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**SRI Funds: Investor Demand,
Exogenous Shocks and ESG Profiles**

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SRI Funds: Investor Demand, Exogenous Shocks and ESG Profiles

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Abstract: We provide evidence that investor demand for socially responsible or sustainable and responsible (SRI) mutual funds differs from that of conventional funds in that flows to SRI funds have shown greater growth and more persistence than flows to conventional funds. More importantly, using a differences-in-differences approach we provide evidence that these attributes appear to result from investors' nonfinancial considerations. However, as these funds have become more mainstream, there has been convergence in investor resilience. We also find a high level of persistence in SRI funds' ESG profiles, which are generally different from those of conventional funds, consistent with their charters.

Keywords: Socially responsible investment funds, Mutual fund flows, Investor clienteles, Investment screens, Environmental, Social and Governance (ESG) investing

JEL Classification: G10, G12, G23

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1. Introduction

In the last two decades the idea of socially responsible (or sustainable and responsible) investing (SRI) has become increasingly popular, attracting growing amounts of investor money and moving from a niche to a mainstream investment strategy.¹ SRI market participants typically seek to achieve financial returns combined with consideration of some aspect of firms' environmental, social and corporate governance (ESG) profiles. According to the most recent survey undertaken by what is now called the US SIF: The Forum for Sustainable and Responsible Investment, SRI assets under management at the end of 2013 were valued at \$6.57 trillion USD, which is about a ten-fold increase over the previous 19 years and a 76% increase over just the previous two years. As a result of the expansion, according to SIF about 18% of assets under professional management in the United States is now involved in this type of investing.^{2,3} The mutual fund industry has reacted to this trend by increasing the number of funds that incorporate ESG factors, with 80% of fund managers in the SIF survey citing client demand as the reason for their offerings in the ESG space. Moreover, the investment strategy has changed from the traditional approach. Instead of relying on negative screening, the new entrants often use a positive tilt toward firms with higher ESG scores.

Given the rapid proliferation of these products, the increasing assets under management and the differences across the products, it is important to examine this growth and the investor demand behind it to further our understanding of an increasingly important segment of financial markets. A particular issue is the degree to which nonfinancial information is a factor in the SRI investor behavior. In order to examine this investor behavior we employ a sample of 117 US SRI domestic equity funds combined with a sample of 1617 conventional domestic equity funds. We use both matched and full comparisons between the two types of funds.

Before examining the investor behavior, we first examine whether in our sample SRI funds differ from conventional funds in their financial dimensions, that is, their characteristics

¹ See Davidson (2016).

² www.ussif.org.

³ Moreover, the PRI (Principles of Responsible Investment) organization reports that as of April 2015, \$59 trillion in worldwide assets are under the management of institutions that have signed on to their principles, an increase of over tenfold from the \$4 trillion at the organization's 2006 start.

and returns. For our sample of funds, we find the only significant differences in characteristics to be differences in size, age and turnover. The first two would be expected as SRI funds tend to have been introduced to the marketplace more recently than conventional funds.

The issue of differences in returns between SRI funds and conventional mutual funds has been debated extensively in prior research. The core question is whether a trade-off exists for investors between the financial and non-financial dimensions of the investment (e.g., between return performance and adherence to a particular ESG profile). While some studies (Geczy et al., 2003) suggest that ESG screening could have a negative impact on portfolio or single stock performance, other studies (e.g., Statman and Glushkov, 2009) provide evidence that incorporating ESG factors into investment decisions has a positive impact on the portfolio's value.⁴ Even further muddling the issue, additional studies report *no* significant performance effects when using SRI criteria (e.g., Benson, et al., 2006, and Renneboog, et al., 2008). For our sample of funds during the time period studied, we find no significant differences between the risk-adjusted alphas of SRI funds and conventional domestic equity mutual funds, which suggests that over this period at least the SRI investors do not sacrifice returns to achieve their goals.

With regard to our key question on the investment choice behavior of SRI investors, we find that the behavior of SRI fund investors appears to diverge significantly from that of other fund investors. Flows to SRI funds generally increase each year throughout the 1999-2011 sample period, unlike the experience of the conventional domestic equity funds during this period, which had substantial periods of large outflows over parts of the sample period.

The result is consistent with that of previous research showing that in earlier periods the investment patterns (i.e., flows) of SRI investors tend to differ from those of other investors (Bollen, 2007, Benson and Humphrey, 2008). However, the question arises as to whether these differences could result from differences in the growth rates of the two types of funds rather

⁴ Hong and Kacperczyk (2009) have a related study in that they find so-called sin stocks (alcohol, tobacco and gaming stocks) to earn return premia because of investor shunning of such stocks.

than differences in investor behavior and more importantly, whether the differences are due to reliance on nonfinancial information in the SRI fund investors' choices.

In order to examine these questions we first examine whether the profiles of the SRI funds affect their flows. If nonfinancial information represents an important aspect of these investors' choice of funds, then higher profile SRI funds would be expected to have higher flows. We find this to be the case. SRI funds that are members of US SIF and thus listed on their website receive higher inflows as compared to other SRI funds and to conventional funds. Further we find that funds with a higher number of ESG screens in their investment choices have significantly higher inflows than funds with a lower number of screens, which supports the hypothesis that nonfinancial information is an attribute in SRI investor choice.

To perform a more direct test of our hypothesis that investor demand for SRI funds is truly distinct from the demand for conventional mutual funds and that the demand is related to the investors' nonfinancial choices, we use a differences-in-differences approach. We examine the effects of plausibly exogenous shocks to the mutual fund industry that would be expected to affect investor preferences for SRI funds. Specifically, we use the differences between flows to SRI and conventional domestic equity funds around four events. These events are external to the mutual fund industry, but should potentially affect investor demand for holdings in certain types of corporations. Two of these events are considered corporate financial failures (the accounting scandals surrounding Enron, Tyco and Worldcom in 2001-2002 and the global financial crisis of 2008-2009). The other two events are considered to be corporate environmental failures (a major oil spill and a nuclear disaster). If SRI fund investors' decisions are driven by events that affect demand for certain types of companies, we would expect their investments to be conditioned on events that particularly reflect those types of companies in a negative light. For example, during the global financial crisis when there was public outrage regarding corporate actions (along with concerns about the risks of equity investments), the U.S. domestic equity mutual fund industry experienced major outflows of investment dollars. In contrast, SRI domestic equity mutual funds had positive net flows over most of the period with only negligible outflows in two quarters.

The two corporate environmental disasters, which are clearly exogenous to mutual fund operations, provide an opportunity to test whether nonfinancial information has an important influence on investor interest in SRI funds, that is, whether the concept of socially responsible investing under such conditions attracts additional money flows beyond flows to conventional mutual funds. We find strong evidence that nonfinancial information has a significant influence on investor behavior. Using our differences-in-differences tests we find that SRI funds receive significantly more flows than conventional funds during periods after these disasters.

As pointed out, the SRI fund market has expanded and is no longer considered a niche market. This means that the SRI investor has more investment opportunities in the past. Thus, while previously this type of investor had fewer alternatives for a poorly performing fund, they now have many more opportunities to change funds and stay within their investment preferences. Thus, we test whether SRI investors have the same resilience as SRI investors in the past have exhibited (Bollen, 2007; Benson and Humphrey, 2008; Renneboog, et. al., 2011). We do not find this to be the case in that we find there are now no significant differences between SRI funds and conventional funds in either fund flow volatility or in their flow sensitivity to poor performance. In fact, in contrast to the research based on earlier periods, we find that SRI investors are no longer less affected by underperformance in comparison with peer conventional funds.

If SRI investors choose their mutual funds for particular purposes beyond performance as our results indicate, the third major question is whether the funds fulfill those purposes, or whether the growth in SRI funds is at least in part an attempt by some fund managers to capitalize on investor demand by offering a product in name but not in form. That is, the question is whether an investment in SRI funds reflects a stable ESG profile over time and, as investors expect, offers higher exposure to ESG values than conventional funds. The importance of this issue is reflected in the first two questions asked in a November 2015 *Wall Street Journal* article: “What are you actually getting when you put your money into a sustainable investment? And how do you know the mutual fund or the ETF with the

“sustainable” label fulfills its promise?”⁵ In line with this, Morningstar announced in August 2015 and MSCI announced in March 2016 that they would begin scoring mutual funds, in particular, conventional funds, on the ESG ratings of their portfolio companies.⁶

In grouping SRI funds into a separate and distinct category from other domestic equity funds, practitioners (and researchers) necessarily make two implicit assumptions, that the self-defined SRI funds actually have ESG profiles more stringent than those of the conventional funds and that the ESG profiles are persistent through time. We examine the validity of these assumptions through two approaches. First, we compare the ESG profiles of SRI funds to those of conventional funds. Such a comparison is complicated by the fact that SRI funds have diverse objectives, such as being environmentally friendly, focusing on human or animal rights, or following certain religious beliefs. Further, SRI funds use various strategies to achieve their goals, such as negative versus positive screening of companies to build their portfolios. Yet, we would expect that, on average, SRI funds invest in companies with higher ESG profiles than the companies held by conventional funds and that their ESG profiles are persistent through time, an implicit assumption made by researchers in SRI funds. To test this assumption, we examine the ESG ratings of the holdings of the SRI funds and conventional funds in our sample. We find that the SRI funds offer significantly higher positive exposures to each of the ESG categories followed by MSCI ESG Research with the exception of two, community and diversity. We also find that the SRI funds’ ESG profiles are persistent over time.

Most fundamentally, our paper contributes to the literature on nonfinancial information in investment decisions (e.g., Hong and Kacperczyk, 2009; Hvide and Ostberg, 2015; Gompers, Mukharlyamov, and Yuan, 2016). Our paper also contributes to the literature on mutual fund investor behavior (e.g., Sirri and Tufano, 1998; Berk and van Binsbergen, 2016; Akbas, Armstrong, Sorescu and Subrahmanyam, 2015) and particularly the behavior of

⁵ See Davidson (2015).

⁶ “Morningstar to score mainstream funds on ESG factors” Reuters August 15, 2015. “MSCI ESG Research Scores Funds on Sustainability” Reuters March 8, 2016.

socially responsible investors (e.g., Bollen, 2007; Benson and Humphrey, 2008). What distinguishes our paper is the use of an alternative identification strategy to help determine the triggers for increased socially responsible investment. Our paper also contributes to the literature on performance of socially responsible funds such as those cited earlier in the introduction. Finally we contribute novel evidence on the profile of SRI funds as compared to conventional funds.

The remainder of the paper is organized as follows. Section 2 describes the data sources and provides summary statistics. Sections 3 and 4 formulate hypotheses and discuss the empirical results. Section 5 presents robustness checks. The last section concludes the paper with a discussion of the implications for SRI funds and their current and potential investors.

2. Data

In order to examine our hypotheses regarding SRI funds and their comparison to conventional mutual funds, we obtain data from six different sources: Bloomberg, Morningstar, CRSP, MSCI KLD ESG Research, Investment Company Institute, and SEC EDGAR. We first compile a broad sample of U.S. domestic equity funds with SRI objectives by combining the lists of such funds from Bloomberg and Morningstar for the 1999-2011 sample period.⁷

We gather data on the SRI funds' inflows, outflows and net flows from their Securities and Exchange Commission (SEC) filings.⁸ For comparison, we obtain information on aggregated inflows and outflows for all U.S. domestic equity mutual funds from the Investment Company Institute (ICI).

We obtain data on fund characteristics—total net assets (TNA), monthly returns, expenses, investment objectives and portfolio holdings—from the CRSP mutual funds database.⁹ We require at least three years of history on the CRSP database, which gives us a sample of 117 SRI domestic equity funds from the Bloomberg and Morningstar lists. Using CRSP data, we also construct a comparison sample, which consists of all open-end U.S.

