the investment management firm makes the official commitment to the PRI. They sign the declaration form, pay a nominal annual membership fee, and publicly report on their responsible investment activity through a reporting framework provided by the UN. In Appendix A2, we highlight how PRI affiliation is advertised using examples from active mutual fund signatories in our dataset. In Panel A, we provide an example from Trillium Asset Management, which displays its PRI affiliation on its website landing page. In Panel B, we provide an example from Eaton Vance, which dedicates an entire website page to its affiliation and commitment to the UN PRI and ESG. In Panel C, we share an example from Nuveen, which includes an entire page on the PRI and its commitment to ESG in the firm's

marketing material. In Panel D, we highlight a Statement of Responsible Investment Initiatives in the fund document of LSV Asset Management. Overall, these examples highlight that signing the PRI is a serious public commitment and funds disclose the affiliation prominently in various outlets.

As noted in Appendix A1 Panel C, the UN PRI implemented the following minimum requirements starting in 2018: (1) an investment policy for more than 50% of their AUM that covers the firm's responsible investment approach, (2) staff members responsible for implementing responsible investing policy, and (3) senior-level commitment and accountability mechanisms for implementation. Failure to meet these minimum requirements over a two-year grace period, following extensive engagement with the PRI, would result in delisting. However, we note that the UN PRI never delisted a signatory during the time period examined in this paper. The PRI first disclosed through its website in September 2020 that it initiated the first delisting, which related to the filing year 2018.<sup>2</sup> We emphasize that the filing year 2018 should not be confused with delisting year 2018, because the PRI granted its signatories a two-year grace period before actual delisting. In essence, then, the earliest possible filing year that the PRI could have covered in 2020 was the 2018 filing year. We suspect that the PRI's actual move to delist signatories started not long before the actual delisting date.

To support this notion, we highlight two news articles that cite this paper in the first half of 2020.<sup>3,4</sup> First, an article in *Institutional Investor Magazine* featured an interview with the UN PRI's CEO Fiona Reynolds, in which she stated that "the PRI would consider Yoon's research to inform the PRI's work with signatories...the group has been consulting with its signatories since

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<sup>2</sup> UN PRI Website. Sep 2020. Signatories delisted for not meeting the minimum requirements.

<sup>3</sup> *Institutional Investor*. Jun 2020. "UN PRI Revamps Reporting Rules to Focus on 'Real-World' Outcomes."

<sup>4</sup> *Barron's*. May 2020. "Signing PRI Doesn't Mean Better Sustainability or Returns."

2019 on revising its reporting requirements.” This article, along with the grace-period provision, suggests that the PRI’s monitoring of signatories was insufficient during most years examined in our paper, and that actual delisting of signatories (September 2020) might have been triggered by the media’s highlighting (May and June 2020) of this paper. In sum, these facts suggest that it was *ex ante* unclear to the signatories when and whether the PRI would actually monitor them.

While there is little doubt that the PRI provides a signal for funds to communicate to the public that they care about ESG, we acknowledge that the commitment is both voluntary and aspirational in nature. In addition, the six guiding principles do not mandate explicitly that institutional investors should make changes to their portfolio holdings. As such it may not be clear to what extent signing the PRI is a commitment to improve fund-level ESG performance and thus what observable actions we should consider in this research context. To partially alleviate this concern, we conceptually outline our views on greenwashing and explain how the PRI can potentially serve as a pertinent setting to assess funds’ ESG follow through.

## 2.2 Conceptual Underpinnings

We follow Gow, Larcker and Reiss (2016) to present a diagram that serves as a base for our empirical strategy, as well as to clarify how we use observational data to address our research question. Ultimately, we wish to assess whether funds walk the talk (i.e., rather than engage in greenwashing) (see Figure 1 Panel A). We consider greenwashing the following: if a fund joins the UN PRI (i) for monetary rewards but (ii) with insufficient intent to incorporate ESG issues. We acknowledge that we can neither directly verify whether funds join the UN PRI for monetary reasons nor observe the funds’ actual intention on ESG issues, and we are limited by outcome

measures. As such, in the figure we present both Monetary Motivation and ESG Motivation in dotted boxes.

We use observable data to assess whether asset managers engage in greenwashing. As presented in the left half of Figure 1 Panel B, we examine whether joining the PRI leads to an increase in fund flows (i.e., whether funds are rewarded monetarily). Although this does not prove that the funds join the PRI for monetary rewards, it provides circumstantial evidence that it is not implausible that they may join the PRI for monetary reasons. The dotted line between flow and monetary motivation represents that inflow indirectly justifies the monetary incentives.

Next, we examine whether funds that join the UN PRI intend to perform on ESG issues. Similar to monetary motivation, we cannot observe the funds' intention on ESG issues directly (i.e., we can make an assessment using only ESG outcomes), and provide the diagram in the right half of Figure 1 Panel B. The solid line between ESG motivation and ESG performance reflects our assumption that if a fund has an intention to perform on ESG issues, it will manifest via fund-level ESG performance. We note that there is no direct connection between joining the UN PRI and ESG performance, which reveals our implicit assumption that merely committing to the PRI does not cause direct improvement in ESG performance; rather, the improvement would result from the underlying ESG motivation. Furthermore, this assumption clearly shows that the greenwashing in our setup *cannot* be identified by a randomized controlled trial: randomly assigned PRI signatory status will not result in any improvement in ESG performance, and hence we must rely on observational data. Resorting to the frame described above, we assess the funds' intention to perform on ESG issues through their ESG performance.

### **3. Data and Sample**

#### **3.1 ESG Scores**

We use three sources for ESG scores that are not only the most used by asset managers but also yield the most coverage when we match the individual firm ESG scores to the portfolio holdings. The first source is MSCI, which is based on 37 key issues corresponding to one of ten macro themes. The key issues are selected annually for each of the 156 GICS subindustries and weighted according to MSCI's materiality-mapping framework. MSCI uses sources such as annual reports, investor presentations, financial and regulatory filings, and NGO databases. Similarly, risk-management and opportunity-related data are culled from corporate documents, government data, news media, relevant organizations and professionals, and an assortment of popular, trade, and academic journals. MSCI also engages in direct communication with companies and invites them to participate in a data-review process, which includes commenting on the accuracy of firm data. MSCI aggregates the data to an overall score, in which each issue is weighted according to assessed materiality in each industry. The final score ranges from 0 to 10.

The second source we use is Sustainalytics, which analyzes and rates the performance of companies across 42 comparable sub-industries. They identify key ESG issues based on analysis of a company's peer group and its broader value chain, review of the business model, and the key activities associated with environmental and/or social impacts. The organization then weights a comprehensive set of core and sector-specific metrics to determine a company's overall ESG performance with a score ranging from 0 (most negative) to 100 (most positive). Sustainalytics also assesses companies for their level of involvement in major controversies or incidents. Each controversy is categorized from Category 1 (low impact, posing negligible risk to the company) to Category 5 (severe impact, posing serious risk to the company), and linked to an area such as

business ethics, society and community, environmental operations, supply chain, product and service, employee, social supply chain, customer, governance, or public policy.

The last source we use is TruValue Labs (TVL), which tracks ESG-related information across thousands of companies daily. Specifically, the organization sources news from outside the focal firms, including from analyst reports, various media, advocacy groups, and government regulators. To increase transparency and validate the data, TVL enables users to track the original sources of the articles and events that inform the sentiment analysis for each specific issue. It aggregates such unstructured data from over 100,000 sources into a continuous stream of ESG data, and uses natural language processing to interpret semantic content to generate ESG scores that range from 0 (most negative) to 100 (most positive). In addition, TVL uses Sustainability Accounting Standards Board (SASB) classification to determine the materiality of ESG news and separately reports the material ESG score.

In addition to the rationale of comprehensive coverage, we use the three data vendors above because they are updated in a different manner. For example, MSCI and Sustainalytics are updated at least on an annual basis and also at the vendors' discretion when there are material events related to the firm. In contrast, TVL data is constructed at the firm-day level and updated when there is new ESG news about the firm. As such, we believe that using three scores would mitigate any potential issues with how frequently scores are updated, especially because most of our empirical design relies on a fund-quarter panel.

Relatedly, we explore the variation in ESG scores used in our paper, given the concern that ESG scores are sticky. When we use the MSCI Score as a proxy for firm-level ESG score, we find that 46% (58%) of the firms move out of the original quintile after one year (two years), suggesting that there is meaningful variation in firm-level ESG scores, contrary to popular belief. When we

use the Sustainalytics Score as a proxy for firm-level ESG score, we find that 31% (43%) of the firms move out of the original quintile after one year (two years). When we use the TruValue Labs Score as a proxy for firm-level ESG score, we find that 61% (68%) of the firms move out of the original quintile after one year (two years).

### 3.2 Fund and Voting Data

We follow the procedures suggested in Doshi et al. (2015) to obtain and match mutual fund data from the CRSP Survivor Bias-Free Mutual Fund Database and Thomson Financial. We use various fund-level variables (e.g., Lipper fund category, returns, number of funds in family, fund size, management fee, and fund age). We also use the Fama French Database to obtain factors to construct portfolio alpha. CAPM Alpha is the market-risk-adjusted quarterly excess return where the market beta is computed using the previous 60 month returns, and we require at least 36 months of the return data to be populated. Return is the quarterly return net of fees. As for voting data, we obtain mutual fund voting data from Institutional Shareholder Services (ISS). The data contains each mutual funds' voting record in shareholder meetings. We follow Dikolli et al.'s (2021) classification of the agenda item (see their Appendix A), classify each item into E, S, or G, and examine how PRI funds vote on shareholder proposals.

### 3.3 Descriptive Statistics

We obtain the list of UN PRI members from the PRI website ([www.unpri.org](http://www.unpri.org)) and hand-map the list to our CRSP Mutual Fund and ESG Scores dataset. As shown in Table 1, 246 investment management firms, 36 asset owners, and 39 data providers in the US are PRI signatories. We start from these 246 investment management firms, and exclude private-equity-

only and passive-only investment management firms. For our final sample, we have 448 active funds that represent 86 unique investment management firms.

Table 2 presents the summary statistics. Our main unit of observation is at the fund-quarter level, and the sample is constructed around the six quarters pre- and post-signing. Panel A provides information on fund-level ESG scores, which are computed as follows:

$$ESG_{iq} = \sum_s w_{isq} ESG_{sq}^{(stock)} \quad (1)$$

where  $w_{isq}$  is the portfolio weight of stock  $s$  for fund  $i$  in quarter  $q$  and  $ESG_{sq}^{(stock)}$  is the ESG score for stock  $s$  in quarter  $q$ .

Fund-level MSCI Score ranges from 0 to 10 and has a mean of 4.7 and a standard deviation of 0.7. Sustainalytics Score ranges from 0 to 100 and has a mean of 58.5 and a standard deviation of 5.0. TVL Score (TVL Material Score) ranges from 0 to 100 and has a mean of 52.0 (52.2) and a standard deviation of 6.2 (7.5). Total Controversies, which is the raw aggregate number (i.e., not value-weighted) of highly and severely controversial issues, has a mean of 4.1 and a standard deviation of 6.4. Dissent Management Recommendation, which is the proportion of agenda items for which a fund did not vote in line with the management recommendation, has a mean of 0.127 and a standard deviation of 0.548.<sup>5</sup>

We also present summary statistics of other fund-level characteristics. Fee (in annual percentage) has a mean of 1.04 and a standard deviation of 0.42. Fund flow is defined as follows:

$$Flow_{iq} = \frac{AUM_{iq} - AUM_{iq-1}(1+R_{iq})}{AUM_{iq-1}} \quad (2)$$

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<sup>5</sup> Voting variables are yearly variables, as most voting behavior should be concentrated in a single quarter when firms have annual meetings. Accordingly, the result that uses this variable as dependent variable is at the fund-year level.

where AUM is the AUM of the fund, and  $R_{iq}$  is the net return of fund  $i$  in quarter  $q$ .<sup>6</sup> Flow is winsorized at the 0.5% level, and has a mean of -0.01 and a standard deviation of 0.16. Return (net of fees) has a mean of 0.02 and a standard deviation of 0.09, and CAPM Alpha has a mean of -0.004 and a standard deviation of 0.028. On average, the log of fund size is 4.85, the age of a fund is 9.39 years, and a fund holds roughly 90 stocks. There are dummy variables indicating whether a fund is quant-driven (holding more than 100 stocks) and team-managed.<sup>7</sup> In our sample, 23% of funds in our sample are quant-driven and 66% are team-managed.

Panel B reports the correlation table. As documented in Berg et al. (2019), the correlation between ESG scores from different vendors is low. For example, the correlation between fund-level MSCI ESG Score and Sustainalytics ESG Score is only 0.07, and that between MSCI ESG Score and TVL ESG Score is 0.18. The correlation between # of Stocks Held and Total Controversies is 0.47, revealing, not surprisingly, that a portfolio is subject to more issues if it holds more stocks. The correlation between Quant Fund and # of Stocks Held is 0.57. Such high correlation naturally follows from our definition of quant funds. The correlation between  $\log(\text{Fund Size})$  and Fee (%) is -0.38, suggesting that larger funds charge less.

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<sup>6</sup> Flow is a function of return, as discussed in Section 3.2. Following the convention in prior literature, we require at least 36 months of return data during the previous 60 months to calculate fund alpha and return. This leads to lower sample size in tables that examine fund flows, returns, and alpha (Table 3 and 7E) versus those that examine fund-level ESG scores (all other tables).

<sup>7</sup> We could not find a well-received convention to account for quant funds. Among various methods, Beggs et al. (2019) suggest an identification strategy by performing textual analysis of mutual fund prospectuses. We view that applying such sophisticated methods is beyond the scope of this paper, but for robustness consider different thresholds (e.g., 50 or 200 stocks for Quant dummy).

## 4. Research Design and Results

### 4.1 Change in Flows Post PRI

We start our empirical investigation by verifying whether there are visible changes to fund flows after signing the PRI. Given that fund investors' ultimate decision is manifested through their capital allocation, this exercise would show how fund investors respond to fund managers' commitment to ESG. We estimate the following:

$$Dep\ Var_{iq} = \beta_1 Post_{iq} + time\ f.e. + fund\ f.e. + e_{iq} \quad (3)$$

$$Dep\ Var_{iq'} = \sum_{j=1}^6 \beta_j * I(q' = q+j) + time\ f.e. + fund\ f.e. + e_{iq'} \quad (4)$$

where the dependent variable is Flow from equation (2). Post equals 1 for the six quarters after signing the PRI, and 0 for the prior seven quarters.  $I(\cdot)$  is an indicator function, and  $q$  is the quarter during which fund  $i$  joins the UN PRI. We control for year-quarter fixed effects to mitigate the effect of any time-specific and fund-invariant omitted variables. We also control for fund (Wharton Financial Institution Center Number; WFICN) fixed effects to mitigate the effect of any fund-specific and time-invariant omitted variables.

Table 3 presents the results. Column 1 displays the results from equation (3). The coefficient estimate on Post is 0.049 (t-stat: 3.129), which suggests a 4.9% increase in fund flows per quarter post-signing the PRI versus the pre period. Column 2 presents the results from equation (4), which breaks down the post variable. The coefficient estimates on  $q+1$ ,  $q+2$ ,  $\dots$ ,  $q+6$  are 0.039 (t-stat: 1.714), 0.055 (t-stat: 2.782), 0.062 (t-stat: 1.927), 0.058 (t-stat: 2.667), 0.061 (t-stat: 2.500), and 0.049 (t-stat: 1.792), respectively. This shows that the fund inflow persists across all quarters of the post period in question.

