Fund flows and performance: new evidence from retail and institutional SRI mutual funds

Fund Flows and Performance: New Evidence from Retail and Institutional SRI Mutual Funds

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Abstract

In this paper we provide a comprehensive analysis of the performance of US SRI mutual funds as well as its relation to the flow of new money that those funds experience in the context of investors sophistication. In particular, we compare the performance of SRI funds with their conventional peers, matched by both managers and characteristics criteria, using several performance measures. We investigate the the role of investors sophistication and its influence on the flow-performance and performance-flow relations within the retail and institutional SRI fund shareclasses. For the analysis of the flow-performance relation we use portfolio approach along with monotonic relation test, while the shape of the flow-performance relation is studied using piecewise linear panel regressions. For the performance-flow relation, the flow and unexpected flow portfolios are formed and their risk-adjusted performance is evaluated. We find that SRI mutual fund sector earns positive abnormal returns before expenses and retail SRI funds outperform their institutional peers both, before and after fees. No differences in performance when we consider SRI and conventional funds run by the same management companies. Moreover, we find a positive flow-performance relation which is convex for retail SRI funds but no convexity is found for the institutional ones. We cannot confirm the smart money effect for retail SRI funds, instead we find a dumb money effect for SRI institutional funds. Our paper provides new insights into the role of the investors sophistication for those relations in the presence of sustainability preferences.

JEL classification: G10, G11, G23
Keywords: SRI investment, retail funds, institutional funds, flow-performance relation, smart money, dumb money

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1 Introduction

Socially responsible investments (SRI) are not new in financial markets, although for a long time they were perceived as a niche by investment companies. It is, however, just over the recent decade when we have witnessed an increasing awareness of environmental, social and ethical issues among majority of investors, leading to a global trend of adding sustainable investments to their portfolios. According to the Forum for Sustainable and Responsible Investment in US (USSIF)[1], in 2010 around 12% of all the assets under professional management in US ($3.1 out of $25.2 trillion), were involved in investments that apply various environmental, social and governance (ESG) criteria in the analysis and portfolio selection process. Ten years later, in 2020 this number increased to 33% ($17.1 out of $51.4 trillion)[2]. This prevailing development of the SRI sector of investment companies was possibly facilitated by the introduction of the principles by regulatory bodies such as United Nations Principles for Responsible Investments or sustainable ratings by Morningstar.[3]

The recent boom of sustainability investment sector also leads to a growth in the literature on the research of SRI/ESG investments. There is a substantial number of studies that evaluate the performance of SRI funds (Statman, 2000; Climent and Soriano, 2011; Alda, 2020) and the relation between their performance and sustainability ratings (Hartzmark and Sussman, 2019; Madhavan et al., 2021). Other strand of the research focuses on the drivers of the sustainable investment demand (Riedl and Smeets, 2017; Cerqueti et al., 2021) and the relation between SRI fund returns and flows (Benson and Humphrey, 2008; Renneboog et al., 2011). Despite the growth of the SRI fund sector and the related academic literature, the analysis of how the investment decisions of SRI mutual fund investors are related to funds performance and the role investors sophistication plays in this process has not been conducted in the literature. This paper fills in the gap.

In our paper we provide a comprehensive analysis of the performance of US SRI mutual funds as well as its relation to the associated flow of new money. Particularly, we consider not only the entire sample of SRI funds but also its retail and institutional shareclasses that represent investors with different levels of sophistication.[4] We consider mutual funds which are labeled as SRI funds by USSIF and the SRI label serves as a quality label of the mutual fund's sustainability rating. SRI mutual funds offer both retail and institutional investors a convenient possibility to accommodate their sustainability preferences without a need of conducting costly and time-consuming screening process. We are then able to analyse the investment decisions of retail and institutional SRI investors in the light of their sustainability preferences.

The empirical analysis in our paper is three-folded. First, we evaluate the performance of SRI mutual funds and its retail and institutional shareclasses and we compare it with the performance of conventional funds. We use two different matching procedures to identify the conventional funds which allows us to control for the managerial skills within the SRI investments. Second, we investigate how SRI funds characteristics and performance impact the amount of money that those funds attract or lose subsequently (flow-performance relation) and whether the investors sophistication plays a role in the flow-performance relation. Third, we study how investment decisions of the SRI mutual fund investors, reflected in the flows of money, are related to the profits they earn subsequently (performance-flow relation), and whether the investors sophistication matters for the performance-flow relation. While the performance of SRI funds has been extensively studied in academic literature, the analysis of the flow-performance and performance-flow relations for retail and institutional SRI shareclasses is what makes a novelty of our paper.

The contributions of our paper can be listed as follows. First, we evaluate and compare the performance of retail and institutional SRI fund shareclasses. While the literature on the performance differences between

[1] USSIF 2020 Report on US Sustainable, Responsible and Impact Investing Trends, USSIF 2010 Report on Socially Responsible Investing Trends in the United States.

[2] In particular, the assets involved in ESG funds under the management of US registered investment companies (mutual funds, exchange-traded funds and closed-end funds) rose from around $320 billion in 2010 to $3.1 trillion in 2020 and most of them were managed by mutual funds.

[3] United Nations Principles for Responsible Investment was launched in 2006 to reflect the increasing relevance of ESG issues to investment practices (Kim and Yoon, 2022). Morningstar published sustainability ratings in 2016 for mutual funds to show fund's involvement in ESG issues (Hartzmark and Sussman, 2019).

[4] Our focus on a category of SRI mutual funds is motivated by a recent study of Hartzmark and Sussman (2019) who show that while investors value sustainability, in line with psychological literature they tend to respond to extreme indicators of this feature and ignore more detailed information.

retail and institutional mutual funds is in general relatively large, no attention has been devoted to analyse the performance of retail and institutional funds in the context of sustainability preferences. Second, we adopt two matching procedures to compare the performance of SRI funds with their conventional peers: (i) we match SRI funds with the conventional peers using the same manager and investment objective as the matching criteria and (ii) we match SRI funds against conventional funds using fund age, size and investment objective as the set of matching criteria. The comparison of the performance of SRI funds with their conventional funds directly allows us to conclude on the role of managerial skills in performance. Our findings reveal that managerial skills might be of special importance when considering investments into sustainable funds. Finally, we investigate the role of investors sophistication and its influence on the flow-performance and performance-flow relations within the retail and institutional shareclasses of SRI mutual funds. We apply standard methodologies for our analysis but also, as a novelty, we adopt the nonparametric monotonicity relation test proposed by Patton and Timmermann (2010). The advantage of the test is that it does not require any assumptions regarding the functional form of the monotonic relation, which is of special importance in our context as we investigate the shape of the flow-performance relation for SRI funds.

Our main empirical findings are as follows. First, our results show that SRI funds earn positive abnormal returns before fees, but not after fees. We also find that retail SRI funds outperform institutional SRI funds both before and after fees. Second, we find no differences in performance when we consider SRI and conventional funds run by the same management companies. However, when we compare SRI and conventional funds with similar fund characteristics, yet not necessarily run by the same management companies, we observe that SRI mutual funds outperform their conventional peers both before and after expenses. Third, we provide an evidence that there is a positive relation between performance and subsequent investment flow for SRI funds and its retail and institutional shareclasses. Thus good performers among retail and institutional SRI funds subsequently attract more money. Further analysis reveals that the flow-performance relation is convex for retail SRI funds, but no convexity can be confirmed for institutional SRI funds. Finally, our study shows that there is no smart money effect among SRI and retail SRI funds. Interestingly, we find a dumb money effect for institutional SRI funds as funds net attracting new money subsequently underperform funds net losing new money. In summary, with our empirical results we shed a new light on the role of investors sophistication in the flow-performance and performance-flow relations. Both, retail and institutional SRI investors, after accommodating their sustainability preferences, direct more of their money towards best past performers. Yet, institutional SRI investors are more harsh in punishing mutual fund managers for bad performance. On the other hand, the lack of smart money effect for retail SRI funds and the dumb money effect for institutional ones, may indicate that, apart from preferences for sustainability and performance, there might be other factors that drive the investment of the SRI investors.

The rest of the paper is organised as follows. Section 2 overviews in details the literature related to this study. In section 3 we provide the description of the dataset used and the measurement of the flow of funds. In section 4 we discuss performance measures, examine the performance of SRI mutual funds as well as its retail and institutional shareclasses and compare it with the performance of conventional funds. In section 5 we analyse the relation between performance and subsequent flow of money for SRI mutual funds while in section 6 we study the relation between flow of money and subsequent performance for SRI mutual funds. Both sections 5 and 6 are self-sufficient in the sense that they contain the description of the relevant methodologies, discussion of the empirical results and necessary robustness checks. Section 7 concludes.

2 Literature Review

2.1 SRI fund performance

Early studies on SRI mutual funds focus on the performance comparison and find no evidence of significant differences between SRI funds and their conventional peers, possibly due to the constraints of portfolio as non-financial criteria rather than mean-variance efficiency (Hamilton et al., 1993; Statman, 2000; Benson et al., 2006; Bauer et al., 2007; Renneboog et al., 2008). Hamilton et al. (1993) find that only the young SRI funds outperform the randomly selected conventional funds during 1981-1990 whereas the superior performance vanishes for the older funds. Similar evidence has been found by Statman (2000) that the SRI funds on average outperform the conventional funds during 1990-1998 but only at a marginal extent. Benson et al. (2006) instead find that SRI funds underperform the conventional funds during 1994-2003 using an eight-factor model. No significance difference has been found between the performance of SRI funds and conventional alternatives, during 1990-2001 (Bauer et al., 2005) and

during 1991-2003 (Renneboog et al., 2008) respectively. Climent and Soriano (2011) also confirm that SRI funds either underperform or perform indifferently from their conventional peers, during the period of 1987-2009. Using a different matching approach, Gil-Bazo et al. (2010) find that SRI funds perform better before- and after-fee than conventional funds during 1997-200, exclusively due to the SRI funds managed by SRI specialised management companies.

However, recent studies have identified that socially responsible investing may have a positive impact on fund performance, especially during economic downturns. According to Henke (2016), SRI bond funds can outperform their conventional peers during the period 2001-2014, and this outperformance is directly related to the mitigation of ESG risks, which is achieved by the exclusion of corporate bond issuers with poor corporate social responsibility activities. Focusing on both European and US green funds during 1996-2015, Silva and Cortez (2016) find that US green funds can outperform other SRI funds in crisis periods although European green funds underperform benchmark. Some mixed evidence on the fund performance has been found by later studies when ESG ratings are related to performance (Alda, 2020; Madhavan et al., 2021; Bofinger et al., 2021; Omura et al., 2021; Pavlova and de Boyrie, 2022). For instance, using sustainability (ESG) ratings of funds from 2016-2017, Hartzmark and Sussman (2019) suggest that sustainability is viewed as positively predicting future performance, but they find no evidence that high-sustainability funds outperform low-sustainability funds.

2.2 SRI fund flow and performance relation

The relation between fund performance and flow of money has been investigated in the academic literature from two main perspectives, which reflect two different angles of research. The first perspective focuses on how mutual fund investors respond to fund performance and subsequently invest their funds. For that purpose the relation between performance of the mutual funds and their subsequent flow of money is analysed (flow-performance relation). Majority of the empirical works show that this relation is positive so that funds with better performance attract subsequently more money. Earlier studies (Chevalier and Ellison, 1997; Sirri and Tufano, 1998; Del Guercio and Tkac, 2002; Huang et al., 2007; Ferreira et al., 2012) unveil that the flow-performance is convex, implying that investors dis-proportionally reward past winners but reluctantly punish past losers. However, the more recent works (Spiegel and Zhang, 2013; Ha and Ko, 2019; Schiller et al., 2020) provide evidence that this relation is more linear rather than convex, after controlling for fund flow endogeneity or model misspecifications. The second strand of literature can be traced back to the question of Zheng (1999) of why, in spite of bad performance, the mutual fund industry attracts so much money and how it is related to managerial skills. For that purpose academics study the relation between funds flow of money and their subsequent performance (performance-flow relation). Most of the studies (Gruber, 1996; Zheng, 1999; Keswani and Stolin, 2008; Jiang and Yuksel, 2017) show that this relation is positive so that funds that attract more money, subsequently perform better than funds losing the money (smart money effect). There are, however some studied that shed some light on the smart money effect and find opposite empirical results (Frazzini and Lamont, 2008; Feng et al., 2014; Akbas et al., 2015; Rakowski and Yamani, 2021).

The literature on fund flow and performance relations for SRI/ESG mutual funds is much less developed and focuses on the comparison of the relations for SRI and conventional funds. Bollen (2007) examines the flow-performance relation and finds evidence that the flows of SRI funds are more sensitive to positive past returns but not necessarily less sensitive to negative past returns in comparison to conventional funds. Using different sample and methodologies, Benson and Humphrey (2008) show that SRI fund flows are actually less sensitive to past returns than conventional fund flows, indicating that SRI investors derive non-financial utility from their investments. There is however no difference in the shape of the flow-performance relation of SRI funds in comparison to conventional funds. Finally, Renneboog et al. (2011) investigate how non-financial/sustainable attributes influence the flow-performance relation of SRI mutual funds across various geographical regions in comparison to conventional funds. They confirm the findings of Benson and Humphrey (2008) and show that the flow-return relation depends on the types of screens used and screening intensity. Considering performance-flow relation, in an earlier study, Renneboog et al. (2008) find a mixed evidence of a smart money effect. They show that SRI investors cannot identify good future performers, but they can point to some extent funds that subsequently poorly. However in a later study (Renneboog et al., 2011) when they control for various fund characteristics, they find no smart money effect within the SRI funds as the past flows of SRI funds are not related to their future performance. Interestingly, in a recent study Muñoz (2019), using a different sample of sustainable mutual fund, finds that there exists a smart money effect among non-institutional SRI investors, however it is driven by the flow-persistent hypothesis related to pricing pressure mechanism of Lou (2012). While all the aforementioned studies analyze separately the flow-performance and performance-flow relations for SRI funds, the concern of our paper is somehow different. We investigate both

these relations for SRI funds but focus on how these relations differ between two SRI clienteles, the retail and the institutional one, applying as well alternative methodologies.This allows us to build a general picture of how investors sophistication influences performance and flow within SRI fund classes.

2.3 Institutional and retail investors

Mutual fund normally provide institutional and retail shareclasses for different investor clientele. Various studies (Del Guercio and Tkac, 2002; James and Karceski, 2006; Goyal and Wahal, 2008; Keswani and Stolin, 2008; Evans and Fahlenbrach, 2012) show that investor sophistication may influence the fund performance and play an role in how the investors respond to this performance and other investment attributes. The reason for that is that retail and institutional investors differ significantly from each other in terms of their investment objectives, the level of financial sophistication, the search costs they face or the available information. James and Karceski (2006) show that in spite of lower management expenses, the performance of institutional mutual funds is comparable to that of the retail funds. They also find that the flows of institutional investors are less sensitive to past returns than the flows of the retail investors and more sensitive to risk-adjusted performance measures in comparison to retail funds. Evans and Fahlenbrach (2012) confirm their conclusions with similar findings and Salganik-Shoshan (2016) demonstrates that institutional clients use more quantitatively advanced performance evaluation criteria such as risk-adjusted returns or tracking error and are less sensitive to fund expense ratio. Mazur et al. (2017) on the other hand investigate the shape of the flow-performance relation for retail and institutional investors. They find convex/concave relationship in the upper/lower performance region, with the convexity characterising retail funds and concavity being more pronounced for institutional funds. On the other hand, the academic research on the performance-flow relationship also provides evidence that the investor sophistication may play a role here. Frazzini and Lamont (2008) conclude that retail mutual fund investors represent dumb money while institutional mutual fund investors can be perceived as smart ones. This is also confirmed by Feng et al. (2014), who shows that institutional investors represent smart money as they move their funds into future good performers. On the contrary, Salganik-Shoshan (2013) finds the smart money effect for both retail and institutional mutual funds, and Jiang and Yuksel (2017) show that the positive relation between past flow and future performance disappears for retail and institutional funds once they take into account the persistence of the flow. Döttling and Kim (2021) is the only study, to the best of our knowledge, that considers investment decisions of retail and institutional SRI mutual fund. The focus of the paper is however different to ours, as they investigate the fund flows of SRI investors as a reaction to the COVID-19 pandemic shock. They do not study the flow-performance and performance-flow relation for retail and institutional SRI investors, which is what we do in our paper.

3 Data

3.1 Mutual fund sample

In line with earlier studies, we consider the monthly performance of SRI equity funds from December 1999 to March 2021[5]. The data for SRI funds come from the survivor-bias free US mutual fund database of the Center for Research in Security Prices (CRSP). This database provides a comprehensive coverage of mutual funds, including monthly return rates, size (total net asset values), expense ratio, turnover, and load. The focus of our study is an examination of the fund performance and flow of SRI equity funds. The list of SRI funds is quoted from the USSIF's reports published in the previous years[6]. The USSIF uses survey approach to obtain information from thrid parties, specifically, if a fund utilises one or more social or environmental criteria as part of a formal investment policy it will be included in the list.[7]

To be included in our SRI fund sample, we allocate the SRI label to a fund for the given year if this fund appeared in the report. For the existing funds which have inconsistent appearances in all report, we use the similar data screening method from Gil-Bazo et al. (2010) to cross-validate with funds' prospectuses to examine if the

[5]We truncate the original starting date of January 1991 to December 1999 in our analysis, in order to have at least three funds in the constructed portfolios.

[6]The report from 2010, 2012, 2014, 2016, 2018, 2020 are available from USSIF website.

[7]According to USSIF, the funds included are also required to provide written confirmation of social screening if they are not explicitly incorporated in fund prospectus. More stringent checks are also performed by USSIF to exclude any funds without a formal policy or falsely claiming that they have adopted social or corporate governance criteria in their investment decisions.

inconsistency is due to drastic changes of funds' investment objectives. We also find that this temporary exclusion from certain reports is not due to the significant changes of funds' investment strategies. Consequently, we keep the SRI label for a fund for the whole sample period as long as it appears in USSIF report as least once. We merge the list of SRI funds with the CRSP mutual fund database to get the historical data on fund returns, size and other characteristics.

We only focus on the SRI equity funds (both US domestic and foreign), and exclude the bond or fixed-income funds. To address the incubation bias (Evans, 2010), we exclude the returns from the period before a fund received a ticker[8] from NASDAQ. As for all funds, we do not impose an additional filter for fund size or return history. Mutual funds tend to offer different shareclasses[9] to investors, even though the returns come from the same portfolio. The data report net return rates for each fund shareclass separately. For each fund and month, we compute the weighted net fund return rate by averaging over the net return rates of a fund's different shareclasses using, as weights, the ratios of shareclass net assets to the fund's total net assets (TNA). The resulting net return rate is what the average investor receives when investing in the fund. Shareclass aggregation prevents newly-created shareclasses of a fund from causing duplication of return data that comes, effectively, from the same portfolio. We compute the gross return for each fund following the same procedure in Fama and French (2010). We also repeat the same procedure to aggregate the institutional (and retail) shareclasses as institutional (and retail) funds as sated in the literature (MacGregor et al., 2022). As a result we have 57 SRI mutual funds in total, 52 retail funds, and 47 institutional funds from December 1999 to March 2021.

We examine the fund performance and performance versus flow relationship of SRI funds with respect to their conventional peers. There are two matching methods used in this study to filter the conventional funds to take account of both fund manager skills and fund characteristics for more robust references. The first method is less restrictive but controls for fund managerial skills, by matching SRI funds with the conventional peers managed by the same managers and under the same investment objectives defined by CRSP.[10] Implementing this matching approach can allow us to control for the influence of managerial skills on the performance of funds under the same investment objective categories. The second approach relies on the characteristics of funds. We adopt similar procedures in Climent and Soriano (2011), and match SRI funds against an equally weighted portfolio of several conventional funds using fund age, end of period fund size, and fund investment objective as the set of matching criteria.