⁷ Both databases have a special category for SRI funds. Bloomberg categorizes these funds as socially responsible and Morningstar as socially conscious. Because the ESG rating methodology changed with the acquisition of KLD Research & Analytics in 2010, we restrict the sample period to the KLD period.

⁸ Section 28 of the funds' N-SAR filings.

⁹ We aggregate fund share classes into funds by computing a fund-level variable aggregate across different share classes using value-weights.

domestic equity funds with a minimum of 3 years history and whose portfolio holdings have firms with at least 90% MSCI ESG database coverage during the sample period. These requirements yield a sample of 1617 conventional funds.

In order to compare the SRI funds with the conventional funds, we use both the aggregate conventional fund sample, and we employ subsamples by matching on fee structure, age, risk profile and size. That is, we first select subsets of the conventional funds matched to a given SRI fund based on fund age and fee structure.¹⁰ We then match further based on performance and size. The key part of the procedure is the calculation of a matching measure for a given SRI fund (i) and conventional fund (j), which is calculated with the following formula:

$$\text{Match}_{i,j} = \frac{(\beta_{\text{Market},i} - \beta_{\text{Market},j})^2}{\sigma_{\text{Market}}^2} + \frac{(\beta_{\text{SMB},i} - \beta_{\text{SMB},j})^2}{\sigma_{\text{SMB}}^2} + \frac{(\beta_{\text{HML},i} - \beta_{\text{HML},j})^2}{\sigma_{\text{HML}}^2} + \frac{(\beta_{\text{UMD},i} - \beta_{\text{UMD},j})^2}{\sigma_{\text{UMD}}^2} + \frac{(TNA_i - TNA_j)^2}{\sigma_{\text{TNA}}^2}, \quad (1)$$

where each of the β coefficients are derived from the Fama-French-Carhart four-factor model; TNA is defined as the mean of a fund's total net assets during the fund's life; and σ is the cross-sectional standard deviation of the β coefficients and TNA. The group of conventional funds matched to the given SRI fund is characterized by the lowest matching measure. Throughout the analysis, we report results for two sets of matches: 1-1 matching (one SRI fund to the closest conventional fund, i.e., the conventional fund with the lowest matching measure) and alternatively, in order to have comparisons that are not as dependent on a single matching funds' characteristics, we also include a second 1-5 matching process of one SRI fund to the five closest conventional funds.

For each of the 117 SRI funds in our sample we also obtain prospectuses (available on the SEC EDGAR website) and manually gather information on the number of ESG screens

¹⁰ This procedure, also employed by Bollen (2007) and Renneboog et al. (2011), begins with the selection of a pool of conventional funds considered as potential matches for a given SRI fund as defined by fee structure and age. Only no-load conventional funds are eligible candidates for matching with no-load SRI funds, and only conventional funds with a load are eligible candidates for matching with SRI funds that have a load. All conventional funds are required to be no more than 2 years older or younger than a target SRI fund.

(positive or negative) the funds employ as well as the characteristics of these screens. The average number of screens is six, but more than 50% of the funds have at least 5 screens.

In Table 1, we report summary statistics for the characteristics of the SRI funds, the matched conventional funds and the aggregate of all conventional funds with sufficient MSCI ESG coverage. We also include tests of the null hypothesis of equal means (medians) across the SRI and conventional funds. As can be seen from the table, in terms of means, SRI domestic equity funds in general are significantly different from the pool of conventional domestic equity funds in terms of their age, size of assets under management, and turnover, but not expense ratios. Not surprisingly, given the rapid recent growth of the SRI fund sector, the average conventional domestic equity fund is almost three years older and has more than two and a half times the assets under management than the average SRI domestic equity fund. The conventional funds also trade more often as their average turnover ratio is over 0.9 compared to around 0.7 for the SRI funds. It is worth noting that the average cost of investing in an SRI fund in our sample, as measured by total expense ratios, is no more expensive than for conventional funds.

[Insert Table 1 about here]

The analysis of raw monthly returns shows that before considering factor models, SRI funds appear to underperform, on average, in comparison with the average for all of the conventional funds, but not in comparison with the average of the matched funds. (The latter lack of significant difference is due mechanically to the construction of the matching sample being based in part on return similarity.) In order to control for differences in risk between the funds, we also compare annualized alphas estimated from the Fama-French-Carhart four-factor model. Table 2 summarizes our findings on the distribution of the four-factor alphas estimated for the 1999-2011 period for the SRI funds, matched conventional funds and the sample of comparison equity funds with at least 90% of their holdings rated by MSCI ESG Research.

In line with previous studies by Bauer et al. (2005) and Renneboog et al. (2008), which employ earlier time periods and different samples, we find that, on average, no significant difference exists between the risk-adjusted performance of SRI and conventional domestic

equity funds.¹¹ Overall, Tables 1 and 2 suggest that characteristics and risk-adjusted performance of the SRI mutual funds tend to be similar to those of conventional funds, with no significant differences except for average age, size, and turnover.

[Insert Table 2 about here]

3. Flows into SRI funds versus conventional funds

Our hypotheses are centered on the assumption of increasing investor interest and attention toward ESG issues and consequently SRI funds, resulting in the use of nonfinancial considerations in investment decisions. Consistent with this assumption is the growth in the number of providers of ESG information (e.g., MSCI, Bloomberg, Trucost). Also consistent with our assumption of increasing investor attention toward SRI funds, we find growing media attention to ESG issues over the sample period. For example, in Figure 1 we show for each year the number of mentions in all U.S. publications on Factiva between January 1999 and December 2011 that cite the terms: social responsibility, socially responsible investing, green energy, sustainability, and environmental, social and governance. As the figure shows, these mentions have generally increased each year and have further risen dramatically over time, being around 41 times greater in 2011 than in 1999. Such media attention can reveal important considerations for investors, either because the media reflects investors' interests or because the media attention itself focuses investors on an issue (e.g., Tetlock, 2007).

[Insert Figure 1 about here]

We hypothesize that the increasing interest in ESG considerations over the sample period has resulted in increased net flows to SRI funds because of their ESG objectives. If this hypothesis is valid, then we should observe greater net inflows to SRI funds than for conventional funds, controlling for factors that impact mutual funds in general.

Alternatively, one could argue that since domestic equity SRI funds are simply a subgroup of domestic equity funds, their net flows are driven simply by the same factors that

¹¹ Using different samples, sample periods and performance measures, Statman (2000) and Hamilton et al. (1993) also find no significant differences between the performance of SRI funds and non-SRI funds.

affect the conventional funds. In that case, given the net outflows of money from U.S. domestic funds over the last five years of our sample period (during what has become known as the global financial crisis and its aftermath), the alternative hypothesis suggests that SRI funds should as well experience substantial outflows of capital during this period.

To test these conflicting hypotheses we employ inflow and outflow data for the sample SRI funds from their SEC N-SAR filings. In these filings, inflow is defined by the total Net Asset Value (NAV) of shares sold, including new sales (with exchanges), reinvestment of dividends and other. Outflow is defined as the total NAV of shares redeemed and repurchased, including exchanges. Figure 2 depicts the total inflows (upper bar graph) and outflows (lower bar graph) to the SRI funds over the sample period. Although both gross inflows and outflows to SRI funds have generally increased over time, the graphs indicate that the inflows have increased at a much faster rate than the outflows.

[Insert Figure 2 about here]

Figure 3 provides a comparison of the net flows for the SRI funds (the differences between the inflows and outflows in each period) to the aggregated net flows for U.S. domestic equity mutual funds. A striking difference between the two graphs is that net flows to the SRI mutual funds have been generally positive throughout most of the sample period with net outflows appearing only in four of the 52 sample quarters (and two of those quarters had very small outflows). In contrast, the domestic equity funds in aggregate had many quarters of net outflows. In fact, over the 2006–2011 period, these funds show only six out of 24 quarters with positive net flows. Overall, Figures 2 and 3 demonstrate that aggregate investor flows to SRI domestic equity mutual funds have been much more robust than those to conventional domestic equity funds. Further, Figure 3 also suggests that any negative impact of the global financial crisis on the net sales of the SRI funds was short-lived, unlike the experience of the conventional funds.

[Insert Figure 3 about here]

3.1 Ratio of inflows to outflows

The comparison of the two panels in Figure 3 suggests that the growth of SRI fund investment is distinct from mutual fund growth in general. As a first test of this distinction, we consider

how SRI fund inflows (normalized by the fund outflows to control for differences across funds) compare to the inflows for all U.S. domestic equity funds. Table 3 reports summary statistics for the monthly ratios of inflows to outflows for SRI funds and for the domestic equity funds. Over the sample period the average monthly inflows to SRI funds exceed outflows by 70.9%. In comparison, as the second row of the table demonstrates, on average, monthly inflows to domestic equity funds were just 3.4% higher than their outflows. The difference between the two is statistically significant. Further, this result is not driven by outliers as is confirmed by analysis of the 25th, 50th and 75th percentiles.

[Insert Table 3 about here]

If the SRI funds attract more flows because of their status as SRI funds, that is, nonfinancial information, then we expect that because of search and participation costs (e.g., Sirri and Tufano, 1998, Huang, Wei and Yan, 2007), those funds more easily identifiable as SRI funds would show even higher inflows than SRI funds less easily identified. One way in which investors find SRI funds is through the U.S. SIF website. Thus, membership in the U.S. SIF would presumably provide funds with more exposure to investors searching specifically for these types of funds. To test this hypothesis, we examine whether SIF SRI funds have higher flows than non-SIF SRI funds. The results, provided in the middle rows of Panel A of Table 3, show that consistent with our hypothesis, SIF SRI funds have significantly more inflows than do other SRI funds. Specifically, funds that are members of the SIF experience 85.2% higher new money flows versus about 59% for funds that are not members of the association. In the last column of the table, we report the *t*-statistic for a test of equal means for funds with SIF membership versus the non-SIF membership group, which shows that the null hypothesis of equal means is rejected.

One would also expect that SRI funds using more screens to eliminate companies would meet the preferences of a more diverse investor base, thus, attracting more investors and consequently more flows. To test this hypothesis we examine whether SRI funds with more screens receive higher flows than those with fewer screens. The results are presented in the next rows of Table 3, which show that funds with more screens than the median SRI fund have inflows that are 82.2% higher than their outflows as compared to the SRI funds with a lower

than median number of filters in which the inflow is 55.5% higher than the outflow. The last column of the panel shows that the difference between the flow ratios is significant. Comparing all sets of funds in Table 3, it is clear that SRI funds, whether members of SIF or not or with a high or low number of screens, all have substantially higher ratios of inflows to outflows than do the conventional funds. These results support our hypotheses regarding recent investor interest and the consequent flows into SRI funds.

We next examine whether the ratio of inflows to outflows for SRI funds is higher than the ratio of inflows to outflows for domestic mutual funds, in general, after also controlling for trends in the mutual fund industry and markets. To do so, we run the following regression:

$$Ratio_SRI_t = \beta(Ratio_US_funds_t - 1) + \gamma Time_t + C, \quad (2)$$

where *Ratio_SRI* and *Ratio_US_funds* are the monthly ratios of inflows to outflows for SRI funds and U.S. domestic funds, respectively. The variable *Time* measures the number of months from the beginning of the sample.

