

# Responsible Institutional Investing Around the World

Rajna Gibson, Simon Glossner, Philipp Krueger, Pedro Matos and Tom Steffen\*

First version: March 2019

This version: December 2019

## ABSTRACT

We explore a novel survey on responsible investing by institutional investors around the world and match it to archival data on equity portfolio holdings. We document that institutions that commit to responsible investing exhibit different environmental, social and governance (ESG) portfolio-level scores but this is not the case for US-domiciled institutions. We also examine if different ESG implementation strategies (e.g., screening, integration, engagement) affect portfolio-level ESG scores but find limited evidence. Finally, we find that responsible investing does not enhance portfolio returns but acts more as a risk mitigation tool.

JEL: G15, G23, G30, M14

Keywords: ESG, SRI, socially responsible investing, sustainability, institutional investors

---

\* Rajna Gibson ([Rajna.Gibson@unige.ch](mailto:Rajna.Gibson@unige.ch)) is at the University of Geneva, the Geneva Finance Research Institute and ECGI. Simon Glossner ([GlossnerS@darden.virginia.edu](mailto:GlossnerS@darden.virginia.edu)) is at the University of Virginia – Darden School of Business. Philipp Krueger ([Philipp.Krueger@unige.ch](mailto:Philipp.Krueger@unige.ch)) is at the University of Geneva, the Geneva Finance Research Institute and the Swiss Finance Institute. Pedro Matos ([MatosP@darden.virginia.edu](mailto:MatosP@darden.virginia.edu)) is at the University of Virginia – Darden School of Business and ECGI. Tom Steffen ([Tom.Steffen@osmosisim.com](mailto:Tom.Steffen@osmosisim.com)) is at Osmosis Investment Management. We thank Mikael Homanen, Mary Margaret Frank, Johan Sulaeman, Qifei Zhu as well as conference and seminar participants at Darden School of Business, EFA Panel on the European Commission Sustainable Finance Action Plan, EnAnpad, FGV EESP, IE Business School, Itau Asset Management, Massey University, PRI Knowledge Sharing Session, PUC Rio, Sustainable Finance Forum in Shenzhen, Syracuse University, SMU-TBLI Conference Singapore, UC3 Madrid, UIUC, Unigestion, University of Canterbury, Victoria University of Wellington for comments and also Valentin Jouvenot and Nadine Riand for excellent research assistance. This research has been supported by the Swiss National Science Foundation (SNSF) within the framework of the National Research Programme “Sustainable Economy: resource-friendly, future-oriented, innovative” (NRP 73). The authors also acknowledge financial support from the Richard A. Mayo Center for Asset Management at the Darden School of Business. We thank the Principles for Responsible Investment (PRI) for providing the reporting framework data. The PRI has not reviewed the methodology, the data use, nor the conclusions drawn from their data. The views expressed in the paper are those of the authors.

## 1. Introduction

The practice of responsible investing, whereby institutional investors incorporate environmental, social and governance (ESG) issues into their investment processes, is increasingly important and likely to grow around the world (US SIF (2018); GSIA, 2018).<sup>1</sup> However, there is only limited academic evidence on the portfolio consequences of responsible investing. Prior studies use anonymized surveys (e.g., Krueger, Sautner and Starks (2019); Amel-Zadeh and Serafeim, 2018) or rely on archival data of portfolio holdings (e.g., Gibson and Krueger (2018) or Starks, Venkat and Zhu, 2018) to study the implications of responsible investing for institutional investors. These studies cannot compare what investors say they do versus what they effectively do in terms of ESG integration in their portfolios and are also ultimately unable to assess the link between ESG investing and risk-adjusted portfolio returns.

The pressure on institutional investors to integrate ESG issues into their decision-making varies around the world. The first source of variation are differences in the sustainability-preferences of their clients and beneficiaries. For example, environmental and social norms are relatively stronger in Europe (Dyck, Lins, Roth and Wagner (2019)) where sustainable investing has been more broadly practiced with European-based institutions managing over about half of global responsible investing assets in some surveys (GSIA, 2018). A second important source of variation are the regulatory requirements across distinct jurisdictions. Several countries have adopted “stewardship codes” instructing institutional investors on their responsibilities in integrating ESG. In the U.S., there is an open debate on whether fiduciary duties should include the consideration of ESG factors. In 2018, the U.S. Department of Labor stated that fiduciaries “must avoid too readily treating ESG issues as being economically relevant(...) rather, ERISA fiduciaries must always put first the economic interests of the plan in providing retirement benefits”.<sup>2</sup> The SEC chairman has also emphasized that investment advisers cannot put any interests,

---

<sup>1</sup> Survey estimates put the assets managed according to responsible investment criteria at US\$ 12 trillion according to the US SIF Foundation’s biennial Report in 2018 (up 38% from 2016, US SIF (2018)) and over US\$ 30 trillion across the world according to The Global Sustainable Investment Review 2018 that collates the US data with other regional reports (GSIA (2018)).

<sup>2</sup> DOL, “U.S. Department of Labor Releases Field Assistance Bulletin Clarifying Issues Regarding Proxy Voting, Shareholder Engagement, and Economically Targeted Investments” (April 23, 2018). This Trump administration statement came after DOL relaxed it in the Obama presidency with IB 2015-01 when it had stated that ESG criteria could be used in fiduciaries’ investment framework.

including ESG factors, ahead of those of their clients (Clayton, 2018). Outside the U.S., especially in countries that are more stakeholder-oriented there is a higher awareness for corporate social responsibility (Liang and Renneboog, 2017). This cross-country variation on pressure to incorporate ESG offers a good empirical setting to test responsible investing worldwide.

In this paper, we combine a non-anonymous survey with matched archival data on institutional investors' worldwide equity portfolios to examine which kinds of institutional investors commit to responsible investment and whether or not different ESG strategies result in better portfolio-level ESG scores and risk-return tradeoffs.<sup>3</sup> The survey data we use comes from the Principles for Responsible Investment (PRI), founded in 2006 by a group of the world's largest institutional investors with the support from the United Nations (UN).<sup>4</sup> The PRI is the world's leading proponent of responsible investment and operates as an industry-led membership network.<sup>5</sup> Principle #1 calls for the incorporation of ESG issues in the analysis and selection of investments. Importantly for our study, one of the obligations resulting from signing the principles is that institutions are required to provide detailed annual reports on how they implement responsible investment (e.g., screening, integration or engagement-oriented approaches). In our analysis, we then merge these investor reports with archival data on their institutional stock holdings to examine the impact of the reported responsible investing strategies on their equity portfolio-level ESG scores and the portfolios' risk-return implications.

We start by studying which investor characteristics are related to an institution committing to responsible investing by joining the PRI. We document that institutions that are larger in AUM, European-based and asset owners (e.g. pension plans or insurers that invest in stocks directly) are more likely to join the PRI network. We then examine differences in terms of portfolio-level sustainability

---

<sup>3</sup> Although technically we prefer the term "responsible investing" in the context of our paper, we are using the terms responsible, sustainable and ESG investing interchangeably.

<sup>4</sup> The PRI network counts more than 2,000 different signatory institutions ranging from investment managers and asset owners to service providers and collectively, the signatories represent assets under management of more than US\$ 80 trillion (<https://www.unpri.org/about-the-pri>). In our analysis, we focus only on institutional investors such as asset owners (ex: pension plans, endowments or sovereign wealth funds) and investment managers (ex: investment companies and advisors) and ignore service providers (ex: ESG rating or consulting firms).

<sup>5</sup> It is supported by the UN with the objective of harnessing the financial weight of institutional investors to address sustainable development goals. The 17 Global Sustainable Development Goals set out economic, social and environmental ambitions for UN member states (<https://www.undp.org/content/undp/en/home/sustainable-development-goals.html>).

between PRI and non-PRI investors. To do so, we match the self-reported PRI data with detailed archival data from Factset Ownership on institutional investors' equity holdings of publicly-listed companies in developed and emerging markets. This data shows that institutional investors control large pools of capital, collectively owning over US\$ 32 trillion in listed equities worldwide as of end of 2017.<sup>6</sup> PRI investors grew from the 47 founding members to over 684 PRI signatories with data in Factset and their holdings represented over US\$ 18 trillion (i.e. more than one in every two dollars of institutionally managed equities) at the end of our sample period. We augment these data with stock-level environmental, social and governance scores from three ESG rating providers (Thomson Reuters ASSET4, MSCI IVA and Sustainalytics). We then follow Gibson and Krueger (2018) and Starks, Venkat and Zhu (2018) and calculate the value-weighted average ESG scores for each institutional investors' stock portfolio and call these "ESG footprints".

We find some evidence that institutions who are part of the PRI network exhibit better ESG footprints, with most of the effect coming from differences in the social and governance scores. There are also interesting regional differences: In non-U.S. regions, investors who signed the PRI have better portfolio-level ESG scores than non-PRI investors, while in the U.S., PRI investors tend to exhibit no better ESG scores. This could be related to the interpretation of "fiduciary duty" by US institutional money managers that prevent them from considering ESG issues as financially material. We address the issue that PRI signatories could be different from non-PRI institutions by estimating a difference-in-difference regression which shows that portfolio ESG footprints of non-U.S. investors improve after institutions sign the PRI compared to non-signatories. However, despite U.S. institutional investors being the largest group of new PRI signatories in recent years, we find no improvement in U.S. investors' portfolio-level ESG scores after signing the principles. To help with identification, we use the staggered adoption of investor stewardship codes in different countries setting out investors' responsibilities on how they should integrate ESG factors and monitor their investments (OECD 2017). These codes were sometimes mandated by regulators (e.g., UK's Financial Reporting Council) or the result of peer-

---

<sup>6</sup> This represents over 40% of the world market capitalization and it is similar to the level estimated by an OECD (2019) study on the ownership structure of the World's listed companies.

pressure initiatives by industry bodies (e.g., Canadian Coalition for Good Governance). Using the introduction of an investor stewardship code in a country as an instrumental variable for the decision by institutions from that country to sign the PRI, we show that ESG portfolio footprints subsequently improve. We conclude that there is some evidence that PRI signatory institutions seem to “walk the ESG talk” but not necessarily in the U.S. market.<sup>7</sup>

We then move on to study ESG implementation strategies in greater detail using the unique survey data from the PRI reporting framework. The practice of responsible investing in public equity markets started mostly with negative screening approaches that – based on moral, norms-based, or ethical considerations – excluded certain stocks from a portfolio (Hong and Kacperczyk, 2009). It has evolved substantially in recent years and there are now at least six different implementation strategies of responsible investment (see, for instance, CFA Institute (2015), GSIA (2016) and Amel-Zadeh and Serafeim (2018)). These can be classified into (i) negative or exclusionary screening, (ii) positive or best-in-class screening (investing in most ESG-friendly companies), (iii) norms-based screening (ex: the UN Global Compact Principles), (iv) integration (ex: incorporating ESG factors into financial analysis), (v) thematic investments (ex: green investments) and (vi) engagement approaches (individual dialogue, collaborative campaigns and overall shareholder voting policies). While collaborative engagement approaches have been studied before using another dataset from the PRI collaboration platform (Dimson, Karakas and Li, 2018), there is little academic research on the prevalence of the other ESG strategies listed above and their potential impact on institutional investors’ ESG footprints and also on their portfolios’ risk-return implications.

The PRI survey indicates that signatories’ most common responsible investment strategies (in order of reported frequency) are engagement, ESG integration and negative screening. These approaches are not mutually exclusive with most institutions reporting implementing multiple strategies simultaneously. The only style that remains niche is thematic investing. However, when we test if these

---

<sup>7</sup> There are some press reports that the SEC is scrutinizing how strictly ESG funds adhere to responsible investment practices (WSJ, 2019). Concerns over “greenwashing” (overstating their commitment to sustainable investing) have also led the European Commission to set up a special task force to develop a taxonomy for sustainable investing such as setting standards for eco-labeling of investment vehicles (Eurosif, 2018)

different implementation strategies are related to portfolio-level ESG scores the picture is less clear. Our results show that responsible investment strategies have little association with ESG portfolio footprints. We only observe that positive/best-in-class screening strategies have a significant positive relation with portfolio-level ESG scores. The other responsible investing strategies are not statistically associated with ESG portfolio footprints.

In the final part of the paper, we examine whether there are trade-offs between responsible investing and risk-adjusted investment performance. We compare the yearly buy-and-hold portfolio returns of both PRI and non-PRI signatories. While panel regressions indicate no significant performance differences, we uncover a weak underperformance by PRI signatories (versus non-PRI investors) using monthly calendar-time portfolio return regressions. This does not validate the “doing well by doing good (ESG)” mantra for the average PRI signatory and could be the result of constrained portfolio optimization. However, when we test if there is an effect of responsible investment strategies on holdings-based returns, we do not find an association between the actual implementation of strategies and portfolio performance but we document that negative screening, engagement and integration are associated with significantly lower portfolio risk. We conclude that responsible investing has acted more as a risk management tool (not a return enhancer) and it is important to separate between investors that truly adopt responsible investing strategies versus those that pledge to it but fall short of implementing it.

Our paper contributes to the emerging literature studying responsible investment by different types of institutional investors. Starks, Venkat and Zhu (2018) document that long-term investors care more about ESG issues while Gibson and Krueger (2018) find that environmental issues matter more for investment risk-adjusted performance when institutions are long-term oriented. In addition, Dyck et al (2019) show that international institutional investors that are domiciled in high social-norms countries influence firms to adopt better ESG policies. This line of work uses archival data on investor characteristics (investment horizon or country of origin) rather than their actual ESG implementation practices due to lack of data. Alternatively, Amel-Zadeh and Serafeim (2018) conduct a survey on whether, how, and why investment managers use ESG data and Krueger, Sautner, Starks (2019) survey

institutional investors on their climate-related policies, but both studies cannot observe their actual investments. Our paper addresses some of the shortcomings of the previously cited studies which either use anonymized surveys (Amel-Zadeh and Serafeim (2018), Krueger, Sautner and Starks (2019)) or exclusively archival data (Dyck et al. (2019), Starks et al. (2019), Gibson and Krueger (2018)). Our survey-portfolio matched data allows us to make inferences about institutional investors' sustainability choices and compare what investors' say they do in terms of overall responsible investment (the PRI survey data) versus what they actually do (ESG scores in the FactSet portfolio holdings) and uncover interesting differences between US and non-US investors. One exception is the study by Dimson, Karakas and Li (2018) which examines in detail one of the ESG sub-strategies (coordinated engagements) with direct data from the PRI Collaboration Platform matched to the activist investors' portfolio data in Factset Ownership. We take a broader view of ESG strategies that comprise screening, integration and overall engagement.

We also contribute to the literature on investor preferences for responsible investment. Due to social norms, investors historically have been shown to shun "sin stocks" (Hong and Kacperczyk (2009)). Recent work has examined the growing retail demand for products that invest responsibly. Investor flows seem to react positively to fund companies that sign the PRI (Humphrey and Li (2019)) and those with high portfolio sustainability ratings (Hartzmark and Sussman (2019)). Ceccarelli, Ramelli and Wagner (2019) document how European investors respond to the eco-labelling of mutual funds but in the U.S. only good performing mutual funds seem to exhibit higher flows. Riedl and Smeets (2017) investigate the intrinsic social preferences of Dutch investors that correlate with holding (lower return) SRI equity funds. Our paper focuses instead on studying how delegated portfolio managers (investment managers and asset owners) invest on behalf of individuals. Since these financial intermediaries increasingly control the largest pools of capital it is important to study how they invest based on their social preferences for responsible investing.

Finally, our paper adds to the debate on the portfolio costs and benefits of ESG investing. From a standard risk-return portfolio theory perspective one should expect lower returns due to constrained optimization, but Pedersen, Fitzgibbons and Pomorski (2019) argue that positive ESG factors contain

relevant information about firm fundamentals which could be a predictor of future returns. Alternatively, ESG factors could negatively predict returns in case of excessive demand by responsible investors. Previous studies are either conducted at the stock-level (for example, on “E” see Bolton and Kacperczyk (2019), on “S” see Edmans (2011), and on “G” see Gompers, Ishii and Metricks (2003)) or at the individual fund-level (ex: SRI funds in Renneboog, Ter Horst and Zhang (2008)). Our study focuses on global institutional investors to explore the effect of different ESG strategies on portfolio risk-return. We do not find that responsible investing leads to return enhancement, but we find it acts more as a risk mitigation tool .

