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Do Responsible Investors Invest Responsibly?

Finance Working Paper N° 712/2022
September 2022

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ECGI Working Paper Series in Finance

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Abstract

We study whether institutional investors that sign the Principles for Responsible Investment (PRI), a commitment to responsible investing, exhibit better portfolio-level environmental, social, and governance (ESG) scores. Signatories outside the US have superior ESG scores than non-signatories, but US signatories have at best similar ESG ratings, and worse scores if they have underperformed recently, are retail-client facing, and joined the PRI late. US signatories do not improve the ESG scores of portfolio companies after investing in them. Commercial motives, uncertainty about fiduciary duties, and lower ESG market maturity explain why US-domiciled PRI signatories do not follow through on their responsible investment commitments.

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

JEL Classifications: G15, G23, G30, M14

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ABSTRACT

We study whether institutional investors that sign the Principles for Responsible Investment (PRI), a commitment to responsible investing, exhibit better portfolio-level environmental, social, and governance (ESG) scores. Signatories outside the US have superior ESG scores than non-signatories, but US signatories have at best similar ESG ratings, and worse scores if they have underperformed recently, are retail-client facing, and joined the PRI late. US signatories do not improve the ESG scores of portfolio companies after investing in them. Commercial motives, uncertainty about fiduciary duties, and lower ESG market maturity explain why US-domiciled PRI signatories do not follow through on their responsible investment commitments.

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1. Introduction

There is growing interest globally in responsible investing, whereby institutional investors incorporate environmental, social, and governance (ESG) issues into their investment processes. The leading initiative, the Principles for Responsible Investment (PRI), which was founded in 2006 by some of the world's largest institutional investors with support from the United Nations, counted close to 4,000 signatories with combined assets under management (AUM) of over US$ 120 trillion at the end of 2021. This raises the questions of how responsible investment principles are implemented by institutional investors and how these translate into different ESG portfolio outcomes. It is important to determine if institutions who commit to invest responsibly by joining the PRI do so in practice. After all, the goal of responsible investing[1]—to allocate capital towards companies that make the world more sustainable—can only be achieved if investors live up to their commitments.[2]

In this paper, we examine whether institutional investors' public commitments to responsible investing and higher reported levels of ESG incorporation in fact translate into more sustainable equity portfolio allocations. We also examine whether there are geographical differences among investors given the variation in the development of ESG considerations worldwide. For this purpose, we combine filings by institutional investors on their equity holdings around the world with stock-level ESG ratings from three leading ESG data providers to calculate value-weighted ESG scores at the portfolio level. We call these *portfolio ESG scores* and use these to quantify the extent to which an institutional investor is pursuing ESG investment objectives.

We begin by documenting which types of institutional investors join the PRI and find that the largest asset managers and those located outside of the United States are more likely to become part of the initiative. We then turn to our main research question and examine whether PRI signatories have better portfolio ESG scores than those who do not join the initiative. Our analysis shows that, on average,

[1] Although technically we prefer the term responsible investing in the context of our paper, we use the terms responsible, sustainable, and ESG investing interchangeably.
[2] Responsible investing can affect the corporate capital allocation towards sustainable goals either by reducing the cost of capital on the primary market or act as a price feedback mechanism on the secondary market.

institutional investors who sign the PRI have better portfolio ESG scores and also improve these scores after joining the PRI.

Next, we examine whether the extent to which PRI signatory institutions invest responsibly varies around the world. For instance, a survey by Amel-Zadeh and Serafeim (2018) suggests that ethical motives to invest responsibly play less of a role in the United States. In the U.S., however, institutional investors might be more commercially driven, potentially to attract the growing ESG-related fund flows (i.e., to increase their AUM and the associated management fees). Active fund managers in the U.S. have witnessed some of the strongest competition from indexed products (Cremers et al., 2016) and some US institutional investors might have responded to the recent popularity of ESG by signing the PRI opportunistically, but failing to incorporate ESG considerations into portfolio management. There is also more regulatory uncertainty in the U.S. over whether institutions' fiduciary duties are consistent with the incorporation of ESG considerations in the investment process, whereas this debate seems more settled in other parts of the world. For instance, the UK Law Commission has clarified in 2013 that considering ESG factors was consistent with investors' fiduciary duties and the EU has launched an action plan for financing sustainable growth in 2018. Finally, the U.S. has also witnessed a large increase in the assets under management of PRI signatories in the later parts of our sample period, but is still lagging other markets, which could suggest that the US responsible investment market is less mature. All these factors motivate conducting a study on responsible investing that examines cross-country variation.

In our analysis of cross-country differences, we find that only PRI signatories located *outside* the U.S. have better portfolio ESG scores than non-signatory investors. In terms of the economic significance of the results, we find that outside the U.S., the portfolio ESG scores of PRI signatories are about 13% of a standard deviation higher than those of non-signatories. Hence, asset allocators considering investment managers should care about whether an investment manager is a signatory or not, at least when the manager is located outside the US. In contrast, PRI signatories do not exhibit better portfolio ESG scores than their uncommitted peers in the US. In addition, while institutional investors located outside the U.S. improve their portfolio ESG scores by about 14% of a standard deviation once

they join the PRI, there is no evidence that US PRI signatories do so after signing the principles. The latter raises concerns about greenwashing (i.e., overstating an institution's commitment to sustainable investing) among U.S. PRI signatories.

Signing up to the PRI is voluntary and institutions can resort to a menu of possible actions for incorporating ESG issues in their investment analysis and selection process. We use detailed survey data from the annual PRI reporting framework about the set of actions taken by the signatories, which is a key PRI tool to enable signatory transparency on their ESG efforts. These reports are often used by asset allocators and other stakeholders to assess an institution's ESG credentials. Instead of treating PRI signatories as a homogenous group of responsible investors, this survey data allows us to classify institutions into three groups: (1) those that report that they fully apply ESG incorporation strategies to 100% of their equity AUM; (2) those that report that they partially do so; and (3) those that do not report any form of ESG incorporation. Our analysis shows that, outside of the U.S., PRI signatories that report that they apply ESG incorporation strategies fully do exhibit significantly better portfolio ESG scores than institutions that do not sign the PRI (the difference amounts to 17% of the standard deviation of the portfolio ESG score). In the U.S., however, we find no significantly different portfolio ESG scores, not even for signatories that report that they fully apply ESG incorporation. More concerning, perhaps, we find that US-domiciled PRI signatories that do not report any form of ESG incorporation (the third group above) have significantly *worse* portfolio ESG scores than non-PRI institutions. In terms of magnitude, we estimate their portfolio ESG scores to be lower by an economically large 26% of a standard deviation (relative to non-PRI signatories in the U.S.).

In tests that further leverage the survey data, we aim to rule out the possibility that US PRI signatories might invest in low-ESG stocks and instead use shareholder engagement to improve the ESG performance of their investee firms over time. Our analysis, however, suggests that this is unlikely to be the case. First, the PRI survey data reveals that US investors report significantly less usage of individual or collective ESG shareholder engagement than their peers from other geographical regions. Secondly, we also find evidence that the US PRI institutions that report that they engage on ESG with their portfolios firms do not exhibit better portfolio ESG scores in subsequent years. While we do not regard

our paper as contributing directly to the ESG engagement literature (see, for instance, Dimson, Karakas and Li, 2015, 2021), these tests help rule out the alternative explanation that US PRI signatories rely on shareholder activism to pursue responsible investing.

Our analysis identifies a group of US-domiciled institutions that join the PRI initiative but do not follow through on their commitments. These US investors either report that they do not incorporate ESG issues in the investment process or do not report on their ESG incorporation efforts at all. Hence, these US institutions are fundamentally uncompliant with Principle 1 of the PRI ("We will incorporate ESG issues into investment analysis and decision-making processes"). They also have significantly *worse* portfolio ESG scores than non-PRI institutions, which seems also inconsistent with the principles. In our paper, we also study what characterizes these US PRI signatories that report no ESG incorporation and exhibit worse portfolio ESG scores and find that (1) these institutions have recently underperformed; (2) cater to retail clients; (3) have been involved in negative ESG incidents in their own institutions' operations; and (4) are more likely to have joined the PRI late. These cross-sectional results indicate that the US PRI signatories that fail to implement ESG might be greenwashing because of a misalignment of interest between the fund managers and their end investors or other stakeholders.

In the final part of the paper, we evaluate three non-mutually exclusive channels that might explain why PRI signatory status is *not* a good proxy for committed responsible investors in the US. Our first explanation is that commercial motives are a more important driver of signing the PRI in the U.S. than in other parts of the world. We find that US institutions receive higher investor flows of 9% of a standard deviation after joining the PRI and are more likely to sign the PRI when they recently underperformed. We do not find similar flow benefits for non-US investors. These results suggest that some U.S. investors join the PRI opportunistically for commercial motives (i.e., to attract higher flows and possibly to make up for lost business due to lower past performance). The second potential explanation we advance is related to regulatory uncertainty about whether responsible investing is consistent with investors' fiduciary duties. While there is an open regulatory debate in the U.S. as to whether fiduciaries can consider ESG factors, other countries' regulators took a more favorable stance

towards the use of ESG information.[3] To evaluate the role of increased legal clarity, we use a country-specific experiment involving the UK Law Commission's[4] clarifications in 2013 that considered ESG factors to be consistent with investors' fiduciary duties. We find that UK PRI signatories improve their portfolio ESG scores relative to non-signatories in the UK after the regulator's clarifications. Despite the limitations of using a single legal shock in a different country, the evidence from the UK experience does lend support to the view that the legal uncertainty in the U.S. might be holding back US PRI signatories from implementing ESG more thoroughly. The third explanation we explore is related to ESG market maturity. The U.S. has witnessed growth in responsible investing somewhat later compared to other parts of the world where responsible investing has had a longer presence. One possibility is that with increased market diffusion of ESG standards, market maturity can lead to more pressure for ESG implementation, and ultimately better portfolio ESG scores of PRI signatories. Consistent with this idea, we find that as the fraction of AUM commanded by PRI signatories increases in a region so do portfolio ESG scores of PRI signatories in the same region, suggesting that a lack of market maturity in the US might explain the cross-country differences. While we are not able to decisively pinpoint one single dominant explanation, we believe that a mix of the three channels described above are at play and help explain why an ESG portfolio incorporation gap between US and non-US PRI signatories exists.

Our paper contributes to the literature on responsible investment by institutional investors. Using survey-portfolio matched data, we show that there is a disconnect between what US institutional investors report in terms of ESG incorporation and their ESG portfolio allocations. In contrast to prior studies examining responsible investment by institutional investors, which have relied either on anonymized investor surveys (e.g., Amel-Zadeh and Serafeim, 2018; Krueger, Sautner and Starks, 2020) or archival data of portfolio holdings (e.g., Starks, Venkat and Zhu, 2018; Dyck et al. 2019; Gibson Brandon, Krueger and Mitali, 2021), we combine both survey and archival data. In particular, we extend prior research in Dyck et al. (2019), who find that E&S scores of firms with higher ownership by PRI

[3] For instance, the U.S. Department of Labor (DOL), which regulates private company retirement plans, has provided conflicting guidance on how to apply the Employee Retirement Income Security Act of 1974 (ERISA) fiduciary standards to ESG depending on the political party in power (see, Reuters, 2021).
[4] The UK Law Commission is a statutory independent body that keeps the law of England and Wales under review and recommends reform where it is needed.

signatories tend to be higher, by exploring important heterogeneities in ESG incorporation among PRI signatories. We provide novel evidence that, even when we consider the reported level of ESG incorporation, US signatories who report that they fully incorporate ESG strategies in fact do not have better portfolio ESG scores. Moreover, we identify a group of US signatories that exhibit *worse* portfolio ESG scores than non-PRI institutions, raising concerns about greenwashing.[5]

In related studies that are narrower in scope, Kim and Yoon (2021) study only US mutual funds and also find that those who sign the PRI fail to have better ESG scores. While our paper studies all institutional investors (and not only mutual funds), we can also highlight important geographic differences among PRI signatories due to the global scope of our study. Liang, Sun and Teo (2021) find some underperformance among the subset of hedge fund PRI signatories with poor incentive alignment. Dimson, Karakas and Li (2021) focus instead on shareholder engagement in their study of the PRI collaboration platform. Our paper examines the aggregated and global equity portfolios of all types of institutional investors (investment managers as well as asset owners), based in different geographic regions, and using different types of ESG strategies. Our use of the survey-portfolio matched data allows us to measure the reported level of ESG incorporation among PRI signatories and compare it directly to portfolio outcomes. We uncover economically significant differences in ESG incorporation between different categories of US and non-US investors.