Figure 1 depicts the development of the SRI mutual fund sector. From Panel A of Figure 1 we can see that the number of available SRI funds has been steadily growing since 1999 with a clear jump around 2016 when around 10 new SRI funds appeared at once[11]. Panel B of Figure 1 shows the dynamics of the Total Net Assets of the SRI mutual fund sector. Similarly to the number of funds, the amount of money invested into SRI funds has been increasing since 1999. We can observe as well a clear change of the dynamics in TNA of SRI and retail SRI funds around the financial crisis of 2007-2008.

[Figure 1 here]

3.2 Fund Flows

In measuring the flow of new money into the mutual fund, we follow a usual practice in the literature and use two most often applied measures of the flow of new money.[12]

First, we compute the dollar net flow of new money for fund i in month $t+1$ according to the following formula:

$$dollar\ flow_{i,t\to t+1} = TNA_{i,t+1} - TNA_{i,t}(1 + R_{i,t+1}) \tag{1}$$

[8] A ticker is an abbreviation used to uniquely identify publicly traded shares of a particular stock on a stock market.

[9] Shareclasses can differ regarding their front- and back-end loads paid to brokers, and the contribution to annual operating expenses of portfolio management.

[10] We use '*crsp_obj_cd*' provided in CRSP mutual fund database as it gives a more comprehensive coverage of fund investment objectives.

[11] It might be related to the fact that in March 2016 the Morningstar introduced the Sustainability Ratings which provide easy and intuitive signals of how well the mutual funds deal with ESG issues. Hartzmark and Sussman (2019) show that after the introduction of these ratings, it became easier and less costly for the investors to assess the sustainability of mutual funds which attracted much attention of the investment industry.

[12] Frazzini and Lamont (2008) provide an excellent explanation of the concept of new money flow for mutual funds.

where $TNA_{i,t+1}$ and $TNA_{i,t}$ is the Total Net Asset (TNA) of the fund $i$at the end of month $t+1$ and t respectively, $R_{i,t+1}$ is the fund's i net return over the month $t+1$. The dollar flow reflects the new money (new cash) that inflow to the fund net out of all possible new cash outflows.[13] Moreover, the equation (1) assumes that the flow of new money occurs at the end of month $t+1$, all fund's dividends are reinvested into the fund and that the investors of the merged funds put their money into a surviving fund, which helps to address the survivorship bias problem.[14] Many previous studies show that these assumptions are not crucial from empirical perspective (Chevalier and Ellison, 1997; Sirri and Tufano, 1998; Sapp and Tiwari, 2004; Frazzini and Lamont, 2008; Ferreira et al., 2012). The dollar flow is commonly used when studying the relation between past flow of new money and future funds' performance (performance-flow relation) for the formation of flow portfolios (Zheng, 1999; Sapp and Tiwari, 2004; Keswani and Stolin, 2008; Frazzini and Lamont, 2008; Feng et al., 2014; Jiang and Yuksel, 2017). As pointed by Zheng (1999), the dollar amount of new money is more appropriate for mutual fund industry since it focuses on economically meaningful new money flows from the aggregate perspective.

Second, we compute as well the percentage net flow of new money for fund i in month $t+1$ as the dollar flow given in equation (1) normalized by the fund's previous month's TNA. Specifically:

$$percentage\ flow_{i,t\to t+1} = \frac{TNA_{i,t+1} - TNA_{i,t}(1+R_{i,t+1})}{TNA_{i,t}} \tag{2}$$

The percentage flow tells us the dollar value of new money relative to the fund's assets. According to Sirri and Tufano (1998) it reflects "the percentage growth of a fund in excess of the growth that would have occurred had no new funds flowed in and had all dividends been reinvested". Such a normalisation is often applied in the literature for methodological reasons. Moreover, Chevalier and Ellison (1997) provide empirical evidence that mutual funds have tendency to grow or shrink proportionately to their initial TNA, which justifies the use of normalized flow. On the other hand, the normalisation may inflate the flow when fund experiences disproportionately high net inflows or outflows, which often occurs at the beginning or end of the fund's life. Thus in order to ensure that extreme values of percentage flow do not impact our empirical results, we follow a standard procedure and winsorize the percentage flow by fund at the bottom and top 1% of its distribution. The percentage flow is more appropriate in the examinations of the relation between past performance and future flow of money (flow-performance relation) since economically small dollar flows (e.g. for small mutual funds) might be relatively high from the perspective of an individual fund and potentially driven by the fund's past performance (Sirri and Tufano, 1998; Huang et al., 2007; Ferreira et al., 2012).

In some pieces of the analysis in this study, we consider the flow of new money for SRI mutual funds over periods longer than a month. We define then the dollar net flow of new money for fund i over the p consecutive months $t+1$, $t+2$, ..., $t+p$ as follows:

$$dollar\ flow_{i,t\to t+p} = TNA_{i,t+p} - TNA_{i,t}(1+R_{i,i,t\to t+12}) \tag{3}$$

where $TNA_{i,t+p}$ and $TNA_{i,t}$ is the Total Net Asset (TNA) of the fund i at the end of month $t+p$ and t respectively, $R_{i,i,t\to t+12}$ is the fund's i net return over the p consecutive months $t+1$, $t+2$, ..., $t+p$. In a similar spirit we define the percentage flow over the p months as the dollar flow normalised by the TNA in month t.

4 Performance of SRI mutual fund sector

4.1 Methodological approach

In measuring performance of SRI mutual funds we take a standard approach in the academic literature and use alpha which reflects the abnormal return, that is the additional return the fund pays in excess of what it expects to pay according to its risk. It is the most often used risk-adjusted measure in empirical research on mutual fund

[13] It is an approximation of the exact flow of new money and expresses only the net effects of money flows. The reason for that is that the CRSP Mutual Fund Database does not report directly the data on new money inflows and outflows for mutual funds so these must be recovered from funds' TNA and returns. Keswani and Stolin (2008) provide a more detailed discussion on this approximation and the consequences of its usage in empirical work.

[14] In our sample we have 4 SRI mutual funds that merge with bigger but non-SRI funds which are here considered as surviving funds. Consequently from the practical perspective the 4 funds leave our sample of SRI funds and we do not have the merger factor (MGTNA) in our formula.

performance evaluation. The expected return of the fund depends on its riskiness and is determined by a specific benchmark model. In this study we use three common benchmark models for performance evaluation: CAPM, three-factor model of Fama and French (1993) (FF) and four-factor model of Carhart (1997) (Carhart). Alphas from the three models are estimated from the following time series regressions:

$$R_{i,t} - R_{f,t} = \alpha_i^{capm} + \beta_m MKTRF_t + \varepsilon_{i,t} \quad (4)$$

$$R_{i,t} - R_{f,t} = \alpha_i^{ff} + \beta_m MKTRF_t + \beta_{smb} SMB_t + \beta_{hml} HML_t + \varepsilon_{i,t} \quad (5)$$

$$R_{i,t} - R_{f,t} = \alpha_i^{car} + \beta_m MKTRF_t + \beta_{smb} SMB_t + \beta_{hml} HML_t + \beta_{umd} UMD_t + \varepsilon_{i,t} \quad (6)$$

where $R_{i,t}$ and $R_{f,t}$ are respectively fund/portfolio i return and risk free rate in month t, $MKTRF_t$ is excess return on value-weighted market portfolio in month t, SMB_t, HML_t, UMD_t are the returns on factor-mimicking portfolios related respectively to size, book-to-market and momentum effects in month t.[15]

Elton and Gruber (2020) note that while the academic community has already recognised that performance evaluation of mutual funds needs to be adjusted for risk and various benchmark models have been proposed for that purpose, the investment profession very often relies on simple performance measures such as excess return (in excess of a risk free rate or of a market return), Sharpe ratio or Treynor ratio. In order to accommodate the views of both, in this study, where necessary and applicable, we also report the aforementioned simple measures of performance.

The first step of our empirical analysis focuses on assessing the average performance of SRI mutual fund sector with a breakdown to retail and institutional shareclasses (which we refer shortly to as retail SRI and institutional SRI funds) and evaluation of how well the SRI funds perform in comparison to their conventional peers. In order to measure the performance of SRI mutual funds as a sector, each month we form a portfolio constructed out of all SRI funds available at given month and compute its return. We use both net and gross fund returns in order to study the performance respectively after and before deducting the expenses. Commonly before-fees (gross) performance reflects the abnormal return of the fund earned by the fund management while after-fees (net) performance reflects the abnormal return that flows to the investors. In a similar spirit, we form fund portfolios out of retail and institutional SRI funds only, which represent respectively the sectors of retail and institutional SRI investors. Additionally, in order to compare the relative performance of the two sectors, we also form a zero-cost portfolio which is long/short in a portfolio of retail/institutional SRI funds and we assess its performance. Equivalent empirical steps are undertaken when assessing the performance of conventional mutual funds and comparing it with the performance of SRI funds.

4.2 Performance comparison with conventional funds

Our basic results on performance of the sectors of all, retail and institutional SRI funds are reported in Table 1. There are few interesting observations which we would like to focus on in what comes. First, we can observe in Panels A-C that SRI funds as a sector over the December 1999 to March 2021 period obtained on average positive and statistically significant abnormal returns (alphas) before applying fees. For example, according to Carhart model, a portfolio of all SRI funds was paying abnormal return of 0.143% per month before fees. After deducting the fees, the alpha is still positive, however not significant any more. This indicates that active management of SRI funds indeed seems to add value, however this value is not further passed to final clients. Second, over the same period institutional funds were performing on average badly. We can observe that after fees abnormal returns were statistically negative and of magnitude from –0.063% (for Carhart model) to –0.091% (for CAPM) per month. The abnormal returns before fees were negative as well, however not statistically significant. Thus for institutional funds, in contrast to all SRI funds, active management not only does not bring value, but it negatively impacts final clients. Third, in the last two columns of Table 1 we report performance measures for a zero-cost portfolio which is long in a portfolio of retail SRI funds and short in a portfolio of institutional SRI funds. While retail funds, as a separate portfolio, from statistical perspective perform neither well nor badly. In comparison to institutional funds, they perform statistically better both before and after the fees. We can observe that before (after) fees they pay around 0.1% (0.07%) per month more than institutional funds and this number is statistically significant. It is important to underline here, that the conclusions reported above are insensitive to whether we use CAPM,

[15]The data for risk factors are quoted from Kenneth French data library.

Fama-French or Carhart benchmark pricing models. Moreover, the magnitude of estimated alphas is similar to the findings of other studies in this literature.[16]

[Table 1 here]

In Table 2 we report the performance of the two sectors: SRI and conventional funds. We consider two samples of conventional funds: a sample of manager-matched funds that represents funds matched to the SRI sample based on the same manager and investment objective as a set of matching criteria, and a sample of characteristics-matched funds that represents funds matched to the SRI sample based on age, end of period size, and investment objective as a set of matching criteria. We can observe in Table 2 that the performance of conventional funds crucially depends on the matching method. Manager-matched funds perform neither badly nor well from a statistical perspective and indifferently in comparison to SRI funds. In other words, roughly the same group of managers obtains similar performance when managing SRI and conventional funds. On the other hand, when we compare the performance of a sample of characteristics-matched funds, we can observe that they are performing statistically badly after fees: their abnormal returns are –0.149% or –0.140% per month, according to respectively Carhart or Fama-French models. Moreover, they earn around 0.2% per month less than the equivalent SRI funds and this number is statistically significant.

[Table 2 here]

Comparing the results of the two samples of conventional funds with SRI funds, it seems that the management skills play an important role in the managing mutual funds that focus on investments into a specific sectors of equities. We can see that the same group of managers obtains similar investment results when managing SRI or conventional funds, while the sample of conventional funds preforms worse than equivalent sample of SRI funds, when the management is different. The empirical results we find here, fit well into a strand of literature which examines the role of specialised manager knowledge for performance of sector funds, such as real estate (MacGregor et al., 2021, 2022). Overall, we can conclude that SRI funds may perform better but do not perform worse than conventional funds.

4.3 Performance dynamics of SRI funds

The performance evaluation of SRI funds as a sector and its comparison with the conventional funds, conducted so far, is an unconditional performance which does not change over time. In order to address a possible time variation in fund performance, we analyse it using 60-month rolling window regressions. Specifically each month, we estimate time series regressions for portfolios of all SRI, retail and institutional funds as specified in equations (4)–(6) using the latest 60 months of observations and we record alphas. In this manner we obtain a dynamic measure of abnormal returns that reflects the information about portfolio performance over the last 5 years[17].

The dynamic alphas from different benchmark models and for the three SRI fund portfolios are depicted in Figure 2. We can observe that there is not much variation in performance of SRI fund portfolios over time and the alphas from various benchmark models are rather stable over time. In Figure 2 in panels A and B we can see that abnormal returns for portfolios of all SRI and retail funds are mostly focused around zero. On the other hand, the alphas for institutional funds (in panel C) are usually below zero. This accounts for a further confirmation that indeed SRI institutional funds are were not performing well over the considered Dec1999–Mar2021 period.

[Figure 2 here]

In order to address the possible dynamic in relative performance of retail vs institutional SRI funds, as well as relative performance of conventional (both manager-matched and characteristics-matched) vs SRI funds, we repeat the 60-month rolling windows regressions for the three zero-cost portfolios. The dynamic alphas from different benchmark models for the three zero-cost portfolios are depicted in Figure 3. Comparing the performance of the

[16] see e.g. Keswani and Stolin (2008), Tables IV-VI or (Zheng, 1999), Tables III-IV.

[17] We focus in this section on value-weighted portfolios constructed using returns after fees (net portfolios). Since the equivalent empirical results for gross portfolios are qualitatively similar to the results presented in this section, we place them into the Online Appendix.

retail vs institutional SRI funds, we can see from panel A of Figure 3 that retail funds were performing in general better than institutional funds over the Dec1999–Mar2021 period. Equivalent conclusion can be drawn when we compare the relative performance of manager-matched/characteristics-matched conventional funds with SRI funds. We can see from panels B and C of Figure 3 that the zero-cost portfolios representing the differences between conventional and SRI funds usually had negative abnormal returns. This indicates that the conventional funds were usually performing worse than SRI funds. The results are more pronounced for characteristics-matched conventional funds, which further confirms the findings from the static analysis of the relative performance of the two groups of funds that characteristics-matched conventional funds were performing worse than SRI funds.

[Figure 3 here]

In summary, the analysis of the performance dynamics of SRI funds and the comparison to their conventional peers draws no qualitatively different inferences with that of unconditional performance in subsection 4.2.

5 Flow-performance relation

The relation between performance and subsequent flow of money is often analyzed in the related literature in the context of designing the proper incentive structure for mutual funds managers as many studies have shown that there exists a convex relation between past performance and future flow of money (see e.g. Chevalier and Ellison (1997)). This implies that mutual fund managers are rewarded for doing well in the past with disproportionately large fund inflows while they are not punished to the same extent for underperforming in the past with equally large fund outflows, which can lead to moral hazard problems.

5.1 Methodological approach

In order to determine the influence of investor sophistication on the flow-performance relation, we investigate this relation separately for SRI, retail SRI and institutional SRI mutual funds. As it is common in the literature (Sirri and Tufano, 1998; Huang et al., 2007; Ferreira et al., 2012), we measure flow of funds using a percentage flow measure given in equation (2). Past performance usually reflects the fund performance over the recent year period, however it can be measured in different ways. We follow three most frequently used methods based on review of the literature.

First, we measure past performance by a 12-month cumulative alpha which reflects fund's average abnormal return over the past year. Such a measure of past performance has been often used in more recent studies.[18] It is defined as follows:

$$\alpha_{i,t}^{cum} = \prod_{t-11}^{t}(1 + R_{i,t} - \hat{R}_{i,t}) - 1 \tag{7}$$

The 12-month cumulative alpha for fund i at month t, $\alpha_{i,t}^{cum}$ is computed as the geometric average of the differences between fund net realised $R_{i,t}$ and estimated $\hat{R}_{i,t}$ returns over the past 12 months. Estimated returns are calculated as the sum of a risk free rate and product of factor loadings (estimated using recent 36-month estimation window) and factor realisations over the relevant months. We use three benchmark models to estimate fund returns: CAPM, Fama-French three-factor model and Carhart four-factor model. Second, we measure past performance as alpha which represents the intercept from a specified asset pricing model given in equations (4)–(6). A common practice in the literature is that alpha for a given month is estimated over the period of 36 months prior to a given month-end.[19] Such a measure of past performance has been common in the context of flow-performance relation in earlier studies.[20] Third, following our discussion in subsection 4.1, we use as well simple performance measures which reflect the fund's performance not fully adjusted for risk. Specifically, we measure fund's past performance in a given month as fund's average excess return in excess of a risk free rate and of a market return, as a Sharpe ratio and as a Treynor ratio[21]. Again these measures reflect the performance over the 12 months prior to a given month-end.

[18] Ferreira et al. (2012); Agarwal et al. (2018); Harvey and Liu (2019).

[19] We also consider the 24-month period as the robustness check, and find no qualitative differences of empirical results from the 36-month rolling estimation period.

[20] Sirri and Tufano (1998); Huang et al. (2007).

[21] These or similar past performance measures have been used in Ferreira et al. (2012) and Spiegel and Zhang (2013).

In a detailed analysis in the rest of this section and in order to keep the main empirical picture clear, we focus on the case when past performance is measured by 12-month cumulative alpha given in (7). The empirical results for the other two groups of performance measures are considered as robustness checks are placed into the Online Appendix.

5.2 Flow-performance relation

In order to obtain an overview the flow-performance relation for each of the three groups of SRI funds we form five equal portfolios[22]. Each month SRI funds are ranked into one of five portfolios based on their past performance (that is a performance in the preceding month) and a percentage flow is computed for each portfolio. The relation between relative past performance and average percentage flow for the three groups of SRI funds is depicted in Figure 4.

[Figure 4 here]

We can observe from Figure 4 that there is a positive relation between performance and subsequent flow of funds no matter whether we consider all, retail or and institutional SRI funds. Mutual funds with a better performance attract higher percentage of new money subsequently on average in comparison to funds performing worse in the past. The detailed quantitative estimation results for Figure 4 are reported in Table 3. We can see that the worst past performers among SRI and retail SRI funds actually experience net outflows of new money. For example, if we consider a portfolio of all SRI funds that performs worst according to CAPM benchmark model, we can see that the average net outflow of new money from this portfolio is 0.606% per month of its TNA. On the other hand, the equivalent portfolio of best past performers attracts new money – the average net inflow for this portfolio is 2.548% per month of its TNA. For retail SRI funds in the low past performance region, the net outflow of money is even greater. For instance, in case of CAPM model, we can see that not only the worst past performance portfolio but also the second worst portfolio net lose new money as the average net outflow for each of these two portfolios is respectively 0.653% and 0.142% of their $TNAs$. This is however not the case for institutional SRI funds, for which all portfolios (no matter the past performance) on average net attract new money subsequently.

[Table 3 here]

In order to investigate whether there exists a truly positive relation between past performance and subsequent flow of money for SRI fund portfolios (observed in Figure 4), we run the monotonic relation test (MR test hereafter) proposed by Patton and Timmermann (2010). The null hypothesis in the MR test is that the relation between past performance and future flow of money is flat or weakly declining, while the alternative maintains a monotonically increasing relation. The MR test is a nonparametric test, it is implemented via bootstrap method to cope with nonnormality and it does not require any assumptions regarding the functional form of the monotonic relation between past performance and future flows. The latter point is of special importance in the context of the analysis in this paper and the recent debate whether the relation between performance and future flows is convex or rather linear. Following Patton and Timmermann (2010) we include two variants of MR test statistics (referred by Patton and Timmermann (2010) as MR and MR^{all}) to test the monotonic relation and for comparison reasons we include as well the standard Student t-test. The details of the two variants of the MR tests, Student t-test and the implementation procedure are explained in Patton and Timmermann (2010) and we refer the Reader there if necessary.

The results of the tests are reported in the last three columns of Table 3. We can observe a strong evidence against the null hypothesis for all SRI and retails SRI funds – all the p-values (no matter which asset pricing model was used to adjust performance for the risk) are zero which implies that the relation between past performance and future flow of money for SRI and retail SRI funds is statistically positive. For the institutional SRI funds the evidence against the null is a bit weaker as the p-values range from 0.001 to 0.085. This seems to confirm what we observe in Panel C of Figure 4 for institutional SRI funds that the increasing relation between past performance and future flow is not as clear and smooth as for all or retail SRI funds.

