

Does Socially Responsible Investing Change Firm Behavior?

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ABSTRACT

Socially responsible investment (SRI) funds are increasing in popularity. Yet, it is unclear if these funds improve corporate behavior. Using novel micro-level data, we find that SRI funds select firms with higher environmental and social standards: the firms they hold exhibit lower pollution, greater board diversity, higher employee satisfaction, higher workplace safety, and fewer customer complaints. Yet, using an exogenous shock to SRI capital, we find no evidence that SRI funds *improve* firm behavior. The results suggest SRI funds invest in a portfolio consistent with the fund's objective, but they do not significantly improve corporate conduct.

Keywords: Environmental, Social, and Governance (ESG), Institutional Investing, Socially Responsible Investing (SRI), Sustainability

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I. Introduction

Friedman (1970) and Jensen and Meckling (1976) popularized the view that corporate managers should work to maximize shareholder value. More recently, this view has been challenged. In particular, Hart and Zingales (2017) argue that corporations should not seek to maximize shareholder value, rather they should seek to maximize shareholder *welfare*. The debate between these two opposing views depends in large part on the “separability assumption” – if investors can take profits out of the firm and use them to undo the negative externalities generated by the firm, then maximizing shareholder value will tend to be the same as maximizing shareholder welfare. If not, the two goals will be different and in this scenario Hart and Zingales (2017) argue that socially responsible investment funds should play a role.¹ While this debate remains unsettled, there is a related fundamental question that is also unanswered: do socially responsible investment funds change real-world behavior? Put differently, to understand whether socially responsible investment funds should play a larger role in society it is first necessary to understand whether these funds actually influence corporate behavior. In this paper, we use detailed micro-level data to provide some of the first empirical evidence on the effects of socially responsible investment (SRI) funds.

To date there is little evidence on the net effects of SRI funds. However, it is clear that investors value the idea of socially responsible investing – the amount of capital allocated to SRI funds has more than doubled over the last decade (see Figure 1) and a SRI fund recently launched by BlackRock attracted more than \$600 million in its first week of activity (Coumarios, 2020). Moreover, Hartzmark and Sussman (2019) find that the release of mutual funds’ sustainability ratings in 2016 led to large inflows into SRI funds.² In light of

¹See also Elhauge (2005) and Bénabou and Tirole (2010).

²Similarly, in 2019 \$20.6 billion flowed into funds that explicitly divest from “non-sustainable” companies (Broccardo, Hart, & Zingales, 2020).

these trends, it is important to understand the behavior of SRI funds to see if, and how, they affect portfolio firms.

Instead of examining third party environmental and social (E&S) ratings, which may be unreliable,³ we assemble a novel set of outcome variables designed to measure whether SRI affects different firm stakeholders. Our outcome variables assess the relation between SRI and firm customers, employees, and society in general. In particular, we examine 9 different measures of employee satisfaction using data from Glassdoor, Inc., 3 measures of customer satisfaction using data from the Consumer Financial Protection Bureau, 2 measures of workplace safety using data from the Occupational Safety and Health Administration, 2 measures of diversity on the board of directors using data from BoardEx and ISS, and 8 different measures of pollution using data from the Environmental Protection Agency.

From a broad perspective, there are three main possibilities on the relation between SRI and firm-level stakeholders. First, SRI funds might do nothing. In other words, they may not behave differently than non-SRI funds in their portfolio choices or the way in which they interact with firms (i.e., “greenswashing”). Second, SRI funds might not engage with their portfolio companies, but they might select companies that focus on environmental and social issues (i.e., a selection effect).⁴ Finally, SRI funds might actively improve the behavior of the companies in their portfolio to improve environmental and social issues (i.e., a treatment

³Berg, Koelbel, and Rigobon (2019) show that environmental and social (E&S) ratings often differ significantly for the same firm across different rating agencies. Accordingly, we avoid this issue by focusing on outcome variables, instead of E&S ratings. Yet, our results are similar and our conclusions are unchanged if we instead use E&S ratings. We also note that our analyses focus on real E&S outcomes, but we do not examine governance even though it is often mentioned along with environmental and social goals (i.e., environmental, social, and governance “ESG”). Dyck, Lins, Roth, Towner, and Wagner (2020) show there is a relation between good governance and better environmental performance.

⁴The selection effect could also generate a response by firms. It is possible that the threat of entry or exit by SRI funds may itself induce firms to change their behavior. However, in Table A1 of the Appendix we show that SRI funds do not allocate more (or less) capital to firms that recently change their environmental or social policies, suggesting this channel is not influential.

effect).

Of course, examining the impact of SRI investing is challenging because holdings by SRI funds are endogenously related to firm characteristics. Put differently, SRI funds *choose* which stocks to own, making it difficult to determine if they change behavior at their portfolio companies or merely select companies that behave differently. Moreover, firm characteristics such as corporate governance may jointly impact holding decisions and responsible behavior. As a result, there is concern of both reverse causality and omitted variable bias in this setting. Accordingly, we develop a new research design that uses exogenous variation in the amount of capital allocated to SRI funds. Our design allows us to vary the amount of capital allocated to SRI funds in a way that is unrelated to firm characteristics – this allows us to examine if SRI funds *change* behavior at their portfolio firms. We find little evidence that they do.

Broccardo et al. (2020) argue that portfolio selection (either *exit* or *not entering*) is less effective than active engagement in pushing firms to act in a socially responsible manner.⁵ Consistent with this notion, survey evidence indicates that SRI funds consider engagement, rather than divestment, to be the better approach for addressing climate risks (Krueger, Sautner, & Starks, 2020). Similarly, Dimson, Karakaş, and Li (2015) show that engagement on corporate social responsibility is more likely to occur in firms with greater SRI fund ownership. Yet, when we examine real outcomes, we find that SRI funds choose to invest in stocks with better environmental and social responsibility, but SRI fund ownership does not lead to further improvements in environmental or social responsibility. Following an exogenous increase in SRI capital allocated to a stock, we find no change in air, land, or water pollution nor do we find any change in workplace safety, employee satisfaction, or gender

⁵A similar argument is also advanced by Hart and Zingales (2017).

or racial diversity on corporate boards. Our results suggest there is a relation between SRI fund ownership and firm behavior, but it is largely driven by selection effects, not treatment effects.

Our research design uses the assignment of Morningstar “star ratings” as an exogenous shock to SRI fund capital. Morningstar is an investment research company that provides independent ratings of investments, including a wide-variety of U.S. equity funds. Each period, Morningstar ranks the universe of investment funds using a proprietary algorithm that evaluates funds based on their risk-adjusted returns within a category. The best performing funds receive five stars, while the worst performing funds receive one star. Importantly, these star ratings are widely used by investors, and they have been shown to strongly affect the amount of investor capital allocated to a given fund (Reuter & Zitzewitz, 2010). Moreover, Morningstar star ratings are assigned in a complex nonlinear fashion based on each fund’s category and its lagged three, five, and ten year returns, with break-points between the discrete star ratings which change from month to month. As a result, the setting is close to the ideal experiment: it is nearly impossible for funds to manipulate their rating each period, and the discontinuities in the “star rating” leads to sharp discontinuities in capital allocation. For example, a fund that just barely receives five stars will tend to receive significantly larger inflows than a similar fund that just barely misses the cutoff for five stars and instead receives four stars.⁶

We construct a set of matched treated and control funds that have different star ratings but are indistinguishable on their observable characteristics – including, crucially, the inputs into their Morningstar star ratings. Treated funds are SRI funds that received a high star rating; control funds are non-SRI funds that received a lower star rating in the same fund

⁶See Table III, which is consistent with the findings in (Reuter & Zitzewitz, 2010).

category and with near-identical lagged returns. The average difference between treated and control funds in their lagged three year return is 8 basis points; for the five and ten year lagged returns the difference is 7 and 10 basis points respectively (none of these return differences is economically or statistically significant). In other words, our treated and control funds are effectively identical ex-ante except for their star ratings.

We use a difference-in-differences regression to identify the impact of star ratings on SRI capital. While treated and control funds had similar assets and flows in the years prior to treatment, afterward they diverge sharply, with the assets of treated funds increasing by 22 percent relative to control funds. These additional flows are plausibly exogenous to the funds' actions or performance. We then use these relative changes in fund assets, multiplied by the funds' *pre-treatment* holdings, to construct plausibly exogenous flows of SRI investment dollars into portfolio firms. As a result, the setting allows us to exogenously vary the quantity of SRI capital allocated to each firm to see if SRI funds *change* corporate behavior.

To establish a baseline, we first explore the relation between SRI fund ownership and stakeholders using ordinary least squares (OLS) regressions. Specifically, we examine whether SRI fund ownership is related to better (or worse) outcomes for firm customers, employees, and society in general. We start by examining the relation between SRI fund ownership and firm-level pollution using data from the Environmental Protection Agency (EPA). Survey evidence in Krueger et al. (2020) indicates that institutional investors believe climate risks have financial implications for their portfolio firms. As a result, many investors state that they consider pollution when making holding decisions. Consistent with this, we find that

SRI fund ownership is strongly related to lower pollution at the firm-level.⁷ Specifically, more SRI ownership is associated with lower air, land, and water pollution. Moreover, the results are economically large. A one-standard deviation increase in SRI ownership is associated with 26 percent lower total emissions (scaled by firm sales). We also find it is associated with a 12 percent increase in investments in pollution abatement technologies.

We then examine whether SRI fund ownership is related to outcomes for two important firm stakeholders: employees and customers. To examine *employees*, we look at employee satisfaction ratings, which have been shown to be related to shareholders' returns (Edmans, 2011). We also examine workplace safety. For the former, we use data on self-reported employee reviews about their firms from Glassdoor, Inc. For the latter, we use workplace safety data from the U.S. Department of Labor Occupational Safety and Health Administration (OSHA). Consistent with our pollution results, we again find that SRI fund ownership is associated with better firm-level outcomes for stakeholders. Employees at firms with more ownership by SRI funds rate their firm better in nearly every category, including career opportunities, compensation benefits, corporate culture and overall job satisfaction. Using OSHA data, we find that SRI fund ownership is associated with fewer workplace injuries as measured by hospitalization and amputations.

We also examine broader social dimensions at the employee level. Specifically, we examine gender and racial diversity on each firm's board of directors. Board diversity has received considerable attention recently (Lublin & Krouse, 2017). Although some research suggests that imposing gender quotas has negative effects on firm valuation and performance (Ahern & Dittmar, 2012), many institutional investors actively support board diversity and many

⁷These findings are also consistent with the results of Dyck, Lins, Roth, and Wagner (2019) who find that institutional ownership in Europe is correlated with better environmental scores by a third-party rating agency.

companies have publicly committed to increase it (Krouse, 2018). Moreover, NASDAQ is advancing diversity through a new proposed listing requirements, and some states have issued legislation requiring gender or racial diversity for companies headquartered or operating in their states.⁸ As a result, many directors now recognize board diversity as a major issue.⁹

We find that firms with more SRI ownership have significantly more women on their board of directors and slightly more non-caucasian board members. A one-standard deviation increase in SRI ownership is associated with 1.4 percentage points more women on the board and 0.5 percentage points more non-caucasian board members. While these findings may seem small in an absolute sense, they are large relative to the unconditional means (in our sample, only 15% of directors are female and 10% are non-caucasian).