In Panel B of Table 3 we report the results of this regression model for several different samples: the first row contains the results for the entire sample of SRI funds; the second and third rows show the SRI fund sample divided by whether the fund has membership in SIF. The fourth and fifth rows show the SRI fund sample divided at the median number of screens. In each regression we expect the β coefficient to be greater than one if investors invest relatively more in SRI funds than in other mutual funds during the sample period, controlling for time fixed effects. In addition, we expect the intercept in the regression to be not only statistically significantly different from zero, but also greater than one if SRI funds have consistently higher inflows than outflows.

As the first row shows, for the entire sample of SRI funds, both the β coefficient and the intercept are significantly greater than 1, supporting the hypothesis that over our sample period SRI mutual funds, in general, experience much higher inflows than outflows, and to a greater extent than conventional funds, even after controlling for the time trend. However, the remaining rows in the panel show that this greater influx of investment into SRI funds over

conventional funds is not universal as SRI funds without membership in the U.S. SIF or with a lower number of ESG screens do not have statistically significant β coefficients at the 5% level although the funds with membership in SIF or a larger number of screens do. Thus, it appears that while investors are prepared to invest more money in SRI mutual funds, they do so more so when funds have more visibility and stricter ESG profiles (in terms of number of screens). This result suggests that nonfinancial information is important in the investors' decisions. We analyze this hypothesis in more depth in the following section.

3.2 Differences-in-differences analyses of exogenous shocks

Although our analysis thus far supports the hypothesis of increasing investment in SRI domestic equity funds versus conventional domestic equity funds, consistent with investor interest in nonfinancial ESG issues, it is possible that other characteristics also affect the flow differences we measure. Thus, to isolate the nonfinancial information part of the investors' decisions, we conduct a differences-in-differences analysis of several events during our sample period that would be considered exogenous to SRI funds and yet could affect SRI investors' preferences for investing in those funds based on nonfinancial information. Two of the events are environmental, the BP oil spill in 2010 and the Fukushima nuclear disaster of 2011, and two of the events are related to what were thought to be firms' corporate governance failures, the accounting scandals of 2001-2002 (when executives of companies such as Enron, Tyco and Worldcom were accused of malfeasance) and the financial crisis of 2008-2009, when outrage regarding corporate actions peaked.

We first examine the two environmental events. Many SRI investors reportedly decide to invest in socially responsible funds in order to achieve returns on their investments without harming the environment.¹² Given this motivation, one would expect that soon after well-publicized corporate environmental disasters, SRI funds would experience additional inflows. We select two recent catastrophes due to their scale, costs of cleanup, and the significant media

¹² Hamilton (1995) provides evidence that stock performance can be influenced by a company's environmental profile. In addition, Derwall et al. (2004) construct equity portfolios based on environmental performance criteria and measure the performance of these portfolios by the Carhart (1997) four-factor model. The study shows that a portfolio of firms with high environmental scores outperforms a portfolio of firms with low scores.

attention that surrounded the events. The first event began in April 2010 with the explosion on board the BP-contracted Transocean LTD Deepwater Horizon oil rig in the Gulf of Mexico and the resulting oil spill.¹³ At an estimated 3.19 million barrels of oil, this has been billed as the worst oil spill in U.S. history.¹⁴ The costs to BP are estimated to exceed USD 42.4 billion.¹⁵

The second recent large-scale environmental disaster was the accident at the Fukushima Daiichi power plant initiated by a tsunami, which hit the Japanese coast in March 2011. As a result of equipment failure, there was a nuclear meltdown followed by the release of radioactive materials. It was the largest nuclear disaster since the Chernobyl reactor explosion. Japan's National Institute of Advanced Industrial Science and Technology estimates (AIST) the cost of the rescue operation and cleanup at USD 58 billion, although the final bill is expected to be higher.¹⁶ The importance of the Fukushima Daiichi accident for the future of civilian use of nuclear power is highlighted by the German government's subsequent decision to close down all of its nuclear power plants by 2020.¹⁷

We hypothesize that these two environmental disasters should have been a trigger for some investors to allocate more money in a way that considers firms' ESG profiles. Our premise is that the environmental disasters prompted additional flows to SRI funds from either existing SRI fund investors who move more of their investments to the SRI funds or from investors who become motivated to invest in such mutual funds because of their concerns regarding such disasters. Thus, we argue that if nonfinancial ESG information is important, the two corporate environmental disasters should have had a positive impact on the flows to SRI funds, without a corresponding effect on flows to conventional mutual funds.

As alternative potential triggers for ESG issues to become important for investors, we examine the corporate accounting scandals of 2001-2002 and the financial crisis of 2008-2009, because of the negative reputational effects these events created for many corporations. Such negative reputational effects would be expected to influence investor demand for funds that

¹³ See Freudenburg and Gramling (2012) for an analysis of the disaster including the clean-up operation.

¹⁴ ocean.si.edu/gulf-oil-spill.

¹⁵ Estimates reported by *The Economist* on April 18, 2015.

¹⁶ The estimates presented in an article by Kyoko Hasegawa published on the website <http://phys.org/news/2013-07-fukushima-nuclear-clean-up-bn.html>

¹⁷ The future of nuclear power after the Fukushima disaster is analysed in Joskow and Parsons (2012).

invest in companies regarded as better managed and more socially responsible, relative to investor demand for funds without the stated ESG objectives.

We conduct a differences-in-differences test of SRI fund flows using the flows to conventional funds as the control group with the following model:

$$\log(\text{Inflow}_t) - \log(\text{Outflow}_t) = \beta_0 + \beta_1 \text{Time}_t + \beta_2 \text{SRI} + \beta_3 \text{Event}_t + \beta_4 \text{Event}_t * \text{SRI} + \varepsilon_t, (3)$$

where Time_t measures the number of months from the beginning of the sample, SRI is an indicator variable for an SRI fund, Event_t is an indicator variable for whether month t is a month in which one of the environmental disasters or financial scandals occurred. We also include an interaction term between the disaster and the SRI indicator variable. In the case of an environmental disaster, the Event_t variable indicates the three-month periods starting with the beginning of the environmental disaster caused by the BP oil spill (April 2010) or the failure of the Fukushima Daichi nuclear plant (March 2011). In the case of the accounting scandal the variable indicates the period when these scandals were being announced (October 2001-March 2002). For the financial crisis, the Event variable indicates the equity market financial crisis period between September 2008 and February 2009.

Table 4 presents the results of these differences-in-differences tests. In the first regression, Model (1), we combine all four events, that is, the Event variable indicates whether in a given month any one of these events. The results show that although over the sample period, there were generally positive ratios of inflows to outflows for mutual funds (as shown by the significantly positive constant term), there was a slight downward time trend in these flows. The coefficients on the SRI fund indicator shows that these funds had substantially larger inflows over the period, consistent with what is shown without controls in Figure 2. The indicator variable for the occurrence of one of the events shows no overall effect on fund flows in general. In contrast, the coefficient on the interaction term between SRI funds and an event shows that during the event months, investors were significantly more likely to contribute to SRI funds.

We then break down the events into each type. As shown in Model (2), we find that the occurrence of the environmental disasters had a significant effect on SRI funds in general as we expected. The regression shows that during the environmental disaster periods, mutual fund investments were generally increasing, but SRI fund investments were increasing at an even higher rate consistent with the argument that environmental disasters initiate investor attention for SRI funds and that nonfinancial information matters for the investor decisions.

[Insert Table 4 about here]

The differences-in-differences test for the accounting scandals are shown in Model (3). Again we find more flows into SRI funds at the time of the scandals, indicating that investors were more likely to invest in SRI mutual funds than mutual funds in general during that period. Finally, Model (4) of Table 4 reports the results for the financial crisis. While the crisis had a negative effect on inflows relative to outflows for all funds, once we account for the general differences in SRI funds from other funds, we do not find a significant difference during the crisis for the SRI funds.

Overall, the tests reported in Table 4 show that SRI funds are treated differently by investors than other types of mutual funds and that interest in these funds is heightened during times of corporate environmental or some types of negative financial events. These results are consistent with the results of Kruger (2015) who studies market reactions to corporate news events and finds that investors react negatively to negative CSR news.

As a further test of our hypothesis that nonfinancial information is important for investor flows into SRI funds, we consider the type of SRI fund receiving the flows. That is, if the flows into SRI funds are driven by investor concerns about negative news on corporations, then one would expect that for the negative environmental news, flows would be higher into SRI funds with environmental screens versus SRI funds without such screens. We divide the SRI funds into those with at least one environmental screen (60% of the sample) and those with no environmental screens and we examine the ratios of inflows to outflows across the two sets of SRI funds in the three months immediately following each of the environmental disasters (the BP oil spill and the Fukushima Daichi nuclear plant meltdown). The results of these tests are reported in Table 5 and are consistent with the hypothesis that if nonfinancial information

is important, investor decisions affected by these environmental disasters should be reflected more strongly in environmentally oriented funds. We find that the flows are significantly higher for the SRI funds with environmental screens than for the SRI funds without such screens.

3.3 Resilience of SRI fund investors over time

Arguments have been made and evidence presented that SRI fund investors are in some sense more resilient investors than investors in conventional mutual funds (Bollen, 2007; Benson and Humphrey, 2008), an argument that is consistent with our result of a higher ratio of inflows to outflows for SRI funds over the sample period. Moreover, these authors find differences between SRI funds and conventional funds in their fund flow volatility or flow-performance sensitivity. For example, Bollen finds lower monthly flow volatility for his 1992–2002 sample period, which suggests that SRI investors move money in and out of their mutual funds at a significantly slower rate than investors in other funds. In fact, he concludes that the volatility of fund flows to SRI funds is economically and statistically significantly smaller than that of conventional funds. Bollen as well as studies by Benson and Humphrey (2008), and Renneboog, et. al. (2011) have examined whether SRI funds have lower flow-performance sensitivity in comparison to other funds and overall evidence suggests this to be the case for their sample periods. However, if investing in SRI funds has become less of a niche investment strategy as suggested by the large amounts of flows into the funds, then the resilience of these types of investors would be expected to have changed.

In a first test of a change in SRI fund investor resilience, we examine fund flow volatility using the test employed by Bollen (2007). We estimate fund flow for fund i at month t by

$$Flow_{i,t} = \frac{TNA_{i,t} - TNA_{i,t-1}(1 + R_{i,t})}{TNA_{i,t-1}}, \quad (4)$$

where $TNA_{i,t}$ is the total net asset value in USD of fund i at the end of month t , and $R_{i,t}$ is fund i 's raw return at month t .

We then calculate the monthly volatilities of fund flows for SRI funds and conventional funds. Table 6 reports the results for two periods: the Bollen sample period (1992–2002) and

the full sample (1999–2011). The table is also divided into two panels, with each reporting the comparison of SRI funds to a different control group of conventional funds. The first panel shows the volatilities for the matched set of conventional funds in which we match 1 conventional fund to 1 SRI fund based on the previously described matching algorithm using fee structure, age, previous performance and size. The second panel shows the results for the matched set of conventional funds in which we match 5 conventional funds for each SRI fund.

[Insert Table 6 about here]

In line with the Bollen (2007) results, we find that for the period 1992–2002 the volatility of flows to SRI funds is lower than for the conventional funds, independent of the size of the matching group. For the group of conventional funds matched 1 to 1 and matched 1 to 5, the mean of the volatilities is 0.11. In contrast, the mean of volatilities for the SRI funds is lower at 0.09. The difference is statistically significant at the 5% and 10% level for the smaller and larger control groups, respectively.