[22] We are not able to create 10 or 20 portfolios as is done by Sirri and Tufano (1998) or Huang et al. (2007) because our sets of SRI funds is much smaller in comparison to the set of all equity funds; for example in some months we have no more than 10 institutional SRI funds.

The above analysis takes into account only one dimension of possible reasons for increasing flow of money: past performance. In order to account for a multivariate dimension and control for other factors which can potentially influence the flow of new money, we consider multivariate panel OLS regressions with a set of possible determinants of future flow of money. We run then the panel regressions (separately for each group of SRI mutual funds) where we regress flow of funds on past performance and a set of control variables, as given in the following equation:

$$Flow_{i,t\to t+1} = \theta_0 + \theta_{pp} PastPerf_{i,t} + \sum_j \theta_j Controls_{i,j,t} + \varepsilon_{i,t} \tag{8}$$

where $Flow_{i,t\to t+1}$ is the percentage flow of fund's i over the month $t+1$, $PastPerf_{i,t}$ is its past performance and a set of control variables includes: size of the fund, measured by the log of its TNA ($logTNA_{i,t}$), age of the fund, measured by the log of fund's age ($logAGE_{i,t}$), standard deviation of fund's net return ($std(ret)_{i,t}$), expense ratio ($ExpRatio_{i,t}$), turnover ratio ($TurnRatio_{i,t}$), size of the fund's family, measured by the log of fund's family TNA ($logFamTNA_{i,t}$) and the log of the number of funds under management of the fund's family ($logFamNum_{i,t}$). All the explanatory variables are measured for month t or are computed/estimated based on data before (and including) month t. We run panel regressions with time and fund family company fixed effects and adopt the cross-fund robust standard errors (Ferreira et al., 2013; MacGregor et al., 2021, 2022).[23]

The results of the multivariate panel regressions are reported in Table 4[24]. We can observe from the table that for all three groups of SRI funds, past performance is a statistically significant determinant of next month's flow of funds and funds with higher past year's performance attract subsequently relatively larger amounts of new money. This relation holds even when we take into account other potential factors influencing the future flow of money. Consequently, the obtained results provide a robustness to our previous findings in Figure 4 and confirm a positive relation between performance and subsequent flow of money for SRI mutual funds in the presence of other factors.

[Table 4 here]

5.3 Shape of the flow-performance relation

In the light of the recent debate whether the flow-performance relation is convex or not, we find it important to address this question within our set of SRI mutual funds. Initial inspection of the Figure 4 suggest that there seems to be a convex relation between past performance and future flow of funds for retails SRI funds, while the convexity is the least obvious for institutional SRI funds.

In order to shed more light on the possible shape of the flow-performance relation, we implement a piecewise-linear specification in the spirit of Sirri and Tufano (1998) or Huang et al. (2007) which allows the flow-performance relation to have different sensitivities at different levels of past performance.

The methodological procedure is as follows. For each month the fractional performance ranks (ranging from zero as worst past performance to one as best past performance) are assigned to each fund based on its past year performance. The ranks reflect the percentage relative performance of funds within a given month. Then the fractional ranks are piecewise decomposed into three performance "pieces", each reflecting respectively the bottom quintile (Low), the three middle quintiles (Mid) and the top quintile ($High$) of the fund's fractional performance ranks, according to the following definition:

$$Low_{i,t} = \min(0.2, Rank_{i,t}) \tag{9}$$

$$Mid_{i,t} = \min(0.6, Rank_{i,t} - Low_{i,t}) \tag{10}$$

$$High_{i,t} = Rank_{i,t} - (Low_{i,t} + Mid_{i,t}) \tag{11}$$

So for example if within a particular month, the fund is ranked as the 10th best out of 100 funds according to its past performance, its fractional rank equals 0.90. Out of that value, 0.2 reflects the bottom quintile of the rank (Low), 0.6 reflects the middle three quintiles of the rank (Mid) and 0.1 reflects the top quintile of the rank ($High$). The

[23] We didn't consider dynamic panel data method because our dataset doesn't have the ideal data structure or instrument variables to apply either system or differenced Generalised Method of Moments (GMM) approach, i.e., small T large N panels (Roberts and Whited, 2013).

[24] We report in the table the estimation results for the full econometric specification as given in equation (8). The nested models with limited number of control variables give qualitatively similar results and are available from authors upon request.

piecewise linear specification allows the piecewise decompositions of fractional ranks, given in equations (9)-(11), to have different slopes in their relation with future flow of money.

We pool the data across funds and months and regress monthly flow of money on piecewise past performance and a set of control variables as follows:

$$Flow_{i,t\to t+1} = \gamma_0 + \gamma_{low} Low_{i,t} + \gamma_{mid} Mid_{i,t} + \gamma_{high} High_{i,t} + \sum_j \gamma_j Controls_{i,j,t} + \varepsilon_{i,t} \tag{12}$$

where $Flow_{i,t\to t+1}$ is the percentage flow of fund's i over the month $t+1$, $Low_{i,t}, Mid_{i,t}, High_{i,t}$ are its past piecewise decompositions of fractional ranks and control variables include the same set of variables as in equation (8). The coefficients γ_{low}, γ_{mid}, γ_{high} reflect how sensitive the future flow is with respect to past performance at different levels of past performance. Similar to Ferreira et al. (2012), we do not use Fama-Macbeth approach as there months in our sample in which there exist data for as little as 6 mutual funds only. Instead, we run panel regressions with time and fund fixed effects and adjust standard errors for clustering by funds. The described above methodological procedure is applied separately to each of the three groups of SRI funds.

The estimation results for piecewise linear specifications are reported in Table 5. For brevity, we focus only on coefficients related to the three piecewise decompositions of fractional ranks ($\gamma_{low}, \gamma_{mid}, \gamma_{high}$) as they represent the sensitivities of the flow-performance relation at different levels of performance and omit the coefficients on control variables to conserve the space. We can observe from Panels A and B of the table that for SRI and retails SRI funds, the flow of new money is most sensitive to past performance when the level of past performance is high. This holds no matter which benchmark model is used for measuring past performance. For example when we consider retail SRI funds and adjust past performance using Carhart four-factor model, the change in $High$ performance ranking in a given month by 10% (e.g. from 85th to 95th percentile) induces an increase in the percentage flow of new money of 1.32% per month (0.1×0.132), while the same change in Low performance ranking increases the percentage flow of new money only by 0.23% per month (0.1×0.023). In order to determine whether the sensitivity of the flow is indeed higher for high levels of past performance in comparison to low levels of past performance, we conduct a Wald test and test the null of no difference between the relevant sensitivity coefficients ($H_0 : \gamma_{high} = \gamma_{low}$). The results of the test (reported in Table 5 in the column "H-L") indicate that for SRI and retail SRI mutual funds, the flow of new money is statistically more sensitive to past performance when we consider high past performance regions rather than the low ones. This is a direct evidence of the convex relation between past performance and future flow of funds for SRI and retail SRI funds.

[Table 5 here]

The picture is, however, quite different when w consider institutional SRI mutual funds. Inspecting Panel C of Table 5 one can see that only the institutional SRI funds in the Mid piecewise decomposition of fractional rank are characterized with statistically positive sensitivity of future flow to past performance. The sensitivity coefficients for the funds in the low and high past performance regions are not only statistically indifferent from zero but, more importantly, not different from each other, which is reflected in high p-values of the Wald test in the "H-L" column of Table 5. This implies that the sensitivity of the future flow to past performance is the same for SRI institutional funds within low and high past performance regions. We can conclude that the relation between past performance and future flow of funds for institutional SRI funds, although positive, is not convex.

As a final exercise, we consider the long-term aspect of the relation between past performance and future flow and investigate whether the shape of flow-performance relation for the three groups of SRI funds is preserved over longer periods. Specifically, we are interested here whether convexity in the flow-performance relation for SRI and retails SRI funds is a short-lived phenomenon which is present only in the flow of money in the subsequent month or perhaps it persists over longer periods. For that purpose we focus now on the percentage flow of money over periods longer than a subsequent month with respect to past performance. From the methodological perspective, we pool the data across funds and months and regress a flow of money over the consecutive p months on piecewise past performance and a set of control variables as follows:

$$Flow_{i,t\to t+p} = \gamma_0 + \gamma_{low} Low_{i,t} + \gamma_{mid} Mid_{i,t} + \gamma_{high} High_{i,t} + \sum_j \gamma_j Controls_{i,j,t} + \varepsilon_{i,t} \tag{13}$$

where $Flow_{i,t\to t+p}$ is the percentage flow of fund's i between the end of months t and $t+p$, $Low_{i,t}$, $Mid_{i,t}$, $High_{i,t}$ are its past piecewise decompositions of fractional ranks in month t and control variables include the same set of variables

as in equation (8). We consider future flow of money over horizons up to 24 months, i.e. $p \in \{1, 3, 6, 9, 12, 18, 24\}$. Given the estimated equation for various values of p, we compute the differences between the sensitivities of the flow-performance relation at $High$ and Low piecewise decompositions of fractional ranks and test, using the Wald test, whether these differences are statistically significant.

The estimation results for various horizons are reported in Table 6. We can see from Panels A and B of the table that for SRI and retail SRI funds, the flow-performance relation continues to be convex even if we consider flow of money over longer periods. Comparing the sensitivity coefficients on $High$ and Low piecewise decomposition, we can observe that the sensitivity of the future flow of money over the next 3 or 6 months to past performance is statistically higher for high performance regions, although its economic magnitude decreases as the horizon increases. This holds, no matter which benchmark model is used. We conclude then that SRI and retail SRI funds that perform best in the past, continue attracting disproportionately higher percentages of new money not only over the consecutive month but even up to 6-month periods in the future. As previously, this is not the case for institutional SRI funds. We can observe in Panel C of Table 6 that the reported differences in the sensitivity coefficients of the flow-performance relation at high and low levels of performance for various horizons are of low economic magnitude and statistically not different from zero. This result is robust to various benchmark models used to risk-adjust the past performance.

[Table 6 here]

5.4 Robustness checks

In order to assure that our empirical results are not driven by a particular measures of past performance, we conduct our empirical analysis of the flow-performance relation, using alternative past performance measures. In particular, we measure past performance by alpha which represents the intercept from a specified asset pricing model given in equations (4)–(6), estimated using the 36-month rolling window regressions, but we also use simple performance measures which reflect fund's performance not adjusted for the risk.

The estimation results for these alternative past performance measures are reported in Tables B1–B8 in the Online Appendix. For both groups of past performance measures we can observe that there exists a positive relation between performance and susequent flow of money for all, retail and institutional SRI mutual funds as can be seen in Figure B1 and Figure B2. The Student t-test as well as the two variants of MR test of Patton and Timmermann (2010), reported in Table B1 and Table B2, further confirm this. In Table B3 and Table B4 we show that this positive relation is robust to the inclusion of a set of control variables – we can observe that the coefficients reflecting the influence of the past performance on future flow of money (first columns) are statistically positive for all, retail and institutional SRI funds, no matter which benchmark model is used. The empirical results related to the examination of the shape of the flow-performance relation are reported in Table B5 and Table B6. We can observe in Panels A and B of the two tables that for SRI and retail SRI funds, the Wald test confirms that the flow-performance relation is steeper in high past performance regions in comparison to the low past performance regions which indicates that the flow of new money is statistically more sensitive to past performance when we consider high levels of past performance. Again, this is not the case for institutional SRI funds, for which the flow of money has the same sensitivity in high and low past performance regions. This confirms our previous findings that the flow performance relation is convex for SRI and retail SRI funds, while this is not the case for institutional SRI funds. Finally, in Table B7 and Table B8 we report the results related to the long term aspect of the shape of the flow-performance relation. Again, the results confirm that the convexity in the flow-performance relation for SRI and retail SRI funds is preserved up to three or even six months ahead (depending on the past performance measure used), while there we find no convexity for institutional SRI funds.

6 Performance-flow relation

The relation between funds flow of money and their subsequent performance has been studied since Gruber (1996) in the context of the identification of managerial skills. The intuition of Gruber (1996)'s idea is simple: a rational investor that is able to differentiate between skilled and unskilled fund managers, should direct her capital to mutual funds managed by skilled managers that will subsequently perform well. This smart money effect, that is a positive relation between past flow and future performance because of managerial skills, was later confirmed, among others by Zheng (1999) and Keswani and Stolin (2008).

6.1 Methodological approach

In order to determine the influence of investor sophistication on the relation between past flow of new money and future performance, we investigate this relation separately for SRI, retail SRI and institutional SRI mutual funds. From a methodological perspective, we use portfolio approach[25] that focuses on the evaluation of the performance for flow portfolios and currently is commonly used within the literature on smart or dumb money effect. Flow portfolios are dynamically formed out of a set of mutual funds available at a given time, based on the fund's flow of money. Following the literature, we use a dollar flow measure given in equation (1).

The portfolio formation procedure is the following. Each month we group mutual funds into two portfolios based on the sign of their flow in the preceding month: (i) a negative flow portfolio that includes the funds that were losing money in the previous month (in net) and this is reflected in the negative value of the fund's past dollar flow and (ii) a positive flow portfolio that includes the funds that were attracting money in the previous month (in net) and this is reflected in a positive value of the fund's past dollar flow. Once the mutual funds are sorted into the portfolios, for each portfolio we obtain monthly returns using two portfolio-weighting schemes. Specifically, we compute (i) flow-weighted (FW) portfolio returns, where the funds' returns are weighted with their previous month flows and (ii) equally-weighted (EW) portfolio returns. Using flow-weighted returns for flow portfolios is a standard practice and has been often applied in the literature since Zheng (1999). Weighting funds according to their flows focuses on funds that experience high money flows in absolute terms so it gives more importance to extreme funds in this respect. On the other hand, equal weighting scheme does not focus on any specific group of funds and all of them are treated equally. Finally, given portfolio returns we evaluate the portfolio performance using alphas from CAPM, Fama-French three-factor and Carhart four-factor models, as specified in equations (4)–(6) as well as simple performance measures. We analyze the performance of the positive and negative flow portfolios, but effectively, we are interested whether the two portfolios differ in their performance.

6.2 Performance of flow portfolios

We report the performance of positive and negative flow portfolios in Table 7. We can observe from Panel A of the table that for the entire sample of SRI mutual funds, both negative and positive flow portfolios have alphas which are statistically not different from zero. This holds no matter which weighting scheme is applied. The difference in performance between positive and negative flow portfolios, although positive, is also statistically indifferent from zero. This reflects the fact that SRI funds that net attract and net lose new money, experience subsequently the same performance. A very similar situation holds for retail SRI funds in Panel B of Table 7. Both positive and negative flow portfolios underperform however this underperformance is significant only for EW positive flow portfolios for which estimated alphas range from -0.110% to -0.125% per month. When comparing the performance of retail SRI funds with positive and negative net money flows we observe that their abnormal returns are the same from a statistical perspective. Given no difference in performance of mutual funds that experience money inflows and outflows, we conclude that there is no smart money effect neither for SRI mutual funds nor for retail SRI funds.

[Table 7 here]

Very different patterns can be observed in Panel C of Table 7 where we consider flow portfolios formed out of institutional SRI funds. We can observe that mutual funds net attracting new money in the past, subsequently perform badly. If we consider flow-weighted scheme, their abnormal returns are statistically negative and of relatively high economic magnitude ranging from -0.140% to -0.156% per month. This may not be that surprising given that the institutional SRI funds overall were underperforming as can be seen in Table 1. However, positive flow portfolios perform statistically worse than negative flow portfolios: they underperform the negative flow portfolios by approximately 0.11% per month. This actually reflects a dumb money effect among the institutional SRI funds as the funds which are net attracting new money not only subsequently perform badly but also perform statistically worse than the funds net losing new money. The new money is directed to the mutual funds performing relatively badly in the future so we can see that dumb money effect is mostly driven by institutional SRI funds with net new money inflows. Comparison of the above empirical results with equal-weighting scheme, yields some interesting observations. We can see that in this case positive flow portfolios also perform statistically badly (their alphas range

[25] Zheng (1999) refers to this approach as "portfolio regression approach" while Keswani and Stolin (2008) call it "portfolio-level approach".

from -0.140% to -0.156% per month) although they do not underperform the negative flow portfolios in statistical sense. We can infer that the dumb money effect is mainly driven by mutual funds with the highest dollar inflows or outflows, which could be summarised as "big money is dumb but the small one not so much".

Given our empirical findings, we now turn to a question of whether the observed dumb money effect for SRI institutional funds preserves over longer periods. A priori, we would expect it to be rather a short-lived phenomenon. For that purpose we again build positive and negative flow portfolios, however this time we keep them over horizons longer than a month. Specifically, at the end of each p-month period we group mutual funds into two portfolios, negative and positive flow portfolios, based on the sign of their dollar flow over the preceding p months $Flow_{i,t-p\to t}$. We then compute flow-weighted returns for each portfolio and consider the zero-cost portfolio that reflects difference between positive and negative flow portfolio. For this zero-cost portfolio we estimate its performance and test whether this difference is statistically significant. We consider horizons p from 1 to 12 months so $p \in \{1, 2, ..., 12\}$.

The estimation results for a flow-weighted scheme for various horizons are reported in Table 8. If we consider flow portfolios constructed out of SRI or retail SRI funds (Panels A and B), we can see that both positive and negative flow portfolios have the same performance from a statistical perspective, as the reported differences in their performance are not significant, no matter whether the considered horizon. The only exception is the 12-month period for all SRI funds (Panel A, p=12) where we observe that positive flow portfolio is underperforming the negative flow portfolio by around 0.183% to 0.194% per month. We believe this might be related to the performance reversion over long term but have no further explanation for that. Interestingly, when we consider flow portfolios composed out of institutional SRI funds (Panel C) we can observe that positive flow portfolio statistically underperform negative flow portfolio over the period up to around 3 months. The differences between alphas for positive vs negative flow portfolio are statistically different from zero for horizons $p = 1, 2, 3$ but not beyond that. Intuitively it means that institutional SRI funds that net attract new money perform on average statistically worse than the institutional SRI funds that net lose new money and such an underperformance continues over up to 3 months. Then the differences in performance disappear. We conclude that the dumb money effect among the institutional SRI funds is rather a short-lived phenomenon and lasts for around 3 months.

[Table 8 here]

It is worth noting that our empirical findings are quite different from what most of the studies conclude on the relation between past flow of money and future performance. A substantial set of empirical work[26] confirms that there is a positive relation between flows and subsequent performance which suggests that investor's money is smart as most of it is directed towards the funds that subsequently either perform well or outperform the funds with negative/lowest flow of money. Our study does not support the smart money hypothesis but instead suggests that SRI institutional investor's money is dumb as it flows to the funds which are subsequently performing badly and underperform funds with negative money flows.

There are, however few studies that shed some light on the smart money effect. For example Frazzini and Lamont (2008) demonstrate that retail mutual fund investors represent dumb money as they lose on average in their mutual fund investments. The reason for that is that they direct their funds towards stocks with high sentiment which are overvalued and subsequently revert to fundamentals thus paying lower returns. The institutional mutual fund investors, on the other hand, reflect smart money as they exploit the inefficiencies introduced by retail investors. In a related study by Akbas et al. (2015), they provide an empirical evidence that there exists the dumb money effect for mutual fund investors at aggregated level. They show that aggregated flows of mutual funds inflate the cross sectional mispricing which consequently exacerbates standard stock return anomalies. Thus the mutual fund investors make sub-optimal asset allocation decisions and in this sense they represent dumb money. Hedge fund investors, on the other hand, represent smart money as they trade upon those anomalies and consequently alleviate the cross sectional mispricing. Also Feng et al. (2014) show that Chinese retail investors exhibit a dumb money effect while the institutional investors' flows can be considered as smart money as they move into future good performers.