Finally, we examine customer satisfaction using data from the Consumer Financial Protection Bureau (CFPB). Once again, we find that SRI fund ownership is associated with better outcomes for stakeholders. We find that more SRI fund ownership is associated with fewer customer complaints and better relief for complaints and relief that occurs in a more timely manner. However, here, the results are not statistically significant at conventional levels due to the small sample size.

The results so far provide clear evidence that SRI funds do not do nothing (i.e., SRI funds are not all greenwashing). However, two possibilities remain: (1) *Selection* – SRI funds might not engage with their portfolio companies but they might select companies that focus on environmental and social issues. (2) *Treatment* – SRI funds might work to actively improve the behavior of their portfolio companies.

To distinguish between these possibilities, we use our novel research design that exploits

⁸<https://www.nasdaq.com/press-release/nasdaq-to-advance-diversity-through-new-proposed-listing-requirements-2020-12-01> and <https://www.wsj.com/articles/california-lawmakers-mandate-racial-diversity-on-corporate-boards-11598915372>

⁹See https://www.akingump.com/a/web/113016/aokJr/top10_directors_010820-4.pdf

Morningstar “star ratings” as an exogenous shock to SRI fund capital. As before, we explore whether SRI investment is related to better (or worse) outcomes for firm customers, employees, and society in general. However, our tests now examine whether SRI investment *causes* changes to these outcomes.

In theory, SRI funds may directly engage with their portfolio firms to mitigate risks associated with environmental activities, which should reduce the probability of regulatory penalties (and, at the margin, may even increase expected returns). For example, BlackRock’s Investment Stewardship team claims to regularly engage with companies to understand how material environmental factors are considered from the perspective of risk and opportunity. Gas emissions are a key focus area in their engagements with portfolio companies as consensus grows around the impact of climate change on financial markets, companies’ performance, and society.¹⁰

Accordingly, using Morningstar ratings as an exogenous shock to SRI capital, we examine whether SRI investment causes firms to change their pollution. However, while we find that SRI funds tend to hold companies that pollute less, we find little evidence that SRI funds *cause* changes in pollution. We find that an exogenous increase in SRI capital leads to a small decrease in land pollution and a small increase in air pollution, however, it leads to no change in total pollution, water pollution, one-time pollution, or investment in pollution abatement technology. In other words, the findings are inconsistent with SRI funds improving the environmental behavior of their portfolio firms.

The results are similar when we examine stakeholder outcomes. Following an exogenous increase in SRI capital, we find no improvement in employee or customer satisfaction, workplace safety, or gender and racial diversity. If anything, after an exogenous increase in SRI

¹⁰<https://www.blackrock.com/corporate/literature/publication/blk-commentary-engaging-on-emissions.pdf>

investment, we find a slight worsening in employee views about the company outlook. In general, our findings are consistent with the theoretical predictions in Davies and Van Wesep (2018) who show that most managerial compensation contracts reward long-run profitability and, as a result, it is unlikely that SRI fund holding decisions will significantly change managerial incentives to engage in E&S friendly policies.¹¹

Overall, our results suggest that SRI funds do invest differently than non-SRI funds. They are significantly more likely to own companies that have good environmental and social performance. However, we find no evidence that the decisions of SRI funds, nor the amount of capital allocated to them, have any measurable effect on the behavior of their holding companies. In other words, we find evidence of a selection effect, but no evidence of a treatment effect: SRI funds choose to hold companies that behave in a relatively more environmentally and socially responsible manner, but SRI funds do not improve environmentally and socially responsible behavior. Importantly, our non-results on the treatment effects of SRI are not due to limited statistical power. For each of our analyses, we compute the minimum detectable effect size (MDES) as in (Bloom, 1995). The MDES measures the magnitude of treatment effect that a given estimator could reliably detect. Throughout our analyses, the MDES indicates that we have enough power to reliably detect a meaningful change in real outcomes.¹² Thus, the fact that we find SRI investing does not change firm behavior indicates there is no significant effect.

Our paper makes a number of contributions to the literature. A growing body of work shows that investors care about social responsibility. For example, Bialkowski and Starks (2016) document an increase in investor demand for socially responsible funds. Hartzmark

¹¹Indeed, they show that SRI fund holding decisions may even decrease incentives to invest in E&S friendly policies.

¹²Our tests using the CFPB data are an exception – they have weaker power due to a small sample size.

and Sussman (2019) document a large capital flow into highly rated SRI funds following the 2016 introduction of Morningstar sustainability ratings. Consistent with this, Riedl and Smeets (2017) use survey data to examine investor preferences and they find investors are willing to forgo financial performance to invest in accordance with their social preferences.¹³ Bauer, Ruof, and Smeets (2019) conduct a survey at a major pension fund and find that a majority of investors want the fund to invest in a sustainable manner, even if it leads to a reduction in performance, and Gantchev, Giannetti, and Li (2020) find that funds change their holdings to boost their Morningstar sustainability ratings. These results show clear evidence that investors care about responsible investing. Yet, it remains unclear if ownership by SRI funds has effects on E&S behavior at portfolio firms.

Our paper is among the first to use novel micro-level data to examine whether SRI funds have real effects. Akey and Appel (2019) find a 17% reduction in emissions following hedge fund activist campaigns.¹⁴ Azar, Duro, Kadach, and Ormazabal (2020) find that the Big 3 passive fund families concentrate their engagement activities in large portfolio firms with higher emissions. However, the funds managed by the Big 3 families have varying objectives (and most are not SRI funds); our paper differs in that we specifically focus on SRI funds. Further, we are the first to examine the social impact on multiple groups of stakeholders, in addition to environmental practices. Dyck et al. (2019) examine international evidence and find that institutional ownership is associated with better aggregate environmental and social performance. Consistent with this, we find that SRI fund ownership is associated with better environmental and social performance in a number of dimensions for U.S. companies, how-

¹³Benson and Humphrey (2008) show that SRI fund flows are less sensitive to returns than conventional funds and Bollen (2007) finds that cash outflows from SRI funds are less sensitive to lagged negative returns, indicating that investors do appear to derive utility from more than just performance.

¹⁴Similarly, Naaraayanan, Sachdeva, and Sharma (2020) examine whether activist investors improve environmental behavior and Brav, Jiang, and Kim (2015) show that activist hedge funds do change firm-level behavior.

ever, we provide an important new fact: the relation between SRI ownership and outcomes is driven primarily by selection, not treatment. Our results suggest SRI funds might not significantly contribute to their stated goals. Consistent with a divergence between stated objectives and real outcomes in this space, Raghunandan and Rajgopal (2020) show that signatory firms of the Business Roundtable and firms listed in two major E&S indexes have higher environmental and labor-related compliance violations.

II. Data and Research Design

To examine the relation between socially responsible investing and environmental and social (ES) corporate behavior, we combine micro-level data from a wide variety of public and private sources, as discussed below.

A. Data and Variables

We construct a firm-year panel of firms held by U.S. open-end mutual funds for the period from 2011 to 2018.¹⁵ First, from the Morningstar database we collect all mutual funds with available star ratings. To identify an SRI fund, we use data from three sources: Bloomberg, Morningstar, and the US Sustainable Investment Forum (US SIF) membership list. Using the Bloomberg terminal, we hand-collect mutual funds that identify themselves as “social responsible funds” or “SRI funds.” Second, we obtained data from Morningstar Socially Conscious data set, which indicates if the fund identifies itself as selectively investing based on certain non-economic principles. These funds may make investments based on such issues as environmental responsibility, human rights, or religious views. An SRI fund identified in

¹⁵Based on the availability of data in the different tests, the sample period varies. We provide more details about each single source of data below.

this list can take a proactive stance by selectively investing in, for example, environmentally friendly companies or firms with good employee relations. This list also includes funds that may avoid investing in companies in the defense industry or companies involved in promoting alcohol, tobacco, or gambling. Finally, the Forum for Sustainable and Responsible Investment (US SIF) is a U.S.-based membership association that advances impact investing across all asset classes.¹⁶ We manually match institutions in the three lists with those in the CRSP Mutual fund holdings database, from which we retrieve information about a fund's asset under management (AUM), turnover ratio, management fees and expense ratio, and portfolio holdings, which allow us to measure the percentage of a firm's ownership held by SRI funds (*SRI Investment*). The average firm in our sample has 2.6 percent ownership by SRI funds (Table I). Figure 1 shows the substantial growth in SRI funds number and AUM over time.

We aim to examine environmental and social corporate practices. Hence, we collect firm-year level data from various databases. To examine a firm environmental behavior, from the Environmental Protection Agency (EPA) we obtain data from (1) the Form R of the Toxic Release Inventory (TRI database) and (2) from the EPA Pollution Prevention (P2) database. The EPA TRI database contains facility-year level data on the chemical emissions of firms operating in regulated industries that meet a requirement on the minimum number of employees. Facilities in the U.S. are required to report to the EPA the pounds of chemical (grams for dioxin and dioxin-like compounds) released on-site, which are comprised by releases into the ground, air, water, and the total amount of releases transferred off-site.

We use the TRI database to create six measures of pollution at the parent company-year level. Our aggregated measure is *Total releases*, which is the total on-site and off-site

¹⁶See <https://charts.ussif.org/mfpc/>

releases. On site releases are the total quantity of the toxic chemicals released to air, water and land on-site at the facility. We measure *Air*, which is the total quantity of the chemical released as air emissions at the reporting facility; *Water*, which is the total quantity of the chemical released on-site as surface water discharges; an *Land*, which is the total quantity of the chemical injected on site at the facility to underground injection wells, on-site landfills, surface impoundments, or other. We also measure *Off Site*, which is the total quantity of the toxic chemical reported as transferred to off-site locations for release or disposal, and *One-time*, which is the total quantity of the toxic chemical released to the environment or transferred off site due to events not associated with routine production processes.

From the EPA P2 database, we collect information about a facility’s yearly investments in pollution reducing activities. Investment data is divided into two categories: (1) the number of activities each facility undertakes in order to reduce pollution—for example operating process modifications, taking actions to prevent spills and leaks, and redesigning products to reduce pollution, etc.; and (2) the number of facilities that implemented pollution reducing activities. From the P2 database we create two measures of a firm’s propensity and frequency to invest in pollution reducing activities. *logAbatements*, which is the log of the number of abatement actions that a firm discloses in a given year, and *Abatement*, which is an indicator variable equal to 1 if the firm reports an abatement activity across any category, and 0 otherwise.

