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ABSTRACT

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

JEL: G15, G23, G30, M14

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

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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).[1] However, there is only limited academic evidence of the portfolio consequences of responsible investing for institutional investors, given that it is a relatively recent phenomenon and there are data limitations. Prior studies use anonymized investor surveys (e.g., Krueger, Sautner, and Starks, 2020; Amel-Zadeh and Serafeim, 2018) or rely on archival data of portfolio holdings (e.g., Gibson Brandon and Krueger, 2018; Starks, Venkat, and Zhu, 2018) to study the implications of responsible investing for institutional investors. These studies cannot compare what investors say they do, to what they effectively do in terms of ESG integration in their portfolios; the studies are ultimately also unable to assess the link between ESG investment strategies 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 is differences in the sustainability preferences of the investors' 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: Europe-based institutions manage over half of global responsible investing assets in some surveys (GSIA, 2018). A second important source of variation comes from the varying regulatory requirements across distinct jurisdictions. Several countries have adopted "stewardship codes" instructing institutional investors on their responsibilities in integrating ESG. In the United States, there is an open debate over whether fiduciary duties should include consideration of ESG factors. In 2018, the U.S. Department of Labor restated that fiduciaries "must avoid too readily treating ESG issues as being economically relevant (…) rather, ERISA fiduciaries must always put first the economic interests

[1] 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, which collates the U.S. data with other regional reports (GSIA, 2018).

of the plan in providing retirement benefits." [2,3] The chair of the U.S. Securities and Exchange Commission (SEC) has also emphasized that investment advisers cannot put any interests, including ESG factors, ahead of the financial interests of their clients (Clayton, 2018). Outside the United States, 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 to incorporate ESG factors offers a good empirical setting to study 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 different ESG strategies result in better portfolio-level ESG scores ("footprints") and risk-return tradeoffs.[4] The survey data comes from the Principles for Responsible Investment (PRI), founded in 2006 by a group of the world's largest institutional investors with support from the United Nations (UN).[5] The PRI is the world's leading proponent of responsible investment and operates as an industry-led membership network.[6] Its 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 signatories are required to provide detailed annual reports on how they implement responsible investment (e.g., screening, ESG integration, or engagement-oriented approaches). In our analysis, we merge these investor reports with archival data on signatories' institutional stock holdings to examine the impact of the reported responsible investing strategies on their equity portfolio–level ESG footprints and the portfolios' risk-return profiles.

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[2] The Employee Retirement Income Security Act of 1974 (ERISA) is the federal US law on private pension plans.

[3] U.S. Department of Labor, "U.S. Department of Labor Releases Field Assistance Bulletin Clarifying Issues Regarding Proxy Voting, Shareholder Engagement, and Economically Targeted Investments" (April 23, 2018). This statement from the Trump administration came after a previous Obama administration statement, IB 2015-01, that ESG criteria could be used in fiduciaries' investment framework.

[4] Although technically we prefer the term "responsible investing" in the context of our paper, we use the terms "responsible," "sustainable," and "ESG investing" interchangeably.

[5] The PRI network counts more than 2,000 different signatory institutions, ranging from investment managers and asset owners to service providers; collectively, the signatories represent assets under management (AUM) 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 (e.g., pension plans, endowments, or sovereign wealth funds) and investment managers (e.g., investment companies and advisors) and ignore service providers (e.g., ESG rating or consulting firms).

[6] It is supported by the United Nations 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).

We start by studying which investor characteristics are related to an institution committing to responsible investing by joining the PRI. We document that the institutions more likely to join the PRI network have the following characteristics: they have more equity assets under managements (AUM); they are based in Europe; and they are asset owners (e.g., pension plans or insurers that invest in stocks directly). We then examine differences in terms of portfolio-level sustainability 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. These data show that institutional investors control large pools of capital, collectively owning over US$ 32 trillion in listed equities worldwide as of end of 2017.[7] The number of PRI investors grew from 47 founding members to over 684 PRI signatories with equity data in FactSet; 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 in 2017. We augment these data with stock-level ESG scores from three ESG rating providers [Thomson Reuters ASSET4 (now Refinitiv ESG), MSCI IVA, and Sustainalytics]. We then follow Gibson Brandon and Krueger (2018) and Starks, Venkat, and Zhu (2018) to calculate the value-weighted average ESG scores for each institutional investor's stock portfolio. We call these portfolio scores "*ESG footprints*."

We find some evidence that institutions that are part of the PRI network exhibit better ESG footprints than those not in the PRI network, with most of the effect coming from differences in the social and governance footprints. There are also interesting regional differences: in countries other than the United States, PRI signatories have better portfolio-level ESG footprints than non-PRI investors, while in the United States, PRI signatories' ESG footprints tend to be no better than those of non-PRI investors. This could be related to the interpretation of "fiduciary duty" by U.S. institutional money managers, which prevents 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 that shows that, among non-U.S. investors, portfolio ESG footprints improve after

[7] 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.

institutions sign the PRI, as 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 footprints after they sign the PRI principles.

To help with identification, we use two different tests. First, 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., the United Kingdom's Financial Reporting Council), or they were the result of peer-pressure initiatives by industry bodies (e.g., the Canadian Coalition for Good Governance). Using the introduction of an investor stewardship code in a country as an instrumental variable for the decisions by institutions from that country to sign the PRI, we show that ESG portfolio footprints subsequently improve. Second, we study how PRI signatories react to BP's Deepwater Horizon oil spill in 2010, which serves as an exogenous signal of the importance of strong corporate environmental policies (Dyck, Lins, Roth, and Wagner, 2019). We find that PRI signatories with higher investments in extractive industry stocks improve their portfolio-level environmental footprints significantly more than their peers in the years following the event. We conclude that there is some evidence that PRI signatory institutions seem to "walk the ESG talk," except in the U.S. market.[8]

To more directly compare the (ESG) "talk" to the "walk", we examine the survey data from the PRI reporting framework and breakdown the PRI signatories into leaders and laggards based on which fraction of their equity AUM is managed according to ESG strategies. We observe that our earlier findings of better ESG portfolio footprints are driven by PRI leaders, i.e., institutions that apply ESG strategies to 100% of their equity AUM. In contrast, when compared to non-PRI investors, PRI laggards show no significantly different ESG footprints in non-U.S. markets, and even worse footprints in the United States. To disentangle whether these results are driven by different sustainability preferences or by different ESG management approaches, we use RepRisk data to look at the institutions' own ESG

[8] There are some press reports that the SEC is scrutinizing how strictly ESG funds adhere to responsible investment practices (*Wall Street Journal*, 2019). Concerns over "greenwashing" (overstating an institution's 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).

incidents. In other words, we examine the ESG track record of the institutional manager itself – for example, by looking at whether the institution is known for having poor employment conditions or anti-competitive practices. We find that PRI leaders are less likely to be involved in negative ESG incidents than laggards suggesting that leaders pursue a fundamentally different approach to ESG.

To further understand heterogeneity among PRI signatories, we then move on to studying different ESG implementation strategies in greater detail. To do so, we use the rich 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 for 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 preferentially in companies with the best ESG performance); (iii) norms-based screening (e.g., based on UN Global Compact Principles that highlight the importance of issues such as human rights or anti-corruption); (iv) integration (e.g., incorporating ESG factors into financial analysis); (v) thematic investments (e.g., green investments); and (vi) engagement approaches (individual dialogue, collaborative campaigns, and overall shareholder voting policies). While engagement approaches have been studied before in Dimson, Karakas, and Li (2015, 2019), there is little academic research on the prevalence of the other ESG implementation strategies listed above and their potential impact on institutional investors' ESG footprints or 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, and that PRI leaders implement these strategies more frequently than laggards. The approaches are not mutually exclusive: most institutions report implementing multiple strategies simultaneously. The only strategy that remains niche is thematic investing. However, when we test if these different implementation strategies are related to portfolio-level ESG footprints, the picture is less clear. Our results show that responsible investment strategies have little association with ESG portfolio footprints. We observe only

that positive/best-in-class screening strategies have a significant positive relation with portfolio-level ESG footprints. The other responsible investing strategies cannot be statistically associated with portfolio ESG performance.

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 equity 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. When we test whether there is an effect of the different responsible investment strategies on holdings-based returns, we do not find an association between the actual implementation strategy and portfolio returns or risk-adjusted 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).

Our paper contributes to the emerging literature on 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 Brandon and Krueger (2018) introduce the novel measure of institutional investors' ESG footprints and document that better environmental footprints are associated with better risk-adjusted performance especially when institutions are long-term oriented. In addition, Dyck, Lins, Roth, and Wagner (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) conducted a survey on whether, how, and why investment managers use ESG data, and Krueger, Sautner, and Starks (2020) surveyed institutional investors on their climate-related policies, but neither study was able to observe their actual investments. Our paper addresses some of the shortcomings of the previously cited studies, which used either anonymized surveys (Amel-Zadeh and Serafeim, 2018;

Krueger, Sautner, and Starks, 2020) or exclusively archival data (Dyck et al., 2019; Starks, Venkat, and Zhu, 2018; Gibson Brandon and Krueger, 2018).

Our survey-portfolio matched data allow us to make inferences about institutional investors' sustainability choices; compare what investors say they do in terms of their responsible investment policies (the PRI survey data) to actual portfolio outcomes (ESG footprints of the FactSet portfolio holdings). Notable exceptions are the study by Dimson, Karakas, and Li (2015) that examines shareholder engagement with respect to ESG issues using proprietary data from one large asset manager, and Dimson, Karakas, and Li (2019) that examines in detail the coordinated ESG engagement substrategy using direct data from the PRI Collaboration Platform matched to the activist investors' portfolio data in FactSet Ownership. In contrast to these two studies, we take a broader view of ESG strategies that comprise screening, integration, and overall engagement. Finally, having both policies and outcomes on a global sample allows us to uncover interesting differences between U.S. and non-U.S. investors and distinguish between investors that truly adopt responsible investing strategies from those that pledge to do so but fall short of implementation.

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 have signed the PRI (Humphrey and Li, 2019) and those with high portfolio-sustainability ratings (Hartzmark and Sussman, 2019). Ceccarelli, Ramelli, and Wagner (2019) document that European investors respond to the eco-labelling of mutual funds, while in the United States, only high-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 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 responsible investing preferences.

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 (2020) argue that positive ESG factors contain relevant information about firm fundamentals that could be a predictor of future returns. Alternatively, ESG factors could negatively predict returns in the case of excessive demand by responsible investors. Pastor, Stambaugh, and Taylor (2020) examine sustainable investing in equilibrium. In a related paper, Landier and Lovo (2020) examine optimal ESG investing comparing ESG impact and risk and return in a general equilibrium framework. 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 level of individual funds (e.g., 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 their portfolio risk and return. We do not find that responsible investing leads to portfolio return enhancement, but we find that it acts 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), which invited 21 institutional investors, including 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.[9] They were joined by 47 additional founding signatories and, by 2018, the PRI network had grown to be the largest investor initiative worldwide, with over 2,000 signatories and more than US$ 80 trillion of 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.