2. Data on Responsible Investing

2.1 The Growth of the Principles for Responsible Investment (PRI)

The Principles for Responsible Investment (or PRI) was launched in 2006 with support from the United Nations (UN), which invited large institutional investors, including the California Public Employees' Retirement System (CalPERS), Hermes Pensions Management, and the Norwegian Government Pension Fund. The objective of PRI is to harness the financial weight of institutional investors to address sustainable development goals (SDGs). The PRI is a nonprofit institution and its funding comes from

[5] The U.S. Securities and Exchange Commission (SEC) started to scrutinize how strictly ESG funds adhere to responsible investment practices (Wall Street Journal, 2019) and recently announced enhanced disclosures on ESG (SEC, 2022).

annual membership fees from its signatories. By 2021, the PRI network had grown to be the largest investor initiative worldwide, with close to 4,000 signatories and over US$ 120 trillion of AUM. Signatories include asset owners (e.g., pension funds, sovereign wealth funds, foundations), investment managers (e.g. fund companies and advisers) and service providers. Since service providers do not manage assets, these are excluded from the analysis in this paper.

The six PRI principles are as follows:

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

By signing the principles, investors publicly commit to their adoption. The signatory status comes with two mandatory requirements. First, all signatories need to pay an annual membership fee. Second, PRI signatory investors commit to publicly report on their responsible investment considerations and decision-making on a yearly basis (principle #6 above). PRI has started delisting signatories for not meeting the minimum requirements in 2020 but there are other forms of enforcement (PRI, 2020). In particular, PRI reports are increasingly posted voluntarily on investor websites and also provided by investment managers as signals of their ESG credentials when they compete for requests for proposals on investment mandates (as well as in subsequent reporting).

We match the PRI signatory data to global institutional equity holdings obtained from FactSet Ownership – see Ferreira and Matos (2008) for details on this data. The sample period starts in 2003 (three years before the PRI was formed) and ends in 2017, covering the set of institutions domiciled in countries that are part of the MSCI All Country World Index. We use portfolio data at the end of each calendar year. Our final sample consists of 684 signatories that completed the PRI survey modules related to listed equities and whose disclosed equity holdings are available on FactSet Ownership. Table IA1 of the Internet Appendix describes in detail how we match PRI signatory data to the institutional equity holdings data.

Figure 1 shows the growth of the PRI initiative both in terms of the number of PRI signatory institutions (Panel A) and the increasing importance of PRI signatory holdings in stock markets worldwide (Panel B). PRI signatories' equity holdings grew from US$ 0.7 trillion in 2006 to US$ 18 trillion by 2017. This means that, at the end of our sample, PRI institutions represented more than half of the total institutional investor equity holdings of US$ 32 trillion and illustrates the importance of institutional capital that purports to follow ESG principles.[6] Panels C and D of Figure 1 display the PRI expansion for US and non-US investors separately. At the end of 2017, the PRI AUM share was still substantially larger outside of the United States.

Panel A of Table 1 shows additional statistics on PRI signatories. While early signatories tended to be based in Europe, the percentage of North American signatories gradually rose and the share of PRI signatories from Asia-Pacific and remaining countries in the MSCI All Country World Index was relatively stable at around 20%. Also of note is that the percentage of investment managers increased over time, while asset owners accounted for a larger proportion of the early cohort of signatories.[7] Finally, the number of small AUM signatories increased over time, which might reflect the fact that being part of PRI became a de facto requirement to obtain investment mandates from many clients. For reference, we provide a list of the largest institutional investors by portfolio AUM for each region and their PRI signing date in Table IA3 of the Internet Appendix. By the end of 2017, all of the top-10 global institutional investors had joined the PRI (including Vanguard, BlackRock, NBIM, UBS, and Nomura).

Panel B of Table 1 complements the univariate evidence on the characteristics of PRI versus non-PRI signatories with estimated Probit regressions. Column (1) shows that the probability of joining the PRI is higher when an institution is an asset owner, is larger in terms of total equity holdings, and is domiciled outside of North America. Column (2) looks at data from the world values survey obtained

[6] These figures are calculated based on equity holdings for which ESG scores are available. The $32 trillion in institutional holdings represents over 40% of the world market capitalization and it is similar to the level of institutional ownership estimated in the OECD (2019) study on the ownership structure of the world's listed companies.

[7] Note that for an asset owner to be covered by FactSet Ownership, the institution needs to have considerable direct equity holdings. Asset owners that outsource the management of their equity investments do not show up in our sample as a separate institution, as their assets will be part of their respective investment managers' portfolio filings.

from Dyck et al. (2019) providing evidence that institutions domiciled in countries with stronger E&S values are also more likely to sign the PRI.

2.2 PRI Survey Data

Our research also makes use of the novel survey from the PRI reporting framework which is key to enable signatory transparency. These reports are showcased by many signatory institutions in their corporate sustainability websites and commonly submitted in response to request for proposals for investment mandates to demonstrate an institution's ESG efforts to their end investors.[8] This data allows us to distinguish PRI signatories according to their reported ESG incorporation strategies. The survey is non-anonymous and we are able to observe investor names and responses to a questionnaire for each signatory and reporting year.[9] While the PRI was founded in 2006, signatory reporting data only starts in 2014 and extends to 2018. Overall, the five years of PRI reports available to us contain 5,326 signatory-year observations by 1,549 unique PRI signatory identifiers.

Figure 2 shows the reported ESG incorporation strategies of PRI signatories.[10] It provides the average percentage of signatories' AUM that is covered by screening, thematic, or integration strategies, following a taxonomy of ESG strategies commonly used in academia and industry (e.g., Amel-Zadeh and Serafeim, 2018; CFA Institute, 2015; and GSIA, 2018). In Panel A, we find that PRI signatories apply, on average, ESG integration strategies to two-thirds of their equity AUM. Integration strategies consist of inclusion of ESG factors into financial analysis by institutional investors. Signatories further apply screening strategies to close to half of their equity AUM. Screening consists of either including

[8] The PRI reports are used frequently by institutions around the world to communicate their responsible investment activities. For example, Blackrock features it prominently as part of their sustainability credentials – see awards https://www.blackrock.com/corporate/literature/publication/blk-awards-and-recognition-web.pdf and transparency reports https://www.blackrock.com/corporate/sustainability/pri-report. In addition, anyone can freely access the reports on the PRI website (e.g., for Blackrock https://www.unpri.org/signatory-directory/blackrock/948.article which is also made available by the firm on https://www.blackrock.com/corporate/sustainability/pri-report).

[9] PRI has put processes in place to ensure the verifiability of the reports. A central element of this is to make a majority of the responses accessible to the public. For example, these 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 runs validation checks to detect inconsistencies. Third-party audit and/or assurance of the PRI reports are not mandatory but encouraged.

[10] This is obtained from LEI 01.1 question of the PRI survey. See Figure IA2 in the Internet Appendix for more details on the survey question. The approaches (screening, thematic and integration) are not mutually exclusive and many institutions report implementing multiple ESG strategies simultaneously.

or excluding stocks based on their ESG performance relative to industry peers or other criteria such as international norms and standards. Finally, only around 10% of PRI's equity assets are managed according to thematic strategies that target investments in areas specifically related to sustainability (e.g., clean energy). These strategies are not mutually exclusive: most PRI signatories' equity AUM are covered by multiple strategies (e.g., integration plus screening). The panel also illustrates that the reported usage of the three ESG incorporation strategies increases over the sample years.

Given that the defining principle #1 of PRI is the commitment by signatories to incorporate ESG issues into their investment decisions (see Section 2.1 above), we study the heterogeneity among PRI signatories in achieving this stated goal. We focus our analysis on the share of equity assets to which institutions report that they apply any form of ESG incorporation strategy as a proxy for their level of commitment to responsible investing. We do not attempt to separate the individual ESG strategies as they are typically combined in practice. We classify signatories into three different groups: (1) *PRI: Full ESG incorporation* representing signatories that report applying any form of ESG incorporation strategy to 100% of their equity holdings; (2) *PRI: Partial ESG incorporation* for those that report applying ESG strategies to less than 100% of their equity holdings; and (3) *PRI: No reported ESG incorporation* for the subset that do not apply ESG strategies to their equity holdings or do not report these figures. Panel B of Figure 2 illustrates that investors who state to incorporate ESG issues fully use all of the three ESG strategies to a higher degree both in the U.S. and in the rest of the World than investors who report partial or no integration. Table 2 shows other survey indicators (engagement with portfolio companies plus organizational resources dedicated to ESG) which confirm that our classification of PRI signatories is a good proxy for an institutions' overall ESG investment effort. We discuss these and other descriptive statistics regarding the survey data in more detail in Appendix A.

3. How Do Responsible Investing Commitments Map to Portfolio ESG Outcomes?

3.1 Portfolio ESG Scores

One challenge in examining how the adherence to the PRI principles maps into portfolio ESG outcomes is the lack of a universally accepted definition of sustainability. Prior literature has shown that ESG ratings of companies can diverge from one another (Gibson Brandon, Krueger, and Schmidt, 2021; Berg,

Koelbel, and Rigobon, 2022). We overcome this challenge by calculating a portfolio-level sustainability score for each institutional investor based on the market consensus of three leading ESG rating providers: Thomson Reuters' ASSET4 (now Refinitiv ESG); MSCI IVA; and Sustainalytics (now part of Morningstar). We expect average ESG ratings to provide a better measure of corporate sustainability, similar to the notion that the consensus of equity analyst forecasts is a better predictor of future firm earnings than a forecast by an individual analyst. Taking the consensus of multiple ESG scores should also mitigate biases (e.g., selective company disclosures, methodological differences across rating agencies). Another reason for using multiple ESG scores is that different investors might use different data to implement their strategies, and by using the consensus we are more likely to capture this. Though we use ESG consensus ratings in our main tests, we corroborate our main results using individual ESG ratings (see Internet Appendix Table IA10).

We calculate the portfolio ESG score for each investor in two steps. First, we calculate the consensus as the equal-weighted average of the standardized scores from the three ESG data providers for each individual company:

$$ESG\ Score_{it} = \frac{1_{A4,it} \times z_t(ASSET4_{it}) + 1_{MSCI,it} \times z_t(MSCI_{it}) + 1_{SUST,it} \times z_t(SUST_{it})}{1_{ASSET4,it} + 1_{MSCI,it} + 1_{SUST,it}}$$

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. Given the different rating scales of each data provider, we Z-score normalize the ESG scores in each year to have a mean of zero and a standard deviation of one; we denote these as $z_t(Score)$. Due to the growing data coverage over our sample period, we take the average of the ESG scores that are available if there is no full coverage by all rating providers for a given stock in a given year, reflected in the formula above by multiplying the Z-scored scores with the respective indicator variables $1_{k,it}$.

Second, we follow Gibson Brandon, Krueger, and Mitali (2021) and compute the portfolio ESG score using the weights of the individual stock holdings in the investors' portfolios:

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

where *Portfolio ESG score* denotes one of the following sustainability scores: *Total ESG score*, *Environmental score*, *Social score*, or *Governance score*. The variable $w_{i,j,t}$ denotes the value-weight of stock *i* in investor *j*'s portfolio at the end of year *t*. $ESG\ Score_{i,t}$ is the normalized sustainability score of stock *i* at the end of year *t* as defined above. $N_{j,t}$ is the total number of stocks investor *j* holds at the end of year *t* for which stock-level scores are available. The *Portfolio ESG score* variable quantifies the equity portfolio-level sustainability of institutional investor *j* at the end of year *t*. Note that the measure is scaled in a way that higher values correspond to better adherence to sustainability principles at the equity portfolio level.

This aggregate measure of portfolio sustainability is our main variable to capture the effect of the actions taken by institutional investors to incorporate ESG considerations. It is reasonable to assume that more committed institutions will, on average, have better portfolio scores. This is similar in spirit to mutual fund ESG ratings (for instance, the Morningstar Globe ratings) that, at least partially, rank the sustainability of a fund by the average ESG profile of the securities held in their portfolios (used in Hartzmark and Sussman, 2019 among others). However, in our subsequent analysis, we also conduct robustness checks using other ESG portfolio outcomes, such as the percentage of equities allocated to stocks with the highest or lowest ESG ratings or, alternatively, the portfolio allocation to stocks operating in the sin and fossil fuel industries that are considered more controversial from an ESG perspective (Hong and Kacperczyk, 2009; Bolton and Kacperczyk, 2021).

3.2 Do PRI Signatories Exhibit Better Portfolio ESG Scores?

Table 3 estimates pooled OLS regressions, in which we compare the portfolio ESG scores of PRI signatories to non-PRI signatories controlling for other portfolio attributes (e.g., AUM, turnover, number of stocks, etc.) as well as other institution characteristics (e.g., region or investor type) and year fixed effects. The main variable of interest is the *PRI dummy*, which takes the value of one if an investor is a

PRI signatory in a given year and zero otherwise. Standard errors are double clustered at the institution- and year-level.