We scale all variables by each company’s annual sales. The EPA data is at the facility-chemical year level. For each facility, the EPA reports the name of the parent company, which is defined as highest-level corporation that owns at least 50 percent of voting shares. In order to merge the EPA data with our sample of funds and portfolio firms, we first combine all the EPA data at the parent-year level. Second, we combine data from the EPA

P2 database with data from the EPA TRI database. Finally, we match the EPA parent name with Compustat firm name and retrieve the company gvkey by conducting a fuzzy match (we remove common suffixes like “Company”, “Corp”, “Incorporated”, “LLC” etc.).

In Table I we report descriptive statistics for the EPA data. We observe that firms in our sample release 1.4 million pounds of chemicals per year: 440 thousand pounds into the air, 130 thousand pounds into the water, 650 thousand thousand pounds into the land, and 210 thousand pounds off-site respectively. Furthermore, on average the firms in our sample report a 4,540 pounds of releases due to non-routine production process. Finally, firms in our sample invests on average in 3.7 abatement activities every year, which result in 43 percent of our sample firms investing in pollution reducing activities.

We also aim to examine each firm’s social behavior. To do so, we use four different data sources with micro-level data about a company’s employee satisfaction, workplace safety, board demographics, and customer satisfaction.¹⁷

To measure employee satisfaction, we obtain data on employee reviews from Glassdoor, Inc., which is a worldwide leader in providing insights about jobs and companies.¹⁸ Glassdoor, Inc. collects employee feedback, company ratings and reviews, CEO approval ratings, salary reports, interview reviews and questions, and benefits reviews from a large spectrum of companies worldwide.

From Glassdoor, we obtain nine measures of employees reviews of their companies. First, we obtain six different measures of employee satisfaction that each take on numerical values between 0 (bad) and 5 (good). These ratings are (1) the overall company rating (*Overall*), which shows a mean of 3.26 for our sample firms; (2) the rating for the career opportunity

¹⁷Similar to the process described above for the EPA data, we aggregate data at the parent company-year level (where necessary) and conduct a fuzzy name match with Compustat.

¹⁸See www.glassdoor.com.

within a corporation (*Careeropps*), which has a mean of 3.01, (3) the rating for compensation benefits (*Benefits*), with a mean of 3.36; (4) the rating for senior leadership (*Srleader*), with a mean of 2.91; (5) the rating for the corporation’s work-life balance (*Worklife*), with a mean of 3.28; and (6) the rating for the corporate culture (*Culture*), with a mean of 3.21. We also obtained an indicator variable *Rec_frd*, which is equal to one if an employee would recommend her company to a friend, and zero otherwise. Approximately 58 percent of the companies in our sample would be recommended by their employees. Finally, we obtain two variables that range from -1 to 1: *CEO*, which is the review for the company’s CEO (-1 if the employee disapproves, 0 if no opinion, and 1 if she approves); and *Outlook*, which measures the company outlook (-1 if worse, 0 if same, and 1 if better). These two variables have a mean for the firms in our sample of 0.29 and 0.24 respectively.

Next, from the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA), we obtain data on the workplace safety. Starting in 2015, OSHA requires employers to report all severe work-related injuries, defined as an amputation or in-patient hospitalization. Accordingly, we create two variables. First, we measure *Hospitalization*, which is the log of the number of work-related injuries that required hospitalization (scaled by the firm’s total number of employees in thousands). Second, we measure *Amputation*, which is the log of the yearly number of work-related injuries that required amputation (scaled by the firm’s total number of employees in thousands). We observe that the firms report an average of 2.26 employees’ injuries that require hospitalization, and 0.67 employees’ injuries that require amputations each year.

We combine these data with BoardEx, which we use to measure gender diversity on the board of directors. Specifically, we estimate the percentage of women on board (*Gender_div*), which is the number of women on the board divided by the total number of board members.

Next, from Institutional Shareholder Services (ISS) database we retrieve data on the board racial diversity (*Racial_div*), which is the number of non-caucasian directors divided by the total number of board members. In our sample, firms have on average 15 percent of their board represented by women and 10 percent of their board represented by non-caucasian directors (Table I).

Finally, to measure customer satisfaction we obtain data from the Consumer Financial Protection Bureau (CFPB), as in Hayes, Jiang, and Pan (2020). In 2010, the Dodd-Frank Act authorized the creation of the Consumer Financial Protection Bureau which, among other things, collects and publishes consumer complaints with the goal of identifying inappropriate practices and stopping them before they become major issues. The CFPB database was established in 2011 and collects complaints on a range of consumer financial products and services. Although the CFPB does not validate the factual allegations of complaints, it does verify the existence of a relationship between the customer and the financial institution, and withholds complaints from publication if they are unable to verify the commercial relationship or if CFPB staff believe the complaint was filed by an unauthorized third party.¹⁹ Using this data, we measure the number of complaints (*Complaints*), the number of complaints that have been resolved with monetary or other form of relief (*Relief*), and the number of complaints when the bank's response was timely (*Timely*). The average bank in our sample has 834 complains per year, 95 percent of which are resolved in a timely manner, and 15 percent of which are resolved with monetary or other form of relief.²⁰

¹⁹Note also that duplicate complaints from the same consumer are consolidated by CFPB.

²⁰To assure comparability and consider scale issues, we scale *Complaints* by the company annual sales and compute the log of the ratio, we scale *Relief* by the company annual number of complaints and compute the log of the ratio, and we scale *Timely* by the company annual number of complaints and compute the log of the ratio.

B. Research Design

B.1. Exogenous changes in fund assets

We begin our analysis by examining the correlations between SRI investment and firm environmental and social behavior, using cross-sectional ordinary least squares (OLS) regressions with year fixed effects. However, we note that there are two main channels that could lead to significant results in OLS regressions of firm behavior on SRI investment. The first channel is that SRI funds could select firms that are already behaving in a responsible manner (a selection effect). The second channel is that SRI investment may *cause* a positive change in firms' behavior (a treatment effect).

Disentangling these channels is difficult, because it requires us to isolate flows of investor capital into SRI funds that are not related to the SRI funds' investing priorities, or their performance, or the intended policies at their portfolio firms. To do this, we make use of funds' Morningstar star ratings. Each month Morningstar Investments assigns each fund in their database an integer number of stars, from 1 to 5, within the fund's investment category. The star rankings are a complex nonlinear function of each fund's percentile ranking, within its category, on the basis of their returns over a three, five, and ten year lagged basis, each adjusted for the fund's return volatility over the same period.²¹ Crucially, these are the *only* inputs that determine funds' star ratings.

The mapping from lagged returns to Morningstar stars allows us to construct a matched set of funds that were indistinguishable on all observable characteristics – including their investment category and lagged returns in the Morningstar database – but had different Morningstar star ratings. We select all U.S. equity funds in the Morningstar database with at least \$50 million in AUM, in December of each year from 2011 to 2019. Our matched sets

²¹For a detailed primer on the assignment of Morningstar stars, see Reuter and Zitzewitz (2010).

of treated and control funds satisfy the following requirements: The treated fund is an SRI fund as defined in Section II.A. The treated fund is matched with a control fund that:

1. is a non-SRI fund;
2. is in the same Morningstar category as the treated fund;
3. has assets under management within +/- 50% of the treated fund;
4. has lagged three, five, and ten year adjusted returns that were within +/-50 basis points of the treated fund;
5. is assigned *one fewer* star than the treated fund in January of the following year.

When a treated fund has multiple candidate control funds that satisfy the requirements above, as happens in the majority of cases, we pick up to three control funds with the closest three, five, and ten year adjusted returns to the treated fund, weighted equally.

Table II Panel A shows the comparison between the treated and control fund-cohort-years, measured as of December just prior to treatment. The first row illustrates the main idea behind our research design: Treated funds were assigned exactly a one-star higher rating than the matched control funds. Otherwise, as well as belonging to the same Morningstar fund category in each case, the two groups of funds are very closely matched in terms of their size and fundamentals. In particular, the mean differences in the three, five, and ten year Morningstar returns – the inputs that determine the Morningstar star ratings – are 8, 7 and 10 basis points respectively. None of these differences is economically or statistically significant, as is also evident in Figure 2.

Second, like a regression discontinuity design (RDD), in our setting unconfounded causal inference rests on a condition of conditional independence of treatment status. Investor

flows covary with fund returns. Because the Morningstar star ratings are determined by fund returns, we cannot use fund ratings directly as our treatment variable. Instead, we construct matched pairs of funds near the thresholds. If the matched pairs are sufficiently similar ex ante, then fund returns should not predict treatment status within our matched sample. Table II Panel B examines this requirement. The first two columns regress the Morningstar star rating of each fund-year on the fund’s lagged Morningstar returns, within fund categories by year (within which the star ratings are determined). We see that both in the full sample and our matched sample, the lagged returns strongly predict the fund’s Morningstar star rating, as measured by both their statistical significance and the adjusted R^2 of the estimates. However, when we compare the matched fund-years’ treatment versus control status in column 3 – whether a given matched fund was just above or just below the cutoff relative to its matches – the lagged returns have no predictive power. The coefficients on the individual 3, 5 and 10 year returns are economically small and statistically insignificant. Moreover, the adjusted R^2 of the estimate is strongly negative. We conclude that overall, our matched sample of fund-years are plausibly similar ex ante on all characteristics, including the lagged returns that determine treatment assignment.

Third, if the difference in star ratings between the treated and control funds was due *only* to the arbitrary breakpoints of the Morningstar star function, the funds should satisfy the parallel trends requirement that in the absence of the different star ratings their AUM would have evolved similarly. To examine how our treated and control funds’ assets evolve over time, we take each set of matched funds per year (“cohort year”) and examine their assets under management each year for three years before and three years after the cohort-year.

Figure 3 shows the AUM for treated and control funds in event time relative to the cohort-year. We find that both groups of funds have similar pre-treatment trends in their AUM,

while post-treatment their AUMs diverge sharply. In particular, the AUM of the treated funds (with a higher star rating) increased on average, while the AUM of control funds (with a lower star rating) decreased on average post-treatment, consistent with investors reacting to the Morningstar star ratings *independent* of the funds' underlying fundamentals.

Table III Panel A, Column 1 shows the corresponding cohort difference-in-differences estimate of the treatment effect on funds' AUM. Because of the difference in their star ratings, which could not be manipulated by the funds themselves, the AUM of the higher-rated (treated) funds were 22.9 log points higher post treatment compared to the lower-rated (control) funds. These additional investment dollars, driven by the arbitrary cutoffs in the Morningstar star assignment, are plausibly unrelated to the treated funds' performance or objectives (Reuter & Zitzewitz, 2010).