[9] The PRI is a nonprofit institution that is independent from, but supported by, different UN agencies. Funding is assured primarily via annual membership fees from its signatories.

By signing the principles, the investors publicly commit to their adoption as long as they are consistent with their 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 AUM. Second, PRI signatory investors commit to publicly report on their responsible investment considerations and decision-making on a yearly basis (principle #6 above).[10]

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.[11] Asset owners include pension funds, sovereign wealth funds, foundations, endowments, and insurance companies; these could be concerned about ESG factors because of their beneficiaries' sustainability preferences. Investment managers include investment fund companies and advisers; these 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

Along with 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, so we observe investor names and detailed responses to an extensive questionnaire for each signatory and reporting year.[12] Overall,

[10] A list of delisted signatories is available at https://www.unpri.org/annual-report-2018/how-we-work/new-and-delisted-signatories.

[11] This provision aims to prevent financial groups from signing up subsidiaries or funds with particularly strong ESG performances. 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 independently of whether 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 these entities can, therefore, represent themselves as signatories. In addition, entities can sign up separately from the parent, even if the latter already signed; both then need to report independently.

[12] 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 its 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 not mandatory but encouraged.

the five years of PRI reports available to us contain 5,326 signatory-year observations by 1,549 unique PRI signatory identifiers.

Annual reporting takes place between January and March, and we interpret responses to account for the previous calendar year (meaning, for example, that the 2018 report covers activities in 2017). 2014 constitutes the baseline year. In our analysis, we adjust reports to align and standardize them across years, as reporting frameworks after 2014 were subject to modifications and improvements. The PRI reporting framework includes 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 screening, integration, thematic strategies, and engagement. We use only answers to questions that are *mandatory to report and to disclose*, and which are made publicly available via the reporting database.[13] The Internet Appendix (see Figures IA5 to IA8) 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, which is the leading source for global institutional equity ownership data. The sample period starts in 2003 (three years before the PRI was formed) and ends in 2017, and covers the set of institutions domiciled in countries that are part of the MSCI All Country World Index. More details on these 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 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).

[13] 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 of interpreting descriptive responses.

We are able to match 684 PRI signatories with institutional investor names in FactSet using a name-matching algorithm and manual verifications.[14] All of our analysis is conducted at the FactSet entity level.[15] Of the 1,549 unique PRI identifiers, only 874 needed to complete the PRI modules relating to listed equity (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). Of those 874 signatories, we match 537 to the FactSet database leaving us with 337 unmatched entities.[16] We conclude that our PRI-FactSet match is reasonably complete. Some of the matches are at the group parent level and translate to 684 FactSet affiliated entities. The PRI signatories in our final sample held over US$ 18 trillion in equity holdings as of 2017, representing 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 ratings providers: 1) Thomson Reuters' ASSET4 (now Refinitiv ESG); 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 so our results would not depend on only a single ESG rating, given that there is significant rating disagreement among data

[14] In a first stage we run a name-matching algorithm on the two lists of names cleaned for punctuation, accents, and 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 URLs reported to PRI and FactSet.

[15] Our matching of the PRI with the FactSet investor universe occasionally leads to a double match. 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.

[16] In addition, a large proportion of the 337 signatories that do report to PRI 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 required only for institutional investment managers that exercise discretion over US$ 100 million or more.

providers (Berg, Koelbel, and Rigobon, 2019; Gibson Brandon, Krueger, Riand, and Schmidt, 2020). An average positive ESG score between the three data providers therefore indicates higher confidence and agreement that the ESG performance of the evaluated company was indeed positive and vice versa. Due to the increasing data coverage over our sample period, we take the average from the ESG scores that are available if there is not full coverage by all ratings providers for a given stock. Given the different rating scales of each data provider, we normalize scores in each year to have a mean of zero and a standard deviation of one; we denote these as $z_t(Score)$.

$$Score_{it} = \frac{1_{A4,it} \times z_t(Score\_A4_{it}) + 1_{MSCI,it} \times z_t(Score\_MSCI_{it}) + 1_{SUST,it} \times z_t(Score\_SUST_{it})}{1_{A4,it} + 1_{MSCI,it} + 1_{SUST,it}}$$

As a second step, following Gibson Brandon and Krueger (2018), we compute the portfolio-level sustainability "footprints" using the size of the individual stock holdings in the investors' portfolio. To do this, 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.

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

where *Portfolio footprint* denotes one of the following sustainability footprints: *Total ESG footprint*, *Environmental footprint*, *Social footprint*, or *Governance footprint*. The variable $w_{i,j,t}$ denotes the value-weight of stock *i* in investor *j*'s portfolio at the end of year *t*. $Score_{i,t}$ is the normalized sustainability score of stock *i* at the end of year *t*. $N_{j,t}$ is the total number of stocks investor *j* holds at the end of year *t* for which stock-level ESG scores are available. The *Portfolio footprint* variable quantifies the portfolio-level sustainability footprint of institutional investor *j* at the end of year *t* as the value-weighted average of the normalized 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 have 83,768 institution-year observations at the investor portfolio-level ranging from 2003 to 2017. For the more detailed analysis, which requires time-varying

information from the PRI annual surveys, our sample includes 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 illustrate 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, we see that PRI signatories now represent more than half of institutionally owned public-listed equities.[17]

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 group investors into three regions: Europe, North America, and Asia-Pacific plus the rest of the world (Africa, the Middle East, and 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 institution type (Panel D of Figure 1), meaning 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, asset owners are slightly overrepresented among PRI signatories compared to the overall population. Note that for an asset owner to be included in the sample, the institution needs to have considerable direct equity holdings, because otherwise it would not show up in FactSet. In other words, asset owners that outsource the management of their equity investments do not show up in our sample.[18] In terms of the size distribution (see Panel E of Figure 1), small institutions are underrepresented among PRI signatories

[17] These figures are calculated based on equity holdings with valid ESG scores.
[18] In the case an asset owner outsources the management of its equity investments, its assets will be part of the investment managers' portfolio filings.

(<US$ 1 billion in AUM), while medium (US$ 1–10 billion), large (US$ 10–100 billion), and very large (>US$ 100 billion) institutions are overrepresented.

Table 1 shows further sample splits using the cross-section and time-series jointly. While early signatories tend to be European, the percentage of North American signatories has gradually risen over time from only 19% when PRI was founded in 2006 to 31% 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 of note, the 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 versus 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, is an asset owner, and is more long-term oriented, more index-like, and larger in terms of total equity holdings. Table IA2 of the Internet Appendix also provides a 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 the rest of the world had joined the PRI (including Vanguard, BlackRock, Norges Bank, UBS, and 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 footprint* as well as the individual *Environmental*, *Social*, or *Governance footprints* for each institutional investor (see section 2.4 for more details).[19] In Table 2, we

[19] In Figure IA1 of the Internet Appendix, we plot the distribution of portfolio-level ESG footprints 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 footprints. Second, the

estimate OLS regressions where we use the portfolio-level ESG footprints 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 double clustered at the institution- and year-level.

In Panel A of Table 2, we find that PRI signatories have significantly better portfolio-level *Total ESG footprints*, *Social footprints*, and *Governance footprints* but no better *Environmental footprints*.[20] A PRI dummy coefficient of 0.06 corresponds to six hundredths of a standard deviation improve in portfolio ESG footprints. The results are robust to several portfolio characteristics, including 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 footprints are not driven by portfolio characteristics. We also see that portfolio turnover is negatively associated with ESG footprints, which is consistent with previous results for U.S. institutions in Starks, Venkat, and Zhu (2018) and Gibson Brandon and Krueger (2018).[21]

Panels B and C of Table 2 split the sample into U.S. and non-U.S. subsamples to investigate regional differences.[22] For example, whether institutional investors should incorporate ESG factors into their decision-making is an ongoing regulatory debate in the United States, but that question is more settled in other countries. We find that in non-U.S. regions, such as Europe and Asia, PRI signatories have significantly better portfolio-level ESG footprints than do non-PRI institutions (see Panel C), while in the United States, PRI signatories tend to exhibit similar or even worse ESG footprints, especially with respect to the *Environmental* and *Governance footprints* (Panel B). These could be related to

distribution of portfolio-level footprints of non-PRI institutions has a fatter left tail, suggesting that in the non-PRI population, there are more institutions that have bad portfolio-level ESG footprints.

[20] While we choose to concentrate our analysis on mean portfolio-level footprints, 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 and less in stocks with the lowest ESG scores than do non-PRI signatories.

[21] While we focus on average ESG scores across the three ESG data providers, in unreported results, we also find that the results are robust if we use only one of the three individual ESG ratings. In addition, we also find similar results when we calculate the portfolio-level ESG footprints based on only U.S. or only non-U.S. stock holdings.

[22] We find qualitatively similar results when we interact the *PRI dummy* with a US dummy.

different social preferences or a generalized interpretation of U.S. fiduciary standards that prevents social or environmental concerns from affecting investment decisions.

It is possible that PRI signatory institutions are systematically different from non-PRI institutions. We address this issue using three additional tests. First, we examine whether PRI signatories improve their portfolio-level ESG footprints 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 footprints 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 improve their *Total ESG*, *Social*, and *Governance footprints* in the years after joining the PRI (compared to the non-PRI control institutions). Panels B and C, however, indicate that this improvement is concentrated among non-U.S. institutions.

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 United Kingdom in 2010 and, among other principles, it required institutional investors to monitor their investee companies, to have a clear voting policy, and to publicly disclose their stewardship and voting activities.[23] Some codes are initiated by regulators (e.g., the United Kingdom's Financial Reporting Council) and are binding, while others are introduced by industry bodies (e.g., the Canadian Coalition for Good Governance) and are often voluntary. For the United States, we take the Obama-era Department of Labor (DOL) position (IB-2015-01) that it would be appropriate for managers of pension plan assets to weigh in on ESG issues. The instrumental variable *Stewardship Code* takes the value of 1 for country-year observations that are covered by a stewardship

[23] A revised version of the UK Stewardship code 2020 is scheduled to take effect on January 1, 2020 (https://www.frc.org.uk/investors/uk-stewardship-code).

code.[24] The first-stage regression in column (1) of Panel A in 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 signatories have significantly better *Total ESG*, *Social*, and *Governance footprints*, as well as slightly better *Environmental footprints*, than non-PRI institutions.[25]

Our third test examines how PRI signatories react to BP's Deepwater Horizon oil spill on May 24, 2010, which serves as an exogenous shock to how institutional investors perceive the importance of environmental policies (Dyck, Lins, Roth, and Wagner, 2019). Following the oil spill, institutional investors might reassess their exposure to environmental risks and adjust their portfolios accordingly, especially if they committed to the PRI and hold significant investments in extractive industries. We test this hypothesis with a difference-in-difference approach using the years 2009-2012. Our coefficient of interest is the triple interaction for *PRI dummy x OilGas exposure x Post*, where *OilGas exposure* is a dummy indicating whether an investor had more than 5% of her equity AUM invested in extractive industries (SIC 13, Oil and Gas Extraction) before the event and *Post* equals one for the years 2011 and 2012 and zero otherwise. Panel B of Table 4 indicates that PRI signatories with high investments in extractive industries improve their *Environmental footprints* (and their *Social footprints*, although the effect is more subdued) significantly more than their peers in the two years following the oil spill.[26] This is consistent with PRI signatories paying more attention to ESG issues.