## **2. Data and Methodology**

### *2.1. Principles for Responsible Investment (PRI)*

The PRI was launched in 2006 on the initiative of the United Nations (UN) who invited 21 institutional investors such as the California Public Employees' Retirement System (CalPERS), Hermes Pensions Management and the Norwegian Government Pension Fund to collaborate in establishing the Principles for Responsible Investment.<sup>8</sup> They were joined by 47 additional founding signatories and, by 2018, the PRI network grew to be the largest investor initiative worldwide with over 2,000 signatories that had more than US\$ 80 trillion of assets under management (AUM). The six PRI principles are as follows:

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

By signing the principles, the investors publicly commit to their adoption as long as they are consistent with the investors’ fiduciary duties. While the principles are voluntary, the signatory status comes with two mandatory requirements. First, all signatories need to pay an annual membership fee, which depends on signatory type (investment manager, asset owner, or service provider) and their AUM.

---

<sup>8</sup> The PRI is a non-profit institution that is independent from, but supported by different UN agencies. Funding is assured primarily via the annual membership fees from its signatories.

Second, PRI signatory investors commit to publicly report on their responsible investment considerations and decision-making on a yearly basis (principle #6 above).<sup>9</sup>

The PRI principles can be signed by three organizational types: 1) asset owners, 2) investment managers, and 3) service providers. Investors should sign the PRI at the highest level of the group.<sup>10</sup> Asset owners comprise pension funds, sovereign wealth funds, foundations, endowments, and insurance companies and could be concerned about ESG factors that affect the ability to meet their obligations to beneficiaries. Investment managers comprise investment fund companies and advisors and could integrate ESG issues as they seek to maximize the value of their clients' investments. Service providers do not manage assets by themselves so these are excluded from our analysis in this paper.

## 2.2. PRI Survey Data

Besides the PRI signatory status, our research makes direct use of information derived from the PRI reporting framework (principle #6 above). While the PRI was founded in 2006, signatory reporting data only starts in 2014 and extends to 2018. The survey is non-anonymous and we thus observe investor names and detailed responses to an extensive questionnaire for each signatory and reporting year.<sup>11</sup> Overall, the five years of PRI reports available to us contain 5,326 signatory-year observations by 1,549 unique PRI signatory identifiers.

Reporting takes place every year between January and March and we interpret responses to account for the previous calendar year (i.e., the 2018 report covers activities in 2017). 2014 constitutes

---

<sup>9</sup> A list of delisted signatories is available in <https://www.unpri.org/annual-report-2018/how-we-work/new-and-delisted-signatories>.

<sup>10</sup> This provision aims to prevent financial groups from signing up subsidiaries or funds with particularly strong ESG performance. We subsequently refer to the highest level of the group as a parent and to a subsidiary as an entity. Only entities that are autonomous (e.g., separate legal entities to the parent) can sign the principles independent of whether or not the parent signed them too. It follows that if an entity signs and the parent does not, the PRI signatory status cannot be inherited by the wider group. Conversely, when the parent signs on behalf of the wider group, generally all assets of the entities should be included in the reporting and entities can, therefore, represent themselves as a signatory. In addition, entities can sign up apart from the parent, even if the latter already signed itself; both then need to report separately.

<sup>11</sup> PRI has put processes into place to ensure the verifiability of the reports. A central element of this is to make a vast majority of the responses accessible to the public. For example, the publicly available reports allow asset owners to search and screen for potential investment managers providing a strong incentive to report truthfully. In addition, the PRI compares the reports within their peer groups and analyzes responses of recurring themes over time. Lastly, the PRI runs validation checks to detect inconsistencies. Third-party audit and/or assurance of the PRI reports are encouraged but voluntary.

the baseline year and, in our analysis, we adjust reports to align and standardize them across years as subsequent reporting frameworks were subject to modifications and improvements. The PRI reporting framework comprises twelve modules. Since we focus on direct equity investments by the signatories, we use the “organizational overview”, “strategy and governance”, “listed equity incorporation” and “listed equity active ownership” modules to draw the necessary information for our analysis. These modules include information on responsible investment strategies, such as the screening, integration, thematic strategies, as well as engagement. We only work with answers to questions that are *mandatory to report and to disclose* which are made publicly available via the reporting database.<sup>12</sup> The Internet Appendix provides examples of the PRI survey questions used in our analysis.

### 2.3. Institutional Investor Equity Holdings

The second main data source is the institutional holdings data from Factset Ownership (previously LionShares), which is the leading source for global institutional equity ownership data. The sample period starts in 2003 (3 years prior to the PRI being formed) until 2017 and covers the set of institutions domiciled in countries that are part of the MSCI All Country World Index. More details on this data can be found in Ferreira and Matos (2008). We use portfolio data at the end of each calendar year. In line with the PRI definitions, we group institutions by their type: asset owners (pension funds, foundation and endowment managers, sovereign wealth managers, insurance companies, and governmental agencies) versus investment managers (bank investment divisions, investment companies, investment advisers, and hedge funds).

We are able to match 684 PRI signatories with the Factset institutional investors using a name matching algorithm and manual verifications.<sup>13</sup> All of our analysis is conducted at the Factset entity

---

<sup>12</sup> The reason is that mandatory indicators are completed by all eligible investors, while the response rates to voluntary indicators can vary widely and are imperfect due to missing information. In addition, we only work with binary, categorical, or multiple choice responses in order to avoid the challenges arising from interpreting descriptive responses.

<sup>13</sup> In a first stage we run a name matching algorithm on the two lists of names cleaned for punctuation, accents, non-alphanumeric and special characters using the Jaro-Winkler measure to determine the smallest distance between two given names in the lists. In a second step, we perform manual checks and improvements to the initial output of the name matching algorithm by controlling for the country location of the signatory’s headquarter, the asset class composition of its holdings as reported to PRI and the website URL reported to PRI and Factset.

level.<sup>14</sup> Of the 1,549 unique PRI identifiers only 874 need to complete the PRI modules relating to listed equity (while the other 675 either do not hold publicly-listed equities, do not incorporate responsible investment in their equities, or hold less than 10% of their AUM in actively managed equity strategies).<sup>15</sup> We thus conclude that our PRI-Factset match is reasonably complete. The 684 PRI signatories in our final sample held over US\$ 18 trillion in equity holdings as of 2017 and this represents more than half of the total institutional holdings in FactSet.

#### 2.4. ESG Scores

The third data sources are stock-level sustainability scores from three ESG rating providers: 1) Thomson Reuters' ASSET4; 2) MSCI IVA; and 3) Sustainalytics. The ESG scores from each of these data providers are also broken down into environmental, social and governance dimensions. We obtain these scores on a yearly basis between 2003 and 2017 by keeping the last available ESG scores in each firm-calendar year combination, assuming that it reflects the most up-to-date information on the company for that year. We then calculate an equal-weighted average of the normalized scores from the three ESG data providers. We use three ESG ratings as we do not want our results to overly depend just on a single ESG rating, given the level of disagreement among data providers (Berg, Koelbel and Rigobon (2019) and Gibson, Krueger, Riand and Schmidt (2019)). Due to the increasing data coverage over our sample period, we take the average from the ESG scores that are available if there is no full coverage by all ratings providers for a given stock. Given the different ratings scales of each data provider, we normalize each score to have a mean of zero and a standard deviation of one – we denote these as  $z(\text{Score})$ .

$$Score_{it} = \frac{1_{A4,it} \times z_t(\text{Score}_{A4,it}) + 1_{MSCI,it} \times z_t(\text{Score}_{MSCI,it}) + 1_{SUST4,it} \times z_t(\text{Score}_{SUST,it})}{1_{A4,it} + 1_{MSCI,it} + 1_{SUST,it}}$$

---

<sup>14</sup> Our matching of the PRI with the Factset investor universe occasionally leads to a double-matching. This can happen when both the parent and the entity sign the PRI independently. In such cases, we give priority to entity over parent matches. In rare cases, even though both parent and entity signed, a valid report might not be available for the entity while it is available for the parent. Should this occur, we then prioritize the parent match. Whenever a parent signed but the entities did not, we assume that the entities inherit the PRI status, but not vice versa.

<sup>15</sup> In addition, a large proportion of the 263 signatories that do report on their listed equities often do not have sufficient direct equity holdings to show up in Factset. Many do hold a substantial proportion of their equity AUM under fund-of-funds, or simply do not have enough AUM. For example, the SEC Form 13-F filing of portfolio holdings of equity-like securities is only required for institutional investment managers that exercise discretion over US\$ 100 million or more.

As a second step, we follow Gibson and Krueger (2018) and compute the portfolio-level sustainability “footprints” using the size of the individual stock holdings in the investors’ portfolio. To do so we compute the value-weighted average of the portfolio using the market value of each stock position as a fraction of the sum of all reported equity positions.

$$Portfolio\ Score_{j,t} = \sum_{i=1}^{N_{j,t}} w_{i,j,t} \times Score_{i,t}$$

where *Portfolio Score* denotes one of the following sustainability scores: *Total ESG Score*, *Environmental Score*, *Social Score* or *Governance Score*.  $w_{ij}$  denotes the value-weight of stock  $i$  in investor  $j$ ’s portfolio at the end of year  $t$ .  $Score_{it}$  is the normalized sustainability score of stock  $i$  at the end of year  $t$ .  $N_{jt}$  is the total number of stocks investor  $j$  holds at the end of year  $t$  for which the stock-level scores are available. The *Portfolio Score* variable quantifies the portfolio-level sustainability footprint of institutional investor  $j$  at the end of year  $t$  as the value-weighted average of the sustainability scores of the stocks that make up the institution’s portfolio.

After merging all three data sources (PRI survey, FactSet holdings, and ESG scores) and applying the filters as described above, we are left with 83,768 institution-year observations at the investor portfolio-level ranging from 2003 to 2017. For the more detailed analysis that requires time-varying information from the PRI annual surveys, we are left with a sample of 2,796 institution-year observations from 2013 to 2017.

### 3. Committing to Responsible Investing

#### 3.1. Which Institutional Investors Sign up for PRI?

In Figure 1, we provide some graphical evidence about the composition of our sample. Panel A shows that the number of PRI signatory institutions has increased over time. Panel B shows the increasing importance of PRI signatories in global stock markets. While global equity holdings of PRI institutions represented about US\$ 0.7 trillion in 2006, the value of total holdings by PRI signatories grew to US\$ 18 trillion by 2017 (see also Table 1). Relating the total value of holdings by PRI institutions to the total

institutional investor equity holdings of about US\$ 32 trillion, shows that PRI signatories now represent more than half of institutionally owned public-listed equities.

In Panel C of Figure 1, we contrast the sample of PRI signatories with the overall population of institutional investors in terms of their geographical locations. We restrict our sample to institutions that are located in countries that are part of the MSCI All Country World Index and group them into three regions: Europe, North America and Asia-Pacific plus the rest of the world (Africa, Middle East, South America). Compared to North American institutional investors, investors from Europe and Asia Pacific plus the rest of the world are more likely to sign the PRI. In terms of types of institutions (Panel D of Figure 1), that is asset owners or investment managers, we do not find large differences between the PRI signatories and overall population of institutional investors in FactSet. If anything, there is a slight over-representation of asset owners among PRI signatories compared to the overall population. Note that for an asset owner to be included in the sample, the institution would need to have considerable direct equity holdings because otherwise it would not show up in FactSet. In other words, asset owners who outsource the management of their equity investments do not show up in our sample.<sup>16</sup> In terms of the size distribution (see Panel E of Figure 1), the small institutions are under-represented among PRI signatories (<US\$ 1 billion in AUM) and there is an over-representation of medium (US\$ 1-10 billion), large (US\$ 10-100 billion) and very large (>US\$ 100 billion) institutions.

Table 1 shows further sample splits using the cross-section and time-series jointly. While the early signatories tended to be more European, the percentage of North American signatories has gradually risen over time from only 19 percent when PRI was founded in 2006 to 31 percent in 2017. The fraction of PRI signatories from Asia Pacific and the rest of the world remains smaller and more stable over time. Analyzing changes in the size distribution over time allows for some interesting observations: while in 2006, PRI was dominated by larger institutions, the number of small signatories has increased steadily over time. The increase might reflect the fact that being part of PRI is now an important requirement for investment managers to obtain investment mandates from clients. Also the

---

<sup>16</sup> In the case an asset manager outsources its equity investments, it will be part of the investment managers' portfolio filings.

percentage of investment managers has increased over time, while asset owners accounted for a larger proportion of the early signatories.

In the Internet Appendix, we complement the univariate evidence on the characteristics of PRI vs non-PRI signatories by estimating Probit regressions in Table IA1 and confirm that the probability of joining is higher when the institution is not based in North America, when the institution is an asset owner and when it is more long-term oriented, more index-like and larger in terms of total equity holdings. Table IA2 of the Internet Appendix also provides the list of the largest institutional investors by portfolio AUM for each region and their PRI signing date. By the end of 2017, all top 10 institutions in North America, Europe and in the rest of the world had joined the PRI (e.g. Vanguard, BlackRock, Norges Bank, UBS, or Nomura).

### 3.2. Do PRI Signatories Exhibit Better ESG Portfolio Footprints?

We now turn to analyze portfolio-level outcomes conditional on PRI membership. To do so, we calculate an average portfolio-level *Total ESG Score* as well as individual *Environmental Score*, *Social Score* or *Governance Score* component scores for each institutional investor (see section 2.4 for more details).<sup>17</sup> In Table 2 we estimate OLS regressions where we use the portfolio-level ESG scores as a dependent variable. The main variable of interest is the *PRI dummy*, which takes the value of 1 if an investor is a PRI signatory in a given year. We also control for region, institution-type (investment manager versus asset owner) and time fixed effects. Standard errors are clustered at the institution- and year-level.

In Panel A of Table 2, we find that PRI signatories have significantly better *Total ESG Score*, *Social Score* and *Governance Score* but no better *Environmental score* at the portfolio-level.<sup>18</sup> The

---

<sup>17</sup> In Figure IA1 of the Internet Appendix, we plot the distribution of portfolio-level ESG scores between PRI and non-PRI institutions. The univariate graphs show two interesting patterns. First, from the density graph it seems as if PRI institutions have slightly higher mean and median portfolio-level ESG scores. Secondly, the distribution of portfolio-level scores of non-PRI institutions has a fatter left tail, suggesting that in the non-PRI population there are more institutions that have low portfolio-level ESG scores.

<sup>18</sup> While we choose to concentrate our analysis on mean portfolio-level scores, in Table IA3 of the Internet Appendix, we analyze the extent to which investors allocate capital to firms with extremely low or extremely high firm-level ESG scores. To do so, we calculate the fraction of the portfolio that is allocated to the stocks with the highest overall ESG scores (fourth quartile of the overall ESG score distribution at the firm-level) versus the fraction of the portfolio that is allocated to the stocks with lowest firm-level ESG scores (first quartile). We find that PRI signatories invest more in stocks with the highest ESG scores than non-PRI signatories.

results are robust to several portfolio characteristics, such as the number of stocks, industry concentration, portfolio turnover, portfolio activeness, and the average stock size. This indicates that the observed differences between PRI and non-PRI signatories in terms of portfolio-level ESG scores are not driven by portfolio characteristics. We also see that portfolio turnover is negatively associated with ESG scores, which is consistent with previous results for US institutions in Starks, Venkat and Zhu (2018) and Gibson and Krueger (2018).

Panels B and C of Table 2 split the sample into US and non-US samples to investigate regional differences.<sup>19</sup> For example, whether or not institutional investors should incorporate ESG factors into their decision-making is an ongoing regulatory debate in the U.S., but more settled in other countries. We find that in non-US regions, such as Europe and Asia, PRI signatories have significantly better portfolio-level ESG scores than non-PRI institutions, while in the US, PRI signatories tend to exhibit no different or even worse ESG scores (especially with respect to *Environmental score* and *Governance score*). These could be related to a generalized interpretation of US fiduciary standards that prevent social or environmental concerns to affect investment decisions.

PRI signatory institutions could be systematically different from non-PRI institutions. We address this issue using two additional tests. First, we examine whether PRI signatories increase their portfolio-level ESG scores after becoming a PRI signatory. Table 3 runs difference-in-difference regressions, in which we match each PRI signatory to one non-PRI institution based on the logarithm of AUM, region and institution type (using a nearest-neighbor algorithm without replacement) and estimate the PRI signing-effect on portfolio-level ESG scores measured in the years [-3;+3] around the signature dates. These regressions include year, region and type fixed effects as well as controls for portfolio characteristics. In Panel A, we find that PRI signatories significantly increase their *Total ESG score*, *Social score* and *Governance score* in the years after joining the PRI (compared to the non-PRI control institutions). Panels B and C, however, indicate that only non-US institutions (but not US institutions) tend to increase their portfolio-level ESG scores after joining the PRI.

---

<sup>19</sup> We find qualitatively similar results when we interact the *PRI dummy* with a US dummy.