B.2. Removing Aggregate Trends in Fund Assets

One concern for our research design is that our results may reflect aggregate trends in fund assets over time, rather than the pure effect of the Morningstar star ratings on fund assets. For example, because SRI funds are increasing their assets throughout the sample (both in absolute terms and relative to non-SRI funds), perhaps they were more likely to have higher AUM in later (post-treatment) years independent of their Morningstar rating.

We examine this possibility in two ways. First, we repeat the matching exercise as described above, but we require treated and control funds to have the *same* star rating. This serves as a placebo (or falsification) test since we compare funds that had similar underlying fundamentals, as in our first specification, but had the *same* Morningstar star rating. Table III Panel A Column 2 shows the resulting difference-in-differences estimate. We see that in contrast to our first specification, in the placebo specification, there is no

significant difference in AUM between the treated and control funds post-treatment, either economically or statistically (3.2 log points, $t=0.6$).

Second, we orthogonalize each funds' $\log(\text{AUM})$ to yearly trends within each Morningstar category, separately for SRI and non-SRI funds. To do this, we demean each fund's $\log(\text{AUM})$ by its Morningstar category, interacted with the year, interacted with SRI fund status. Thus, the "Residualized" $\log(\text{AUM})$ removes all trends in assets under management, within each Morningstar investment category each year, for SRI and non-SRI funds separately. Table III Panel A Column 3 shows the main difference-in-differences estimate, where the outcome variable is the residualized fund AUM. We see that the results are nearly identical to our first specification, namely, we see a large difference between the treated and control fund assets (21.9 log points, $t=3.2$) post-treatment.

B.3. Effects on Treated Funds' Share Holdings

What effect did this flow of assets into treated funds have on their share holdings? In particular, did treated funds expand their portfolio or increase their existing holdings? And did they increase their holdings *pro rata*, or did they channel the inflows into relatively low-ESG or relatively high-ESG portfolio firms?

Table III Panel B investigates the effects of the flow of assets into treated funds on their holdings. Here, the panel is fund by cohort year by portfolio firm. Column 1 regresses post-treatment status for treated funds on an indicator variable for whether a firm held is a new holding, that is, a firm that the fund did not hold at all in the previous year. We see that if anything, treated funds were slightly less likely to add a new firm to their holdings in post-treatment years. Thus, the inflows into treated funds were channeled into their existing holdings.

Table III Panel B Column 2 show that the 23 log point average increase in treated funds' assets under management was reflected in a 27 log point average increase in the number of shares held in each of their portfolio firms.²² Did funds selectively channel the inflows into high-ESG firms to boost their rating, or into low-ESG firms where more investment might have a positive effect? Columns 3 and 4 find no evidence of such selection: the increase in ownership of high-ESG and low-ESG firms were effectively identical, 27 log points on average.

Table III Panel B Columns 5-7 examine how the investment in individual portfolio firms changed in a different way. Here, the dependent variable is the fraction of the fund's total net assets that each portfolio firm represented. We see that both overall and for high- and low-ESG firms, the inflows into treated funds were not accompanied by any change in their weights in the fund portfolio.

Overall, we conclude that the inflows into treated funds due to their higher Morningstar star ratings were, on average, allocated *pro rata* to the fund's existing portfolio. These observations motivate our research design to investigate the effects of SRI investment on firm behavior, as we describe next.

B.4. Exogenous changes in SRI investment

Having verified that the difference in their star ratings, independent of their fundamentals, leads to a relative increase in assets under management for our treated funds, we project the 21.9 log point treatment effect (Table III Column 3) onto treated and control funds' holdings *as of the December just prior to treatment*. That is, for each fund in the matched set, we compute the fitted value of the difference-in-differences estimate for fund assets, and

²²The non-significant discrepancy between the change in fund-level assets and firm-level shares held could be due to non-significant differences in share issuance between firms.

multiply that change by that fund’s pretreatment holdings of each U.S. firm in the merged CRSP/Compustat data. The resulting value, fund-by-firm-by-year, is the projected change in investment by that fund in that firm, holding the fund’s portfolio composition fixed after treatment (i.e., with no look-ahead bias). For a control fund, this value is zero for all firms and years. For a treated fund, this value is zero in pre-treatment years, and a positive fraction of firm value in post-treatment years.

Summing the fitted values by firm-year, we obtain a *single* fitted value for each firm-year. The value is zero for firms that were never held by a treated (SRI) fund, and for firms that were held by any treated fund in pretreatment years. The value is a positive fraction of firm value for firms that were held by at least one treated fund in post-treatment years. Thus, the fitted value, which we denote by $\Delta SRI \widehat{Investment}$, represents the predicted change in SRI investment for each firm in the sample, that flows from our matched funds difference-in-differences setting. Put differently, it is a difference-in-differences estimator at the firm-year level, with a continuous treatment intensity for each firm-year.

III. Results

We examine the environmental and social behavior of SRI funds by conducting two types of analysis. First we examine the portfolio selection choices of SRI funds. Second, we examine the treatment effects of SRI funds on the environmental and social behavior of their portfolio firms. Our analyses are centered around four important environmental and social pillars for which we are able to examine micro-level data: the environment, employee satisfaction and safety, gender and racial diversity, and customer satisfaction.

A. Selection Effects

A.1. SRI funds and firm-level environmental behavior

Based on their stated objective, SRI funds should select firms with lower emissions. Examining micro data on firms' emissions from the EPA Toxic Release Inventory (TRI) allows us to understand whether a firm's actual pollution is one of the parameters in an SRI funds portfolio selection strategy. The EPA's TRI provides granular data about the emissions at the production facility (on site), about the emissions transferred on a different location (off site), as well as their disaggregation into the air, ground, and water. Hence, we conduct OLS regressions with year fixed effects to examine the association between SRI ownership and firms' pollution emissions. The results are reported in Table IV.

In Panel A, we find evidence consistent with SRI funds selecting firms that pollute less. A one standard deviation increase in SRI ownership is associated with 26 percent lower total emissions (scaled by total sales, Column 1). To put this number in perspective, this relation implies that firms owned by SRI funds have an average of 211 thousand pounds less of toxic chemicals releases per year, which is approximately 15 percent of the unconditional mean of total releases across firms. This result indicates that SRI funds provide investors with a portfolio of firms that pollute significantly less than the average firm.

The granularity of the EPA TRI data allows us to go a step further and examine different pollution mechanisms – namely air, water and ground. This analysis is important in light of the intense debate on climate change and the repeated claims of some mutual funds to care about carbon emissions. As a matter of fact, most of the industrial pollution involve air emissions, although in terms of pounds produced, ground emissions represent the largest share given the different chemicals emitted (see Table I for more details). Accordingly, we

examine which types of emission outlets are preferred by SRI funds; results are presented in Columns 2 to 4. We find that SRI funds invest in firms that pollute less across all three categories, although the relation with air seems to be predominant, consistent with anecdotal evidence.²³

Recall that in addition to on-site releases into the air, land, and water, total releases are also comprised by off-site releases, which are emissions transferred offsite for disposal. Moreover, any toxic chemical released to the environment or transferred off site due to events not associated with routine production processes is not computed in the total releases. Hence, to provide a complete picture of a firm's pollution production, we also examine off-site releases and one time releases. Results are reported in Columns 5 and 6 of Table IV. We find a negative and statistically significant association between one time emissions and SRI fund's ownership, whereas we observe no statistically significant association between SRI fund ownership and off-site release, although the direction of the relation is in the expected direction (negative).

Finally, we take a step back and examine firm investments in pollution reducing activities (i.e., investments in abatement technologies). This analysis allows us to shed light on the channels that drive the portfolio selection of SRI funds. Firms document their investments to reduce emissions in their annual TRI filings to the EPA. The EPA does not require firms to report the dollar amounts spent on these investments, but firms must disclose what types of actions they take according to seven categories of pollution reduction. We combine these disclosures into two variables: *Abatement*, which takes the value of one if the firm reports

²³BlackRock's Investment Stewardship team claims to regularly engage with companies to understand how material environmental factors are considered from the perspective of risk and opportunity. Gas emissions are a key focus area in their engagements with portfolio companies as consensus grows around the impact of climate change on financial markets, companies' performance, and society. See <https://www.blackrock.com/corporate/literature/publication/blk-commentary-engaging-on-emissions.pdf>.

an abatement activity across any category and is zero otherwise, and *Numb. Abatements* which is the (log of one plus) the number of abatement actions that a firm discloses in a given year. Columns 7 and 8 of Table IV show the association between SRI ownership and firms' investment in pollution abatement activities. We observe that SRI funds tend to hold firms that are 5% more likely to invest in, and invest 12.5% more in, pollution abatements.

Taken together, our results show that SRI funds select firms that pollute less and invest more in pollution-reducing activities. This is consistent with SRI's stated objective.

A.2. SRI funds and employees well-being

Next, we examine whether SRI funds select firms with better employee well-being. We begin by looking at employee satisfaction and workplace safety. In our analysis, we use private data on several dimensions of employee satisfaction provided by Glassdoor, Inc. and public data on workplace accidents available through the Department of Labor – Occupational Safety and Health Administration (OSHA). Results are shown in Table V Panel A.

Across the board, we observe positive relations, both overall and in regard to career opportunities, compensation benefits, senior leadership, corporate culture, willingness to recommend the company to a friend, confidence in the CEO, and future outlook. The only respect in which SRI fund ownership is *not* positively associated with employee satisfaction is in regard to work-life balance (Column 5). Thus, SRI funds tend to invest in firms with significantly higher employee satisfaction.

Furthermore, we observe that in Columns (10) and (11) we examine the cross-sectional relation between SRI fund ownership and workplace safety. For accidents that resulted in either hospitalizations (Column 10) or amputations (Column 11) we observe strong negative associations. Thus, we find that SRI funds invest in firms with significantly better workplace

safety.

Next, we study another important dimension of employee welfare, which is gender and racial diversity in the workplace. Results are shown in Table V Panel B. We examine corporate diversity on the board of directors since board diversity is one of the most controversial topics in corporate board governance given the recent considerable attention on the composition of boards of directors in terms of gender quotas (e.g., Lublin and Krouse (2017)). Although some research shows that imposing gender quotas has significant negative effect on firm valuation and performance (Ahern & Dittmar, 2012), many institutional investors actively support board diversity and publicly commit to increase it (Krouse, 2018). Similarly, NASDAQ is considering a proposal to advance diversity through a new listing requirements,²⁴ and some state's have enacted legislation requiring gender or racial diversity for companies headquartered or operating in their states.²⁵ As a result, many directors now recognize board diversity as a major issue of importance.²⁶

Given the SRI funds' stated objective in terms of fostering diversity, and the widespread view that directors are expected to reflect shareholders' interests, it is crucial to examine SRI funds preferences on board diversity. If SRI funds select firms with greater diversity, we expect to observe an association between SRI ownership and board of directors diversity.