We conclude that there is some evidence that PRI signatory institutions have better portfolio-level ESG footprints. In Europe, PRI signatories have a better ESG performance, while there is no difference in the US. Regulatory and industry pressures, for instance via stewardship codes, can

[24] We obtain the years of introduction of the stewardship code in each country from PRI's regulation map (https://www.unpri.org/sustainable-markets/regulation-map) and we cross-check it with an OECD (2017) report. In Japan, for example, the Financial Services Agency introduced the stewardship code "Principles for Responsible Institutional Investors" in 2014.

[25] 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.

[26] The results are robust to different definitions of *OilGas exposure* (5%, median, top/bottom tercile) and to different industry definitions (SIC2, Fama/French 17 industries).

incentivize investors to act more responsibly. In general, the evidence is consistent with PRI signatory institutions "walking [some of] the ESG talk."

3.3. Breakdown of PRI Signatories into Leaders and Laggards

To get a first impression of the heterogeneity among PRI signatories, we combine the PRI signatory data with the unique survey data from the PRI reporting framework. We break down PRI signatories into leaders and laggards based on how much of their equity AUM is covered by ESG strategies. We define PRI signatories as leaders when they report in the PRI survey that they apply some form of ESG incorporation strategies to 100% of their equity AUM (which is the median answer).[27] [28] About one third of the signatories fail this hurdle and are categorized as laggards. The variables are further described in Appendix A1.

In Table 5, we regress ESG footprints on the indicator variables *PRI leader (vs. non-PRI)* and *PRI laggard (vs. non-PRI)*. The results for the full sample, reported in Panel A, show that PRI leaders have significantly better portfolio-level ESG footprints than non-PRI institutions, whereas PRI laggards exhibit no significant difference in footprints.[29] [30] In Panels B and C, we find that PRI leaders have better footprints only in non-U.S. markets, while PRI laggards actually have significantly worse footprints than non-PRI institutions in the U.S. market.

These results could reflect different sustainability preferences or different ESG management approaches of the institutions themselves. To disentangle between these two explanations, we use the extent to which institutions are involved in negative ESG incidents to study how committed institutions are to good ESG practices. The idea behind using incident data is to get a sense of how institutional investors treat their own stakeholders. We obtain the ESG incident data from RepRisk, which covers both private and publicly listed companies around the world since 2007. We choose not to use data from

[27] We cannot do the same for engagement strategies as PRI signatories are not required to disclose for how much of their AUM they engage.
[28] We find similar results when we use the mean (which ranges between 75-80% in the five years) instead of the median to categorize PRI signatories into leaders and laggards.
[29] In unreported tests, we also examine whether there are differences between early and late PRI adopters but find limited evidence.
[30] A Wald test shows that the coefficients of the two PRI dummies are significantly different at the 10% level in the first columns of the three panels.

the ESG rating providers used in the prior analyses because their data would limit us to investment managers that are publicly listed, while in fact a large fraction of PRI signatories are private institutions. RepRisk collects the ESG incidents by searching thousands of information sources (such as newspapers, blogs, NGOs, government agencies). Examples of ESG incidents include poor employment conditions, environmental pollution, and violation of national or international legislation.[31]

In Table 6, we regress the ESG incident measures on *PRI leader (vs. laggard),* a dummy variable that takes the value of one if a PRI signatory is a leader and zero if she is a laggard. We use two different ESG incident measures as dependent variables. The first is the proprietary Peak RepRisk Index (*Investor incident score*), which is a weighted moving average of investors' past ESG incidents calculated by RepRisk. The index takes into account an incident's severity, novelty, and reach. The support of the index is between 0 and 100, with higher values being due to either a larger number of incidents or more novel or more severe events. The index increases when an investor has a new ESG incident, and it decays over time if there are no new incidents. The second measure is the natural logarithm of the total number of ESG incidents in a given year (*Investor incidents*). Based on both incident measures, we find that PRI leaders have significantly less negative ESG incidents than PRI laggards.

We conclude that there is large heterogeneity among PRI signatories and that it is important to differentiate between leaders and laggards as they seem to have heterogeneous commitment levels and to pursue fundamentally different management approaches with regard to ESG.

4. Implementing Responsible Investing

4.1. What Are the Most Popular Responsible Investment Strategies Used by PRI Signatories?

The analysis of the previous section suggests that there might be considerable heterogeneity in terms of how signatories implement responsible investing. Using the unique survey data, we now explore this heterogeneity further and study whether different implementation strategies lead to different ESG outcomes at the portfolio-level.

[31] These data have been used in Glossner (2018), He, Kahraman, and Lowry (2019) and Gantchev, Gianetti, and Li (2020) among other papers.

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 responsible investment strategies 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 follows 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 ESG factors into financial analysis
5. **[The] Thematic:** Investment in themes or assets specifically related to sustainability (e.g., 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, but 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 7, 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 IA5 in the Internet Appendix for more details on the survey questions we use from the PRI framework). The statistics are based on the overall sample period, a yearly breakdown from 2013 to 2017, geographic regions, investor types, investor size (as proxied by their equity AUM), and commitment 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 invested using integration strategies, followed by screening strategies (50% of AUM) and thematic strategies (only 11% of AUM). These strategies are not mutually exclusive: most AUM are covered by multiple strategies (e.g., integration plus screening).

Panel A also provides statistics for the *PRI leader* and *PRI laggard* split introduced in the previous subsection. We defined PRI leaders as those signatories that apply ESG strategies to 100% of their equity AUM. When we look at the specific ESG strategies, we find that leaders use more integration (84% of AUM) than screening (64% of AUM) and thematic strategies (15% of AUM). PRI laggards apply integration, screening, and thematic strategies to 21%, 16%, and 2% of their AUM, respectively.

In Panel B of Table 7, we provide descriptive statistics of the frequency with which PRI signatories report the use of responsible investment strategies (question LEI 04.1 of the PRI survey; see Figure IA6 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, 2018) reports of material growth rates in these strategies. Second, we see that there is wide heterogeneity in the adoption of certain strategies across geographies, investor types, and investor size. European PRI signatories 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 and positive screening as well as thematic approaches than do asset owners. Larger institutions tend to prefer negative screening, thematic, integration, and engagement strategies relative to smaller institutions.

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

Table 8 analyzes which responsible investment strategies most effectively influence the ESG footprints 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' approaches towards responsible investment: *%-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, which captures whether an investor applies any form of negative/exclusionary screening (LEI 04.1 of the PRI survey). The regressions control for investor characteristics as well as for year, region, and type fixed effects.

The main results of Table 8 can be summarized as follows. First, we observe that positive screening/best-in-class strategies have a positive association with *Total ESG* and *Environmental footprints*. Second, we observe that the other responsible investment strategies do not significantly affect the ESG footprints, either because these are ineffective or take time to show measurable impacts (e.g., engagement). Alternatively, there might be different implementations of these strategies among the PRI survey participants.[32] There are currently efforts to establish more standardized ESG implementation.[33]

[32] 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 footprints, we find that investor relation involvement is negatively associated with portfolio-level ESG footprints, which could be an indication of some "greenwashing."

[33] World Economic Forum, "Toward Common Metrics and Consistent Reporting of Sustainable Value Creation" (January 2020).

5. Risk-Return Implications of Responsible Investing

5.1. Holdings-Based Returns of Institutional Investors

Following Gibson Brandon and Krueger (2018), we investigate the risk-return implications of the overall ESG strategy followed by PRI signatories; 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 buy-and-hold returns measure 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-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*), and a downside risk measure (*semivar*) as in Hoepner, Oikonomou, Sautner, Starks, and Zhou (2020). 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 seems to underperform its benchmark after fees.

5.2. Do PRI Signatories Exhibit Different Portfolio Performance?

To analyze the risk-return implications, we estimate OLS panel regressions in Table 9 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 double clustered at the institution and year levels. The sample period is from 2003 to 2017.

In Panel A of Table 9, 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 footprints. We observe no change in the coefficient estimates of the *PRI dummy*, suggesting that differences in portfolio-level ESG footprints do not affect the performance of PRI signatories.[34] Panels B and C show the results for the U.S. and non-U.S. samples separately. While U.S. PRI signatories have significantly higher portfolio risks (systematic and idiosyncratic) than U.S. non-PRI signatories, we find no performance differences between PRI and non-PRI signatories in non-U.S. regions.

Alternatively, we estimate monthly calendar-time portfolio regressions, which allow us to control for systematic risk differences between PRI and non-PRI signatories. To construct these portfolios, we aggregate in each month the total portfolio holdings of PRI and non-PRI investors. In Panel A of Table 10, 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 PRI signatories.

In Panels B and C of Table 10, we run the portfolio regressions for U.S. and non-U.S. investors separately. We find that in the United States, PRI signatories significantly underperform non-PRI signatories when equal-weighting the portfolios (with a 4-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.

[34] Table IA6 of the Internet Appendix splits the *Total ESG footprints* control variable into *Environmental*, *Social*, and *Governance footprints* control variables. The coefficient estimates of the *PRI dummy* are qualitatively similar to the ones in Table 9. Consistent with Gibson Brandon and Krueger (2018), Table IA6 also shows that investors with better environmental footprints tend to have better risk-adjusted investment performance.

We conclude that there is no evidence that PRI signatories "do well by doing good". In fact, we find weak evidence that PRI signatories have a slightly lower investment performance than non-PRI signatories and this evidence is more pronounced in the United States.[35]

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 11. As in Table 8, 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 Gibson Brandon and Krueger's (2018) earlier findings for the U.S. market that ESG implementation strategies act as portfolio risk mitigating tools. 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 9 and 11 combined with earlier tables in the paper suggest that there are important differences among PRI signatories. Some PRI signatories truly adopt responsible investing strategies and have better ESG footprints and lower idiosyncratic portfolio risks, while others pledge to follow these strategies but fall short of implementing them. We conclude that it

[35] In unreported tests, we further examine whether we can relate these performance differences to PRI leaders or laggards but do not find consistent results. While panel regressions show some evidence that PRI leaders have a higher investment performance than PRI laggards, there is no significant performance difference between leaders and laggards in the monthly calendar-time portfolio returns regressions.

is important to separate between these investors as well as between their actual ESG investment strategies.

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 AUM 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 that join the PRI exhibit better portfolio-level ESG footprints, particularly on the social and governance dimensions, but differences are not overwhelmingly large. However, when we differentiate between U.S. and non-U.S. investors, we find that only non-U.S. PRI signatories have better portfolio-level ESG footprints. This could be related to the different interpretation of fiduciary duties in the U.S. market.