In Panel A of Table 3, we find that PRI signatories have significantly better *Total ESG scores*, *Social scores*, and *Governance scores* but not better *Environmental scores*.[11] A *PRI dummy* coefficient of 0.06 implies that the portfolio ESG scores of PRI signatories is about 12% of a standard deviation higher than the portfolio ESG scores of non-signatories (0.06/0.49). We report the relevant descriptive statistics for the main variables in Internet Appendix Table IA6. As explained above, these results control for several portfolio characteristics.

We further examine whether institutions improve their portfolio ESG scores after becoming PRI signatories. Panel A of Table 4 runs difference-in-difference regressions, in which we match each PRI signatory to one non-PRI institution using a two-step algorithm. We first match strictly on region and institution type, and then we match on propensity scores using a nearest-neighbors match. We calculate the propensity scores by regressing the PRI dummy on portfolio size, region, and institution type.

We estimate the PRI signing effect on portfolio ESG scores measured in the years [−3; +3] around the signature dates. These regressions include year, region and type fixed effects as well as controls for portfolio characteristics. Panel A of Table 4 shows that, on average, PRI signatories significantly improve their *Total ESG* and *Social scores* in the years after joining the PRI (compared to the non-PRI control institutions). We find that *Total ESG scores* improve by about 9% (0.04/0.48) of a standard deviation upon being signatory. Environmental and governance scores (columns 2 and 4) are unchanged.

We next investigate whether there are differences in the portfolio ESG scores between PRI signatories based in the U.S. and other regions given that motives to sign the PRI, regulatory environments, and the maturity of responsible investment markets could differ around the world. This

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

sub-sample analysis for the U.S. is motivated by the fact that US signatories tend to be late PRI joiners who might perceive the PRI label as an emerging commercial trend they need to adopt in order to grow their business. Furthermore, there is an ongoing regulatory debate in the U.S. on whether ESG concerns conflict with the fiduciary duties of institutional investors.[12] This question is more settled in other countries (e.g., member countries of the European Union or the UK), where ESG investing has become fairly mainstream over the last decades.

We test possible cross-country differences by comparing the portfolio ESG scores of PRI signatories to non-PRI institutions for the subsamples of US and non-US institutional investors separately. In Panel B of Table 3, we find that US-based PRI signatories tend to exhibit at best similar, if not, worse ESG scores than US non-signatory institutions. In line with this, in Panel B of Table 4, we also find no evidence that US-based institutions improve their portfolio ESG scores after signing the PRI relative to non-PRI institutions. In contrast, Panels C of Tables 3 and 4 show that, outside the U.S., PRI signatories not only have significantly better portfolio ESG scores than non-PRI institutions, but they also in fact improve these scores after joining the initiative. We obtain qualitatively similar results in full sample regressions when we use interactions between the PRI dummy and a variable indicating if the institution is domiciled in the U.S.

In terms of economics significance, we estimate slightly larger coefficients for the non-US subsample (Panels C in Tables 3 and 4) relative to the full sample analysis (Panel A of the respective tables). For instance, we find about 13% of a standard deviation higher ESG scores for non-US PRI signatories (0.07/0.54) relative to non-US investors who do not sign the principles. We think of this effect as being sizeable enough to be relevant for an asset allocator. When looking at the signing effects in Table 4, we find that scores improve by about 14% of a standard deviation outside of the US upon being signatory, suggesting that the "commitment" of being a signatory is credible.[13]

[12] There has regulatory back-and-forth recently by the DOL on the ERISA fiduciary standards to ESG depending on the Democratic vs. Republican administrations in power (see, Reuters, 2021). In addition, the SEC chair had also emphasized that investment advisers cannot put any interests, including ESG factors, ahead of the financial interests of their clients (Clayton, 2018) but this has also changed again recently with the new SEC chair appointment (SEC, 2021).

[13] The effect sizes are estimated by using descriptive statistics of the relevant estimation sample (see Internet Appendix Tables IA6 and IA7) alongside the relevant coefficient estimates from Tables 3 and 4.

Throughout the paper, we choose to report economic significance in terms of standard deviations. Were we to report economic magnitudes relative to the mean, we would obtain larger effect sizes, e.g., 41 % (0.07/0.17) better portfolio ESG scores for non-US PRI signatories relative to their non-signatory peers. We prefer using the more conservative estimates of economic magnitudes based on standard deviations. In addition, recent methodological papers highlight problems when stating economic significance in terms of means (see Mitton 2022), in particular when the dependent variable has been adjusted by additive transformations (as in our case through the Z-scoring of the raw ESG scores).

We conduct several robustness checks. First, to address concerns about methodological differences in ESG ratings, we test and find qualitatively similar results in regressions using each of the ESG scores from the three ESG rating providers separately instead of the average ESG scores (see Table IA10 of the Internet Appendix). Second, in unreported tests, we find consistent results when we calculate the portfolio ESG scores of US investors based on only their holdings of US listed companies, alleviating concerns that the results might be due to home bias in US investor holdings and lower ESG performance of US stocks compared to, for example, European stocks. Third, unreported tests also show that the results are robust to excluding the Big 3 (Blackrock, Vanguard and State Street), which are US-based and could be different given their larger AUM size and indexed investment styles.

We conclude that there is evidence that PRI signatory institutions have better portfolio ESG scores but only when they are domiciled *outside* the U.S. which is consistent with non-US institutions adhering to Principle 1 of the PRI more diligently. In the U.S., however, our results suggest that some institutions may be following the ESG trend without a thorough adoption of the sustainability criteria into their investment decisions.

3.3 Do Portfolio ESG Scores Depend on an Institution's Level of Reported ESG Incorporation?

The above analysis shows important regional differences between US and non-US PRI signatories. Given that US institutional investors joined the PRI in more recent years, these institutions could be lagging in terms of implementing their responsible investing principles. We now use the annual PRI

survey data to explore if the reported level of ESG incorporation by an institutional investor in fact translates into detectable differences in portfolio ESG scores. The survey is a key PRI mechanism to enable signatory transparency on their efforts, which is often used by end investors and other stakeholders to assess an institution's ESG credentials.

In Table 5, we regress portfolio ESG scores on dummy variables indicating the three sub-groups of PRI signatories by level of reported ESG incorporation (as described in Section 2.2). Panel A shows that PRI signatories that report full ESG incorporation have significantly better portfolio ESG scores than non-PRI institutions but this is not the case for PRI signatories that state to do so only partially or not at all. In Panels B and C of Table 5, we again split the sample into US and non-US based investors. We find that *PRI: Full ESG incorporation* signatories (and to some extent also those in the *PRI: Partial ESG incorporation* group) have better portfolio ESG scores only when the signatories are based outside the US. Somewhat concerning, US PRI signatories that report no ESG incorporation have significantly *worse* scores than US institutions that do not sign the PRI, a result that is primarily driven by worse *Environmental scores*. The magnitude of the effect is a sizeable -26% of a standard deviation lower portfolio ESG score, which is the largest documented effect in our analysis (in absolute terms). The large negative estimate on *PRI: No reported ESG incorporation* in the US sample suggests that these signatories do not follow through on their public ESG commitments and that greenwashing among these investors is a serious concern.[14]

One concern with our baseline tests is that perhaps the portfolio ESG scores might not capture more specialized ESG strategies employed by PRI signatories. For example, some longstanding strategies used by US socially responsible funds involve excluding stocks with worse ESG characteristics or filtering out certain industries for ethical reasons. To address this issue, we examine alternative portfolio-level ESG outcomes in Table 6. We first consider *Top-bottom ESG stocks*, *Top ESG stocks* and *Bottom ESG stocks* which we define as the percentage of AUM invested in stocks with

[14] In Table IA5 of the Internet Appendix, we further break-down *PRI: Full ESG incorporation* signatories based on their reported usage of screening and integration strategies. We observe that no US-based PRI signatories (not even those that report that they apply 100% screening and 100% integration) have significantly better portfolio scores than non-PRI institutions. Outside of the U.S., we find better scores only for signatories that report applying 100% screening but not for signatories that focus on integration or that apply a mix of the two strategies.

a normalized ESG score in the top or bottom deciles. We study the highest and lowest deciles to get additional insights into whether PRI signatories overweight top-rated stocks (representing positive screening) and/or underweight bottom-rated stocks (negative screening) when they implement ESG factors. A second alternative measure we use is *Sin and fossil fuel stocks* which consists of the percentage of assets invested in sin (alcohol, tobacco and gambling) and fossil fuel (oil and gas) industries. The results in Table 6 are consistent with the tests using these variants of the portfolio ESG scores as the dependent variable. The *PRI: Full ESG incorporation* signatories overweight top-performing ESG stocks, underweight bottom ESG stocks, and hold less sin and fossil fuel stocks, but these findings hold only among PRI signatories that are based outside the U.S. (see Panel B). Among US signatories, only the *PRI: Full ESG incorporation* group have a significantly lower investment in sin and fossil fuel stocks (see column 5, Panel A). However, the groups reporting partial or no ESG incorporation exhibit largely similar ESG portfolio outcomes than non-PRI institutions. When we look at US-domiciled *PRI: No reported ESG incorporation*, we find, as in Table 5, worse average ESG scores but no significant differences in the other ESG portfolio outcome dimensions.

Another concern is that US PRI signatories may not target high-ESG-rated stocks but rather invest in low-ESG stocks and aim to improve their investee firms' ESG performance via shareholder engagement. We again make use of the PRI survey data but conclude that it is unlikely to be the case. First, the PRI survey data reveals that US PRI signatories report lower levels of shareholder engagement compared to their signatory peers from the rest of the world. Panel B of Table 2 shows that 78% of the US PRI signatories report that they use engagement strategies, compared to 89% of the non-US PRI signatories. Secondly, in Panel B of Table 7, we find no evidence that those US PRI institutions reporting that they engage with their portfolio firms on ESG issues exhibit better total ESG scores in the three years (t+1, t+2, t+3) subsequent to the reported engagement. These findings suggest that it is unlikely that US investors prioritize engagement over incorporation. In contrast, Panel C of Table 7 shows that the *PRI: Engagement* group is successful outside the U.S. There is still the possibility that either US investors need more than three years to engage successfully or are just *unsuccessful* in their engagement approaches. In any case, we conclude that US institutions seem to fail to live up to PRI principle 2 which

states that signatories "*will be active owners and incorporate ESG issues into their ownership policies and practices.*"

The overall takeaway is that there is a disconnect between words and actions among US institutional investors who sign the PRI. US-domiciled PRI signatories that report full or partial ESG incorporation do not have significantly better ESG portfolio outcomes compared to non-signatory institutions (except perhaps for some US signatories investing less in sin and fossil fuel stocks). More concerning, we identified that the group of US PRI signatories that report no ESG incorporation efforts in fact exhibit significantly worse portfolio ESG scores than non-PRI investors. Hence, our analysis points to potential greenwashing by some US institutions that sign the PRI without following through on their public commitments to responsible investment in their equity portfolios.

4. What are the Characteristics of US PRI Signatories That Fail to Live Up to the Principles?

We now take a closer look at the characteristics of US-domiciled institutions that sign the PRI but do not implement ESG considerations (the *PRI: No reported ESG incorporation* group), ultimately exhibiting worse portfolio ESG scores than their non-PRI peers. Further studying the institutions in this group is important because this subset of US PRI signatories might be preventing their clients from reaching their investments' sustainability goals.

We first test if US PRI signatories that do not report that they incorporate ESG might be tempted to skip ESG implementation and the associated costs if they have underperformed their peers and face more pressure to offset their declining assets under management. Column (1) of Table 8 breaks-down the group of *PRI: No reported ESG incorporation* signatories if these are above and below the median portfolio buy-and-hold return performance among all US institutional investors in the prior year. We measure an investor's performance by its one factor holdings-based alpha as described in Appendix B. We observe that PRI signatories that report no ESG incorporation exhibit significantly worse total ESG scores only when they had below-median portfolio performance. The relation between past underperformance and greenwashing (as measured by having low portfolio ESG scores and being in the *PRI: No reported ESG incorporation group)* suggests that institutions might use the PRI label to

countervail their subpar investment performance, while not deploying resources towards implementing ESG practices.