Lou (2012) suggests that the smart money effect may be related to a simple price mechanism and a tendency of managers to invest new money into existing stock holdings rather than to managerial stock picking skills. Akbas et al. (2015) raise the concerns about whether the smart money effect exists in mutual fund sector and point that the flow-induced trading mechanism and Lou's price pressure of the flow of new money may actually cause distortions in

[26]The non-exhaustive list of studies confirming the smart money hypothesis includes Gruber (1996); Chevalier and Ellison (1997); Zheng (1999); Keswani and Stolin (2008); Yu (2012).

the relation between past flow and future performance and be responsible for the positive direction of this relation found by many previous studies. Jiang and Yuksel (2017) actually show that the positive relation between past flow and future performance is stronger for retail mutual funds rather than for the institutional, which seems to be inconsistent with the smart money explanation. Once they control for the expected flow of funds, they find that positive and negative unexpected flow portfolios do not differ in performance in statistical terms so there is no smart money effect.

6.3 Performance of unexpected flow portfolios

Given our discussion in the previous sub-section as well as the importance of the pricing pressure of the flow of new money and its potential influence the performance-flow relation, we follow Jiang and Yuksel (2017)'s idea and investigate whether this issue has some influence on our empirical findings in this regard. For that purpose for each mutual fund in our sample we break down its flow of new money into the expected component and the unexpected one as follows:

$$Flow_{i,t\to t+1} = \lambda_0 + \sum_{j=1}^{p} \lambda_{flow,j} Flow_{i,t-j\to t+1-j} + \lambda_{i,pp} Perf_{i,t} + \sum_{j} \lambda_{i,j} Controls_{i,j,t} + \varepsilon_{i,t} \tag{14}$$

where $Flow_{i,t\to t+1}$ is the dollar flow of new money for fund i between the end of months t and $t+1$, $Flow_{i,t-j\to t+1-j}$ is its j^{th} lag and p is the optimal number of lags selected from a maximum 12 lags based on Bayesian information criterion. $Perf_{i,t}$ is fund's i performance in month t, which, following Keswani and Stolin (2008) and Jiang and Yuksel (2017), is measured as fund's excess return in month t less the sum of the products of risk factor realizations in this month and corresponding factor loadings estimated based on the preceding 36 months. The risk factors reflect specific asset pricing model. We consider here three benchmarks: CAPM, Fama-French three-factor model and Carhart's four-factor model. We report the performance measure based on the Carhart's model as baseline empirical results in the main paper.

Our methodological approach is as follows: first we estimate the flow equation in (14) separately for each mutual fund in our sample and compute expected flows as the fitted values from that equation. Unexpected flow is the difference between the observed values of the flow and the expected flow. Then, according to the portfolio formation procedure described at the beginning of this section, each month we create positive and negative unexpected flow portfolios based on the sign of the fund's unexpected flow in the preceding month. Finally, we evaluate the performance of the two portfolios and we are interested in whether they differ in their performance.

The empirical results for the unexpected flow portfolios are reported in Table 9. We can observe from Panels A and B that for SRI and retail SRI funds the positive and negative unexpected flow portfolios have the same performance. Their alphas are not statistically different from each other, no matter which benchmark model we consider or which weighting scheme we use. This corroborates our empirical findings from Table 7 that there is no smart money effect among SRI and retail SRI funds. However, when we consider institutional SRI funds (Panel C of Table 9), the picture again is different. We can observe that institutional SRI funds attracting more new money than expected, that is with positive unexpected flow, perform subsequently badly: their alphas are in the range of -0.231% to -0.241% per month for the flow-weighted scheme. Additionally, they perform statistically worse than the equivalent funds attracting less new money than expected. Specifically, the positive unexpected flow portfolio underperforms the negative unexpected flow portfolio by around -0.225% to -0.234% per month, which represents a relatively large economic magnitude of the underperformance. Similar pattern can be observed when we consider equal-weighted scheme. The institutional SRI funds with positive unexpected flow earn subsequently statistically negative abnormal return of magnitude -0.216% to -0.223% per month. They also underperform the negative unexpected flow portfolio of institutional SRI funds by around -0.118% to -0.120% per month, which is roughly half of the underperformance for a flow-weighted scheme. This implies that the magnitude of the dumb money effect is more pronounced for institutional SRI funds with high unexpected new money inflows or outflows. Overall, our empirical results reported in Table 9 confirm our findings from the previous section that there exists dumb money effect for institutional SRI funds, which is mainly driven by institutional SRI funds with large net new money inflows.

[Table 9 here]

6.4 Robustness checks

Since our empirical findings do not confirm the smart money effect, which so far has gained most of the confirmation in the academic literature, we conduct a battery of robustness checks in order to eliminate the element of chance or luck in our analysis and further support our main empirical findings. The results of the robustness check are reported in the Online Appendix.

First, following the literature[27] and in order to account for the fact that there might be a disproportionate number of funds net attracting and losing new money in our sample, we create two equal (in terms of the number of funds) flow portfolios. Specifically, the low flow portfolio includes half of mutual funds with the lowest past dollar flow while the high flow portfolio contains half of mutual funds with the highest past dollar flow. The performance of those portfolios is reported in Table C1. We can see from Panels A and B of the table that, when we consider portfolios created out of SRI or retail SRI funds, the performance of high and low flow portfolios is the same from a statistical perspective. This confirms our previous findings that there is no smart money effect between all SRI and retail SRI funds. More importantly, when we consider high and low flow portfolios of institutional SRI funds (Panel C of Table C1) we can recognise the same pattern as in Table 7. For a flow-weighted scheme, half of the institutional SRI funds with the highest flow of new money subsequently perform badly as they achieve statistically negative alphas of -0.173% to -0.190% per month. Moreover, they also underperform the half of the institutional SRI funds with the lowest flow of new money by roughly 0.13% per month and this underperformance is statistically significant. A very similar situation can be observed for an equal-weighted scheme. These results further corroborate our previous findings that there exists the dumb money effect among the institutional SRI mutual funds.

Second, in examining whether the observed dumb money effect for SRI institutional funds preserves over longer periods we considered flow-weighted portfolios of new money. As a robustness check, we consider in Table C2 the long term performance of equally-weighted flow portfolios. We can see in Panel C of the table that, while the dumb money effect is non-existent for a 1-month horizon, it appears at 2-months horizon only and then disappears. This is a confirmation that the dumb money effect is driven mainly by institutional SRI funds with large new money flows.

Finally, we consider also alternative past performance measures for the flow equation given in (14). Specifically, we show that our empirical results are qualitatively invariant to mutual fund performance based on Fama-French three-factor model or CAPM. We report the empirical results for those two performance measures respectively in Table C3 and Table C4 . In both tables in Panel C, where we consider institutional SRI funds, we can see that the mutual funds with greater inflows than expected perform subsequently statistically worse than the funds with lower inflows than expected; the difference in alphas between positive vs negative unexpected flow portfolios is negative in statistical terms. We should add here as well that we considered many alternative econometric specifications for expected flow given in equation (14), (e.g. excluding control variables, using simple performance measures such as excess return) however the empirical findings are qualitatively similar to those presented in Tables 9, C4 and C3 and do not alter our main conclusions. The unreported empirical results are available from the authors upon request.

Overall, our robustness tests confirm the main empirical findings of this study on the performance-flow relation for SRI mutual funds that the retail SRI investors' money is not smart and the institutional SRI mutual funds represent a dumb money effect. The institutional SRI funds that net attract new money or have highest net money inflows subsequently perform poorly and underperform that equivalent SRI funds that net lose new money or have the lowest net new money inflows. The dumb money effect is mainly driven by mutual funds with largest dollar inflows or outflows, persists over a short period of up to three months and is invariant to performance measures used. Additionally, it is economically magnified if we exclude the possible flow-induced trading and related price pressure mechanism.

7 Conclusions

The growing interest from both retail and institutional investors in sustainable investments calls for a thorough analysis of how SRI funds characteristics and performance are related to the flow that those funds attract. The existing literature shows that the SRI fund performance and flow-performance relation may differ as compared to

[27] e.g. Zheng (1999); Keswani and Stolin (2008); Yu (2012)

conventional funds. There is, however, no sufficient evidence showing conclusive findings and no studies conducted on the impact of investor sophistication on fund flow and performance in the context of sustainable preferences. In this paper we fill in this gap and provide the first comprehensive analysis of the performance of US retail and institutional SRI mutual funds as well as their relation to the flow of new money that those funds experience. Special focus is given to the role that investors sophistication pays for those relations.

Our results show that overall the SRI mutual funds make positive abnormal returns before fees of magnitude 0.12%-0.14%, but not statistically significantly different from zero after fees. We also find that retail SRI funds are overperforming their institutional peers both before and after fees by roughly 0.1% and 0.06% per month respectively. These differences in performance between the two shareclasses are mainly due to institutional SRI funds obtaining negative abnormal returns especially after accounting for expenses.

When comparing the performance of SRI funds with their conventional peers, we find no differences in performance when we consider SRI and conventional mutual funds run by the same management companies and with similar investment objectives. However, when we compare the performance and SRI and conventional funds with similar fund characteristics, yet not necessarily run by the same management companies, we observe that SRI mutual funds outperform their conventional peers by almost 0.2% per month (both before and after expenses). There are two sources of these differences: the SRI funds overperforming before fees and conventional funds underperforming after fees. These results allow us to conclude that the managerial skills might play an important role in case of investments made into sustainable funds, however this issue requires a more detailed investigation which is beyond the scope of this paper.

Moreover, our study shows that there is a positive relation between past performance and future investment flow for SRI mutual funds as well as for their both, retail and institutional shareclasses. Thus the SRI funds performing well in the past, subsequently attract more investment. We confirm a positive flow-performance relation with monotonic relation test of Patton and Timmermann (2010). When investigating the shape of the flow-performance relation, we find evidence that this relation is convex within a sample of SRI and retail SRI funds, whereas linear for institutional SRI funds. Our empirical findings are invariant when we control for other factors potentially influencing the flow of new money and are also robust to alternative measures of past performance.

Given the empirical results on the flow-performance relation, we conclude that the fund performance is an important driver for investment decisions made by SRI investors. However, retail and institutional SRI investors incorporate it differently into their decision-making process. In particular, retail SRI investors disinvest their money from worst past performers and this disinvestment is disproportionately lower in comparison to the additional investment they make for equivalent best past performing funds. On the other hand, the linear flow-performance relation for institutional SRI investors indicates that institutional SRI investors disinvest the funds from the worst past performers to the same extent as they invest money into best past performers. They are then more demanding investors in comparison to their retail peers when faced with bad performance.

Additionally, our results reveal that there exists no smart money effect among the sample of all SRI funds as well as retail SRI funds. Interestingly, we find a dumb money effect for institutional SRI funds as funds net attracting new money subsequently underperform funds net losing new money. We show that the dumb money effect is mainly driven by bad performance of institutional SRI funds with large money inflows. We reveal as well that the dumb money effect is rather a short-lived phenomenon and disappears after 3 months. Our results are robust to a series of robustness checks. Specifically, the dumb money effect for institutional SRI funds is invariant to alternative constructions of flow portfolios and it is magnified when we take into account of the consequences of flow-induced trading and related price pressure. Given our findings on the performance-flow relation, we reckon that the decisions of the SRI investors might be driven also by non-financial factors, which confirms the findings in the recent literature. Some recent studies suggest that the investors' preferences for green and sustainable investments, or potential reduction for systematic risk could contribute to the growth of the SRI investments (Renneboog et al., 2011; Borgers and Pownall, 2014; Cerqueti et al., 2021; Pástor et al., 2021; Edmans and Kacperczyk, 2022). On the other hand, certain studies also suggest that the demand for underperformed SRI investment may be due to greenwashing (Cao et al., 2019; Dumitrescu et al., 2022) or investors viewing SRI funds as a long-term investment (Edmans, 2022), irrespective of their poor performance.

Our study provides a comprehensive analysis of possible factors affecting retail and institutional SRI investors' decision-making process. Our empirical results provide important insights on the flow-performance and performance-flow relations for SRI investors and the role the investors sophistication plays for those relations. SRI mutual funds with the best past performance attract more money subsequently from both retail and institutional SRI investors and the funds with the worst performance are punished by the SRI investors with disinvestments. However, institutional

SRI investors are more demanding and punish worst performances with relatively larger money outflows. On the other hand, the lack of smart money effect for retail SRI investors and the dumb money effect for institutional ones signals that, apart from the preference for sustainability and performance, there might be other non-financial factors that drive the investment of the SRI investors. With these novel results, we contribute to the empirical literature on the growing importance of sustainability and investor sophistication in the investment industry.

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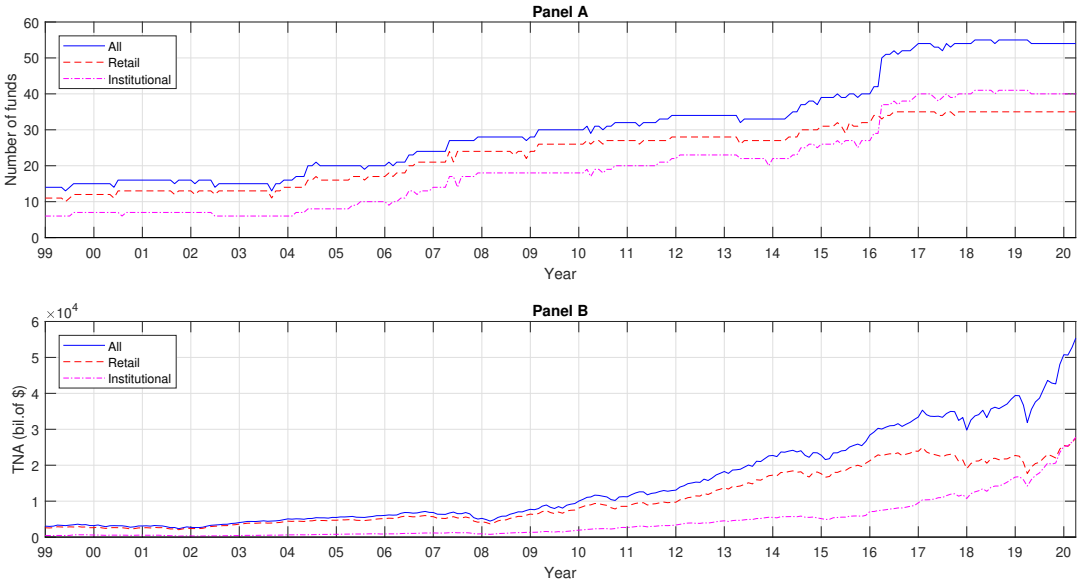
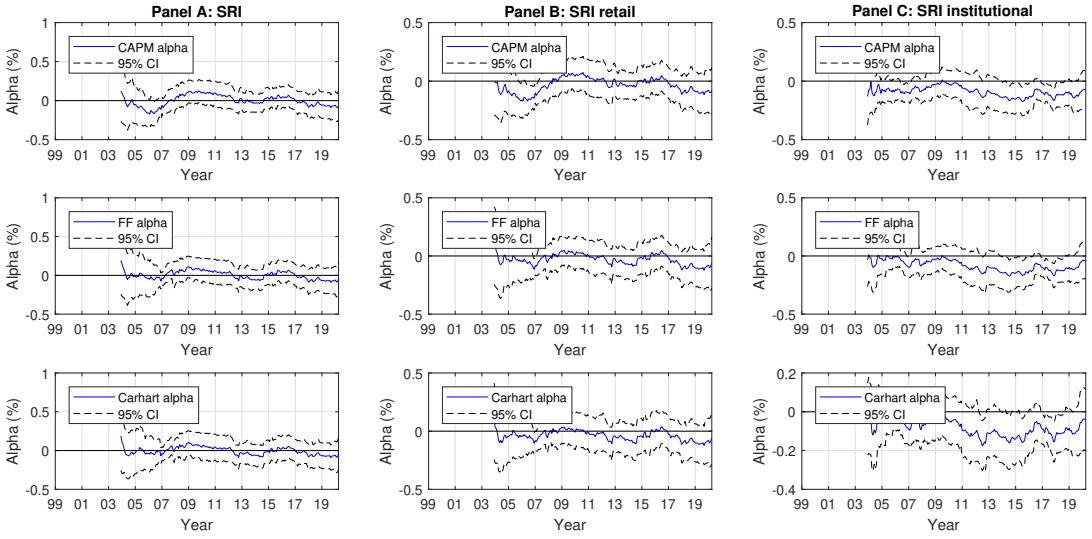
Figures

Figure 1: SRI mutual fund sector development



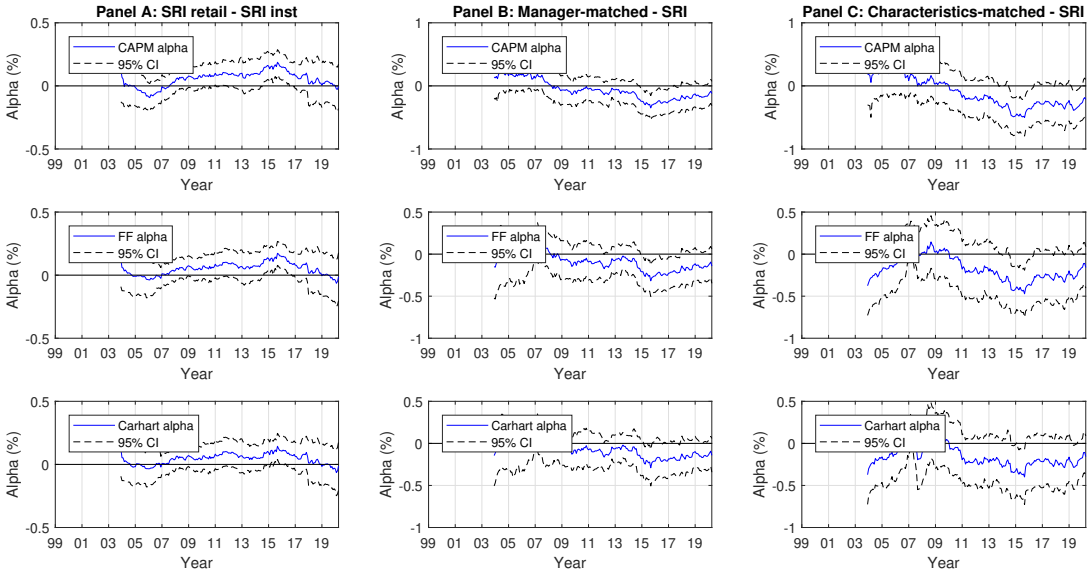
Notes: Figure 1 plots in Panel A the number of all, retail and institutional SRI mutual funds (equity funds, both domestic and international) and in Panel B the amount of money (billions of US $) invested into each group of SRI mutual funds over years 1999–2021.

Figure 2: Performance dynamics of SRI mutual fund sector (value-weighted portfolio of net returns)



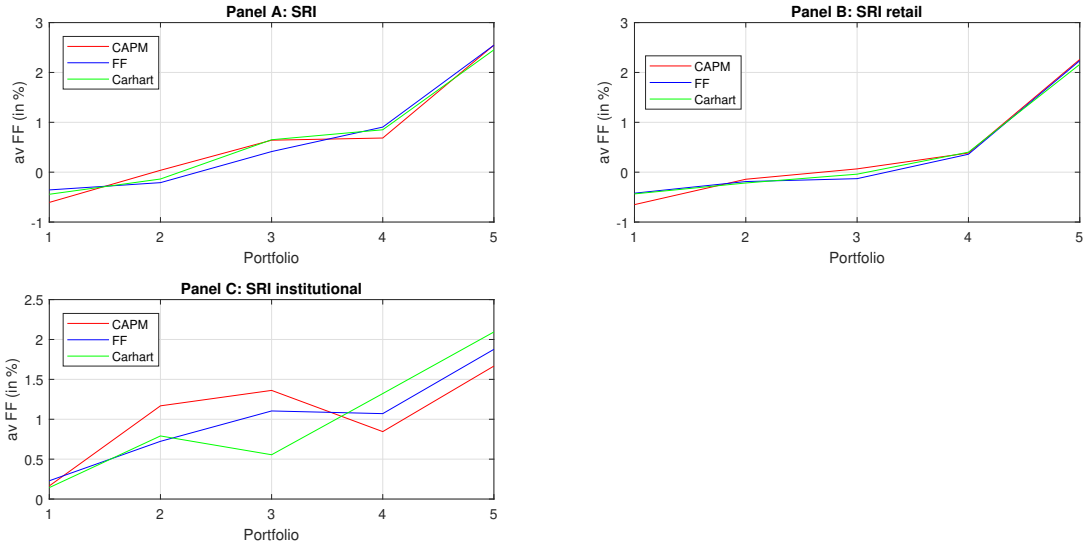
Notes: Figure 2 plots alphas for SRI mutual fund sector which is represented by a value-weighted VW portfolio of net returns. We consider sector portfolios formed within a sample of all SRI funds (Panel A), SRI retail funds (Panel B) and SRI institutional funds (Panel C). Alphas are based on 60-month rolling window time series regressions and for the purpose of their estimation we use the following three benchmark models: CAPM, Fama-French three-factor model (FF) and Carhart four-factor model. We also plot the 95% confidence interval band (based on Newey-West standard errors). The data span the period Dec1999–Mar2021.