We then explore unique survey data that we use to categorize PRI signatories into leaders and laggards and dig deeper into specific ESG strategies. We observe that PRI leaders have better portfolio-level ESG footprints and are involved in fewer negative ESG incidents than laggards, suggesting that leaders and laggards have heterogeneous commitment levels and thus pursue different management approaches with regard to ESG. We further find that PRI signatories predominantly implement responsible investment through engagement, ESG integration, and negative/exclusionary screening. Thematic investment is still a niche. However, when we test for the impact of 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 them to non-PRI signatories (especially in the United States). When we analyze PRI signatory strategies, however, we 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 than 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.

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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 over time. 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 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.

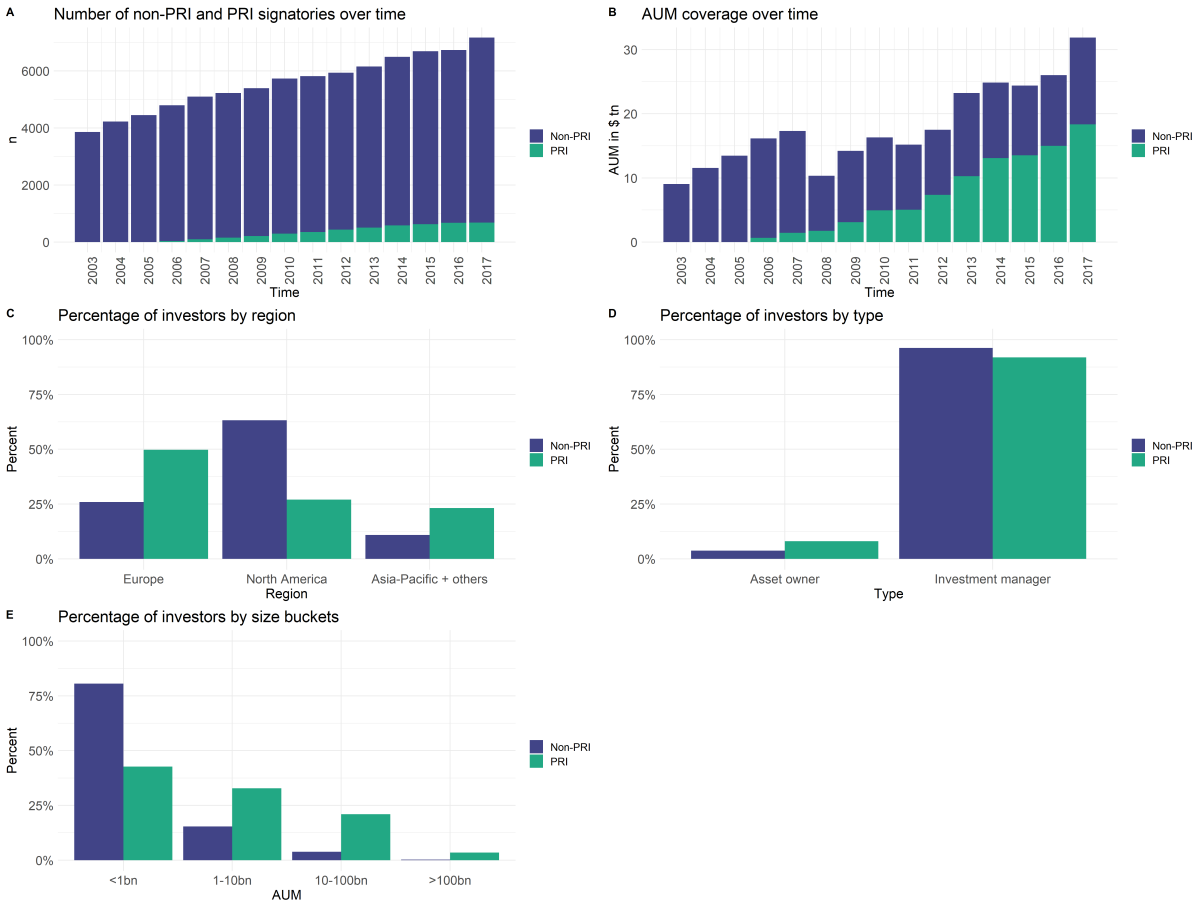

Table 1. Summary statistics on PRI signatories vs. non-PRI institutional investors

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 report in the PRI listed equity module and 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 definitions 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
by Region							
Europe	61.1%	51.3%	47.8%	29.4%	25.2%	19.9%	27.2%
North America	19.4%	23.0%	31.4%	63.1%	61.1%	68.3%	61.2%
Asia-Pacific + others	19.4%	25.7%	20.8%	7.5%	13.7%	11.8%	11.6%
by Type							
Asset owner	30.6%	8.7%	5.4%	5.3%	3.1%	2.0%	4.0%
Investment manager	69.4%	91.3%	94.6%	94.7%	96.9%	98.0%	96.0%
by AUM (USD)							
<1bn	27.8%	41.9%	42.1%	77.8%	82.0%	80.5%	78.5%
1-10bn	25.0%	35.1%	33.2%	16.8%	14.6%	15.8%	16.4%
10-100bn	47.2%	19.6%	19.9%	5.1%	3.3%	3.5%	4.8%
>100bn	0.0%	3.4%	4.8%	0.3%	0.1%	0.3%	0.4%
Portfolio characteristics							
Total ESG footprint	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 footprints on a *PRI dummy* (which takes the value of 1 for PRI signatories from the signature year onwards) and on institutional investors' characteristics. The dependent variables are the four value-weighted ESG footprints of institutional investors' equity portfolios: *Total ESG footprint*, *Environmental footprint*, *Social footprint*, and *Governance footprint*. Panel A reports the full sample, Panel B reports only US investors, and Panel C reports only non-US investors. Appendix A1 provides definitions of the independent variables. Robust standard errors double 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

	Dependent variable:							
	Total ESG footprint		Environmental footprint		Social footprint		Governance footprint	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
PRI dummy	0.07***	0.06***	0.02	0.01	0.05***	0.04***	0.11***	0.10***
	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Europe	0.49***	0.33***	0.41***	0.25***	0.34***	0.22***	0.51***	0.43***
	(0.03)	(0.03)	(0.02)	(0.02)	(0.03)	(0.03)	(0.04)	(0.04)
North America	0.16***	0.06*	0.02	−0.09***	−0.04*	−0.11***	0.65***	0.57***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)	(0.05)	(0.04)
Investment manager	−0.10***	−0.03	−0.11***	−0.03	−0.09***	−0.04**	−0.04**	0.00
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Number of stocks		−0.18***		−0.18***		−0.14***		−0.09***
		(0.01)		(0.01)		(0.02)		(0.01)
Industry concentration		−0.43***		−0.43***		−0.36***		−0.23***
		(0.04)		(0.05)		(0.03)		(0.02)
Portfolio turnover		−0.20***		−0.19***		−0.19***		−0.07***
		(0.02)		(0.01)		(0.01)		(0.01)
Portfolio activeness		−1.48***		−1.61***		−1.14***		−0.92***
		(0.09)		(0.11)		(0.12)		(0.09)
Average stock size		−0.15***		−0.15***		−0.14***		−0.05***
		(0.01)		(0.01)		(0.01)		(0.01)
AUM	0.02***	0.12***	0.02***	0.12***	0.02***	0.10***	0.01***	0.04***
	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(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^2	0.12	0.32	0.13	0.35	0.14	0.32	0.23	0.29

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

Panel B: US sample

	Dependent variable:							
	Total ESG footprint		Environmental footprint		Social footprint		Governance footprint	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
PRI dummy	−0.01	−0.05*	−0.01	−0.05*	−0.01	−0.04	−0.02	−0.04**
	(0.02)	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)	(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^2	0.02	0.35	0.03	0.36	0.03	0.31	0.14	0.25

Panel C: Non-US sample

	Dependent variable:							
	Total ESG footprint		Environmental footprint		Social footprint		Governance footprint	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
PRI dummy	0.10***	0.07***	0.07***	0.05***	0.08***	0.06***	0.08***	0.04*
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.03)	(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^2	0.02	0.23	0.04	0.23	0.02	0.19	0.02	0.16

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

This table regresses portfolio-level ESG footprints on a *PRI dummy*, a *Post-signature dummy*, and institutional investors' characteristics. The dependent variables are the four value-weighted portfolio-level ESG footprints. *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. Panel A reports the full sample, Panel B reports only US investors, and Panel C reports only non-US investors. Robust standard errors double 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

	Dependent variable:			
	Total ESG footprint	Environmental footprint	Social footprint	Governance footprint
	(1)	(2)	(3)	(4)
Post-signature x PRI	0.04**	0.01	0.05***	0.03**
	(0.02)	(0.01)	(0.01)	(0.02)
Post-signature dummy	−0.02*	−0.02	−0.03**	−0.01
	(0.01)	(0.01)	(0.01)	(0.01)
PRI dummy	0.05**	0.06***	0.02	0.02
	(0.02)	(0.02)	(0.02)	(0.02)
Number of stocks	−0.18***	−0.15***	−0.12***	−0.16***
	(0.02)	(0.02)	(0.02)	(0.02)
Industry concentration	−0.68***	−0.59***	−0.59***	−0.45***
	(0.09)	(0.08)	(0.09)	(0.11)
Portfolio turnover	−0.25***	−0.21***	−0.25***	−0.08**
	(0.03)	(0.03)	(0.03)	(0.03)
Portfolio activeness	−0.73***	−0.75***	−0.40***	−0.97***
	(0.10)	(0.09)	(0.08)	(0.10)
Average stock size	−0.18***	−0.16***	−0.14***	−0.08***
	(0.02)	(0.02)	(0.01)	(0.01)
AUM	0.15***	0.13***	0.11***	0.08***
	(0.02)	(0.02)	(0.01)	(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^2	0.31	0.32	0.30	0.27

Table 3. Is there a PRI-signing effect on investors' ESG portfolio footprints? Difference-in-difference regressions (contd.)

Panel B: US sample

	Dependent variable:			
	Total ESG footprint	Environmental footprint	Social footprint	Governance footprint
	(1)	(2)	(3)	(4)
Post-signature x PRI	−0.03	−0.03	−0.04	−0.04*
	(0.03)	(0.02)	(0.03)	(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^2	0.33	0.33	0.27	0.18

Panel C: Non-US sample

	Dependent variable:			
	Total ESG footprint	Environmental footprint	Social footprint	Governance footprint
	(1)	(2)	(3)	(4)
Post-signature x PRI	0.07***	0.04**	0.08***	0.06***
	(0.02)	(0.02)	(0.02)	(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^2	0.20	0.20	0.16	0.17

Table 4. Is there a PRI-signing effect on investors' ESG portfolio footprints? Stewardship codes and BP's oil spill

Panel A regresses portfolio-level ESG footprints 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 footprints. 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. Panel B presents a difference-in-difference approach of BP's Deepwater Horizon oil spill in 2010. *OilGas exposure* is a dummy indicating whether an investor had 5% or more of her AUM invested in extractive industries (SIC 13) before the event and *Post* takes the value of 1 for the years 2011 and 2012 and 0 for the years 2009 and 2010. The difference-in-difference approach includes all other interactions and the same control variables as in Table 2. The definitions for the independent variables are provided in Appendix A1. Robust standard errors double clustered at the investor-level and year-level are reported in parentheses. The sample period is from 2003 to 2017 in Panel A and from 2009 to 2012 in Panel B. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels.

