

Responsible Institutional Investing Around the World

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Very preliminary and incomplete.

ABSTRACT

We explore a novel survey on sustainable and responsible investing by institutional investors around the world and match it to archival data on equity portfolio holdings. We study what factors make institutions commit to incorporate environmental, social and governance (ESG) criteria into their investment processes. We also examine whether different types of institutional investors adopt different styles of implementation (e.g., screening, ESG integration, corporate engagement) and how the different styles perform in terms of delivering positive ESG outcomes at the investor portfolio-level. We find considerable differences between European and North American investors as well as early and late adopters of ESG principles.

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1. Introduction

The practice of institutional investors incorporating environmental, social, and governance (ESG) concerns into their investment processes has spread internationally in recent years. In the U.S. alone, the assets managed according to sustainability criteria have grown by approximately 38 percent since 2016 (USSIF 2018). While previously confined to a set of norms-oriented socially responsible investors, sustainable and responsible investment (SRI) practices are now increasingly used by mainstream institutional investors.

There is limited international evidence on how institutional investors' SRI practices contribute to sustainability outcomes. In this paper, we use both survey and archival data to examine which kinds of investors commit to responsible investment and how different SRI strategies (e.g., screening or engagement oriented approaches) result in better portfolio-level ESG outcomes. The survey data we use comes from the Principles for Responsible Investing (PRI), an investor network founded in 2006 with the support from the United Nations. The network counts more than 2,000 different signatory institutions ranging from investment managers and asset owners to service providers, and collectively, the signatories represent assets under management of more than \$80tn.¹ One of the obligations resulting from signing the PRI is that institutions are required to report detailed annual reports on how they implement sustainable and responsible investment. In our analysis, we test the potential impact of the reported policies and practices on their portfolio-level ESG outcome measures, which we calculate using detailed archival data on the stock holdings of these investors.

We start by studying which investor characteristics are related to an institution committing to responsible investing. We document that asset owners, larger institutions, and institutions located outside of North America are more likely to join the PRI network. 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 on institutional investors' equity holdings of publicly-listed companies worldwide. We augment these data with stock-level environmental, social,

¹ Source: PRI at <https://www.unpri.org/about-the-pri>.

and governance scores from Thomson Reuters ASSET4 to calculate value-weighted average portfolio-level ESG scores for each institutional investor. After controlling for time trends and observable characteristics at the investor-level, we do not find strong evidence that institutions who are part of the network exhibit better portfolio-level ESG outcomes. However, we uncover an interesting cohort effect: institutions who joined the network earlier (i.e., between 2006 and 2012) tend to exhibit better portfolio-level ESG scores than institutions that joined in later years. There are also interesting regional differences: while European investors have better portfolio-level environmental and social scores, North American investors tend to exhibit better governance scores at the portfolio-level. These differences could be correlated to varying interpretations of the “fiduciary duty” by institutional money managers (care for their beneficiaries and carrying out their duties in a prudent manner), particularly in the US where institutions may treat ESG issues as non-financial factors.

We then move on to studying SRI implementation styles in greater detail. Historically, sustainable and responsible investment consisted largely of screening oriented approaches that—based on moral, norms-based, or ethical considerations—excluded certain assets from a portfolio (Hong and Kacperczyk, 2015). The practice of responsible and sustainable investing in public equity markets has evolved from these early forms. There are at least six different styles of implementation of responsible and sustainable investment (see, for instance, CFA Institute, 2015; GSIA, 2016; Amel-Zadeh and Serafeim, 2018). The different styles can be classified into (i) positive screening, (ii) negative screening, (iii) norms-based screening, (iv) ESG integration, (v) thematic investments, and (vi) shareholder engagement oriented approaches. While engagement oriented approaches have been studied before (see Dimson, Karakas, and Li 2015, 2018), there is little academic evidence on the prevalence and effectiveness of the other approaches and on their potential impact on institutional investors equity portfolios’ ESG scores (or “sustainability footprints” as in Gibson Brandon and Krueger, 2018).