Another potential characteristic of the non-reporting PRI investors might be agency issues between investment managers and their clients or conflicts with other stakeholders. We explore this prediction with two cross-sectional tests. First, we conjecture that greenwashing is likely to be more pronounced when institutions face less scrutiny, for instance, when they serve the retail segment as opposed to institutional clients, which are more sophisticated and can monitor investment managers more effectively. We classify investment managers as institutional-serving based on their inclusion in eVestment, which is a database used extensively by investment consultants and institutional clients (Jenkinson, Jones, Martinez 2016). Second, we test if there is greenwashing among investment management companies that are themselves involved in conflicts with their own stakeholders (e.g., employees, communities, or regulators). We measure these conflicts by the investment company's own history of negative ESG incidents. Note that this measure is different from the total ESG scores because it is not based on portfolio holdings of the institution, but rather reflects the ESG compliance of the operations of the investment company itself (e.g., poor employment conditions, anti-competitive practices, regulatory violations). For this purpose, we obtain ESG incident data from RepRisk, which covers both private and publicly listed investment companies around the world and has been used in Glossner (2021), He, Kahraman and Lowry (2021), Derrien et al. (2022), and Gantchev, Giannetti and Li (2022), among other papers. Consistent with our two predictions on agency issues, Columns (2) and (3) of Table 8 show that *PRI: No reported ESG incorporation* signatories have worse total ESG scores when institutions predominately serve retail clients and experience more negative ESG incidents (higher operational ESG risks) in-house. Both findings indicate that when US signatories face less scrutiny from their clients or do not treat their own stakeholders responsibly, they also fail to implement ESG strategies in their client portfolios, which is consistent with greenwashing.

Our last cross-sectional test explores the role of an institutional investor's general commitment to the PRI initiative. We conjecture that non-reporting investors who are late joiners of the PRI are more likely to be opportunists who are trying to benefit from the ESG trend. We define a late joiner as an

investor who joined in the second half of the sample period (2013 or later). In column (4) of Table 8, we find that the group of *PRI: No reported ESG incorporation* tend to exhibit worse total ESG scores when the signatories joined the PRI late.

Taken together, these results suggest that the worse portfolio ESG scores are more pervasive among non-reporting US PRI signatories that face higher misalignment between the managers and their clients or other stakeholders. While the investor dimensions studied in Table 8 seem to all play a role in contributing to their greenwashing behavior, we caution here that these characteristics may interact and are not mutually exclusive.

5. Potential Explanations for the Differences Between US and Non-US PRI Signatories

In this section, we evaluate three non-mutually exclusive channels that can help explain why PRI signatory status is *not* a good proxy for committed responsible investors in the US market. Specifically, we focus on (1) stronger commercial reasons to opportunistically sign the PRI in the U.S., (2) regulatory clarity about the compatibility of responsible investing with investors' fiduciary duties outside of the U.S., and (3) higher ESG market maturity outside of the U.S.

5.1 Commercial Reasons

We first explore whether US institutions have stronger commercial incentives to greenwash compared to institutional investors based elsewhere. US investment managers may experience commercial benefits from PRI membership that come in the form of fund inflows. If these commercial benefits are higher in the U.S. than elsewhere, this may explain why more U.S. institutions opportunistically sign the PRI without actually implementing ESG principles.

The benefits of ESG/SRI labels that come in the form of investor flows have been documented in the asset management industry. For instance, Morningstar (2019) shows record annual US net flows to sustainable mutual funds (standing in stark contrast with the outflows in actively managed funds). Bialkowski and Starks (2016), Hartzmark and Sussman (2019), and Ceccarelli, Ramelli and Wagner (2021) document similar patterns. ESG fund flows have also been shown to be less volatile and less sensitive to past negative returns (Renneboog, Ter Horst and Zhang, 2011). Since most investment

management fees in the U.S. are a fixed percentage of assets, institutions are incentivized to increase their AUM through fund inflows.

U.S. institutions may greenwash if end investors regard PRI membership as a form of ESG certification but are unable to distinguish PRI signatories in terms of their actual commitment to incorporate ESG into their investment processes (i.e., there is a pooling equilibrium). At the same time, the PRI signatory fees are low and there is little formal enforcement by PRI of minimum ESG standards. The latter is evidenced, for instance, by the fact that no investors were kicked out of the PRI during our sample period (only in 2020, the PRI delisted five signatories for not meeting minimum ESG practices).[15] This may give the opportunity for US institutions to greenwash and not implement ESG in order to not incur organizational costs (e.g., from hiring or training ESG staff, buying and analyzing ESG data, etc.). While we cannot exactly quantify the magnitude of these costs, we believe that they are non-negligible. For instance, in a survey of investment organizations, Amel Zadeh and Serafeim (2018) find that about 40 percent of the respondents state that the cost of gathering and analyzing ESG information is one of the reasons for them to not incorporate ESG in their investment decisions.

In Table 9, we present evidence of the commercial benefits from PRI membership being higher in the U.S. compared to other parts of the world. Specifically, we study investor flows imputed from institutional investors' disclosed portfolio holdings.[16] Column (1) of Panel A shows that US PRI signatories attract significantly higher investor flows of 9% of a standard deviation (=0.09/1.04) than non-PRI institutions also located in the U.S., even after controlling for past returns and flows.[17] In Column (2), we find that both signatories that fully incorporate ESG and even those with no reported ESG incorporation receive significantly higher flows. In fact, the group of US PRI signatories who do not incorporate ESG issues receive the highest flows, suggesting that clients are unable to distinguish

[15] PRI, "Signatories delisted for not meeting the minimum requirements" (27 September 2020) https://www.unpri.org/reporting-and-assessment/signatories-delisted-for-not-meeting-the-minimum-requirements/6480.article

[16] We first calculate quarterly flows as the change in total equity assets scaled by total equity assets of the previous quarter-end and adjusting it for stock returns during the quarter. We then compute the total annual flows as the cumulative quarterly flows that an institution experienced over the year.

[17] Kim and Yoon (2021) and Humphrey and Li (2021) also show that investor flows to US equity mutual funds react positively to fund companies that sign the PRI.

between PRI signatories in terms of their ESG commitment. Outside of the US market, we find that the situation is different and investor flows are not related to PRI membership: Column (1) of Panel B shows an insignificant coefficient for the PRI dummy. When we break down non-US PRI investors by their level of reported ESG incorporation in Column (2), we observe that signatories that are fully committed to ESG are subject to lower asset growth than their regional non-signatory peers. The absence of positive flows could be due to sustainable investing being more mature outside the U.S., a possibility that we explore later in this section.[18]

Given that non-US signatories implement responsible investing more thoroughly as evidenced by higher portfolio scores (as shown in the main tests in Tables 2, 3 and 4), but do not receiver higher flows, these results suggest that commercial incentives are less important for non-US investors implementing responsible investing. Our evidence is consistent with prior survey evidence suggesting that outside of the U.S., ethical motives play a larger role in investors' use of ESG information in investment decisions (see Amel-Zadeh and Serafeim, 2018).

To further explore whether commercial motives drive differences in portfolio ESG scores around the world, we investigate how past portfolio performance is related to signing the PRI. Our conjecture is that U.S. institutions that have done poorly in the past should be more likely to join the PRI, perhaps in order to offset the outflows stemming from their poor performance. In Panel A of Table 10, we find that investors with worse pre-signing performance are more likely to sign the PRI in the U.S. sample. According to the estimates of Table 10 and sample descriptive statistics from Table IA6 of the Internet Appendix, in column (1), a standard deviation lower mean return (0.02) is associated with a 12 percentage points (=-5.99*0.02*100) higher probability of signing the PRI when the investor is based in the U.S. In column (2), we find similar results using past alpha. In the rest of the world, however, neither past returns (column 3) nor past alpha (column 4) are related to an institution signing

[18] Sustainable investing may have reached maturity in some non-US markets. For example, the GSIA (2020) survey suggests that sustainable investment assets have been shrinking in the EU due to the stricter standards of sustainable investment that have become embedded into legislation as part of the European Sustainable Finance Action Plan.

the PRI. This suggests that US institutions are more likely to sign opportunistically the PRI for commercial reasons than investors from other areas of the world.

5.2 Uncertainty About Whether ESG is Compatible with Fiduciary Duties

A second possible explanation for why US PRI signatories do not fully implement ESG investing could be the concern that considering ESG factors may be inconsistent with their fiduciary duties. For instance, the U.S. Department of Labor, which regulates private sector pension plans, has provided conflicting ESG guidance to plan fiduciaries depending on the political party in power.[19] Hence, regulatory uncertainty may be holding back US PRI signatories from fully implementing ESG. By the same token, non-US PRI signatories may implement ESG because there is more regulatory clarity on whether investors can incorporate ESG issues in their investment decisions.

To examine the role of increased legal clarity regarding the compatibility of ESG with fiduciary duties, we study the effects of the UK Law Commission clarifying that considering ESG factors was consistent with investors' fiduciary duties. In response to the 2012 Kay Review of UK Equity Markets and Long-Term Decision Making, the UK government asked the Law Commission in 2013 to examine the fiduciary duties of investment intermediaries. As a result of its project, the Law Commission put forward that trustees may consider ESG factors when making investment decisions. If these ESG factors are financially material, trustees should consider these in their investment decisions.[20]

Relying on a difference-in-difference research design, we test if the UK Law Commission's clarifications reduced greenwashing by PRI signatories in the UK. In Panel B of Table 10, we regress the portfolio ESG scores of UK institutional investors in the years surrounding the project of the UK Law Commission (i.e., 2011-2015) on the interaction between the *PRI dummy* and an indicator *2013*

[19] The U.S. DOL IB 2018-01 restated that fiduciaries "must not too readily treat ESG factors as economically relevant (…) rather, ERISA fiduciaries must always put first the economic interests of the plan in providing retirement benefits". 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 frameworks for ERISA plans.
[20] See the 2013 consultation paper http://www.lawcom.gov.uk/app/uploads/2015/03/cp215_fiduciary_duties.pdf and the 2014 report http://www.lawcom.gov.uk/app/uploads/2015/03/lc350_fiduciary_duties.pdf.

onwards, which marks the years after the legal clarification.[21] We observe that PRI signatories in the UK improved their portfolio ESG scores relative to non-signatories in the UK starting in 2013, suggesting that after regulators reduced the uncertainty about fiduciary compatibility of responsible investing, UK PRI signatories appeared to implement ESG more consistently. In addition, the analysis shows that before the legal clarification, UK PRI signatories had lower ESG portfolio scores, similar to the U.S. results we find for our full sample period.

Despite the limitations of using a single legal shock in a different country, the evidence does lend support to the view that the legal uncertainty in the U.S. about the fiduciary compatibility of ESG integration might be holding back US PRI signatories from implementing ESG more thoroughly. Given the historical common law roots of both the U.K. and U.S., one may extrapolate from this test that, to curb greenwashing, legal clarity on ESG could potentially mitigate greenwashing also in the U.S.

5.3 ESG Market Maturity

The last explanation we explore is related to ESG market maturity. The U.S. witnessed growth in ESG investing only later compared to other parts of the world, where responsible investing has had a longer presence. This is shown, for example, in the GSIA (2018, 2020) surveys or our own evidence from the slower market penetration of PRI in the U.S. (as shown in panel B of Figure 1). One possibility is that with increased market diffusion of ESG standards, market maturity can lead to more pressure for ESG implementation, and ultimately better portfolio ESG scores of PRI signatories. To test this channel, we construct a proxy variable for market maturity consisting of the PRI AUM share in the region in which the investor is located (separately for the US versus non-US markets). We denote the variable as *PRI AUM share*. In Panel C of Table 10, we provide evidence that, as PRI signatories become more important in terms of AUM in a given market, PRI signatories tend to implement ESG more consistently (i.e., the interaction between the *PRI dummy x PRI AUM share* is positive).

[21] Our post-period includes the year 2013 due to the publication of the Law Commission's consultation paper in 2013. In Table IA11 of the Internet Appendix, we show that the results are qualitatively similar when we exclude 2013 and define the years 2011-12 as the pre-period and the years 2014-15 as the post-period.

Overall, while we are not able to pinpoint one single dominant explanation for why there is an ESG portfolio incorporation gap between US versus non-US PRI signatories, we provide evidence that a mix of the three explanations described above is at play. A more recent phenomenon is tighter regulatory scrutiny on ESG labels. For example, ESG regulations such as the EU Sustainable Finance Disclosures Regulation (SFDR) and alignment with EU Taxonomy are starting to come into effect.[22] In a similar spirit, the SEC has only very recently unveiled rules to ensure ESG funds follow through on ESG claims (SEC, 2022). However, given that all these events occur after our sample period ends, we leave the recent higher regulatory scrutiny as an interesting empirical explanation for cross-country differences to be explored in future papers.