## 4.2 Value-Weighted Fund-level ESG Score

Next, we examine whether signatories incorporate ESG by changing their portfolio holdings. Because a fund is a basket of individual assets, we view this as a natural start to examine whether a fund incorporates ESG, by observing the ESG factors of individual assets. Specifically, we create the fund-level ESG score in equation (1) and estimate (3) and (4) with the fund-level ESG score as the dependent variable. We present the results in Table 4 Panel A. Columns 1 and 2 present the results using MSCI ESG Score as the dependent variable. In column 1, the coefficient estimate on Post is -0.039 (t-stat: -1.284), and in column 2 the coefficient estimates on  $q + 1$ ,  $q + 2$ ,  $\dots$ ,  $q + 6$  are -0.022 (t-stat: -0.657), -0.022 (t-stat: -0.467), -0.009 (t-stat: -0.153), 0.006 (t-stat: 0.087), 0.024 (t-stat: 0.308), and 0.030 (t-stat: 0.357), respectively. This suggests that there is no meaningful change in fund-level ESG score post signing the PRI. Our findings are similar when we consider Sustainalytics (columns 3 and 4) and TVL ESG Scores (columns 5 and 6). We do not find any meaningful improvements in fund-level ESG score relative to the pre period.<sup>8</sup>

The aggregate ESG score in Panel A may not reflect an asset manager's specific focus on a focal ESG topic (e.g., a fund manager may focus on CO<sub>2</sub> emission rather than gender inequality). To partially address this issue, we use sub-ESG scores (i.e., score related to E, S, or G) in computing fund-level scores and estimate (3) and (4). We present the results in Table 4 Panel B. Columns 1 and 2 present results using MSCI Environmental Score as the dependent variable. In column 1, the coefficient estimate on Post is -0.075 (t-stat: -1.602), and in column 2 the coefficient estimates on  $q+1$ ,  $q+2$ ,  $\dots$ ,  $q+6$  are -0.059 (t-stat: -1.024), -0.051 (t-stat: -0.720), -0.035 (t-stat: -

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<sup>8</sup> One concern with the results above is whether six quarters post-signing is a pertinent time frame. In the current literature, there is little guidance on what the appropriate window of comparison should be. To address this concern, we try 4, 8, and 12 quarters. A shorter window would have a tighter identification but is at risk of not picking up any real effort, and a longer window would have a weaker identification but potential for picking up more effect. The inferences drawn from these tests are nearly identical to the main results presented, in that there is no increase in ESG performance, so we omit reporting them for brevity.

0.402), 0.004 (t-stat: 0.038), -0.010 (t-stat: -0.076), and 0.019 (t-stat: 0.129), respectively, which suggests that there are no meaningful changes in fund-level Environmental performance. We also consider MSCI Social and Governance Scores, Sustainalytics Environmental, Social, and Governance Scores, and TVL Materiality Score, but do not find any meaningful improvements (see columns 3-14). We note, however, that this test has limitations because different funds may have different focal ESG topics (e.g., a fund could be focused only on social issues), and we are only picking up how each fund performs on E, S, or G issues separately, and not how focused funds perform on their specific focal topic.

#### 4.3 Channels of ESG Incorporation

The value-weighted fund-level ESG score explored above is a first step to gauge PRI funds' follow-through, but it is limited in illuminating the details of ESG incorporation. For example, fund-level ESG score has three components (i.e., firm-level ESG score, share value, and fund holdings), and it is uncertain which of the components is driving the change in overall fund-level ESG score. With this in mind, we note that the two important ways in which an active manager can implement ESG are via (1) entry/exit (i.e., selling poor ESG performers and buying good ESG performers) and (2) engagement (i.e., influencing the behavior of firms held). In this section, we explore these two channels in more detail.

##### 4.3.1 Entry and Exit

We examine whether UN PRI signatories exercise entry and exit strategies. First, we examine ESG scores of entered and exited stocks. Specifically, we estimate equations (3) and (4) using the value-weighted average fund-level ESG scores of stocks that are entered and exited as

dependent variables. We present the results using equation (3) in Table 5 Panel A. The dependent variable in Columns 1-3 is the ESG score of stocks that are entered by PRI funds. The coefficient estimates on Post are -0.074 (t-stat: -1.679), 0.129 (t-stat: 0.394), and 0.231 (t-stat: 0.453) when using MSCI, Sustainalytics and TVL scores, respectively. This suggests that there are no meaningful improvements in the VW score of the stocks entered by PRI funds, and when MSCI score is considered, there is a small decrease that is statistically significant at the 10% level. The dependent variable in Columns 4-6 is ESG scores of stocks that are exited. The coefficient estimates on Post are -0.003 (t-stat: -0.057), 0.312 (t-stat: 0.839), and 0.109 (t-stat: 0.209) when using MSCI, Sustainalytics, and TVL, respectively. This suggests that there are no meaningful decreases in the VW score of the stocks exited by PRI funds. We omit the results using equation (4), as they are essentially identical to those using equation (3).

Second, we further examine whether signatories buy (sell) firms that are high- (low-) ESG performers. Specifically, we estimate equations (3) and (4) using the following dependent variables: (1) *# of Stocks > 75<sup>th</sup> Pct ESG Score/Total # of Stocks in Portfolio*, which is the number of stocks that are above the 75<sup>th</sup> percentile in the entire universe of stocks with available ESG scores during the specific quarter, divided by the total number of stocks in the portfolio; (2) *\$ Amt of Stocks > 75<sup>th</sup> Pct ESG Score/Total \$ Amt of Stocks in Portfolio*, which is the dollar amount of stocks that are above the 75<sup>th</sup> percentile in the entire universe of stocks with available ESG scores during the specific quarter, divided by the total number of stocks in the portfolio; (3) *# of Stocks < 25<sup>th</sup> Pct ESG Score/Total # of Stocks in Portfolio*, which is the number of stocks that are below the 25<sup>th</sup> percentile in the entire universe of stocks with available ESG scores during the specific quarter, divided by the total number of stocks in the portfolio; and (4) *\$ Amt of Stocks < 25<sup>th</sup> Pct ESG Score/Total \$ Amt of Stocks in Portfolio*, which is the dollar amount of stocks that are below

the 25<sup>th</sup> percentile in the entire universe of stocks with available ESG scores during the specific quarter, divided by the total number of stocks in the portfolio.

The results using equation (3) are presented in Table 5 Panel B. The coefficient estimates on Post are non-significant across all columns where we use data from different ESG vendors to make the cutoff for the 75<sup>th</sup> and 25<sup>th</sup> percentiles. This suggests that signatories do not buy (sell) high- (low-) ESG firms, at least on average. We omit the results using equation (4), as they are qualitatively identical to those using equation (3).<sup>9</sup>

Third, we examine whether PRI funds unload stocks with more controversies, because one prominent way to incorporate ESG would be through screening out potentially problematic firms.<sup>10</sup> We classify a firm as having an ESG controversy if the firm is in Sustainalytics' Category 4 (high impact, posing significant risk to the company) or Category 5 (i.e., controversies that have significant and severe risk to the company). Our classification follows Morningstar, which owns Sustainalytics, and classifies categories 1, 2, and 3 as negligible, minimal, and moderate risk to a company, respectively (see Garcia-Bernabeu et al. 2015). To test for this, we estimate equations (3) and (4) using a dependent variable of number of total controversies divided by the total number of stocks held.

The results are presented in Table 5 Panel C. We not only consider the total number of controversies (columns 1 and 2), but separate them into those related to environmental (columns 3 and 4), social (columns 5 and 6), and governance (columns 7 and 8). We find no evidence of a decrease in the number of controversies in the stocks held by PRI funds. In fact, we actually find

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<sup>9</sup> For robustness, we also consider whether PRI funds increase (decrease) holding stocks that are above (below) fund-level ESG score, but fail to find evidence consistent with this notion.

<sup>10</sup> Slide 6 of <https://www.unpri.org/listed-equity/listed-equity-snapshot-2017-2020/6541.article>

that PRI fund holdings experience a small increase in environmental controversies starting the third quarter post signing the PRI.<sup>11</sup>

Finally, for a similar reason we consider trends of firms that are in the bottom quartile of the PRI signatories' portfolios. If signatory funds are concerned about firms that are poor ESG performers, and if these firms are screened, the group of firms that are in the bottom of the portfolio's distribution may exhibit an improvement in ESG scores. We present the results in Table 5 Panel D and consider ESG scores from MSCI, Sustainalytics, and TVL. Across all columns, we do not observe any meaningful change in fund-level ESG scores. This result is robust to considering quintile and tercile as alternative cutoffs; we omit those analyses for brevity.

#### 4.3.2 Engagement

##### *4.3.2.1. Inducing ESG Improvements*

In this subsection, we examine whether UN PRI signatories seek to influence portfolio firm behaviors. For example, while funds can change their ownership stake quickly (as explored in the previous section), working with firms to alter their ESG behavior can take much longer. For instance, funds may first engage firms (e.g., via letter or phone call) before implementing an exit strategy. If so, it may take longer for consequent changes to be reflected in ESG scores. In addition, funds may exit the firm only if such influence efforts are unsuccessful or improvements are not realized. We implement the following tests as proxies for the possibilities above.

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<sup>11</sup> We also consider the aggregate number of controversies (without deflating it with the number of stocks held) as an alternative dependent variable. We do this to aggregate negative ESG events rather than presenting averages as in other tables in this paper. This approach may reveal how frequently PRI funds divest stocks with serious ESG issues. For example, regardless of the dollar amount of investment or the number of shares held, if a fund holds stocks with a significant issue, it could deteriorate their reputation as a socially responsible fund. Our results are very similar to the results in this table, and thus omitted for the sake of brevity.

First, we restrict our sample to firms held at the time of signing and for the subsequent eight quarters. We do this to account for the possibility that PRI signatories engage companies and induce ESG improvements (i.e., thus, only allowing ESG scores of those firms to vary). Specifically, we fix as constant the weight at the time of signing, so that fluctuations in market value do not affect fund-level ESG scores over time. We present the results estimating equations (3) and (4) in Table 6 Panel A. In general, we find no meaningful changes in ESG performance for firms held by signatories for a reasonable period after signing, but find weak evidence of improvement both in economic magnitude and statistical significance starting the fourth quarter, using MSCI data. We note, however, that this result is coupled with a slight decrease in ESG scores using TVL data. Overall, we conclude that there are no material improvements in ESG scores.

Second, we focus on changes in ESG scores for firms in the portfolios of PRI signatories that are large shareholders, because such signatories can exert more substantial influence. The 25<sup>th</sup>, 50<sup>th</sup>, and 75<sup>th</sup> percentile of a signatory's holdings as a percentage of the total shares outstanding are 0.035%, 0.175%, and 0.616%, respectively (not tabulated for brevity), so we consider the following thresholds: when a signatory holds more than (1) 0.616% (75<sup>th</sup> percentile), and (2) 1% of total shares outstanding. The results are presented in Table 6 Panel B. Again we find no evidence of ESG score improvements among the firms held by PRI funds that are large shareholders. In fact, when using the Sustainalytics score and the 75<sup>th</sup> percentile as the threshold, we find a small *decrease* in ESG performance.<sup>12</sup>

One potential concern with the design above could be that we are examining only cases in which a single PRI fund is a large shareholder. However, PRI funds can potentially coordinate

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<sup>12</sup> Passive funds can be large-block holders. We test whether firms held by passive funds exhibit ESG improvements. We note that the 25<sup>th</sup>, 50<sup>th</sup>, and 75<sup>th</sup> percentile of holdings are 0.075%, 0.375%, and 1.651%, respectively, and use the three thresholds, but again find no ESG improvements. We thus omit these results for brevity.

their efforts (Dimson et al. 2020), and/or firms held by more PRI funds may feel more pressure to engage in ESG issues. Although our research question is to examine fund-level follow-through, it would be worthwhile to construct aggregate PRI fund holdings during a particular quarter and examine the impact on firm ESG performance in the subsequent quarter. To examine this, we aggregate PRI holdings at the firm level and use the following specification:

$$Firm\ ESG\ Score_{kt} = \beta_1 PRI\ Holdings_{kt-1} + Controls + time\ f.e. + firm\ f.e. + e_{kt} \quad (5)$$

where Firm ESG Score at time t is the firm-level ESG score from MSCI, Sustainalytics, or TVL. PRI Holdings at time t-1 (i.e., lag PRI holding) is the aggregate PRI holdings during the prior time period. Controls include the following variables. Size is the log of market capitalization. MTB is market value over book value of equity. ROE is defined as net income over average shareholder equity. Leverage is long-term debt plus current debt over the average of total assets of the current and previous year. CAPEX/PPE is capital expenditure divided by property, plant, and equipment. SG&A/Sales is selling, general, and administrative expense over sales. R&D/Sales is R&D expense over sales. We build two panels for robustness: firm-quarter and firm-year. We also use time (firm) fixed effect to control for time-specific and firm-invariant (firm-specific and time-invariant) characteristics.

The results are presented in Table 6 Panel C. In columns (1)-(3) we use firm-quarter panel, and in columns (4)-(5) we use firm-year panel. Across all columns, we fail to find a statistically positive coefficient for lag PRI Holdings. Overall, we conclude there are no notable improvements in ESG performance among firms held by PRI signatory funds with meaningful influence.

#### 4.3.2.2. Voting

Next, we examine how funds vote, because voting is another critical mechanism for active engagement (Dimson et al. 2015). For example, a Catholic fund purchased shares of Sturm Ruger, a firearm manufacturing company, and demanded substantial changes in the firm’s business model through shareholder proposals.<sup>13</sup> To test for such a possibility, we construct a fund-year panel instead of a fund-quarter panel because voting is concentrated in a single quarter when firms have annual meetings. We evaluate whether signatories voice their opinion using the following:

$$Dep\ Var_{iy} = \beta_1 Post_{iy} + time\ f.e. + fund\ f.e. + e_{iy} \quad (6)$$

$$Dep\ Var_{iy'} = \sum_{j=1}^2 \beta_j * I(y' = y+j) + time\ f.e. + fund\ f.e. + e_{iy'} \quad (7)$$

The dependent variable is Dissent Management Recommendations, which represents the proportion of agenda items for which a fund did not vote in line with management’s recommendations. If a fund did not vote, the variable would equal 0. Post equals 1 during the two years post-signing the PRI and 0 during the years of and prior to signing.  $I(\cdot)$  is an indicator function, and  $y$  is the year during which fund  $i$  joins the UN PRI for the fund-year panel. We control for year fixed effect to mitigate the effect of any year-specific and fund-invariant omitted variables, and also include fund fixed effect as in equations (3) and (4).

As mentioned in Section 3.2, we focus on shareholder proposals. This is because proposals that reach the voting stage are those for which managers and shareholders did not reach an agreement, and hence became agenda items. Dikolli et al. (2021) suggest that the ESG issues in the voting agenda of shareholder proposals are issues raised by shareholders to induce managers to make positive ESG-related changes. Indeed, firm managers vote against more than 98% of shareholder proposals in our dataset. In essence, the dependent variable “Dissent Management

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<sup>13</sup> *NY Times*. May 2018. Sturm Ruger Shareholders Adopt Measure Backed by Gun Safety Activists.

Recommendations” captures when PRI funds are voting for (i.e., supporting) pro-ESG shareholder proposals, as management almost always votes against them.

In Table 6 Panel D, the coefficient estimates on Post for All Issues, Environmental Issues, Social Issues, and Governance Issues are -0.057 (t-stat: -2.334), -0.014 (t-stat: -0.838), -0.028 (t-stat: -1.243), and -0.094 (t-stat: -2.820). This suggests that PRI funds generally do not support pro-ESG proposals more than in the pre period, and that this effect is driven by their votes on governance proposals. In untabulated tests, we also use alternative definitions of ESG shareholder proposals using the classification, SRI, in the ISS dataset. Again, we do not find evidence that PRI funds support pro-ESG proposals more than in the pre period. We view our result as complementing a working paper by DeGroot et al. (2021) which shows that passive PRI managers do not vote in favor of ESG proposals.