We examine the ratio of woman on the board of directors and the ratio of non-caucasian directors. In Table V Panel B, we find that SRI funds select firms with more women on board and firms with more diverse boards, consistent with their stated objective. A one standard deviation increase in SRI ownership is associated with 1.4 percentage points more

²⁴<https://www.nasdaq.com/press-release/nasdaq-to-advance-diversity-through-new-proposed-listing-requirements-2020-12-01>

²⁵<https://www.wsj.com/articles/california-lawmakers-mandate-racial-diversity-on-corporate-boards-11598915372>

²⁶https://www.akingump.com/a/web/113016/aokJr/top10_directors.010820-4.pdf

women on the board, and 0.5 percentage points more non-caucasian board members. The findings are consistent with Gow, Larcker, and Watts (2020) who show that shareholders are more likely to support gender diverse candidates than racially diverse candidates. While the economic magnitudes of these findings may seem small, the effects are large relative to the unconditional mean values in our sample (only 15% of board members are female and 10% are non-caucasian).

Overall, our findings show that the welfare of the employees—their satisfaction and workplace safety as well as the diversity on the board of directors are important determinants of an SRI fund’s investment strategy. This confirms our prior findings: SRI funds offer their investors a portfolio of firms with stronger environmental and social performance, consistent with those funds’ stated objective.

A.3. SRI funds and customer satisfaction

As a final set of test to study SRI funds portfolio strategy, we examine another important stakeholder: customers. In 2010, the Dodd-Frank Act authorized the creation of the Consumer Financial Protection Bureau (CFPB), which, among other things, collects and publishes consumer complaints with the objective to identify inappropriate practices and stop them before they become major issues. We use data from the CFPB and study whether customer’s satisfaction is one of the considerations made by SRI funds when they select firms.

We report results in Table VI. We examine three outcomes: the total number of complaints, the percentage of total complaints that were resolved with relief (monetary or otherwise), and the percentage of complaints that have been resolved in a timely manner. We observe that SRI funds, on average, invest in firms that had fewer customer complaints (-

10 log points), while there is no economically significant association with the provision of customer relief or timeliness of the resolution.

In contrast to our previous tests, the smaller number of firms in the CFPB database means that our estimates on customer satisfaction have low statistical power. However, the point estimates are again consistent with the conclusion that SRI funds invest consistent with their objective.

B. Treatment Effects

B.1. SRI funds and firm-level environmental behavior

In Table IV we found that SRI fund ownership is associated with lower emissions. Yet, it remains unclear whether SRI funds take actions to improve the environmental behavior of their portfolio firms. In other words, this result could be due to selection or treatment. In this section, we examine whether SRI fund ownership causes changes in pollution.

Table VII implements our difference-in-differences design that uses exogenous variation in SRI fund ownership to examine EPA pollution data. For three of the six measures of toxic releases, the estimate of the effect of SRI investment is negative, which is consistent with emissions reduction. Yet, only one of the estimates is significantly different from zero. In particular, we find that a one standard deviation increase in SRI ownership is followed by a 2.3 percent reduction in Landfill pollution (Column 4). Interestingly, we also observe a positive effect of SRI ownership on Air pollution of the same order of magnitude (Column 2). The net effect of these results is a zero effect of SRI ownership on total releases (Column 1).

It is possible that significant reductions in pollution take time to occur. Accordingly, we also examine whether SRI ownership leads to investments in pollution abatement activities

(which might happen more quickly). If SRI funds aim to reduce pollution of their firms, then we should observe greater investments in abatement technologies of SRI funds' portfolio firms. The results, shown in Table VII, show no effect of SRI funds ownership on abatements at the extensive margins (Column 7) or at the intensive margins (Column 8).

In general, we observe that the point estimates in Table VII are all small in magnitude. One important question for our difference-in-difference estimates is whether our research design is adequately powered to detect a significant treatment effect. If not, then our finding that SRI fund ownership has no effect on emissions could be due to our estimates being underpowered. To check this, for each of our difference-in-differences estimates, we compute the minimum detectable effect size (MDES) following Bloom (1995). The MDES is a simple measure of the magnitude of treatment effect that a given estimator could reliably detect. The minimum detectable effect size suggests that our research design is adequately powered to detect an effect in the order of magnitude of 3 to 5 percent of the average firm's emissions. These findings suggest that higher ownership by SRI funds produces no significant reduction in pollution. In the case of the log number of pollution abatements (Column 6), our research design could reliably detect a treatment effect on the order of 0.045 log points or larger. The number of abatements in our sample has a mean of 3.7 and a standard deviation of 15.2 – in logs, it has a mean of 0.71 and a standard deviation of 1.01. Thus, our research design could reliably detect a treatment effect of a magnitude less than 1/20 of one sample standard deviation. The fact that we do not find a result indicates there is no meaningful change. We conclude that our research design is well-powered for all eight outcomes examined in the table. To the extent that we do not find an effect of SRI fund ownership on pollution and abatements, it is because there is no meaningful effect, at least for the funds and firms in our sample.

Our results so far suggest that SRI funds select firms that pollute less. Yet, SRI funds do not improve firm level pollution behavior. In other words, we do not observe any changes in the environmental behavior of firms due to share ownership by SRI funds. This result coupled with no change in investments to reduce pollution suggest that changing corporate practices to reduce emissions is costly, and the marginal cost is higher than the marginal benefit. Consistent with this notion, Bartram, Hou, and Kim (2019) show that some firms shift emissions and plant ownership from California to other states to avoid stringent regulation on plant emission.

B.2. SRI funds and employees well-being

Next, examine whether SRI fund ownership leads to improved employee well-being. First, we examine employee satisfaction and workplace safety in Table VIII Panel A. Then we examine board of directors diversity in Table VIII Panel B.

In Panel A, we observe that an exogenous increase in SRI fund ownership is followed by insignificant or negative changes in employee satisfaction. Six out of nine measures of employee satisfaction decreases, on average, following treatment. For one measure the treatment effect is statistically significant, reflecting a worsening of the overall firm outlook (Column 9). Similarly, we observe that an increase in SRI fund ownership is not followed by any meaningful decrease in employee workplace safety, as measured by hospitalization or amputation incidents.

Once again, the MDES calculations suggest that our research design is adequately powered. In particular, we can rule out the possibility that all or most of the associations in Table V are due to causal effects of SRI fund ownership on employee satisfaction and safety. If anything, the opposite appears to be true. Put differently, while SRI funds invest in firms

with higher employee satisfaction and safety, SRI funds have either a zero or negative causal effect on employee satisfaction.

We also examine the board of directors' gender and racial diversity. Given the SRI funds' stated objective in terms of fostering diversity, and the widespread view that directors are expected to reflect shareholders' interests, it is crucial to examine SRI funds preferences on board diversity. If SRI funds actively engage with their portfolio firms in order to improve the diversity of their boards, we expect to see an effect of SRI ownership on board of directors diversity.

We examine the ratio of women on the board of directors and the ratio of non-caucasian directors. In Table VIII, Panel B, we find that an exogenous increases in SRI fund ownership are followed by a small increase of women on board but no significant changes in board racial diversity. Yet, the positive and statistical significant effect on the percentage of women on board is close to zero as a one standard deviation increase in SRI fund ownership leads to a 0.2 percent more women on board.

Again, the MDES calculations suggest that our research design is adequately powered. For example, the MDES for gender diversity is 0.2%, so our research design could and does reliably detect a change in board diversity of 0.2% or more. Since the cross-sectional association reported in Table V is a 1.4 percent increase in gender diversity per standard deviation increase in SRI fund ownership, this suggests that we can conclude that all or most of the association is *not* due to a treatment effect of SRI fund ownership on gender diversity, but rather to SRI funds' selection. The same reasoning is valid for racial diversity. In other words, while SRI funds select firms with more diverse boards in order to fulfill their social goals, they do not increase the proportion of women or non-white directors at their portfolio firms.

B.3. SRI funds and customer satisfaction

Finally, we examine if customers' satisfaction increases following greater SRI fund ownership using the Consumer Financial Protection Bureau (CFPB) data. Table IX reports the results of our difference-in-differences estimation. We see that an exogenous increase in SRI fund investment is followed by, if anything, a slight increase (2.4%) in customer complaints (yet not statistically different from zero). Increased SRI fund investment is not followed by a decrease in the provision of customer relief nor by a decrease in the timeliness of the resolution.

In contrast to our previous tests, the smaller number of firms in the CFPB database means that our estimates on customer satisfaction have low statistical power. However, the point estimates are again consistent with the conclusion that, while SRI funds invest in firms with higher customer satisfaction, SRI funds have zero causal effect on customer satisfaction.

B.4. Heterogeneous treatment effects of SRI funds ownership

In our final set of tests we examine potential heterogeneity in our treatment effect. While SRI funds AUM has substantially increased over the last ten years (see Figure 1), the average SRI fund's ownership is still relatively moderate (2.6% of shares outstanding in our sample). It is possible that our non-results indicate that SRI funds have are not large enough to influence company-level policies. However, there is substantial variation in the position sizes of SRI funds – funds in the top decile hold approximately 6% of shares outstanding in a company. This represents a sizeable position that likely allows them to influence firm policies. Indeed, the U.S. Securities and Exchange Commission requires funds to disclose “beneficial ownership of more than 5% of any class of voting equity securities.” To examine whether our non-results are due to the small average position size of many funds, we test for

heterogeneity in the treatment effect by conditioning on terciles of SRI ownership prior to the shock. In other words, we examine whether the effect of SRI ownership is different for funds that own large stakes versus funds that own smaller stakes.

The results are reported in Table X; for brevity, we present estimates for a subset of the variables we examined in our prior analyses, however the findings are similar across all of our outcomes variables. We continue to find no effect of SRI funds ownership on total releases and investments in abatement activities. Similarly, we find no effect on overall employee satisfaction or the fraction of women on boards. Moreover, F-tests for heterogeneity in the treatment effect show no significant differences between funds with large versus small position sizes. The results suggest that our non-results are not simply because SRI funds are not big enough – even SRI funds with larger position sizes tend to have no impact on environmental and social outcomes of interest.

Finally, in Column (5) we examine the E&S score assigned to firms by KLD, a major provider of environmental and social scores. This final analysis is motivated by the notion that SRI funds may care more about the overall E&S score of a firm rather than the disaggregated environmental and social performance. We observe two interesting facts. First, we find that the effect of SRI ownership on E&S score is stronger in the bottom tercile of ownership: a one standard deviation in SRI funds ownership is followed by an 3.7 percent increase in the E&S score. Second, while we continue to observe a positive effect for the second tercile, we find a negative effect on the top tercile. This suggest a mean reversion. Overall, the analysis in Table X confirms that our treatment effect analyses are not under-powered. There is simply no meaningful effect of SRI funds ownership on environmental and social practices.