6. Conclusions

We analyze how responsible investment principles map into ESG portfolio outcomes by studying the PRI, the largest (and UN-supported) global network focused on responsible investment. We compare what institutional investors report doing in terms of ESG incorporation with their portfolio ESG scores to answer which responsible investors in fact invest responsibly.

We document that PRI signatories who report that they fully or partially incorporate ESG into their active equity holdings have better portfolio ESG scores than non-PRI signatories – but this holds only for institutions domiciled outside of the U.S. In the U.S., we observe a substantial disconnect between what institutional investors claim to do in terms of ESG and what they really do. We do not find better portfolio ESG scores for US PRI signatories, not even for those that report full ESG incorporation. US PRI signatories that report no ESG incorporation in fact have, on average, *worse* scores than non-PRI investors, which is consistent with greenwashing. The difference in findings between the US and non-US PRI signatories appear to be driven by a mix of (1) commercial incentives to become a PRI signatory being higher in the US than elsewhere, (2) more regulatory uncertainty in the U.S. as to whether ESG investing is consistent with institutions' fiduciary duties, and (3) less ESG

[22] SFDR is part of the European green deal and is scheduled to apply from January 2023 (see https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance/sustainability-related-disclosure-financial-services-sector_en).

market maturity in the U.S. and hence less pressure for ESG implementation. Overall, our results highlight that—at least in the U.S.—end investors need to look beyond the PRI label alone when evaluating investment managers on their sustainability credentials and the true alignment between their responsible investing commitments and actions.

This paper leaves open many questions for future research. Given that we show that some US PRI signatories do not allocate capital responsibly one may wonder about the ability of responsible investing to drive change in corporate ESG practices. More research is needed to better understand why some US PRI signatories engage in greenwashing whereas this phenomenon is not visible in other parts of the world. One avenue that we believe is particularly fruitful for future research is to study the role of the emerging ESG related market regulations. In addition, our sample period is relatively short given the recent history of the PRI initiative and the cross-section of our portfolio analysis is limited to publicly listed equities. Other asset classes, such as private equity, fixed income or real estate investments are also worthy of investigation, but the empirical challenge is that for those assets there is less portfolio-level information. It remains to be seen to what extent responsible investing reduces the cost of capital or acts as a price-feedback-mechanism to encourage companies to make the world more sustainable and ultimately contributes to attaining sustainability objectives such as those outlined in the UN Sustainable Development Goals.

Data Availability

The data underlying this article were provided by FactSet (institutional ownership data), PRI (PRI signatory and survey data), MSCI (IVA ESG ratings), Sustainalytics (Sustainalytics ESG ratings), Thomson Reuters (Asset 4 ESG ratings), eVestment (eVestment database inclusion indicator), RepRisk (ESG incident data), Datastream (stock returns) under license. The World/European Values Survey data was obtained from Dyck et al. (2019).

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Appendix A: Additional Background on PRI Survey Data

In this appendix, we provide some further background information on the data from the PRI Reporting Framework. Annual reporting takes place between January and March and we interpret responses to account for the previous calendar year, resulting in a sample period from 2013 to 2017 (for example, the final 2018 report in our sample covers activities in 2017). In our analysis, we adjust and standardize reports to align across years, as reporting frameworks were subject to modifications. 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 ESG strategies. We use only answers to questions that are *mandatory to report and to disclose*. The reason is that mandatory indicators are completed by all eligible investors, while the response rates to voluntary indicators can vary widely. The Internet Appendix provides examples of the PRI survey questions used in our analysis (see Figures IA2 to IA8).

Table 2 shows descriptive statistics. Exploring cross-sectional heterogeneity, screening strategies (favoring or excluding stocks based on their ESG performance) are reported more frequently among European signatory institutions, while integration (the inclusion of ESG factors into financial analysis) is most popular among signatories from Asia-Pacific and the rest of the world. Thematic strategies (specific investments related to sustainability) are niche. Furthermore, larger signatories tend to use more integration relative to signatories with less equity AUM. There is an upward time trend in the intensity with which any given ESG strategy is applied over the sample period.

We focus our analysis on the share of equity assets to which institutions apply any form of ESG incorporation strategy as a proxy for their level of commitment to responsible investing. For this purpose, we classify signatories into three different groups: (1) *PRI: Full ESG incorporation*; (2) *PRI: Partial ESG incorporation* representing; and (3) *PRI: No reported ESG incorporation*. Among the top institutions, listed in Table IA3 of the Internet Appendix, Norges Bank Investment Management and Standard Life Aberdeen Plc are examples of *PRI: Full ESG incorporation* signatories. Fidelity and

Korea National Pension Service are classified as *PRI: Partial ESG incorporation* signatories, while Deutsche Bank AG and Janus Henderson Group Plc are *PRI: No reported ESG incorporation*.

The lower section of Panel A of Table 2 shows that the relative proportion of institutions that fully incorporate ESG into their portfolios is higher among non-US signatories (1,596 out of 2,144 investor-years) compared to US signatories (372 out of 651 investor-years). Conversely, the share of signatories not reporting ESG incorporation is higher among US PRI signatories. This is a first indication that US signatories report lower levels of ESG incorporation than signatories based in other regions. Among the *PRI: Full ESG incorporation* group, investors report using integration most frequently (89% and 83% of equity AUM among US and non-US signatories, respectively) followed by screening (54% and 66% of AUM) and with thematic strategies lagging far behind (18% and 14% of AUM). As expected, *PRI: Partial ESG incorporation* apply ESG strategies to a substantially lower share of their AUM, while signatories in the *PRI: No reported ESG incorporation* group report no usage of ESG incorporation strategies at all.

In order to validate whether our PRI signatory classification above is a plausible proxy for an institution's overall ESG investment effort, we examine other survey indicators in the PRI reporting framework. Panel B of Table 2 reports the frequency with which PRI signatories use specific ESG strategies.[23] Perhaps not surprisingly, we first document that signatories that report higher ESG incorporation (in terms of equity AUM covered) also report a higher frequency in usage of specific strategies. Second, a higher intensity of ESG incorporation strategies in terms of portfolio allocation (screening, integration, and thematic) also correlates with higher reported engagement with their portfolio companies. However, PRI signatories that do not incorporate ESG considerations in portfolio construction (i.e., those in the *PRI: No reported ESG incorporation* group) also engage less with portfolio companies on ESG issues. In fact, more than 50% of these signatories do not report any form of individual or collaborative ESG engagement.

[23] Table IA2 of the Internet Appendix provides variable definitions of the PRI survey These are sourced from questions LEI 04, LEA 02, LEA 16 of the PRI survey. For more details, see Figures IA3 to IA5. We provide overall statistics on the percentage of PRI signatories that use ESG strategies in Panel A of Table IA4.

Panel C of Table 2 looks at the PRI survey module that quantifies the organizational resources that PRI signatories dedicate to ESG issues.[24] We observe that *PRI: Full ESG incorporation* and *PRI: Partial ESG incorporation* have similar organizational structures when it comes to ESG. Almost all of these signatories have a dedicated ESG policy, involve their C-Suite executives and portfolio managers in the ESG process, employ 5-8% dedicated ESG employees (measured as a share of total employees), and are part of about five other responsible initiatives besides the PRI. In contrast, the signatories in the *PRI: No reported ESG incorporation* group are less organizationally focused on ESG. About 20-30% of them report no involvement of the C-suite executives or portfolio managers in ESG issues, ESG staff involvement is also 20-30% lower, and these signatories participate in fewer other sustainability initiatives.

Overall, we conclude that our classification of PRI signatories is a good proxy for how institutions incorporate ESG issues. *PRI: Full ESG incorporation* not only apply ESG to the entirety of their equity allocations, but these signatories also subsequently engage companies on ESG issues and have more organizational resources dedicated to ESG. *PRI: Partial ESG incorporation* commit to ESG for only a fraction of their AUM but still engage companies on ESG issues. The last group – *PRI: No reported ESG incorporation* – reports no ESG investment activity except for some engagement.

[24] This is sourced from questions SG 01, SG 07, SG 09 of the PRI survey. See Figures IA6 to IA8 of the Internet Appendix for more details. Panel B of Table IA4 of the Internet Appendix provides more overall statistics.

Appendix B: Variable definitions

ESG portfolio outcomes
Sources: FactSet Ownership, MSCI IVA, ASSET4, Sustainalytics

Total ESG scores	is the (value-weighted) equity portfolio-level total ESG scores 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 scores	is the portfolio-level environmental scores of an institutional investor.
Social scores	is the portfolio-level social scores of an institutional investor.
Governance scores	is the portfolio-level governance scores of an institutional investor.
Top–bottom ESG stocks	is the percentage of equity assets invested in stocks with a normalized ESG score (based on MSCI IVA, ASSET4, and Sustainalytics) in the best decile minus the percentage of equity assets invested in stocks with an ESG score in the bottom decile.
Top ESG stocks	is the percentage of equity assets invested in stocks with a normalized ESG score in the best decile.
Bottom ESG stocks	is the percentage of equity assets invested in stocks with a normalized ESG score in the worst decile.
Sin and fossil fuel stocks	is the percentage of equity assets invested in sin stocks (Factset industries: alcoholic beverages, tobacco, casinos/gaming) and fossil fuel stocks (Factset industry codes: oil & gas production, integrated oil, oil refining/marketing, coal, contract drilling, oil & gas pipelines).

PRI signatories and country-level ESG variables
Sources: PRI signatory data from 2006 to 2017 and World/European Values Survey

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.
World Values (ES)	is the average World Values E&S index from the World Values Survey and European Values Study for 1999-2010. We obtain the values from Dyck et al. (2019).
PRI AUM share	is the percentage of PRI signatories' AUM among all institutional investors' AUM within the US or non-US and year.

PRI signatories: by level of ESG incorporation and ESG engagement
Sources: PRI surveys from 2013 to 2017

PRI: Full ESG incorporation	is one if a PRI signatory reports that it applies ESG incorporation strategies (i.e., screening, thematic, or integration) to 100% of its equity AUM, and zero if a PRI signatory applies ESG strategies to less than 100% of its 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. See Figure IA2 of the Internet Appendix.
PRI: Partial ESG incorporation	is one if a PRI signatory reports that it applies ESG strategies (i.e., screening, thematic, or integration) to between 1-99% of its equity AUM, and zero if a PRI signatory applies ESG strategies to 100% or 0% of its 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. See Figure IA2 of the Internet Appendix.

PRI: No reported ESG incorporation	is one if a PRI signatory reports that it applies ESG strategies (i.e., screening, thematic, or integration) to 0% of its equity AUM or does not report this number, and zero if a PRI signatory applies ESG strategies to more than 0% of its 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. See Figure IA2 of the Internet Appendix.
PRI: Engagement	is one if a PRI signatory reports that it engages companies on ESG issues (through either collaborative engagement, individual engagement, or internal voting), and zero if a PRI signatory reports that it does not engage companies or if an investor is not a PRI signatory. We take the engagement strategies in LEA 02.1 and LEA 16.1 of the PRI survey. See Table IA2 for more detailed definitions of the three engagement strategies.
PRI: No engagement	is one if a PRI signatory reports that it does not engage companies on ESG issues, and zero if a PRI signatory reports that it engages companies (through either collaborative engagement, individual engagement, or internal voting) or if an investor is not a PRI signatory. We take the engagement strategies in LEA 02.1 and LEA 16.1 of the PRI survey. See Table IA2 for more detailed definitions of the three engagement strategies.

PRI signatories: break-downs by investor characteristics

Sources: PRI surveys from 2013 to 2017, eVestment, and RepRisk

A: Low or B: high past performance	is low if an investor had a below-median 1-factor alpha of the holdings-based returns in the past year, and low if the alpha was above the median. 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. We use AQR's global equity market factors to calculate the alpha.
A: Institutional or B: retail clients	is institutional if an investor is covered by the eVestment database, and retail if the investor is not in eVestment.
A: Low or B: high operational ESG risks	is high if an investor has an above-median ESG incident rate in her own investment company in a given year, and zero if the incident rate is below the median. We proxy the ESG incident rate of an investor based on 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.
A: Early or B: late joiner	is early if an investor committed to the PRI before 2013, and late if an investor joined the PRI in 2013 or later.

Portfolio characteristics

Sources: FactSet Ownership and Datastream returns

Europe	is one if the institutional investor is domiciled in Europe (country codes: AT, BE, CH, CZ, DE, DK, ES, FI, FR, GB, GR, HU, IE, IT, NL, NO, PL, PT, RU, SE, and TR) .
North America	is one if the institutional investor is domiciled in North America (country codes: CA, MX, and US).
US dummy	is one if the institutional investor is domiciled in the United States.
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 stock's average market capitalizations.
AUM	is the logarithm of the total market value of an investors' equity holdings for which ESG scores are available.