#### 4.4 Additional Test

##### 4.4.1 PRI Fund’s ESG Performance Prior to Joining

Thus far, we have found no meaningful follow-through from PRI funds. However, a fund may want to sign the PRI only when it is already a high-ESG-performance fund, and hence easily PRI-compliant. For example, prior to joining the PRI a fund might have had policies in place to sell an ESG-problematic investment proactively. To examine this possibility, we conduct two tests. First, we consider placebo pre windows that end earlier (e.g., ending one year and two years before signing), to exclude any anticipatory actions. If signatories improved ESG performance in anticipation, we would observe a meaningful increase in ESG performance when we use these alternate pre periods. We perform all tests conducted in Tables 4-6 using the two pre periods. We fail to find evidence consistent with any anticipatory action, and use Table 7 Panels A-D to present

some exemplary results using the pre period that ends one year before signing (i.e., results on fund-level ESG score, voting, controversies, bottom ESG performers).

Second, we compare the initial fund-level ESG scores of PRI signatories to those of other funds. For example, some signatories, especially those that sign early, may be true believers in ESG, while others might join subsequently for marketing purposes. In Figure 2 Panels A, B, and C, we use fund-level ESG scores from MSCI, Sustainalytics, and TVL, respectively, and compare PRI funds' ESG score at the time of signing across time to those of the following groups of funds: (1) propensity-matched set of control funds as in difference-in-differences test (see Section 4.6.3 for details), and (2) all non-signatory active funds. We find no evidence that PRI signatories are superior performers on ESG issues at the time of signing. In addition, early joiners do not exhibit a substantially higher fund-level ESG score than late joiners.

#### 4.4.2 Fund Returns

Next, we examine whether there are meaningful changes to PRI funds' portfolio returns. Through this analysis, we address the following possibility: PRI funds may prioritize generating fund returns over ESG performance. Given that mutual fund managers are bound by their fiduciary duty to put clients' financial interests first, such an argument is plausible, for example, because there is disagreement regarding the value-relevance of ESG and also a lack of training on ESG issues among managers (Khan et al. 2016; CFA Institute Survey, 2017). These factors may result in minimal ESG follow-through.

The results are presented in Table 7 Panel E. In columns 1 and 2, we use CAPM Alpha as the dependent variable. Interestingly, we find a general decrease in fund-level alpha after funds sign the UN PRI. For example, the coefficient estimate on Post is -0.003 (t-stat: -1.017) and the

estimates on  $q+1$ ,  $q+2$ ,  $\dots$ ,  $q+6$  are -0.003 (t-stat: -1.026), -0.007 (t-stat: -1.829), -0.004 (t-stat: -0.960), -0.009 (t-stat: -2.017), -0.011 (t-stat: -2.307), and -0.013 (t-stat: -2.804), respectively. Our finding of no improvement in fund returns remain unchanged when we add  $\log(\text{Fund Size})$  to control for diseconomies of scale (Berk and Green 2004), and when we use Fund Return as an alternative dependent variable. Our results are robust to using alpha from the three-factor model by Fama and French (1993) and the four-factor model by Carhart (1997) as dependent variables. We omit these results for brevity. In sum, this set of findings suggests that signatory funds experience a decrease in alpha post-signing while enjoying an increase in fund flow (Table 3) without notable improvements in ESG performance (Table 4-6).

#### 4.5 Exploring Cross-Sectional Fund Characteristics

##### 4.5.1 Who Changes ESG Performance and Who Gets the Money?

Our results so far reflect on-average effects. Hence, in this subsection we examine whether cross-sectional fund characteristics influence funds to incorporate ESG. We consider the following specification:

$$Dep\ Var_{iq} = \beta_1 Post_{iq} * Fund\ Dummy_i + \beta_2 Post_{iq} + \beta_3 Fund\ Dummy_i + time\ f.e. + e_{iq} \quad (8)$$

We focus on two dependent variables: Fund Flow and Fund-level ESG Performance. For Fund Dummy, we use indicators of whether a fund is a quant fund, small fund, high-fee fund, team-managed fund, or a fund with high ESG score during the six quarters prior to signing the UN PRI. Quant funds are those that hold more than 100 stocks in the portfolio, and team-managed funds are those managed by multiple portfolio managers. Other variables are equal to 1 if the fund is above the average fund with regard to the characteristics considered. We consider the variables above for the following reasons. Quant funds, for example, may have an advantage implementing

ESG issues because ESG investing has mainly been carried out using signals to create long/short portfolios rather than through fundamental analysis (Khan et al. 2016). Similarly, funds with higher fees and larger AUM may improve ESG performance as they have more resources to devote to ESG issues. Team-managed funds, on one hand, may have difficulty agreeing on details of ESG implementation, but on the other may also be more open to diverse opinions. Finally, funds with lower pre-period ESG performance may have to play catch-up as they have not previously committed to ESG implementation.

We report the results from this specification in Table 8. In Panel A, we find that quant funds exhibit higher fund-level MSCI and TVL ESG scores post-signing the PRI compared to non-quant funds. Specifically, when using MSCI as a proxy for ESG, the coefficient estimates on Post\*Quant Fund, Post, and Quant Fund are 0.079 (t-stat: 2.256), -0.057 (t-stat: -2.045), and 0.028 (t-stat: 0.553), respectively. When using TVL as a proxy for ESG, the coefficient estimates on Post\*Quant Fund, Post, and Quant Fund are 0.579 (t-stat: 1.773), -0.338 (t-stat: -1.073), and -0.037 (t-stat: -0.106), respectively. However, quant funds do not attract more flows post-signing versus the control group.

We make two additional observations. First, we note that the economic magnitude may be too small, given that average fund-level MSCI and TVL scores are 4.684 and 51.964, respectively. Second, we note that quant funds are not necessarily improving ESG scores relative to the pre period (i.e., the F-stats on Post\*Quant Fund+Post are non-significant for both MSCI and TVL scores), but they perform better during the post period than the non-quant funds.

In Panels B-E, we consider fund size, fee, team-managed status, and pre-period ESG score as cross-sectional covariates. We find that small funds and high-fee funds are more likely to attract more fund flows, but do not find these characteristics to positively influence fund-level ESG

performance post-signing. Last, we do not find prior ESG scores to positively influence fund flow or fund-level ESG performance. This result indicates that asset allocators do not emphasize ESG performance when making capital allocation decision.

#### 4.5.2 Analyzing Quant Funds

In the previous subsection, we presented evidence that quant funds make small but statistically significant improvements to fund-level ESG scores versus non-quant funds. In this subsection, we explore potential mechanisms used by quant funds to improve fund-level ESG scores compared to the control group. We explore all channels considered so far (i.e., channels presented in Tables 5 and 6) and find evidence that quant funds improve fund-level ESG scores through buying high-ESG-performers.

Table 9 presents the results. In columns 1-6, we examine whether quant funds buy high-ESG-performers. When using MSCI score to identify the number of stocks above the 75<sup>th</sup>-percentile ESG score, the coefficient estimates on Post\*Quant Fund, Post, and Quant Fund are 0.021 (t-stat: 2.274), -0.017 (t-stat: -2.325), and -0.013 (t-stat: -0.721), respectively. When using TVL score to identify the number of stocks above the 75<sup>th</sup>-percentile ESG score, the coefficient estimates on Post\*Quant Fund, Post, and Quant Fund are 0.011 (t-stat: 2.331), -0.004 (t-stat: -0.870), and -0.004 (t-stat: -0.415), respectively. In both cases, the F-stats on Post\*Quant Fund+Post+Quant Fund are statistically significant, at the 5% and 10% levels, respectively. Though the effect is small in economic magnitude, this suggests that quant funds increase the number of stocks that are high-ESG-performers relative to both the pre period and the control group. We note that our results hold only for MSCI and TVL ESG Scores, which is consistent with the results in Table 8 Panel A.

Next, we use the dollar amount instead of the number of stocks as a proxy for high- and low-ESG-performers. Our results are broadly similar to those above, but when we use MSCI score, the F-stats on Post\*Quant Fund+Post+Quant Fund are non-significant. This suggests that PRI quant funds increase the dollar amount of stocks that are high-ESG-performers relative to the pre period as well as to the control group only when using TVL score as the proxy. Overall, we view our results as weak evidence that quant funds exhibit improvements in ESG performance through buying high-ESG-performers. Finally, in columns 7-12, we examine whether quant funds sell poor-ESG-performers, but find no evidence consistent with the notion. Finally, we omit the results that explore other channels because none is significant.

#### 4.6 Additional Tests and Caveats

##### 4.6.1 Determinants Test

In this subsection, we examine which asset manager (i.e., fund family) characteristics increase the likelihood for a manager to sign the PRI. We note that the decision to sign the PRI is made at the asset manager level, not at the fund level. As such, we view this test as complementary to our previous findings but not as informing those results. We build an asset manager-quarter panel and use the hazard model to understand which characteristics influence a non-PRI asset manager to sign. We separate non-PRI asset managers until quarter q-1 and then estimate the following:

$$Pr(\text{Sign } PRI_{jq} = 1) = h(a + b * \text{Asset Management Firm Characteristics}_{jq} + \text{time f.e.}) \quad (8)$$

where  $h(\cdot)$  is the Cox proportional hazard function and  $\text{Sign}PRI_{jq}$  equals 1 if an asset management firm  $j$  signs the UN PRI in quarter  $q$ .

We use the following asset management firm characteristics as covariates. # Funds in Family is the number of funds in the fund family. We consider this variable because when an asset manager launches a fund, the fund is typically financed by one client investor (asset owner). As a result, when an asset manager has multiple funds, it will have a more diverse client investor base. If so, there is a higher likelihood that one of the clients will be an advocate for ESG issues (e.g., a large pension fund like Norwegian Sovereign Wealth Fund, which prioritizes ESG), which may push the asset management firm to sign the PRI. Similarly, an asset management firm with a low number of funds in the family may be less likely to sign the PRI, given the higher likelihood that it will be influenced by one client (or a small number of clients) who may not care about ESG issues. We also control for Listed status, which indicates whether the asset management firm is publicly listed, as listed asset managers may be sensitive to public attention and often have larger client investors (i.e., pension funds likely to care about ESG).

We also add the following variables. First is the Size of Fund Family, which is the log of the value-weighted fund size of the fund family. This variable would capture the amount of resources that funds can allocate to pursue ESG issues. Second is the ESG Score of the Fund Family, which is the value-weighted score of respective fund-level ESG scores according to their market capitalization at quarter's end, as signatories could be superior performers in ESG before signing the PRI. Third is the CAPM Alpha of the Fund Family, which is the value-weighted CAPM Alpha of the fund family, as managers who believe in their expertise to generate higher returns may be more likely to sign the PRI (Bansal et al. 2018). Fourth is the Fee (%) of Fund Family, which is the value-weighted average annual management fee of the fund family, as managers with lower management fees may face more competition and may be more likely to sign the PRI to attract more capital (Roussanov et al. 2018). Fifth is All Quant Only, which indicates when all

funds in the fund family are quant funds (i.e., have more than 100 stocks in the portfolio). Finally, we control for Age of the Family, which is the age of the fund family's oldest fund, as older and conventional asset management firms may be slower to embrace ESG, as it is a more recent phenomenon. We do not use asset manager fixed effect to explore the variation in asset management firm-level characteristics that explain why they sign the UN PRI.

Appendix Table A3 presents the results. In columns 1-3, we use ESG Scores from MSCI, Sustainalytics, and TruValue Labs, respectively. Across the three columns, we find that asset management firms with more funds in the family are more likely to sign the PRI. This supports the notion that for asset management firms with a greater number of funds, there is a higher likelihood that some clients will be advocates for ESG issues, which may push the asset management firm to sign the PRI. In addition, we find that asset managers who charge a lower fee and those that are listed are more likely to seek publicity and capital using their PRI status.

#### 4.6.2 Penalizing Firms with Missing ESG Scores

Thus far, we assigned the average score of the portfolio to stocks with missing firm-level ESG scores. However, as Giglio and Shue (2014) argue, information disclosure is endogenously determined, and no information on ESG may be considered a negative signal by the market. To account for this, we assign the lowest possible score to firms with missing ESG scores and recreate fund-level ESG scores. We again find no evidence of ESG improvement (see Online Appendix Table OA1).

### 4.6.3 Difference-in-differences Specification

In our main specification, we use fund and time fixed effects and conduct a within-fund and time design to show that PRI signatories do not make significant improvements to ESG. One may think that it would be helpful to find a group of funds that are similar to PRI signatory funds and show that our documented effect holds with regard to these non-PRI funds. Thus, we conduct propensity score matching without replacement to identify non-PRI signatories that are similar in fund size and in the same Morningstar fund category as the signatories at their time of signing, using a caliper of 0.01.<sup>14</sup> Then, we estimate the following difference-in-differences specification:

$$ESG_{iq} = \beta_1 Treat_i * Post_{iq} + \beta_2 Post_{iq} + time\ f.e. + fund\ f.e. + e_{iq} \quad (9)$$

where all variables are defined as in previous specifications and  $Treat_i$  equals 1 for PRI signatory funds and 0 for propensity-score-matched non-PRI active funds.

In Online Appendix Table OA2 Panel A, we first show the covariate balance. Interestingly, we find that signatories are worse performers on ESG issues prior to joining the UN PRI versus non-signatories. This is robust with regard to ESG scores from all of the vendors. We want to highlight that this is a direct contradiction to a notion that PRI signatories may be better ESG performers. Next, we note that matching leads to substantially lower fund-level ESG scores when compared to the entire sample. Specifically, both PRI and non-PRI funds exhibit an average MSCI ESG Score around 3 after we conduct matching, but unmatched PRI funds in Online Appendix Table OA2 Panel B exhibit an average MSCI ESG Score of 4.7.

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<sup>14</sup> To the best of our knowledge, there is no theoretical guidance on which covariates to include because assessing fund-level ESG performance is a nascent area. We add fund size as it would likely be correlated with the resources available to fund managers to analyze ESG information. We also add fund category to compare funds with similar strategies. However, we acknowledge potential debates may focus on what the correct control group should be, which is a key reason we use the within-fund design for our empirical analysis.

We note that the two working papers mentioned earlier (Gibson et al. 2020 and Liang et al. 2020) compare PRI and non-PRI funds, but both use *all* non-PRI funds as a control group without addressing in detail the comparability of these two fund groups. If there are covariates that may drive fund-level ESG performance, their results may have to be interpreted with caution. In contrast, we use the specification without a control group (e.g., equation 3) as our main specification, because there is substantial discretion involved in the matching process. Regardless, results from difference-in-differences model are similar to our main results (see Panel B).<sup>15</sup>

#### 4.6.4. Caveats

We acknowledge several caveats related to our work. First, while we consider many dimensions of ESG implementation, we cannot capture every channel that asset managers implement, such as private engagements (Grewal et al. 2016). Relatedly, our assessment of PRI funds' ESG follow-through is based on output measures, and thus we cannot observe the inputs or motivations of funds. Second, at least in more recent years, some asset managers may have their own proprietary ESG scoring systems and methodologies to evaluate firms' ESG efforts. Unfortunately, our empirical design cannot capture such efforts, which are not disclosed. Third, we note that signing with the UN PRI is voluntary and aspirational, and there could be concerns regarding which outcomes are most appropriate to assess follow-through, due to the vagueness of the principles. In addition, the ESG scores that we use are confounded by noise and subjectivity.