We find wide heterogeneity in terms of the adoption of SRI strategies across institutions domiciled in different geographies, types, and assets under management. In particular, US-based PRI signatories have the lowest inclination to adopt norms-based and positive screening as well as collective engagement strategies, while in Europe and Asia, institutions seem to particularly focus on negative

screening, ESG integration, and individual engagement strategies. Asset owners privilege engagement strategies while investment managers are more prone to pursue negative and positive screening as well as thematic ESG investments. Investors' size matters as well in as much as largest PRI signatories with AUM above \$50bn tilt more heavily towards negative screening, ESG integration and engagement strategies than their smaller counterparts. Over time, PRI signatories have placed a noticeably increasing emphasis on norms-based, positive screening and thematic ESG strategies which is in line with the GSIA 2016 report noticing material growth rates in these same strategies (GSIA (2016)). Finally, early PRI signatories in the 2006-2012 cohort have significantly privileged specific investment styles such as negative screening and engagement relative to late joiners.

In the second part of our analysis, we focus on the effectiveness of the adoption of specific SRI strategies to enhance the ESG score (or "sustainability footprints") of PRI investors. We observe that the adoption of negative and positive screening strategies had an economically significant positive impact on the total ESG scores of these investors as well as on their E and S scores while engagement mostly contributes to enhancing their environmental scores. Finally, we note that adopting a norms-based screening strategy had a negative impact on their governance scores.

As we continue to work on the paper, we plan to examine the implications of different SRI approaches for portfolio risk and returns. This additional analysis will provide insights into the trade-offs that might exist in terms of implementing sustainable and responsible investing. For instance, we will examine the question of whether certain responsible investment approaches are restrictive in terms of portfolio construction and reduce diversification benefits, an argument that is often advanced against responsible investment approaches.

We contribute to the literature studying sustainable investment by institutional investors. Dyck et al (2019), for instance, show that international institutional investors influence firms to adopt better ESG policies and that the social norms of the countries where investors are headquartered matter. In addition, recent research suggests that long-term investors care more about ESG issues (Starks, Venkat, and Zhu 2018) and that environmental issues matter more for investment performance when institutions are long-term oriented (Gibson Brandon and Krueger 2018). Krueger, Sautner, Starks (2019) survey

institutional investors on their climate-related policies. Methodologically speaking, our paper addresses some of the shortcomings of the previously cited studies. Many of these focus either exclusively on survey data and methods (Amel Zadeh and Serafeim, 2018; Krueger, Sautner, and Starks 2019) or exclusively on archival data (Dyck et al. 2019, Starks et al (2019), Gibson Brandon and Krueger 2018) to make inferences about institutional investors' sustainability choices. Since we effectively combine a multi-year, non-anonymous, verifiable, and transparent survey dataset that is cross- and peer-checked and to some extent verified by PRI, with observable outcome measures, we can substantially add to this literature. One of the fundamental issues with surveys as a research method is that perceptions expressed when answering the survey questions may differ from actual actions undertaken by participants in managing their portfolios. Since we can match survey data with portfolio-level outcomes, we can benchmark what investors say they do against actual portfolio-level outcomes. Compared to survey studies, who face a trade-off when offering complete anonymity to the respondents so they can better elicit investor views, our study matches non-anonymous survey data with portfolio outcomes. In contrast to studies which rely entirely on archival data, we can observe from PRI survey what investors pursue in terms of their SRI actions, and can match those actions with actual portfolio outcomes.

2. Principles for Responsible Investment (PRI)

The PRI were launched in April 2006 after the successful initiative of former United Nations (UN) Secretary-General Kofi Annan who invited 21 institutional investors from 12 countries to collaborate in establishing the principles for responsible investments.² The drafting signatories included institutions such as CalPERS, Hermes Pensions Management, and the Norwegian Government Pension Fund. They were joined by 47 additional founding signatories — investment managers, asset owners, and financial service providers such as Andra AP-fonden, BNP Paribas, and Vigeo— to form what is nowadays an international network of institutional investors working together to put several principles related to sustainable investment into practice. It has grown to be the leading proponent of responsible investment and has developed an extensive reporting framework to capture investors' relationship with the ever-

² <https://www.unpri.org/pri/about-the-pri>

growing sustainable investment thematic. As of 2018, there are over 2,000 signatories with more than \$80tn of assets under management (AUM).