Investment performance and flows

Sources: FactSet Ownership and Datastream returns

Annual flows	are the annual flows of an institutional investor calculated based on her disclosed equity portfolio for which ESG scores are available. We calculate the quarterly flows as the change in total equity assets scaled by total equity assets of the previous quarter-end. We adjust the change in total equity assets for stock price changes during the quarter. We assume no interim trading between reported quarter-ends.
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.
Alpha	is the 1-factor alpha of the 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. We use AQR's global equity market factor to calculate the alpha.

Figures and Tables

Fig. 1. The growth of the Principles for Responsible Investment (PRI)

These figures examine the growth of PRI signatories among the population of institutional equity investors around the world. *PRI* denotes those institutional investors in the FactSet Ownership data that signed the UN Principles for Responsible Investment (PRI). *Non-PRI* denotes institutional investors that did not sign the PRI. Panel A plots the number of PRI signatories and non-PRI signatories by year end. Panel B shows the coverage in terms of equity assets under management (AUM in USD trillion is computed as the sum of the market value of equity holdings for which we have ESG scores). Panels C and D show the AUM coverage for the sample of US and Non-US investors. The full sample period is from 2003 to 2017.

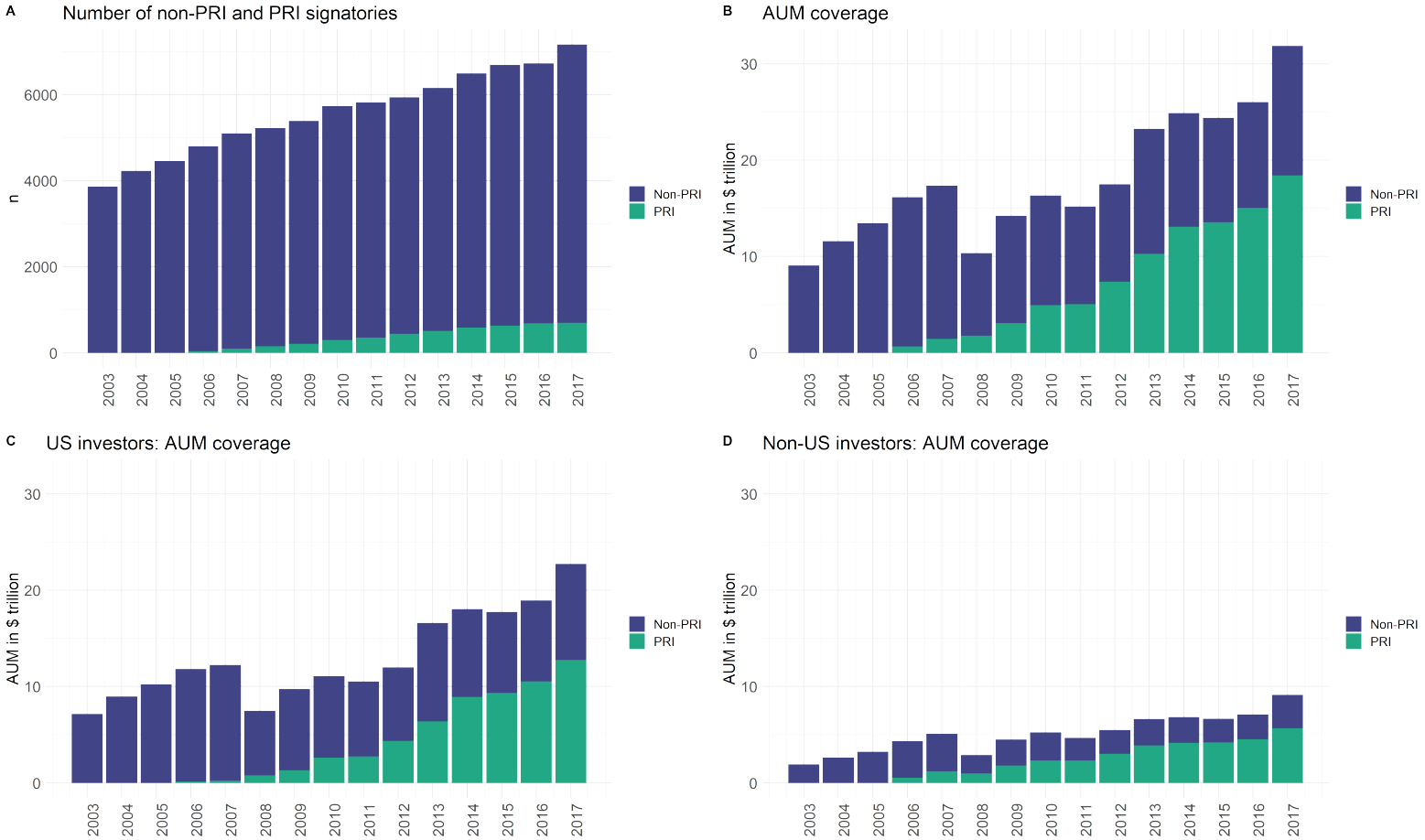

Fig. 2. Reported ESG incorporation strategies by PRI signatory institutional investors

These figures compare the percentage of equity assets under management (AUM) affected by different ESG incorporation strategies among PRI signatory institutional investors. Panel A shows the average percentage of AUM affected by the different strategies across each survey year. The strategies are screening (*%-Screening*), thematic investment (*%-Thematic*), and integration of ESG factors (*%-Integration*). Detailed definitions are provided in Table IA2 of the Internet Appendix. Panel B shows the average percentage of AUM affected by the strategies by level of ESG incorporation, separately for the sample of US and Non-US institutional investors. We define the level of ESG incorporation based on whether PRI signatories report in the PRI survey that they apply ESG incorporation strategies (i.e., screening, thematic, or integration) to all of their equity AUM (*PRI: Full ESG incorporation*), part of their equity AUM (*PRI: Partial ESG incorporation*), or none of their equity AUM or do not report (*PRI: No reported ESG incorporation*). The sample period of the survey is from 2013 to 2017.

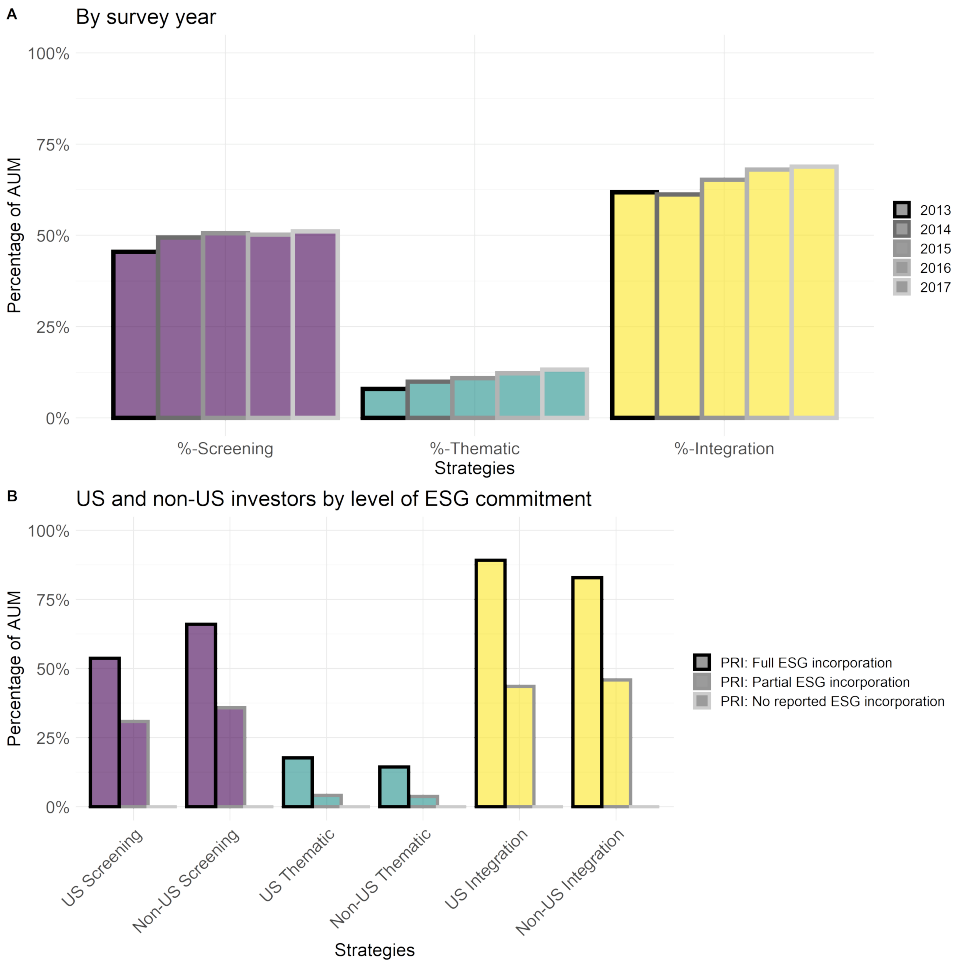

Table 1. Descriptive statistics on PRI signatory institutional investors

Panel A compares the characteristics of PRI signatory institutional investors to non-PRI investors in the FactSet Ownership data in different sample years (2006, 2012, and 2017). PRI signatories are institutional investors that report in the PRI survey (listed equity module of the PRI reporting framework) and could be matched to FactSet Ownership data on equity 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. Panel B relates the PRI signing dummy to institutional investors' characteristics. Variable *PRI dummy* takes the value of 1 for PRI signatories from the signature year onwards. 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. Definitions of the variables are provided in Appendix B.

Panel A: Summary statistics on PRI signatories vs. non-PRI institutional investors

	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	-
Total ESG scores	0.36	0.18	0.22	0.12	0.01	0.01	0.05
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%

Table 1. Descriptive statistics on PRI signatory institutional investors (contd.)

Panel B: Characteristics of PRI signatories

	Dependent variable:	
	PRI dummy	
	(1)	(2)
World Values (ES)		3.13^{***}
		(0.37)
Europe	-0.06	-0.34^{***}
	(0.08)	(0.08)
North America	-1.06^{***}	-1.28^{***}
	(0.07)	(0.07)
Investment manager	-0.23^{**}	-0.23^{**}
	(0.11)	(0.11)
Number of stocks	0.09^{**}	0.12^{***}
	(0.04)	(0.04)
Industry concentration	0.34^{**}	0.38^{**}
	(0.15)	(0.15)
Portfolio turnover	-0.16^{**}	-0.11^{*}
	(0.06)	(0.06)
Portfolio activeness	-0.62^{***}	-0.41^{*}
	(0.23)	(0.22)
Average stock size	0.08^{*}	0.08^{*}
	(0.05)	(0.05)
AUM	0.12^{**}	0.11^{**}
	(0.05)	(0.05)
Constant	-6.51^{***}	-8.38^{***}
	(0.34)	(0.42)
Year fixed effects	Yes	Yes
Pseudo/Adjusted R2	0.27	0.29
Observations	76,335	75,704

Table 2. Reported ESG strategies by PRI signatory institutional investors

This table compares the ESG strategies of PRI signatory institutional investors as reported in the PRI surveys from 2013 to 2017. Panel A shows the percentage of signatories' AUM that is covered by an ESG strategy (*%-Screening*, *%-Thematic*, *%-Integration*). We define the level of ESG incorporation based on whether PRI signatories report in the PRI survey that they apply ESG incorporation strategies (i.e., screening, thematic, or integration) to all of their equity AUM (*PRI: Full ESG incorporation*), part of their equity AUM (*PRI: Partial ESG incorporation*), or none of their equity AUM or do not report (*PRI: No reported ESG incorporation*). Panel B provides the frequency by which PRI signatories report using negative screening, positive screening, norms-based screening, thematic investment, integration of ESG factors, and engagement. Overall engagement is further broken down into individual engagement, collaborative engagement, and internal voting. The strategies are not mutually exclusive. Panel C provides the frequency by which PRI signatories report having a formal ESG policy, Board involvement in ESG, C-suite involvement in ESG, asset manager involvement in ESG, and having a dedicated ESG staff. The panel also reports the number of ESG employees per total employees and the number of other responsible initiatives that the investor has committed to. Detailed definitions of these variables are available in Table IA2 of the Internet Appendix. The first column of each panel reports the number of investor-year observations.