To alleviate such concerns as best we can, we consider as many observable outcomes and mechanisms as possible here. Last, we note that the PRI is committing to pursue greater ESG-

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<sup>15</sup> The inference from our results is identical even when we add other covariates such as fund fee, fund age, and return to our matching process. We choose to match just on fund size and fund category, as this method provides the greatest number of observations and is the cleanest specification.

related disclosure from firms (see Appendix 1 Panel B, PRI Principle 3). ESG disclosure is related to the ESG performance scores we use in our paper because these scores are often based on firm-initiated ESG disclosure. However, we do not analyze firm disclosure directly here, and acknowledge that it may be an area that PRI funds could be pursuing.

#### 4.6.5. Further Discussion

One question that may arise from our findings is why investors do not respond to PRI funds' "cheap talk" related to ESG by pulling out their capital. Our views on this are as follows. It is well-documented that investors respond quite slowly in general, even to financial performance. Granted, in the rational benchmark model of Berk and Green (2004, JPE), the flow responds to the benchmark-adjusted returns immediately, such that benchmark-adjusted returns in a given month do not affect future flow at all. However, recent empirical analyses by Berk and van Binsbergen (2016, JFE) and Barber, Huang, and Odean (2016, RFS) find that the flow responds not only to recent performance but also to more distant performance up to at least prior six quarters.

The slow response of investors remains an important puzzle in the mutual fund literature, and no theoretical model has successfully explained it. If investors respond to financial performance slowly, it is not surprising that they respond similarly to ESG performance. For monetary performance, at least, investors can observe performance by looking at the market value of their holdings. In contrast, it is much more difficult for investors to evaluate ESG performance of fund managers, given the lack of consensus around ESG metrics.

We believe that what we document in Table 3 (i.e., no change in investor (asset owner) attitude after six quarters) is consistent with the findings of the aforementioned papers as well as recent anecdotal evidence, including the famous Blackrock whistleblowing case where the head

of sustainable investing admitted publicly that the firm did not have much ESG follow-through. That admission was made public only in March 2021, and reportedly came as a big shock to asset owners and regulators. We believe that such high-profile shocks and research like ours will eventually motivate asset owners to pay more attention to monitoring of ESG funds, though that news was unlikely sufficient to shift the equilibrium during our sample period.<sup>16</sup>

## **5. Conclusion**

In this paper, we use the United Nations Principles for Responsible Investment to empirically assess whether signatory funds engage in meaningful follow-through on ESG issues. Based on ESG outcome measures, we summarize our findings broadly as follows. First, we find that signatory funds experience a large fund inflow, and note that this increase in fund flow happens regardless of prior fund-level ESG performance. Second, PRI funds on average do not exhibit improvements in fund-level ESG scores post-signing, and this result is robust to analyzing many facets of ESG implementation and execution. Third, PRI funds exhibit no improvements in portfolio return and alpha. Last, and critically, given that the findings above reflect on-average effects, we examine cross-sectional fund characteristics and find that quant-driven funds improve fund-level ESG performance post-signing versus non-quant funds: specifically, they buy high-performing-ESG stocks. Overall, a reasonable reader may perceive our findings to be consistent with PRI funds' greenwashing, at least on average. Still, we acknowledge the possibility of genuine ESG incorporation from some signatories and note that our results reflect only outcome-based measures and do not capture the actual efforts of signatories.

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<sup>16</sup> Bloomberg. March 23, 2021, Former Blackrock Executive Blows Whistle on Greenwashing.

Environmental, social, and governance (ESG) has been a controversial topic, but also been one of the fastest-growing business phenomena in recent times. Much effort has been paid (e.g., EU Taxonomy of Harmonizing ESG taxonomy and UN Global Compact to be more ESG-focused signed by more than 9,500 listed companies) not only to better understand ESG but also to increase comparability and transparency. We believe that our paper has large implications for these movements. Overall, we hope that our findings call on regulators to engage in greater scrutiny of asset managers' ESG execution, on asset owners to be more aware of the capital allocation process, and on asset managers to provide more transparent communications on their ESG incorporation. We are optimistic that future research in this domain would eventually extend to other asset classes such as fixed income and private equity, as well as to other global markets, as more data becomes available in this space.

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## Table 1 Sample Selection

### Panel A. By Signatory Type

Signatory Type	# of Asset Managers
Investment Management Firms	246
Asset Owners	36
Data Service Providers	39

### Panel B. By Fund Type

	# of Asset Managers	# of Funds
Total UN PRI Investment Management Firms	246	
(Less: Private Equity)	-83	
(Less: Passive Managers)	-68	
(Less: Active Funds without ESG data)	-9	
Active Funds	86	448

### Panel C. By Year

Year	# of New Asset Managers	# of New Funds
2008	6	24
2009	6	33
2010	5	17
2011	4	25
2012	11	40
2013	8	92
2014	7	50
2015	18	78
2016	9	50
2017	11	38
2018	1	1
Total	86	448

**Table 2 Descriptive Statistics**

## Panel A. Summary Statistics

	N	Mean	S.D.	25%	50%	75%
<b>Fund Level ESG Performance</b>						
MSCI ESG Score	3,617	4.684	0.690	4.377	4.621	5.008
Sustainalytics ESG Score	3,451	58.518	4.953	55.000	58.834	62.106
TVL ESG Score	4,041	51.964	6.233	50.153	52.146	54.072
TVL Material ESG Score	4,015	52.154	7.491	49.928	52.225	54.890
Total Controversies	3,451	4.127	6.380	0.000	2.000	5.000
Dissent Management Recommendations*	1,521	0.127	0.548	0.000	0.000	0.000
<b>Other Variables</b>						
Fee (%)	1,906	1.044	0.421	0.780	1.000	1.307
Flow	1,476	-0.009	0.164	-0.050	-0.024	0.005
Return	1,476	0.021	0.090	-0.012	0.033	0.081
CAPM Alpha	1,476	-0.004	0.028	-0.018	-0.004	0.010
log(Fund Size)	2,058	4.850	1.701	3.732	4.775	5.998
Age	5,245	9.386	9.773	2.000	6.000	14.000
# of Stocks Held	5,245	91.081	174.385	18.000	47.000	94.000
Quant	5,245	0.233	0.423	0.000	0.000	0.000
Team-Managed	5,245	0.663	0.473	0.000	1.000	1.000

This table presents summary statistics of the key variables used. The following variables are at the fund-quarter level. MSCI ESG Score, Sustainalytics ESG Score, TVL ESG Score, and TVL Material ESG Score are derived via value-weighting the respective firm-level ESG scores according to their holding value at quarter end. Total Controversies is the number of total controversies experienced by stocks held in a portfolio. Fee (%) is the annual management fee in percentage. Flow is the total AUM at the end of quarter minus last quarter's AUM times this quarter's return divided by last quarter's AUM. Return is the quarterly return net of fees. CAPM Alpha is the market-risk-adjusted quarterly excess return where the market beta is computed using the previous 60 month returns. log(Fund Size) is logarithm of fund size. Age is the fund age. # of Stocks Held is the number of stocks held in the portfolio. Quant indicates funds that have more than 100 stocks in the portfolio. Team-Managed indicates funds that are managed by a team of portfolio managers. Dissent Management Recommendations represents the proportion of agenda items for which a fund did not support management recommendations during the year. This variable is marked with an asterisk (\*) because it is a fund-year level construct.

Panel B. Correlation Table

	1	2	3	4	5	7	8	9	10	11	12	13	14	15	16
1 MSCI ESG Score	1.00														
2 Sustainalytics ESG Score	0.07	1.00													
3 TVL ESG Score	0.18	0.08	1.00												
4 TVL Material ESG Score	0.14	0.18	0.67	1.00											
5 Total Controversies	0.19	0.06	-0.01	-0.04	1.00										
6 Dissent Mgmt Recommendations	0.06	-0.02	0.02	0.01	0.03	1.00									
7 Fee (%)	-0.02	-0.19	0.07	0.11	-0.21	0.00	1.00								
8 Flow	-0.04	0.00	0.04	0.03	-0.05	-0.01	-0.02	1.00							
9 Return	0.01	0.01	0.05	0.05	0.08	0.01	-0.12	0.04	1.00						
10 CAPM Alpha	0.07	0.03	0.03	-0.02	0.06	0.02	-0.02	0.00	0.26	1.00					
11 log(Fund Size)	0.00	0.02	-0.08	-0.09	0.23	0.01	-0.38	-0.06	0.09	-0.02	1.00				
12 Age	0.09	-0.10	0.04	0.02	0.00	0.02	-0.14	-0.15	0.04	-0.02	0.35	1.00			
13 # of Stocks Held	0.00	-0.04	0.05	0.05	0.47	0.01	-0.24	0.02	0.06	0.02	0.19	-0.04	1.00		
14 Quant	0.00	-0.04	0.06	0.06	0.46	0.02	-0.18	0.03	0.04	0.02	0.22	-0.03	0.57	1.00	
15 Team-Managed	-0.02	0.03	-0.01	-0.02	0.07	0.03	0.08	0.05	-0.04	0.04	-0.09	-0.26	0.03	0.09	1.00

This table presents correlations among the key variables used. All variables are at the fund-quarter level. MSCI ESG Score, Sustainalytics ESG Score, TVL ESG Score, and TVL Material ESG Score are derived via value-weighting the respective firm-level ESG scores according to their holding value at quarter end. Total Controversies is the number of total controversies experienced by stocks held in a portfolio. Dissent Management Recommendations represents the proportion of agenda items for which a fund did not support management recommendations during the quarter. Fee (%) is the annual management fee in percentage. Flow is the total AUM at the end of quarter minus last quarter's AUM times this quarter's return divided by last quarter's AUM. Return is the quarterly return net of fees. CAPM Alpha is the market-risk-adjusted quarterly excess return where the market beta is computed using the previous 60 month returns. log(Fund Size) is logarithm of fund size. Age is the fund age. # of Stocks Held is the number of stocks held in the portfolio. Quant indicates funds that have more than 100 stocks in the portfolio. Team-Managed indicates funds that are managed by a team of portfolio managers.

**Table 3 Trend in Fund Flow**

	Flow	
<i>Post</i>	0.049*** [3.129]	
<i>q + 1</i>	0.039* [1.714]	
<i>q + 2</i>	0.055*** [2.782]	
<i>q + 3</i>	0.062* [1.927]	
<i>q + 4</i>	0.058*** [2.667]	
<i>q + 5</i>	0.061** [2.500]	
<i>q + 6</i>	0.049* [1.792]	
FE	Time and Fund	
Observations	1,476	1,476
R <sup>2</sup>	0.242	0.241

This table presents the results examining the change in fund flows. Flow is the total AUM at the end of quarter minus last quarter's AUM times this quarter's return divided by last quarter's AUM. Post indicates the six quarters post signing the PRI. *q+j* indicates the *j*-th quarter after signing the PRI. Time (fund) fixed effect indicates year-quarter (WFICN) fixed effect. T-stats are in brackets. Standard errors are robust to heteroskedasticity and clustered at the fund level. \*\*\*, \*\*, \* are statistically significant at the 1%, 5%, and 10% levels, respectively.

**Table 4 Trend in Fund-level ESG Performance**

Panel A. Trend in Fund-level Value-Weighted ESG Score

	MSCI		Sustainalytics		TVL	
<i>Post</i>	-0.039		0.031		0.086	
	[-1.284]		[0.128]		[0.188]	
<i>q + 1</i>	-0.022		0.048		-0.363	
	[-0.657]		[0.184]		[-0.768]	
<i>q + 2</i>	-0.022		-0.118		0.418	
	[-0.467]		[-0.334]		[0.755]	
<i>q + 3</i>	-0.009		-0.182		0.029	
	[-0.153]		[-0.402]		[0.043]	
<i>q + 4</i>	0.006		-0.122		-0.305	
	[0.087]		[-0.235]		[-0.408]	
<i>q + 5</i>	0.024		-0.128		-0.125	
	[0.308]		[-0.228]		[-0.150]	
<i>q + 6</i>	0.03		-0.311		-0.484	
	[0.357]		[-0.490]		[-0.541]	
FE			Time and Fund			
Observations	3,786	3,786	3,662	3,662	4,041	4,041
R <sup>2</sup>	0.795	0.796	0.877	0.877	0.536	0.538

This table presents the results from examining the trend in fund-level ESG performance. MSCI ESG Score, Sustainalytics ESG Score, and TVL ESG Score are value-weighted scores of respective firm-level scores according to their holding value at quarter end. *Post* indicates the six quarters post signing the PRI. *q+j* indicates the *j*-th quarter after signing the PRI. Time (fund) fixed effect indicates year-quarter (WFICN) fixed effect. T-stats are in brackets. Standard errors are robust to heteroskedasticity and clustered at the fund level. \*\*\*, \*\*, \* are statistically significant at the 1%, 5%, and 10% levels, respectively.

Panel B. Trend in Fund-level E, S, G Sub-score

	MSCI						Sustainalytics			TVL				
	Environmental		Social		Governance		Environmental		Social	Governance	Materiality			
<i>Post</i>	-0.075		-0.072		0.051		0.027		0.174		-0.256		-0.593	
	[-1.602]		[-1.416]		[0.822]		[0.082]		[0.600]		[-1.336]		[-1.344]	
<i>q + 1</i>	-0.059		-0.066		0.024		0.035		0.272		-0.273		-0.590	
	[-1.024]		[-1.043]		[0.388]		[0.098]		[0.869]		[-1.300]		[-1.184]	
<i>q + 2</i>	-0.051		-0.088		0.037		-0.124		-0.011		-0.302		-0.234	
	[-0.720]		[-1.117]		[0.488]		[-0.257]		[-0.027]		[-1.113]		[-0.413]	
<i>q + 3</i>	-0.035		-0.097		0.030		-0.194		-0.141		-0.225		0.199	
	[-0.402]		[-0.962]		[0.309]		[-0.317]		[-0.266]		[-0.626]		[0.289]	
<i>q + 4</i>	0.004		-0.096		-0.035		-0.013		-0.074		-0.224		0.283	
	[0.038]		[-0.762]		[-0.306]		[-0.019]		[-0.122]		[-0.535]		[0.339]	
<i>q + 5</i>	-0.010		-0.089		-0.016		-0.029		-0.035		-0.247		0.452	
	[-0.076]		[-0.624]		[-0.133]		[-0.038]		[-0.053]		[-0.511]		[0.451]	
<i>q + 6</i>	0.019		-0.100		-0.033		-0.373		-0.126		-0.343		0.497	
	[0.129]		[-0.626]		[-0.239]		[-0.428]		[-0.168]		[-0.627]		[0.435]	
FE	Time and Fund													
Observations	3,786	3,786	3,786	3,786	3,786	3,786	3,662	3,662	3,662	3,662	3,662	3,662	4,015	4,015
R <sup>2</sup>	0.792	0.792	0.713	0.713	0.735	0.736	0.89	0.891	0.852	0.852	0.837	0.837	0.579	0.580

This table presents the results from examining the trend in fund-level ESG performance. MSCI Environmental Score, Social Score, Governance Score, Sustainalytics Environmental Score, Social Score, Governance Score, TVL Materiality Score are value-weighted scores of respective firm-level scores according to their holding value at quarter end. Post indicates the six quarters post signing the PRI. q+j indicates the j-th quarter after signing the PRI. Time (fund) fixed effect indicates year-quarter (WFICN) fixed effect. T-stats are in brackets. Standard errors are robust to heteroskedasticity and clustered at the fund level. \*\*\*, \*\*, \* are statistically significant at the 1%, 5%, and 10% levels, respectively.