However, when the time period for the analysis is extended to include the years from 2003 through 2011, the differences between the volatilities of the monthly flows for SRI funds versus conventional funds are much smaller and no longer statistically significant, a result that is different from that of Bollen (2007). This result is consistent with the hypothesis that in earlier times such as during the period of his study, SRI investing was more of a niche way of allocating money. However, given the increase in the pool of SRI investors in terms of size and type of investors (U.S. Social Investment Forum (2012)), the investment style has become more mainstream.¹⁸ Thus, one would expect that the investment patterns of these investors would have changed as well to be more similar to that of conventional funds. Our examination shows that with this passing time and an increasing investor base, the volatilities of the fund flows for SRI and conventional mutual funds have converged.

We next test for whether there have been corresponding changes over time in the flow-performance sensitivity of SRI funds as compared to conventional funds. Previous research for

¹⁸ By 2003, there were only 200 mutual funds incorporating ESG criteria and their total net assets reached USD 151 billion. In comparison with the end of 2011, the SRI segment of mutual fund industry was four times smaller in terms of total net assets (see U.S. Social Investment Forum (2012)).

the U.S. and other markets shows that the flow-performance relationship for mutual funds tends to exhibit convexity (see Sirri and Tufano (1998), Ferreira et al. (2013)). That is, investors direct their money to fund managers according to past fund performance, but the flow-performance relationship is more convex when investors pursue winner funds as compared to when they sell losers. With respect to SRI funds, Benson & Humphrey (2008) show that SRI investors are less likely to change mutual funds. They point out that because these funds tend to have unique investment criteria, the SRI investors have a lack of alternative funds and will thus tolerate poorer performance than other investors. However, they find diverse results with regard to the sensitivity SRI investors display toward fund performance. In Bollen's (2007) tests of flow-performance sensitivity, he finds weak evidence that cash outflows from SRI funds are less sensitive to negative returns. He also shows that new money flows into SRI funds are more sensitive to lagged positive returns than new money flows into conventional funds. A later study by Renneboog et al. (2011), using an international sample, concludes that SRI investors appear to be less concerned than conventional investors with a fund's underperformance, i.e., the SRI investors are less sensitive to negative performance.

We examine the flow-performance relationship for our SRI and conventional fund sample for our later sample period. We first examine whether SRI funds' higher inflows over the sample period still hold once we have controlled for fund flow performance sensitivity and other fund characteristics. We then test for differences in flow-performance sensitivity between SRI funds and conventional funds.

A common approach to examining the flow-performance relationship is the piecewise linear regression proposed by Sirri and Tufano (1998), and recently used by Ferreira et al. (2013) and Sialm et al. (2015) based on defining three linear segments in the flow-performance relationship. In each quarter, fractional performance ranks ranging from zero to one are assigned to funds according to their average performance. We use two proxies of fund performance: raw returns in the past four quarters or four-factor alphas estimated for the past 36 months' returns.

In the flow-performance regression, we include fund characteristics as controls (lagged by one quarter): volatility, measured by the standard deviation of monthly returns over the

previous 12 month, the flows over the previous quarter, the log of total net assets, the total expense ratio, the portfolio turnover and the log of fund age in years. We also include an indicator variable in each regression to capture the flows to SRI funds independent of the flow-performance sensitivity and the fund characteristics that attract flows. We use three different SRI indicator variables. We use *SRI* to distinguish SRI funds from conventional funds. *US SIF* denotes SRI funds with membership in the U.S. *SIF. Number of screens* measures the number of ESG filters used by an SRI fund for stock selection.¹⁹ In the case of conventional funds, each of these indicator variables will be zero.

The dependent variable in the regression is the quarterly flow given by equation (4). We consider the following piecewise linear regression, with the cut-offs 20/60/20:

$$\begin{aligned} Flow_{i,t} = & Intercept + \beta_1 LOW_{i,t-1} + \beta_2 MID_{i,t-1} + \beta_3 HIGH_{i,t-1} + \beta_4 Volatility_{i,t-1} \\ & + \beta_5 LagFlow_{i,t-1} + \beta_6 Lag_log_Size_{i,t-1} + \beta_7 Lag_Expense_Ratio_{i,t-1} \\ & + \beta_8 Lag_Turnover_{i,t-1} + \beta_9 Lag_log_Age_{i,t-1} \\ & + \beta_{10} SRIINDICATOR_{i,t-1} \quad (5) \end{aligned}$$

where *LOW*, *MID* and *HIGH* are defined as

$$\begin{aligned} LOW_{i,t-1} &= \min(0.2, Rank_{i,t-1}), \\ MID_{i,t-1} &= \min(0.6, Rank_{i,t-1} - LOW_{i,t-1}), \\ HIGH_{i,t-1} &= RANK_{i,t-1} - MID_{i,t-1} - LOW_{i,t-1}, \end{aligned}$$

The results of these regressions are reported in Table 7. The coefficients for the control variables confirm that larger and older funds receive less percentage flow than other funds. Consistent with previous research (e.g., Sirri and Tufano, 1998 and Ferreira et al., 2013), we find that the flow-performance relationship is performance sensitive at the lowest performance quintile, relatively flat in the middle performance quintiles and even more sensitive at the top performance quintile. In the case of raw returns used as a proxy of fund performance, the sensitivity for the top-performing quintile is around 51.55% (0.1564/0.1032) higher than in case of the bottom quintile. For the four-factor alpha measure of performance, the differences between quintiles are even more pronounced and reach the level of 62.43% (0.1137/0.07).

¹⁹ Lee, Humphrey, Benson and Anh (2010) find that the return on SRI funds is related to their screening intensity, i.e., number of screens.

During our sample period the volatility of returns has a negative impact on fund flows. We also find autocorrelation in the fund flows as the lag fund flow variable has a statistically significant coefficient at the 1% level.

[Insert Table 7 about here]

The results also show that having a higher socially responsible profile creates an opportunity for funds to attract additional money after controlling for the flow-performance convexity and other fund characteristics. The coefficients for the SRI proxies (*SRI*, *US_SIF* and *Number of Screens*) are all positive and statistically significant. Thus, SRI funds receive additional flows even after controlling for fund characteristics and the flow-performance relationship.

In order to test whether the flow-performance relationship for SRI mutual funds is similar to conventional funds, we run multiple piecewise regressions and test the hypothesis of equal coefficients. The results of the Wald tests are summarized in Table 8, which consists of three panels: the top panel describes the results for SRI funds, the middle for conventional funds and the bottom panel presents the results of tests comparing the flow-performance sensitivity of the two groups of mutual funds. We find that the flows to both SRI funds and conventional funds are more sensitive to high performance than to low performance. Over the entire sample period, the flows to SRI funds, in comparison with conventional funds, is nearly three times more sensitive to the highest performance, a result primarily driven by the latter part of the sample period. On the other hand, in the latter part of the sample period, there is no significant difference in responsiveness to underperformance between investors in SRI funds and investors in conventional funds suggesting that SRI fund investors are no longer more resilient to poor performance as would be expected if they are no longer niche fund investors with fewer alternative fund opportunities.

[Insert Table 8 about here]

4. Funds' ESG exposures

In the analysis thus far we have made two implicit assumptions. First, we have assumed that the self-defined SRI funds actually have ESG profiles that are more rigorous than the conventional funds. Second, we have assumed that these ESG profiles are persistent through time. We examine the validity of these assumptions in this section.

A problem with identifying and measuring an SRI fund's ESG profile is that, as discussed earlier, these types of funds have many different approaches to their portfolio formation decisions. Further, the managers of these funds often use qualitative methods to describe their approach to socially responsible investing in their communications with shareholders (e.g., advertising, website information or prospectuses). In order to compare ESG profiles across funds, we need a quantitative approach. Consequently, we develop ESG profiles for the funds in our sample by approximating the funds' ESG exposures using a research firm's ratings of common stocks held by the funds. Specifically, we estimate each fund's ESG score from the MSCI ESG Research (formerly KLD) ratings on their portfolio firms. We chose the MSCI ratings due to the coverage and history of that rating service.²⁰ Since the early 2000s, MSCI ESG and its predecessors have been formulating indicators for up to 3000 of the largest U.S. companies by market capitalization. The ratings cover seven major categories of social responsibility: community (COM), corporate governance (CGOV), diversity (DIV), employee relations (EMP), environment (ENV), human rights (HUM) and products (PRO). MSCI ESG also provides exclusionary screening on business activities related to alcohol, gambling, firearms, the military, nuclear power and tobacco (see KLD Research & Analytics (2006)).²¹

According to MSCI, the ESG score for a company consists of the sum of its strengths less its concerns, both of which are measured as binary indicators on a number of dimensions. MSCI bases the strengths (or concerns) as their assessments of the firm's social responsibility (or irresponsibility) in a given category. Within the seven categories, the MSCI ESG dataset includes over 80 binary indicators of whether or not a given company meets the criteria for a

²⁰ We identify five other institutions/organizations evaluating the level of social responsibility among U.S. listed companies: Bloomberg, IW Financial\Ethical Investment Research Service, FTSE Group, GMI Ratings, and Trucost, but they did not have the depth of historical data that KLD has.

²¹ A number of studies have used the KLD data as measurements of firms' ESG or CSR exposures, e.g., Waddock (2003), Statman and Glushkov (2009), Hong and Liskovich (2016).

strength or concern. The total ESG score for a company can be estimated as an aggregate for the seven main MSCI categories.

We calculate the MSCI ESG profile for a given mutual fund in each year by summing over all holdings in the fund, the product of the fund's proportional holding in a given company (by value weight) and the firm's total ESG score. In Table 9, we report the analysis of the percentage differences in scores for the SRI funds and conventional funds in our sample. The table is divided into two panels. Panel A reports results for positive ESG screening criteria and Panel B for negative screening criteria, i.e., exclusionary screens. For each quarter in the period Q2 2002 through Q4 2011, we estimate exposure to ESG values by taking the mean across funds for a given group.²² The percentage difference is defined as the average MSCI score for SRI funds minus the average MSCI score for the group of conventional funds divided by the average MSCI score for SRI funds. In each case, we provide a *t-statistic* for whether the difference is statistically different than zero.

[Insert Table 9 about here]

Panel A of Table 9 summarises the results for the seven major categories of positive ESG screening criteria. The percentage differences range between -11.6% and 90.4% in comparison with the control group that contains 1 matched fund for each SRI fund. For the control group that contains 5 matched conventional funds for each SRI fund and for the entire sample of conventional funds, the percentage differences range from -12.7% to 105.6%. For five of the seven categories (corporate governance, human rights, environment, employee relations and product), the differences are positive and statistically significant (indicating that as expected, SRI fund portfolio companies have higher ESG profiles). On the other hand, our analysis shows that the percentage differences for the MSCI ESG category, Community, are very small and insignificant. Further, the differences for the MSCI ESG category, Diversity, are negative and statistically significant in the two groups of matched funds (but not compared to all conventional funds). It appears to be the case that firms of all different types are focusing on improving the community and diversity aspects of their firms.

²² We begin this analysis in 2002 because before that period the MSCI data was much more limited in terms of number of firms.

Panel B of Table 9 presents the differences in MSCI scores for SRI funds compared to conventional funds for the exclusionary criteria. The oldest and most common practice among SRI funds is based on negative screening in which these fund managers exclude specific stocks or industries from their portfolios based on social, environmental and ethical criteria. The MSCI ESG Research identifies firms whose products are included in the following common negative screens: alcohol, gambling, firearms, military, nuclear and tobacco. Not surprisingly, across all of these categories, we observe higher exposure to those products for the conventional fund samples. The null hypothesis of the average MSCI ESG score being equal for SRI and conventional funds is rejected beyond the 5% significance level.