Panel A: Stewardship codes

	Dependent variable:				
	PRI dummy	Total ESG footprint	Environmental footprint	Social footprint	Governance footprint
	First stage	Second stage			
	(1)	(2)	(3)	(4)	(5)
Stewardship code	0.06*** (0.01)				
Instrumented PRI dummy		2.22*** (0.36)	0.27 (0.25)	1.51*** (0.38)	3.45*** (0.64)
Europe	−0.02* (0.01)	0.35*** (0.04)	0.25*** (0.02)	0.23*** (0.03)	0.45*** (0.05)
North America	−0.11*** (0.02)	0.29*** (0.06)	−0.06 (0.04)	0.05 (0.05)	0.95*** (0.08)
Investment manager	−0.03** (0.01)	0.04 (0.04)	−0.02 (0.03)	0.01 (0.03)	0.11* (0.05)
Number of stocks	0.02*** (0.00)	−0.22*** (0.01)	−0.18*** (0.01)	−0.17*** (0.01)	−0.16*** (0.02)
Industry concentration	0.04** (0.01)	−0.51*** (0.06)	−0.44*** (0.05)	−0.41*** (0.04)	−0.35*** (0.06)
Portfolio turnover	−0.00 (0.00)	−0.20*** (0.02)	−0.18*** (0.01)	−0.19*** (0.01)	−0.07*** (0.02)
Portfolio activeness	−0.14*** (0.04)	−1.20*** (0.15)	−1.58*** (0.10)	−0.95*** (0.16)	−0.48** (0.20)
Average stock size	0.02*** (0.00)	−0.20*** (0.01)	−0.16*** (0.01)	−0.16*** (0.01)	−0.11*** (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 4. Is there a PRI-signing effect on investors' ESG portfolio footprints? Stewardship codes and BP's oil spill (contd.)

Panel B: BP's Deepwater Horizon oil spill in 2010

	Dependent variable:			
	Total ESG footprint	Environmental footprint	Social footprint	Governance footprint
	(1)	(2)	(3)	(4)
PRI dummy : OilGas exposure : Post	0.03 (0.02)	0.06^{***} (0.02)	0.04^{*} (0.02)	0.04 (0.03)
Controls and other interactions	Yes	Yes	Yes	Yes
Observations	19,402	19,402	19,402	19,402

Table 5. Breakdown of PRI signatories into leaders and laggards

This table regresses portfolio-level ESG footprints on dummy variables indicating whether a PRI signatory is a leader or a laggard. We split the *PRI dummy* into *PRI leader (vs. non-PRI)* and *PRI laggard (vs. non-PRI)* based on whether PRI signatories report in the PRI survey that they apply ESG strategies to 100% of their equity AUM (which is the median answer in all years). The dependent variables are the four value-weighted ESG footprints of institutional investors' equity portfolios: *Total ESG footprint*, *Environmental footprint*, *Social footprint*, and *Governance footprint*. Panel A reports the results for the full sample, Panel B for US investors, and Panel C reports for non-US investors. We control for institutional investor's region, type, and portfolio characteristics. Robust standard errors double clustered at the investor-level and year-level are reported in parentheses. The sample period is from 2013 to 2017. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels.

Panel A: Full sample

	Dependent variable:			
	Total ESG footprint (1)	Environmental footprint (2)	Social footprint (3)	Governance footprint (4)
PRI leader (vs. non-PRI)	0.06** (0.02)	0.02 (0.02)	0.05** (0.01)	0.06** (0.02)
PRI laggard (vs. non-PRI)	−0.02 (0.02)	−0.03 (0.02)	−0.00 (0.02)	−0.02 (0.02)
Controls	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	30,253	30,253	30,253	30,253
Adjusted R^2	0.34	0.34	0.30	0.25

Panel B: US sample

	Dependent variable:			
	Total ESG footprint (1)	Environmental footprint (2)	Social footprint (3)	Governance footprint (4)
PRI leader (vs. non-PRI)	−0.04 (0.03)	−0.06 (0.04)	−0.03 (0.03)	−0.03 (0.03)
PRI laggard (vs. non-PRI)	−0.12** (0.04)	−0.13** (0.04)	−0.07* (0.03)	−0.05 (0.03)
Controls	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	17,544	17,544	17,544	17,544
Adjusted R^2	0.34	0.36	0.26	0.15

Panel C: Non-US sample

	Dependent variable:			
	Total ESG footprint (1)	Environmental footprint (2)	Social footprint (3)	Governance footprint (4)
PRI leader (vs. non-PRI)	0.09** (0.02)	0.05** (0.02)	0.07** (0.02)	0.05 (0.03)
PRI laggard (vs. non-PRI)	0.04 (0.03)	0.03 (0.03)	0.04 (0.02)	−0.01 (0.04)
Controls	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	12,709	12,709	12,709	12,709
Adjusted R^2	0.22	0.22	0.17	0.17

Table 6. Is there a difference between PRI leaders and laggards with regard to ESG incidents in their own companies?

This table regresses news-based measures capturing the extent to which institutional investors are involved in ESG-related incidents on a *PRI leader (vs. laggard)* dummy. The dummy takes the value of 1 if a PRI signatory reports in the PRI survey that she applies ESG strategies to 100% of her equity AUM. The dependent variables are a weighted moving average of an investor's history of ESG incidents (*Investor incident score*) and the natural logarithm of the number of ESG incidents that an investor had in a given year (*Investor incidents*). The ESG incident data is obtained from RepRisk. More detailed variable definitions are available in Appendix A1. Robust standard errors double 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.

	Dependent variable:	
	Investor incident score (1)	Investor incidents (2)
PRI leader (vs. laggard)	-6.81^{**} (1.81)	-0.56^{**} (0.14)
Number of stocks	0.64 (0.98)	0.00 (0.06)
Industry concentration	1.63 (5.37)	0.16 (0.34)
Portfolio turnover	1.64 (3.32)	−0.05 (0.23)
Portfolio activeness	-20.32^{**} (5.76)	-1.70^{**} (0.47)
Average stock size	1.00 (0.74)	0.02 (0.05)
AUM	−0.96 (0.76)	−0.04 (0.05)
Year fixed effects	Yes	Yes
Region fixed effects	Yes	Yes
Type fixed effects	Yes	Yes
Observations	2,171	2,171
Adjusted R^2	0.06	0.08

Table 7. 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*). The strategies are not mutually exclusive. Detailed definitions of these variables are available in Appendix A1. We define commitment based on whether PRI signatories apply ESG strategies to all of their equity AUM.

Panel A: PRI strategies: Percentage of AUM

	PRI			
	Total	**%-Screening**	**%-Thematic**	**%-Integration**
Overall	2,796	50%	11%	66%
by Year				
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%
by Region				
Europe	1,379	60%	12%	62%
North America	777	37%	11%	62%
Asia-Pacific + others	640	42%	10%	77%
by Type				
Asset owner	184	57%	8%	67%
Investment manager	2,612	49%	11%	65%
by AUM (USD)				
<1bn	1,202	47%	12%	58%
1-10bn	919	55%	10%	68%
10-100bn	560	49%	10%	75%
>100bn	115	43%	12%	79%
by Commitment (our definition)				
PRI leader	1,968	64%	15%	84%
PRI laggard	828	16%	2%	21%

Table 7. 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%
by Year										
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%
by Region										
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%
by Type										
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%
by AUM (USD)										
<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%
by Commitment (our definition)										
PRI leader	1,968	80%	44%	39%	39%	92%	93%	88%	72%	80%
PRI laggard	828	39%	25%	17%	19%	42%	69%	62%	50%	53%

Table 8. Is there an effect of responsible investment strategies on ESG portfolio footprints?

This table regresses portfolio-level ESG footprints on the reported implementation of responsible investment strategies by PRI signatories. The dependent variables are the value-weighted portfolio-level ESG footprints. 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 double 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.

	Dependent variable:			
	Total ESG footprint (1)	Environmental footprint (2)	Social footprint (3)	Governance footprint (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 (0.03)
%-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^2	0.28	0.30	0.27	0.17

Table 9. 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*. Panel A reports the full sample, Panel B reports only US investors, and Panel C reports only non-US investors. Appendix A1 provides detailed definitions of the independent variables. Robust standard errors double 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

	Dependent variable:													
	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	−0.09	−0.08	0.06	0.11	−1.52	−1.49	−0.11*	−0.09	0.06	0.07	−0.01	0.04	0.13	0.16*
	(0.06)	(0.07)	(0.10)	(0.10)	(2.55)	(2.48)	(0.06)	(0.06)	(0.07)	(0.07)	(0.09)	(0.10)	(0.10)	(0.09)
Total ESG footprint		−0.15		−0.79***		−0.57		−0.22**		−0.13		−0.91***		−0.48***
		(0.10)		(0.18)		(1.77)		(0.09)		(0.12)		(0.15)		(0.13)
Europe	0.02	0.07	−0.55**	−0.28	4.67	4.86	−0.08	−0.00	0.28*	0.32**	−1.16***	−0.86***	−0.39*	−0.23
	(0.20)	(0.19)	(0.24)	(0.21)	(4.07)	(3.95)	(0.21)	(0.20)	(0.17)	(0.16)	(0.19)	(0.17)	(0.22)	(0.21)
North America	−0.01	0.00	−1.43***	−1.39***	6.68	6.72	0.10	0.12	−0.59***	−0.58***	−1.35***	−1.30***	−0.90***	−0.88***
	(0.25)	(0.25)	(0.18)	(0.19)	(5.08)	(5.08)	(0.27)	(0.26)	(0.15)	(0.15)	(0.15)	(0.17)	(0.10)	(0.10)
Investment manager	−0.17	−0.17	−0.66	−0.69	0.58	0.56	−0.03	−0.04	−0.35	−0.35	−0.57	−0.59	−0.04	−0.06
	(0.18)	(0.18)	(0.47)	(0.46)	(0.98)	(1.00)	(0.07)	(0.07)	(0.21)	(0.21)	(0.42)	(0.42)	(0.06)	(0.06)
Number of stocks	−0.08	−0.11	0.20	0.06	−1.70	−1.80	−0.10*	−0.14***	0.19*	0.16	0.11	−0.05	0.15**	0.06
	(0.07)	(0.07)	(0.16)	(0.17)	(1.13)	(1.28)	(0.06)	(0.05)	(0.11)	(0.11)	(0.12)	(0.13)	(0.06)	(0.06)
Industry concentration	0.00	−0.06	3.71***	3.37***	−11.34**	−11.58**	0.02	−0.08	0.32	0.26	3.81***	3.41***	1.80***	1.59***
	(0.11)	(0.10)	(0.34)	(0.31)	(5.47)	(4.91)	(0.13)	(0.12)	(0.21)	(0.18)	(0.32)	(0.29)	(0.19)	(0.15)
Portfolio turnover	0.45**	0.42**	1.05**	0.89*	1.49	1.38	0.32**	0.27*	0.37**	0.35**	0.94*	0.75	0.18**	0.09
	(0.21)	(0.21)	(0.51)	(0.53)	(1.45)	(1.39)	(0.14)	(0.14)	(0.16)	(0.16)	(0.48)	(0.50)	(0.08)	(0.07)
Portfolio activeness	0.48	0.25	1.74*	0.57	−11.35	−12.19	0.48	0.16	1.54**	1.35***	1.56	0.22	1.39***	0.66
	(0.55)	(0.47)	(0.99)	(0.85)	(12.70)	(10.74)	(0.47)	(0.41)	(0.61)	(0.49)	(0.96)	(0.83)	(0.52)	(0.48)
Average stock size	−0.06	−0.08	0.56**	0.44*	−2.74***	−2.83***	−0.09**	−0.13***	0.19	0.17	0.59***	0.45**	0.29***	0.22***
	(0.09)	(0.09)	(0.23)	(0.24)	(0.64)	(0.65)	(0.04)	(0.04)	(0.12)	(0.12)	(0.19)	(0.20)	(0.05)	(0.04)
AUM	0.10	0.12	−0.51***	−0.41**	3.23***	3.30***	0.13***	0.16***	−0.18*	−0.17	−0.53***	−0.42***	−0.27***	−0.21***
	(0.08)	(0.08)	(0.19)	(0.20)	(0.67)	(0.70)	(0.04)	(0.04)	(0.10)	(0.11)	(0.16)	(0.16)	(0.04)	(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^2	0.35	0.35	0.10	0.11	0.68	0.68	0.03	0.03	0.28	0.28	0.06	0.07	0.53	0.54