**Table 5 ESG Incorporation through Change in Holdings**

Panel A. VW Scores of Entered/Exited Stocks

	VW Score of Entered Stocks			VW Score of Exited Stocks		
	MSCI	Sustainalytics	TVL	MSCI	Sustainalytics	TVL
Post	-0.074*	0.129	0.231	-0.003	0.312	0.109
	[-1.679]	[0.394]	[0.453]	[-0.057]	[0.839]	[0.209]
FE			Time and Fund			
Observations	3,257	3,130	3,524	3,026	2,878	3,286
R-squared	0.579	0.660	0.400	0.493	0.598	0.320

This table presents the results from examining the trend in fund-level ESG performance. MSCI ESG Score, Sustainalytics ESG Score, and TVL ESG Score are value-weighted scores of respective firm-level scores according to their holding value at quarter end. Post indicates the six quarters post signing the PRI. Q+j indicates the j-th quarter after signing the PRI. Time (fund) fixed effect indicates year-quarter (WFICN) fixed effect. T-stats are in brackets. Standard errors are robust to heteroskedasticity and clustered at the fund level. \*\*\*, \*\*, \* are statistically significant at the 1%, 5%, and 10% levels, respectively.

Panel B. Buying (Selling) Tendency of High (Low) ESG Performers

	(# of Stocks>75th Pct ESG Score)/ Total # of Stocks in Portfolio			(\$ Amt of Stocks>75th Pct ESG Score)/ Total \$ Amt of Portfolio			(# of Stocks<25th Pct ESG Score)/ Total # of Stocks in Portfolio			(\$ Amt of Stocks<25th Pct ESG Score)/ Total \$ Amt of Portfolio		
	MSCI	Sustainalytics	TVL	MSCI	Sustainalytics	TVL	MSCI	Sustainalytics	TVL	MSCI	Sustainalytics	TVL
Post	-0.004 [-0.502]	0.002 [0.226]	-0.002 [-0.371]	-0.006 [-0.712]	-0.001 [-0.149]	-0.003 [-0.537]	0.002 [0.356]	0.009 [1.003]	-0.007 [-0.395]	0.003 [0.471]	0.007 [0.783]	-0.004 [-0.202]
FE												
Observations	3,786	3,662	4,041	3,786	3,662	4,041	3,786	3,662	4,041	3,786	3,662	4,041
R-squared	0.766	0.826	0.517	0.728	0.830	0.551	0.642	0.730	0.510	0.619	0.736	0.518

This table presents the results from examining whether signatories buy high- and sell low-ESG performers. # of Stocks > 75<sup>th</sup> Pct ESG Score/Total # of Stocks in Portfolio is the number of stocks that are above 75<sup>th</sup> percentile in ESG score in the entire universe of stocks with available ESG scores during the specific quarter divided by the total number of stocks in portfolio. \$ Amt of Stocks > 75<sup>th</sup> Pct ESG Score/Total \$ Amt of Stocks in Portfolio is the dollar amount of stocks that are above 75<sup>th</sup> percentile in ESG score in the entire universe of stocks with available ESG scores during the specific quarter divided by the total dollar amount of stocks in portfolio. # of Stocks < 25<sup>th</sup> Pct ESG Score/Total # of Stocks in Portfolio is the number of stocks that are below 25<sup>th</sup> percentile in ESG score in the entire universe of stocks with available ESG scores during the specific quarter divided by the total number of stocks in portfolio. \$ Amt of Stocks < 25<sup>th</sup> Pct ESG Score/Total \$ Amt of Stocks in Portfolio is the dollar amount of stocks that are below 25<sup>th</sup> percentile in ESG score in the entire universe of stocks with available ESG scores during the specific quarter divided by the total dollar amount of stocks in portfolio. Post indicates the six quarters post signing the PRI. q+j indicates the j-th quarter after signing the PRI. Time (fund) fixed effect indicates year-quarter (WFICN) fixed effect. T-stats are in brackets. Standard errors are robust to heteroskedasticity and clustered at the fund level. \*\*\*, \*\*, \* are statistically significant at the 1%, 5%, and 10% levels, respectively.

Panel C. Trend in Fund-level ESG Controversy

	Total Controversies/ Stocks Held		Environmental Controversies/ Stocks Held		Social Controversies/ Stocks Held		Governance Controversies/ Stocks Held	
<i>Post</i>	-0.009		-0.002		-0.005		-0.001	
	[-1.336]		[-0.647]		[-1.301]		[-1.481]	
<i>q + 1</i>		-0.005		-0.000		-0.004		-0.001
		[-0.822]		[-0.074]		[-0.885]		[-0.741]
<i>q + 2</i>		-0.007		0.001		-0.007		-0.001
		[-1.105]		[0.542]		[-1.541]		[-0.943]
<i>q + 3</i>		-0.001		0.004*		-0.004		-0.001
		[-0.195]		[1.661]		[-0.838]		[-0.521]
<i>q + 4</i>		0.004		0.007**		-0.003		0.001
		[0.553]		[2.291]		[-0.450]		[0.472]
<i>q + 5</i>		0.005		0.008**		-0.003		0.000
		[0.512]		[2.286]		[-0.475]		[0.147]
<i>q + 6</i>		0.005		0.009**		-0.004		0.000
		[0.476]		[2.360]		[-0.525]		[0.079]
FE				Time and Fund				
Observations	3,662	3,662	3,662	3,662	3,655	3,655	3,662	3,662
R <sup>2</sup>	0.759	0.759	0.767	0.767	0.743	0.743	0.691	0.691

This table presents the results from examining the trend in fund-level ESG performance. Total Controversies/Stocks Held is the number of total controversies experienced by stocks held in a portfolio divided by total shares held. Environmental Controversies/Stocks Held is the number of total environment-related controversies experienced by stocks held in a portfolio divided by total shares held. Social Controversies/Stocks Held is the number of total social-related controversies experienced by stocks held in a portfolio divided by total shares held. Governance Controversies is the number of total governance-related controversies experienced by stocks held in a portfolio divided by total shares held. Post indicates the six quarters post signing the PRI. *q*+*j* indicates the *j*-th quarter after signing the PRI. Time (fund) fixed effect indicates year-quarter (WFICN) fixed effect. T-stats are in brackets. Standard errors are robust to heteroskedasticity and clustered at the fund level. \*\*\*, \*\*, \* are statistically significant at the 1%, 5%, and 10% levels, respectively.

Panel D. Trend in Bottom ESG Performers

	MSCI		Sustainalytics		TVL	
<i>Post</i>	-0.026		0.148		0.322	
	[-0.789]		[0.577]		[0.464]	
<i>q + 1</i>		-0.025		0.171		-0.492
		[-0.711]		[0.624]		[-0.704]
<i>q + 2</i>		-0.027		-0.067		0.510
		[-0.577]		[-0.182]		[0.630]
<i>q + 3</i>		-0.019		-0.140		-0.313
		[-0.314]		[-0.296]		[-0.335]
<i>q + 4</i>		-0.007		-0.120		-0.947
		[-0.098]		[-0.221]		[-0.880]
<i>q + 5</i>		-0.012		-0.164		-0.899
		[-0.150]		[-0.282]		[-0.770]
<i>q + 6</i>		-0.025		-0.296		-1.671
		[-0.286]		[-0.452]		[-1.342]
FE			Time and Fund			
Observations	3,786	3,786	3,662	3,662	4,041	4,041
R <sup>2</sup>	0.797	0.797	0.867	0.868	0.481	0.482

This table presents the results from examining the trend in fund-level ESG performance by restricting the sample to firms that are in the bottom quartile of ESG Scores in each portfolio. MSCI ESG Score, Sustainalytics ESG Score, and TVL ESG Score are value-weighted scores of respective firm-level scores according to their holding value at quarter end. *Post* indicates the six quarters post signing the PRI. *q+j* indicates the *j*-th quarter after signing the PRI. Time (fund) fixed effect indicates year-quarter (WFICN) fixed effect. T-stats are in brackets. Standard errors are robust to heteroskedasticity and clustered at the fund level. \*\*\*, \*\*, \* are statistically significant at the 1%, 5%, and 10% levels, respectively.

**Table 6 Engagement**

Panel A. Only Firms Held Since Signing the PRI

	MSCI		Sustainalytics		TVL	
<i>Post</i>	0.040		0.161		-0.507	
	[1.141]		[0.806]		[-1.159]	
<i>q + 1</i>		0.057		0.153		-0.781*
		[1.381]		[0.762]		[-1.749]
<i>q + 2</i>		0.071		0.158		-0.302
		[1.385]		[0.556]		[-0.574]
<i>q + 3</i>		0.118		0.182		-0.516
		[1.591]		[0.467]		[-0.764]
<i>q + 4</i>		0.171*		0.152		-0.371
		[1.742]		[0.325]		[-0.439]
<i>q + 5</i>		0.217*		0.145		-0.423
		[1.899]		[0.275]		[-0.465]
<i>q + 6</i>		0.208*		0.163		-0.847
		[1.674]		[0.271]		[-0.897]
FE			Time and Fund			
Observations	2,102	2,102	2,013	2,013	2,326	2,326
R <sup>2</sup>	0.791	0.792	0.929	0.929	0.572	0.573

This table presents the results from examining the improvements in fund-level ESG performance by restricting the sample to the firms that are held at signing the UN PRI and held for subsequent 8 quarters, without changing their portfolio weight. MSCI ESG Score, Sustainalytics ESG Score, and TVL ESG Score are value-weighted scores of respective firm-level scores according to their holding value at quarter end. *Post* indicates the six quarters post signing the PRI. *q+j* indicates the *j*-th quarter after signing the PRI. Time (fund) fixed effect indicates year-quarter (WFICN) fixed effect. T-stats are in brackets. Standard errors are robust to heteroskedasticity and clustered at the fund level. \*\*\*, \*\*, \* are statistically significant at the 1%, 5%, and 10% levels, respectively.

Panel B. Only Firms Where PRI Funds are Large Shareholders

	MSCI		Sustainalytics		TVL	
	A single fund holding					
	>0.616% (75th Pct)	>1%	>0.616% (75th Pct)	>1%	>0.616% (75th Pct)	>1%
Post	0.047 [0.523]	-0.005 [-0.046]	-1.000** [-2.151]	-1.276 [-1.439]	-1.570 [-1.057]	0.066 [0.035]
Observations	1,067	787	933	711	1,389	1,092
R <sup>2</sup>	0.770	0.763	0.865	0.869	0.528	0.530

This table presents the results from examining the trend in fund-level ESG performance by restricting the sample to firms that PRI signatories hold at more than the following thresholds: 75th percentile (0.616%) and 1% of shares outstanding. For example, >1% contains a group of firms for which a signatory owns more than 1% of the total outstanding shares. MSCI ESG Score, Sustainalytics ESG Score, and TVL ESG Score are value-weighted scores of respective firm-level scores according to their holding value at quarter end. Post indicates the six quarters post signing the PRI. q+j indicates the j-th quarter after signing the PRI. Time (fund) fixed effect indicates year-quarter (WFICN) fixed effect. T-stats are in brackets. Standard errors are robust to heteroskedasticity and clustered at the fund level. \*\*\*, \*\*, \* are statistically significant at the 1%, 5%, and 10% levels, respectively.

Panel C. Firm-level ESG Scores in Response to PRI Holdings

	(1)	(2)	(3)	(4)	(5)	(6)
	Dep Var: Firm-Level ESG Score					
	MSCI	Sustainalytics	TVL	MSCI	Sustainalytics	TVL
	Firm-Quarter Panel			Firm-Year Panel		
Lag PRI Holdings (%)	1.896 [1.011]	7.184 [0.515]	-8.346 [-0.580]	3.359 [1.456]	8.836 [0.591]	-22.668 [-1.209]
ROE	0.031 [1.203]	0.268* [1.810]	0.067 [0.406]	0.044 [1.632]	0.287* [1.675]	-0.146 [-0.594]
Leverage	-1.064*** [-3.730]	-0.193 [-0.105]	-2.988 [-1.272]	-1.234*** [-3.931]	-2.478 [-1.410]	-3.464 [-1.220]
CAPEX/PPE	-0.083 [-0.262]	-3.661* [-1.704]	1.528 [0.598]	-0.009 [-0.028]	-1.806 [-0.817]	-0.426 [-0.135]
SG&A/Sales	-0.000 [-0.433]	-0.002 [-1.533]	0.003 [0.750]	-0.000 [-0.757]	-0.009*** [-11.260]	-0.003 [-1.314]
R&D/Sales	0.005 [0.345]	0.027 [0.853]	-0.116 [-0.789]	0.008 [0.590]	0.047* [1.868]	0.039 [0.484]
MTB	-0.002 [-0.407]	0.007 [0.205]	-0.014 [-0.397]	-0.001 [-0.137]	0.019 [0.554]	0.022 [0.441]
Size	0.787*** [8.500]	2.333*** [3.401]	-0.919 [-1.220]	0.833*** [8.564]	3.590*** [5.257]	-0.830 [-0.921]
FE	Year-quarter and Firm			Year and Firm		
Observations	32,063	32,063	34,403	8,159	8,159	8,812
R-squared	0.703	0.879	0.374	0.711	0.909	0.402

This table presents the results from examining how firm-level ESG score changes in response to the change in PRI holdings. Firm ESG Score is the firm-level ESG score from MSCI, Sustainalytics, or TVL. Lag PRI holding (%) is the aggregate PRI holdings during the prior time period. ROE is defined as net income over average shareholder equity. Leverage is long-term debt plus current debt over the average of total assets of the current and previous year. CAPEX/PPE is capital expenditure divided by property plant and equipment. SG&A/Sales is selling, general, and administrative expense over sales. R&D/Sales is R&D expense over sales. Size is the log of market capitalization. MTB is market value over book value of equity. T-stats are in brackets. Standard errors are robust to heteroskedasticity and clustered at the firm and time level. \*\*\*, \*\*, \* are statistically significant at the 1%, 5%, and 10% levels, respectively

Panel D. Voting for Pro-ESG Shareholder Proposals

	Dissent Management Recommendations							
	All Issues	Environmental Issues		Social Issues		Governance Issues		
<i>Post</i>	-0.057** [-2.334]		-0.014 [-0.838]		-0.028 [-1.243]		-0.094*** [-2.820]	
<i>y + 1</i>		-0.045 [-1.510]		-0.009 [-0.418]		-0.025 [-0.931]		-0.086** [-2.181]
<i>y + 2</i>		-0.022 [-0.459]		0.003 [0.092]		-0.018 [-0.425]		-0.071 [-1.251]
FE								
Observations	1,521	1,521	1,521	1,521	1,521	1,521	1,521	1,521
R <sup>2</sup>	0.839	0.839	0.575	0.575	0.705	0.705	0.781	0.781

This table presents the results from examining the trend in fund-level voting patterns using pro-ESG shareholder proposals. ESG proposals are classified following Dikolli et al. (2021). Dissent Management Recommendations on All Issues represents the proportion of all agenda items for which a fund did not support management recommendations (i.e., voting for a pro-ESG agenda because the firm always votes against the pro-ESG agenda). Dissent Management Recommendations on Environmental Issues represents the proportion of environmental agenda items for which a fund did not support management recommendations. Dissent Management Recommendations on Social Issues represents the proportion of social agenda items for which a fund did not support management recommendations. Dissent Management Recommendations on Governance Issues represents the proportion of governance agenda items for which a fund did not support management recommendations. *Post* indicates the two years post signing the PRI. *y+j* indicates the *y*-th year after signing the PRI. Time (fund) fixed effect indicates year (WFICN) fixed effect. T-stats are in brackets. Standard errors are robust to heteroskedasticity and clustered at the fund level. \*\*\*, \*\*, \* are statistically significant at the 1%, 5%, and 10% levels, respectively.