An important question with regard to SRI funds' ESG exposures is whether the underlying portfolio companies themselves have increased their ESG profiles (according to MSCI) through corporate actions. Figure 3 depicts the bar graph of the average ESG score of U.S. companies covered by MSCI ESG Research for the 2002–2011 period. The base value for 2002 of 100 or -100 depends on each of the seven categories. In five of the seven categories, we observe an improvement in the MSCI ESG ratings overall. Only in the corporate governance (CGOV) and employee relations (EMP) categories is a decrease in rating reported.²³ Notably in the last decade, companies' ESG scores have improved quite a bit in some categories such as environment (ENV) and community (COM). The average score in the environment category increased from -50 to 550, and the average score for the community category was seven times higher at the end of the sample period than in 2002. The value of the MSCI ESG score overall is 13 times higher. It is also worth noting that the increase in the scores of single companies translates into a higher ESG profile for both SRI and conventional mutual funds. Overall Figure 3 suggests that firms in general have been increasing their ESG profiles over time.

[Insert Figure 3 about here]

²³ Interpreting the results for the corporate governance category is complicated because the MSCI definition of corporate governance is narrower than the one broadly used in other venues. The MSCI definition focuses on the following areas of corporate activity: limited compensation, ownership, transparency, political accountability and other (see KLD Research & Analytics (2006)).

To examine the validity of our second assumption (that SRI funds' ESG profiles are persistent through time), we rank all SRI equity funds, based on the previous 12-month aggregate MSCI ESG profiles for their holdings. The 1/3 of funds with the highest previous period (selection period) profiles are assigned to portfolio I (high ESG score), the 1/3 of funds with the lowest previous period MSCI ESG scores are assigned to portfolio III (low ESG score), with the remaining 1/3 of funds in the middle portfolio. These three equally-weighted portfolios are then held for 12 months before being rebalanced based on their most recent ESG score. This process is continued throughout the sample period, resulting in a time series of monthly ESG scores for all three portfolios. Funds that disappear during the year are included until they disappear, after which the portfolio weights are re-adjusted accordingly. We conduct this analysis for our sample of SRI funds with sufficient coverage by the MSCI ESG database for the SRI mutual funds. For comparison, we also measure the persistence of the control group of conventional funds (matched 1 to 5).

[Insert Table 10 about here]

Table 10 reports the results of the above-described procedure. For all three SRI portfolios, we observe a monotonically decreasing ESG score if we move from high to low past ESG score. Both high and low portfolios for SRI funds offer investors higher exposure to ESG values in all except two categories: community (COM) and diversity (DIV). The MSCI index for SRI fund holdings is around 16.5% higher than for conventional funds in the group with five matched funds. For all examined MSCI categories and fund groups, we observe a positive and statistically significant spread. In addition, we examine the volatility of the scores in each category/group. There is no clear indication that the MSCI scores of SRI funds are less volatile than the ratings for conventional funds, as the differences in the standard deviation of the MSCI index for SRI funds versus conventional funds is not statistically significant. This result implies that SRI and conventional funds expose an investor to a comparable risk of an ESG score change. Mutual funds' ESG scores tend to be persistent through time. The difference between the SRI funds and conventional funds is in the level of exposure to ESG values, not in the variance of the values.

5. Robustness checks

To examine the sensitivity of our results to sample selection, we perform a number of robustness checks. We consider different sub-periods for each part of the above empirical analysis. In order to address potential concerns related to the possibility that reported results are driven by the selection of a particular cut-off level for flow-performance analysis, we consider the 10/80/10 and 30/40/30 levels in addition to the used 20/60/20 level. The change of cut-off level has not impacted our conclusions on the flow-performance sensitivity for SRI funds.

Since the reported results depend on the selection of the control group for conventional funds, we also check whether our results are confirmed for slightly modified matching criteria—only exposure to the Fama-French-Carhart factors is taken into account. In addition to matching 1 to 1 and 1 to 5 with SRI funds, we consider matching 1 to 3 or 1 to 7 with conventional funds. The modifications of matching criteria do not impact our main results. In summary, the robustness tests indicate that the empirical results are robust to the sample selection.

6. Conclusions

In this paper, we examine the characteristics of socially responsible funds (SRI funds) using a large sample of equity funds between 1999 and 2011. We scrutinize the investment patterns of SRI investors across time and also use exogenous events to understand how flows to SRI funds may be driven by investor preferences during times of scandals or major corporate environmental disasters. In order to further understand the differences between investors in SRI and conventional funds, we compare the flow-performance convexity for both groups. The analysis of actual money flows and flow sensitivity to a fund's performance delivers several novel findings. First, after controlling for known factors that affect fund flows, we show that SRI funds have attracted more flows, on average, than conventional funds over our sample period and that these SRI fund flows have been consistently positive for almost all periods. This result is robust to the selection of the proxy used to identify the degree to which a fund is investing in an SRI manner. Second, the investigation of the actual money flows to SRI funds

shows that, in contrast to conventional funds, there was a positive net flow in all but two quarters during the 1999-2011 period. Third, after the major corporate environmental disasters we study (BP oil spill and the Fukushima Daiichi nuclear meltdown) and the accounting scandals, SRI funds show a statistically significant inflow of money not related to changes in market or industry conditions.

Our results have assumed that SRI funds have higher exposure to ESG values and that these higher exposures are persistent through time. We test these assumptions and find that in terms of ESG scores approximated by the MSCI ESG ratings, the sample SRI funds dominate non-SRI funds in all categories with the exception of community and diversity. We also find the ESG scores to be persistent through time, thus suggesting that managers exhibit a relatively constant approach to their portfolio composition in terms of ESG profiles.

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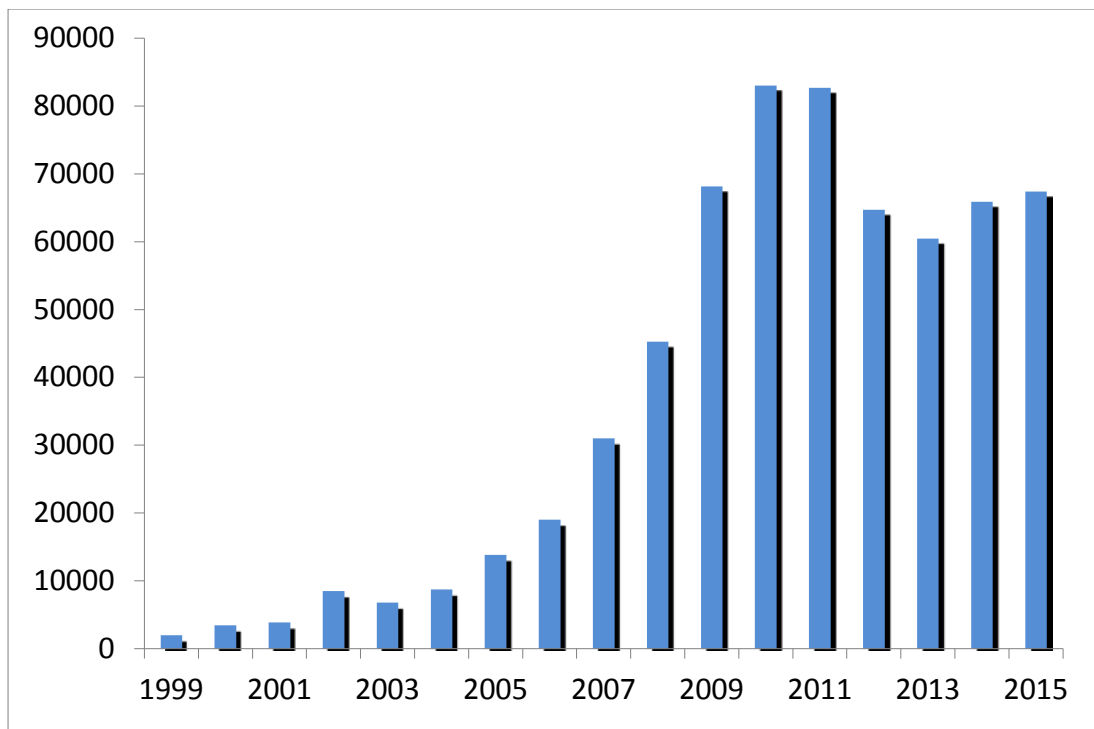


Figure 1: Growth in news stories related to social responsibility. This graph illustrates the number of news stories for each year mentioning green energy, social responsibility, socially responsible investing, sustainability, or environmental, social and governance.

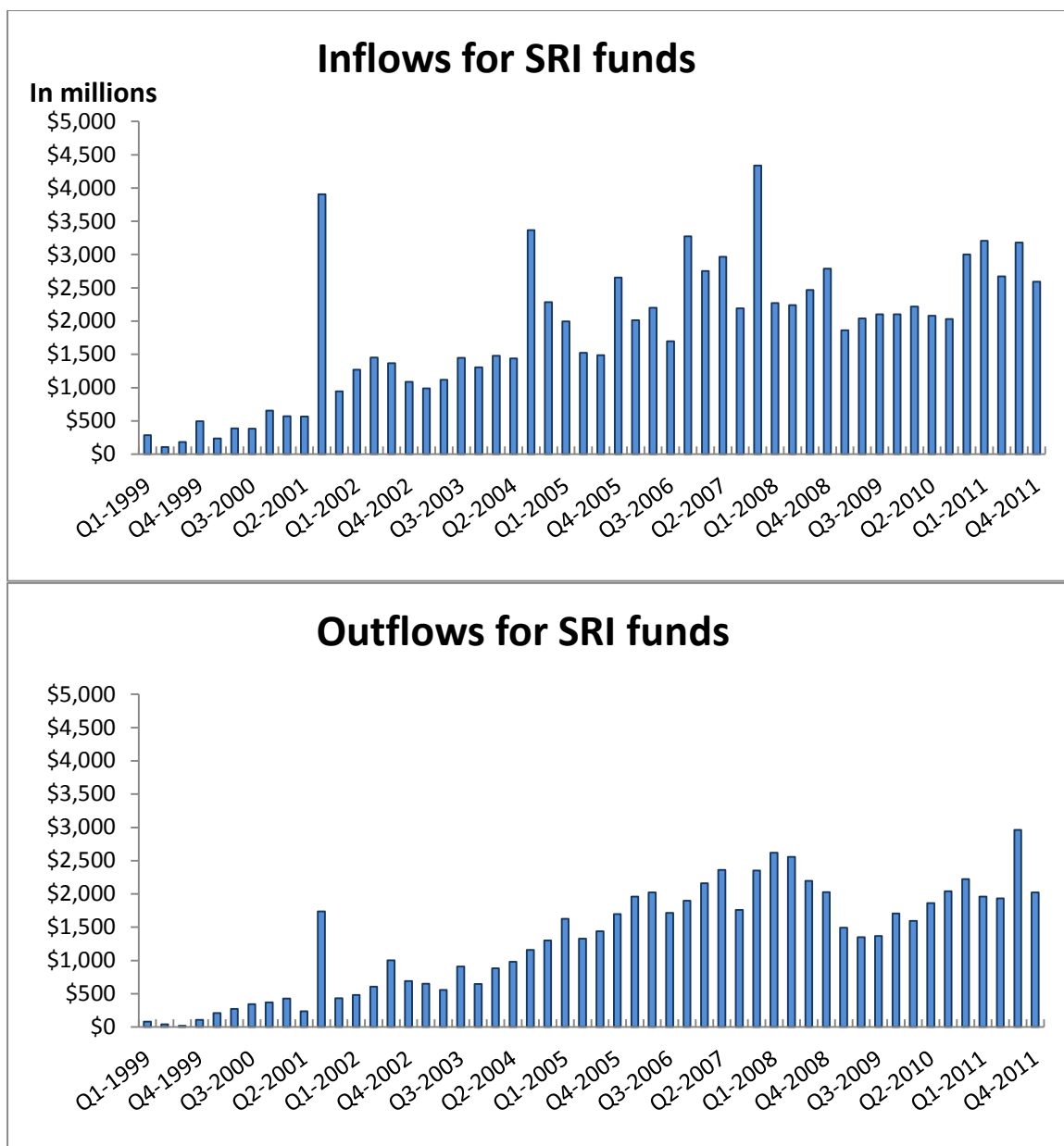


Figure 2: Inflows and outflows over time for sample SRI funds. The upper graph presents the aggregate monthly inflows to the sample SRI funds over the 1999 through 2011 period, where inflow is defined as the sum of new share sales (including exchanges) and reinvestment of dividends. The lower graph presents the aggregate monthly outflows from the SRI funds, where outflow is defined as the value of shares redeemed and repurchased. The data were sourced from SEC N-SAR filings available on the website of the U.S. Securities and Exchange Commission (<http://www.sec.gov/edgar.shtml>).