Table 9. What are the holdings-based returns of PRI signatory institutional investors? (contd.)

Panel B: US sample

	Dependent variable:													
	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	−0.04	0.64***	0.58***	−0.42	−0.29	−0.05	−0.05	0.23***	0.20***	0.51***	0.45***	0.42***	0.38***
	(0.05)	(0.05)	(0.13)	(0.12)	(3.02)	(3.09)	(0.06)	(0.06)	(0.07)	(0.07)	(0.13)	(0.12)	(0.08)	(0.07)
Total ESG footprint		−0.13		−1.26***		2.63		−0.10		−0.48***		−1.17***		−0.65***
		(0.09)		(0.19)		(2.55)		(0.07)		(0.15)		(0.17)		(0.15)
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^2	0.65	0.65	0.37	0.39	0.72	0.72	0.07	0.07	0.61	0.62	0.25	0.27	0.52	0.53

Panel C: Non-US sample

	Dependent variable:													
	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	0.03	−0.04	−0.01	1.14	1.23	−0.02	0.00	0.10	0.08	−0.13*	−0.07	0.03	0.06
	(0.04)	(0.05)	(0.08)	(0.09)	(1.71)	(1.71)	(0.05)	(0.06)	(0.07)	(0.07)	(0.07)	(0.08)	(0.09)	(0.08)
Total ESG footprint		−0.09		−0.43		−1.21		−0.28*		0.24		−0.87***		−0.38**
		(0.17)		(0.29)		(2.04)		(0.15)		(0.16)		(0.26)		(0.16)
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^2	0.28	0.28	0.06	0.06	0.69	0.69	0.08	0.09	0.18	0.18	0.03	0.03	0.55	0.56

Table 10. 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). Panel A reports the full sample, Panel B reports only US investors, and Panel C reports only non-US investors. 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 11. 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 double 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.

	Dependent variable:						
	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 (4.68)	-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 (5.97)	0.94^{***} (0.18)	0.54 (0.55)	4.23^{***} (1.21)	1.92^{***} (0.66)
Portfolio turnover	0.23 (0.43)	−0.39 (0.42)	1.88 (8.94)	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^{***} (9.76)	−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^{***} (0.10)	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 (0.16)	-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^2	0.42	0.48	0.74	0.06	0.60	0.46	0.38

Appendix

Table A1. Variable definitions

ESG footprints	
Sources: FactSet Ownership, MSCI IVA, ASSET4, Sustainalytics	
Total ESG footprint	is the (value-weighted) equity portfolio-level total ESG footprint 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 ESG scores from three ESG data providers (MSCI IVA, ASSET4, and Sustainalytics) or from the ones that are available if there 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.
Environmental footprint	is the portfolio-level environmental footprint of an institutional investor.
Social footprint	is the portfolio-level social footprint of an institutional investor.
Governance footprint	is the portfolio-level governance footprint of an institutional investor.
Investment performance	
Sources: FactSet Ownership, Datastream returns, AQR and Fama-French Equity Factors	
mean(return)	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.
std(return)	is the standard deviation of the holdings-based returns over 12 months.
sharpe	is the Sharpe ratio of the holdings-based returns over 12 months.
alpha1F	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.
systematic	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.
idiosyncratic	is the idiosyncratic risk of the holdings-based returns over 12 months.
semivar	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.
PRI signatories	
Sources: PRI signatory data from 2006 to 2017, PRI surveys from 2013 to 2017, and OECD	
PRI dummy	is one if the institutional investor is a PRI signatory in a given year, and zero if an investor is not a PRI signatory.
PRI leader (vs. non-PRI)	is one if a PRI signatory reports that she applies ESG strategies to 100% of her equity AUM, and zero if a PRI signatory applies ESG strategies to less than 100% of her equity AUM or if an investor is not a PRI signatory. We take the percentage of equities to which incorporation strategies are applied in LEI 01.1 of the PRI survey.
PRI laggard (vs. non-PRI)	is one if a PRI signatory reports that she applies ESG strategies to less than 100% of her equity AUM, and zero if a PRI signatory applies ESG strategies to 100% of her equity AUM or if an investor is not a PRI signatory. We take the percentage of equities to which incorporation strategies are applied in LEI 01.1 of the PRI survey.
PRI leader (vs. laggard)	is one if a PRI signatory reports that she applies ESG strategies to 100% of her equity AUM, and zero if she applies ESG strategies to less than 100% of her equity AUM. We take the percentage of equities to which incorporation strategies are applied in LEI 01.1 of the PRI survey.
Stewardship code	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.

Investors' ESG incidents

Source: RepRisk from 2013 to 2017

Investor incident score	is a weighted moving average of an institutional investor's history of ESG incidents (the "Peak RepRisk Index"). The range of this measure is from 0 to 100, where a higher value signals that an investor had more or more severe ESG incidents in the past years. RepRisk calculates this measure by collecting ESG incidents from news sources and weighting them according to an incident's severity, reach, and novelty. The measure increases when an investor has new incidents and it decays over time when an investor has no new incidents. Examples of ESG incidents are environmental pollution, poor employment conditions, or anti-competitive practices.
Investor incidents	is the natural logarithm of the total number of ESG incidents plus one that an institutional investor had in a given year.

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.

%-Screening:Negative	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 *Negative screening (Neg)*, a dummy on whether an investor any form of negative/exclusionary screening in LEI 04.1 of the PRI survey.
%-Screening:Positive	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 *Positive screening (Pos)*, a dummy on whether the investor uses the positive/best-in-class screening in LEI 04.1 of the PRI survey.
%-Screening:Norms	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 *Norms-based screening (N-b)*, a dummy on whether the investor uses any form of norms-based screening in LEI 04.1 of the PRI survey.
%-Thematic	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).
%-Integration	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.
Negative screening (Neg)	is one if the "Negative/exclusionary screening" type is selected in *LEI 04.1* of the PRI survey. This comprises the exclusion from a portfolio of certain sectors, companies, or practices based on specific ESG criteria.
Positive screening (Pos)	is one if the "Positive/best-in-class screening" type is selected in *LEI 04.1* of the PRI survey. This comprises the investment in companies selected for positive ESG performance relative to industry peers.
Norms-based screening (N-b)	is one if the "Norms-based screening" type is selected in *LEI 04.1* of the PRI survey. This comprises screening of investments against minimum standards of business practice based on international norms (UN Global Compact Principles, etc.).
Thematic (The)	is one if any of the options containing the word "thematic" and/or "All three strategies combined" are ticked in *LEI 01.1* of the PRI survey.
Integration (Int)	is one if any of the options containing the word "integration" and/or "All three strategies combined" are ticked in *LEI 01.1* of the PRI survey.
Engagement (Eng)	is one if any of the variables individual engagement (*Indiv eng*), collaborative engagement (*Collab eng*), or internal voting (*Int Vot*) is one.

Individual engagement (Indiv eng)	is one if the type of engagement in *LEA 02.1* 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_____"
Collaborative engagement (Colla eng)	is one if the type of engagement in *LEA 02.1* 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_____"
Internal voting (Int vot)	is one if the approach in *LEA 16.1* 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

Europe	is one if the institutional investor is domiciled in Europe.
North America	is one if the institutional investor is domiciled in North America.
Investment manager	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).
Number of stocks	is the number of unique stocks (in logs) held by an investor.
Industry concentration	is a dummy that takes the value of one if an investor holds stocks from two or less different industries.
Portfolio turnover	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.
Portfolio activeness	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).
Average stock size	is the logarithm of the stocks' average market capitalizations.
AUM	is the logarithm of the total market value of an investors' equity holdings for which ESG scores are available.
OilGas exposure	is a dummy that takes the value of one if an investor invested 5% or more of her equity AUM in oil and gas (SIC 13) stocks.

Internet Appendix

Fig. IA1. Densities of portfolio-level ESG footprints: 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 footprints for all stocks with available ESG scores. Panel A compares the *Total ESG footprint* for PRI and Non-PRI investors, while the other panels compare the densities of the *Environmental footprint* (Panel B), *Social footprint* (Panel C), and *Governance footprint* (Panel C). The sample period is from 2003 to 2017.