**Table 7 Additional Tests**

## Panel A. Anticipatory Action- Fund-level ESG Score

	MSCI		Sustainalytics		TVL	
	Pre period (6 quarters) ending 1 year prior to signing					
<i>Post</i>	-0.066		-0.215		0.512	
	[-0.947]		[-0.465]		[0.758]	
<i>q + 1</i>		-0.052		-0.415		-0.027
		[-0.410]		[-0.591]		[-0.030]
<i>q + 2</i>		-0.066		-0.587		0.781
		[-0.464]		[-0.741]		[0.785]
<i>q + 3</i>		-0.065		-0.657		0.536
		[-0.399]		[-0.723]		[0.491]
<i>q + 4</i>		-0.061		-0.606		0.189
		[-0.338]		[-0.607]		[0.155]
<i>q + 5</i>		-0.044		-0.632		0.457
		[-0.227]		[-0.602]		[0.338]
<i>q + 6</i>		-0.058		-0.842		0.006
		[-0.272]		[-0.744]		[0.004]
FE			Time and Fund			
Observations	3,463	3,463	3,358	3,358	3,663	3,663
R <sup>2</sup>	0.797	0.797	0.880	0.880	0.567	0.568

This table presents the results from examining the trend in fund-level ESG performance. Pre period is the 6 quarters ending 1 year prior to signing. MSCI ESG Score, Sustainalytics ESG Score, and TVL ESG Score are value-weighted scores of respective firm-level scores according to their holding value at quarter end. Post indicates the six quarters post signing the PRI.  $q+j$  indicates the  $j$ -th quarter after signing the PRI. Time (fund) fixed effect indicates year-quarter (WFICN) fixed effect. T-stats are in brackets. Standard errors are robust to heteroskedasticity and clustered at the fund level. \*\*\*, \*\*, \* are statistically significant at the 1%, 5%, and 10% levels, respectively.

Panel B. Anticipatory Action: Fund-level Voting

	Dissent Management Recommendations (Alternative Pre Periods)							
	Pre period ending 1 year prior to signing							
	All Issues	Environmental Issues		Social Issues		Governance Issues		
<i>Post</i>	-0.084*		0.026		-0.051		-0.114**	
	[-1.709]		[0.828]		[-0.795]		[-2.572]	
<i>y + 1</i>		-0.073		0.079		-0.055		-0.104*
		[-1.136]		[1.324]		[-0.622]		[-1.665]
<i>y + 2</i>		-0.063		0.120		-0.059		-0.095
		[-0.794]		[1.451]		[-0.522]		[-1.173]
FE				Time and Fund				
Observations	1,376	1,376	1,376	1,376	1,376	1,376	1,376	1,376
R <sup>2</sup>	0.857	0.857	0.604	0.604	0.701	0.701	0.817	0.817

This table presents the results from examining the trend in fund-level voting patterns using pro-ESG shareholder proposals. Pre period is the 2 years ending 1 year prior to signing. Dissent Management Recommendations on All Issues represents the proportion of all agenda items for which a fund did not support management recommendations (i.e., voting for a pro-ESG agenda because the firm always votes against the pro-ESG agenda). Dissent Management Recommendations on Environmental Issues represents the proportion of environmental agenda items for which a fund did not support management recommendations. Dissent Management Recommendations on Social Issues represents the proportion of social agenda items for which a fund did not support management recommendations. Dissent Management Recommendations on Governance Issues represents the proportion of governance agenda items for which a fund did not support management recommendations. Post indicates the two years post signing the PRI. *y*+*j* indicates the *y*-th year after signing the PRI. Time (fund) fixed effect indicates year (WFICN) fixed effect. T-stats are in brackets. Standard errors are robust to heteroskedasticity and clustered at the fund level. \*\*\*, \*\*, \* are statistically significant at the 1%, 5%, and 10% levels, respectively.

Panel C. Anticipatory Action: Screening (Controversies)

	Total Controversies/Stocks Held		Environmental Controversies/Stocks Held		Social Controversies/Stocks Held		Governance Controversies/Stocks Held	
	Pre period (6 quarters) ending 1 year prior to signing							
<i>Post</i>	-0.019		-0.010		-0.007		-0.002	
	[-1.341]		[-1.502]		[-0.870]		[-1.144]	
<i>q + 1</i>		-0.011		-0.007		-0.004		-0.000
		[-1.012]		[-1.466]		[-0.517]		[-0.158]
<i>q + 2</i>		-0.014		-0.006		-0.007		-0.001
		[-1.156]		[-1.256]		[-0.862]		[-0.309]
<i>q + 3</i>		-0.008		-0.004		-0.003		-0.000
		[-0.745]		[-1.159]		[-0.399]		[-0.145]
<i>q + 4</i>		-0.003		-0.003		-0.002		0.001
		[-0.294]		[-0.672]		[-0.186]		[0.295]
<i>q + 5</i>		-0.005		-0.003		-0.002		0.001
		[-0.386]		[-0.662]		[-0.263]		[0.146]
<i>q + 6</i>		-0.005		-0.003		-0.003		0.000
		[-0.382]		[-0.555]		[-0.298]		[0.083]
FE				Time and Fund				
Observations	3,358	3,358	3,358	3,358	3,351	3,351	3,358	3,358
R <sup>2</sup>	0.754	0.754	0.781	0.781	0.730	0.731	0.670	0.671

This table presents the results from examining the trend in fund-level ESG performance. Pre period is the 6 quarters ending 1 year prior to signing. Total Controversies/Stocks Held is the number of total controversies experienced by stocks held in a portfolio divided by total shares held. Environmental Controversies/Stocks Held is the number of total environment-related controversies experienced by stocks held in a portfolio divided by total shares held. Social Controversies/Stocks Held is the number of total social-related controversies experienced by stocks held in a portfolio divided by total shares held. Governance Controversies is the number of total governance-related controversies experienced by stocks held in a portfolio divided by total shares held. Time (fund) fixed effect indicates year-quarter (WFICN) fixed effect. T-stats are in brackets. Standard errors are robust to heteroskedasticity and clustered at the fund level. \*\*\*, \*\*, \* are statistically significant at the 1%, 5%, and 10% levels, respectively.

Panel D. Anticipatory Action: Trend in Bottom ESG Performers

	MSCI		Sustainalytics		TVL	
	Pre-period (6 quarters) ending 1 year prior to signing					
<i>Post</i>	-0.020		0.000		0.699	
	[-0.277]		[0.000]		[0.616]	
<i>q + 1</i>		-0.029		-0.185		-0.627
		[-0.231]		[-0.255]		[-0.451]
<i>q + 2</i>		-0.041		-0.408		0.447
		[-0.282]		[-0.500]		[0.286]
<i>q + 3</i>		-0.037		-0.472		-0.225
		[-0.226]		[-0.499]		[-0.130]
<i>q + 4</i>		-0.027		-0.452		-0.684
		[-0.149]		[-0.435]		[-0.357]
<i>q + 5</i>		-0.030		-0.488		-0.556
		[-0.156]		[-0.445]		[-0.266]
<i>q + 6</i>		-0.056		-0.611		-1.260
		[-0.265]		[-0.516]		[-0.551]
FE			Time and Fund			
Observations	3,463	3,463	3,358	3,358	3,663	3,663
R <sup>2</sup>	0.799	0.799	0.870	0.870	0.481	0.482

This table presents the results from examining the trend in fund-level ESG performance by restricting the sample to firms that are in the bottom quartile of ESG Scores in each portfolio. Pre period is the 6 quarters ending 1 year prior to signing. MSCI ESG Score, Sustainalytics ESG Score, and TVL ESG Score are value-weighted scores of respective firm-level scores according to their holding value at quarter end. Post indicates the six quarters post signing the PRI. *q+j* indicates the *j*-th quarter after signing the PRI. Time (fund) fixed effect indicates year-quarter (WFICN) fixed effect. T-stats are in brackets. Standard errors are robust to heteroskedasticity and clustered at the fund level. \*\*\*, \*\*, \* are statistically significant at the 1%, 5%, and 10% levels, respectively.

Panel E. Trend in CAPM Alpha, and Return

	CAPM Alpha				Return			
<i>Post</i>	-0.003 [-1.017]		-0.003 [-1.023]		-0.001 [-0.263]		-0.001 [-0.270]	
<i>q + 1</i>		-0.003 [-1.026]		-0.003 [-1.039]		-0.001 [-0.300]		-0.001 [-0.312]
<i>q + 2</i>		-0.007* [-1.829]		-0.007* [-1.834]		-0.005 [-0.998]		-0.005 [-1.005]
<i>q + 3</i>		-0.004 [-0.960]		-0.004 [-0.987]		-0.002 [-0.432]		-0.002 [-0.457]
<i>q + 4</i>		-0.009** [-2.017]		-0.010** [-2.050]		-0.007 [-1.307]		-0.007 [-1.338]
<i>q + 5</i>		-0.011** [-2.307]		-0.012** [-2.345]		-0.009 [-1.520]		-0.009 [-1.550]
<i>q + 6</i>		-0.013*** [-2.804]		-0.013*** [-2.830]		-0.011* [-1.893]		-0.011* [-1.915]
log(Fund Size)			0.002 [1.250]	0.003 [1.403]			0.002 [0.948]	0.003 [1.053]
FE				Time and Fund				
Observations	1,476	1,476	1,476	1,476	1,476	1,476	1,476	1,476
R <sup>2</sup>	0.209	0.214	0.210	0.214	0.906	0.906	0.906	0.906

This table presents the results examining the trend of fund return and alpha. CAPM Alpha is the market-risk-adjusted quarterly excess return where the market beta is computed using the previous 60 month returns. Return is the quarterly return net of fees. Post indicates the six quarters post signing the PRI. *q*+*j* indicates the *j*-th quarter after signing the PRI. Time (fund) fixed effect indicates year-quarter (WFICN) fixed effect. T-stats are in brackets. Standard errors are robust to heteroskedasticity and clustered at the fund level. \*\*\*, \*\*, \* are statistically significant at the 1%, 5%, and 10% levels, respectively.

**Table 8 Who Changes ESG Performance?**

Panel A. Quant Fund

	Flow	MSCI	Sustainalytics	TVL
Post*Quant Fund	0.016 [0.981]	0.079** [2.256]	0.238 [0.810]	0.579* [1.773]
Post	0.045*** [2.949]	-0.057** [-2.045]	-0.051 [-0.305]	-0.338 [-1.073]
Quant Fund	0.007 [0.264]	0.028 [0.553]	0.388 [0.932]	-0.037 [-0.106]
FE		Time and Fund		
Observations	1,476	1,316	1,271	1,476
R <sup>2</sup>	0.237	0.896	0.939	0.553

This table examines whether fund characteristics prior to signing the PRI impact fund flows and ESG performance. Flow is the total AUM at the end of quarter minus last quarter's AUM times this quarter's return divided by last quarter's AUM. MSCI ESG Score, Sustainalytics ESG Score, and TVL ESG Score are value-weighted scores of respective firm-level scores according to their holding value at quarter end. Quant Fund indicates funds that have more than 100 stocks in the portfolio during the prior six quarters. Post indicates the six quarters post signing the PRI. Time (fund) fixed effect indicates year-quarter (WFICN) fixed effect. T-stats are in brackets. Standard errors are robust to heteroskedasticity and clustered at the fund level. \*\*\*, \*\*, \* are statistically significant at the 1%, 5%, and 10% levels, respectively.

Panel B. Fund Size

	Flow	MSCI	Sustainalytics	TVL
Post*Small Fund	0.032*** [2.626]	0.046 [0.958]	0.179 [0.568]	-0.230 [-0.669]
Post	0.027 [1.564]	-0.061 [-1.469]	-0.098 [-0.361]	0.059 [0.174]
Small Fund	0.03 [1.309]	0.035 [0.400]	0.198 [0.606]	1.693*** [4.582]
FE			Time and Fund	
Observations	1,476	1,316	1,271	1,476
R <sup>2</sup>	0.239	0.895	0.939	0.556

This table examines whether fund characteristics prior to signing the PRI impact fund flows and ESG performance. Flow is the total AUM at the end of quarter minus last quarter's AUM times this quarter's return divided by last quarter's AUM. MSCI ESG Score, Sustainalytics ESG Score, and TVL ESG Score are value-weighted scores of respective firm-level scores according to their holding value at quarter end. Small Fund indicates funds that are below average size during the prior six quarters. Post indicates the six quarters post signing the PRI. Time (fund) fixed effect indicates year-quarter (WFICN) fixed effect. T-stats are in brackets. Standard errors are robust to heteroskedasticity and clustered at the fund level. \*\*\*, \*\*, \* are statistically significant at the 1%, 5%, and 10% levels, respectively.

Panel C. Fee

	Flow	MSCI	Sustainalytics	TVL
Post*Hi Fee Fund	0.049** [2.121]	0.051 [1.202]	-0.236 [-0.769]	0.343 [0.796]
Post	0.030** [2.147]	-0.045 [-1.460]	0.135 [0.766]	-0.270 [-0.737]
Hi Fee Fund	-0.014 [-0.562]	0.064 [1.243]	0.551 [1.406]	-0.864 [-1.322]
FE		Time and Fund		
Observations	1,476	1,316	1,271	1,476
R <sup>2</sup>	0.240	0.895	0.939	0.553

This table examines whether fund characteristics prior to signing the PRI impact fund flows and ESG performance. Flow is the total AUM at the end of quarter minus last quarter's AUM times this quarter's return divided by last quarter's AUM. MSCI ESG Score, Sustainalytics ESG Score, and TVL ESG Score are value-weighted scores of respective firm-level scores according to their holding value at quarter end. Hi Fee Fund indicates funds that are above average in fee during the prior six quarters. Post indicates the six quarters post signing the PRI. Time (fund) fixed effect indicates year-quarter (WFICN) fixed effect. T-stats are in brackets. Standard errors are robust to heteroskedasticity and clustered at the fund level. \*\*\*, \*\*, \* are statistically significant at the 1%, 5%, and 10% levels, respectively.

Panel D. Team-Managed Status

	Flow	MSCI	Sustainalytics	TVL
Post*Team-Managed Fund	0.017 [0.925]	0.052 [1.448]	0.012 [0.041]	-0.193 [-0.542]
Post	0.039** [2.080]	-0.060* [-1.915]	0.031 [0.123]	-0.002 [-0.006]
Team-Managed Fund	0.003 [0.142]	0.011 [0.190]	0.142 [0.371]	0.241 [0.678]
FE		Time and Fund		
Observations	1,476	1,316	1,271	1,476
R <sup>2</sup>	0.237	0.895	0.939	0.551

This table examines whether fund characteristics prior to signing the PRI impact fund flows and ESG performance. Flow is the total AUM at the end of quarter minus last quarter's AUM times this quarter's return divided by last quarter's AUM. MSCI ESG Score, Sustainalytics ESG Score, and TVL ESG Score are value-weighted scores of respective firm-level scores according to their holding value at quarter end. Team-Managed indicates funds that are managed by a team of portfolio managers during the prior six quarters. Post indicates the six quarters post signing the PRI. Time (fund) fixed effect indicates year-quarter (WFICN) fixed effect. T-stats are in brackets. Standard errors are robust to heteroskedasticity and clustered at the fund level. \*\*\*, \*\*, \* are statistically significant at the 1%, 5%, and 10% levels, respectively.