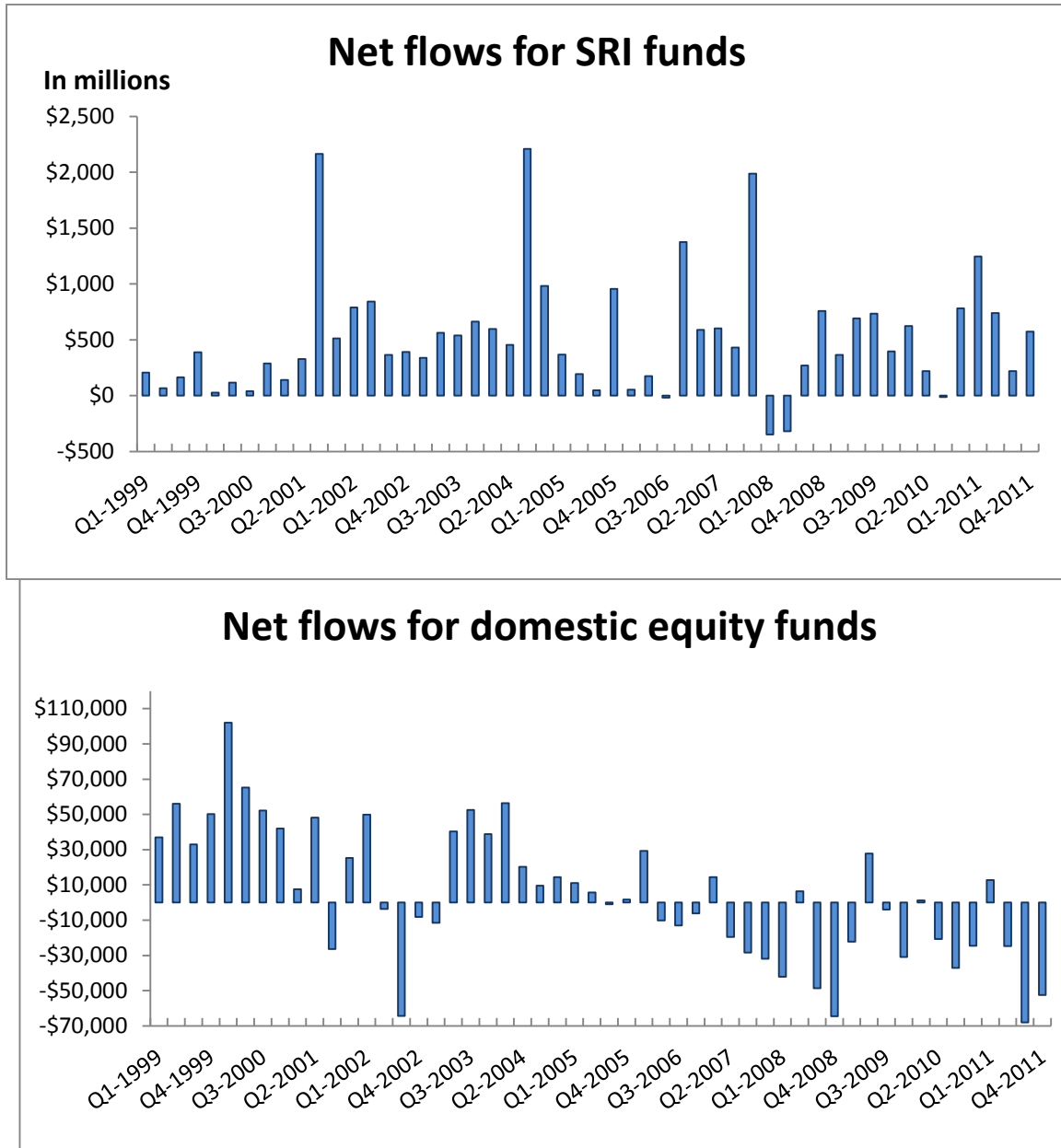


Figure 3: Net flows for SRI funds compared to U.S. domestic equity funds

The upper graph presents the aggregate monthly net flows for U.S. SRI funds, where net flows measure the differences between inflows and outflows. The inflow is defined as the sum of new share sales (including exchanges) and reinvestment of dividends. The outflow is defined as the NAV of shares redeemed and repurchased. The lower graph presents the aggregate monthly net flows for U.S. domestic equity funds. The data for the SRI funds were manually extracted from semiannual N-SAR filings and the data for the domestic equity funds were sourced from the Investment Company Institute (ICI).

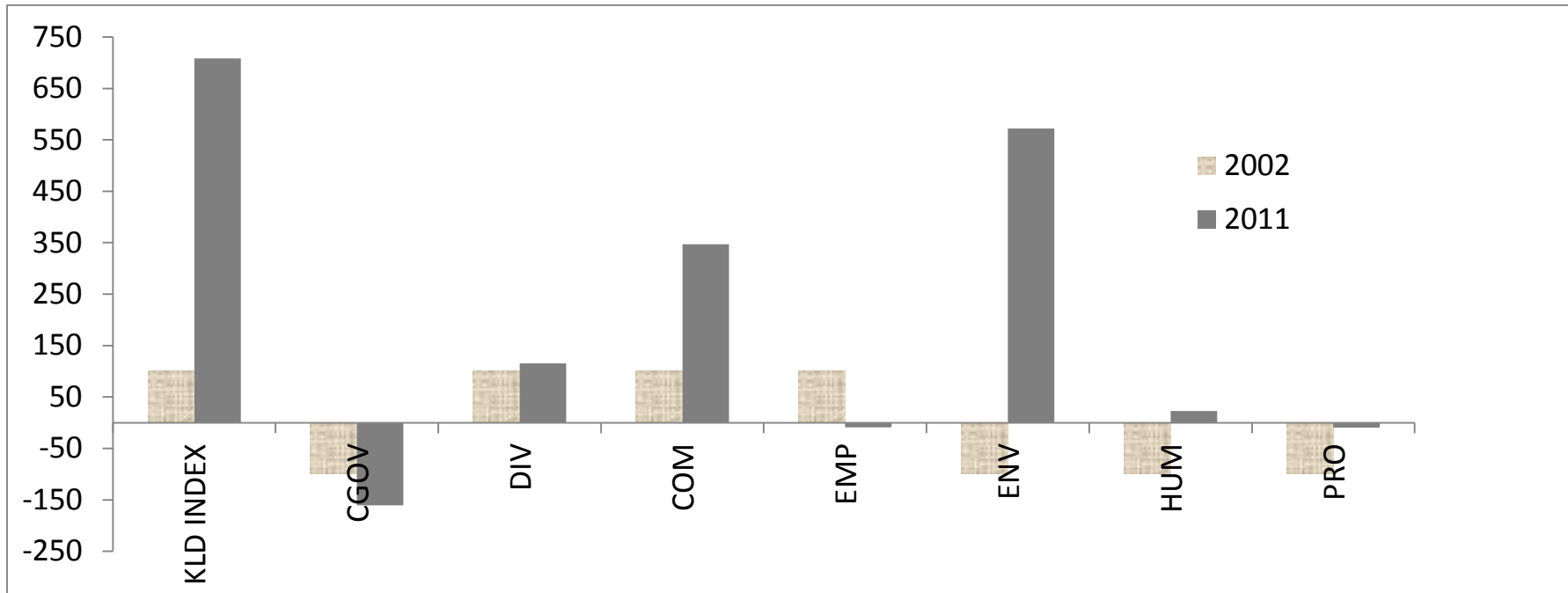


Figure 4: The comparison of MSCI ESG scores for U.S. companies

The bar graph presents the average ESG score for U.S. companies covered by MSCI ESG Research for the sample period 2002–2011. The base value for each category is 100 or -100. The rating covers seven major categories of social responsibility: community (COM), corporate governance (CGOV), diversity (DIV), employee relations (EMP), environment (ENV), human rights (HUM) and products (PRO). The MSCI ESG index for a company is the sum of a large number of binary indicators for each of the seven major categories of social responsibility.

Table 1: Summary statistics of SRI funds and matching conventional funds

This table presents cross-sectional statistics for SRI funds and two groups of matching conventional funds for the period January 1999 through December 2011. *Matched Funds* are defined by matching conventional funds with SRI funds based on the fund's distance between estimated Fama-French-Carhart factors and TNA. For each SRI fund, we match five corresponding funds characterized by the lowest distances. *Funds with >90% MSCI ESG database coverage* is a group of funds where each has on average at least 90% or more of its holdings rated by MSCI ESG. The equality of means and medians for the sample of SRI funds and conventional funds was tested. *(at 10%),**(at 5%), and ***(at 1%) indicate whether the mean or median for the sample of conventional funds is statistically different than the mean or median recorded for the sample of SRI funds.

	<i>SRI funds</i>			<i>Matched Funds (1 to 5)</i>			<i>Funds with >90% MSCI ESG database coverage</i>		
	<i>Mean</i>	<i>Median</i>	<i>Standard deviation</i>	<i>Mean</i>	<i>Median</i>	<i>Standard deviation</i>	<i>Mean</i>	<i>Median</i>	<i>Standard deviation</i>
<i>Age (in years)</i>	12.47	11.35	9.76	15.14**	12.44***	12.38	15.56***	13.24***	12.06
<i>TNA (total net asset)(in millions)</i>	163.54	47.13	339.88	222.48	86.17***	394.31	417.91***	79.78***	1874.95
<i>Turnover ratio (in %)</i>	71.29	61.69	56.07	90.67***	76.89***	76.87	90.66***	77.03***	74.38
<i>Expense ratio (in %)</i>	1.37	1.26	0.96	1.32	1.30***	0.32	1.32	1.31***	0.32
<i>Mean monthly return (in %)</i>	0.30	0.34	0.45	0.37	0.36	0.51	0.38*	0.38***	0.45
<i>Standard deviation of returns</i>	4.98	4.79	1.16	4.49	4.68	1.27	4.99	4.80	1.28

Table 2: Comparisons of four-factor alphas for SRI and conventional funds

This table reports descriptive statistics for annual four-factor alphas estimated for the period 1999–2011 for SRI funds and two groups of matching conventional funds. *Matched Funds* are defined by matching with SRI funds based on the distance between the fund's estimated Fama-French-Carhart factors and TNA. For each SRI fund, we match five corresponding funds characterized by the lowest distances. *Funds with >90% MSCI ESG database coverage* is a group of funds where each has on average at least 90% or more of its holdings rated by MSCI ESG. The hypothesis of equal means of alphas for the sample of SRI funds and conventional funds was tested. *, **, and *** indicate the significance level at the 10%, 5%, and 1% levels, respectively.