In the second test, we address endogeneity concerns more directly by instrumenting the *PRI dummy* with the staggered adoption of investor stewardship codes in different countries. A stewardship code instructs investors on their responsibilities in integrating and monitoring ESG factors of their investments. The first code was introduced in the UK in 2012 and, among other principles, required institutional investors to monitor their investee companies, to have a clear voting policy, and to publicly disclose their stewardship and voting activities.<sup>21</sup> Some codes are initiated by regulators (e.g. UK’s Financial Reporting Council) and are binding, while others are introduced by industry bodies (e.g. Canadian Coalition for Good Governance) and are often voluntary. For the U.S., we take the Obama-era DOL position (IB-2015-01) that it would be appropriate for managers of plan assets to weigh in environmental, social and governance issues. The instrumental variable *Stewardship Code* takes the value of 1 for country-year observations that are covered by a stewardship code.<sup>22</sup> The first-stage regression in column (1) of Table 4 shows that when stewardship codes are present in a country, institutions are significantly more likely to become PRI signatories. The remaining columns ([2]-[5]) show the second-stage regressions. These confirm the findings of previous analyses: PRI institutions have significantly higher *Total ESG score*, *Social score* and *Governance score* and also slightly better *Environmental score* than non-PRI institutions.<sup>23</sup>

We conclude that there is some evidence that PRI signatory institutions have better portfolio-level ESG footprints, especially with respect to *Governance and Social scores*. This evidence is consistent with PRI signatory institutions “walking (some of) the ESG talk”.

#### **4. Implementing Responsible Investing**

##### *4.1. What are the Most Popular Responsible Investment Strategies used by PRI Signatories?*

---

<sup>21</sup> The UK Stewardship code 2020 revises the original 2012 version and is scheduled to take effect from 1 January 2020 (<https://www.frc.org.uk/investors/uk-stewardship-code>).

<sup>22</sup> We obtain the years of introduction of the stewardship code in each country from the OECD (2017, Table 3) report. Japan, for example, the Financial Services Agency introduced the stewardship code “Principles for Responsible Institutional Investors” in 2014.

<sup>23</sup> The estimated coefficients on the *PRI dummy* in the instrumental variable approach are larger than those in the corresponding OLS models (Table 2). The reason for this could be that the instrumental variable approach estimates the Local Average Treatment Effect (LATE), which is the effect of signing the PRI for the subset of institutions that are affected by an investor stewardship code. The OLS model, by contrast, estimates the effect of signing the PRI for the average sample firm.

One empirical challenge in responsible investing is that it can mean different things to different investors. While there is no official classification of the various ESG investment styles pursued by institutional investors, the academic and professional literature (see, in particular, Amel-Zadeh and Serafeim, 2018; CFA Institute, 2015; and GSIA, 2016) identifies at least six different ESG strategies. The PRI also followed this framework, so we adopt the following classification:

1. **[Neg] Negative/exclusionary screening:** the exclusion from a fund or portfolio of certain sectors, companies or practices based on specific ESG criteria;
2. **[Pos] Positive/best-in-class screening:** investment in sectors or companies selected for positive ESG performance relative to industry peers;
3. **[N-b] Norms-based screening:** screening of investments against minimum standards of business practice based on international norms;
4. **[Int] Integration:** the systematic and explicit inclusion by investment managers of environmental, social and governance factors into financial analysis;
5. **[The] Thematic:** investment in themes or assets specifically related to sustainability (for example clean energy, green technology or sustainable agriculture);
6. **[Eng] Engagement:** individual corporate engagement and shareholder action, collaborative corporate engagement and shareholder action and internal voting;
  - a. **[Indiv eng] Individual corporate engagement and shareholder action:** the use of shareholder power to influence corporate behavior, including through direct corporate engagement (i.e., communicating with senior management and/or boards of companies) and filing or co-filing shareholder proposals. In this case, the engagement is to be carried out solely by the investor's internal staff without involvement from other investors;
  - b. **[Colla eng] Collaborative corporate engagement and shareholder action:** the conduct of corporate engagement, as defined above, however it is undertaken jointly with other investors;

- c. **[Int vot] Internal voting:** the use of proxy voting that is guided by comprehensive ESG guidelines where the voting decisions are undertaken internally and not outsourced to an external service provider.

In Panel A of Table 5, we provide descriptive statistics on the percentage of signatories' AUM that is covered by a screening, thematic or integration strategy (obtained from LEI 01.1 question of the PRI survey – see Figure IA.5 in the Internet Appendix). The statistics are based on the overall sample period, a yearly breakdown from 2013 until 2017, geographic regions, investors types, and investor size (as proxied by their equity AUM) of the PRI signatories. The same information is illustrated graphically in Figure IA2 of the Internet Appendix. We observe that 66% of the signatories' AUM is covered by integration strategies, followed by screening strategies (50% of AUM) and thematic strategies (only 11% of AUM). These strategies are not mutually exclusive with most AUM being covered by multiple strategies (e.g. integration plus screening).

In Panel B of Table 5, we provide descriptive statistics for the frequency by which PRI signatories report the use of responsible investment strategies (LEI 04.1 of the PRI survey – see question in Figure IA.6 and univariate plots in Figure IA3 of the Internet Appendix). We observe that the dominant strategies pursued by PRI signatories are engagement (especially individual and internal voting), ESG integration, and negative screening. Over time, PRI signatories have placed increasing emphasis on norms-based, positive screening, and thematic strategies which is in line with the GSIA (2016) report noticing material growth rates in these strategies. Second, we see that, there is wide heterogeneity in terms of how the adoption of certain strategies differs across geographies, investor types, and investor size. PRI signatories from Europe show a higher frequency of negative, positive, and norm-based screening strategies, while signatories from Asia-Pacific place more emphasis on integration and engagement strategies. We also observe that investment managers more often pursue negative, positive, and thematic screening than asset owners. Larger institutions tend to prefer negative, thematic, integration, and engagement strategies relative to smaller institutions.

#### *4.2. Are Reported Responsible Investing Strategies Related to Actual ESG Portfolio Footprints?*

Table 6 analyzes which responsible investment strategies most effectively influence the ESG score of the PRI signatories. We use six different variables (obtained from LEI 01.1 and LEI 04.1 of the PRI survey) to capture the signatories' responsible investment strategies: *%-Screening:Negative*, *%-Screening:Positive*, *%-Screening:Norms*, *%-Thematic*, *%-Integration* and an *Engagement* dummy. The percentage variables measure the percentage of AUM that is covered by a responsible investment strategy. Definitions of these variables are provided in Appendix A1. For example, *%-Screening:Negative* is calculated by multiplying the percentage of equities to which screening is applied (LEI 01.1) by the *Neg* dummy on whether an investor applies any form of negative/exclusionary screening (LEI 04.1 of the PRI survey). The regressions include year, region, and type fixed effects.

The main results of Table 6 can be summarized as follows. First, we observe that positive screening/best-in-class strategies have a positive association with *Total ESG score*, *Environmental score*, and *Governance score*. Second, we observe that the other responsible investment strategies do not significantly affect the ESG scores, either because these are ineffective or may be still in early stages of adoption. Alternatively, there might just be no agreement on how these strategies are defined among the PRI survey participants.<sup>24</sup>

## **5. Risk-Return Implication of Responsible Investing**

### *5.1. Holdings-Based Returns of Institutional Investors*

Following Gibson and Krueger (2018), we investigate the risk- return implications of the overall ESG strategy followed by PRI signatories and for that purpose we calculate the monthly returns of an institutional investor as the buy-and-hold returns based on an institution's disclosed equity holdings (for which ESG scores are available). The variable measures the hypothetical gross return of the long equity portion of the institutional investor's portfolio. We calculate the holdings-based returns by assuming that investors trade their positions only when the new equity holdings are observed (usually at quarter-

---

<sup>24</sup> In Table IA4 of the Internet Appendix, we further estimate the effect of employee involvement on ESG portfolio footprints. The main variables of interest are dummies that take the value of 1 if different corporate roles are involved in the implementation and/or oversight of responsible investment strategies. While most corporate roles (e.g. executives, investment staff, ESG staff, or external managers) do not significantly affect ESG scores, we find that investor relation involvement is negatively associated with portfolio-level ESG scores which could be an indication of some "greenwashing".

ends). This implies no interim trading between reported quarter-ends. We start by constructing standard mean-variance investment performance measures ( $mean(return)$ ,  $std(return)$  and  $Sharpe$ ) the decomposition of risk ( $systematic$ ,  $idiosyncratic$ ) as well as a downside risk measure ( $semivar$ ) as in Hoepner, Oikonomou, Sautner, Starks, and Zhou (2018). We calculate the performance measures over 12 months and use AQR's global equity market factor as the benchmark to compute risk-adjusted performance  $alpha1F$ . Worldwide stock returns are obtained from Datastream. Detailed variable definitions are provided in Appendix A1. Table IA5 of the Internet Appendix provides descriptive statistics for investors' holdings-based returns. Institutional investors have a mean monthly return of 0.95%, a standard deviation of 4.92% and a 1-factor alpha of 0.09% between 2003 and 2017. Given that the holdings-based returns are gross returns (i.e. they do not include transaction costs or management fees), the average institution seem to underperform its benchmark after fees.

### 5.2. Do PRI Signatories Exhibit Different Portfolio Performance?

To analyze the risk-return implications, we estimate OLS regressions in Table 7 where we use the holdings-based returns as a dependent variable. The main variable of interest is the *PRI dummy*. We also control for region, type, and year fixed effects as well as for portfolio characteristics. Standard errors are clustered at the institution level and year level. The sample period is again from 2003 to 2017.

In Panel A of Table 7, we observe that PRI signatories have slightly lower returns and higher portfolio risks, but the relation is insignificant in most regressions. To investigate whether PRI signatories perform differently because of different social preferences, we control for portfolio-level ESG scores. We observe no change in the coefficient estimates of the *PRI dummy*, suggesting that differences in portfolio-level ESG scores do not affect the performance of PRI signatories.<sup>25</sup> Panels B and C show the results for the US and non-US sample separately. While US PRI signatories have significantly higher portfolio risks than US non-PRI signatories, we find no performance differences between PRI and non-PRI signatories in non-US regions.

---

<sup>25</sup> Table IA6 of the Internet Appendix splits the *Total ESG score* control variable into *Environmental score*, *Social score*, and *Governance score* control variables. The coefficient estimates of the *PRI dummy* are qualitatively similar to the ones in Table 7.

Alternatively, we estimate monthly calendar-time portfolio regressions, which allow us to control for systematic risk differences between PRI and non-PRI signatories. In Panel A of Table 8, we observe that PRI signatories have a monthly 4-factor alpha of 0.02% (equal-weighted) and 0.08% (value-weighted), while non-PRI signatories have an alpha of 0.12% (equal-weighted) and 0.11% (value-weighted). This suggests that PRI signatories underperform non-PRI signatories by 0.04% to 0.10% per month. The difference is statistically significant with the equal-weighted but not with the value-weighted portfolio. However, we find significant underperformance in both equal- and value-weighted portfolios when we employ a 7-factor model used in more recent research on the “sin stocks anomaly” (Blitz and Fabozzi (2017)). The underperformance could be the result of constrained portfolio optimization or of price pressure reversals in the stock prices held by those institutions.

In Panels B and C of Table 8, we run the portfolio regressions for US and non-US investors separately. We find that in the U.S., PRI signatories significantly underperform non-PRI signatories when equal-weighting the portfolios (with a four-factor alpha of 0.09% per month). In non-U.S. regions, by contrast, there seem to be no performance differences between PRI and non-PRI signatories. These findings again reveal important regional differences.

We conclude that there is weak evidence that PRI signatories have a slightly lower investment performance than non-PRI signatories (especially in the U.S.), suggesting that “doing well by doing good” might not hold. However, we cannot relate the underperformance to differences in the portfolio-level ESG scores.

### *5.3. Are Reported Responsible Investing Strategies Related to Portfolio Performance?*

We now turn to analyze the effects of the different responsible investment strategies on the institutions’ holdings-based returns in Table 9. As in Table 6, we use six variables from the PRI survey (LEI 01.1 and LEI 04.1) to capture the responsible investment strategies: *%-Screening:Negative*, *%-Screening:Positive*, *%-Screening:Norms*, *%-Thematic*, *%-Integration*, and an *Engagement* dummy. Definitions of these variables are provided by Appendix A1. Since this analysis requires the PRI reporting data, the sample period is from 2013 to 2017.

In columns (1), (3), and (4), we observe an insignificant relation between responsible investment strategies and mean returns, Sharpe ratios, and the 1-factor alphas. However, in columns (2) and (7), we find that three responsible investment strategies (negative screening, ESG integration, and engagement) have a significant *negative* effect on portfolio risks measured by the standard deviation and semi-variance of returns. This evidence is consistent with earlier findings for the U.S. market by Gibson and Krueger (2018) at the overall institutional portfolio level on the fact that an ESG strategy acts as a portfolio risk mitigating tool. In columns (5) and (6), we differentiate between idiosyncratic and systematic portfolio risks and observe that responsible investment strategies primarily lower idiosyncratic risks. Interestingly, there is one exception to the risk-reduction effect of responsible investment strategies: norms-based screening has a significant *positive* effect on portfolio risks, especially on idiosyncratic risks.

Taken together, the evidence from Tables 8 and 9 suggest that there are important differences among PRI signatories. Some PRI signatories truly adopt responsible investing strategies and have higher ESG footprints and lower idiosyncratic portfolio risks, while others pledge to it but fall short of implementing it. We conclude that it is important to separate between these investors as well as between their actual ESG investment styles.

## **6. Conclusions**

We analyze the largest global network focused on responsible investment (PRI) and combine it with institutional investor equity portfolio holdings around the world. We document the considerable growth in the number and assets under management of PRI signatory institutions, but also find considerable investor heterogeneity with larger and European-based investors more likely to commit to responsible investing. Our results show that institutional investors who join the PRI exhibit better portfolio-level ESG performance, particularly on the social and governance dimensions, but differences are not overwhelmingly large. However, when we differentiate between US and non-US investors, we find that only non-US PRI signatories have better portfolio-level ESG scores, but not US PRI signatories. This could be related to the different interpretation of fiduciary duties in the US market.

We then explore unique survey data which shows that PRI signatories predominantly implement responsible investment through engagement, ESG integration, and negative/exclusionary screening. Thematic investment is still niche. However, when we test for the impact of the responsible investment strategies, we do not find strong evidence that portfolio-level ESG performance is related to the reported implementation strategies (except for positive/best-in-class screening).

Finally, we ask if there are benefits and costs associated with responsible investing? We uncover weak evidence of lower equity portfolio returns when comparing PRI signatories to non-PRI signatories (especially in the U.S.). When we analyze PRI signatory strategies, we however find evidence that negative screening, integration, and engagement lower portfolio risk.

This paper leaves open many questions for future research. In particular, what are the real effects of initiatives such as the PRI in achieving change in ESG practices in the investee companies and how much do these contribute to fulfill the UN Sustainable Development Goals. Our sample period is relatively short given the recent history of the PRI initiative and the cross section of our analysis is limited to publicly-listed equities. The impact of responsible investing could take time to properly reflect in aggregate measures of portfolio sustainability, not least since ESG scores by rating agencies are imperfect and assessments are conducted mostly on a yearly basis. Other asset classes such as private equity, fixed income, or infrastructure and real estate investments might also be prone to the sustainability preferences expressed by the investment community. The empirical challenge is that there is much less portfolio-level information on those asset classes as there is for the institutional investor equity holdings that we examine in this paper. Since responsible investing is a growing trend, future research should address these topics.