The PRI is an independent non-profit institution that is not associated with any government but supported by the UN through partnerships with the UN Environment Programme (UNEP) and the UN Global Compact. Funding is assured primarily via the raising of an annual membership fee from its signatories. Corporate sponsorship is only utilized to sponsor standalone projects and events.

The organization's missions are to support the transition to a sustainable global financial system by improving the understanding of the investment implications of environmental, social and governance (ESG) factors, encouraging the adoption of the principles, and supporting its international signatory network to incorporate the said factors into their investment and ownership decision making. It relies on channels such as conferences, support of academic research, authoring of knowledge pieces, provision of thought leadership, and training. The PRI also proposes voluntary and aspirational investment guidelines (a set of principles) to help signatory institutions to enhance their incorporation of ESG considerations. The principles are as follows

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

In signing the principles, the investors publicly commit to adopting them 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 is scaled by signatory type and AUM³. Second, all PRI signatory investors commit to a yearly compulsory reporting on their responsible investment progress and consideration of ESG factors in making

³ <https://www.unpri.org/signatories/become-a-signatory>

investment decisions. The reporting is voluntary only for first-time signatories and failure to report results in delisting. Our research makes direct use of information derived from the reporting framework developed by the PRI. More information on the data derived from the reporting framework can be found in Section 3.

The reporting framework is to be completed annually from the beginning of January to the end of March via an online reporting tool. The PRI compiles the answers of the reporting in a database. The reporting framework comprises several modules. The three modules ‘organizational overview’, ‘strategy and governance’, and the ‘closing module’ need to be reported by all signatories.⁴ The remaining nine modules are asset class-specific and cover equity, fixed income, private equity, and others. Of the asset class-specific modules only the ones relevant to the signatory need to be reported. Relevance is determined via a decision tree, where only asset classes that are held by the signatory, for which responsible investment is incorporated, and which account for over 10% of the total AUM fulfill the mandatory reporting requirement. However, signatories always have the option to voluntarily report. Overall, the modules together comprise over 200 indicators and around 900 sub-indicators, each asking specific questions. Moreover, the indicators are divided into different categories: i) *Mandatory to report and disclose*, implies that responses are publicly available on the PRI website and via access to the reporting database. ii) *Mandatory to report, voluntary to disclose*, requires firms to report but gives them the choice whether this information should be made public. iii) *Voluntary to report and disclose*, allows signatories to decide whether to respond and if the information should be treated as public or private. Finally, responses to indicators can be close-ended (i.e., binary, categorical, or multiple choice), open-ended (descriptive), or a combination of both.

The PRI principles can be signed by any organization fitting one of the three categories: 1) Asset owners, 2) investment managers, and 3) professional service providers.⁵ Asset owners represent the depositors of long-term retirement savings, insurance, and other assets. For example, pension funds, sovereign wealth funds, foundations, endowments, insurance, and reinsurance companies. Investment

⁴ <https://www.unpri.org/signatories/reporting-framework-module-faqs-for-investors/3714.article>

⁵ <https://www.unpri.org/Uploads/l/f/j/Signatory-Categorisation-WEBSITE-UPDATE---MARCH--18.pdf>

managers control investment funds, either on their own account or on behalf of others and do not own more than half of such investment funds. Service providers do not manage assets by themselves but offer products or services to asset owners and/or investment managers to help them achieve the principles. Moreover, the predominant activity is used to categorize the signatory.

Investors can, in principle, only sign up to the PRI at the highest level of the group in order to prevent financial groups to sign up subsidiaries or funds with particularly strong ESG performance. We subsequently refer to the highest level of the group as a parent and to a subsidiary as an entity. Only entities that are autonomous (e.g., is a separate legal entity to the parent or controls its own investment decisions) can sign the principles independent of whether or not the parent signed them. It follows that if an entity signs and the wider group does not, the PRI signatory status cannot be inherited by the wider group. Conversely, when the parent signs on behalf of the wider group, generally all assets of the entities should be included in the reporting and entities can, therefore, represent themselves as a signatory. In addition, entities can sign up separately from the parent, even if the latter already signed itself; both then need to report separately. It should also be noted that banks can only become signatories if their wealth or asset management branch is not a legal entity in its own right as it is then encourage to sign up independently.