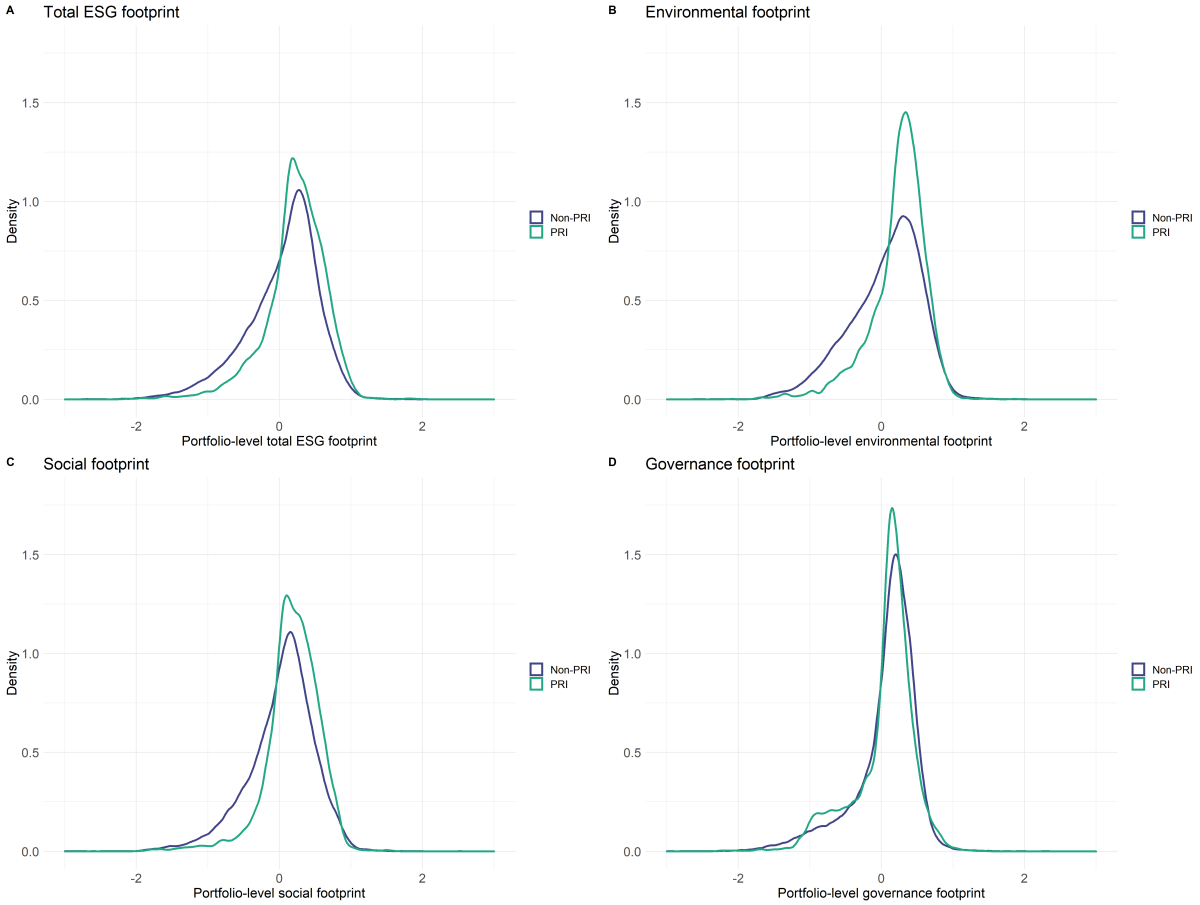

Fig. IA2. PRI signatory institutional investors: Responsible investment strategies in percentage of AUM

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, E and F show the average percentage of AUM affected by the strategies across years, region, type, and equity portfolio size (AUM), and commitment. We define commitment based on whether PRI signatories apply ESG strategies to all of their equity AUM. The sample period is from 2013 to 2017.

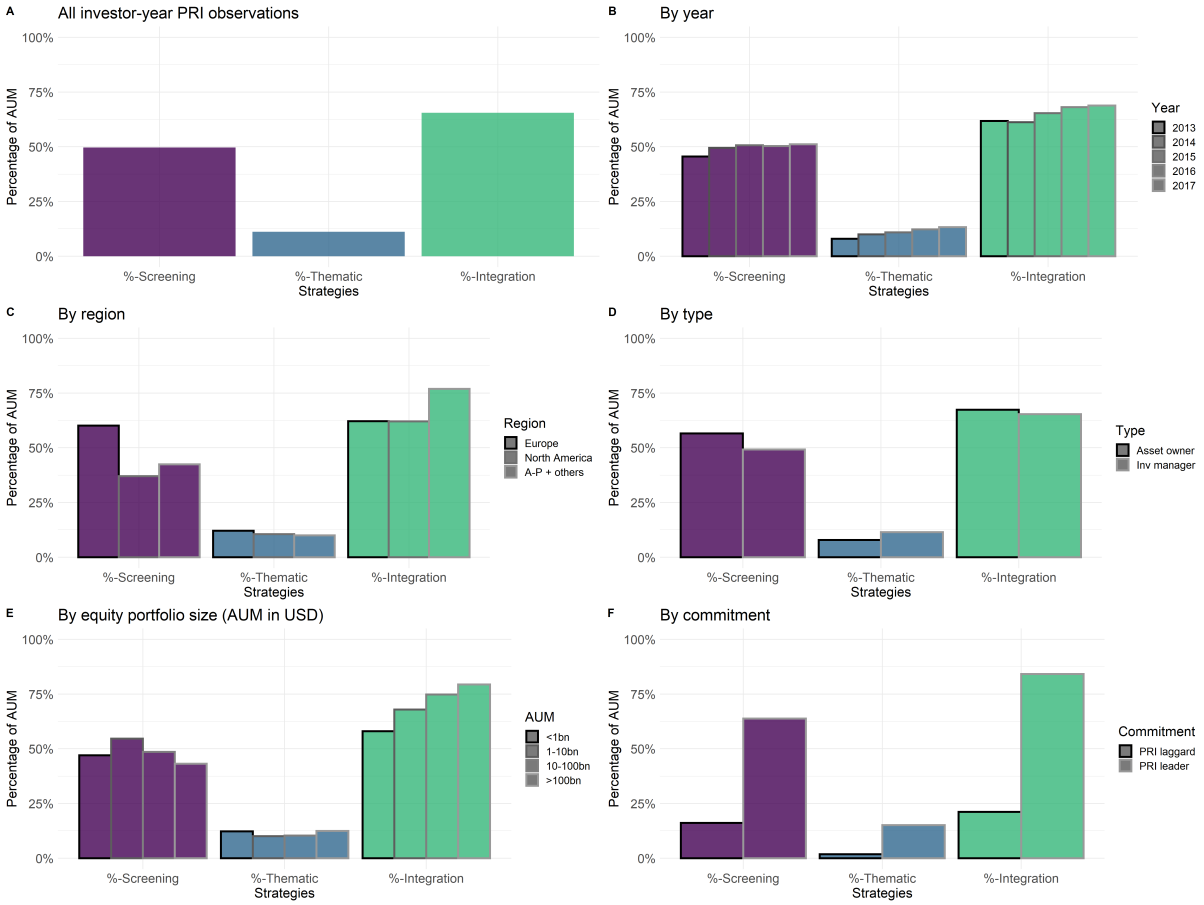

Fig. IA3. PRI signatory institutional investors: Frequency of responsible investment strategies

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, E and F compare the applied strategies (in percent) by year, region, type, equity portfolio size (AUM), and commitment. The sample period is from 2013 to 2017.

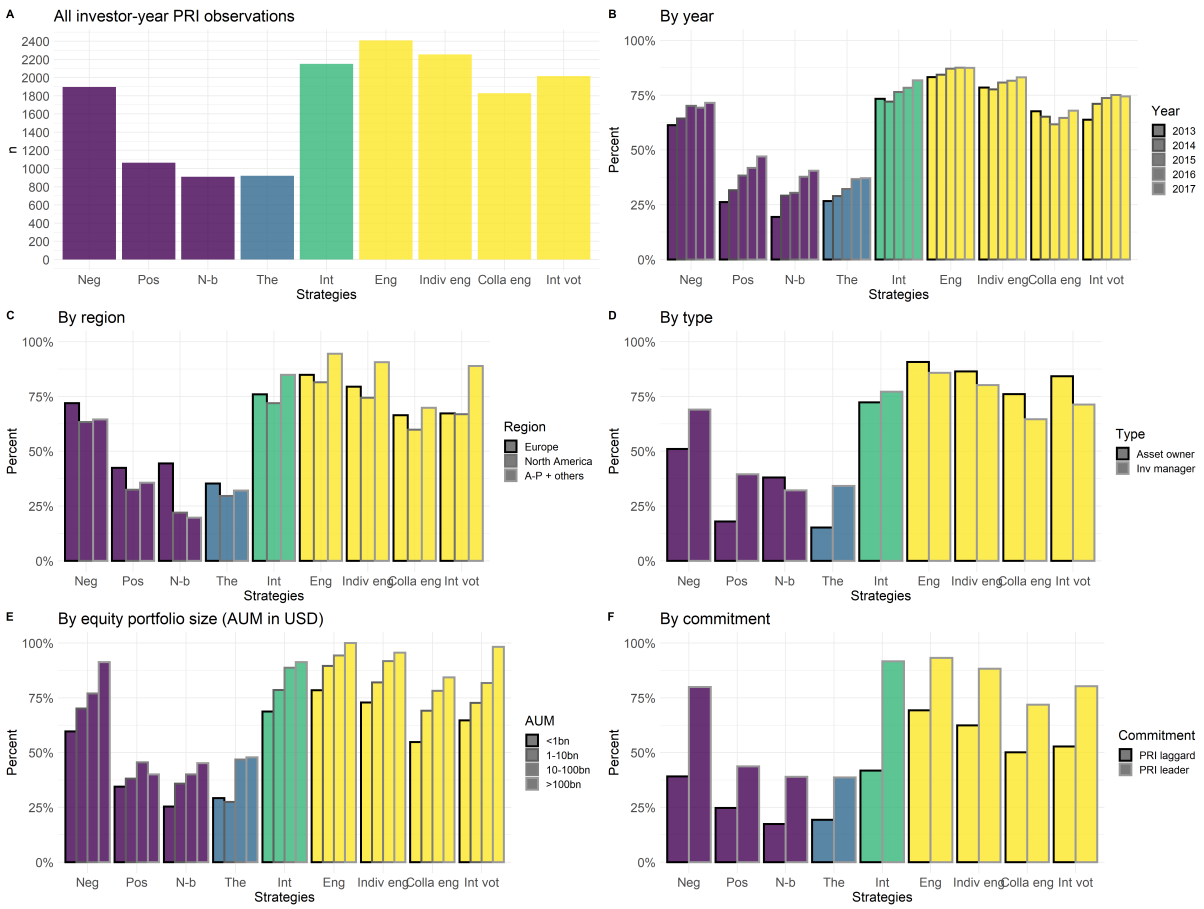

Fig. IA4. Densities of holdings-based returns: PRI signatories vs. Non-PRI investors

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.