Figure 3: Performance dynamics of zero-cost portfolios (value-weighted net return)



Notes: Figure 3 plots alphas for zero-cost portfolios which are constructed by: subtracting the value-weighted net returns (VWnet) of SRI retail fund portfolio from the equivalent returns of the SRI institutional fund portfolio (Panel A), subtracting the VWnet returns of "Manager-matched" fund portfolio from the equivalent returns of the SRI fund portfolio (Panel B), subtracting the VWnet returns of "Characteristics-matched" fund portfolio from the equivalent returns of the SRI fund portfolio (Panel C). Alphas are based on 60-month rolling window time series regressions and for the purpose of their estimation we use the following three benchmark models: CAPM, Fama-French three-factor model (FF) and Carhart four-factor model. We also plot the 95% confidence interval band (based on Newey-West standard errors). The data span the period Dec1999–Mar2021.

Figure 4: Average flow of funds for 5 SRI portfolios formed monthly on past performance (cumulative alpha)



Notes: Figure 4 plots the average flow of funds (in % per month) for 5 quintile portfolios formed on past performance (PP). We consider portfolios formed within a sample of all SRI funds (Panel A), SRI retail funds (Panel B) and SRI institutional funds (Panel C). Each month funds are grouped into 5 portfolios based on their performance in previous month (past performance) and average flow of funds is computed for each portfolio. We measure past performance by 12-month cumulative alpha, defined as $\alpha_{i,t}^{cum} = \prod_{t-11}^{t}(1 + R_{i,t} - \hat{R}_{i,t}) - 1$ that reflects the monthly alphas, computed as the difference between realized $R_{i,t}$ and model-fitted $\hat{R}_{i,t}$ portfolio net returns. Model-fitted returns are calculated as the sum of a risk free rate and product of factor loadings (estimated using 36-month estimation window) and factor realizations for given month. We use three benchmark models to determine the fitted portfolio returns: CAPM, Fama-French three-factor model (FF) and Carhart four-factor model. The data span the period Dec1999–Mar2021.

Tables

Table 1: Performance of SRI mutual fund sector

	SRI		**SRI retail**		**SRI institutional**		**SRI-retail–SRI-institutional**	
	VWnet	**VWgross**	**VWnet**	**VWgross**	**VWnet**	**VWgross**	**VWnet**	**VWgross**
Panel A: CAPM model								
alpha (in %)	0.037	**0.121**	-0.023	0.065	**-0.091**	-0.036	**0.068**	**0.101**
t-stat(NW)	0.658	2.164	-0.523	1.465	-2.153	-0.797	1.786	2.454
pv(NW)	0.511	0.031	0.602	0.144	0.032	0.426	0.075	0.015
pv(boot)	0.508	0.040	0.590	0.141	0.026	0.440	0.086	0.015
R^2a	0.961	0.961	0.965	0.965	0.967	0.967	0.030	0.001
Panel B: Fama-French model								
alpha (in %)	0.040	**0.125**	-0.014	0.074	**-0.083**	-0.031	**0.069**	**0.105**
t-stat(NW)	0.711	2.196	-0.314	1.607	-2.145	-0.746	1.897	2.557
pv(NW)	0.477	0.029	0.754	0.109	0.033	0.456	0.059	0.011
pv(boot)	0.489	0.029	0.751	0.126	0.040	0.499	0.058	0.010
R^2a	0.961	0.961	0.967	0.967	0.975	0.973	0.146	0.066
Panel C: Carhart model								
alpha (in %)	0.058	**0.143**	0.005	**0.094**	**-0.063**	-0.015	**0.068**	**0.109**
t-stat(NW)	1.014	2.468	0.111	1.986	-1.637	-0.365	1.901	2.675
pv(NW)	0.311	0.014	0.912	0.048	0.083	0.716	0.058	0.008
pv(boot)	0.314	0.015	0.920	0.048	0.080	0.703	0.076	0.007
R^2a	0.963	0.963	0.969	0.969	0.977	0.974	0.143	0.066
Panel D: Simple performance measures								
av(R-Rf) in %	0.581	0.666	0.526	0.614	0.473	0.508	0.053	0.107
av(R-Rm) in %	-0.011	0.073	-0.067	0.022	-0.120	-0.085	-0.540	-0.486
Sharpe	0.136	0.156	0.123	0.143	0.108	0.120	0.083	0.161
Treynor in %	0.632	0.725	0.567	0.663	0.497	0.554	-2.061	11.048
St dev in %	4.260	4.259	4.284	4.283	4.397	4.232	0.635	0.662

Notes: Table 1 presents various performance measures (in panels) for a portfolio of SRI mutual funds. For constructing the portfolio we use returns before (gross) and after (net) deduction of expenses and we compute value-weighted (VW) returns. We consider portfolios formed within a sample of all, retail and institutional SRI funds. The last two columns show the results for the zero-cost portfolios, which are constructed by subtracting the VWnet/VWgross returns of SRI retail fund portfolio from the relevant returns of the SRI institutional fund portfolio. Panels A–C report alphas from three benchmark models (CAPM, Fama-French three-factor and Carhart four-factor) along with basic statistics such as *t-stat* for testing the null of no significance in performance, the related p-values (parametric $pv(NW)$ and bootstrapped $pv(boot)$ following Kosowski et al. (2006)) and adjusted R^2 (R^2a). For parametric estimations we use Newey-West (NW) standard errors. In Panel D we report simple performance measures such as average returns in excess of risk free rate av(R-Rf) and in excess of market return av(R-Rm), Sharpe ratio and Treynor ratio. Finally, we report as well the standard deviation of portfolio returns. Statistically significant parameters (at least at 10% significance level) are in bold. The data span the period Dec1999–Mar2021.

Table 2: Comparison of performance between SRI and conventional mutual fund sector

	SRI		**Manager-matched**		**Manager-matched–SRI**		**Characteristics-matched**		**Characteristics-matched–SRI**	
	VWnet	**VWgross**	**VWnet**	**VWgross**	**VWnet**	**VWgross**	**VWnet**	**VWgross**	**VWnet**	**VWgross**
Panel A: CAPM model										
alpha (in %)	0.037	**0.121**	-0.010	0.079	-0.047	-0.042	-0.105	-0.024	-0.141	**-0.146**
t-stat(NW)	0.658	2.164	-0.187	1.396	-0.818	-0.736	-1.205	-0.277	-1.620	-1.666
pv(NW)	0.511	0.031	0.852	0.164	0.414	0.463	0.229	0.782	0.106	0.097
pv(boot)	0.508	0.040	0.856	0.184	0.426	0.471	0.232	0.776	0.103	0.102
R^2a	0.961	0.961	0.970	0.969	0.070	0.070	0.924	0.924	0.102	0.102
Panel B: Fama-French model										
alpha (in %)	0.040	**0.125**	-0.028	0.061	-0.068	-0.064	**-0.149**	-0.069	**-0.189**	**-0.193**
t-stat(NW)	0.711	2.196	-0.552	1.176	-1.222	-1.139	-1.982	-0.906	-2.350	-2.403
pv(NW)	0.477	0.029	0.581	0.241	0.223	0.256	0.049	0.366	0.020	0.017
pv(boot)	0.489	0.029	0.606	0.266	0.248	0.274	0.051	0.386	0.016	0.021
R^2a	0.961	0.961	0.974	0.974	0.192	0.192	0.948	0.947	0.369	0.369
Panel C: Carhart model										
alpha (in %)	0.058	**0.143**	-0.035	0.055	-0.093	-0.088	**-0.140**	-0.060	**-0.198**	**-0.203**
t-stat(NW)	1.014	2.468	-0.684	1.073	-1.621	-1.538	-1.857	-0.791	-2.348	-2.401
pv(NW)	0.311	0.014	0.495	0.284	0.106	0.125	0.064	0.430	0.020	0.017
pv(boot)	0.314	0.015	0.490	0.283	0.116	0.130	0.057	0.433	0.022	0.020
R^2a	0.963	0.963	0.974	0.974	0.243	0.243	0.948	0.947	0.371	0.370
Panel D: Simple performance measures										
av(R-Rf) in %	0.581	0.666	0.573	0.662	-0.008	-0.003	0.508	0.588	-0.073	-0.078
av(R-Rm) in %	-0.011	0.073	-0.019	0.070	-0.601	-0.596	-0.085	-0.005	-0.666	-0.671
Sharpe	0.136	0.156	0.126	0.146	-0.007	-0.003	0.104	0.120	-0.046	-0.049
Treynor in %	0.632	0.725	0.582	0.673	-0.124	-0.052	0.491	0.569	-0.641	-0.682
St dev in %	4.260	4.259	4.548	4.547	1.105	1.105	4.891	4.890	1.606	1.607

Notes: Table 2 presents various performance measures (in different panels) for a portfolio of SRI mutual funds in comparison to portfolios of equivalent conventional funds. We consider two groups of equivalent conventional funds: manager-matched funds and characteristics-matched funds. For constructing the portfolio we use returns before (gross) and after (net) deduction of expenses and we compute value-weighted (VW) returns. We provide as well the estimation results the zero-cost portfolios, which are constructed by subtracting the VWnet/VWgross returns of conventional fund portfolio from the equivalent returns of SRI fund portfolio (respectively "Manager-matched–SRI" and "Characteristics-matched–SRI"). Panels A–C report alphas from three benchmark models (CAPM, Fama-French three-factor and Carhart four-factor) along with basic statistics such as *t-stat* for testing the null of no significance in performance, the related p-values (parametric $pv(NW)$ and bootstrapped $pv(boot)$ following Kosowski et al. (2006)) and adjusted R^2 (R^2a). For parametric estimations we use Newey-West (NW) standard errors. In Panel D we report simple performance measures such as average returns in excess of risk free rate av(R-Rf) and in excess of market return av(R-Rm), Sharpe ratio and Treynor ratio. Finally, we report as well the standard deviation of portfolio returns. Statistically significant parameters (at least at 10% significance level) are in bold. The data span the period Dec1999–Mar2021.

Table 3: Flow of funds for 5 SRI portfolios formed monthly on past performance (cumulative alpha)

		Past Performance (PP) Portfolios						Monotonicity relation tests			
		worst PP	2nd worst	mid PP	2nd best	best PP	best-worst		t-test	MR test	MR^{all} test
Panel A: SRI											
CAPM	mean FF (in %)	-0.606	0.038	0.641	0.685	2.548	3.155	test stat	**6.752**	**0.044**	**0.044**
	st dev of FF (in%)	2.550	3.959	2.448	2.288	3.824	4.244	p-value	0.000	0.000	0.000
FF	mean FF (in %)	-0.356	-0.210	0.413	0.904	2.546	2.902	test stat	**6.129**	**0.146**	**0.146**
	st dev of FF (in%)	2.674	2.987	2.350	3.544	3.895	4.272	p-value	0.000	0.000	0.000
Carhart	mean FF (in %)	-0.443	-0.137	0.651	0.850	2.453	2.897	test stat	**6.347**	**0.200**	**0.200**
	st dev of FF (in%)	2.524	2.776	2.592	3.339	3.724	4.105	p-value	0.000	0.000	0.000
Panel B: SRI retail											
CAPM	mean FF (in %)	-0.651	-0.142	0.066	0.384	2.261	2.912	test stat	**8.936**	**0.208**	**0.208**
	st dev of FF (in%)	1.722	1.914	1.182	1.443	3.640	3.754	p-value	0.000	0.000	0.000
FF	mean FF (in %)	-0.421	-0.188	-0.130	0.360	2.236	2.657	test stat	**8.066**	**0.058**	**0.058**
	st dev of FF (in%)	1.625	1.856	1.280	1.594	3.690	3.689	p-value	0.000	0.000	0.000
Carhart	mean FF (in %)	-0.436	-0.217	-0.040	0.401	2.162	2.598	test stat	**8.141**	**0.177**	**0.177**
	st dev of FF (in%)	1.588	1.824	1.351	1.394	3.575	3.610	p-value	0.000	0.000	0.000
Panel C: SRI institutional											
CAPM	mean FF (in %)	0.165	1.168	1.362	0.845	1.667	1.502	test stat	**1.977**	**-0.517**	**-0.517**
	st dev of FF (in%)	3.951	7.121	5.175	3.451	4.690	6.069	p-value	0.049	0.085	0.040
FF	mean FF (in %)	0.229	0.723	1.104	1.071	1.876	1.647	test stat	**2.083**	**-0.034**	**-0.034**
	st dev of FF (in%)	4.093	7.293	5.349	4.098	4.725	6.075	p-value	0.038	0.001	0.001
Carhart	mean FF (in %)	0.143	0.791	0.555	1.322	2.094	1.951	test stat	**2.306**	**-0.236**	**-0.236**
	st dev of FF (in%)	4.147	7.127	7.778	4.072	3.512	5.147	p-value	0.022	0.003	0.002

Notes: Table 3 presents average flow of funds (in % per month) and its standard deviation for 5 quintile portfolios formed on past performance (PP). We consider portfolios formed within a sample of all SRI funds (Panel A), SRI retail funds (Panel B) and SRI institutional funds (Panel C). Each month funds are grouped into 5 portfolios based on their performance in previous month (past performance) and average flow of funds is computed for each portfolio. We measure past performance by 12-month cumulative alpha, defined as $\alpha_{i,t}^{cum} = \prod_{t-11}^{t}(1 + R_{i,t} - \hat{R}_{i,t}) - 1$ that reflects the monthly alphas, computed as the difference between realized $R_{i,t}$ and model-fitted $\hat{R}_{i,t}$ portfolio net returns. Model-fitted returns are calculated as the sum of a risk free rate and product of factor loadings (estimated using 36-month estimation window) and factor realizations for given month. We use three benchmark models to determine the fitted portfolio returns: CAPM, Fama-French three-factor model (FF) and Carhart four-factor model. We report as well in this table monotonicity relation tests (test statistics *test stat* and respective p-values) associated with monotonicity of average flow of funds across portfolios. The null hypothesis of no monotonic relation in average flow of funds across portfolio is tested against the alternative of a positive relation. We report here the results of three tests. *t-test* is a standard parametric test for testing the significance in the spread between average flow of funds of the top and bottom ranked portfolios (with Newey-West standard errors). MR and MR_all are Monotonic Relation tests proposed by Patton and Timmermann (2010) and applied to the 5 quintile portfolios. They are based respectively either on the minimal set of portfolio comparisons (MR) or on all possible comparisons (MR^{all}). Statistically significant parameters (at least at 10% significance level) are in bold. The data span the period Dec1999–Mar2021.

Table 4: Multivariate panel regressions of monthly flow of funds on past performance (cumulative alpha)

		PastPerf	logTNA	logAGE	std(ret)	ExpRatio	TurnRatio	logFamTNA	logFamNum	R^2a	N
Panel A: SRI											
CAPM	coef	**0.213**	**-0.016**	**-0.012**	0.010	**-3.710**	0.001	**0.019**	**-0.014**	7.735	5170
	p-value	0.000	0.000	0.017	0.881	0.001	0.867	0.000	0.018		
FF	coef	**0.249**	**-0.016**	**-0.012**	0.010	**-3.132**	0.001	**0.020**	**-0.014**	7.764	5170
	p-value	0.000	0.000	0.016	0.867	0.002	0.768	0.000	0.029		
Carhart	coef	**0.226**	**-0.016**	**-0.012**	0.061	**-3.188**	0.000	**0.020**	**-0.014**	7.069	5170
	p-value	0.000	0.000	0.013	0.405	0.002	0.931	0.000	0.025		
Panel B: SRI retail											
CAPM	coef	**0.195**	**-0.011**	0.000	0.011	**-1.467**	-0.003	0.001	**-0.014**	8.124	4345
	p-value	0.000	0.001	0.922	0.828	0.085	0.468	0.393	0.028		
FF	coef	**0.227**	**-0.011**	0.000	0.028	-1.056	-0.003	0.002	**-0.013**	8.242	4345
	p-value	0.000	0.001	0.971	0.550	0.218	0.492	0.232	0.044		
Carhart	coef	**0.203**	**-0.011**	0.000	0.081	-1.020	-0.004	0.002	**-0.014**	7.079	4345
	p-value	0.000	0.001	0.913	0.171	0.250	0.435	0.321	0.021		
Panel C: SRI institutional											
CAPM	coef	**0.167**	**-0.006**	-0.008	-0.102	**-5.247**	0.009	**0.010**	-0.012	1.673	3044
	p-value	0.000	0.001	0.162	0.448	0.012	0.572	0.019	0.408		
FF	coef	**0.178**	**-0.006**	-0.010	-0.137	**-4.451**	0.009	**0.010**	-0.009	1.458	3044
	p-value	0.005	0.003	0.111	0.348	0.028	0.576	0.022	0.514		
Carhart	coef	**0.180**	**-0.006**	-0.010	-0.114	**-4.490**	0.010	**0.010**	-0.010	1.524	3044
	p-value	0.002	0.003	0.092	0.423	0.028	0.552	0.023	0.505		

Notes: Table 4 presents the estimation results (coefficient estimates along with p-values) of panel regressions for the flow of funds. Panel regressions are conducted separately for a sample of all SRI funds (Panel A), SRI retail funds (Panel B) and SRI institutional funds (Panel C). The dependent variable is the flow of funds between month $t+1$ and $t+2$. Explanatory variables include: past performance ($PastPerf$), log TNA ($logTNA$), log of fund's age ($logAGE$), standard deviation of fund return ($std(ret)$), expense ratio ($ExpRatio$), turnover ratio ($TurnRatio$), log of fund's family TNA ($logFamTNA$) and the log of the number of funds under management for the fund's family ($logFamNum$). The explanatory variables are all measured for month t and are computed or estimated based on data before (and including) month t. We measure past performance by 12-month cumulative alpha, defined as $\alpha^{cum}_{i,t} = \prod_{t-11}^{t}(1 + R_{i,t} - \hat{R}_{i,t}) - 1$ that reflects the monthly alphas, computed as the difference between realized $R_{i,t}$ and model-fitted $\hat{R}_{i,t}$ portfolio net returns. Model-fitted returns are calculated as the sum of a risk free rate and product of factor loadings (estimated using 36-month estimation window) and factor realizations for given month. We use three benchmark models to determine the fitted portfolio returns: CAPM, Fama-French three-factor model (FF) and Carhart four-factor model. We report as well the adjusted R square (R^2a) and the total number of observations (N). In all regressions we include time fixed effects and we used robust, clustered standard errors. Statistically significant parameters (at least at 10% significance level) are in bold. The data span the period Dec1999–Mar2021.