In order to ensure transparency and accountability of the signatories regarding their commitment to the principles, PRI standardized its reporting tool. While the reporting framework is self-reported, PRI has tried to put processes and controls into place to reduce reporting errors and to ensure the verifiability and credibility of reports. A central element of this is the transparency of the reporting and the PRI thus decided to make a vast majority of the reporting public. For example, the publicly available reports allow asset owners to search and screen for potential investment managers, providing a strong incentive to the latter to report truthfully. In addition, the PRI provides peer comparisons, allowing signatories with similar holdings to be compared to each other, as well as analyzing responses of recurring themes. Lastly, the PRI runs validation checks to detect inconsistencies, contradictory responses, major changes across reporting years, and outlier data points.⁶ Third-party audit and

⁶ <https://www.unpri.org/signatories/reporting-for-signatories/validation-and-credibility-of-reported-data>

assurance are encouraged but voluntary. This being said, the data still suffers from concerns common to survey data.

3. Data and Methodology

For this study we rely on three sources of data: 1) the PRI reporting framework, 2) Factset institutional holdings, and 3) Asset4 ESG scores.

a. PRI reporting framework

While the PRI was founded in 2006, the dataset with responses from signatories starts in 2014 and extends to 2018. It is non-anonymous survey data, where we observe responses to a detailed questionnaire for each signatory investor and reporting year. The fact that investment company names are at our disposal is crucial as it allows us to combine the survey data to archival data, thereby addressing one of the shortcomings of anonymous survey studies. Overall, the five years of PRI reports available to us contain 5,326 investor-year observations by 1549 unique PRI investor identifiers.

Reporting takes place every year between January and March and we interpret responses to account for the previous calendar year, i.e., the 2018 report covers activities in 2017. 2013/2014 constitutes the baseline year and subsequent reporting frameworks were subject to modifications and improvements. Questions might have changed, were added, or dropped and we adjust for this when formatting the data for our analysis.

The PRI reporting framework comprises twelve modules. Since we focus on equity markets, the ‘organizational overview’, ‘strategy and governance’, ‘listed equity incorporation’, and ‘listed equity active ownership’ modules are the ones of interest to this study and used to draw the necessary information for our analysis. We are mainly interested in information on responsible and sustainable investment strategies, such as the screening, integration, and thematic strategies of the signatories, as well as their engagement and voting processes.

Given that the PRI reporting framework distinguishes between indicator questions to which investors can provide public or private responses, we only work with answers to those questions that are

mandatory to report and to disclose. The reason being that mandatory indicators are in principle 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 to close-ended questions in order to avoid the challenges arising from interpreting the descriptive responses. Lastly, we limit our focus to asset owners and investment managers, excluding service providers, in order to be able to combine the filtered data with the Factset institutional holdings database.

b. Factset institutional holdings

We retrieve international institutional investor holdings data from Factset/LionShares following Ferreira and Matos (2008). The data are the leading source for global institutional ownership and cover historical international portfolio holdings from 2003 to 2017. We use portfolio data at the end of each calendar year. We restrict holdings to American Depositary Receipts (ADRs), Alien/Foreign shares, Depositary Receipts (DRs)/Certificates, Global Depositary Receipts (GDRs), Non-Voting Depositary Receipt (NVDRs), preferred shares, preferred equity, and common/ordinary shares. We further restrict the sample to holdings for which an International Securities Identification Number (ISIN) is available, as this is a necessary condition to be able to join the ESG stock-level information. We further group entities by their type. In line with the PRI definition, asset owners are pension, foundation and endowment managers, sovereign wealth managers, insurance companies, and governmental agencies. Investment managers are bank investment divisions, investment companies, investment advisers, and hedge funds.

c. Thomson Reuter Asset4 ESG scores

We retrieve stock-level ESG data from Thomson Reuters' Asset4 and aggregate on a yearly basis by keeping the last available scores in each company-calendar year combination assuming that it reflects the most accurate and up-to-date information on the company for that time period.⁷ We retrieve the overall score, the social score, the environment score, and the governance score for each company.