IV. Discussion

Our results suggest that while SRI funds are successful in providing their investors with a portfolio of environmentally and socially responsible firms, they do not change corporate behavior of their portfolio firms. Of course, there are several possible explanations for this. First, our analyses examine the impact of SRI in a narrow window around a change in Morningstar ratings. It is possible that SRI is successful at changing corporate behavior at longer horizons; our results show it is not successful in changing corporate behavior at short- and medium-term horizons measured in months and years.

It is also possible that SRI funds indirectly cause firms to behave differently via the threat of entry or exit. For example, a firm could dramatically reduce its pollution in order to attract capital from SRI funds. While it is inherently challenging to examine whether firms change their behavior because of the *threat* of entry or exit, we do find little evidence that catering, as a strategy, is valuable for firms. In Table A1, we show that SRI funds do not allocate more (or less) capital to firms that recently change their environmental or social policies.

Finally, we are careful to note that our analyses do not measure the overall welfare impact from SRI. Existing evidence clearly shows that investors value the idea of SRI (e.g., Hartzmark and Sussman (2019), Riedl and Smeets (2017), Bauer et al. (2019), among others). Our results show that SRI funds do not change corporate behavior. This fact, combined with existing evidence that SRI funds tend to underperform (Geczy, Stambaugh, & Levin, 2005), suggests that SRI may not improve welfare. Nonetheless, this does not necessarily indicate that SRI is bad for investor welfare. Investors may be happy to invest in SRI funds even if

they do not change real world behavior.²⁷

V. Conclusion

While there is an active debate about the role of investment companies in society, to date there is little evidence on whether socially responsible investing actually affects corporate behavior. We provide novel evidence on the actions of SRI funds. We find that SRI funds are significantly more likely than non-SRI funds to hold firms with good environmental and social behavior. SRI funds tend to hold companies that pollute less, have better workplace safety, have greater board diversity, and have better employee satisfaction. However, despite this, we find little evidence that SRI funds succeed in changing corporate behavior. In particular, we find no evidence that SRI contributes in reducing firms' pollution, improving employee and customers satisfaction, improve workplace safety, or gender and racial diversity on corporate boards. Our results suggest investors who want to change real world behavior might be investing in the wrong firms. Put differently, it is difficult to reduce pollution in a company that is already doing everything it can to reduce pollution. Instead of investing in the best behaving companies, SRI investors might have a bigger impact if they invested in the worst behaving companies.²⁸ Future research should explore the best way for socially responsible investing to generate positive outcomes.

²⁷Consistent with this, Lins, Servaes, and Tamayo (2017) find that companies that invest more in social responsibility perform better in the 2008 financial crisis, suggesting that investments in social capital improve the relation between firms and stakeholders.

²⁸Consistent with this, Cohen, Gurun, and Nguyen (2020) show that oil, gas, and energy-producing firms (who tend to have the worst ESG scores) are key contributors to the invention of environmentally friendly technology.

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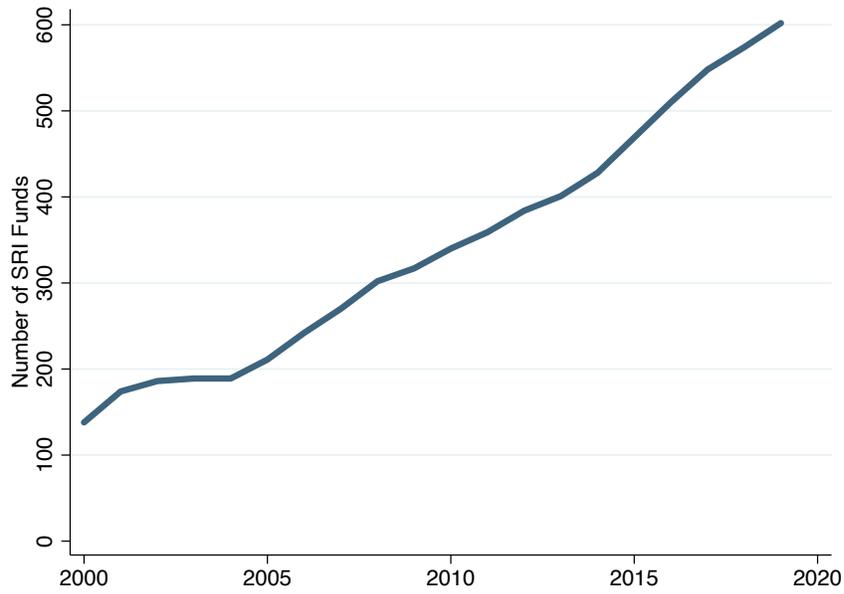
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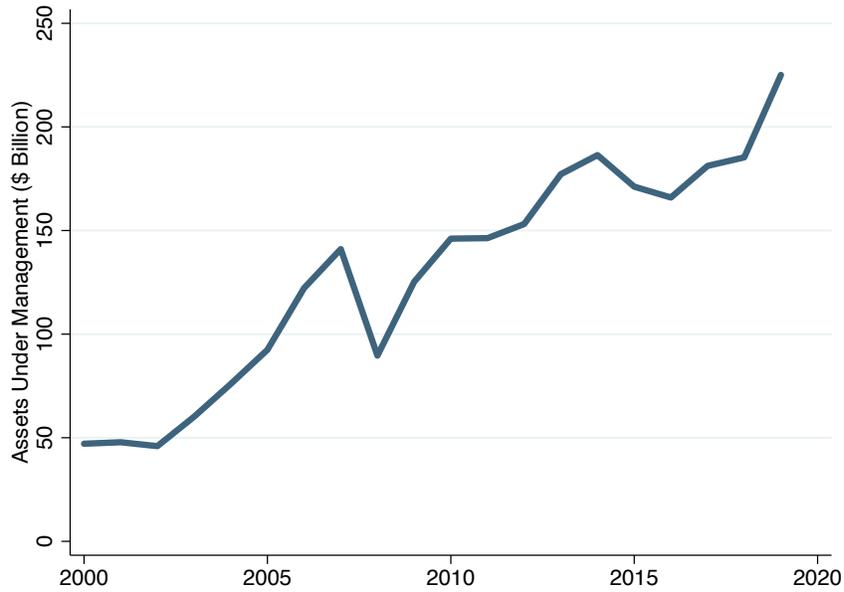
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Panel A: Number of SRI funds



Panel B: SRI Assets Under Management

Figure 1. Growth in SRI Funds and Assets over Time

The figure plots the number of SRI funds (Panel A) and the total assets under management in those funds (Panel B) in the CRSP Mutual Fund Database, as of December of each year.

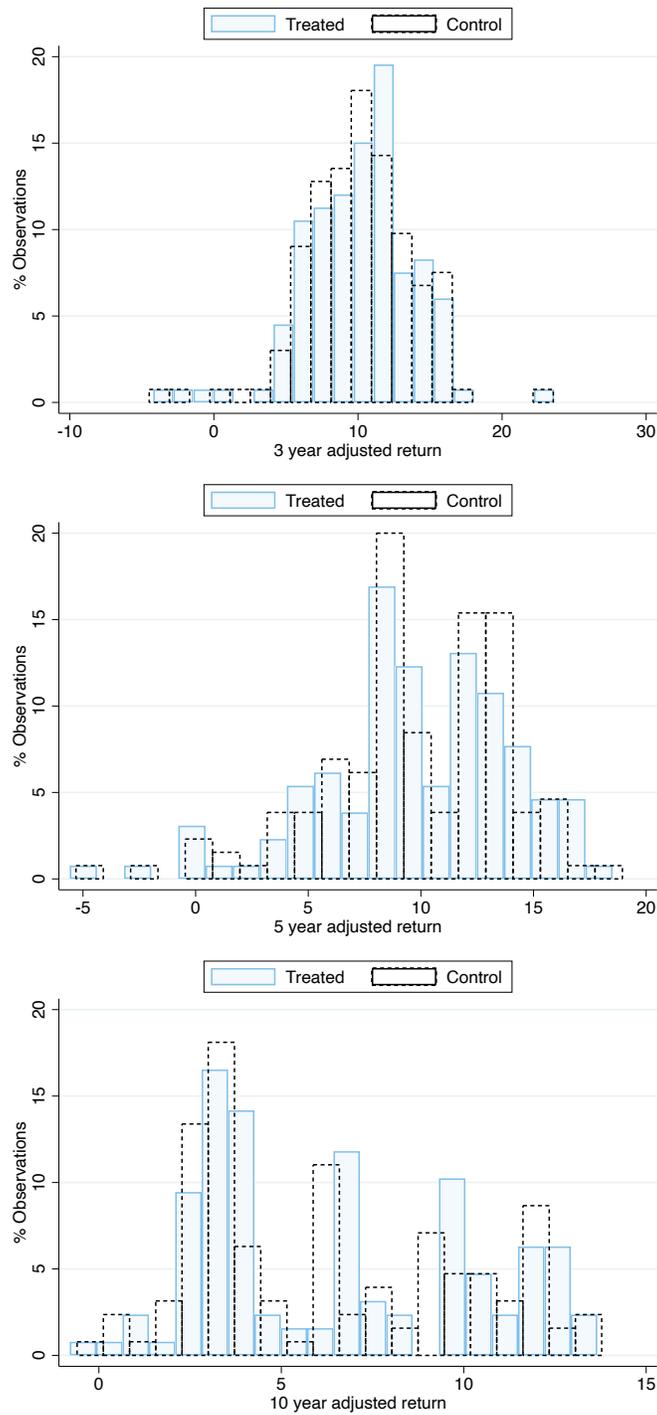


Figure 2. Treated vs control fund lagged returns

The figure plots the distribution of the variables that determine Morningstar star assignment (3 year, 5 year and 10 year adjusted returns) for the treated and control funds, measured as of the December prior to the treatment year.