Panel E. Pre-Signing Fund-Level ESG Scores

	Flow			MSCI	Sustainalytics	TVL
	Using Pre-signing ESG Scores from					
	MSCI	Sustainalytics	TVL	MSCI	Sustainalytics	TVL
Post*Hi ESG Fund	0.009 [0.416]	-0.045 [-1.612]	0.014 [0.561]	0.015 [0.206]	-0.092 [-0.278]	0.756 [0.647]
Post	0.044** [2.315]	0.085*** [3.160]	0.039* [1.740]	-0.039 [-0.506]	0.122 [0.340]	-0.799 [-0.659]
Hi ESG Fund	-0.015 [-0.681]	0.051 [0.822]	-0.036 [-1.163]	-0.018 [-0.400]	0.161 [0.401]	0.609 [0.992]
FE	Time and Fund					
Observations	1,316	1,271	1,476	1,316	1,271	1,476
<i>Adj R</i> <sup>2</sup>	0.236	0.238	0.237	0.894	0.939	0.553

This table examines whether fund characteristics prior to signing the PRI impact fund flows and ESG performance. Flow is the total AUM at the end of quarter minus last quarter's AUM times this quarter's return divided by last quarter's AUM. MSCI ESG Score, Sustainalytics ESG Score, and TVL ESG Score are value-weighted scores of respective firm-level scores according to their holding value at quarter end. Hi ESG Fund indicates funds that are above average in ESG scores during the prior six quarters. Post indicates the six quarters post signing the PRI. Time (fund) fixed effect indicates year-quarter (WFICN) fixed effect. T-stats are in brackets. Standard errors are robust to heteroskedasticity and clustered at the fund level. \*\*\*, \*\*, \* are statistically significant at the 1%, 5%, and 10% levels, respectively.

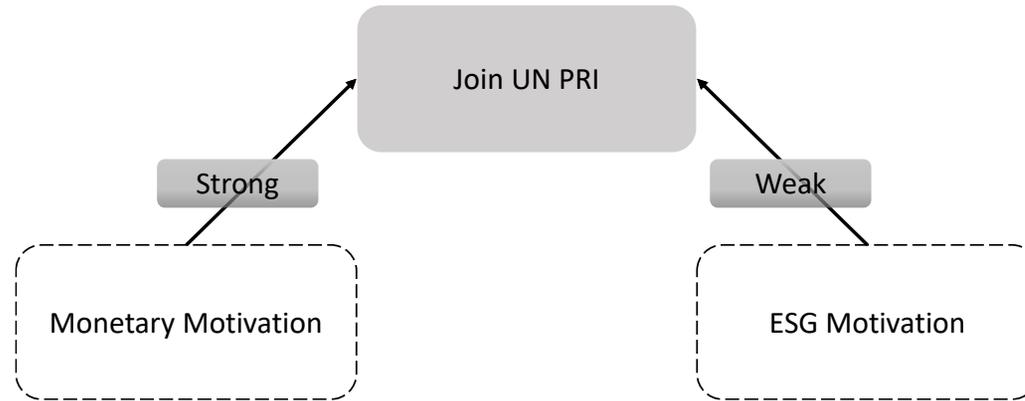
**Table 9 Buying (Selling) High (Low) ESG Performers: Quant Funds**

	(# of Stocks>75th Pct ESG Score)/ Total # of Stocks in Portfolio			(\$ Amt of Stocks>75th Pct ESG Score)/ Total \$ Amt of Portfolio			(# of Stocks<25th Pct ESG Score)/ Total # of Stocks in Portfolio			(\$ Amt of Stocks<25th Pct ESG Score)/ Total \$ Amt of Portfolio		
	MSCI	Sustainalytics	TVL	MSCI	Sustainalytics	TVL	MSCI	Sustainalytics	TVL	MSCI	Sustainalytics	TVL
Post*Quant Fund	0.021** [2.274]	-0.003 [-0.466]	0.011** [2.331]	0.018* [1.661]	-0.002 [-0.304]	0.015** [2.495]	0.018** [2.506]	-0.002 [-0.448]	0.003 [0.563]	0.011 [1.330]	-0.005 [-0.999]	-0.001 [-0.193]
Post	-0.017** [-2.325]	0.003 [0.550]	-0.004 [-0.870]	-0.022*** [-2.796]	0.000 [0.004]	-0.009* [-1.813]	-0.003 [-0.559]	-0.001 [-0.287]	-0.003 [-0.675]	0.001 [0.219]	-0.001 [-0.177]	0.004 [0.744]
Quant Fund	-0.013 [-0.721]	0.019* [1.788]	-0.004 [-0.415]	0.002 [0.079]	0.028** [2.219]	-0.010 [-1.187]	-0.030* [-1.778]	-0.003 [-0.349]	0.005 [0.728]	-0.024 [-1.386]	0.002 [0.284]	-0.005 [-0.605]
FE							Time and Fund					
Observations	1,316	1,271	1,476	1,316	1,271	1,476	1,316	1,271	1,476	1,316	1,271	1,476
R <sup>2</sup>	0.832	0.929	0.757	0.806	0.926	0.774	0.692	0.833	0.583	0.668	0.835	0.642

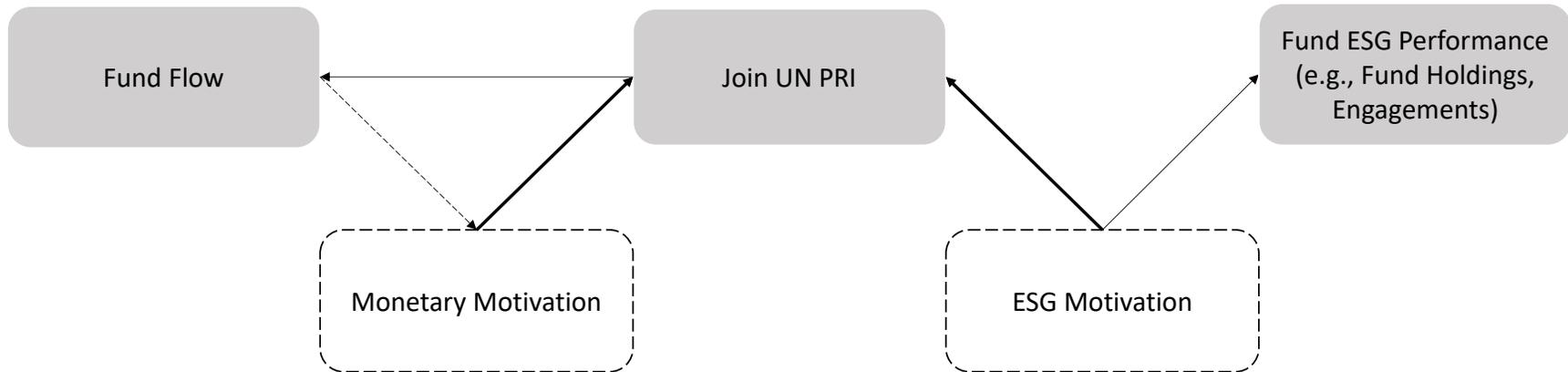
This table presents the results from examining whether signatories buy high- and sell low-ESG performers. # of Stocks > 75<sup>th</sup> Pct ESG Score/Total # of Stocks in Portfolio is the number of stocks that are above 75<sup>th</sup> percentile in ESG score in the entire universe of stocks with available ESG scores during the specific quarter divided by the total number of stocks in portfolio. \$ Amt of Stocks > 75<sup>th</sup> Pct ESG Score/Total \$ Amt of Stocks in Portfolio is the dollar amount of stocks that are above 75<sup>th</sup> percentile in ESG score in the entire universe of stocks with available ESG scores during the specific quarter divided by the total dollar amount of stocks in portfolio. # of Stocks < 25<sup>th</sup> Pct ESG Score/Total # of Stocks in Portfolio is the number of stocks that are below 25<sup>th</sup> percentile in ESG score in the entire universe of stocks with available ESG scores during the specific quarter divided by the total number of stocks in portfolio. \$ Amt of Stocks < 25<sup>th</sup> Pct ESG Score/Total \$ Amt of Stocks in Portfolio is the dollar amount of stocks that are below 25<sup>th</sup> percentile in ESG score in the entire universe of stocks with available ESG scores during the specific quarter divided by the total dollar amount of stocks in portfolio. Post indicates the six quarters post signing the PRI. q+j indicates the j-th quarter after signing the PRI. Time (fund) fixed effect indicates year-quarter (WFICN) fixed effect. T-stats are in brackets. Standard errors are robust to heteroskedasticity and clustered at the fund level. \*\*\*, \*\*, \* are statistically significant at the 1%, 5%, and 10% levels, respectively.

**Figure 1. Directional Diagram**

Panel A – Assessing Greenwashing

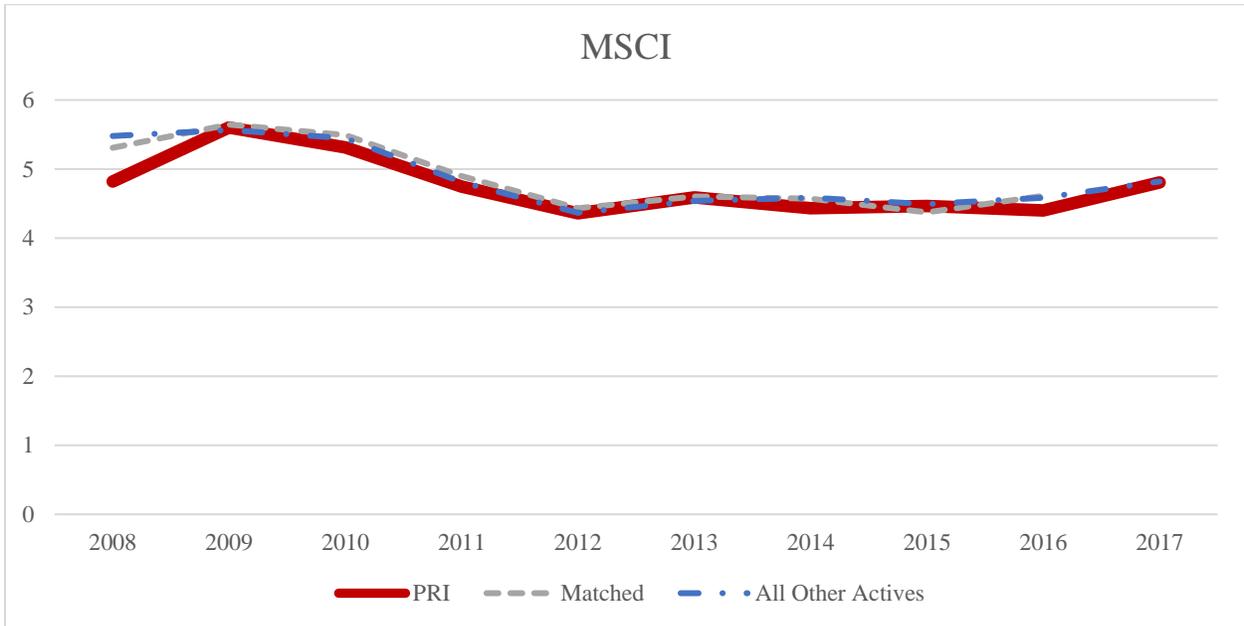


Panel B – Empirical Design

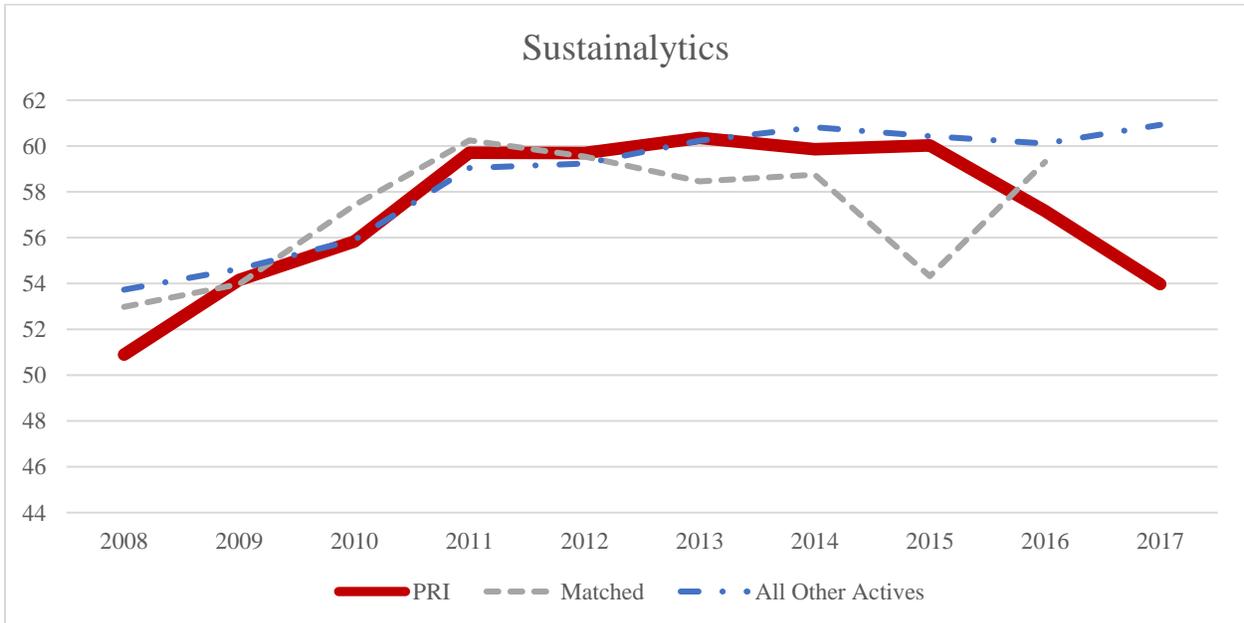


**Figure 2. Comparing Initial ESG Scores of Signatories to Others**

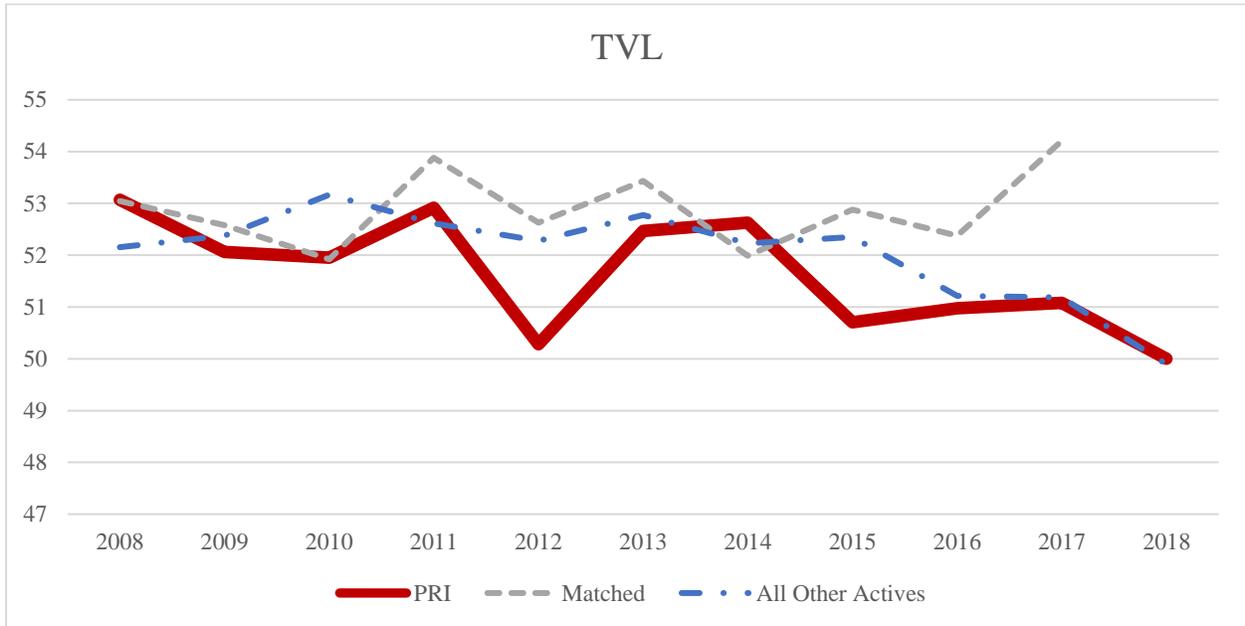
Panel A. MSCI



Panel B. Sustainalytics



Panel C. TVL



This figure presents the trend in ESG scores at the time of joining the PRI. PRI indicates the PRI funds. Matched indicates the propensity-score-matched control group as in the difference-in-differences specification. All Other Actives indicates non-PRI active funds that are unmatched.