## 7. References

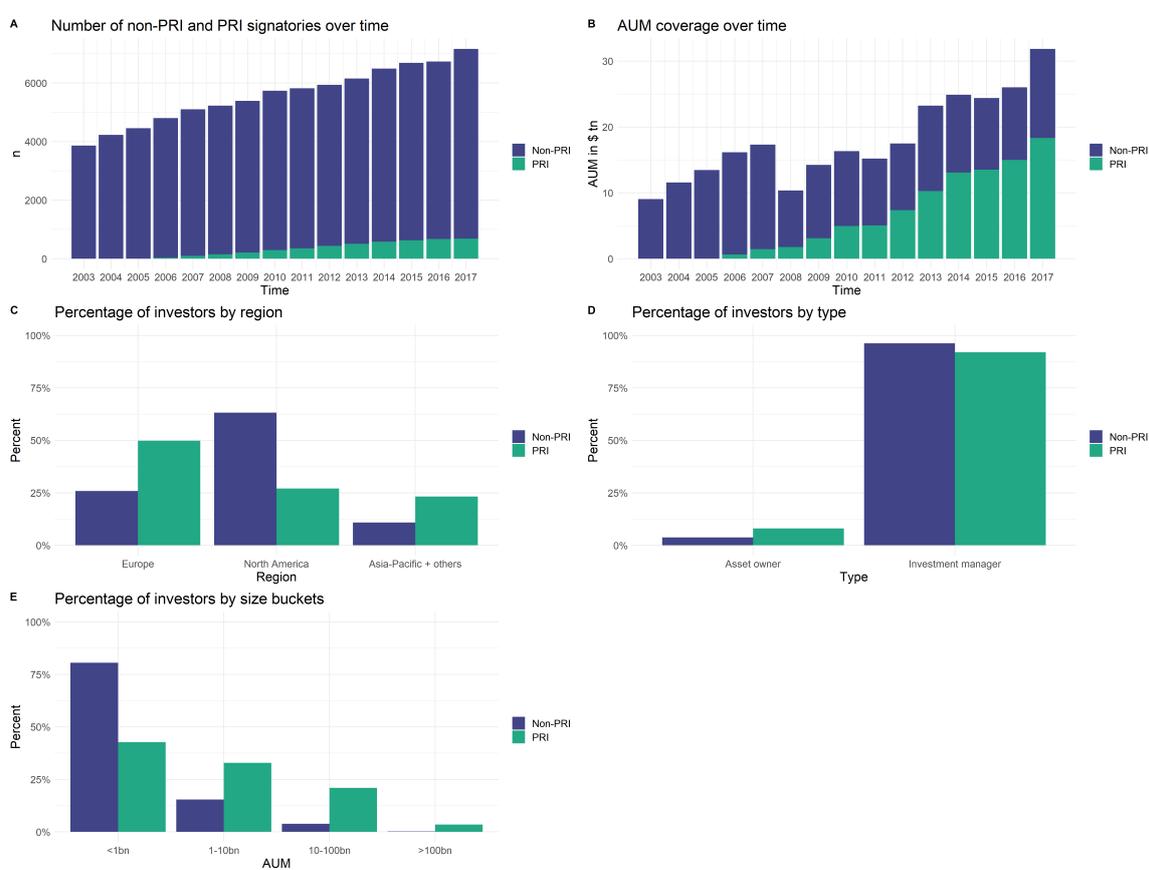
- Amel-Zadeh, Amir and George Serafeim, 2018, Why and how investors use ESG information: Evidence from a global survey, *Financial Analysts Journal*, 74(3), 87-103.
- Blitz, David and Frank Fabozzi, 2017, Sin stocks revisited: resolving the sin stock anomaly, *The Journal of Portfolio Management* 44 (1), 105.111.
- Bolton, Patrick and Marcin Kacperczyk, 2019, Do Investors Care about Carbon Risk?, Columbia University working paper.
- CFA Institute, 2015, Environmental, Social and Governance Issues in Investing: A Guide for Investment Professionals, 1–43.
- Ceccarelli, Marco, Ramelli, Stefano and Alexander Wagner, 2019, When Investors call for climate responsibility, how do mutual funds respond?, Swiss Finance Institute working paper.
- Clayton, Jay, 2018, SEC Chairman Remarks to the SEC Investor Advisory Committee, Dec. 13 2018.
- Dimson, Elroy, Oguzhan Karakas and Xi Li, 2015, Active ownership. *Review of Financial Studies*, 28(12), 3225–3268.
- Dimson, Elroy, Karakas, Oguzhan and Xi Li, 2018, Coordinated Engagements, University of Cambridge working paper.
- Dyck, Alexander, Karl Lins, Lukas Roth and Hannes Wagner, 2019, Do institutional investors drive corporate social responsibility? International evidence, *Journal of Financial Economics* 131, 693-714.
- Edmans, Alex, 2011, Does the Stock Market Fully Value Intangibles? Employee Satisfaction and Equity Prices, *Journal of Financial Economics* 101 (3), 621–640.
- European Sustainable Investment Forum (Eurosif), 2018, European SRI Study.
- Ferreira, Miguel and Pedro Matos, 2008, The colors of investors' money: The role of institutional investors around the world, *Journal of Financial Economics* 88, 495-533.

- Gibson, Rajna and Philipp Krueger, 2018, The sustainability footprint of institutional investors, Swiss Finance Institute working paper.
- Gibson, Rajna, Krueger, Philipp, Riand, Nadine and Peter Schmidt, 2019, ESG rating disagreement and stock returns, Swiss Finance Institute working paper.
- Global Sustainable Investment Alliance (GSIA), 2016, Global Sustainable Investment Review 2016.
- Global Sustainable Investment Alliance (GSIA), 2018, Global Sustainable Investment Review 2018.
- Gompers, Paul, Joy Ishii and Andrew Metrick. 2003. "Corporate Governance and Equity Prices." *Quarterly Journal of Economics* 118 (1), 107–156.
- Hartzmark, Samuel and Abigail Sussman, 2019, Do Investors Value Sustainability? A Natural Experiment Examining Ranking and Fund Flows, *The Journal of Finance* (forthcoming)
- Hoepner, Andreas, Oikonomou, Ioannis, Sautner, Zacharias, Starks, Laura and Xiao Zhou, 2018, ESG Engagement and Downside Risk, University College Dublin working paper.
- Hong, Harrison and Marcin Kacperczyk, 2009, The price of sin: The effects of social norms on markets, *Journal of Financial Economics*, 93(1), 15-36.
- Humphrey, Jacquelyn and Yong Li, 2019, Commitment or greenwash? How the market views fund family sustainability signaling, University of Queensland working paper.
- Krueger, Philipp, Zacharias Sautner and Laura Starks, 2019, The Importance of climate risks for institutional investors, *Review of Financial Studies* (forthcoming).
- Liang, Hao and Luc Renneboog, 2017, On the Foundations of Corporate Social Responsibility, *The Journal of Finance* 72(2), 853-910.
- Organisation for Economic Co-operation and Development (OECD), 2017, Investment governance and the integration of environmental, social and governance factors.
- Organisation for Economic Co-operation and Development (OECD), 2019, Owners of the World's Listed Companies, OECD Capital Market Series.

- Pedersen, Lasse, Fitzgibbons, Shaun and Lukazs Pomorski, 2019, Responsible Investing: The ESG-Efficient Frontier, AQR Capital Management working paper.
- Renneboog, Luc, Jenke Ter Horst and Chendi Zhang, 2008, Socially responsible investments: Institutional aspects, performance and investor behavior, *Journal of Banking and Finance* 32, 1723-1742.
- Riedl, Arno and Paul Smeets, 2017, Why do investors hold socially responsible mutual funds?, *The Journal of Finance* 72, 2505–2550.
- Starks, Laura, Parth Venkat and Qifei Zhu, 2018, Corporate ESG Profiles and Investor Horizons, UT Austin working paper.
- United States Forum on Sustainable and Responsible Investment (US SIF), 2018. Report on US sustainable, responsible and impact investing trends.
- Wall Street Journal, 2019, ESG Funds Draw SEC Scrutiny, December 16 edition.

**Fig. 1.** Descriptive statistics on PRI signatory institutional investors

*PRI* denotes those institutional investors in the FactSet Ownership data that signed the UN Principles for Responsible Investment (PRI). *Non-PRI* denotes all institutional investors in the FactSet data that did not sign the PRI. Panel A plots the number of PRI signatories and non-PRI signatories. Panel B shows the coverage in terms of assets under management (AUM in USD billion is computed as the sum of the market value of equity holdings for which we have portfolio-level ESG scores). Panel C compares the percentage of investors by geographic region of domicile. Panel D compares the percentage of investors by type (investment managers or asset owners). Panel E compares the percentage of investors by size. The sample period is from 2003 to 2017.



**Table 1.** Summary statistics on PRI signatories vs. non-PRI institutional investors

This table compares the characteristics of PRI signatory institutional investors to non-PRI investors in the FactSet Ownership data in 2006, 2012, and 2017. PRI signatories are institutional investors that reported in the PRI listed equity module that could be matched to FactSet Ownership data on portfolio holdings, Datastream stock returns, and to ESG company ratings. *Number of investors* counts the number of institutional investors in each group. *AUM coverage* corresponds to the sum of the market value of equity holdings for which ESG scores are available. Variable definition for portfolio characteristics are provided in Appendix A1.

	PRI			Non-PRI			All
	2006	2012	2017	2006	2012	2017	All
Number of investors	36	439	684	4762	5498	6481	10689
AUM coverage (USD, trillion)	0.65	7.37	18.35	15.52	10.13	13.52	271.61
<i>by Region</i>							
Europe	61.11%	51.25%	47.81%	29.40%	25.17%	19.90%	27.23%
North America	19.44%	23.01%	31.43%	63.06%	61.15%	68.34%	61.19%
Asia-Pacific + others	19.44%	25.74%	20.76%	7.54%	13.68%	11.76%	11.58%
<i>by Type</i>							
Asset owner	30.56%	8.66%	5.41%	5.29%	3.15%	2.04%	4.01%
Investment manager	69.44%	91.34%	94.59%	94.71%	96.85%	97.96%	95.99%
<i>by AUM (USD)</i>							
<1bn	27.78%	41.91%	42.11%	77.78%	81.99%	80.50%	78.46%
1-10bn	25.00%	35.08%	33.19%	16.82%	14.62%	15.75%	16.39%
10-100bn	47.22%	19.59%	19.88%	5.08%	3.27%	3.47%	4.76%
>100bn	0.00%	3.42%	4.82%	0.31%	0.11%	0.28%	0.40%
<i>Portfolio characteristics</i>							
Total ESG score	0.36	0.18	0.22	0.12	0.01	0.01	0.05
Number of Stocks	1187	805	819	276	211	207	269
Industry Concentration	0.00	0.01	0.02	0.01	0.02	0.04	0.02
Portfolio Turnover	0.28	0.27	0.28	0.40	0.37	0.33	0.37
Portfolio Activeness	0.69	0.82	0.82	0.89	0.90	0.88	0.88
Average Stock Size (USD, million)	11.5	19.6	22.6	15.0	17.1	24.9	17.8

**Table 2.** What is the ESG portfolio footprint of PRI signatory institutional investors?

This table regresses portfolio-level ESG scores on a *PRI dummy* (whether an investor is a PRI signatory or not) and on institutional investors' characteristics. The dependent variables are the four value-weighted ESG scores of institutional investors' equity portfolios: *Total ESG score*, *Environmental score*, *Social score*, and *Governance score*. Appendix A1 provides definitions of the independent variables. Robust standard errors clustered at the investor-level and year-level are reported in parentheses. The sample period is from 2003 to 2017. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels.

Panel A: Full sample

	<i>Dependent variable:</i>							
	Total ESG score		Environmental score		Social score		Governance score	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
PRI dummy	0.1*** (0.02)	0.1*** (0.01)	0.02 (0.02)	0.01 (0.01)	0.05*** (0.01)	0.04*** (0.01)	0.1*** (0.02)	0.1*** (0.02)
Europe	0.5*** (0.03)	0.3*** (0.03)	0.4*** (0.02)	0.2*** (0.02)	0.3*** (0.03)	0.2*** (0.03)	0.5*** (0.04)	0.4*** (0.04)
North America	0.2*** (0.03)	0.1** (0.03)	0.02 (0.03)	-0.1*** (0.03)	-0.04** (0.02)	-0.1*** (0.02)	0.6*** (0.05)	0.6*** (0.04)
Investment manager	-0.1*** (0.02)	-0.03 (0.02)	-0.1*** (0.02)	-0.03 (0.02)	-0.1*** (0.02)	-0.04** (0.02)	-0.04** (0.02)	0.00 (0.02)
Number of Stocks		-0.2*** (0.01)		-0.2*** (0.01)		-0.1*** (0.02)		-0.1*** (0.01)
Industry Concentration		-0.4*** (0.04)		-0.4*** (0.05)		-0.4*** (0.03)		-0.2*** (0.02)
Portfolio Turnover		-0.2*** (0.02)		-0.2*** (0.01)		-0.2*** (0.01)		-0.1*** (0.01)
Portfolio Activeness		-1.5*** (0.1)		-1.6*** (0.1)		-1.1*** (0.1)		-0.9*** (0.1)
Average Stock Size		-0.2*** (0.01)		-0.2*** (0.01)		-0.1*** (0.01)		-0.05*** (0.01)
AUM	0.02*** (0.00)	0.1*** (0.01)	0.02*** (0.00)	0.1*** (0.01)	0.02*** (0.00)	0.1*** (0.01)	0.01*** (0.00)	0.04*** (0.01)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	83,768	76,356	83,768	76,356	83,768	76,356	83,768	76,356
Adjusted R <sup>2</sup>	0.1	0.3	0.1	0.3	0.1	0.3	0.2	0.3

**Table 2.** What is the ESG portfolio footprint of PRI signatory institutional investors? (contd.)

Panel B: US sample

	<i>Dependent variable:</i>							
	Total ESG score		Environmental score		Social score		Governance score	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
PRI dummy	-0.01 (0.02)	-0.1** (0.03)	-0.01 (0.03)	-0.05* (0.03)	-0.01 (0.02)	-0.04 (0.02)	-0.02 (0.02)	-0.04** (0.02)
Baseline controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Portfolio controls	No	Yes	No	Yes	No	Yes	No	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	47,975	43,629	47,975	43,629	47,975	43,629	47,975	43,629
Adjusted R <sup>2</sup>	0.02	0.3	0.03	0.4	0.03	0.3	0.1	0.2

Panel C: Non-US sample

	<i>Dependent variable:</i>							
	Total ESG score		Environmental score		Social score		Governance score	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
PRI dummy	0.1*** (0.02)	0.1*** (0.02)	0.1*** (0.02)	0.1*** (0.02)	0.1*** (0.02)	0.1*** (0.01)	0.1*** (0.03)	0.04* (0.02)
Baseline controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Portfolio controls	No	Yes	No	Yes	No	Yes	No	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	35,793	32,727	35,793	32,727	35,793	32,727	35,793	32,727
Adjusted R <sup>2</sup>	0.02	0.2	0.04	0.2	0.02	0.2	0.02	0.2

**Table 3.** Is there a PRI-signing effect on an investors' ESG portfolio footprint? Difference-in-difference regressions

This table regresses portfolio-level ESG scores on a *PRI dummy*, a *Post-signature dummy*, and institutional investors' characteristics. The dependent variables are the four value-weighted portfolio-level ESG scores. *Post-signature dummy* takes the value 1 for country-year observations from the signature year onwards (also for matched non-signatories), and 0 otherwise. *PRI dummy* takes the value 1 for PRI signatories, and 0 for matched non-signatories. *Post-signature x PRI* interacts the previous two dummies. Definitions for the other independent variables are provided in Appendix A1. Robust standard errors clustered at the investor-level and year-level are reported in parentheses. The sample period is from 2003 to 2017, but trimmed to [-3;+3] years around the signature dates. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels.

Panel A: Full sample

	<i>Dependent variable:</i>			
	Total ESG score	Environmental score	Social score	Governance score
	(1)	(2)	(3)	(4)
Post-signature x PRI	0.04** (0.02)	0.01 (0.01)	0.05*** (0.01)	0.03** (0.02)
Post-signature dummy	-0.02* (0.01)	-0.02 (0.01)	-0.03** (0.01)	-0.01 (0.01)
PRI dummy	0.05** (0.02)	0.06*** (0.02)	0.02 (0.02)	0.02 (0.02)
Number of Stocks	-0.18*** (0.02)	-0.15*** (0.02)	-0.12*** (0.02)	-0.16*** (0.02)
Industry Concentration	-0.68*** (0.09)	-0.59*** (0.08)	-0.59*** (0.09)	-0.45*** (0.11)
Portfolio Turnover	-0.25*** (0.03)	-0.21*** (0.03)	-0.25*** (0.03)	-0.08** (0.03)
Portfolio Activeness	-0.73*** (0.10)	-0.75*** (0.09)	-0.40*** (0.08)	-0.97*** (0.10)
Average Stock Size	-0.18*** (0.02)	-0.16*** (0.02)	-0.14*** (0.01)	-0.08*** (0.01)
AUM	0.15*** (0.02)	0.14*** (0.02)	0.11*** (0.01)	0.08*** (0.01)
Year fixed effects	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes
Type fixed effects	Yes	Yes	Yes	Yes
Observations	8,610	8,610	8,610	8,610
Adjusted R <sup>2</sup>	0.31	0.32	0.30	0.27

**Table 3.** Is there a PRI-signing effect on an investors' ESG portfolio footprint? (contd.)

## Panel B: US sample

	<i>Dependent variable:</i>			
	Total ESG score	Environmental score	Social score	Governance score
	(1)	(2)	(3)	(4)
Post-signature x PRI	-0.03 (0.03)	-0.03 (0.02)	-0.04 (0.03)	-0.04* (0.02)
Controls	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Type fixed effects	Yes	Yes	Yes	Yes
Observations	2,345	2,345	2,345	2,345
Adjusted R <sup>2</sup>	0.33	0.33	0.27	0.18

## Panel C: Non-US sample

	<i>Dependent variable:</i>			
	Total ESG score	Environmental score	Social score	Governance score
	(1)	(2)	(3)	(4)
Post-signature x PRI	0.07*** (0.02)	0.04** (0.02)	0.08*** (0.02)	0.06*** (0.02)
Controls	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes
Type fixed effects	Yes	Yes	Yes	Yes
Observations	6,265	6,265	6,265	6,265
Adjusted R <sup>2</sup>	0.20	0.20	0.16	0.17

**Table 4.** Is there a PRI-signing effect on investors' ESG portfolio footprint? Instrumental variables using stewardship codes

This table regresses portfolio-level ESG scores on an *instrumented PRI dummy* and institutional investors' characteristics (using a two-stage least squares estimation). The dependent variable of the first stage is the *PRI dummy* that takes the value of 1 for investors that are PRI signatories from the signature year onwards. The dependent variables for the second stage are the value-weighted portfolio-level ESG scores. The instrumental variable, *Stewardship code*, takes the value of 1 for country-year observations that are covered by a stewardship code obtained from the "Investment governance and the integration of environmental, social and governance factors" report by the OECD (2017, Table 3), and 0 otherwise. *Instrumented PRI Dummy* is the predicted value obtained from the first-stage regression. The definitions for the independent variables are provided in Appendix A1. Robust standard errors clustered at the investor-level and year-level are reported in parentheses. The sample period is from 2003 to 2017. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels.