⁷ This data is used in Dyck et al (2019) and many other papers in the ESG literature.

We filter ESG scores between 2003 and 2017 and only keep stocks for which an ISIN is available. ESG scores on a yearly basis

d. Matching

We perform a name matching between all the investors contained in the PRI reporting framework and the full Factset institutional investor population. In a first stage we run a name matching algorithm on the two lists of names cleaned for punctuation, accents, non-alphanumeric, and special characters using the Jaro-Winkler measure in order to determine the smallest distance between two given names in the lists.⁸ In a second step, we perform manual checks and improvements to the initial output of the name matching algorithm by controlling for the country location of the signatory's headquarter, the asset class composition of its holdings as reported to PRI, and the website URL reported to PRI and Factset. In total, we match 611 PRI signatories with the Factset institutional holdings investor names at either the entity or the parent level. Of the 1,549 unique PRI identifiers only 874 need to complete the PRI modules relating to listed equity. The remaining 675 either do not hold equities, do not incorporate responsible investment in their equity holdings, or hold less than 10% of equities compared to their overall asset AUM. In addition, a large proportion of the 263 signatories that report on their listed equities and that we do not match are asset owners, which often do not have sufficient direct equity holdings to show up in Factset.⁹ Many do hold a substantial proportion of their equity AUM under fund-of-funds, or simply have not enough assets under management. We thus conclude that our PRI-Factset match is robust. Lastly, we join the Asset4 ESG score data to the Factset holdings via ISINs available in both datasets.

e. Data filters

We construct our final analysis samples by restricting the set of investors to the countries of the MSCI All Country World Index.¹⁰ We further filter solely for holdings that have Asset4 ESG scores

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https://ipfs.io/ipfs/QmXoypizjW3WknFiJnKLwHCnL72vedxjQkDDP1mXWo6uco/wiki/Jaro%E2%80%93Winkler_distance.html

⁹ For example, the SEC Form 13-F filing of portfolio holdings of equity-like securities is only required for institutional investment managers that exercise discretion over \$100 million or more.

¹⁰ <https://www.msci.com/market-classification>

readily available. Our matching of the PRI with the Factset investor universe occasionally leads to a double-matching. This can happen when both the parent and the entity sign the PRI independently. In such cases, we give priority to entity over parent matches. In rare cases, even though both parent and entity signed, a valid report might not be available for the entity while it is available for the parent. Should this occur then we 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. All of our analysis is conducted at the Factset entity level. After merging all three sources and applying the filters as described above, we are left with 70,759 investor-year entity portfolio-level observations ranging from 2006 to 2017. For the analysis that requires PRI information, we are left with a sample of 2,778 investor-year observations, down from the initial 5,326 initial investor-year PRI responses.

f. ESG Portfolio Scores

The stock-level Asset4 sustainability scores that we obtain are organized along the environmental, social, and governance pillars. The three scores represent the quality of the company’s products, operations, and management in terms of the environmental (CO₂ emissions, resource use, innovation), social (workforce, human rights, communities), and governance (management, shareholders, strategy) aspects. We also retrieve the total score, which aggregates the considerations of the three pillars.

We follow Gibson Brandon and Krueger (2018) in computing the portfolio-level sustainability “footprints” by using the Asset4 scores to quantify the portfolio-level ESG scores of institutional investors. To do so we compute the value-weighted sustainability footprint of an investor’s holdings defined as

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

where *Score* denotes one of the four sustainability scores: *Total_score*, *Env_score*, *Soc_score*, or *Gov_score*. w_{ij} denotes the value-weight of stock *i* in investor *j*’s portfolio at the end of year *t*. $Score_{it}$ is the sustainability score of stock *i* at the end of year *t*. N_{jt} the total number of stocks investor *j* holds at

the end of year t for which the stock-level Asset4 scores are available. The $Score^{PF}$ variable quantifies the portfolio (PF)-level sustainability footprint of institutional investor j at the end of year t as the value-weighted average of the sustainability score of the stocks that make up the institution's portfolio.