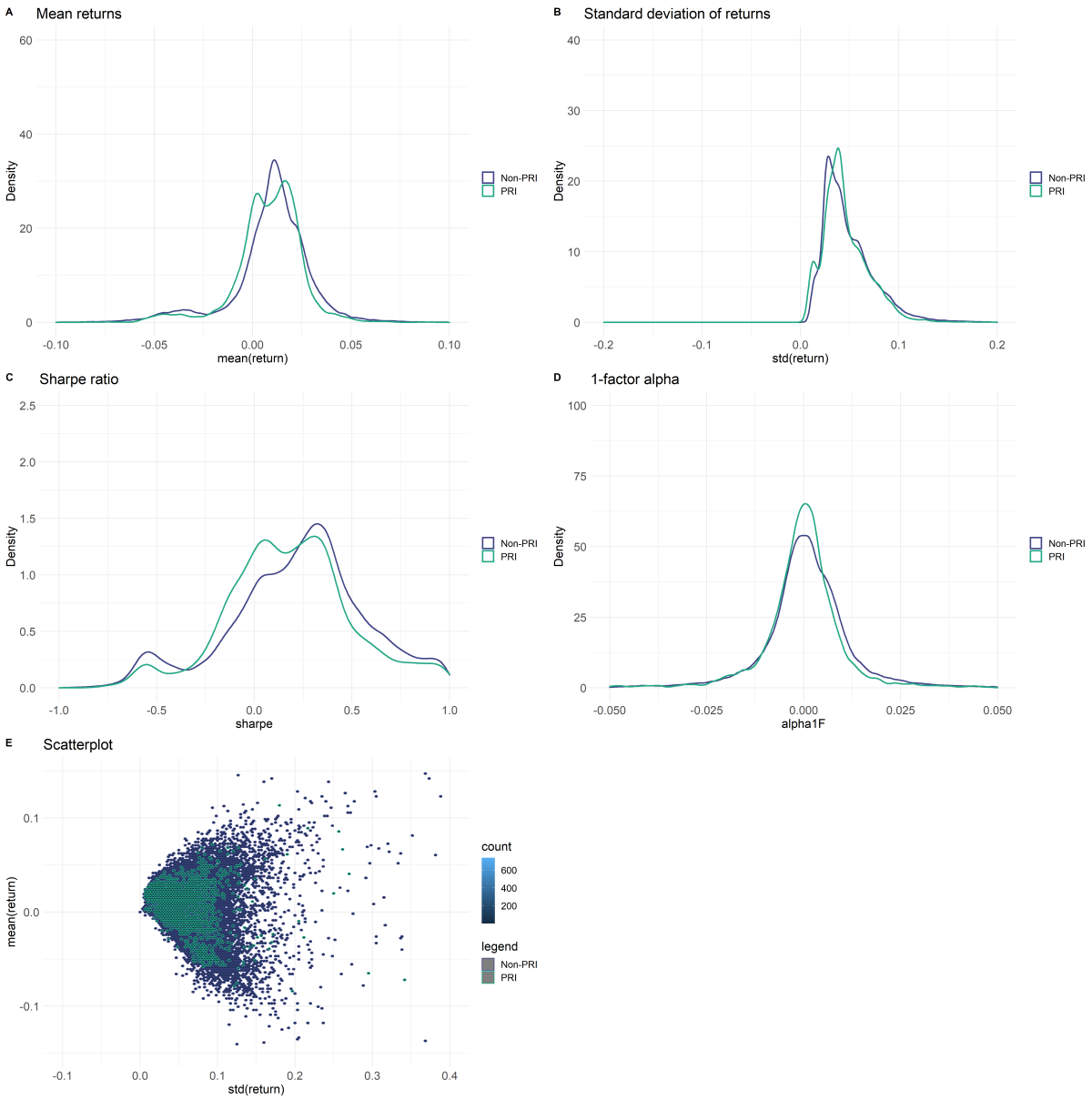

Fig. IA5. PRI Reporting Framework: Indicator LEI 01.1

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 • which ESG incorporation strategy and/or combination of strategies you apply to your actively managed listed equities; and • the breakdown of your actively managed listed equities by strategy or combination of strategies.	
	ESG incorporation strategy (select all that apply)	**Percentage of active listed equity to which the strategy is applied — you may estimate +/- 5%**
	❑ Screening alone (i.e. not combined with any other strategies)	%
	❑ Thematic alone (i.e., not combined with any other strategies)	%
	❑ Integration alone (i.e., not combined with any other strategies)	%
	❑ Screening and integration strategies	%
	❑ Thematic and integration strategies	%
	❑ Screening and thematic strategies	%
	❑ All three strategies combined	%
	❑ We do not apply incorporation strategies	%
	Total actively managed listed equities	**100%**

Fig. IA6. PRI Reporting Framework: Indicator LEI 04.1

Retrieved from the Listed Equity Incorporation (LEI) module of the PRI survey. This indicators 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.

	Indicator status	Purpose	Principle
LEI 04	MANDATORY	DESCRIPTIVE	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	❒ Product ❒ Activity ❒ Sector ❒ Country/geographic region ❒ Environmental and social practices and performance ❒ Corporate governance	
	Positive/best-in-class screening	❒ Product ❒ Activity ❒ Sector ❒ Country/geographic region ❒ Environmental and social practices and performance ❒ Corporate governance	
	Norms-based screening	❒ UN Global Compact Principles ❒ The UN Guiding Principles on Business and Human Rights ❒ International Labour Organization Conventions ❒ United Nations Convention Against Corruption ❒ OECD Guidelines for Multinational Enterprises ❒ 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.

	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	❒ To influence corporate practice (or identify the need to influence) on ESG issues ❒ To encourage improved/increased ESG disclosure ❒ Other; specify_____ ❒ We do not engage via internal staff. Please specify why your organisation does not engage via internal staff. (max. 200 words)
	Collaborative engagements	❒ To influence corporate practice (or identify the need to influence) on ESG issues ❒ To encourage improved/increased ESG disclosure ❒ Other; specify_____ ❒ We do not engage via collaborative engagements. Please specify why your organisation does not engage via collaborative engagement. (max. 200 words)
	Service provider engagements	❒ To influence corporate practice (or identify the need to influence) on ESG issues ❒ To encourage improved/increased ESG disclosure ❒ Other; specify_____ ❒ 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.

	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**
	❍ We use our own research or voting team and make voting decisions without the use of service providers.	❍ Our own voting policy ❍ Our clients' requests or policy ❍ Other; explain_____
	❍ We hire service provider(s) that makes voting recommendations and/or provides research that we use to inform our voting decisions.	❍ The service provider voting policy we sign off on ❍ Our own voting policy ❍ Our clients' requests or policy ❍ Other; explain_____
	❍ 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.	❍ The service provider voting policy we sign off on ❍ Our own voting policy ❍ Our clients' requests or policy ❍ Other; explain_____
	❍ We hire service provider(s) that make voting decisions on our behalf.	❍ The service provider voting policy we sign off on ❍ Our own voting policy ❍ Our clients' requests or policy ❍ Other; explain_____

Table IA1. Which institutional investors sign the PRI?

This table we relate the PRI signing dummy to 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.

	Dependent variable:
	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
Psuedo 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 ESG scores 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 double 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.

	Dependent variable:			
	Quartile-to-overall AUM ratio			
	(1) Total Q1	(2) Total Q2	(3) Total Q3	(4) Total Q4
PRI dummy	-0.02^{**}	-0.01	-0.00	0.03^{***}
	(0.01)	(0.00)	(0.00)	(0.01)
Europe	-0.09^{***}	-0.04^{***}	-0.02^{*}	0.16^{***}
	(0.01)	(0.01)	(0.01)	(0.02)
North America	-0.03^{**}	0.03^{***}	0.00	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)
Investment manager	0.01	0.00	-0.01	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)
Number of stocks	0.06^{***}	0.02^{***}	-0.02^{***}	-0.06^{***}
	(0.00)	(0.00)	(0.00)	(0.01)
Industry concentration	0.18^{***}	0.03^{**}	-0.08^{***}	-0.13^{***}
	(0.02)	(0.01)	(0.02)	(0.01)
Portfolio turnover	0.06^{***}	0.03^{***}	-0.00	-0.10^{***}
	(0.01)	(0.01)	(0.01)	(0.01)
Portfolio activeness	0.58^{***}	0.21^{***}	-0.31^{***}	-0.48^{***}
	(0.04)	(0.02)	(0.03)	(0.04)
Average stock size	0.06^{***}	0.01^{***}	-0.02^{***}	-0.05^{***}
	(0.00)	(0.00)	(0.00)	(0.00)
AUM	-0.05^{***}	-0.01^{***}	0.01^{***}	0.04^{***}
	(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^2	0.24	0.12	0.10	0.33

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

This table regresses portfolio-level ESG footprints on employee involvement variables and institutional investors' characteristics. The dependent variables are the four value-weighted portfolio-level ESG footprints. 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 double 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.

	Dependent variable:			
	Total ESG footprint (1)	Environmental footprint (2)	Social footprint (3)	Governance footprint (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^2	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 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 definitions for the independent variables. Robust standard errors double 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.

	Dependent variable:						
	mean(return)	std(return)	sharpe	alpha1F	systematic	idiosyncratic	semivar
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
PRI dummy	−0.07	0.11	−1.16	−0.08	0.07	0.04	0.15*
	(0.06)	(0.09)	(2.54)	(0.06)	(0.06)	(0.09)	(0.09)
Environmental footprint	0.33*	−0.85***	11.44***	0.35**	−0.28*	−0.84***	−0.61***
	(0.18)	(0.20)	(3.22)	(0.14)	(0.16)	(0.19)	(0.11)
Social footprint	−0.43**	0.43***	−12.60***	−0.56***	0.28*	0.24	0.34**
	(0.19)	(0.16)	(3.27)	(0.21)	(0.17)	(0.17)	(0.16)
Governance footprint	−0.11	−0.57***	−0.06	−0.09	−0.18	−0.54***	−0.33***
	(0.11)	(0.16)	(1.34)	(0.09)	(0.13)	(0.10)	(0.11)
Europe	0.08	−0.18	4.59	−0.01	0.36**	−0.77***	−0.17
	(0.19)	(0.21)	(3.78)	(0.19)	(0.16)	(0.17)	(0.22)
North America	0.04	−1.13***	6.35	0.12	−0.48***	−1.09***	−0.74***
	(0.22)	(0.14)	(4.61)	(0.24)	(0.13)	(0.13)	(0.11)
Investment manager	−0.18	−0.67	0.38	−0.04	−0.34	−0.58	−0.04
	(0.17)	(0.47)	(0.97)	(0.07)	(0.21)	(0.42)	(0.06)
Number of stocks	−0.10	0.06	−1.49	−0.13**	0.16	−0.06	0.06
	(0.07)	(0.18)	(1.26)	(0.05)	(0.11)	(0.13)	(0.06)
Industry concentration	−0.04	3.37***	−11.00**	−0.05	0.26	3.41***	1.58***
	(0.10)	(0.30)	(4.94)	(0.12)	(0.18)	(0.28)	(0.14)
Portfolio turnover	0.42*	0.93*	1.19	0.27*	0.36**	0.79	0.11*
	(0.21)	(0.53)	(1.30)	(0.14)	(0.16)	(0.50)	(0.07)
Portfolio activeness	0.41	0.32	−7.32	0.34	1.25**	−0.02	0.48
	(0.46)	(0.83)	(9.34)	(0.41)	(0.49)	(0.80)	(0.48)
Average stock size	−0.07	0.47*	−2.74***	−0.12***	0.18	0.47**	0.23***
	(0.09)	(0.25)	(0.61)	(0.04)	(0.12)	(0.21)	(0.04)
AUM	0.11	−0.43**	3.20***	0.15***	−0.17	−0.44***	−0.22***
	(0.08)	(0.20)	(0.67)	(0.04)	(0.11)	(0.17)	(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^2	0.36	0.11	0.68	0.04	0.28	0.07	0.54

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