	<i>Dependent variable:</i>				
	PRI dummy First stage	Total ESG score	Environmental score	Social score	Governance score
	(1)	(2)	(3)	(4)	(5)
Stewardship code	0.06*** (0.02)				
Instrumented PRI Dummy		2.03*** (0.38)	0.43* (0.26)	1.61*** (0.38)	2.50*** (0.75)
Europe	-0.03** (0.01)	0.34*** (0.03)	0.25*** (0.02)	0.23*** (0.03)	0.44*** (0.04)
North America	-0.12*** (0.02)	0.27*** (0.06)	-0.05 (0.04)	0.06 (0.05)	0.84*** (0.09)
Investment manager	-0.03** (0.01)	0.03 (0.04)	-0.02 (0.03)	0.01 (0.03)	0.08* (0.04)
Number of Stocks	0.02*** (0.00)	-0.22*** (0.01)	-0.18*** (0.01)	-0.17*** (0.01)	-0.14*** (0.02)
Industry Concentration	0.04*** (0.01)	-0.51*** (0.05)	-0.44*** (0.05)	-0.42*** (0.04)	-0.32*** (0.05)
Portfolio Turnover	-0.00 (0.00)	-0.20*** (0.02)	-0.18*** (0.01)	-0.19*** (0.01)	-0.07*** (0.02)
Portfolio Activeness	-0.13*** (0.04)	-1.23*** (0.15)	-1.56*** (0.11)	-0.94*** (0.17)	-0.61*** (0.17)
Average Stock Size	0.02*** (0.00)	-0.19*** (0.01)	-0.16*** (0.01)	-0.17*** (0.01)	-0.10*** (0.02)
AUM	0.00 (0.00)	0.12*** (0.01)	0.11*** (0.01)	0.10*** (0.01)	0.03*** (0.01)
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	76,356	76,356	76,356	76,356	76,356

**Table 5.** Summary statistics: Responsible investment strategies

This table compares the responsible investment strategies of PRI signatories as reported in the PRI surveys from 2013 to 2017. Panel A shows the percentage of signatories' AUM that is covered by a responsible investment strategy (*%-Screening*, *%-Thematic*, *%-Integration*). Panel B provides the frequency by which PRI signatories report using negative screening (*Neg*), positive screening (*Pos*), norms-based screening (*N-b*), thematic investment (*The*), integration of ESG factors (*Int*), and engagement (*Eng*). Overall engagement (*Eng*) is further broken down into individual engagement (*Indiv eng*), collaborative engagement (*Colla eng*), and internal voting (*Int vot*). Detailed definitions of these variables are available in Appendix [A1](#).

Panel A: PRI strategies: Percentage of AUM

	PRI			
	Total	%-Screening	%-Thematic	%-Integration
Overall	2,796	50%	11%	66%
<i>by Year</i>				
2013	442	46%	8%	62%
2014	497	49%	10%	61%
2015	556	51%	11%	65%
2016	625	50%	12%	68%
2017	676	51%	13%	69%
<i>by Region</i>				
Europe	1,379	60%	12%	62%
North America	777	37%	11%	62%
Asia-Pacific + others	640	42%	10%	77%
<i>by Type</i>				
Asset owner	184	57%	8%	67%
Investment manager	2,612	49%	11%	65%
<i>by AUM (USD)</i>				
<1bn	1,202	47%	12%	58%
1-10bn	919	55%	10%	68%
10-100bn	560	49%	10%	75%
>100bn	115	43%	12%	79%

**Table 5.** Summary statistics: Responsible investment strategies (contd.)

Panel B: PRI strategies: Dummy variables

	PRI									
	Total	Neg	Pos	N-b	The	Int	Eng	Indiv eng	Colla eng	Int vot
Overall	2,796	68%	38%	33%	33%	77%	86%	81%	65%	72%
<i>by Year</i>										
2013	442	61%	26%	19%	27%	73%	83%	79%	68%	64%
2014	497	64%	32%	29%	29%	72%	84%	78%	65%	71%
2015	556	70%	38%	30%	32%	76%	87%	81%	62%	74%
2016	625	69%	42%	38%	37%	78%	88%	82%	65%	75%
2017	676	71%	47%	41%	37%	82%	87%	83%	68%	74%
<i>by Region</i>										
Europe	1,379	72%	42%	44%	35%	76%	85%	79%	66%	67%
North America	777	63%	32%	22%	30%	72%	81%	74%	60%	67%
Asia-Pacific + others	640	65%	36%	20%	32%	85%	95%	91%	70%	89%
<i>by Type</i>										
Asset owner	184	51%	18%	38%	15%	72%	91%	86%	76%	84%
Investment manager	2,612	69%	40%	32%	34%	77%	86%	80%	65%	71%
<i>by AUM (USD)</i>										
<1bn	1,202	60%	34%	25%	29%	69%	78%	73%	55%	65%
1-10bn	919	70%	38%	36%	28%	79%	90%	82%	69%	73%
10-100bn	560	77%	46%	40%	47%	89%	94%	92%	78%	82%
>100bn	115	91%	40%	45%	48%	91%	100%	96%	84%	98%

**Table 6.** Is there an effect of responsible investment strategies on ESG portfolio footprints?

This table regresses portfolio-level ESG scores on the reported implementation of responsible investment strategies by PRI signatories. The dependent variables are the value-weighted portfolio-level ESG scores. The independent variables are the percentage of AUM effected by a responsible strategy (*%-Screening*, *%-Thematic*, *%-Integration*) and a dummy taking the value of 1 for institutional investors who engage with firms on ESG issues (*Engagement*). More detailed variable definitions are available in Appendix A1. Robust standard errors clustered at the investor-level and year-level are reported in parentheses. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels. The sample period is from 2013 to 2017.

	<i>Dependent variable:</i>			
	Total ESG score (1)	Environmental score (2)	Social score (3)	Governance score (4)
%-Screening:Negative	-0.00 (0.03)	0.00 (0.02)	0.01 (0.02)	-0.04 (0.03)
%-Screening:Positive	0.07** (0.03)	0.08*** (0.03)	0.04 (0.03)	0.06* (0.04)
%-Screening:Norms	0.01 (0.03)	-0.02 (0.03)	0.01 (0.03)	-0.03 (0.03)
%-Thematic	0.04 (0.04)	0.02 (0.03)	0.02 (0.03)	0.06 (0.05)
%-Integration	0.00 (0.02)	-0.00 (0.02)	-0.01 (0.02)	0.01 (0.03)
Engagement	0.04 (0.05)	0.04 (0.04)	0.02 (0.03)	0.03 (0.04)
Number of Stocks	-0.06 (0.04)	-0.05* (0.03)	-0.03 (0.03)	-0.11*** (0.03)
Industry Concentration	-0.56*** (0.12)	-0.52*** (0.14)	-0.52*** (0.10)	-0.13 (0.23)
Portfolio Turnover	-0.25*** (0.07)	-0.13** (0.06)	-0.23*** (0.07)	-0.17** (0.07)
Portfolio Activeness	-0.12 (0.10)	-0.29*** (0.10)	0.09 (0.09)	-0.56*** (0.15)
Average Stock Size	-0.10*** (0.03)	-0.09*** (0.03)	-0.09*** (0.03)	-0.05** (0.02)
AUM	0.08*** (0.03)	0.08*** (0.03)	0.06** (0.03)	0.06** (0.03)
Year fixed effects	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes
Type fixed effects	Yes	Yes	Yes	Yes
Observations	2,718	2,718	2,718	2,718
Adjusted R <sup>2</sup>	0.28	0.30	0.27	0.17

**Table 7.** What are the holdings-based returns of PRI signatory institutional investors?

This table regresses institutional investors' performance measures on a *PRI dummy* and portfolio characteristics. The dependent variables are these yearly holdings-based performance measures: *mean(return)*, *std(return)*, *sharpe*, *alpha1F*, *systematic*, *idiosyncratic*, and *semivar*. Appendix A1 provides detailed definitions of the independent variables. Robust standard errors clustered at the investor-level and year-level are reported in parentheses. The coefficients are multiplied by 100. The sample period is from 2003 to 2017. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels.

Panel A: Full sample

	<i>Dependent variable:</i>													
	mean(return)		std(return)		sharpe		alpha1F		systematic		idiosyncratic		semivar	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
PRI dummy	-0.1 (0.1)	-0.1 (0.1)	0.1 (0.1)	0.1 (0.1)	-1.5 (2.5)	-1.5 (2.5)	-0.1* (0.1)	-0.1 (0.1)	0.1 (0.1)	0.1 (0.1)	-0.01 (0.1)	0.04 (0.1)	0.1 (0.1)	0.2* (0.1)
ESG Score		-0.2 (0.1)		-0.8*** (0.2)		-0.6 (1.8)		-0.2** (0.1)		-0.1 (0.1)		-0.9*** (0.1)		-0.5*** (0.1)
Europe	0.02 (0.2)	0.1 (0.2)	-0.5** (0.2)	-0.3 (0.2)	4.7 (4.1)	4.9 (3.9)	-0.1 (0.2)	-0.00 (0.2)	0.3* (0.2)	0.3** (0.2)	-1.2*** (0.2)	-0.9*** (0.2)	-0.4* (0.2)	-0.2 (0.2)
North America	-0.01 (0.3)	0.00 (0.2)	-1.4*** (0.2)	-1.4*** (0.2)	6.7 (5.1)	6.7 (5.1)	0.1 (0.3)	0.1 (0.3)	-0.6*** (0.1)	-0.6*** (0.1)	-1.3*** (0.2)	-1.3*** (0.2)	-0.9*** (0.1)	-0.9*** (0.1)
Investment manager	-0.2 (0.2)	-0.2 (0.2)	-0.7 (0.5)	-0.7 (0.5)	0.6 (1.0)	0.6 (1.0)	-0.03 (0.1)	-0.04 (0.1)	-0.3 (0.2)	-0.3 (0.2)	-0.6 (0.4)	-0.6 (0.4)	-0.04 (0.1)	-0.1 (0.1)
Number of Stocks	-0.1 (0.1)	-0.1 (0.1)	0.2 (0.2)	0.1 (0.2)	-1.7 (1.1)	-1.8 (1.3)	-0.1* (0.1)	-0.1*** (0.05)	0.2* (0.1)	0.2 (0.1)	0.1 (0.1)	-0.1 (0.1)	0.1** (0.1)	0.1 (0.1)
Industry Concentration	0.00 (0.1)	-0.1 (0.1)	3.7*** (0.3)	3.4*** (0.3)	-11.3** (5.5)	-11.6** (4.9)	0.02 (0.1)	-0.1 (0.1)	0.3 (0.2)	0.3 (0.2)	3.8*** (0.3)	3.4*** (0.3)	1.8*** (0.2)	1.6*** (0.1)
Portfolio Turnover	0.4** (0.2)	0.4** (0.2)	1.0** (0.5)	0.9* (0.5)	1.5 (1.4)	1.4 (1.4)	0.3** (0.1)	0.3* (0.1)	0.4** (0.2)	0.3** (0.2)	0.9* (0.5)	0.8 (0.5)	0.2** (0.1)	0.1 (0.1)
Portfolio Activeness	0.5 (0.6)	0.3 (0.5)	1.7* (1.0)	0.6 (0.8)	-11.3 (12.7)	-12.2 (10.7)	0.5 (0.5)	0.2 (0.4)	1.5** (0.6)	1.3*** (0.5)	1.6 (1.0)	0.2 (0.8)	1.4*** (0.5)	0.7 (0.5)
Average Stock Size	-0.1 (0.1)	-0.1 (0.1)	0.6** (0.2)	0.4* (0.2)	-2.7*** (0.6)	-2.8*** (0.7)	-0.1** (0.04)	-0.1*** (0.04)	0.2 (0.1)	0.2 (0.1)	0.6*** (0.2)	0.4** (0.2)	0.3*** (0.05)	0.2*** (0.04)
AUM	0.1 (0.1)	0.1 (0.1)	-0.5*** (0.2)	-0.4** (0.2)	3.2*** (0.7)	3.3*** (0.7)	0.1*** (0.04)	0.2*** (0.04)	-0.2* (0.1)	-0.2 (0.1)	-0.5*** (0.2)	-0.4*** (0.2)	-0.3*** (0.04)	-0.2*** (0.04)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	76,356	76,356	76,356	76,356	76,356	76,356	76,356	76,356	76,356	76,356	76,355	76,355	72,289	72,289
Adjusted R <sup>2</sup>	0.4	0.4	0.1	0.1	0.7	0.7	0.03	0.03	0.3	0.3	0.1	0.1	0.5	0.5

**Table 7.** What are the holdings-based returns of PRI signatory institutional investors? (contd.)

Panel B: US sample

	<i>Dependent variable:</i>													
	mean(return)		std(return)		sharpe		alpha1F		systematic		idiosyncratic		semivar	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
PRI dummy	-0.03 (0.1)	-0.04 (0.1)	0.6*** (0.1)	0.6*** (0.1)	-0.4 (3.0)	-0.3 (3.1)	-0.05 (0.1)	-0.1 (0.1)	0.2*** (0.1)	0.2*** (0.1)	0.5*** (0.1)	0.5*** (0.1)	0.4*** (0.1)	0.4*** (0.1)
ESG Score		-0.1 (0.1)		-1.3*** (0.2)		2.6 (2.6)		-0.1 (0.1)		-0.5*** (0.1)		-1.2*** (0.2)		-0.7*** (0.1)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	43,629	43,629	43,629	43,629	43,629	43,629	43,629	43,629	43,629	43,629	43,629	43,629	41,342	41,342
Adjusted R <sup>2</sup>	0.6	0.6	0.4	0.4	0.7	0.7	0.1	0.1	0.6	0.6	0.2	0.3	0.5	0.5

Panel C: Non-US sample

	<i>Dependent variable:</i>													
	mean(return)		std(return)		sharpe		alpha1F		systematic		idiosyncratic		semivar	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
PRI dummy	0.02 (0.04)	0.03 (0.05)	-0.04 (0.1)	-0.01 (0.1)	1.1 (1.7)	1.2 (1.7)	-0.02 (0.1)	0.00 (0.1)	0.1 (0.1)	0.1 (0.1)	-0.1* (0.1)	-0.1 (0.1)	0.03 (0.1)	0.1 (0.1)
ESG Score		-0.1 (0.2)		-0.4 (0.3)		-1.2 (2.0)		-0.3* (0.2)		0.2 (0.2)		-0.9*** (0.3)		-0.4** (0.2)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	32,727	32,727	32,727	32,727	32,727	32,727	32,727	32,727	32,727	32,727	32,726	32,726	30,947	30,947
Adjusted R <sup>2</sup>	0.3	0.3	0.1	0.1	0.7	0.7	0.1	0.1	0.2	0.2	0.03	0.03	0.6	0.6

**Table 8.** Portfolio Performance of PRI and Non-PRI signatories

This table reports monthly calendar-time portfolio returns regressions of PRI and Non-PRI signatories. The panels present the risk-adjusted alphas of portfolios comprising PRI and Non-PRI signatories. The equity return factors are MKT (1-factor), MKT SMB HML UMD (4-factor), and MKT SMB HML UMD BAB RMW CMA (7-factor). Newey-West standard errors are reported in parentheses. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels. The coefficients are multiplied by 100. The sample period is from 2003 to 2017.