4. Empirical analysis

4.1 General sample characteristics

In Figure 1, we provide some graphical evidence about the composition of our sample. In Panels A and B, we show that the number of PRI signatory institutions and their total equity holdings has increased over time. We also split it up by whether institutions signed the PRI at the entity or parent-level. Panel B shows the increasing importance of PRI signatories in global stock markets. While global equity holdings of PRI institutions represented about \$0.63tn in 2006, the value of total holdings by PRI signatories grew to \$15tn by 2017. Relating the total value of holdings by PRI institutions with total institutional investor equity holdings of about \$26tn shows that PRI signatories now represent 64% ($=\$15tn/\$26tn$) of institutionally owned equity.

4.2 Which institutions sign up for PRI?

In Panel C, we contrast the sample of PRI signatories with the overall population of institutional investors in terms of their geographical location. We restrict our sample to the MSCI All Country World Index and group them into four regions. Compared to North American institutional investors, investors from Asia-Pacific, Europe and the Rest of the World are more likely to sign the PRI. In terms of types of institutions, we do not find large differences in terms of asset owners or managers between the PRI and overall population.¹¹ If anything, there is a slight over-representation of asset owners compared to the overall population. Note that for an asset owner to be included in the sample, the institution would need to have considerable direct equity holdings because otherwise it would not show up in Factset.¹² In other words, asset owners who delegate the management of their equity investments would not show up in our sample. In terms of the size distribution (see Panel E), there is under-representation of very

¹¹ In untabulated analysis, we find that investment advisors, investment companies, pension funds and endowments are more likely to sign up to PRI while hedge funds, and venture capital funds less likely to do so.

¹² As mentioned before, only U.S. institutional investment managers with more than \$100 million in AUM need to file the SEC Form 13-F.

small institutions among PRI signatories (<\$1bn) and over representation of large (1-20bn) and very large (>\$50bn) institutions.

In Table 1, Panel B we show further sample splits using the cross-section and time-series jointly. While founding and early signatories tended to be more European (61 (47) percent in 2006 (2017)), the percentage of North American signatories has gradually risen over time from only 6 percent when PRI was founded in 2006 to 31 percent in 2007. The fraction of signatories from Asia Pacific and the Rest of the World is 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 smaller (and very small) signatories has increased steadily over time. This might reflect the fact that being part of PRI is now an important requirement for investment managers to obtain investment mandates from asset owners. Also the percentage of signatories being investment managers has increased over time.

To complement the largely univariate evidence on the characteristics of PRI vs Non-PRI signatories presented so far, we estimate Probit regressions in Table 2. The regressions are aimed at better understanding which kinds of institutions join the investor network. We confirm that the probability of joining is higher when the institution is not based in North America, when the institution is an asset owner, and when it is larger in terms of total equity holdings (see Column (1)). When looking at the decision to sign at the parent- or entity-level (see columns (2) and (3)), there are no important differences.

4.3 ESG footprint of PRI institutions vs non-PRI institutions.

We now turn to analyzing portfolio-level outcomes conditional on PRI membership. To do so we, calculate an average portfolio-level ESG score as well as individual E, S, and G component scores. In Panel A of Figure 2 we provide some graphical evidence. In Panel A, we compare the distribution of portfolio-level ESG scores between PRI and non-PRI institutions.¹³ Two interesting patterns emerge.

¹³ One important difference to note versus firm-level studies as in Dyck et al (2019) is while ESG scores have to be an equal-weighted average of 50 (our sample mean is 50.01) that is no longer true when one does value-weighted portfolio ESG scores (sample average of 63.24 in 2017) as larger firms tend to have better corporate sustainability performance.

First, from the graph it seems as if PRI institutions have higher mean and median total portfolio-level ESG score. Secondly, the distribution of portfolio-level scores of non-PRI institutions has a fatter left tail, suggesting that in the non-PRI population there are more institutions that have a low score. In Panels B and C, we look at the social and environmental component separately. The distributions look very similar to that of the overall score depicted in Panel A, that is fatter left tail for non-PRI institutions and higher mean/median scores for PRI institutions. In contrast, the picture reverses when looking at the governance dimension: it seems as if the portfolio-level governance scores are on average higher for non-PRI institutions. It could be that non signatories probably favor more of a shareholder value maximization approach with a strong emphasis thus on corporate governance issues. The left tails look fairly similar for both PRI and Non-PRI signatories.