Table 5: Shape of the flow-performance relation (piecewise performance ranks based on cumulative alphas)

		Low	Mid	High	H-L	R^2a	N
Panel A: SRI							
CAPM	coef	0.026	**0.010**	**0.133**	**0.108**	10.356	5168
	pv(NW)	0.229	0.080	0.000	0.009		
FF	coef	0.027	**0.012**	**0.128**	**0.100**	10.365	5168
	pv(NW)	0.164	0.029	0.000	0.014		
Carhat	coef	0.035	**0.010**	**0.117**	**0.081**	10.051	5168
	pv(NW)	0.077	0.091	0.001	0.049		
Panel B: SRI retail							
CAPM	coef	0.006	**0.010**	**0.134**	**0.128**	10.703	4345
	pv(NW)	0.671	0.019	0.000	0.001		
FF	coef	0.020	**0.007**	**0.140**	**0.121**	10.767	4345
	pv(NW)	0.209	0.091	0.000	0.002		
Carhart	coef	0.023	0.005	**0.132**	**0.109**	10.274	4345
	pv(NW)	0.124	0.253	0.000	0.003		
Panel C: SRI institutional							
CAPM	coef	0.054	**0.015**	0.029	-0.025	3.078	3042
	pv(NW)	0.010	0.080	0.260	0.418		
FF	coef	0.036	**0.020**	0.049	0.013	3.418	3042
	pv(NW)	0.252	0.003	0.250	0.842		
Carhart	coef	0.017	**0.024**	0.044	0.026	3.436	3042
	pv(NW)	0.577	0.001	0.275	0.685		

Notes: Table 5 presents the estimation results of panel regressions investigating the shape of the flow-performance relation. Panel regressions are conducted separately for a sample of all SRI funds (Panel A), SRI retail funds (Panel B) and SRI institutional funds (Panel C). The dependent variable is the percentage flow of money over the month $t+1$. Explanatory variables include piecewise performance ranks Low, Mid, $High$ and a set of control variables: log TNA ($logTNA$), log of fund's age ($logAGE$), standard deviation of fund return ($std(ret)$), expense ratio ($ExpRatio$), turnover ratio ($TurnRatio$), log of fund's family TNA ($logFamTNA$) and the log of the number of funds under management for the fund's family ($logFamNum$). The explanatory variables are all measured for month t or are computed based on data before (and including) month t. Piecewise performance ranks are assigned to mutual funds based on past performance measured as the 12-month cumulative alpha, which is defined as $\alpha_{i,t}^{cum} = \prod_{t-11}^{t}(1 + R_{i,t} - \hat{R}_{i,t}) - 1$. It reflects the monthly alphas, computed as the difference between realized $R_{i,t}$ and model-fitted $\hat{R}_{i,t}$ portfolio net returns. Model-fitted returns are calculated as the sum of a risk free rate and product of factor loadings (estimated using 36-month estimation window) and factor realizations for given month. We use three benchmark models to determine the fitted portfolio returns: CAPM, Fama-French three-factor model (FF) and Carhart four-factor model. For brevity, we report in this table only the coefficients (along with its p-values) for the three piecewise performance ranks Low, Mid, $High$ as well as the difference between the coefficients for $High$ and Low piecewise performance ranks (column "H-L"). We test the null of equality between the $High$ and Low coefficients using Wald test and report the related p-values underneath the difference. We report as well the adjusted R square (R^2a) and the total number of observations (N). In all regressions we include time fixed effects and we used robust, clustered standard errors. Statistically significant parameters (at least at 10% significance level) are in bold. The data span the period Dec1999–Mar2021.

Table 6: Shape of the flow-performance relation over longer horizons (piecewise performance ranks based on cumulative alphas)

	p:	1	3	6	9	12	18	24
Panel A: SRI								
CAPM	H-L	**0.108**	**0.098**	**0.069**	**0.075**	0.014	0.041	0.034
	p-value	0.009	0.014	0.040	0.060	0.725	0.357	0.457
FF	H-L	**0.100**	**0.098**	**0.069**	0.041	0.016	0.013	0.013
	p-value	0.014	0.003	0.004	0.196	0.562	0.754	0.697
Carhart	H-L	**0.081**	**0.091**	**0.063**	0.051	0.022	0.012	-0.002
	p-value	0.049	0.008	0.017	0.195	0.491	0.758	0.954
Panel B: SRI retail								
CAPM	H-L	**0.128**	**0.106**	**0.086**	**0.064**	**0.054**	0.016	0.037
	p-value	0.001	0.001	0.007	0.036	0.064	0.573	0.343
FF	H-L	**0.121**	**0.104**	**0.047**	0.049	0.010	-0.018	0.001
	p-value	0.002	0.001	0.090	0.137	0.708	0.597	0.966
Carhart	H-L	**0.109**	**0.119**	**0.068**	0.061	0.040	0.021	0.007
	p-value	0.003	0.000	0.024	0.114	0.198	0.580	0.802
Panel C: SRI institutional								
CAPM	H-L	-0.025	-0.030	-0.004	0.003	0.015	0.040	-0.107
	p-value	0.418	0.316	0.910	0.929	0.677	0.543	0.250
FF	H-L	0.013	0.020	0.046	0.024	0.062	-0.001	-0.062
	p-value	0.842	0.739	0.485	0.685	0.385	0.985	0.483
Carhart	H-L	0.026	0.022	0.046	0.038	0.060	0.030	-0.039
	p-value	0.685	0.688	0.428	0.599	0.378	0.516	0.672

Notes: Table 6 presents the differences between the coefficients on $High$ and Low piecewise performance ranks ("H-L") and the p-values associated with testing, using Wald test, the null of the equality between the two coefficients. The coefficients are estimated from panel regressions. In panel regressions, separately run for a sample of all SRI funds (Panel A), SRI retail funds (Panel B) and SRI institutional funds (Panel C), we regress a percentage flow of money over the consecutive p months on piecewise past performance and a set of control variables as given in equation (13). We consider future flow of money over horizons up to 12 months, i.e. $p \in \{1, 3, 6, 9, 12, 18, 24\}$ and each column in the table represents the results for a different horizon p. The dependent variable is the percentage flow of money between the end of months t and $t + p$. Explanatory variables include piecewise performance ranks Low, Mid, $High$ and a set of control variables: log TNA ($logTNA$), log of fund's age ($logAGE$), standard deviation of fund return ($std(ret)$), expense ratio ($ExpRatio$), turnover ratio ($TurnRatio$), log of fund's family TNA ($logFamTNA$) and the log of the number of funds under management for the fund's family ($logFamNum$). The explanatory variables are all measured for month t or are computed based on data before (and including) month t. Piecewise performance ranks are assigned to mutual funds based on past performance measured as the 12-month cumulative alpha, which is defined as $\alpha^{cum}_{i,t} = \prod_{t-11}^{t}(1 + R_{i,t} - \hat{R}_{i,t}) - 1$. It reflects the monthly alphas, computed as the difference between realized $R_{i,t}$ and model-fitted $\hat{R}_{i,t}$ portfolio net returns. Model-fitted returns are calculated as the sum of a risk free rate and product of factor loadings (estimated using 36-month estimation window) and factor realizations for given month. We use three benchmark models to determine the fitted portfolio returns: CAPM, Fama-French three-factor model (FF) and Carhart four-factor model. In all regressions we include time fixed effects and we used robust, clustered standard errors. Statistically significant parameters (at least at 10% significance level) are in bold. The data span the period Dec1999–Mar2021.

Table 7: Performance of Negative and Positive flow portfolios formed on past month dollar flow

Negative/Positive flow portfolios						
Panel A: SRI						
	Flow-weighted			**Equally-weighted**		
	Neg	**Pos**	**Pos-Neg**	**Neg**	**Pos**	**Pos-Neg**
alpha CAPM (%)	-0.063	0.004	0.067	-0.037	-0.075	-0.038
pv CAPM	0.530	0.947	0.559	0.618	0.212	0.448
alpha FF (%)	-0.070	0.000	0.069	-0.046	**-0.088**	-0.043
pv FF	0.484	0.998	0.541	0.508	0.094	0.402
alpha Car (%)	-0.048	0.017	0.065	-0.025	-0.074	-0.049
pv Car	0.641	0.778	0.576	0.719	0.171	0.341
av(R-Rf)	0.532	0.527	-0.005	0.517	0.469	-0.048
av(R-Rm)	-0.054	-0.059	-0.186	-0.069	-0.116	-0.244
Sharpe	0.111	0.127	-0.003	0.117	0.109	-0.058
Treynor	0.523	0.590	0.041	0.546	0.505	2.979
Panel B: SRI retail						
	Flow-weighted			**Equally-weighted**		
	Neg	**Pos**	**Pos-Neg**	**Neg**	**Pos**	**Pos-Neg**
alpha CAPM (%)	-0.026	-0.103	-0.077	-0.063	**-0.120**	-0.057
pv CAPM	0.766	0.184	0.479	0.405	0.038	0.280
alpha FF (%)	-0.035	-0.106	-0.070	-0.073	**-0.125**	-0.052
pv FF	0.676	0.177	0.506	0.282	0.026	0.297
alpha Car (%)	-0.018	-0.090	-0.072	-0.056	**-0.110**	-0.053
pv Car	0.835	0.265	0.499	0.407	0.058	0.272
av(R-Rf)	0.554	0.424	-0.130	0.498	0.433	-0.066
av(R-Rm)	-0.031	-0.161	-0.289	-0.087	-0.153	-0.280
Sharpe	0.119	0.100	-0.085	0.112	0.099	-0.087
Treynor	0.559	0.471	1.436	0.520	0.458	4.621
Panel C: SRI institutional						
	Flow-weighted			**Equally-weighted**		
	Neg	**Pos**	**Pos-Neg**	**Neg**	**Pos**	**Pos-Neg**
alpha CAPM (%)	-0.048	**-0.154**	**-0.106**	-0.033	**-0.108**	-0.075
pv CAPM	0.423	0.010	0.066	0.591	0.048	0.175
alpha FF (%)	-0.046	**-0.157**	**-0.111**	-0.031	**-0.118**	-0.087
pv FF	0.405	0.008	0.050	0.586	0.022	0.102
alpha Car (%)	-0.026	**-0.140**	**-0.114**	-0.013	**-0.102**	**-0.089**
pv Car	0.636	0.016	0.049	0.827	0.045	0.092
av(R-Rf)	0.507	0.403	-0.103	0.519	0.446	-0.072
av(R-Rm)	-0.079	-0.182	-0.310	-0.067	-0.139	-0.266
Sharpe	0.114	0.091	-0.097	0.118	0.102	-0.080
Treynor	0.535	0.424	-22.964	0.550	0.471	-14.119

Notes: Table 7 presents the performance measures (alphas) along with their p-values for portfolios formed on past dollar flow. Each month funds are grouped into 2 portfolios: Negative and Positive flow portfolios (respectively "Neg" and "Pos"), based on the sign of their dollar flow in previous month. Then the portfolio flow-weighted and equally-weighted net returns are computed. We provide as well the estimation results the zero-cost portfolios, which are constructed by subtracting the returns of Negative flow portfolio from the returns of Positive flow portfolio ("Pos-Neg"). We consider portfolios formed within a sample of all SRI funds (Panel A), SRI retail funds (Panel B) and SRI institutional funds (Panel C). Portfolio performance is evaluated using alpha from a specified benchmark model. We use three benchmark models: CAPM, Fama-French three-factor model (FF) and Carhart four-factor model. Finally, we report as well the simple performance measures for the aforementioned portfolios: average returns in excess of risk free rate av(R-Rf) and in excess of market return av(R-Rm) as well as Sharpe and Treynor ratios. Statistically significant parameters (at least at 10% significance level) are in bold. The data span the period Dec1999–Mar2021.

Table 8: Difference in performance of Positive vs Negative flow portfolios formed on past dollar flow over different horizons (flow-weighted portfolios)

Panel A: SRI												
	Positive-Negative flow portfolio											
p:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
alpha CAPM (%)	0.067	-0.005	-0.028	-0.040	-0.050	-0.008	0.057	-0.016	-0.013	0.022	-0.054	-0.144
pv CAPM	0.559	0.964	0.791	0.733	0.662	0.939	0.610	0.884	0.904	0.841	0.588	0.153
alpha FF (%)	0.069	0.000	-0.020	-0.022	-0.034	0.008	0.072	-0.001	0.006	0.032	-0.050	-0.139
pv FF	0.541	1.000	0.848	0.846	0.747	0.938	0.514	0.991	0.948	0.771	0.615	0.148
alpha Car (%)	0.065	-0.006	-0.020	-0.023	-0.029	0.011	0.067	-0.010	0.004	0.024	-0.064	-0.149
pv Car	0.576	0.957	0.851	0.839	0.793	0.914	0.573	0.926	0.970	0.834	0.537	0.136
av(R-Rf)	-0.005	-0.057	-0.084	-0.104	-0.105	-0.052	0.012	-0.060	-0.042	0.000	-0.073	-0.148
av(R-Rm)	-0.186	-0.183	-0.195	-0.214	-0.211	-0.193	-0.211	-0.197	-0.203	-0.198	-0.237	-0.255
Sharpe	-0.003	-0.039	-0.056	-0.066	-0.072	-0.035	0.008	-0.040	-0.028	0.000	-0.054	-0.101
Treynor	0.041	0.632	0.834	0.956	1.149	0.705	-0.170	0.795	0.865	-0.006	2.605	30.512
Panel B: SRI retail												
	Positive-Negative flow portfolio											
p:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
alpha CAPM (%)	-0.077	-0.117	-0.166	-0.099	-0.092	-0.075	-0.022	-0.067	-0.119	-0.092	-0.128	**-0.194**
pv CAPM	0.479	0.258	0.087	0.334	0.410	0.459	0.827	0.501	0.192	0.313	0.145	0.016
alpha FF (%)	-0.070	-0.112	-0.157	-0.088	-0.081	-0.056	-0.006	-0.050	-0.098	-0.079	-0.122	**-0.187**
pv FF	0.506	0.269	0.104	0.390	0.447	0.559	0.953	0.604	0.219	0.363	0.147	0.013
alpha Car (%)	-0.072	-0.132	-0.160	-0.089	-0.068	-0.043	0.005	-0.047	-0.090	-0.073	-0.117	**-0.183**
pv Car	0.499	0.196	0.104	0.400	0.535	0.669	0.961	0.637	0.288	0.421	0.176	0.021
av(R-Rf)	-0.130	-0.164	-0.206	-0.148	-0.129	-0.099	-0.044	-0.087	-0.131	-0.102	-0.139	-0.192
av(R-Rm)	-0.289	-0.270	-0.295	-0.289	-0.257	-0.216	-0.231	-0.217	-0.226	-0.253	-0.291	-0.287
Sharpe	-0.085	-0.110	-0.155	-0.104	-0.092	-0.070	-0.030	-0.063	-0.093	-0.075	-0.106	-0.145
Treynor	1.436	2.038	2.862	1.784	2.133	2.505	1.241	2.490	6.353	6.412	8.338	-66.850
Panel C: SRI institutional												
	Positive-Negative flow portfolio											
p:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
alpha CAPM (%)	**-0.106**	**-0.137**	**-0.142**	-0.114	-0.061	0.010	-0.093	-0.033	0.018	0.002	0.034	0.048
pv CAPM	0.066	0.044	0.044	0.144	0.408	0.904	0.316	0.704	0.827	0.986	0.697	0.532
alpha FF (%)	**-0.111**	**-0.132**	**-0.142**	-0.115	-0.068	0.004	-0.087	-0.035	0.011	-0.011	0.021	0.034
pv FF	0.050	0.035	0.037	0.117	0.324	0.954	0.289	0.656	0.887	0.909	0.815	0.658
alpha Car (%)	**-0.114**	**-0.133**	**-0.145**	-0.104	-0.054	0.012	-0.070	-0.028	0.022	0.001	0.033	0.038
pv Car	0.049	0.036	0.032	0.155	0.433	0.881	0.392	0.714	0.779	0.993	0.695	0.594
av(R-Rf)	-0.103	-0.136	-0.144	-0.112	-0.074	-0.005	-0.088	-0.043	0.006	-0.006	0.020	0.038
av(R-Rm)	-0.310	-0.289	-0.329	-0.328	-0.308	-0.256	-0.299	-0.256	-0.243	-0.238	-0.255	-0.251
Sharpe	-0.097	-0.133	-0.138	-0.106	-0.071	-0.005	-0.078	-0.040	0.005	-0.005	0.018	0.036
Treynor	-22.964	-100.407	60.626	-34.233	3.406	0.207	-10.550	2.655	-0.272	0.479	-0.973	-2.345

Notes: Table 8 presents the differences in performance measures (alphas) along with their p-values for Negative vs Positive flow portfolio for various horizons p up to 12 months. At the end of each p-month period mutual funds are grouped into 2 portfolios: Negative and Positive flow portfolios, based on the sign of their dollar flow over the preceding p months. Then the portfolio flow-weighted net returns are computed for both portfolios and we subtract the returns of Negative flow portfolio from the returns of Positive flow portfolio. We consider portfolios formed within a sample of all SRI funds (Panel A), SRI retail funds (Panel B) and SRI institutional funds (Panel C). Portfolio performance is evaluated using alpha from a specified benchmark model. We use three benchmark models: CAPM, Fama-French three-factor model (FF) and Carhart four-factor model. Finally, we report as well the simple performance measures for the aforementioned portfolios: average returns in excess of risk free rate av(R-Rf) and in excess of market return av(R-Rm) as well as Sharpe and Treynor ratios. Statistically significant parameters (at least at 10% significance level) are in bold. The data span the period Dec1999–Mar2021.

Table 9: Performance of Negative and Positive unexpected flow portfolios – past performance based on Carhart's model

Negative/Positive flow portfolios						
Panel A: SRI						
	Flow-weighted			**Equally-weighted**		
	Neg	**Pos**	**Pos-Neg**	**Neg**	**Pos**	**Pos-Neg**
alpha CAPM (%)	-0.093	-0.059	0.034	**-0.127**	**-0.168**	-0.041
pv CAPM	0.160	0.244	0.646	0.019	0.000	0.397
alpha FF (%)	-0.094	-0.052	0.042	**-0.121**	**-0.165**	-0.043
pv FF	0.173	0.316	0.601	0.028	0.000	0.381
alpha Car (%)	-0.087	-0.048	0.039	**-0.118**	**-0.158**	-0.040
pv Car	0.223	0.364	0.628	0.036	0.000	0.418
av(R-Rf)	0.779	0.739	-0.040	0.741	0.667	-0.075
av(R-Rm)	-0.113	-0.152	-1.031	-0.150	-0.225	-1.065
Sharpe	0.181	0.189	-0.034	0.175	0.164	-0.105
Treynor	0.796	0.825	0.479	0.761	0.712	1.951
Panel B: SRI retail						
	Flow-weighted			**Equally-weighted**		
	Neg	**Pos**	**Pos-Neg**	**Neg**	**Pos**	**Pos-Neg**
alpha CAPM (%)	-0.049	-0.090	-0.041	**-0.113**	**-0.180**	-0.068
pv CAPM	0.496	0.238	0.628	0.059	0.000	0.245
alpha FF (%)	-0.032	-0.073	-0.041	**-0.105**	**-0.185**	-0.081
pv FF	0.623	0.345	0.638	0.079	0.000	0.163
alpha Car (%)	-0.025	-0.057	-0.032	**-0.100**	**-0.178**	-0.077
pv Car	0.715	0.452	0.704	0.098	0.000	0.179
av(R-Rf)	0.812	0.740	-0.072	0.758	0.663	-0.095
av(R-Rm)	-0.079	-0.151	-1.063	-0.133	-0.229	-1.086
Sharpe	0.191	0.179	-0.056	0.178	0.161	-0.112
Treynor	0.841	0.795	2.099	0.776	0.701	3.057
Panel C: SRI institutional						
	Flow-weighted			**Equally-weighted**		
	Neg	**Pos**	**Pos-Neg**	**Neg**	**Pos**	**Pos-Neg**
alpha CAPM (%)	-0.006	**-0.231**	**-0.225**	**-0.110**	**-0.223**	**-0.112**
pv CAPM	0.936	0.000	0.006	0.051	0.000	0.058
alpha FF (%)	-0.006	**-0.241**	**-0.234**	**-0.101**	**-0.219**	**-0.118**
pv FF	0.934	0.000	0.004	0.076	0.000	0.041
alpha Car (%)	-0.004	**-0.235**	**-0.231**	**-0.097**	**-0.216**	**-0.120**
pv Car	0.963	0.000	0.003	0.092	0.000	0.039
av(R-Rf)	0.853	0.612	-0.241	0.762	0.640	-0.122
av(R-Rm)	-0.039	-0.280	-1.232	-0.129	-0.251	-1.113
Sharpe	0.201	0.148	-0.225	0.179	0.152	-0.150
Treynor	0.885	0.647	13.647	0.779	0.661	11.265

Notes: Table 9 presents the performance measures (alphas) along with their p-values for portfolios formed on past unexpected dollar flow. The unexpected dollar flow for each fund-month is the difference between the observed and fitted values of the fund's flow given in equation (14) where the performance measure is based on Carhart's four-factor model. Each month funds are grouped into 2 portfolios: Negative and Positive unexpected flow portfolios (respectively "Neg" and "Pos"), based on the sign of their unexpected dollar flow in previous month. Then the portfolio flow-weighted and equally-weighted net returns are computed. We provide as well the estimation results the zero-cost portfolios, which are constructed by subtracting the returns of Negative flow portfolio from the returns of Positive flow portfolio ("Pos-Neg"). We consider portfolios formed within a sample of all SRI funds (Panel A), SRI retail funds (Panel B) and SRI institutional funds (Panel C). Portfolio performance is evaluated using alpha from a specified benchmark model. We use three benchmark models: CAPM, Fama-French three-factor model (FF) and Carhart four-factor model. Finally, we report as well the simple performance measures for the aforementioned portfolios: average returns in excess of risk free rate av(R-Rf) and in excess of market return av(R-Rm) as well as Sharpe and Treynor ratios. Statistically significant parameters (at least at 10% significance level) are in bold. The data span the period Dec1999–Mar2021.