Panel A: Full sample

	EQ(1factor)	EQ(4factor)	EQ(7factor)	VW(1factor)	VW(4factor)	VW(7factor)
PRI	0.00	0.02	-0.02	0.09**	0.08**	0.08*
Non-Pri	0.09**	0.12***	0.16***	0.12**	0.11*	0.19***
Long/Short	-0.09	-0.10*	-0.18***	-0.03	-0.04	-0.11***

Panel B: US sample

	EQ(1factor)	EQ(4factor)	EQ(7factor)	VW(1factor)	VW(4factor)	VW(7factor)
PRI	0.13	0.13	0.20**	0.17**	0.16**	0.21**
Non-Pri	0.20**	0.21**	0.31***	0.16**	0.15*	0.24**
Long/Short	-0.07	-0.09*	-0.11**	0.01	0.01	-0.02

Panel C: Non-US sample

	EQ(1factor)	EQ(4factor)	EQ(7factor)	VW(1factor)	VW(4factor)	VW(7factor)
PRI	-0.02	-0.01	-0.08	-0.02	-0.01	-0.05
Non-Pri	-0.05	-0.01	-0.05	-0.01	0.00	0.03
Long/Short	0.03	0.00	-0.03	0.00	-0.01	-0.07

**Table 9.** Is there an effect of responsible investment strategies on holdings-based returns?

This table regresses institutional investors' performance measures on responsible investment strategies. The dependent variables are the yearly holdings-based performance measures of institutional investors. The independent variables are the percentage of AUM effected by a responsible strategy (*%-Screening*, *%-Thematic*, *%-Integration*) and a dummy taking the value 1 for institutional investors who engage with firms on ESG issues (*Engagement*). Robust standard errors clustered at the investor-level and year-level are reported in parentheses. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels. The coefficients are multiplied by 100. The sample period is from 2013 to 2017.

	<i>Dependent variable:</i>						
	mean(return) (1)	std(return) (2)	sharpe (3)	alpha1F (4)	systematic (5)	idiosyncratic (6)	semivar (7)
%-Screening:Negative	0.04 (0.04)	-0.19** (0.08)	1.34 (1.48)	0.03 (0.06)	-0.06 (0.05)	-0.18** (0.08)	-0.09* (0.05)
%-Screening:Positive	0.03 (0.06)	-0.03 (0.09)	-0.26 (2.09)	0.02 (0.08)	0.02 (0.05)	-0.07 (0.08)	-0.04 (0.05)
%-Screening:Norms	-0.04 (0.05)	0.26*** (0.09)	-1.54 (1.50)	0.01 (0.12)	0.06 (0.08)	0.24*** (0.08)	0.22*** (0.04)
%-Thematic	-0.03 (0.04)	-0.08 (0.09)	2.28** (1.01)	-0.11* (0.07)	0.08 (0.05)	-0.06 (0.09)	-0.09 (0.08)
%-Integration	-0.01 (0.05)	-0.22** (0.10)	2.48 (2.15)	0.08 (0.07)	-0.10 (0.07)	-0.24** (0.10)	-0.12* (0.06)
Engagement	-0.02 (0.06)	-0.39*** (0.15)	0.95 (1.21)	0.07 (0.13)	-0.07 (0.07)	-0.42** (0.18)	-0.20** (0.10)
Number of Stocks	-0.33*** (0.12)	-0.28 (0.18)	-1.75 (4.69)	-0.35*** (0.12)	0.01 (0.03)	-0.28 (0.18)	-0.06 (0.13)
Industry Concentration	0.50** (0.24)	4.28*** (1.39)	3.41 (5.98)	0.94*** (0.18)	0.54 (0.55)	4.23*** (1.21)	1.92*** (0.67)
Portfolio Turnover	0.23 (0.43)	-0.39 (0.42)	1.88 (8.95)	0.27 (0.46)	-0.41* (0.21)	-0.27 (0.32)	0.04 (0.34)
Portfolio Activeness	-0.07 (0.35)	0.10 (0.49)	-28.53*** (9.77)	-0.11 (0.44)	0.25 (0.38)	0.79* (0.44)	-0.21 (0.35)
Average Stock Size	-0.34*** (0.12)	0.12 (0.16)	-4.99** (2.34)	-0.39*** (0.11)	0.05** (0.02)	0.15 (0.19)	0.22** (0.09)
AUM	0.37*** (0.12)	-0.18 (0.16)	5.67** (2.40)	0.39*** (0.14)	-0.07** (0.03)	-0.20 (0.17)	-0.22** (0.11)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Type fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,718	2,718	2,718	2,718	2,718	2,718	2,333
Adjusted R <sup>2</sup>	0.42	0.48	0.74	0.06	0.60	0.46	0.38

# Appendix

**Table A1.** Variable definitions

---

---

<b>ESG scores</b>	
Sources: FactSet Ownership, MSCI IVA, ASSET4, Sustainalytics	
<i>Total ESG score</i>	is the (value-weighted) equity portfolio-level total ESG score of an institutional investor. The first step is to calculate an equal-weighted ESG score for each stock in an investor's portfolio. We do so by taking an equal-weighted average of the normalized scores from three ESG data providers (MSCI IVA, ASSET4, and Sustainalytics) or from the ones that are available if these is no coverage for one of them. The second step is to take the value-weighted average of the portfolio using the market value of each stock position.
<i>Environmental score</i>	is the portfolio-level environmental score of an institutional investor.
<i>Social score</i>	is the portfolio-level social score of an institutional investor.
<i>Governance score</i>	is the portfolio-level governance score of an institutional investor.
<b>Investment performance</b>	
Sources: FactSet Ownership, Datastream returns, AQR and Fama-French Equity Factors	
<i>mean(return)</i>	is the mean of the portfolio holdings-based returns over 12 months. We calculate the returns of an institutional investor as the buy-and-hold returns based on an institutions' disclosed equity holdings (for which ESG scores are available). We assume no interim trading between reported quarter-ends.
<i>std(return)</i>	is the standard deviation of the holdings-based returns over 12 months.
<i>sharpe</i>	is the Sharpe ratio of the holdings-based returns over 12 months.
<i>alpha1F</i>	is the 1-factor alpha of the holdings-based returns over 12 months. We use AQR's global equity market factor to calculate the alpha.
<i>systematic</i>	is the systematic risk of the holdings-based returns over 12 months. We use AQR's global equity market factor to calculate the systematic risk.
<i>idiosyncratic</i>	is the idiosyncratic risk of the holdings-based returns over 12 months.
<i>semivar</i>	is the semi-variance of the holdings-based returns over 12 months. It is defined as the standard deviation of all negative returns. We require at least 2 negative months.
<b>PRI signatories</b>	
Sources: PRI signatory data from 2006 to 2017 and OECD	
<i>PRI dummy</i>	is one if the institutional investor is a PRI signatory in a given year, and zero if an investor is not a PRI signatory.
<i>Stewardship code</i>	takes the value of 1 for country-year observations that are covered by an investor stewardship code obtained of the "Investment governance and the integration of environmental, social and governance factors" report by the OECD (2017, Table 3), and 0 otherwise.

### PRI strategies

Sources: PRI surveys from 2013 to 2017. The Internet Appendix provides descriptions of the PRI survey questions from the LEI (Listed Equity Incorporation) and LEA (Listed Equity Active Ownership) modules.

<i>%-Screening:Negative</i>	is the percentage of AUM covered by negative screening strategies. We take the percentage of equities to which screening is applied in LEI 01.1 and multiply it by <i>Negative screening (Neg)</i> , a dummy on whether an investor any form of negative/exclusionary screening in LEI 04.1 of the PRI survey.
<i>%-Screening:Positive</i>	is the percentage of AUM covered by positive screening strategies. We take the percentage of equities to which screening is applied in LEI 01.1 and multiply it by <i>Positive screening (Pos)</i> , a dummy on whether the investor uses the positive/best-in-class screening in LEI 04.1 of the PRI survey.
<i>%-Screening:Norms</i>	is the percentage of AUM covered by norms-based screening strategies. We take the percentage of equities to which screening is applied in LEI 01.1 and multiply it by <i>Norms-based screening (N-b)</i> , a dummy on whether the investor uses any form of norms-based screening in LEI 04.1 of the PRI survey.
<i>%-Thematic</i>	is the percentage of AUM covered by thematic strategies. We take the percentage of equities to which thematic investment is applied in LEI 01.1 of the PRI survey. Thematic is defined as investment in companies specifically related to sustainability (e.g. clean energy, green technology, or sustainable agriculture).
<i>%-Integration</i>	is the percentage of AUM covered by integration strategies. We take the percentage of equities to which thematic investment is applied in LEI 01.1 of the PRI survey. Integration is defined as the systematic and explicit inclusion by investment managers of environmental, social, and governance factors into traditional financial analysis.
<i>Negative screening (Neg)</i>	is one if the “Negative/exclusionary screening” type is selected in <i>LEI 04.1</i> of the PRI survey. This comprises the exclusion from a portfolio of certain sectors, companies, or practices based on specific ESG criteria.
<i>Positive screening (Pos)</i>	is one if the “Positive/best-in-class screening” type is selected in <i>LEI 04.1</i> of the PRI survey. This comprises the investment in companies selected for positive ESG performance relative to industry peers.
<i>Norms-based screening (N-b)</i>	is one if the “Norms-based screening” type is selected in <i>LEI 04.1</i> of the PRI survey. This comprises screening of investments against minimum standards of business practice based on international norms (UN Global Compact Principles, etc.).
<i>Thematic (The)</i>	is one if any of the options containing the word “thematic” and/or “All three strategies combined” are ticked in <i>LEI 01.1</i> of the PRI survey.
<i>Integration (Int)</i>	is one if any of the options containing the word “integration” and/or “All three strategies combined” are ticked in <i>LEI 01.1</i> of the PRI survey.
<i>Engagement (Eng)</i>	is one if any of the variables individual engagement ( <i>Indiv eng</i> ), collaborative engagement ( <i>Collab eng</i> ), or internal voting ( <i>Int Vot</i> ) is one.
<i>Individual engagement (Indiv eng)</i>	is one if the type of engagement in <i>LEA 02.1</i> of the PRI survey equals “Individual/Internal staff engagements” and the reason for interaction includes any of the following: “To influence corporate practice (or identify the need to influence) on ESG issues”, “To encourage improved/increased ESG disclosure”, or “Other; specify _____”

<i>Collaborative engagement (Colla eng)</i>	is one if the type of engagement in <i>LEA 02.1</i> of the PRI survey equals “Collaborative engagements” and the reason for interaction includes any of the following: “To influence corporate practice (or identify the need to influence) on ESG issues”, “To encourage improved/increased ESG disclosure”, or “Other; specify_____”
<i>Internal voting (Int vot)</i>	is one if the approach in <i>LEA 16.1</i> of the PRI survey equals either “We use our own research or voting team and make voting decisions without the use of service providers.” or “We hire service provider(s) that make voting recommendations or provide research that we use to inform our voting decisions.”

### Portfolio characteristics

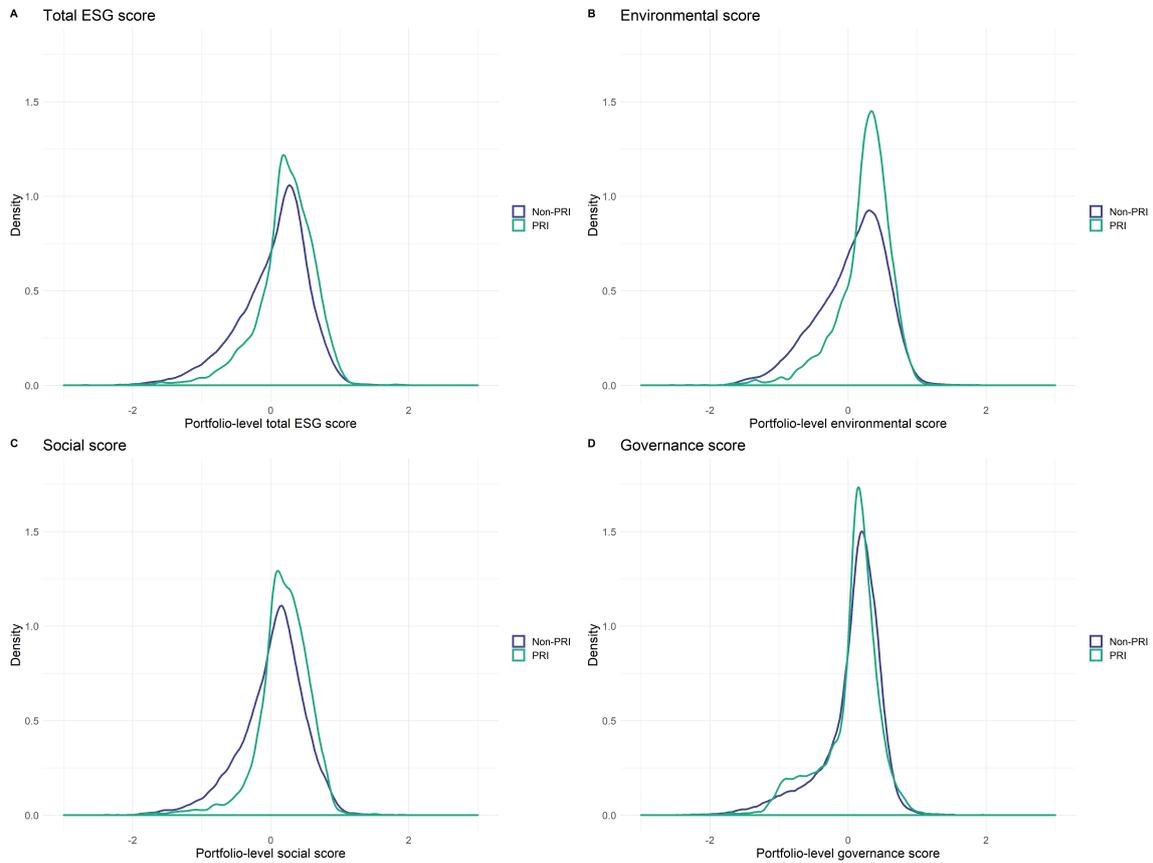
Sources: FactSet Ownership and Datastream returns

<i>Europe</i>	is one if the institutional investor is domiciled in Europe.
<i>North America</i>	is one if the institutional investor is domiciled in North America.
<i>Investment manager</i>	is one if the institution is an investment company or adviser and zero if it is an asset owner (pension funds, endowments, and sovereign wealth funds).
<i>Number of stocks</i>	is the number of unique stocks (in logs) held by an investor.
<i>Industry concentration</i>	is a dummy that takes the value of one if an investor holds stocks from two or less different industries.
<i>Portfolio turnover</i>	is the portfolio turnover of an investor. It is defined as the average portfolio churn rate of the last 4 quarters. See Gaspar, Massa, and Matos (2005) for more details.
<i>Portfolio activeness</i>	is the active share measure (versus the MSCI All Country World Index) of an institutional investor. We calculate active share as in Cremers and Petajisto (2009).
<i>Average stock size</i>	is the logarithm of the stocks’ average market capitalizations.
<i>AUM</i>	is the logarithm of the total market value of an investors’ equity holdings for which ESG scores are available.