Next, we also compare the distributions of the total portfolio score conditional on PRI membership over time. Panel E shows that the distributions of scores shifts to the right for both for PRI and non-PRI institutions. This is consistent with Dyck et al (2019), who document that firm-level ESG scores have improved over time. Quite interestingly, however, the distributions of ESG scores for non-PRI investors—even though it shifts to the right—continues to show a fatter left tail. Finally, in Panel F, we look at cohort effects and examine at the distribution of ESG portfolio scores conditional on the year in which an institution signed PRI. A clear picture emerge here that those who signed earlier tend to have higher scores.

The graphical evidence of Figure 2 is suggestive of two things: first, PRI signatories have better overall E & S but worse G scores. Secondly, it might be that earlier signatories tend have better scores than later signatories. However, these patterns could be driven by time trends or omitted factors. To test these two possibilities, we estimate OLS regressions in Table 3 where we use as a dependent variable the portfolio level ESG scores. The main variable of interest is the PRI dummy. We also control for region and time fixed effects as well as country and institution-type fixed effects (investment manager versus asset owner). The multivariate analysis in Table 3 does not confirm the first part of the graphical evidence: while the PRI dummy is marginally significant in for the overall ESG score in column (1), it is not significant for the component scores (columns (2)—(3)). These findings imply that the observed

differences between PRI and non-PRI signatories in terms of the portfolio level scores (see Figure 3) are mainly driven by time and institution effects

To address the cohort effects, we estimate in Table 4 the same specifications from Table 3 using two separate dummies, one of which marks institution-year observations for early signatories (i.e., between 2006 and 2012) and a second dummy variable that marks institutions that sign later: interestingly, the dummy for the early signatories is positive and significant, while the dummy for the later signatories is not. This suggests that in terms of portfolio-level sustainability, early signatories are different not only from later signatories but also from the overall population.

4.4 Which ESG strategies do PRI signatories pursue and what is the effect on portfolio-level ESG scores?

There is no standard classification of the various ESG investment styles pursued by institutional investors, yet most of the relevant 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 GSIA 2016 report states that their “definitions of sustainable investment, published in their 2012 report (GSIA 2012) have emerged as a global standard of classification”. Adjusting these to our context of public equities investing, we adopt the following classification:¹⁴

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;

¹⁴ We exclude “Impact/community investing” since these are targeted investments, typically made in private markets, aimed at solving social or environmental problems, and including community investing, where capital is specifically directed to traditionally underserved individuals or communities, as well as financing that is provided to businesses with a clear social or environmental purpose. Given our focus on public equities, we modify the GSIA 2016 ESG style classification by (i) excluding the impact investing category which applies mainly to private markets and is still quite small in terms of assets under management and (ii) decomposing the corporate engagement category into individual engagement, collective engagement and voting.

4. **[Int] Integration:** the systematic and explicit inclusion by investment managers of environmental, social and governance factors into financial analysis;
5. **[The] Thematic:** investment in themes or assets specifically related to sustainability (for example clean energy, green technology or sustainable agriculture);
6. **[Indiv engag] 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.
7. **[Colla engag] Collaborative corporate engagement and shareholder action:** the conduct of corporate engagement, as defined above, however it is undertaken jointly with other investors.
8. **[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.