Online Appendix

In this Online Appendix we include additional empirical results which extend our analysis in the main paper and account for robustness checks. The appendix has three parts.

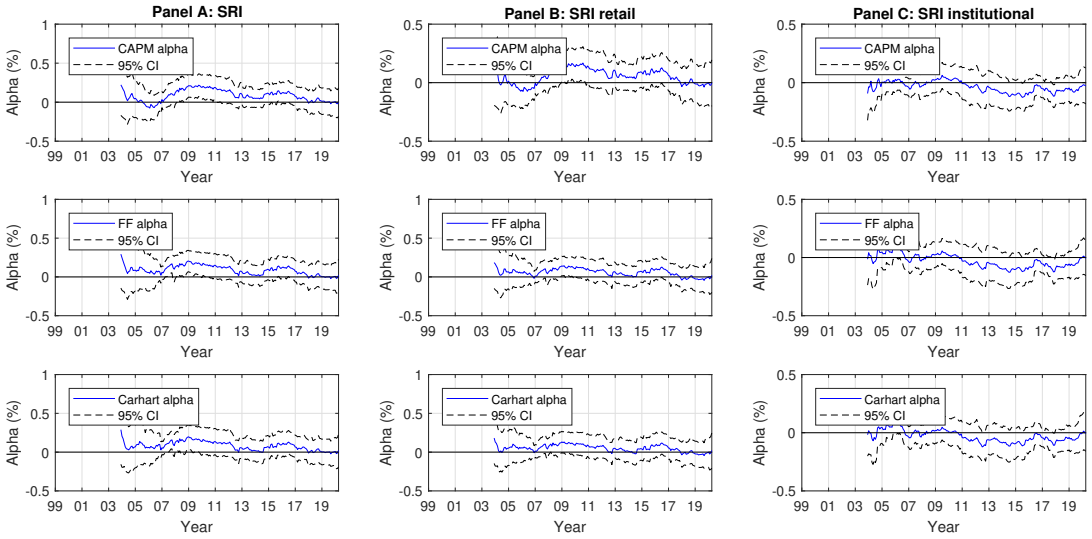
In part A we report additional figures and tables which are related to performance evaluation of SRI, retail SRI and institutional SRI mutual funds as well as conventional funds (both manager-matched and characteristics-matched) equivalent to SRI funds (section 4 in the main paper). Specifically, we consider here dynamics in the performance of mutual funds, compare fund performance in non-recession periods and report estimated alphas and betas for CAPM, Fama-French three-factor model and Carhart four-factor model for various mutual fund portfolios.

In part B we report additional figures and tables related to the study of the relation between past performance and future flow of money for SRI mutual funds (section 5 in the main paper). Specifically, we include here the empirical results related to the use of two groups of alternative measures of past performance described in subsection 5.1 of the main paper: (i) 36-month rolling alphas which represents the intercept from a specified asset pricing model and (ii) simple performance measures that include fund 12-month average return in excess of a risk free rate and market return as well as Sharpe and Treynor ratios.

In part C we collect additional tables that further support the main findings on the relation between past flow of money and future performance for SRI funds (section 6 in the main paper).Specifically, we consider different criteria for sorting mutual funds into flow portfolios, difference in Positive vs Negative flow portfolios based on equal-weighted scheme and compare the performance of unexpected flow portfolios in which past performance is based on Fama-French three-factor model and CAPM.

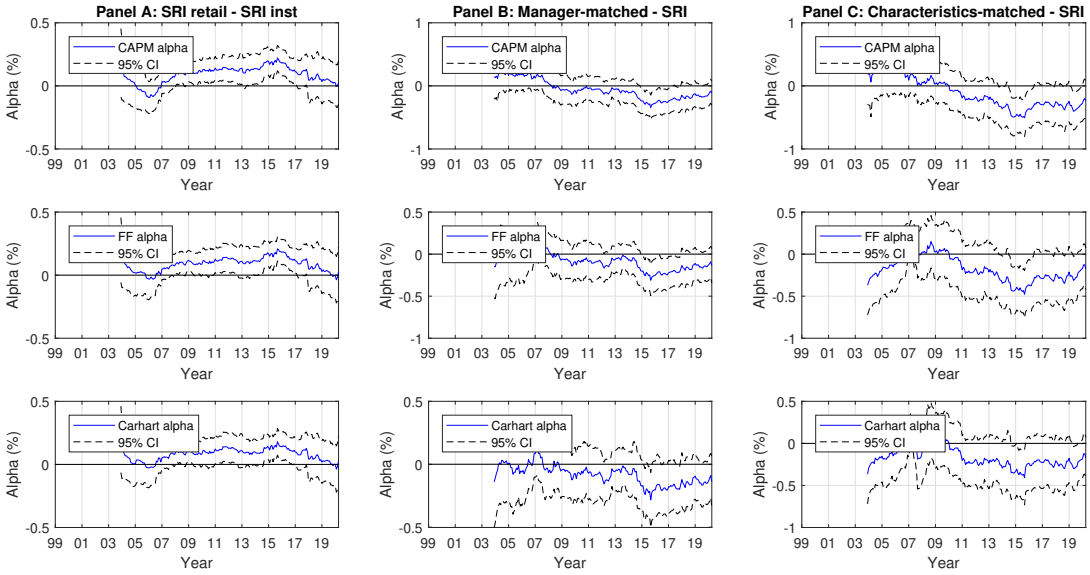
A Performance evaluation of SRI and conventional funds

Figure A1: Performance dynamics of SRI mutual fund sector (value-weighted portfolio of gross returns)



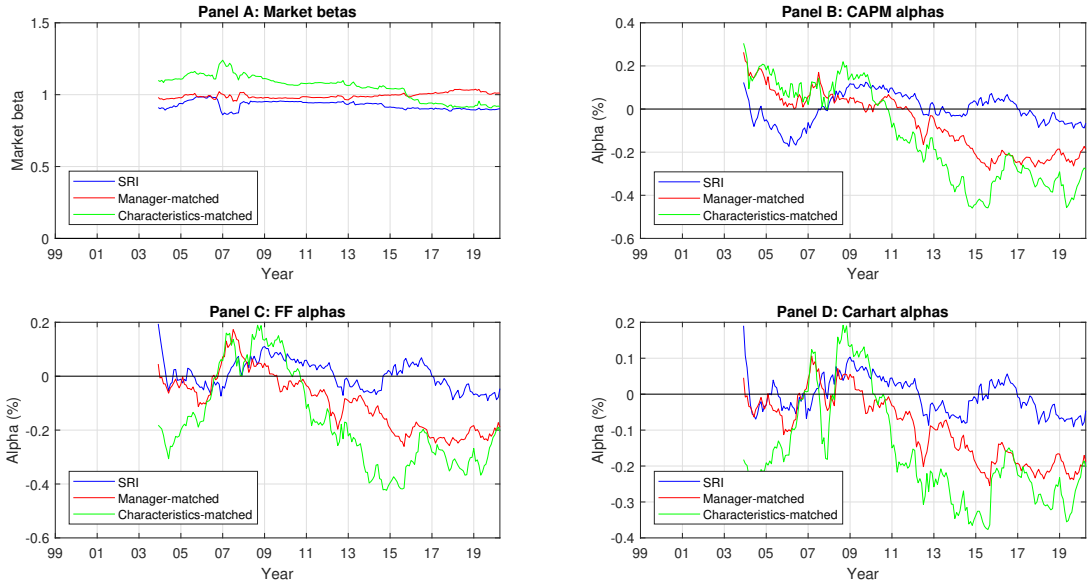
Notes: Figure A1 plots alphas for SRI mutual fund sector which is represented by a value-weighted VW portfolio of gross returns. We consider sector portfolios formed within a sample of all SRI funds (Panel A), SRI retail funds (Panel B) and SRI institutional funds (Panel C). Alphas are based on 60-month rolling window time series regressions and for the purpose of their estimation we use the following three benchmark models: CAPM, Fama-French three-factor model (FF) and Carhart four-factor model. We also plot the 95% confidence interval band (based on Newey-West standard errors). The data span the period Dec1999–Mar2021.

Figure A2: Performance dynamics of zero-cost portfolios (value-weighted gross return)



Notes: Figure A2 plots alphas for zero-cost portfolios which are constructed by: subtracting the value-weighted gross returns (VWgross) of SRI retail fund portfolio from the equivalent returns of the SRI institutional fund portfolio (Panel A), subtracting the VWgross returns of "Manager-matched" fund portfolio from the equivalent returns of the SRI fund portfolio (Panel B), subtracting the VWgross returns of "Characteristics-matched" fund portfolio from the equivalent returns of the SRI fund portfolio (Panel C). Alphas are based on 60-month rolling window time series regressions and for the purpose of their estimation we use the following three benchmark models: CAPM, Fama-French three-factor model (FF) and Carhart four-factor model. We also plot the 95% confidence interval band (based on Newey-West standard errors). The data span the period Dec1999–Mar2021.

Figure A3: Beta and alpha variation for SRI and conventional mutual funds



Notes: Figure A3 plots market betas (Panel A) and alphas (based on CAPM, Fama-French and Carhart models respectively in Panels B, C and D) for sector portfolios (value-weighted portfolios of net returns) representing SRI mutual funds and two groups of conventional funds: manager-matched and characteristics-matched ones. Market betas and alphas are based on 60-month rolling window time series regressions. The data span the period Dec1999–Mar2021.

Table A1: Estimated parameters for various asset pricing models for SRI, retail SRI and institutional SRI mutual funds

		Value-weighted (VW) net						**Value-weighted (VW) gross**					
		$\hat{\alpha}$	$\hat{\beta}_m$	$\hat{\beta}_{smb}$	$\hat{\beta}_{hml}$	$\hat{\beta}_{umd}$	R^2**a**	$\hat{\alpha}$	$\hat{\beta}_m$	$\hat{\beta}_{smb}$	$\hat{\beta}_{hml}$	$\hat{\beta}_{umd}$	R^2**a**
Panel A: SRI													
CAPM	coef	0.037	**0.919**				0.961	**0.121**	**0.919**				0.961
	pv(NW)	0.511	0.000					0.031	0.000				
FF	coef	0.040	**0.924**	-0.024	0.005		0.961	**0.125**	**0.924**	-0.024	0.005		0.961
	pv(NW)	0.477	0.000	0.335	0.810			0.029	0.000	0.349	0.785		
Carhart	coef	0.058	**0.905**	-0.015	-0.009	**-0.040**	0.963	**0.143**	**0.905**	-0.015	-0.009	**-0.040**	0.963
	pv(NW)	0.311	0.000	0.486	0.673	0.026		0.014	0.000	0.505	0.696	0.027	
Panel B: SRI retail													
CAPM	coef	-0.023	**0.927**				0.965	0.065	**0.926**				0.965
	pv(NW)	0.602	0.000					0.144	0.000				
FF	coef	-0.014	**0.939**	**-0.061**	0.010		0.967	0.074	**0.939**	**-0.060**	0.011		0.967
	pv(NW)	0.754	0.000	0.017	0.518			0.109	0.000	0.018	0.503		
Carhart	coef	0.005	**0.919**	**-0.051**	-0.005	**-0.043**	0.969	**0.094**	**0.918**	**-0.051**	-0.004	**-0.043**	0.969
	pv(NW)	0.912	0.000	0.018	0.783	0.002		0.048	0.000	0.019	0.800	0.002	
Panel C: SRI institutional													
CAPM	coef	**-0.091**	**0.952**				0.967	-0.036	**0.917**				0.967
	pv(NW)	0.032	0.000					0.426	0.000				
FF	coef	**-0.083**	**0.973**	**-0.096**	**0.062**		0.975	-0.031	**0.933**	**-0.074**	**0.060**		0.973
	pv(NW)	0.033	0.000	0.012	0.000			0.456	0.000	0.004	0.000		
Carhart	coef	**-0.063**	**0.952**	**-0.086**	**0.046**	**-0.044**	0.977	-0.015	**0.916**	**-0.066**	**0.048**	**-0.034**	0.974
	pv(NW)	0.103	0.000	0.008	0.001	0.000		0.716	0.000	0.002	0.001	0.021	

Notes: Table A1 presents estimated alphas and betas (coef) along with p-values following Newey-West NW standard errors (pv(NW)) for three asset pricing models: CAPM, Fama-French three-factor (FF) and Carhart four-factor models. We report as well the adjusted R^2 (R^2a). In Panel A we consider a portfolio of SRI mutual funds, in Panel B, portfolio of retail SRI funds and in Panel C, portfolio of institutional SRI funds. For constructing the portfolios we use returns before (gross) and after (net) deduction of expenses and we compute value-weighted (VW) returns. Statistically significant parameters (at least at 10% significance level) are in bold. The data span the period Dec1999–Mar2021.

Table A2: Estimated parameters for various asset pricing models for SRI, manager-matched and characteristics-matched conventional mutual funds

		Value-weighted (VW) net						**Value-weighted (VW) gross**					
		$\hat{\alpha}$	$\hat{\beta}_m$	$\hat{\beta}_{smb}$	$\hat{\beta}_{hml}$	$\hat{\beta}_{umd}$	R^2**a**	$\hat{\alpha}$	$\hat{\beta}_m$	$\hat{\beta}_{smb}$	$\hat{\beta}_{hml}$	$\hat{\beta}_{umd}$	R^2**a**
Panel A: SRI funds													
CAPM	coef	0.037	**0.919**				0.961	**0.121**	**0.919**				0.961
	pv(NW)	0.511	0.000					0.031	0.000				
FF	coef	0.040	**0.924**	-0.024	0.005		0.961	**0.125**	**0.924**	-0.024	0.005		0.961
	pv(NW)	0.477	0.000	0.335	0.810			0.029	0.000	0.349	0.785		
Carhart	coef	0.058	**0.905**	-0.015	-0.009	**-0.040**	0.963	**0.143**	**0.905**	-0.015	-0.009	**-0.040**	0.963
	pv(NW)	0.311	0.000	0.486	0.673	0.026		0.014	0.000	0.505	0.696	0.027	
Panel B: Manager-matched funds													
CAPM	coef	-0.010	**0.985**				0.970	0.079	0.985				0.969
	pv(NW)	0.852	0.000					0.164	0.000				
FF	coef	-0.028	**0.964**	**0.102**	0.006		0.974	0.061	0.963	**0.103**	0.007		0.974
	pv(NW)	0.581	0.000	0.000	0.808			0.241	0.000	0.000	0.787		
Carhart	coef	-0.035	**0.970**	**0.099**	0.011	0.014	0.974	0.055	0.970	**0.100**	0.012	0.014	0.974
	pv(NW)	0.495	0.000	0.000	0.678	0.341		0.284	0.000	0.000	0.659	0.342	
Panel C: Characteristics-matched funds													
CAPM	coef	-0.105	**1.034**				0.924	-0.024	**1.033**				0.924
	pv(NW)	0.229	0.000					0.782	0.000				
FF	coef	**-0.149**	**0.983**	**0.246**	0.023		0.948	-0.069	**0.982**	**0.247**	0.024		0.947
	pv(NW)	0.049	0.000	0.000	0.304			0.366	0.000	0.000	0.280		
Carhart	coef	**-0.140**	**0.974**	**0.250**	0.016	-0.019	0.948	-0.060	**0.973**	**0.251**	0.018	-0.018	0.947
	pv(NW)	0.064	0.000	0.000	0.478	0.348		0.430	0.000	0.000	0.443	0.354	

Notes: Table A2 presents estimated alphas and betas (coef) along with p-values following Newey-West NW standard errors (pv(NW)) for three asset pricing models: CAPM, Fama-French three-factor (FF) and Carhart four-factor models. We report as well the adjusted R^2 (R^2a). In Panel A we consider a portfolio of SRI mutual funds, in Panel B, portfolio of equivalent, manager-matched conventional funds and in Panel C, portfolio of equivalent, characteristics-matched conventional funds. For constructing the portfolios we use returns before (gross) and after (net) deduction of expenses and we compute value-weighted (VW) returns. Statistically significant parameters (at least at 10% significance level) are in bold. The data span the period Dec1999–Mar2021.