Panel A: Fraction of PRI signatories' equity AUM covered by ESG incorporation strategies

	PRI overall			
	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%
	PRI by level of ESG incorporation			
US investors:				
PRI: Full ESG incorporation	372	54%	18%	89%
PRI: Part ESG incorporation	112	31%	4%	44%
PRI: No ESG incorp. or unreported	168	0%	0%	0%
All US PRI investors	652	36%	11%	58%
Non-US investors:				
PRI: Full ESG incorporation	1,596	66%	14%	83%
PRI: Part ESG incorporation	275	36%	4%	46%
PRI: No ESG incorp. or unreported	273	0%	0%	0%
All non-US PRI investors	2,144	54%	11%	68%
difference between all US and non-US PRI investors		-18%	0%	-10%
t-test		-9.0	-0.3	-4.5

Table 2. Reported ESG strategies of PRI signatories (contd.)

Panel B: Percentage of PRI signatories that apply different sub-types of ESG strategies

	Total	Negative screening	Positive screening	Norms-based screening	Thematic	Integration	Engagement	Individual engagement	Collaborative engagement	Internal voting
Overall	2,796	68%	38%	33%	33%	77%	86%	81%	65%	72%
	PRI by level of ESG incorporation									
US investors:										
PRI: Full ESG incorporation	372	84%	43%	33%	42%	93%	94%	86%	68%	78%
PRI: Part ESG incorporation	112	88%	52%	32%	31%	89%	85%	71%	52%	76%
PRI: No ESG incorp. or unreported	168	1%	1%	0%	1%	1%	39%	35%	30%	27%
All US PRI investors	652	63%	33%	24%	29%	69%	78%	70%	56%	65%
Non-US investors:										
PRI: Full ESG incorporation	1,596	79%	44%	40%	38%	91%	93%	89%	73%	81%
PRI: Part ESG incorporation	275	81%	53%	39%	45%	89%	96%	91%	68%	86%
PRI: No ESG incorp. or unreported	273	0%	0%	0%	0%	0%	54%	47%	44%	26%
All non-US PRI investors	2,144	69%	40%	35%	34%	79%	89%	84%	68%	74%
difference between all US and non-US PRI investors		-6%	-7%	-11%	-5%	-10%	-11%	-14%	-12%	-9%
t-test		-3.0	-2.9	-5.4	-2.3	-5.4	-5.9	-6.8	-5.9	-4.7

Panel C: ESG organizational resources of PRI signatories

	Total	ESG policy	Board ESG involvement	C-Suite ESG involvement	Asset manager ESG involvement	ESG staff	% ESG employees	Other initiatives
Overall	2,796	95%	59%	90%	95%	72%	5%	4.6
	PRI by level of ESG incorporation							
US investors:								
PRI: Full ESG incorporation	372	93%	44%	94%	92%	74%	7%	4.8
PRI: Part ESG incorporation	112	86%	38%	92%	99%	68%	6%	5.2
PRI: No ESG incorp. or unreported	168	89%	49%	74%	82%	43%	2%	2.5
All US PRI investors	652	91%	44%	89%	91%	65%	5%	4.3
Non-US investors:								
PRI: Full ESG incorporation	1,596	98%	65%	94%	97%	73%	5%	4.7
PRI: Part ESG incorporation	275	92%	57%	94%	98%	87%	8%	6.2
PRI: No ESG incorp. or unreported	273	87%	58%	67%	85%	65%	2%	3.7
All non-US PRI investors	2,144	96%	63%	91%	96%	74%	5%	4.7
difference between all US and non-US PRI investors		-5%	-19%	-2%	-5%	-9%	0%	-47%
t-test		-4.3	-8.6	-1.5	-4.3	-4.2	0.1	-2.7

Table 3. Are ESG portfolio scores better for PRI signatory institutional investors?

This table regresses portfolio ESG scores on the *PRI dummy* (which takes the value of 1 for institutional investors that sign the PRI from the signature year onwards) and institutional investors' characteristics. The dependent variables are the value-weighted ESG scores of institutional investors' equity portfolios: *Total ESG scores*, *Environmental scores*, *Social scores*, and *Governance scores*. Panel A reports the results for the full sample, Panel B for US investors, and Panel C reports for non-US investors. Appendix B provides definitions of the 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 scores	Environmental scores	Social scores	Governance scores
	(1)	(2)	(3)	(4)
PRI dummy	0.06^{***} (0.01)	0.01 (0.01)	0.04^{***} (0.01)	0.10^{***} (0.02)
Europe	0.33^{***} (0.03)	0.24^{***} (0.02)	0.21^{***} (0.03)	0.42^{***} (0.04)
North America	0.05^{*} (0.03)	-0.10^{***} (0.03)	-0.12^{***} (0.02)	0.57^{***} (0.04)
Investment manager	−0.03 (0.02)	−0.03 (0.02)	-0.04^{**} (0.02)	0.00 (0.02)
Number of stocks	-0.19^{***} (0.01)	-0.19^{***} (0.01)	-0.16^{***} (0.02)	-0.10^{***} (0.01)
Industry concentration	-0.43^{***} (0.04)	-0.42^{***} (0.05)	-0.36^{***} (0.04)	-0.23^{***} (0.02)
Portfolio turnover	-0.20^{***} (0.02)	-0.18^{***} (0.01)	-0.19^{***} (0.01)	-0.07^{***} (0.01)
Portfolio activeness	-1.47^{***} (0.09)	-1.60^{***} (0.11)	-1.13^{***} (0.12)	-0.91^{***} (0.09)
Average stock size	-0.17^{***} (0.01)	-0.17^{***} (0.01)	-0.15^{***} (0.01)	-0.06^{***} (0.01)
AUM	0.14^{***} (0.01)	0.13^{***} (0.01)	0.12^{***} (0.01)	0.05^{***} (0.01)
Year fixed effects	Yes	Yes	Yes	Yes
Observations	76,335	76,335	76,335	76,335
Adjusted R^2	0.33	0.35	0.33	0.29

Panel B: US institutional investors

	Dependent variable:			
	Total ESG scores	Environmental scores	Social scores	Governance scores
	(1)	(2)	(3)	(4)
PRI dummy	-0.05^{*} (0.03)	−0.05 (0.03)	−0.03 (0.02)	-0.04^{**} (0.02)
Controls	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	43,620	43,620	43,620	43,620
Adjusted R^2	0.35	0.36	0.31	0.25

Panel C: Non-US institutional investors

	Dependent variable:			
	Total ESG scores	Environmental scores	Social scores	Governance scores
	(1)	(2)	(3)	(4)
PRI dummy	0.07^{***} (0.02)	0.05^{***} (0.02)	0.06^{***} (0.01)	0.04^{*} (0.02)
Controls	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	32,715	32,715	32,715	32,715
Adjusted R^2	0.24	0.24	0.20	0.17

Table 4. Do ESG portfolio scores improve after signing the PRI?

This table regresses portfolio ESG scores on the *PRI dummy*, *Post-signature dummy*, and institutional investors' characteristics. The dependent variables are the value-weighted portfolio ESG scores. *Post-signature dummy* takes the value 1 for investor-year observations from the year an institutional investor signs the PRI onwards (also for non-PRI institutions, matched on AUM, region, and institution type), 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 dummy variables. Panel A reports the results for the full sample, Panel B for US investors, and Panel C reports for non-US investors. Definitions of the variables are provided in Appendix B. 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 for each PRI signatory (and matched non-PRI investor). *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels.

Panel A: Full sample

	Dependent variable:			
	Total ESG scores	Environmental scores	Social scores	Governance scores
	(1)	(2)	(3)	(4)
Post-signature x PRI	0.04** (0.02)	0.01 (0.01)	0.05*** (0.01)	0.03 (0.03)
Post-signature dummy	−0.02* (0.01)	−0.02** (0.01)	−0.03*** (0.01)	−0.01 (0.01)
PRI dummy	0.05** (0.02)	0.05*** (0.02)	0.02 (0.02)	0.02 (0.02)
Number of stocks	−0.20*** (0.03)	−0.17*** (0.02)	−0.13*** (0.03)	−0.17*** (0.03)
Industry concentration	−0.70*** (0.09)	−0.60*** (0.09)	−0.61*** (0.07)	−0.46*** (0.11)
Portfolio turnover	−0.25*** (0.03)	−0.21*** (0.03)	−0.25*** (0.03)	−0.07* (0.04)
Portfolio activeness	−0.73*** (0.12)	−0.74*** (0.11)	−0.39*** (0.11)	−0.97*** (0.14)
Average stock size	−0.20*** (0.02)	−0.18*** (0.02)	−0.16*** (0.02)	−0.10*** (0.02)
AUM	0.17*** (0.02)	0.16*** (0.02)	0.12*** (0.02)	0.09*** (0.02)
Year fixed effects	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes
Type fixed effects	Yes	Yes	Yes	Yes
Observations	8,601	8,601	8,601	8,601
Adjusted R^2	0.31	0.32	0.30	0.27

Panel B: US institutional investors

	Dependent variable:			
	Total ESG scores	Environmental scores	Social scores	Governance scores
	(1)	(2)	(3)	(4)
Post-signature x PRI	−0.03 (0.03)	−0.03 (0.03)	−0.04 (0.03)	−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	0.34	0.34	0.27	0.18

Panel C: Non-US institutional investors

	Dependent variable:			
	Total ESG scores	Environmental scores	Social scores	Governance scores
	(1)	(2)	(3)	(4)
Post-signature x PRI	0.07** (0.03)	0.04* (0.02)	0.08*** (0.02)	0.06 (0.03)
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	6,256	6,256	6,256	6,256
Adjusted R^2	0.21	0.21	0.17	0.18

Table 5. Are the ESG portfolio scores of PRI signatories different by extent of ESG incorporation?

This table regresses portfolio ESG scores on the intensity of ESG incorporation as reported in the PRI reporting framework. We split the *PRI dummy* into three groups based on whether PRI signatories report in the PRI survey that they use ESG incorporation strategies (i.e., screening, thematic, or integration). These signatories report incorporating ESG to 100% of their equity AUM (*PRI: Full ESG incorporation*), to 1-99% of their equity AUM (*PRI: Partial ESG incorporation*), or to 0% of their equity AUM or do not report (*PRI: No reported ESG incorporation*). Panel A reports the results for the full sample, Panel B for US investors, and Panel C reports for non-US investors. As in Table 3, we control for institutional investor's region, type, and portfolio characteristics. Definitions of the variables are provided in Appendix B. Robust standard errors double clustered at the investor-level and year-level are reported in parentheses. The sample period is from 2013 to 2017 (the years of the PRI survey). *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels.

Panel A: Full sample

	Dependent variable:			
	Total ESG scores	Environmental scores	Social scores	Governance scores
	(1)	(2)	(3)	(4)
PRI: Full ESG incorporation	0.06** (0.02)	0.02 (0.02)	0.05** (0.01)	0.06** (0.02)
PRI: Partial ESG incorporation	0.04 (0.02)	0.02 (0.02)	0.04* (0.02)	−0.02 (0.03)
PRI: No reported ESG incorporation	−0.02 (0.02)	−0.04 (0.02)	0.00 (0.02)	0.01 (0.02)
Controls and year fixed effects	Yes	Yes	Yes	Yes
Observations	30,511	30,511	30,511	30,511
Adjusted R^2	0.34	0.34	0.30	0.25

Panel B: US institutional investors

	Dependent variable:			
	Total ESG scores	Environmental scores	Social scores	Governance scores
	(1)	(2)	(3)	(4)
PRI: Full ESG incorporation	−0.04 (0.03)	−0.06 (0.04)	−0.03 (0.03)	−0.03 (0.03)
PRI: Partial ESG incorporation	−0.07 (0.05)	−0.08 (0.05)	−0.04 (0.03)	−0.06* (0.03)
PRI: No reported ESG incorporation	−0.12** (0.03)	−0.13** (0.03)	−0.07 (0.04)	−0.04 (0.03)
Controls and year fixed effects	Yes	Yes	Yes	Yes
Observations	17,641	17,641	17,641	17,641
Adjusted R^2	0.34	0.36	0.26	0.15

Panel C: Non-US institutional investors

	Dependent variable:			
	Total ESG scores	Environmental scores	Social scores	Governance scores
	(1)	(2)	(3)	(4)
PRI: Full ESG incorporation	0.09** (0.02)	0.05** (0.02)	0.07** (0.02)	0.05 (0.03)
PRI: Partial ESG incorporation	0.06 (0.03)	0.07* (0.03)	0.07* (0.03)	−0.05 (0.04)
PRI: No reported ESG incorporation	0.06 (0.03)	0.02 (0.03)	0.05* (0.02)	0.03 (0.04)
Controls and year fixed effects	Yes	Yes	Yes	Yes
Observations	12,870	12,870	12,870	12,870
Adjusted R^2	0.22	0.23	0.18	0.18

Table 6. Are other ESG portfolio outcomes of PRI signatories different by extent of ESG incorporation?