	<i>Mean</i>	<i>Standard deviation</i>	<i>25th Percentile</i>	<i>Median</i>	<i>75th Percentile</i>	<i>Test for equality of mean of alphas</i>
<i>US SRI funds</i>	-1.63	4.42	-2.45	-1.14	0.63	
<i>Matched Funds (1 to 5)</i>	-0.93	2.80	-2.25	-0.90	0.46	1.58 (0.1174)
<i>Funds with >90% MSCI ESG database coverage</i>	-0.95	2.72	-2.27	-0.89	0.52	1.59 (0.1144)

Table 3: Comparison of inflows and outflows to SRI funds versus domestic equity funds

The table reports the analysis of the monthly ratios of U.S. equity funds' inflows to outflows. Panel A presents summary statistics for the ratios for the 1999–2011 period. The funds are divided into two groups based on the median of their SRI scores for a given category. *t* –statistics for the test on equal means for the high-score versus the low-score group are reported. Panel B reports the coefficients and associated *t*-statistics for the regression: $Ratio_SRI_t = \beta * (Ratio_domestic_equity_funds_{t-1}) + \gamma * Time_t + C$, where *Ratio_SRI* and *Ratio_domestic equity_funds* are the monthly ratios of inflows to outflows for equity SRI funds and domestic equity funds, respectively. The variable *Time* measures the number of months from the beginning of the sample. All *t*-statistics are corrected for heteroskedasticity and autocorrelation with the Newey-West procedure. The *p*-values are reported in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A. Ratios of inflows to outflows

	<i>Mean</i>	<i>STD</i>	<i>25% Percentile</i>	<i>Median</i>	<i>75% Percentile</i>	<i>t-statistic from test of difference (high =low)</i>
<i>SRI funds</i>	1.7096	1.1052	1.1052	1.4452	1.8366	8.47*** (0.0001)
<i>All US domestic equity funds</i>	1.0343	0.1601	0.9279	1.0234	1.5113	
<i>SRI funds divided by membership in SIF</i>						
<i>Members of SIF</i>	1.8522	1.1822	1.0612	1.6694	2.2317	2.37* (0.0191)
<i>Non-members SIF</i>	1.5949	1.2062	0.9933	1.2795	1.6437	
<i>SRI funds divided by number of screens</i>						
<i>High number of screens</i>	1.8224	1.1177	1.1504	1.5766	2.1590	2.20* (0.0290)
<i>Low number of screens</i>	1.5552	1.4611	0.9047	1.2030	1.5377	

Panel B. Regressions of inflow-outflow ratios

	β	γ	C	Adj. R-sq
<i>SRI funds</i>	1.2660*** (0.0010)	-0.0021 (0.1551)	1.6562*** (0.0001)	0.1413
<i>SRI funds- members US SIF</i>	2.1098*** (0.0003)	-0.0017 (0.9484)	1.8420*** (0.0001)	0.1282
<i>SRI funds- non-members US SIF</i>	0.3470 (0.5231)	-0.0046* (0.0702)	1.6522*** (0.0001)	0.0355
<i>SRI funds with high # screens</i>	1.7908*** (0.0007)	-0.0027 (0.2100)	1.8384*** (0.0001)	0.1853
<i>SRI funds with low # screens</i>	0.6865 (0.2804)	-0.0044 (0.1672)	1.7470*** (0.0002)	0.0228

Table 4: Differences-in-differences tests of the ratio of SRI fund flows

This table presents the results of differences-in-difference tests of SRI fund flows versus the aggregated flows to conventional funds using the following regression model: $\log(Inflow_i) - \log(Outflow_i) = \beta_0 + \beta_1 Time_i + \beta_2 SRI + \beta_3 Event_i + \beta_4 Event_i * SRI + \varepsilon_{it}$. The inflows and outflows are measured separately for all SRI and conventional funds for the period January 1999-December 2011. *SRI* is an indicator variable for SRI funds. *Event* is an indicator variable for months in which financial scandals or environmental disasters occurred. *ENV_disaster* is a dummy variable indicating the three-month periods starting with the beginning of the environmental disaster caused by the BP oil spill (April 2010) or the failure of the Fukushima Daichi nuclear plant (March 2011). *ACC_scandals* indicates the period of accounting scandals from October 2001-March 2002. *FINC_crisis* is an indicator for the equity market financial crisis period between September 2008 and February 2009. *ACC_FINC_ENV_event* is an indicator variable whether in a given month one of these events occurred. All *t*-statistics are corrected for heteroskedasticity and autocorrelation using the Newey-West method. The *p*-values are reported in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
Constant	0.2715*** (0.0001)	0.2774*** (0.0001)	0.2512*** (0.0009)	0.2640*** (0.0001)
Time	-0.0032*** (0.0001)	-0.0033*** (0.0001)	-0.0029*** (0.0001)	-0.0030*** (0.0001)
SRI	0.3767*** (0.0001)	0.3936*** (0.0001)	0.3858*** (0.0001)	0.3964*** (0.0001)
ACC_FINC_ENV_event	0.0338 (0.3967)			
ENV_event		0.1400** (0.0077)		
ACC_scandals			0.0165 (0.7145)	
FINC_crisis_08				-0.0508 (0.3590)
ACC_FINC_ENV_event*SRI	0.1904** (0.0387)			
ENV_disaster*SRI		0.1299* (0.0744)		
ACC_scandals*SRI			0.3350*** (0.0098)	
FINC_crisis_08*SRI				0.0604 (0.4696)
Adj. R²	0.3937	0.3950	0.3993	0.3850
Observations	312	312	312	312

Table 5: Comparisons of inflows and outflows to SRI funds with environmental screens versus those without environmental screens after environmental disasters

This table reports summary statistics of the monthly ratios of U.S. equity funds' inflows to outflows in three-month periods starting with the beginning of the environmental disasters (the BP oil spill and the failure of the Fukushima Daichi nuclear plant). The statistics are reported for SRI funds with at least one environmental (ENV) screen and for SRI funds with no environmental screens. 60% of SRI funds have at least one ENV screen. *t* –statistics for the test on equal means for the environmentally-oriented funds versus the non the environmentally-oriented are reported. The *p*-values are reported in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

<i>Timing relative to event</i>		<i>Mean</i>	<i>STD</i>	<i>25% Percentile</i>	<i>Median</i>	<i>75% Percentile</i>	<i>t-statistic from test of difference</i>
<u><i>Month +1</i></u>	<i>SRI funds with ENV screens</i>	9.5521	38.0320	0.5891	1.2085	3.3648	2.13** (0.0359)
	<i>SRI funds with no ENV screens</i>	1.2854	1.3352	0.5120	0.8974	1.8014	
<u><i>Month +2</i></u>	<i>SRI funds with ENV screens</i>	4.9198	16.6199	0.6638	1.5139	3.5600	2.04** (0.0439)
	<i>SRI funds with no ENV screens</i>	1.3379	2.3878	0.3378	0.6955	1.3066	
<u><i>Month +3</i></u>	<i>SRI funds with ENV screens</i>	5.8901	17.9805	0.5463	1.2597	2.6147	1.76* (0.0801)
	<i>SRI funds with no ENV screens</i>	2.0895	9.3194	0.3373	0.7852	1.3562	

Table 6: Monthly fund flow volatility for SRI and non-SRI funds

This table presents the cross-sectional distributions of the monthly volatility in the percentage of fund flows for SRI fund and non-SRI fund samples. The group of non-SRI funds is defined by matching with SRI funds based on the distance between the funds' estimated Fama-French-Carhart factors and TNA. For each SRI fund, we matched based on either 1 or 5 corresponding conventional funds characterized by the lowest distances. The results for each matching process are reported in separate panels.

	1992-2002		1999-2011	
	<i>SRI funds</i>	<i>Non SRI funds</i>	<i>SRI funds</i>	<i>Non SRI funds</i>
	Matched 1 to 1			
25th	0.0435	0.0630	0.0315	0.0397
Median	0.0715	0.1018	0.0684	0.0689
75th	0.1217	0.1450	0.1042	0.0977
Mean	0.0856	0.1056	0.0765	0.0792
T-Stat		1.7142*		0.3918
(p-value)		(0.0927)		(0.6960)
	Matched 1 to 5			
25th	0.0435	0.0717	0.0315	0.0614
Median	0.0715	0.1038	0.0684	0.0717
75th	0.1217	0.1389	0.1042	0.0921
Mean	0.0856	0.1113	0.0765	0.0783
T-Stat		2.6526**		0.3468
(p-value)		(0.0101)		(0.7294)

Table 7: Flow-performance relationship

This table presents the analysis of the flow-performance relationship for the conventional and SRI fund samples over the 1999–2011 period. A piecewise linear regression is used to define three linear segments in the flow-performance relationship. In each quarter, fractional performance ranks ranging from zero to one are assigned to funds according to their average raw returns in the previous four quarters (Models 1–3) or their four-factor alphas, calculated using the past 36 months of returns (Models 4–6). Control variables, lagged by one quarter, include volatility (*Volatility*), measured by the standard deviation of monthly returns over the previous 12 month, previous flows (*Previous flows*), log of total net assets (*TNA*), expense ratio (*Expense Ratio*); portfolio turnover (*Turnover*); and log of fund age (*Age*). *SRI* denotes whether a fund is recognized as a socially responsible fund by either Morningstar or Bloomberg. *US SIF* denotes whether a fund is a member of the US SIF organization. *Number of screens* measures the number of filters used by SRI fund management in their security selection process. The standard errors are clustered by fund. The significance levels, denoted by *, **, and ***, indicate whether the results are statistically different from zero at the 10%, 5%, and 1% significance level, respectively.

	<i>Model specifications</i>					
	<i>Raw returns</i>			<i>4 factor alpha</i>		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Low</i>	0.1037*** (7.79)	0.1034*** (7.76)	0.1032*** (7.75)	0.0702*** (4.23)	0.0699*** (4.21)	0.0700*** (4.22)
<i>Medium</i>	0.0529*** (16.86)	0.0529*** (16.90)	0.0530*** (16.9)	0.0636*** (19.10)	0.0637*** (19.13)	0.0636*** (19.13)
<i>High</i>	0.1563*** (8.66)	0.1560*** (8.66)	0.1564*** (8.06)	0.1140*** (5.64)	0.1126*** (5.59)	0.1137*** (5.63)
<i>Volatility</i>	-0.1774*** (4.72)	-0.1762*** (4.69)	-0.1765*** (4.70)	-0.1206*** (3.11)	-0.1189*** (3.07)	-0.1194*** (3.08)
<i>Previous flows</i>	0.3237*** (31.44)	0.3235*** (31.43)	0.3239*** (31.46)	0.3249*** (32.03)	0.3247*** (32.02)	0.3250*** (32.05)
<i>Total Net Assets</i>	-0.0041*** (9.84)	-0.0041*** (9.95)	-0.0041*** (9.87)	-0.0058*** (13.92)	-0.0059*** (14.04)	-0.0058*** (13.95)
<i>Expense Ratio</i>	-0.0038 (0.93)	-0.0032 (0.87)	-0.0031 (0.85)	-0.0030 (0.34)	-0.0028 (0.32)	-0.0027 (0.31)
<i>Portfolio Turnover</i>	-0.0004 (0.07)	-0.0005 (0.09)	-0.0004 (0.07)	0.0002 (0.03)	0.0006 (0.08)	0.0001 (0.02)
<i>Age</i>	-0.0099 (9.72)	-0.0100 (9.66)	-0.0100 (9.74)	-0.0076*** (7.67)	-0.0076*** (7.64)	-0.0077*** (7.70)
<i>SRI</i>	0.0106*** (3.71)			0.0103*** (3.65)		
<i>US SIF</i>	-	0.0220*** (4.19)		-	0.0214*** (4.31)	
<i>Number of Screens</i>	-	-	0.0010*** (3.66)	-	-	0.0099*** (3.47)
<i>R</i> ²	0.2103	0.2105	0.2103	0.2081	0.2083	0.2080
<i>Time-fixed effects</i>	Yes					

Table 8: The flow-performance relationship sensitivity analysis

This table presents the analysis of the flow-performance relationship for the conventional and SRI fund samples for the 1999–2011 period. A piecewise linear regression is used to define three linear segments in the flow-performance relationship. In each quarter, fractional performance ranks ranging from zero to one are assigned to funds according to their average raw returns in the past four quarters (Models 1–3) or four-factor alphas calculated using the past 36 months returns. The first two panels are divided into two parts depending on the past performance measure. The last column in each part presents the difference between high and low coefficients for each sub-period using a Wald test to test whether this difference is significant. Control variables (not reported) are lagged by one quarter, and include fund size, measured by log TNA (Lag_log_Size), fund age (Lag_log_Age), expense ratio (Lag_Expense Ratio); turnover (Lag_Turnover); and flow (Lag_flow). Volatility is measured by the standard deviation of monthly returns over the previous 12 months. The regressions include time fixed effects. In the last panel, the results of a test of equal sensitivity of flows to the performance of SRI and non-SRI funds are reported. The standard errors take into account clustering by funds. The significance levels are denoted by *, **, and *** indicate whether the results are statistically different from zero at the 10%, 5%, and 1% significance level, respectively.