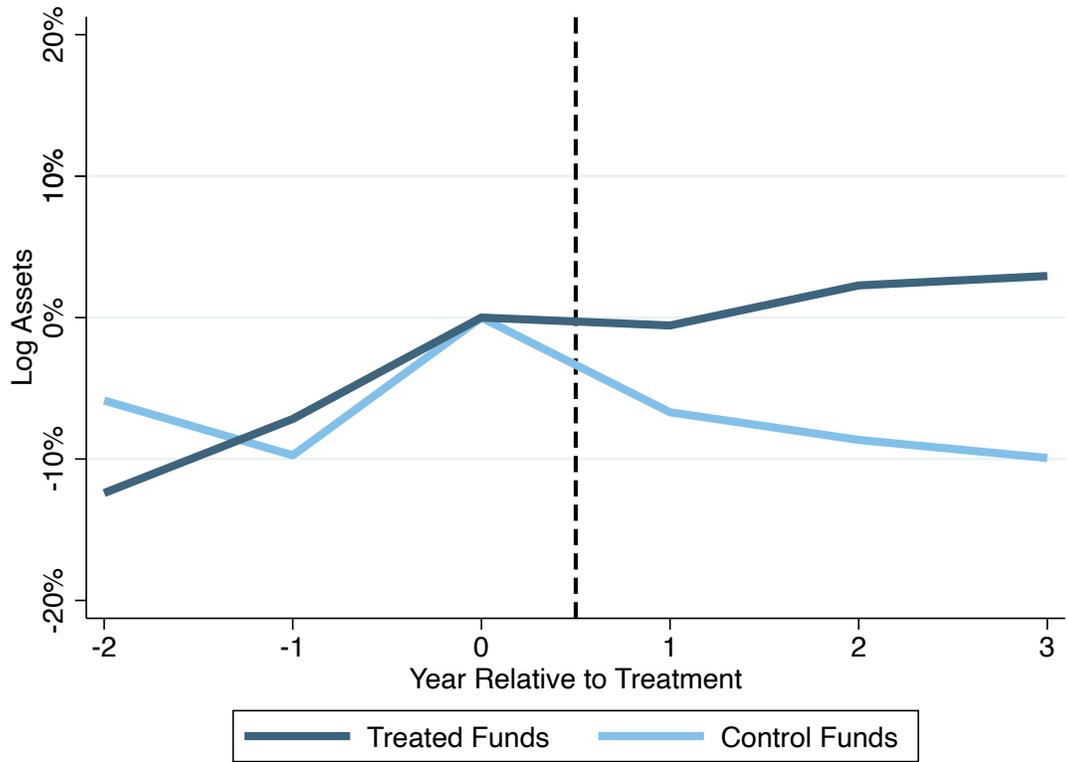


Figure 3. Treated vs control fund assets, pre- versus post-treatment

The figure plots the change in average log fund assets, for treated and control funds separately, for three years before and after the cohort year. Both series have been aligned at zero as of year 0 (the last pretreatment year) for ease of comparison.

Table I
Summary statistics

The table presents summary statistics for key variables used in our analyses. For each variable, we present the mean, the standard deviation, the 1st decile, the median, and the 10th decile. Definitions for all variables are in the Appendix Section A.

Variable	Mean (1)	St. Dev. (2)	p10 (3)	Median (4)	p90 (5)
SRI Investment (%)	2.60	2.32	0.20	1.96	6.03
Total releases (M pounds)	1.43	5.16	0.00	0.04	2.85
Air (M pounds)	0.44	1.59	0.00	0.01	0.79
Water (M pounds)	0.13	1.13	0.00	0.00	0.05
Land (M pounds)	0.65	4.02	0.00	0.00	0.34
Off-site (M pounds)	0.21	1.00	0.00	0.00	0.31
One-time (thousand pounds)	4.54	43.54	0.00	0.00	0.28
Num_abatements	3.66	15.18	0.00	0.00	8.00
Abatement	0.43	0.49	0.00	0.00	1.00
Overall	3.26	0.68	2.46	3.27	4.00
Careeropps	3.01	0.66	2.23	3.00	3.78
Benefits	3.36	0.65	2.55	3.38	4.10
Srleader	2.91	0.73	2.00	2.89	3.84
Worklife	3.28	0.69	2.50	3.30	4.03
Culture	3.21	0.76	2.31	3.22	4.06
Recfrd	0.58	0.25	0.25	0.59	0.92
CEO	0.29	0.42	-0.20	0.32	0.83
Outlook	0.24	0.41	-0.25	0.25	0.75
Hospitalization	2.26	3.86	0.00	1.00	4.00
Amputation	0.67	1.28	0.00	0.00	2.00
Gender_div	0.15	0.11	0.00	0.14	0.29
Racial_div	0.10	0.12	0.00	0.09	0.25
Complaints	834.38	2879.02	2.00	28.50	1240.00
Relief	0.15	0.17	0.00	0.11	0.36
Timely	0.95	0.15	0.88	1.00	1.00

Table II
Comparison of treated and control funds

The table presents comparisons of treated versus control funds, measured as of the December prior to the treatment year. In Panel A, for each fund we examine Morningstar stars, fund assets, Morningstar returns, and fund turnover and fees. In Columns (1) and (3) we report the mean for treatment and control funds respectively, in Columns (2) and (4) we report the standard deviation for treatment and control funds respectively, and in Columns (5) and (6) we report the difference in means and the associated t-statistics. In Panel B, we report results for the test of conditional independence. We regress the Morningstar stars (*MS Star Rating* on their inputs (3, 5, and 10 years returns, and fund category-year fixed effects) in the whole sample (Column 1), and matched sample (Column 2). In Column (3) we regress the treatment status on the same inputs described above.

Panel A: Two-Sample Comparison

Variable	Treated (SRI)		Control (non-SRI)		Difference	t-stat
	Mean	St.dev.	Mean	St.dev.		
	(1)	(2)	(3)	(4)	(5)	(6)
MS Star Rating	3.84	0.68	2.84	0.68	1.00***	(11.93)
Fund Assets (\$M)	997.18	1362.77	970.41	1473.87	26.77	(0.15)
3 year MS Return	10.21	3.86	10.13	3.85	0.08	(0.18)
5 year MS Return	9.77	4.28	9.70	4.19	0.07	(0.13)
10 year MS Return	6.39	3.70	6.29	3.70	0.10	(0.22)
Turnover Ratio	0.35	0.34	0.43	0.77	-0.08	(-1.02)
Management Fee	0.47	0.32	0.47	0.29	-0.00	(-0.10)
Expense Ratio	0.76	0.32	0.81	0.36	-0.06	(-1.28)
Observations	133		133			

Panel B: Testing Conditional Independence

	(1)	(2)	(3)
	MS Star Rating	MS Star Rating	Treated
3 year MS Return	0.09*** (0.00)	0.14** (0.06)	0.00 (0.06)
5 year MS Return	0.15*** (0.01)	0.19*** (0.07)	-0.01 (0.07)
10 year MS Return	0.17*** (0.01)	0.33*** (0.07)	0.07 (0.07)
Funds	All	Matched	Matched
Observations	24,230	254	254
Adjusted R-squared	0.656	0.544	-0.168
MS Fund Category \times Year FE	Yes	Yes	Yes

Table III
Difference-in-differences regression of fund assets

The table presents results examining the effects of the Morningstar ratings on fund assets and holdings. Specifically, we estimate regressions of the form:

$$y_{i,t} = \beta_1(Treated \times Post) + FE_i + FE_t + \epsilon_{i,t},$$

where *Treated* is an indicator that equals one for treated funds, and zero otherwise and *Post* is an indicator that equals one after treatment, and zero otherwise, FE_i is a fund fixed effect, and FE_t is a year fixed effect. Treated funds are SRI funds that have a Morningstar rating that is one star higher than the matched control fund in January of the treatment year. *Placebo* is an indicator that equals one for treated funds in our placebo test, for which treatment funds are defined as SRI funds that have a Morningstar rating equal to the matched control fund in January of the treatment year. Robust standard errors, clustered at the fund level, are shown in parenthesis. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Effects on Fund Assets

	log(AUM) (1)	Falsification log(AUM) (2)	Residualized log(AUM) (3)
Treated \times Post	0.229*** (0.072)		0.219*** (0.069)
Placebo \times Post		0.032 (0.067)	
Observations	1,311	2,632	1,229
Adj. R2	0.914	0.855	0.915
Fund \times Cohort FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

Panel B: Effects on Holdings

	New Holding (1)	log(Shares Held)		% Total Net Assets			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Treated \times Post</i>	-0.012 (0.018)	0.267*** (0.091)	0.274*** (0.094)	0.274*** (0.093)	0.003 (0.014)	-0.007 (0.014)	0.001 (0.015)
Firms	All	All	High ES	Low ES	All	High ES	Low ES
Observations	206,308	206,308	84,356	92,114	206,308	84,356	92,114
Adjusted R-squared	0.154	0.676	0.658	0.710	0.450	0.396	0.552
Fund \times Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table IV

Selection Effects: SRI funds and corporate environmental behavior

The table presents estimates of the relation between SRI fund investment and firm pollution (*Total releases*), air pollution (*Air*), water pollution (*Water*), land pollution (*Land*), total off-site pollution (*Off-site*) and one time pollution (*One-time*) and investments in pollution abatement. *SRI Investment* is the percentage of a firm's ownership held by SRI funds (to facilitate the interpretation of the results, the measure is standardized). Definitions for all variables are in the Appendix Section A. Robust standard errors, clustered at the firm level, are shown in parenthesis. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Total releases	Air	Water	Land	Off-site	One-Time	Abatement	logAbatements
<i>SRI Investment</i>	-0.255*** (0.068)	-0.164*** (0.055)	-0.071** (0.029)	-0.137** (0.054)	-0.076 (0.049)	-0.019** (0.008)	0.053*** (0.012)	0.124*** (0.029)
Observations	3,712	3,712	3,712	3,712	3,712	3,712	3,712	3,712
Adjusted R-squared	0.015	0.007	0.004	0.006	0.002	0.001	0.031	0.038
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table V

Selection Effects: SRI funds, employee welfare, and board diversity

The table presents estimates of the relation between SRI fund investment and a firm's employee welfare using data provided by Glassdoor, Inc. and OSHA (Panel A), and board gender and racial diversity (Panel B). *SRI Investment* is the percentage of a firm's ownership held by SRI funds (to facilitate the interpretation of the results, the measure is standardized). Definitions for all variables are in the Appendix Section A. Robust standard errors, clustered at the firm level, are shown in parenthesis. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Employee welfare

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Overall	Careeropps	Benefits	Srleader	Worklife	Culture	Rec_frd	CEO	Outlook	Hospitalizations	Amputations
<i>SRI Investment</i>	0.026*** (0.008)	0.034*** (0.008)	0.030*** (0.009)	0.014* (0.008)	-0.003 (0.009)	0.023** (0.010)	0.015*** (0.003)	0.019*** (0.005)	0.035*** (0.005)	-0.049*** (0.010)	-0.015*** (0.005)
Observations	10,677	10,612	10,607	10,606	10,613	9,704	10,510	10,172	9,634	1,209	1,209
Adjusted R-squared	0.032	0.024	0.014	0.012	0.008	0.011	0.016	0.011	0.021	0.031	0.010
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel B: Board diversity

	(1)	(2)
	Gender_div	Racial_div
<i>SRI Investment</i>	0.014*** (0.002)	0.005** (0.002)
Observations	13,832	8,682
Adjusted R-squared	0.080	0.004
Year FE	Yes	Yes