This table regresses alternative portfolio ESG outcomes on different levels of reported ESG incorporation in the PRI survey. The dependent variables are the *Total ESG scores*, *Top–bottom ESG stocks*, *Top ESG stocks*, *Bottom ESG stocks*, and *Sin and fossil fuel stocks*. Panel A reports the results for US investors and Panel B reports for non-US investors. As in Table 3, we control for institutional investor's region, type, and portfolio characteristics. Definitions of the variables are provided in Appendix B. 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: US institutional investors

	Dependent variable:				
	Total ESG scores	Top–bottom ESG stocks	Top ESG stocks	Bottom ESG stocks	Sin and fossil fuel stocks
	(1)	(2)	(3)	(4)	(5)
PRI: Full ESG incorporation	−0.04 (0.03)	−0.01 (0.01)	0.01 (0.01)	0.02 (0.01)	−0.02** (0.01)
PRI: Partial ESG incorporation	−0.07 (0.05)	−0.03 (0.01)	−0.01 (0.01)	0.02** (0.01)	−0.01 (0.01)
PRI: No reported ESG incorporation	−0.12** (0.03)	−0.03 (0.02)	−0.01 (0.01)	0.02 (0.01)	0.01 (0.02)
Controls and year fixed effects	Yes	Yes	Yes	Yes	
Observations	17,641	17,641	17,641	17,641	17,641
Adjusted R^2	0.34	0.21	0.20	0.09	0.02

Panel B: Non-US institutional investors

	Dependent variable:				
	Total ESG scores	Top–bottom ESG stocks	Top ESG stocks	Bottom ESG stocks	Sin and fossil fuel stocks
	(1)	(2)	(3)	(4)	(5)
PRI: Full ESG incorporation	0.09** (0.02)	0.04** (0.01)	0.03* (0.01)	−0.01** (0.00)	−0.01** (0.00)
PRI: Partial ESG incorporation	0.06 (0.03)	0.02 (0.01)	0.01 (0.01)	−0.01 (0.01)	−0.01 (0.01)
PRI: No reported ESG incorporation	0.06 (0.03)	0.02 (0.01)	0.01 (0.01)	−0.00 (0.00)	−0.00 (0.01)
Controls and year fixed effects	Yes	Yes	Yes	Yes	
Observations	12,870	12,870	12,870	12,870	12,870
Adjusted R^2	0.22	0.16	0.12	0.10	0.02

Table 7. Do PRI signatories engage companies to become more sustainable?

This table regresses portfolio ESG scores measured in years $t+1$, $t+2$, and $t+3$ on reported ESG engagement activity in the PRI reporting framework. We split the *PRI dummy* into two groups based on whether PRI signatories report in the PRI survey that they engage companies on ESG issues (i.e., collaborative engagement, individual engagement, or internal voting). Panel A reports the results for the full sample, Panel B for US investors, and Panel C reports for non-US investors. As in Table 3, 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 (the years of the PRI survey). *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels. Definitions of the variables are provided in Appendix B.

Panel A: Full sample

	Dependent variable:		
	Total ESG scores (t+1)	Total ESG scores (t+2)	Total ESG scores (t+3)
	(1)	(2)	(3)
PRI: Engagement	0.05* (0.02)	0.04* (0.01)	0.04 (0.01)
PRI: No engagement	−0.05 (0.04)	−0.02 (0.04)	−0.03 (0.04)
Controls and year fixed effects	Yes	Yes	Yes
Observations	22,568	15,893	9,946
Adjusted R^2	0.35	0.38	0.37

Panel B: US institutional investors

	Dependent variable:		
	Total ESG scores (t+1)	Total ESG scores (t+2)	Total ESG scores (t+3)
	(1)	(2)	(3)
PRI: Engagement	−0.07 (0.03)	−0.06 (0.02)	−0.04 (0.03)
PRI: No engagement	−0.15** (0.04)	−0.10 (0.07)	−0.14 (0.05)
Controls and year fixed effects	Yes	Yes	Yes
Observations	13,005	9,083	5,613
Adjusted R^2	0.34	0.35	0.35

Panel C: Non-US institutional investors

	Dependent variable:		
	Total ESG scores (t+1)	Total ESG scores (t+2)	Total ESG scores (t+3)
	(1)	(2)	(3)
PRI: Engagement	0.07* (0.02)	0.06* (0.02)	0.06 (0.01)
PRI: No engagement	0.08 (0.05)	0.10 (0.05)	0.09 (0.05)
Controls and year fixed effects	Yes	Yes	Yes
Observations	9,563	6,810	4,333
Adjusted R^2	0.24	0.26	0.25

Table 8. US-institutional investors: What are the characteristics of "greenwashing" PRI signatories?

This table examines the characteristics of US institutional investors that fail to implement ESG practices despite their commitments. We regress portfolio ESG scores on different levels of ESG incorporation and split the dummy *PRI: No reported ESG incorporation* according to four different investor characteristics. Column 1 differentiates between institutional investors with low and high past portfolio performance, which we measure based on the median of an investor's 1-factor holdings-based alpha in the previous year. Column 2 differentiates institutional investors based on their client focus. An investor is considered to focus on "institutional" clients if it is covered by the eVestment platform, a database used extensively by institutional investment consultants in the US, and "retail" clients otherwise. Column 3 differentiates between institutional investors with high and low operational ESG risks, which we measure based on the median of the number of ESG incident news that the investor experiences in its investment company. The incident data comes from RepRisk. Column 4 differentiates between early and late PRI joiners, where "late" joiners are institutional investors that sign the PRI in 2013 or after. As in Table 3, 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. Definitions of the variables are provided in Appendix B.

	Dependent variable:			
	Total ESG scores			
	A: high past performance B: low past performance	A: institutional clients B: retail clients	A: low operational ESG risks B: high operational ESG risks	A: early joiner B: late joiner
	(1)	(2)	(3)	(4)
PRI: Full ESG incorporation	−0.04 (0.03)	−0.04 (0.03)	−0.04 (0.03)	−0.04 (0.03)
PRI: Partial ESG incorporation	−0.07 (0.05)	−0.07 (0.05)	−0.07 (0.05)	−0.07 (0.05)
PRI: No reported ESG incorporation (A)	−0.07 (0.05)	−0.03 (0.05)	−0.03 (0.06)	−0.08 (0.04)
PRI: No reported ESG incorporation (B)	-0.14^{**} (0.03)	-0.20^{**} (0.06)	-0.17^{*} (0.06)	-0.15^{**} (0.04)
Controls and year fixed effects	Yes	Yes	Yes	Yes
Observations	17,633	17,641	17,579	17,641
Adjusted R^2	0.34	0.34	0.34	0.34

Table 9. Are investors' asset flows different by level of ESG incorporation?

This table tests if investor flows are sensitive to signing the PRI and different levels of ESG incorporation. We regress the growth of institutions' AUM due to investors in- or outflows (annual asset flows) on the PRI signing dummy or different levels of reported ESG incorporation. The dependent variable is *Annual flows*, which is calculated based on the investor's disclosed equity holdings. We calculate the quarterly flows as the change in total equity assets (for which ESG scores are available) scaled by total equity assets of the previous quarter-end. We adjust the change in total equity assets for stock price changes during the quarter. We then compute annual flows by cumulating the quarterly flows. Panel A reports the results for US investors and Panel B reports for non-US investors. The sample period is from 2003 to 2017 (full sample) in the first column and from 2013 to 2017 (survey years) in the second column. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels. Definitions of the variables are provided in Appendix B.

Panel A: US investors

	Dependent variable:	
	Annual flows	
	(1)	(2)
PRI dummy	0.09^{***}	
	(0.02)	
PRI: Full ESG incorporation		0.08^{**}
		(0.03)
PRI: Partial ESG incorporation		0.07
		(0.04)
PRI: No reported ESG incorporation		0.15^{**}
		(0.04)
Past alpha	1.28	0.55
	(0.87)	(0.73)
Past flows	0.04^{**}	0.05^{**}
	(0.01)	(0.01)
Investment manager	0.01	−0.01
	(0.01)	(0.03)
Number of stocks	-0.41^{***}	-0.54^{***}
	(0.06)	(0.06)
Industry concentration	0.15^{**}	0.14^{*}
	(0.06)	(0.06)
Portfolio turnover	0.48^{***}	0.46^{***}
	(0.10)	(0.04)
Portfolio activeness	0.08	-0.41^{**}
	(0.17)	(0.11)
Average stock size	-0.40^{***}	-0.52^{***}
	(0.04)	(0.06)
AUM	0.38^{***}	0.49^{***}
	(0.04)	(0.05)
Year fixed effects	Yes	Yes
Observations	40,054	16,110
Adjusted R^2	0.13	0.15

Panel B: Non-US investors

	Dependent variable:	
	Annual flows	
	(1)	(2)
PRI dummy	0.00	
	(0.02)	
PRI: Full ESG incorporation		-0.05^{***}
		(0.01)
PRI: Partial ESG incorporation		-0.06^{**}
		(0.02)
PRI: No reported ESG incorporation		−0.02
		(0.03)
Past alpha	2.36^{*}	2.83^{**}
	(1.10)	(0.93)
Past flows	0.03^{***}	0.03^{*}
	(0.01)	(0.02)
Investment manager	0.10^{***}	0.06^{**}
	(0.03)	(0.02)
Number of stocks	-0.40^{***}	-0.41^{***}
	(0.03)	(0.03)
Industry concentration	0.13	0.16
	(0.09)	(0.12)
Portfolio turnover	0.66^{***}	0.53^{***}
	(0.11)	(0.02)
Portfolio activeness	0.48^{***}	0.30^{*}
	(0.12)	(0.12)
Average stock size	-0.38^{***}	-0.42^{***}
	(0.03)	(0.03)
AUM	0.39^{***}	0.42^{***}
	(0.03)	(0.03)
Year fixed effects	Yes	Yes
Observations	29,940	12,289
Adjusted R^2	0.15	0.18

Table 10. Why do PRI signatories exhibit better ESG portfolio scores only outside of the US?

Panel A regresses the PRI signing dummy on institutional investors' past performance separately for the US and non-US samples. Panel B tests whether the UK 2013-14 fiduciary duty law resulted in UK-domiciled PRI signatories increasing their ESG portfolio scores relative to uncommitted UK institutions. The sample in this panel is restricted to UK institutional investors and to the years between 2011 and 2015. Variable *2013 onwards* is a dummy that is one for the years 2013-2015 and zero otherwise. Panel C relates ESG portfolio scores to an interaction between PRI signatories and PRI US/Non-US AUM share. We define *PRI US/Non-US AUM share* as the ratio of PRI signatories' AUM to total institutional investors' AUM within the US or non-US countries and year. All panels have similar control variables as in Table 3 Panels B and C. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels. Definitions of the variables are provided in Appendix B.

Panel A: Signing the PRI and past performance

	Dependent variable:			
	PRI dummy			
	US sample		Non-US sample	
	(1)	(2)	(3)	(4)
Past mean(return)	−5.99**		−1.74	
	(2.92)		(2.09)	
Past alpha		−6.56**		−2.54
		(2.82)		(2.30)
Controls and year fixed effects	Yes	Yes	Yes	Yes
Pseudo R2	0.21	0.21	0.22	0.22
Observations	40,054	40,054	29,940	29,940

Panel B: UK investors and the 2013-14 fiduciary duty law

	Dependent variable:			
	Total ESG scores	Environmental scores	Social scores	Governance scores
	(1)	(2)	(3)	(4)
PRI dummy	−0.07*	−0.08*	−0.04	−0.06
	(0.03)	(0.03)	(0.02)	(0.04)
PRI dummy x 2013 onwards	0.04***	0.06***	0.03**	0.005
	(0.01)	(0.01)	(0.01)	(0.01)
Controls and year fixed effects	Yes	Yes	Yes	Yes
Observations	1,862	1,862	1,862	1,862
Adjusted R^2	0.14	0.17	0.14	0.04

Panel C: PRI signatories and responsible market maturity

	Dependent variable:			
	Total ESG scores	Environmental scores	Social scores	Governance scores
	(1)	(2)	(3)	(4)
PRI dummy	−0.15*	−0.07	−0.10*	−0.13**
	(0.07)	(0.06)	(0.05)	(0.06)
PRI AUM share	0.84***	1.10***	1.34***	−1.05***
	(0.13)	(0.14)	(0.12)	(0.13)
PRI dummy x PRI AUM share	0.45***	0.24**	0.33***	0.33***
	(0.13)	(0.11)	(0.10)	(0.11)
Controls and year fixed effects	Yes	Yes	Yes	Yes
Observations	76,335	76,335	76,335	76,335
Adjusted R^2	0.29	0.30	0.29	0.18

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