Type	Period	Raw return				4 factor alpha			
		High	Medium	Low	High-Low	High	Medium	Low	High-Low
SRI funds	1999-2004	0.3611** (2.53)	0.0955*** (4.11)	-0.1553* (1.96)	0.5164*** (11.69)	0.1004 (0.68)	0.0477 (1.53)	-0.1464 (1.17)	0.2468 (2.05)
	2005-2011	0.4194*** (2.72)	0.0306* (1.73)	0.1577* (1.95)	0.2617*** (2.65)	0.5083*** (4.89)	0.0301** (2.05)	0.1564* (2.09)	0.3525*** (9.27)
	1999-2011	0.4043*** (3.61)	0.0481*** (3.61)	0.0551 (0.98)	0.3494*** (8.60)	0.3488*** (3.75)	0.0378*** (2.68)	0.0766 (1.05)	0.2782*** (8.67)
Non SRI funds	1999-2004	0.1718*** (5.52)	0.0636*** (11.95)	0.0943*** (4.52)	0.0775** (4.88)	0.1521*** (4.01)	0.0618*** (10.90)	0.0642*** (2.45)	0.0879*** (3.91)
	2005-2011	0.1436*** (6.53)	0.0470*** (11.56)	0.1078*** (6.29)	0.0358* (1.92)	0.0785*** (3.37)	0.0655*** (15.81)	0.0706*** (3.27)	0.0080*** (0.07)
	1999-2011	0.1468*** (8.09)	0.0530*** (16.56)	0.1068*** (7.85)	0.0400** (3.59)	0.1053*** (5.09)	0.0648*** (18.90)	0.0713*** (4.17)	0.0340*** (1.81)
SRI vs. Non SRI	1999-2004	H0: High(SRI)=High(Non SRI) / H0: Low(SRI)=Low(Non SRI)							
	2005-2011	0.1893 (1.76)		-0.2496*** (9.59)		-0.0517 (0.12)		-0.2106* (2.83)	
	1999-2011	0.2758** (3.22)		0.0499 (0.37)		0.4304*** (9.71)		0.0858 (1.25)	
		0.2575** (5.30)		-0.0517 (0.82)		0.2435** (6.71)		0.053 (0.01)	

Table 9: Comparisons of ESG ratings between SRI funds and conventional funds

This table reports the percentage differences in MSCI ESG ratings between Q2 2002 and Q4 2011 for SRI funds versus matched conventional funds. A positive number indicates that SRI funds have a higher score than a corresponding group of conventional funds. *Matched Funds* are defined by matching with SRI funds based on distance between the funds' estimated Fama-French-Carhart factors and TNA. For each SRI fund, we found exactly 1 or 5 (first and second panel, respectively) corresponding funds characterized by the lowest distance. *Funds with >90% MSCI ESG database coverage* is a group of funds where each has on average at least 90% or more of its holdings rated by MSCI ESG. Panel A provides the percentage differences for the seven major ESG categories, and Panel B provides the differences for the exclusionary factors. The significance levels are denoted by *, **, and *** and indicate whether the results are statistically different from zero at the 10%, 5%, and 1% significance levels, respectively.

Panel A. Seven major ESG categories

	<i>Matched funds (1 to 1)</i>		<i>Matched funds (1 to 5)</i>		<i>Funds with >90% MSCI ESG database coverage</i>	
	<i>Percentage difference in MSCI ESG ratings</i>	<i>T-Stat</i>	<i>Percentage difference in MSCI ESG ratings</i>	<i>T-Stat</i>	<i>Percentage difference in MSCI ESG ratings</i>	<i>T-Stat</i>
<i>MSCI ESG Corp. Governance (CGOV)</i>	16.3981	4.15***	11.8628	5.41***	10.0075	6.02***
<i>MSCI ESG Community (COM)</i>	-0.0023	0.01	-2.2827	-0.77	2.7497	1.37
<i>MSCI ESG Diversity (DIV)</i>	-11.5971	-3.04***	-12.6612	-4.46***	0.2155	0.08
<i>MSCI ESG Human Right (HUM)</i>	23.0472	4.98***	23.0472	3.48***	26.9142	6.69***
<i>MSCI ESG Environment (ENV)</i>	33.3914	3.13***	14.6741	1.78*	43.4646	6.23***
<i>MSCI ESG Employee Relations (EMP)</i>	90.4010	5.38***	14.2163	0.76	105.5893	5.27***
<i>MSCI ESG Product (PRO)</i>	32.5961	5.42***	22.8688	5.46***	23.3412	7.48***
<i>MSCI ESG index (CGOV, COM, DIV, HUM, ENV, EMP, PRO)</i>	13.8692	2.61**	19.1587	4.04***	28.0466	4.57***

Panel B. Exclusionary criteria

	<i>Matched funds (1 to 1)</i>		<i>Matched funds (1 to 5)</i>		<i>Funds with >90% MSCI ESG database coverage</i>	
	<i>Percentage difference in MSCI ESG ratings</i>	<i>T-Stat</i>	<i>Percentage difference in MSCI ESG ratings</i>	<i>T-Stat</i>	<i>Percentage difference in MSCI ESG ratings</i>	<i>T-Stat</i>
<i>MSCI ESG Alcohol (ALC)</i>	119.2982	3.27***	107.8947	2.83***	103.5088	4.71***
<i>MSCI ESG Gambling (GAM)</i>	74.1107	6.32***	43.4783	4.38***	44.4664	5.17***
<i>MSCI ESG Firearms (FIR)</i>	106.7961	3.04***	19.4175	1.00	64.0777	3.49***
<i>MSCI ESG Military (MIL)</i>	37.2947	4.76***	19.5169	2.89***	26.4734	5.20***
<i>MSCI ESG Nuclear (NUC)</i>	61.5191	6.84***	41.4313	3.14***	70.9353	8.74***
<i>MSCI ESG Tobacco (TOB)</i>	119.0840	2.87***	116.0305	2.61**	180.5344	4.10***

Table 10. Persistence in SRI funds and matched funds' ESG ratings

This table presents the results of persistence tests of ESG ratings according to MSCI ESG scores. The results are reported for SRI funds versus matched conventional funds. For each SRI fund, we identify five corresponding *Matched Funds* characterized by the lowest distance between the funds' estimated Fama-French-Carhart factors and TNA. *Funds with >90% MSCI ESG database coverage* is a group of funds where each has on average at least 90% or more of its holdings rated by MSCI ESG. For both classes of funds, we construct three equally weighted portfolios based on the performance in the MSCI ESG category during the previous 12 months. Funds with the highest previous 12-month MSCI ESG score are allocated into portfolio I, and funds with the lowest go into portfolio III. For each portfolio, the panels present the mean and standard deviation MSCI ESG scores and the spread between statistics for portfolios I and III. In each case, the null hypothesis of equal statistics for portfolio I and III is tested. ***, **, * denote statistical significance at the level of 1%, 5% and 10%, respectively.

	Portfolio	<i>SRI funds</i>				<i>Matched funds (1 to 5)</i>				<i>Funds with >90% MSCI ESG database coverage</i>			
		I –(high)	II	III-(low)	Spread (high –low)	I –(high)	II	III-(low)	Spread (high –low)	I –(high)	II	III-(low)	Spread (high –low)
MSCI ESG CGOV	Mean	-0.3545	-0.5464	-0.8448	0.4903***	-0.4147	-0.6406	-0.8579	0.4432**	-0.3935	-0.6443	-0.8499	0.4563***
	Stdev	0.2864	0.2193	0.3660	-0.0796	0.2323	0.2222	0.3124	0.0801	0.2343	0.2238	0.2985	0.0642
MSCI ESG COM	Mean	0.7427	0.4123	0.0638	0.6789***	0.7043	0.4218	0.0736	0.6307***	0.7167	0.4099	0.0702	0.6465***
	Stdev	0.3356	0.3047	0.1192	0.2164**	0.3181	0.3014	0.1439	0.1741*	0.3203	0.2865	0.1443	-0.1760*
MSCI ESG DIV	Mean	2.5045	1.2773	-0.1378	2.6424***	2.5283	1.4214	-0.1051	2.6334***	2.5518	1.4086	-0.2146	2.7665
	Stdev	1.0493	0.7481	0.4594	0.5899	0.9972	0.7592	0.5186	0.4786	0.9159	0.8419	0.5262	0.3897
MSCI ESG HUM	Mean	-0.0435	-0.1088	-0.2741	0.2306***	-0.0473	-0.1753	-0.3062	0.2588***	-0.0443	-0.1716	-0.3094	0.2651***
	Stdev	0.0567	0.0993	0.1866	-0.1299**	0.0662	0.1173	0.1438	-0.0776	0.0637	0.1236	0.1465	0.0828*
MSCI ESG EMP	Mean	0.3608	0.0279	-0.1493	0.5101***	0.2549	-0.0132	-0.1920	0.4470***	0.2280	-0.0096	-0.1851	0.4131***
	Stdev	0.4071	0.2547	0.2551	0.1519	0.3595	0.2753	0.2462	0.1133	0.3355	0.2400	0.2304	0.1051

MSCI ESG ENV	Mean	0.7942	0.2677	-0.0743	0.8685***	0.6565	0.1784	-0.1073	0.7638***	0.6129	0.1359	-0.1290	0.7419***
	Stdev	0.5450	0.2954	0.3543	0.1908	0.4527	0.2675	0.3333	0.1192	0.4601	0.2734	0.3300	0.1301
MSCI ESG PRO	Mean	-0.1292	-0.4508	-0.9375	0.8083***	-0.2093	-0.6401	-1.0478	0.8386***	-0.1816	-0.6455	-1.0707	0.8892***
	Stdev	0.1336	0.2779	0.5146	-0.3810**	0.1965	0.3444	0.4106	-0.2141**	0.1731	0.3463	0.4105	-0.2374**
MSCI ESG index	Mean	3.2470	1.1584	-0.4637	3.7107***	2.7805	1.2210	-0.6068	3.3873***	2.7863	1.0895	-0.7019	3.4882***
	Stdev	1.5818	1.2079	0.7561	0.8257	1.4371	1.3795	0.7082	0.7288	1.4326	1.2797	0.7177	0.7149