Table VI**Selection Effects: SRI funds and customers satisfaction (CFPB data)**

The table presents estimates of the relation between SRI fund investment and the complaints filed by customers. *SRI Investment* is the percentage of a firm's ownership held by SRI funds (to facilitate the interpretation of the results, the measure is standardized). Definitions for all variables are in the Appendix Section A. Robust standard errors, clustered at the firm level, are shown in parenthesis. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)
	<i>Complaints</i>	<i>Relief</i>	<i>Timely</i>
<i>SRI Investment</i>	-0.101 (0.225)	0.006 (0.009)	0.009 (0.007)
Observations	444	444	444
Adjusted R-squared	0.022	0.026	0.040
Year FE	Yes	Yes	Yes

Table VII

Treatment effects: SRI funds and corporate environmental behavior

The table presents estimates of the effect of SRI fund investment on firm pollution (*Total releases*), air pollution (*Air*), water pollution (*Water*), land pollution (*Land*), total off-site pollution (*Off-site*) and one time pollution (*One-time*) and on investments in pollution abatement. $\widehat{\Delta SRI Investment}$ is the predicted change in SRI investment for each firm in the sample from our paired fund-level difference-in-differences regression (to facilitate the interpretation of the results, the measure is standardized). MDES is the minimum detectable effect size (Bloom, 1995). Definitions for all variables are in the Appendix Section A. Robust standard errors, clustered at the firm level, are shown in parenthesis. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Total releases	Air	Water	Land	Off-site	One-Time	Abatement	logAbatements
$\widehat{\Delta SRI Investment}$	0.021 (0.017)	0.026* (0.015)	0.015 (0.011)	-0.023* (0.012)	-0.010 (0.019)	-0.005 (0.011)	0.006 (0.010)	0.001 (0.016)
MDES	±0.049	±0.042	±0.030	±0.033	±0.053	±0.032	±0.029	±0.045
Observations	3,712	3,712	3,712	3,712	3,712	3,712	3,712	3,712
Adjusted R-squared	0.015	0.007	0.004	0.006	0.002	0.001	0.031	0.038
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table VIII

Treatment effects: SRI funds and employee welfare and board diversity

The table presents estimates of the effect of SRI fund investment on a firm’s employee welfare using data provided by Glassdoor, Inc. and OSHA (Panel A), and the effect of SRI fund investment on board diversity (Panel B). $\widehat{\Delta SRI Investment}$ is the predicted change in SRI investment for each firm in the sample from our paired fund-level difference-in-differences regression (to facilitate the interpretation of the results, the measure is standardized). MDES is the minimum detectable effect size (Bloom, 1995). Definitions for all variables are in the Appendix Section A. Robust standard errors, clustered at the firm level, are shown in parenthesis. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

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Panel A: Employee welfare											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Overall	Careeropps	Benefits	Srleader	Worklife	Culture	Rec.frd	CEO	Outlook	Hospitalization	Amputation
$\widehat{\Delta SRI Investment}$	-0.009 (0.009)	-0.005 (0.007)	0.002 (0.008)	-0.004 (0.010)	0.000 (0.009)	0.005 (0.010)	-0.004 (0.003)	-0.008 (0.005)	-0.028*** (0.006)	0.006 (0.005)	-0.003 (0.004)
MDES	±0.025	±0.020	±0.022	±0.028	±0.026	±0.028	±0.010	±0.015	±0.017	±0.013	±0.010
Observations	10,677	10,612	10,607	10,606	10,613	9,704	10,510	10,172	9,634	1,209	1,209
Adjusted R-squared	0.032	0.024	0.014	0.012	0.008	0.011	0.016	0.011	0.021	0.031	0.010
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel B: Board Diversity		
	(1)	(2)
	Gender_div	Racial_div
$\widehat{\Delta SRI Investment}$	0.002* (0.001)	-0.001 (0.001)
MDES	±0.002	±0.003
Observations	13,832	8,682
Adjusted R-squared	0.080	0.004
Firm FE	Yes	Yes
Year FE	Yes	Yes

Table IX**Treatment effects: SRI funds and customers satisfaction**

The table presents estimates of the effect of SRI fund investment on the complaints filed by customers. $\Delta SRI \widehat{Investment}$ is the predicted change in SRI investment for each firm in the sample from our paired fund-level difference-in-differences regression (to facilitate the interpretation of the results, the measure is standardized). MDES is the minimum detectable effect size (Bloom, 1995). Definitions for all variables are in the Appendix Section A. Robust standard errors, clustered at the firm level, are shown in parenthesis. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)
	<i>Complaints</i>	<i>Relief</i>	<i>Timely</i>
$\Delta SRI \widehat{Investment}$	0.024 (0.059)	0.003 (0.006)	0.001 (0.005)
MDES	±0.168	±0.017	±0.014
Observations	444	444	444
Adjusted R-squared	0.022	0.026	0.040
Year FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes

Table X

Evidence of Heterogeneity in Treatment Effects

The table presents estimates of the heterogeneity of the effect of SRI funds investment on firm's environmental and social behavior. We interact the fitted values of SRI fund ownership ($\widehat{\Delta SRI Investment}$) with terciles of lagged SRI fund ownership ($SRI Investment$). Robust standard errors, clustered at the firm level, are shown in parenthesis. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)
	Total Releases	Abatements	Overall	Women on Board	E&S score
Low $SRI Investment_{t-1}$ $\times \widehat{\Delta SRI Investment}$	0.037 (0.030)	-0.005 (0.018)	0.000 (0.016)	0.001 (0.001)	0.037*** (0.006)
Mid $SRI Investment_{t-1}$ $\times \widehat{\Delta SRI Investment}$	-0.014 (0.027)	0.006 (0.027)	-0.005 (0.014)	0.001 (0.001)	0.024*** (0.008)
High $SRI Investment_{t-1}$ $\times \widehat{\Delta SRI Investment}$	0.007 (0.026)	-0.006 (0.027)	-0.010 (0.011)	0.002 (0.001)	-0.029*** (0.009)
F-stat [High = Low]	0.57	0.01	0.28	0.41	38.31***
Observations	3,037	3,037	8,928	11,374	9,439
Adjusted R-squared	0.931	0.715	0.397	0.799	0.611
Firm FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes

Appendix

A. Variable Definitions

- *SRI investment* is the percentage of a firm's ownership held by SRI funds. Data is from Morningstar, Bloomberg and the U.S. Sustainable Investment Forum.
- $\widehat{\Delta SRI Investment}$ is the predicted change in SRI investment for each firm in the sample from our paired fund-level difference-in-differences regression. Data is from Morningstar, Bloomberg and the U.S. Sustainable Investment Forum.
- *Total releases* is the total on-site and off-site releases (data in million pounds). Pollution data is from the Form R of the EPA Toxic Release Inventory (TRI) database.
- *Off-site* is the total quantity of the toxic chemical reported as transferred to off-site locations for release or disposal (data in million pounds). Data is from the Form R of the EPA Toxic Release Inventory (TRI) database.
- *Air* is the total quantity of the chemical released as air emissions at the reporting facility (data in million pounds). Data is from the Form R of the EPA Toxic Release Inventory (TRI) database.
- *Water* is the total quantity of the chemical released on-site as surface water discharges (data in million pounds). Data is from the Form R of the EPA Toxic Release Inventory (TRI) database.
- *Land* is the total quantity of the chemical injected on site at the facility to underground injection wells, on-site landfills, surface impoundments, or other (data in mil-

lion pounds). Data is from the Form R of the EPA Toxic Release Inventory (TRI) database.

- *One-time* is the total quantity of the toxic chemical released to the environment or transferred off site due to events not associated with routine production processes (data in thousand pounds). Data is from the Form R of the EPA Toxic Release Inventory (TRI) database.
- *Num_abatements* is the number of abatement actions that a firm discloses in a given year (only in Table I). Data from the EPA P2 database.
- *logAbatements* is the log of one plus the number of abatement actions that a firm discloses in a given year. Data from the EPA P2 database.
- *Abatement* is an indicator variable equal to 1 if the firm reports an abatement activity across any category, and 0 otherwise. Data from the EPA P2 database.
- *Overall* is the overall employees' satisfaction score from Glassdoor, Inc.
- *Careeroppo*s is the score for career opportunities from Glassdoor, Inc.
- *Benefits* is the score for compensation benefits from Glassdoor, Inc.
- *Srleader* is the score for senior leadership from Glassdoor, Inc.
- *Worklife* is the score for work-life balance from Glassdoor, Inc.
- *Culture* is the score for corporate culture (i.e., cultural values) from Glassdoor, Inc.
- *Rec_frd* is an indicator variable from Glassdoor, Inc. that takes the value of one if the employee would recommend the company to a friend and zero otherwise.

- *CEO* measures the CEO approval (-1 if disapprove, 0 if no opinion, and 1 if approve) from Glassdoor, Inc.
- *Outlook* measures the company outlook (-1 if worse, 0 if same, and 1 if better) from Glassdoor, Inc.
- *Hospitalization* is the number of work-related injuries that required hospitalization. Data from the U.S. Department of Labor, OSHA.
- *Amputation* is the number of work-related injuries that required amputation. Data from the U.S. Department of Labor, OSHA.
- *Gender_div* is the ratio of women directors on the board. Data from BoardEx.
- *Racial_div* is the ratio of the number of non-caucasian directors on the board. Data from ISS.
- *Complaints* is the log of the total number of annual complaints (scaled by annual sales). Data from the Consumer Financial Protection Bureau.
- *Relief* is the log of the total number of annual complaints that have been resolved with relief (monetary or otherwise) scaled by the total number of annual complaints. Data from the Consumer Financial Protection Bureau.
- *Timely* is the log of the total number of annual complaints that have been resolved in a timely manner scaled by the total number of annual complaints. Data from the Consumer Financial Protection Bureau.
- *E&S score* is a firm's total environmental and social score. Data from KLD database.

Table A1
Evidence of Dynamic Selection and Catering

The table presents estimates of the dynamic relation between firms' environmental and social behavior and investment by SRI funds. Robust standard errors, clustered at the firm level, are shown in parenthesis. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Dependent Variable:	Δ_t Investment by SRI Funds				
Independent Variable:	(1)	(2)	(3)	(4)	(5)
	Total Releases	Abatements	Overall	Women on Board	E&S score
$\Delta IndepVar_t$	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.02** (0.01)	-0.00 (0.00)
$\Delta IndepVar_{t-1}$	0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)	-0.00 (0.01)	-0.00* (0.00)
Observations	2,443	2,443	1,896	2,102	1,862
Adjusted R-squared	-0.083	-0.083	-0.101	-0.073	-0.086
Year FE	Yes	Yes	Yes	Yes	Yes