## Internet Appendix

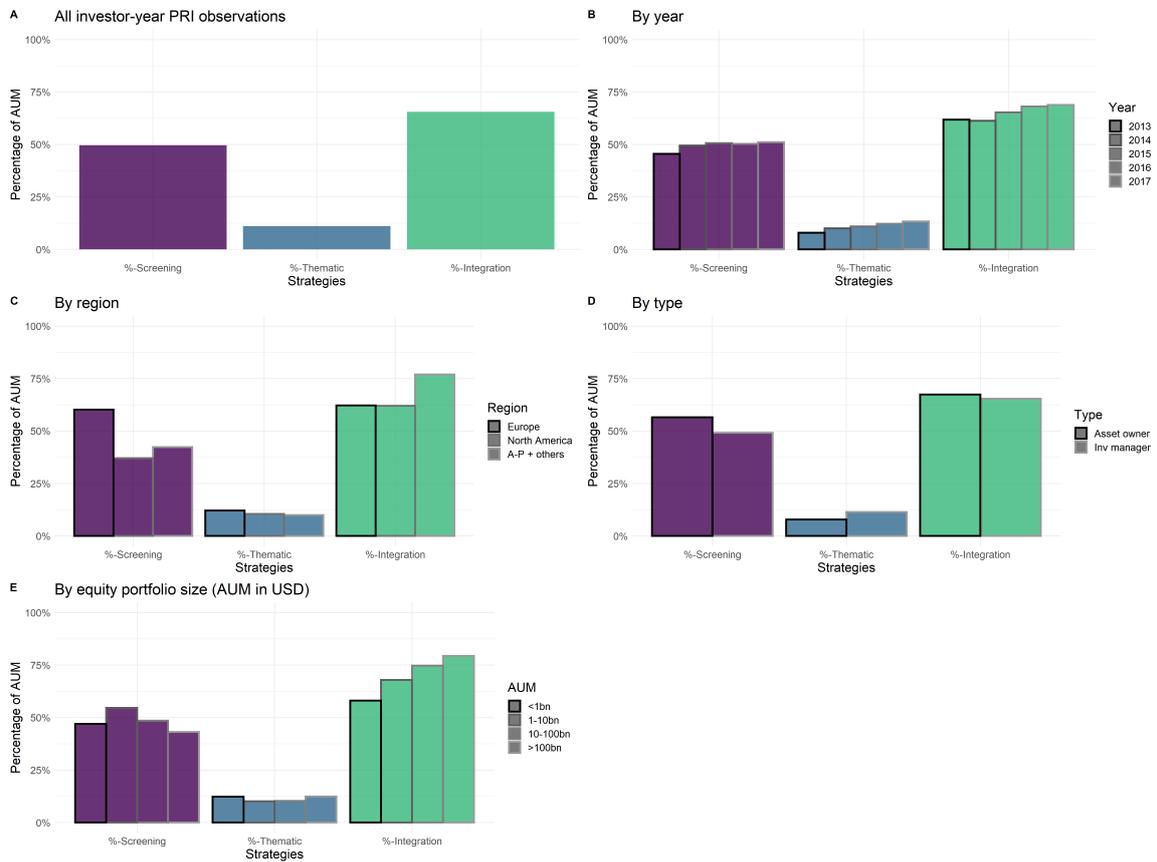
**Fig. IA1.** Densities of portfolio-level ESG scores: PRI signatories vs. non-PRI investors

*PRI* denotes those institutional investors in the FactSet Ownership data that signed the UN Principles for Responsible Investment (PRI). PRI Signatories are denoted *PRI* from their signature year onwards. *Non-PRI* denotes all institutional investors in the FactSet Ownership data that did not sign the PRI. The densities are computed based on value-weighted portfolio-level ESG scores for all stocks with available ESG scores. Panel A compares the *Total ESG score* for PRI and Non-PRI investors, while the other panels compare the densities of the *Environmental score* (Panel B), *Social score* (Panel C), and *Governance score* (Panel C). The sample period is from 2003 to 2017.



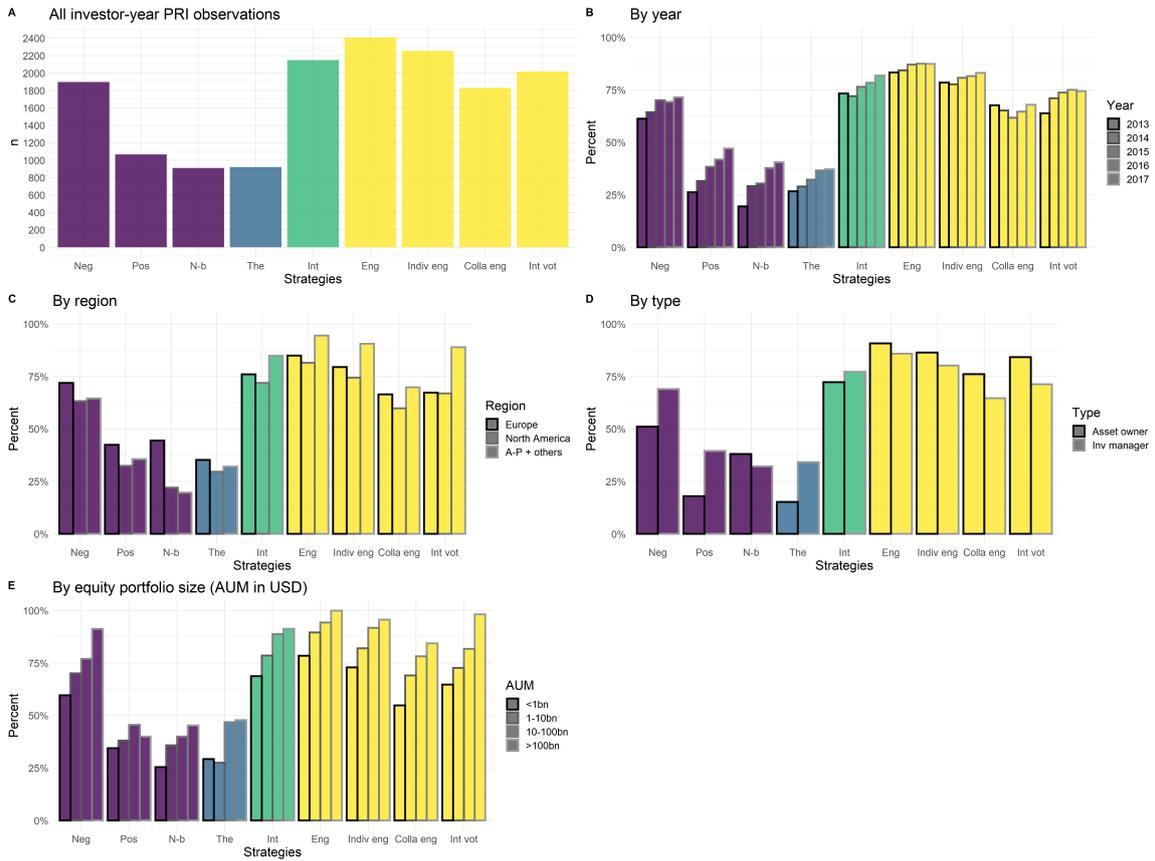
**Fig. IA2.** PRI signatory institutional investors: Responsible investment strategies in percentage of AUM

This figure compares the percentage of equity AUM affected by different responsible investment strategies among PRI signatories. The strategies are screening (*%-Screening*), thematic investment (*%-Thematic*), integration of ESG factors (*%-Integration*). Panel A reports the overall average percentage of AUM for the different strategies. Panel B, C, D, and E show the average percentage of AUM affected by the strategies across years, region, type, and equity portfolio size (AUM). The sample period is from 2013 to 2017.



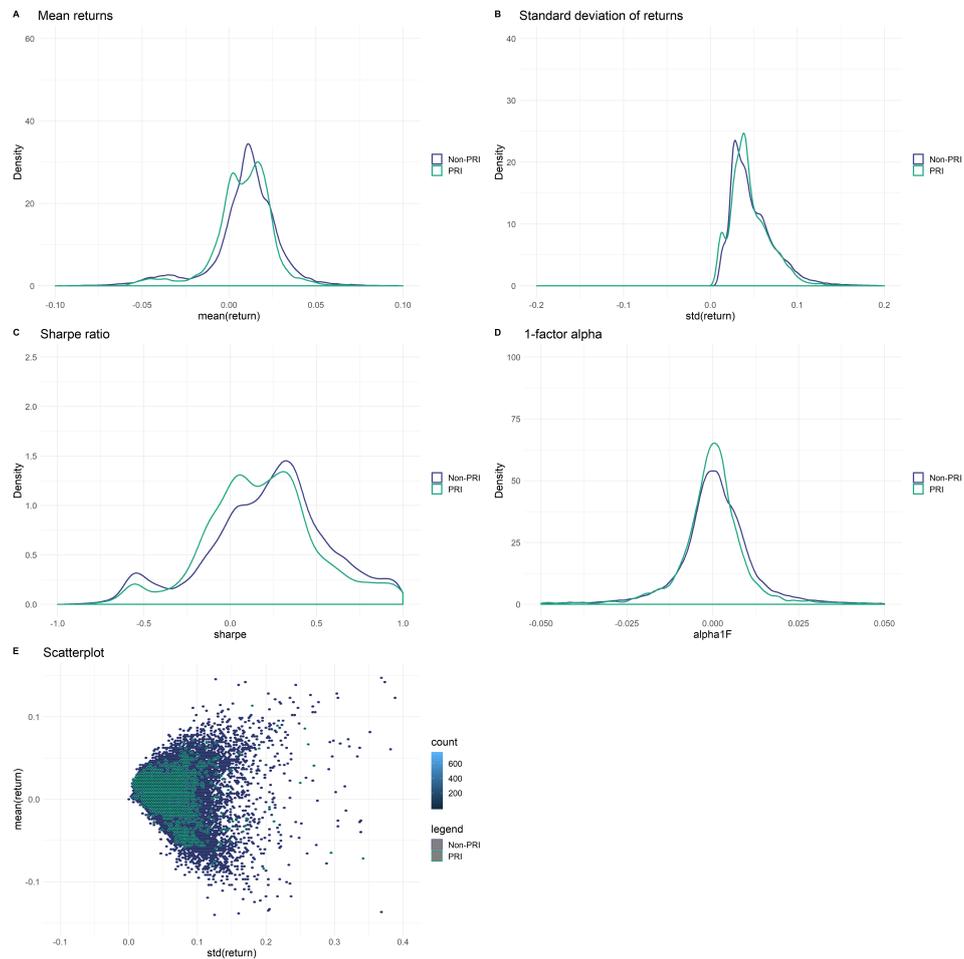
**Fig. IA3.** PRI signatory institutional investors: Frequency of responsible investment strategies

This figure compares the frequency in the implementation of different responsible investment strategies among PRI signatories. The strategies are negative screening (*Neg*), positive screening (*Pos*), norms-based screening (*N-b*), thematic investment (*The*), integration of ESG factors (*Int*), engagement (*Eng*), individual engagement (*Indiv eng*), collaborative engagement (*Colla eng*), and internal voting (*Int vot*). Panel A reports the number of investor-year observations for the different strategies. Panel B, C, D, and E compare the applied strategies (in percent) by year, region, type, and equity portfolio size (AUM). The sample period is from 2013 to 2017.



**Fig. IA4.** Densities of holdings-based returns: PRI signatories vs. Non-PRI investors

*PRI* denotes those institutional investors in the FactSet Ownership data that have signed the UN Principles for Responsible Investment (PRI). *Non-PRI* denotes those investors in the FactSet Ownership data that have not signed the PRI. The densities are computed based on institutional investors' holdings-based returns. Panel A compares the mean returns ( $mean(return)$ ). Panel B compares the standard deviation of returns ( $std(return)$ ). Panel C compares the Sharpe ratio ( $sharpe$ ). Panel D compares the 1-factor alpha ( $alpha1F$ ). Panel E provides a mean-standard deviation of returns scatterplot. The sample period is from 2003 to 2017.



**Fig. IA5. PRI Reporting Framework: Indicator LEI 01.1**

Retrieved from the Listed Equity Incorporation (LEI) module of the PRI survey. Principle 1 states that PRI signatories must incorporate ESG factors into investment analysis and decision-making processes. The purpose of this indicator is to capture the proportions of the listed equity assets of the PRI signatories that are covered by different approaches in implementing this principle. For instance, if a signatory applies two strategies to the same asset, she needs to select the relevant combination options. For example, one may apply screening for only 5% of ones assets, and for the remainder a combination of screening and integration. In these cases, one would report ‘Screening alone’ for 5% and ‘Screening and Integration strategies’ for the remaining 95%. If one does not apply any incorporation approach, then the option ‘We do not apply incorporation strategies’ should account for 100% of your listed equity assets. *Screening* is defined as a) negative/exclusionary screening: The exclusion from a fund or portfolio of certain sectors, companies or practices based on specific ESG criteria; b) positive/best-in-class screening: Investment in sectors, companies or projects selected for positive ESG performance relative to industry peers; or c) norms-based screening: Screening of investments against minimum standards of business practice based on international norms. *Thematic* is defined as investment in themes or assets specifically related to sustainability (for example, clean energy, green technology or sustainable agriculture). *Integration* is defined as the systematic and explicit inclusion by investment managers of environmental, social and governance factors into traditional financial analysis.

Indicator status	Purpose	Principle
LEI 01	MANDATORY	CORE ASSESSED
		PRI 1

LEI 01	INDICATOR	
LEI 01.1	Indicate <ul style="list-style-type: none"> <li>which ESG incorporation strategy and/or combination of strategies you apply to your actively managed listed equities; and</li> <li>the breakdown of your actively managed listed equities by strategy or combination of strategies.</li> </ul>	
	ESG incorporation strategy (select all that apply)	Percentage of active listed equity to which the strategy is applied — you may estimate +/- 5%
	<input type="checkbox"/> Screening alone (i.e. not combined with any other strategies)	<input type="text"/> %
	<input type="checkbox"/> Thematic alone (i.e., not combined with any other strategies)	<input type="text"/> %
	<input type="checkbox"/> Integration alone (i.e., not combined with any other strategies)	<input type="text"/> %
	<input type="checkbox"/> Screening and integration strategies	<input type="text"/> %
	<input type="checkbox"/> Thematic and integration strategies	<input type="text"/> %
	<input type="checkbox"/> Screening and thematic strategies	<input type="text"/> %
	<input type="checkbox"/> All three strategies combined	<input type="text"/> %
	<input type="checkbox"/> We do not apply incorporation strategies	<input type="text"/> %
	<b>Total actively managed listed equities</b>	<b>100%</b>

**Fig. IA6.** PRI Reporting Framework: Indicator LEI 04.1

Retrieved from the Listed Equity Incorporation (LEI) module of the PRI survey. This indicator asks PRI signatories to describe which ESG screens are used and whether they are used in combination with other screens. Screening can be based on: a) *products*—e.g., specified weapons, tobacco; b) *activities*—e.g., specific products within a sector that is not in itself excluded such as uranium mining; c) *sectors*—e.g., oil and gas, mining; d) *countries/geographic regions*—e.g., Sudan, Iran; e) *environmental and social practices and performance*—e.g., child labor, environmental damage, sustainability reporting; or f) *corporate governance*—e.g., excessive executive remuneration, non-independent boards.

LEI 04	Indicator status MANDATORY	Purpose DESCRIPTIVE	Principle PRI 1
--------	-------------------------------	------------------------	--------------------

LEI 04	INDICATOR		
LEI 04.1	Indicate and describe the type of screening you apply to your internally managed active listed equities.		
	Type of screening	Screened by	Description
	Negative/exclusionary screening	<input type="checkbox"/> Product <input type="checkbox"/> Activity <input type="checkbox"/> Sector <input type="checkbox"/> Country/geographic region <input type="checkbox"/> Environmental and social practices and performance <input type="checkbox"/> Corporate governance	
	Positive/best-in-class screening	<input type="checkbox"/> Product <input type="checkbox"/> Activity <input type="checkbox"/> Sector <input type="checkbox"/> Country/geographic region <input type="checkbox"/> Environmental and social practices and performance <input type="checkbox"/> Corporate governance	
	Norms-based screening	<input type="checkbox"/> UN Global Compact Principles <input type="checkbox"/> The UN Guiding Principles on Business and Human Rights <input type="checkbox"/> International Labour Organization Conventions <input type="checkbox"/> United Nations Convention Against Corruption <input type="checkbox"/> OECD Guidelines for Multinational Enterprises <input type="checkbox"/> Other, specify _____	

**Fig. IA7. PRI Reporting Framework: Indicator LEA 02.1**

Retrieved from the Listed Equity Active Ownership (LEA) module of the PRI survey. This indicators targets engagements that seek better ESG-related disclosure and transparency, and relate to Principles 2 and 3. There are many different configurations of engagement. The defining characteristics of an *individual/internal staff engagement* are: a) it is carried out by your internal staff alone; and b) it is conducted in the name of your organization. *Collaborative engagement* is engagement that an investor conducts jointly with other investors. This includes: a) groups of investors working together without the involvement of a formal investor network; b) groups of investors working together within a formal investor network, with some level of support but with individual members of the collaboration responsible for most of the engagement activity; and c) collaborative engagement coordinated and facilitated by a formal investor network (i.e. PRI coordinated investors coalitions). *Service provider engagements* include engagements conducted via: a) commercial parties that provide stand-alone engagement services without managing their clients' underlying assets; and b) investor organizations that conduct engagement on their members' behalf and that have an explicit mandate from their members to represent them. These include engagements conducted entirely on an outsourced basis as well as those facilitated by the service provider with some involvement of the investor's own staff.