Previous academic work has focused on individual and collaborative engagements (Dimson, Karakas, and Li 2015) as well as voting (Bolton et al 2019), making our distinction useful in terms of anchoring our evidence on prior results. Thus, in the end, we have eight distinct categories and, in Table 5, we provide descriptive statistics on these strategies based on the overall sample period, yearly statistics from 2013 until 2017, geographic regions, investors types and assets under management of the PRI signatories. The main conclusions we can derive from this table can be summarized as follows: First, regarding the overall sample period adoption of various ESG investment styles, we observe that the dominant strategies pursued by PRI signatories are negative screening, ESG integration, and engagement (both individual and collective) as well as voting. Second, there is wide heterogeneity in terms of how the adoption of certain strategies differs across geographies, investors' types and investors' size (as proxied by their assets under management). In particular, the US and Rest of the World PRI signatories have the lowest inclination to adopt norms - based, positive screening and collective

engagement strategies while Europe and Asia seem to particularly focus on negative screening, ESG integration and individual engagement strategies. Asset owners privilege engagement strategies while investment managers are more prone to pursue negative and positive screening as well as thematic ESG investments. Investors' size matters as well in as much as largest PRI signatories with AUM above \$50bn tilt more heavily to negative screening, ESG integration and engagement strategies than their smaller counterparts. Over time, PRI signatories have placed a noticeably increasing emphasis on norms-based, positive screening and thematic ESG strategies which is in line with the GSIA 2016 report noticing material growth rates in these strategies.

In Table 6, we use a probit regression with year fixed effects to assess how various PRI signatories' characteristics such as their geographical location, their type, their assets under management and the fact that they are early PRI signatories predict their ESG strategies adoption. We observe first that relative to being located in the US, PRI signatories from Europe and from Asia-Pacific have a significantly higher propensity to adopt any of the eight ESG strategies previously described. While PRI signatories located in the rest of the world display a lower propensity to adopt screening strategies they do have a higher tendency to adopt engagement and voting strategies than their US counterparts. Second, investment managers do have a significantly higher propensity to adopt positive and negative screening, thematic and ESG integration strategies than asset owners but they are less likely to adopt a voting strategy. Third, size matters strongly and positively influences the adoption of any of the eight ESG strategies. Finally, being an early PRI signatory belonging to the 2006-2012 cohort mostly increases the likelihood that this signatory adopted a negative screening and an individual and even more so a collective engagement strategy.

In Table 7, we then run a regression with year, type and region fixed effects to analyze which investment styles most effectively influence the ESG score of the PRI signatories, and we do that for their overall ESG score as well as their E, S and G scores, individually. The main results can be summarized as follows. First, effectiveness seems to come predominantly from following a positive, a negative or an individual engagement strategy. Indeed, we observe that negative and positive screening strategies significantly positively influence, the environmental, the social and the overall ESG scores.

The magnitudes seem to be slightly stronger for negative than for positive screening strategies. Second, individual engagement marginally increases the overall ESG score of PRI signatories and this effect seems to be primarily driven by the noticeable impact of individual engagement on the environmental score. The latter observation may be due to the fact that there has been a more pronounced interest, concern and engagement for environmental – relative to social – issues over the sample period. Third, there is a negative - albeit weaker - impact of voting strategies on the environmental, social and overall ESG scores of the PRI signatories. This somewhat surprising result can be related to the fact that many institutional investors, especially those located in the US, delegate the exercise of their voting rights to specialized proxy voting firms that do not yet adopt a stakeholder friendly approach. Fourth, we observe that the other ESG styles do not significantly affect the ESG scores either because they still represent a small fraction of the AUM of the PRI signatories or because for many investors they may be newer (collective engagement) or conducted through non-equity based investments (this is especially true for the ESG integration, thematic and norms-based strategies pursued by asset owners such as insurance companies or pension funds). Finally, we see that size does independently positively and significantly contribute to the E, the S, the G and the overall score of the PRI signatories which is consistent with previous results for a large variety of institutional investors documented by Gibson and Krueger (2018).

5. Implication for Portfolio Risk and Return [analysis to be completed]

In the next version the paper, we will examine the impact of SRI strategies for portfolio risk and returns. For instance, we will examine the question of whether certain responsible investment approaches are restrictive in terms of portfolio construction and reduce diversification benefits, an argument that is often advanced against responsible investment approaches.

6. Conclusions [preliminary]

We analyze large-scale data on SRI investing strategies by major institutional investors around the world and combine it with their equity portfolio holdings. We find heterogeneity across institutions on how much they engage in ESG investing (for example, European and early PRI signatories being on the forefront) and detect some impact on ESG scores of the portfolio firms.

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