# Appendix

## A1. UN PRI Institutional Details

Panel A. Growth in UN PRI Signatories' Assets Under Management



## Panel B. UN PRI- Six Principles

12/30/2019

What are the Principles for Responsible Investment? | Other | PRI

**The six Principles for Responsible Investment are a voluntary and aspirational set of investment principles that offer a menu of possible actions for incorporating ESG issues into investment practice.**

*The Principles were developed by investors, for investors.*

*In implementing them, signatories contribute to developing a more sustainable global financial system.*

### Signatories' commitment

"As institutional investors, we have a duty to act in the best long-term interests of our beneficiaries. In this fiduciary role, we believe that environmental, social, and corporate governance (ESG) issues can affect the performance of investment portfolios (to varying degrees across companies, sectors, regions, asset classes and through time).

We also recognise that applying these Principles may better align investors with broader objectives of society. Therefore, where consistent with our fiduciary responsibilities, we commit to the following:

- Principle 1: We will incorporate ESG issues into investment analysis and decision-making processes.
- Principle 2: We will be active owners and incorporate ESG issues into our ownership policies and practices.
- Principle 3: We will seek appropriate disclosure on ESG issues by the entities in which we invest.
- Principle 4: We will promote acceptance and implementation of the Principles within the investment industry.
- Principle 5: We will work together to enhance our effectiveness in implementing the Principles.
- Principle 6: We will each report on our activities and progress towards implementing the Principles.

The Principles for Responsible Investment were developed by an international group of institutional investors reflecting the increasing relevance of environmental, social and corporate governance issues to investment practices. The process was convened by the United Nations Secretary-General.

In signing the Principles, we as investors publicly commit to adopt and implement them, where consistent with our fiduciary responsibilities. We also commit to evaluate the effectiveness and improve the content of the Principles over time. We believe this will improve our ability to meet commitments to beneficiaries as well as better align our investment activities with the broader interests of society.

<https://www.unpri.org/pri/an-introduction-to-responsible-investment/what-are-the-principles-for-responsible-investment>

2/5

## Panel C. Three Minimum Requirements

12/30/2019

Minimum requirements for membership | Other | PRI



### Minimum requirements for membership

**In 2018 the PRI implemented minimum requirements for membership alongside introducing programmes for [showcasing leadership](#).**

The increased accountability of the PRI as an organisation is one of the focus areas of our 10-year [Blueprint for responsible investment](#).

The PRI's [consultation](#) on strengthening signatory accountability in September 2017 showed strong signatory support for using reporting and assessment data to delist signatories whose progress in implementing the Principles is not sufficient to meet a basic criteria of being a signatory, as defined by the PRI. A full overview of the consultation responses [can be found here](#).

#### Minimum requirements

The PRI has implemented the following minimum requirements for existing and future asset owner and investment manager signatories. Failure to meet these requirements over a two-year period, following extensive engagement with the PRI, would result in delisting.

The three requirements are:

- Investment policy that covers the firm's responsible investment approach, covering >50% of AUM [indicator SG 01 ]
- Internal/external staff responsible for implementing RI policy [indicator SG 07]
- Senior-level commitment and accountability mechanisms for RI implementation [indicator SG 07]

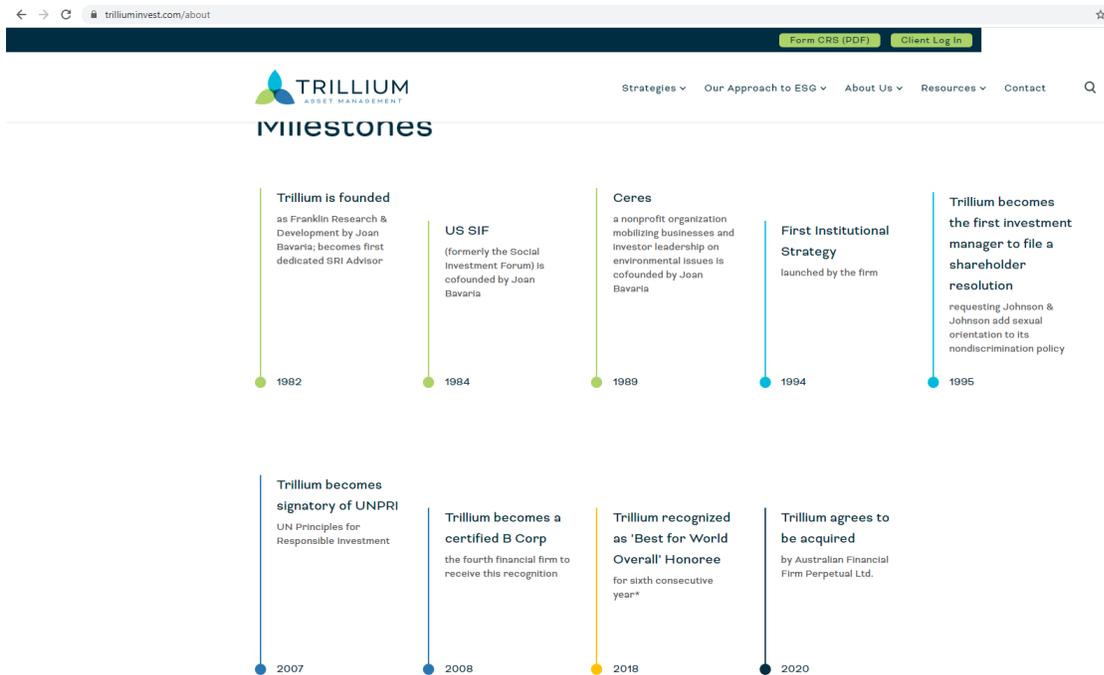
Signatories that do not meet the criteria will be informed privately and delisting will only be as a last resort following unsuccessful engagement over the two-year period.

<https://www.unpri.org/signatories/minimum-requirements>

1/4

## A2. Example of Asset Managers Mentioning UN PRI

### Panel A. In Company Website: Front Page



### Panel B. In Company Website: Dedicated Section

The screenshot shows a dedicated section on the Eaton Vance website for the UN Principles for Responsible Investment (UN PRI). The page features the Eaton Vance logo, navigation links, and a large heading for 'Principles for Responsible Investment'. Below the heading is the UN PRI logo, which consists of a grid of blue squares followed by the text 'PRI | Principles for Responsible Investment'. The main text of the page states that Eaton Vance is proud to announce that it is now a signatory of the UN PRI, implemented by the United Nations Secretary-General. It also mentions that the UN PRI was developed by an international group of institutional investors reflecting the increasing relevance of environmental, social and corporate governance issues to investment practices. The page further states that Eaton Vance's commitment to the UN PRI is consistent with its focus on investing in quality companies with sustainable long-term performance and competitive advantages. It also acknowledges the increasing concerns about the implications of ESG factors that its clients, shareholders and colleagues have. Finally, it lists the six Principles of Responsible Investment, with the first principle being: 'Principle 1: We will incorporate ESG issues into investment analysis and decision-making processes.'

**nuveen**  
A TIAA Company



## The story of responsible investing

### Portfolios with a purpose

Today Nuveen applies RI principles across more than **\$967B** in AUM, including over **\$650B** committed to UN Principles for RI.<sup>8</sup>

With more than **\$20B** under management in ESG-focused products, Nuveen is one of the largest US managers of portfolios that reflect ESG criteria explicitly.<sup>9</sup>

**\$900M+**

in social impact investment commitments<sup>10</sup>



**Private market**



**Real estate**

investments in our general account that seek competitive returns in tandem with positive, measurable social and environmental outcomes

**\$1B+**

in publicly traded green bonds<sup>10</sup>



categorized as supporting renewable energy and other green initiatives to address climate change, our **social choice bond strategy** has made an impact in public fixed income for over 6 years

**LSV Asset Management**  
**Statement of Responsible Investment Initiatives**

**General Statement**

LSV Asset Management ("LSV") provides discretionary investment management services in portfolios of publicly-traded global equity securities to a variety of institutional clients, including private funds and mutual funds, utilizing the application of LSV's proprietary quantitative models. The portfolio decision making process is driven by (1) a proprietary model which ranks securities based on fundamental measures of value, past performance and indicators of recent positive changes and (2) a risk control process that controls for residual risk relative to a benchmark. The fundamental premise on which LSV's investment philosophy is based is that superior long-term results can be achieved by systematically exploiting the judgmental biases and behavioral weaknesses that influence the decisions of many investors. These include: the tendency to extrapolate the past too far into the future, to wrongly equate a good company with a good investment irrespective of price, to ignore statistical evidence and to develop a "mindset" about a company.

**Principles for Responsible Investment ("PRI")**

LSV became a signatory to the PRI in April 2014. The PRI provides a framework, through its six principles, for consideration of environmental, social and governance ("ESG") factors in portfolio management and investment decision-making. The six principles ask an investment manager, to the extent consistent with its fiduciary duties, to seek to: (1) incorporate ESG issues into investment analysis and decision-making processes; (2) be an active owner and incorporate ESG issues into its ownership policies and practices; (3) obtain appropriate disclosure on ESG issues by the entities in which it invests; (4) promote acceptance and implementation of the PRI principles within the investment industry; (5) work to enhance its effectiveness in implementing the PRI principles; and (6) report on its activities and progress toward implementing the PRI principles.

**LSV Responsible Investment Initiatives**

The PRI, and the application of the foregoing principles, is intended to be aspirational and not a prescriptive set of rules. Given its business model, fiduciary duties to its clients and contractual limitations, LSV may not apply all six principles in its daily activities. However, LSV has taken the following actions that promote ESG factors and is committed to continuing such efforts into the future:

1. **Internal Research and Analysis**

LSV is frequently looking for new ways to measure value and conducts research on an ongoing basis on a variety of topics in order to develop enhancements to the LSV quantitative model. LSV has conducted a

Source: <https://www.lsvasset.com/pdf/fund-docs/LSV-Statement-of-Responsible-Investment-Initiatives-072016.pdf>

### A3. Determinants of Signing UN PRI

ESG Scores	Dep Var = Sign PRI		
	MSCI	Sustainalytics	TVL
# Funds in Family	0.014*** [4.865]	0.015*** [4.806]	0.015*** [5.326]
log(Fund Size)_Family	0.002 [0.019]	-0.007 [-0.065]	-0.008 [-0.070]
CAPM Alpha_Family	0.124 [1.177]	0.109 [1.071]	0.092 [0.942]
Fee (%)_Family	-1.427* [-1.904]	-1.374* [-1.832]	-1.391* [-1.930]
ESG Score_Family	0.191 [0.615]	0.049 [1.018]	0.036 [0.881]
Listed	2.660*** [8.582]	2.712*** [8.622]	2.403*** [7.459]
All Quant Only	0.558 [1.393]	0.608 [1.436]	0.448 [1.115]
Age_Family	-0.017 [-1.060]	-0.017 [-1.065]	-0.008 [-0.584]
FE		Time	
Observations	8,321	7,869	9,611

This table presents the results from examining the determinants of signing the UN PRI. Sign PRI indicates the asset manager-quarters after signing the PRI. # Funds in Family is the number of funds in the fund family. log(Fund Size) Family is logarithm of the value-weighted fund size of the fund family. CAPM Alpha Family is the value-weighted CAPM Alpha of the fund family. Fee (%) Family is the value-weighted average annual management fee of the fund family in percentage. ESG Score Family is the value-weighted scores of respective fund-level ESG scores according to their holding value at quarter end. Listed Status indicates whether asset manager is a public listed company. All Quant Only indicates when all funds in the fund family are quant funds (i.e., have more than 100 stocks in the portfolio). Age is the age of the oldest fund in the family. Time fixed effect indicates year-quarter fixed effect. T-stats are in brackets. Standard errors are robust to heteroskedasticity and clustered at the asset management firm level. \*\*\*, \*\*, \* are statistically significant at the 1%, 5%, and 10% levels, respectively.

## Online Appendix: Robustness Tests

Table OA1. Treating Missing ESG Scores as Zeros

	Treating Missing as Zeros		
	MSCI ESG Score	Sustainalytics ESG Score	TVL ESG Score
Post	-0.044 [-0.678]	-0.098 [-0.142]	0.211 [0.334]
FE		Time and Fund	
Observations	4,543	4,543	4,935
R <sup>2</sup>	0.821	0.864	0.855

This table presents the results from examining the trend in fund-level ESG performance. MSCI ESG Score, Sustainalytics ESG Score, and TVL ESG Score are value-weighted scores of respective firm-level scores according to their holding value at quarter end. Post indicates the six quarters post signing the PRI. Time (fund) fixed effect indicates year-quarter (WFICN) fixed effect. T-stats are in brackets. Standard errors are robust to heteroskedasticity and clustered at the fund level. \*\*\*, \*\*, \* are statistically significant at the 1%, 5%, and 10% levels, respectively.

Table OA2 Using Matching

Panel A. Covariate Balance from Propensity Score Matching

	Treat		Control		Difference	
	N	Mean	N	Mean		
MSCI ESG Score	1,248	2.8816	1,042	3.0127	-0.1311	***
Sustainalytics ESG Score	1,248	30.519	1,042	32.035	-1.5165	**
TVL ESG Score	1,248	37.136	1,042	37.959	-0.8224	***
Flow	1,248	0.1073	1,042	0.2254	-0.1181	
Return	1,158	0.0353	985	0.0334	0.0019	
Log(Fund Size)	1,248	4.9023	1,042	4.8342	0.0681	

All variables are at the fund-quarter level. MSCI ESG Score, Sustainalytics ESG Score, TVL ESG Score, and TVL Material ESG Score are derived via value-weighting the respective firm-level ESG scores according to their holding value at quarter end. Flow is the total AUM at the end of quarter minus last quarter's AUM times this quarter's return divided by last quarter's AUM. Return is the quarterly return net of fees. log(Fund Size) is logarithm of fund size.

Panel B. Difference-in-Differences Specification

	MSCI ESG Score	Sustainalytics ESG Score	TVL ESG Score
Treat * Post	0.053 [0.490]	0.434 [0.738]	0.170 [0.388]
Post	-0.100 [-1.464]	-0.711 [-1.534]	-0.386 [-1.250]
FE		Time and Fund	
Observations	2,290	2,290	2,290
R <sup>2</sup>	0.807	0.939	0.752

This table presents the results from examining the trend in fund-level ESG performance. MSCI ESG Score, Sustainalytics ESG Score, and TVL ESG Score are value-weighted scores of respective firm-level scores according to their holding value at quarter end. Treat equals 1 for PRI signatory funds and 0 for propensity score matched non-PRI funds. Post indicates the six quarters post a PRI fund signing the PRI. Time (fund) fixed effect indicates year-quarter (WFICN) fixed effect. T-stats are in brackets. Standard errors are robust to heteroskedasticity and clustered at the fund level. \*\*\*, \*\*, \* are statistically significant at the 1%, 5%, and 10% levels, respectively