LEA 02	Indicator status	Purpose	Principle
LEA 02	MANDATORY	GATEWAY	PRI 1, 2, 3

LEA 02	INDICATOR	
LEA 02.1	Indicate the method of engagement, giving reasons for the interaction.	
	Type of engagement	Reason for interaction
	Individual/Internal staff engagements	<input type="checkbox"/> To influence corporate practice (or identify the need to influence) on ESG issues <input type="checkbox"/> To encourage improved/increased ESG disclosure <input type="checkbox"/> Other; specify _____ <input type="checkbox"/> We do not engage via internal staff. Please specify why your organisation does not engage via internal staff. (max. 200 words)
	Collaborative engagements	<input type="checkbox"/> To influence corporate practice (or identify the need to influence) on ESG issues <input type="checkbox"/> To encourage improved/increased ESG disclosure <input type="checkbox"/> Other; specify _____ <input type="checkbox"/> We do not engage via collaborative engagements. Please specify why your organisation does not engage via collaborative engagement. (max. 200 words)
	Service provider engagements	<input type="checkbox"/> To influence corporate practice (or identify the need to influence) on ESG issues <input type="checkbox"/> To encourage improved/increased ESG disclosure <input type="checkbox"/> Other; specify _____ <input type="checkbox"/> We do not engage via service providers. Please specify why your organisation does not engage via service providers. (max. 200 words)

**Fig. IA8.** PRI Reporting Framework: Indicator LEA 16.1

Retrieved from the Listed Equity Active Ownership (LEA) module of the PRI survey. This indicators relates to PRI signatories' voting policies. The provided answer options are self-explanatory.

LEA 16	Indicator status	Purpose	Principle
LEA 16	MANDATORY	DESCRIPTIVE	PRI 2

LEA 16	INDICATOR	
LEA 16.1	Indicate how you typically make your (proxy) voting decisions.	
	Approach	Based on
	<input type="radio"/> We use our own research or voting team and make voting decisions without the use of service providers.	<input type="radio"/> Our own voting policy <input type="radio"/> Our clients' requests or policy <input type="radio"/> Other; explain _____
	<input type="radio"/> We hire service provider(s) that makes voting recommendations and/or provides research that we use to inform our voting decisions.	<input type="radio"/> The service provider voting policy we sign off on <input type="radio"/> Our own voting policy <input type="radio"/> Our clients' requests or policy <input type="radio"/> Other; explain _____
	<input type="radio"/> We hire service provider(s) that make voting decisions on our behalf, except for some pre-defined scenarios for which we review and make voting decisions.	<input type="radio"/> The service provider voting policy we sign off on <input type="radio"/> Our own voting policy <input type="radio"/> Our clients' requests or policy <input type="radio"/> Other; explain _____
	<input type="radio"/> We hire service provider(s) that make voting decisions on our behalf.	<input type="radio"/> The service provider voting policy we sign off on <input type="radio"/> Our own voting policy <input type="radio"/> Our clients' requests or policy <input type="radio"/> Other; explain _____

**Table IA1.** Which institutional investors sign the PRI?

This table regresses a PRI signing dummy on institutional investors' characteristics. The dependent variable *PRI dummy* takes the value of 1 for PRI signatories from the signature year onwards. Definitions for the independent variables are provided in Appendix A1. Robust standard errors clustered at the investor-level are reported in parentheses. The sample period is from 2003 to 2017. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels.

	<i>Dependent variable:</i>
	PRI dummy (1)
Europe	-0.06 (0.07)
North America	-1.06*** (0.07)
Investment manager	-0.23** (0.11)
Number of Stocks	0.09*** (0.03)
Industry Concentration	0.37** (0.15)
Portfolio Turnover	-0.15** (0.07)
Portfolio Activeness	-0.60*** (0.23)
Average Stock Size	0.08** (0.04)
AUM	0.12*** (0.04)
Constant	-6.56*** (0.30)
Year fixed effects	Yes
Pseudo R2	0.28
Observations	76,356

**Table IA2.** Top institutional investors by region

This table shows the top 10 institutional investors by portfolio AUM at the parent level domiciled for each *Region*. *Signing year* denotes the earliest year where either the parent or any of its entities signed the PRI. The *Parent AUM* and *PRI AUM covg* are the assets under management at the parent level and the proportion (in percent) covered by the PRI signature, and are computed as the sum of the market value of equity holdings for which ESG scores are available.

Parent name	Country	Region	Signing year	Parent AUM	PRI AUM covg
Norges Bank Investment Management	NO	Europe	2006	664 bn	100 %
UBS Group AG	CH	Europe	2009	316 bn	34 %
AXA SA	FR	Europe	2007	239 bn	100 %
BPCE SA	FR	Europe	2008	239 bn	34 %
Deutsche Bank AG	DE	Europe	2008	223 bn	1 %
Janus Henderson Group Plc	GB	Europe	2006	221 bn	9 %
Schroders Plc	GB	Europe	2007	189 bn	100 %
Standard Life Aberdeen Plc	GB	Europe	2007	179 bn	100 %
Amundi	FR	Europe	2006	168 bn	41 %
Legal and General Group Plc	GB	Europe	2010	157 bn	98 %
The Vanguard Group, Inc.	US	North America	2014	2732 bn	100 %
BlackRock, Inc.	US	North America	2008	2619 bn	100 %
State Street Corp.	US	North America	2012	1328 bn	90 %
The Capital Group Cos., Inc.	US	North America	2010	1265 bn	100 %
FMR LLC	US	North America	2017	938 bn	100 %
T. Rowe Price Group, Inc.	US	North America	2010	665 bn	100 %
JPMorgan Chase and Co.	US	North America	2007	491 bn	51 %
Wellington Management Group LLP	US	North America	2012	482 bn	99 %
The Bank of New York Mellon Corp.	US	North America	2006	423 bn	54 %
Northern Trust Corp.	US	North America	2009	384 bn	95 %
Nomura Holdings, Inc.	JP	Asia-Pacific + others	2011	250 bn	52 %
Sumitomo Mitsui Trust Holdings, Inc.	JP	Asia-Pacific + others	2006	141 bn	89 %
FIL Ltd.	BM	Asia-Pacific + others	2012	135 bn	100 %
ORIX Corp.	JP	Asia-Pacific + others	2006	128 bn	32 %
Mitsubishi UFJ Financial Group, Inc.	JP	Asia-Pacific + others	2006	119 bn	45 %
Daiwa Securities Group Inc.	JP	Asia-Pacific + others	2006	59 bn	99 %
Macquarie Group Ltd.	AU	Asia-Pacific + others	2015	57 bn	0 %
Asset Management One Co., Ltd.	JP	Asia-Pacific + others	2013	51 bn	100 %
Commonwealth Bank of Australia	AU	Asia-Pacific + others	2007	43 bn	27 %
Korea National Pension Service	KR	Asia-Pacific + others	2009	38 bn	48 %

**Table IA3.** What is the portfolio allocation of PRI signatories to high and low total ESG score stocks?

This table regresses quartile-over-total AUM ratios on a *PRI dummy* and on institutional investors' characteristics. The dependent variables are the investors' allocation weights to stocks in the low, low-medium, top-medium and high quartiles in terms of their ESG performance (*Quartile-to-overall AUM ratio*). The quartiles in each column are determined based on the *Total ESG score* of the stocks in the FactSet Ownership data and range from low-ESG-score stocks (Q1) to high-ESG-score stocks (Q4). The *PRI dummy* takes the value of 1 for PRI signatories from the signature year onwards. Definitions for the independent variables are provided in Appendix A1. Robust standard errors clustered at the investor-level and year-level are reported in parentheses. The sample period is from 2003 to 2017. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels.

	<i>Dependent variable:</i>			
	(1) Total Q1	(2) Total Q2	(3) Total Q3	(4) Total Q4
PRI dummy	−0.01 (0.01)	−0.00 (0.00)	−0.01* (0.00)	0.02** (0.01)
Europe	−0.11*** (0.01)	−0.05*** (0.01)	−0.02 (0.01)	0.17*** (0.01)
North America	−0.02* (0.01)	0.03*** (0.01)	0.00 (0.01)	−0.01 (0.01)
Investment manager	0.01 (0.01)	0.00 (0.01)	−0.01 (0.01)	−0.00 (0.01)
Number of Stocks	0.02*** (0.00)	0.01*** (0.00)	−0.01*** (0.00)	−0.02*** (0.00)
Industry Concentration	0.20*** (0.02)	0.03*** (0.01)	−0.09*** (0.02)	−0.14*** (0.01)
Portfolio Turnover	0.07*** (0.01)	0.03*** (0.01)	−0.00 (0.01)	−0.10*** (0.01)
Portfolio Activeness	0.71*** (0.04)	0.24*** (0.02)	−0.35*** (0.03)	−0.60*** (0.06)
AUM	0.00* (0.00)	0.00*** (0.00)	−0.00** (0.00)	−0.00*** (0.00)
Year fixed effects	Yes	Yes	Yes	Yes
Observations	76,356	76,356	76,356	76,356
Adjusted R <sup>2</sup>	0.20	0.11	0.09	0.30

**Table IA4.** What is the effect of employee involvement on ESG portfolio footprints?

This table regresses portfolio-level ESG scores on employee involvement variables and institutional investors' characteristics. The dependent variables are the four value-weighted portfolio-level ESG scores. The independent variables are dummies taking the value of 1 if different corporate roles are involved in the implementation and/or oversight of responsible investment, and 0 otherwise. *Executive staff* includes board members, C-suite level employees, and head of departments, *Investment staff* includes portfolio managers and investment analysts. *ESG staff* includes ESG portfolio managers and dedicated responsible investment staff. *External manager* includes external managers or service providers. *Investor relations* includes investor relation staff. *Other* includes various roles that respondents could specify. Appendix A1 provides definitions for the independent variables. Robust standard errors clustered at the investor-level and year-level are reported in parentheses. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels. The sample period is from 2013 to 2017.

	<i>Dependent variable:</i>			
	Total ESG score (1)	Environmental score (2)	Social score (3)	Governance score (4)
Executive staff	0.05 (0.04)	0.04 (0.03)	0.06* (0.03)	0.02 (0.04)
Investment staff	0.00 (0.07)	-0.02 (0.06)	0.00 (0.07)	-0.00 (0.05)
ESG staff	-0.02 (0.03)	-0.01 (0.02)	0.00 (0.02)	-0.07** (0.03)
External manager	0.02 (0.02)	0.04** (0.02)	0.01 (0.01)	-0.01 (0.02)
Investor relations	-0.14*** (0.05)	-0.11** (0.05)	-0.11*** (0.04)	-0.09* (0.05)
Other	0.01 (0.02)	0.03 (0.02)	0.01 (0.02)	-0.02 (0.02)
Number of Stocks	-0.06 (0.04)	-0.05* (0.03)	-0.03 (0.03)	-0.11*** (0.04)
Industry Concentration	-0.56*** (0.11)	-0.53*** (0.14)	-0.52*** (0.10)	-0.12 (0.22)
Portfolio Turnover	-0.25*** (0.07)	-0.13** (0.06)	-0.24*** (0.07)	-0.18** (0.07)
Portfolio Activeness	-0.12 (0.10)	-0.28*** (0.10)	0.10 (0.09)	-0.58*** (0.15)
Average Stock Size	-0.10*** (0.03)	-0.09*** (0.03)	-0.09*** (0.03)	-0.05** (0.02)
AUM	0.08*** (0.03)	0.08*** (0.03)	0.06** (0.03)	0.06** (0.03)
Year fixed effects	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes
Type fixed effects	Yes	Yes	Yes	Yes
Observations	2,718	2,718	2,718	2,718
Adjusted R <sup>2</sup>	0.28	0.30	0.27	0.17

**Table IA5.** Descriptive statistics for investors' holdings-based returns

This table presents descriptive statistics for the institutional investors' holdings-based returns. The measures are the mean return ( $mean(return)$ ), standard deviation ( $std(return)$ ), Sharpe ratio ( $sharpe$ ), 1-factor alpha ( $alpha1F$ ), systematic portfolio risk ( $systematic$ ), idiosyncratic portfolio risk ( $idiosyncratic$ ), and semivar ( $semivar$ ).

Panel A: Sample with PRI dummy (2003–2017)

Variable	Mean	Median	Std	Min	P05	P95	Max	Obs
mean(return)	0.0095	0.0114	0.0281	-0.1402	-0.0343	0.0364	5.1629	76,683
std(return)	0.0492	0.0419	0.0648	0	0.0175	0.0980	15.6280	76,683
sharpe	0.2801	0.2715	0.4231	-5.7835	-0.4729	1.0234	3.7316	76,683
alpha1F	0.0009	0.0007	0.0151	-0.3482	-0.0174	0.0191	1.1602	76,683
systematic	0.0387	0.0340	0.0354	-0.2710	0.0073	0.0829	7.3305	76,683
idiosyncratic	0.0257	0.0190	0.0566	0.0014	0.0079	0.0638	13.8021	76,678
semivar	0.0293	0.0235	0.0213	0.000002	0.0055	0.0703	0.3487	72,596

Panel B: Sample with PRI strategies (2013–2017)

Variable	Mean	Median	Std	Min	P05	P95	Max	Obs
mean(return)	0.0090	0.0085	0.0136	-0.0838	-0.0107	0.0267	0.1138	2,731
std(return)	0.0377	0.0355	0.0236	0.0053	0.0113	0.0717	0.3423	2,731
sharpe	0.4170	0.2258	0.5641	-0.7822	-0.2043	1.5973	2.7088	2,731
alpha1F	-0.0009	-0.0003	0.0133	-0.1028	-0.0202	0.0142	0.2026	2,731
systematic	0.0276	0.0295	0.0160	-0.1213	0.0052	0.0485	0.1654	2,731
idiosyncratic	0.0216	0.0148	0.0223	0.0014	0.0058	0.0577	0.3201	2,731
semivar	0.0222	0.0202	0.0149	0.0001	0.0036	0.0485	0.1723	2,345

**Table IA6.** What are the holdings-based returns of PRI signatory institutional investors?

This table regresses portfolio-level ESG scores on a *PRI dummy* and on institutional investors' characteristics. The dependent variables are investors' holdings-based returns: *mean(return)*, *std(return)*, *sharpe*, *alpha1F*, *systematic*, *idiosyncratic*, and *semivar*. Appendix A1 provides definitions for the independent variables. Robust standard errors clustered at the investor-level and year-level are reported in parentheses. The coefficients are multiplied by 100. The sample period is from 2003 to 2017. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels.

	<i>Dependent variable:</i>						
	mean(return) (1)	std(return) (2)	sharpe (3)	alpha1F (4)	systematic (5)	idiosyncratic (6)	semivar (7)
PRI dummy	-0.1 (0.1)	0.1 (0.1)	-1.2 (2.5)	-0.1 (0.1)	0.1 (0.1)	0.04 (0.1)	0.2* (0.1)
Environmental score	0.3* (0.2)	-0.9*** (0.2)	11.4*** (3.2)	0.4** (0.1)	-0.3* (0.2)	-0.8*** (0.2)	-0.6*** (0.1)
Social Score	-0.4** (0.2)	0.4*** (0.2)	-12.6*** (3.3)	-0.6*** (0.2)	0.3* (0.2)	0.2 (0.2)	0.3** (0.2)
Governance Score	-0.1 (0.1)	-0.6*** (0.2)	-0.1 (1.3)	-0.1 (0.1)	-0.2 (0.1)	-0.5*** (0.1)	-0.3*** (0.1)
Europe	0.1 (0.2)	-0.2 (0.2)	4.6 (3.8)	-0.01 (0.2)	0.4** (0.2)	-0.8*** (0.2)	-0.2 (0.2)
North America	0.04 (0.2)	-1.1*** (0.1)	6.3 (4.6)	0.1 (0.2)	-0.5*** (0.1)	-1.1*** (0.1)	-0.7*** (0.1)
Investment manager	-0.2 (0.2)	-0.7 (0.5)	0.4 (1.0)	-0.04 (0.1)	-0.3 (0.2)	-0.6 (0.4)	-0.04 (0.1)
Number of Stocks	-0.1 (0.1)	0.1 (0.2)	-1.5 (1.3)	-0.1** (0.1)	0.2 (0.1)	-0.1 (0.1)	0.1 (0.1)
Industry Concentration	-0.04 (0.1)	3.4*** (0.3)	-11.0** (4.9)	-0.1 (0.1)	0.3 (0.2)	3.4*** (0.3)	1.6*** (0.1)
Portfolio Turnover	0.4* (0.2)	0.9* (0.5)	1.2 (1.3)	0.3* (0.1)	0.4** (0.2)	0.8 (0.5)	0.1* (0.1)
Portfolio Activeness	0.4 (0.5)	0.3 (0.8)	-7.3 (9.3)	0.3 (0.4)	1.3** (0.5)	-0.02 (0.8)	0.5 (0.5)
Average Stock Size	-0.1 (0.1)	0.5* (0.2)	-2.7*** (0.6)	-0.1*** (0.04)	0.2 (0.1)	0.5** (0.2)	0.2*** (0.04)
AUM	0.1 (0.1)	-0.4** (0.2)	3.2*** (0.7)	0.2*** (0.04)	-0.2 (0.1)	-0.4*** (0.2)	-0.2*** (0.04)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	76,356	76,356	76,356	76,356	76,356	76,355	72,289
Adjusted R <sup>2</sup>	0.4	0.1	0.7	0.04	0.3	0.1	0.5