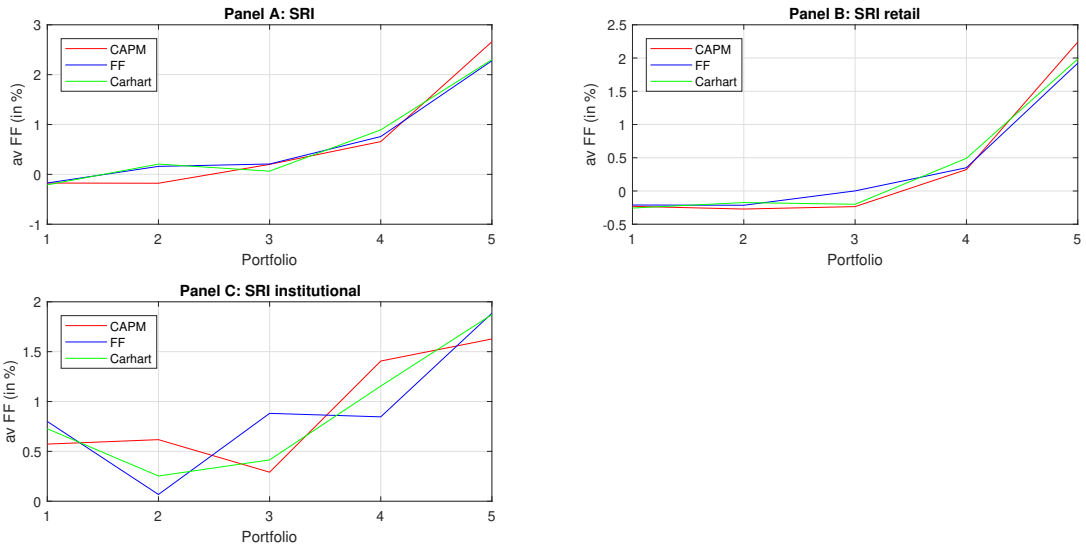
Table A3: Comparison of performance between SRI and conventional mutual funds: full vs non-recession sample period

	Manager-matched–SRI				**Characteristics-matched–SRI**			
	Dec1999-Mar2021		**Dec2009-Dec2019**		**Dec1999-Mar2021**		**Dec2009-Dec2019**	
	VWnet	**VWgross**	**VWnet**	**VWgross**	**VWnet**	**VWgross**	**VWnet**	**VWgross**
Panel A: CAPM model								
alpha (in %)	-0.047	-0.042	-0.122	-0.117	-0.141	**-0.146**	**-0.283**	**-0.295**
t-stat(NW)	-0.818	-0.736	-1.699	-1.627	-1.620	-1.666	-2.550	-2.667
pv(NW)	0.414	0.463	0.092	0.106	0.106	0.097	0.012	0.009
pv(boot)	0.426	0.471	0.121	0.106	0.103	0.102	0.000	0.000
R^2a	0.070	0.070	0.142	0.142	0.102	0.102	0.055	0.055
Panel B: Fama-French model								
alpha (in %)	-0.068	-0.064	-0.107	-0.102	**-0.189**	**-0.193**	**-0.257**	**-0.269**
t-stat(NW)	-1.222	-1.139	-1.656	-1.576	-2.350	-2.403	-2.506	-2.631
pv(NW)	0.223	0.256	0.100	0.118	0.020	0.017	0.014	0.010
pv(boot)	0.248	0.274	0.135	0.158	0.016	0.021	0.000	0.000
R^2a	0.192	0.192	0.198	0.199	0.369	0.369	0.068	0.068
Panel C: Carhart model								
alpha (in %)	-0.093	-0.088	-0.093	-0.088	**-0.198**	**-0.203**	**-0.222**	**-0.233**
t-stat(NW)	-1.621	-1.538	-1.479	-1.396	-2.348	-2.401	-2.205	-2.328
pv(NW)	0.106	0.125	0.142	0.165	0.020	0.017	0.029	0.022
pv(boot)	0.116	0.130	0.199	0.192	0.022	0.020	0.000	0.000
R^2a	0.243	0.243	0.208	0.208	0.371	0.370	0.125	0.126
Panel D: Simple performance measures								
av(R-Rf) in %	-0.008	-0.003	-0.024	-0.018	-0.073	-0.078	-0.203	-0.215
av(R-Rm) in %	-0.601	-0.596	-1.129	-1.124	-0.666	-0.671	-1.308	-1.320
Sharpe	-0.007	-0.003	-0.028	-0.022	-0.046	-0.049	-0.189	-0.200
Treynor in %	-0.124	-0.052	-0.267	-0.208	-0.641	-0.682	-2.808	-2.965
St dev in %	1.105	1.105	0.856	0.856	1.606	1.607	1.075	1.074

Notes: Table A3 presents various performance measures (in different panels) for a portfolio of SRI mutual funds in comparison to portfolios of equivalent, conventional funds. We consider two groups of equivalent conventional funds: manager-matched funds and characteristics-matched funds. For constructing the portfolio we use returns before (gross) and after (net) deduction of expenses and we compute value-weighted (VW) returns. Performance comparison is conducted via the performance estimation for zero-cost portfolios, which are constructed by subtracting the VWnet/VWgross returns of conventional fund portfolios from the equivalent returns of SRI fund portfolio (respectively "Manager-matched–SRI" and"Characteristics-matched–SRI"). Panels A–C report alphas from three benchmark models (CAPM, Fama-French three-factor and Carhart four-factor) along with basic statistics such as *t-stat* for testing the null of no significance in performance, the related p-values (parametric $pv(NW)$ and bootstrapped $pv(boot)$ following Kosowski et al. (2006)) and adjusted R^2 (R^2a). For parametric estimations we use Newey-West (NW) standard errors. In Panel D we report simple performance measures such as average returns in excess of risk free rate av(R-Rf) and in excess of market return av(R-Rm), Sharpe ratio and Treynor ratio. Finally, we report as well the standard deviation of portfolio returns. Statistically significant parameters (at least at 10% significance level) are in bold. We consider here two periods: (i) Dec1999-Mar2021 which is a full sample period and Dec2009-Dec2019 which accounts for the longest sub-period in our sample without recessions.

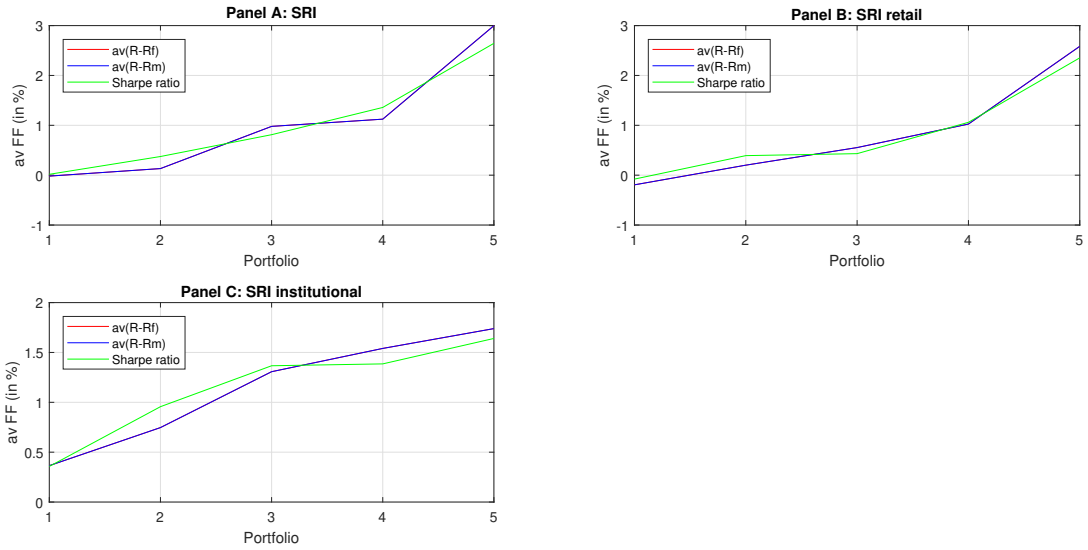
B Flow-performance relation

Figure B1: Average flow of funds for 5 SRI portfolios formed monthly on past performance (alpha)



Notes: Figure B1 plots the average flow of funds (in % per month) for 5 quintile portfolios formed on past performance (PP). We consider portfolios formed within a sample of all SRI funds (Panel A), SRI retail funds (Panel B) and SRI institutional funds (Panel C). Each month funds are grouped into 5 portfolios based on their performance in previous month (past performance) and average flow of funds is computed for each portfolio. We measure past performance as alpha which represents the intercept from a specified benchmark model estimated over the 36 months prior to a given month-end. We use three benchmark models: CAPM, Fama-French three-factor model (FF) and Carhart four-factor model. The data span the period Dec1999–Mar2021.

Figure B2: Average flow of funds for 5 SRI portfolios formed monthly on past performance (simple performance measures)



Notes: Figure B2 plots the average flow of funds (in % per month) for 5 quintile portfolios formed on past performance (PP). We consider portfolios formed within a sample of all SRI funds (Panel A), SRI retail funds (Panel B) and SRI institutional funds (Panel C). Each month funds are grouped into 5 portfolios based on their performance in previous month (past performance) and average flow of funds is computed for each portfolio. We measure past performance with simple performance measures such as average returns in excess of risk free rate av(R-Rf) and in excess of market return av(R-Rm) as well as the Sharpe ratio, all computed over the 12 months prior to a given month-end. The data span the period Dec1999–Mar2021.

Table B1: Flow of funds for 5 SRI portfolios formed monthly on past performance (alpha)

		Past Performance (PP) Portfolios						Monotonicity relation tests			
		worst PP	**2nd worst**	**mid PP**	**2nd best**	**best PP**	**best-worst**		**t-test**	**MR test**	**MR^{all} test**
Panel A: SRI											
CAPM	mean FF (in %)	-0.174	-0.178	0.200	0.657	2.660	2.834	test stat	**6.091**	**-0.004**	**-0.004**
	st dev of FF (in%)	3.428	2.335	3.239	2.060	3.961	5.005	p-value	0.000	0.000	0.000
FF	mean FF (in %)	-0.173	0.160	0.208	0.758	2.279	2.451	test stat	**5.225**	**0.047**	**0.047**
	st dev of FF (in%)	3.448	2.058	3.500	2.177	3.914	4.972	p-value	0.000	0.000	0.000
Carhart	mean FF (in %)	-0.210	0.206	0.065	0.892	2.300	2.510	test stat	**5.460**	**-0.142**	**-0.142**
	st dev of FF (in%)	2.889	2.881	3.220	2.834	3.381	4.257	p-value	0.000	0.001	0.001
Panel B: SRI retail											
CAPM	mean FF (in %)	-0.231	-0.271	-0.235	0.322	2.241	2.471	test stat	**7.589**	**-0.040**	**-0.040**
	st dev of FF (in%)	1.741	1.858	1.559	1.384	3.536	3.606	p-value	0.000	0.000	0.000
FF	mean FF (in %)	-0.211	-0.215	0.002	0.350	1.922	2.133	test stat	**6.386**	**-0.004**	**-0.004**
	st dev of FF (in%)	1.686	1.889	1.745	1.932	3.371	3.492	p-value	0.000	0.000	0.000
Carhart	mean FF (in %)	-0.256	-0.174	-0.200	0.492	1.984	2.241	test stat	**6.652**	**-0.025**	**-0.025**
	st dev of FF (in%)	1.720	1.347	2.127	1.834	3.507	3.613	p-value	0.000	0.000	0.000
Panel C: SRI institutional											
CAPM	mean FF (in %)	0.573	0.618	0.291	1.406	1.627	1.054	test stat	1.620	**-0.326**	**-0.326**
	st dev of FF (in%)	5.990	5.016	3.429	3.341	3.028	6.606	p-value	0.107	0.013	0.007
FF	mean FF (in %)	0.800	0.068	0.881	0.846	1.885	1.085	test stat	**1.662**	-0.732	**-0.732**
	st dev of FF (in%)	5.301	5.554	2.908	3.443	3.797	6.451	p-value	0.098	0.100	0.032
Carhart	mean FF (in %)	0.727	0.253	0.414	1.155	1.872	1.145	test stat	**1.748**	**-0.474**	**-0.474**
	st dev of FF (in%)	5.974	5.084	3.191	3.045	3.657	7.041	p-value	0.082	0.036	0.009

Notes: Table B1 presents average flow of funds (in % per month) and its standard deviation for 5 quintile portfolios formed on past performance (PP). We consider portfolios formed within a sample of all SRI funds (Panel A), SRI retail funds (Panel B) and SRI institutional funds (Panel C). Each month funds are grouped into 5 portfolios based on their performance in previous month (past performance) and average flow of funds is computed for each portfolio. We measure past performance as alpha which represents the intercept from a specified benchmark model estimated over the 36 months prior to a given month-end. We use three benchmark models: CAPM, Fama-French three-factor model (FF) and Carhart four-factor model. We report as well in this table monotonicity relation tests (test statistics *test stat* and respective p-values) associated with monotonicity of average flow of funds across portfolios. The null hypothesis of no monotonic relation in average flow of funds across portfolio is tested against the alternative of a positive relation. We report here the results of three tests. *t-test* is a standard parametric test for testing the significance in the spread between average flow of funds of the top and bottom ranked portfolios (with Newey-West standard errors). MR and MR_all are Monotonic Relation tests proposed by Patton and Timmermann (2010) and applied to the 5 quintile portfolios. They are based respectively either on the minimal set of portfolio comparisons (MR) or on all possible comparisons (MR^{all}). Statistically significant parameters (at least at 10% significance level) are in bold. The data span the period Dec1999–Mar2021.

Table B2: Flow of funds for 5 SRI portfolios formed monthly on past performance (simple performance measures)

		Past Performance (PP) Portfolios						Monotonicity relation tests			
		worst PP	**2nd worst**	**mid PP**	**2nd best**	**best PP**	**best-worst**		**t-test**	**MR test**	**MR^{all} test**
Panel A: SRI											
av(R-Rf)	mean FF (in %)	-0.019	0.132	0.979	1.124	2.998	3.017	test stat	**7.089**	**0.145**	**0.145**
	st dev of FF (in%)	2.398	3.194	3.016	2.614	3.508	4.042	p-value	0.000	0.000	0.000
av(R-Rm)	mean FF (in %)	-0.019	0.132	0.979	1.124	2.998	3.017	test stat	**7.089**	**0.145**	**0.145**
	st dev of FF (in%)	2.398	3.194	3.016	2.614	3.508	4.042	p-value	0.000	0.000	0.000
Sharpe	mean FF (in %)	0.018	0.374	0.812	1.358	2.644	2.627	test stat	**6.161**	**0.357**	**0.357**
	st dev of FF (in%)	2.478	3.021	3.023	2.536	3.675	4.285	p-value	0.000	0.000	0.000
Treynor	mean FF (in %)	0.095	0.158	1.004	1.337	2.591	2.496	test stat	**5.798**	**0.063**	**0.063**
	st dev of FF (in%)	2.527	3.063	3.026	2.654	3.641	4.300	p-value	0.000	0.000	0.000
Panel B: SRI retail											
av(R-Rf)	mean FF (in %)	-0.194	0.201	0.554	1.025	2.584	2.778	test stat	**8.490**	**0.353**	**0.353**
	st dev of FF (in%)	2.038	1.810	1.755	2.253	3.246	3.647	p-value	0.000	0.000	0.000
av(R-Rm)	mean FF (in %)	-0.194	0.201	0.554	1.025	2.584	2.778	test stat	**8.490**	**0.353**	**0.353**
	st dev of FF (in%)	2.038	1.810	1.755	2.253	3.246	3.647	p-value	0.000	0.000	0.000
Sharpe	mean FF (in %)	-0.079	0.392	0.432	1.060	2.353	2.431	test stat	**7.352**	**0.040**	**0.040**
	st dev of FF (in%)	2.154	1.992	1.988	1.774	3.313	3.820	p-value	0.000	0.000	0.000
Treynor	mean FF (in %)	0.007	0.190	0.496	1.032	2.413	2.405	test stat	**7.238**	**0.183**	**0.183**
	st dev of FF (in%)	2.146	2.158	1.728	1.974	3.286	3.734	p-value	0.000	0.000	0.000
Panel C: SRI institutional											
av(R-Rf)	mean FF (in %)	0.365	0.747	1.307	1.540	1.739	1.374	test stat	**2.281**	**0.199**	**0.199**
	st dev of FF (in%)	3.890	3.831	4.594	4.836	3.781	5.052	p-value	0.023	0.000	0.000
av(R-Rm)	mean FF (in %)	0.365	0.747	1.307	1.540	1.739	1.374	test stat	**2.281**	**0.199**	**0.199**
	st dev of FF (in%)	3.890	3.831	4.594	4.836	3.781	5.052	p-value	0.023	0.000	0.000
Sharpe	mean FF (in %)	0.357	0.956	1.367	1.385	1.640	1.283	test stat	**2.098**	**0.019**	**0.019**
	st dev of FF (in%)	3.873	3.628	4.634	5.028	4.044	5.095	p-value	0.037	0.000	0.000
Treynor	mean FF (in %)	0.320	0.829	1.881	0.932	1.904	1.584	test stat	**2.296**	**-0.950**	**-0.950**
	st dev of FF (in%)	3.729	3.970	7.248	4.157	4.083	5.083	p-value	0.023	0.405	0.214

Notes: Table B2 presents average flow of funds (in % per month) and its standard deviation for 5 quintile portfolios formed on past performance (PP). We consider portfolios formed within a sample of all SRI funds (Panel A), SRI retail funds (Panel B) and SRI institutional funds (Panel C). Each month funds are grouped into 5 portfolios based on their performance in previous month (past performance) and average flow of funds is computed for each portfolio. We measure past performance with simple performance measures such as average returns in excess of risk free rate av(R-Rf) and in excess of market return av(R-Rm) as well as Sharpe and Treynor ratios, all computed over the 12 months prior to a given month-end. We report as well in this table monotonicity relation tests (test statistics *test stat* and respective p-values) associated with monotonicity of average flow of funds across portfolios. The null hypothesis of no monotonic relation in average flow of funds across portfolio is tested against the alternative of a positive relation. We report here the results of three tests. *t-test* is a standard parametric test for testing the significance in the spread between average flow of funds of the top and bottom ranked portfolios (with Newey-West standard errors). MR and MR_all are Monotonic Relation tests proposed by Patton and Timmermann (2010) and applied to the 5 quintile portfolios. They are based respectively either on the minimal set of portfolio comparisons (MR) or on all possible comparisons (MR^{all}). Statistically significant parameters (at least at 10% significance level) are in bold. The data span the period Dec1999–Mar2021.

Table B3: Multivariate panel regressions of monthly flow of funds on past performance (alpha)

		PastPerf	logTNA	logAGE	std(ret)	ExpRatio	TurnRatio	logFamTNA	logFamNum	R^2a	N
Panel A: SRI											
CAPM	coef	**2.919**	**-0.018**	**-0.011**	-0.041	**-3.524**	0.000	**0.020**	**-0.012**	5.697	5170
	p-value	0.000	0.000	0.019	0.584	0.001	0.911	0.000	0.047		
FF	coef	**3.243**	**-0.018**	**-0.011**	-0.036	**-3.101**	0.001	**0.021**	**-0.013**	5.627	5170
	p-value	0.002	0.000	0.021	0.616	0.003	0.727	0.000	0.056		
Carhart	coef	**3.421**	**-0.018**	**-0.011**	-0.006	**-3.054**	0.001	**0.022**	**-0.013**	5.750	5170
	p-value	0.001	0.000	0.015	0.938	0.003	0.765	0.000	0.055		
Panel B: SRI retail											
CAPM	coef	**2.489**	**-0.013**	0.002	-0.036	**-1.431**	-0.003	0.001	**-0.013**	4.940	4345
	p-value	0.000	0.001	0.736	0.502	0.085	0.489	0.360	0.034		
FF	coef	**2.699**	**-0.013**	0.002	-0.021	-1.147	-0.003	0.002	**-0.014**	4.815	4345
	p-value	0.002	0.001	0.725	0.680	0.180	0.595	0.336	0.051		
Carhart	coef	**2.847**	**-0.013**	0.002	0.009	-0.992	-0.003	0.002	**-0.014**	4.962	4345
	p-value	0.001	0.001	0.747	0.862	0.244	0.578	0.327	0.049		
Panel C: SRI institutional											
CAPM	coef	**3.152**	**-0.008**	-0.005	-0.170	**-5.321**	0.007	**0.010**	-0.012	1.465	3044
	p-value	0.000	0.000	0.443	0.248	0.010	0.677	0.017	0.394		
FF	coef	**3.662**	**-0.008**	-0.007	-0.198	**-4.586**	0.007	**0.010**	-0.007	1.446	3044
	p-value	0.002	0.000	0.293	0.206	0.023	0.658	0.018	0.638		
Carhart	coef	**3.687**	**-0.008**	-0.008	-0.167	**-4.746**	0.008	**0.010**	-0.007	1.409	3044
	p-value	0.002	0.000	0.226	0.274	0.022	0.622	0.019	0.627		

Notes: Table B3 presents the estimation results (coefficient estimates along with p-values) of panel regressions for the flow of funds. Panel regressions are conducted separately for a sample of all SRI funds (Panel A), SRI retail funds (Panel B) and SRI institutional funds (Panel C). The dependent variable is the flow of funds between month $t+1$ and $t+2$. Explanatory variables include: past performance ($PastPerf$), log TNA ($logTNA$), log of fund's age ($logAGE$), standard deviation of fund return ($std(ret)$), expense ratio ($ExpRatio$), turnover ratio ($TurnRatio$), log of fund's family TNA ($logFamTNA$) and the log of the number of funds under management for the fund's family ($logFamNum$). The explanatory variables are all measured for month t and are computed or estimated based on data before (and including) month t. We measure past performance as alpha which represents the intercept from a specified benchmark model estimated over the 36 months prior to a given month-end. We use three benchmark models: CAPM, Fama-French three-factor model (FF) and Carhart four-factor model. We report as well the adjusted R square (R^2a) and the total number of observations (N). In all regressions we include time fixed effects and we used robust, clustered standard errors. Statistically significant parameters (at least at 10% significance level) are in bold. The data span the period Dec1999–Mar2021.

Table B4: Multivariate panel regressions of monthly flow of funds on past performance (simple performance measures)

		PastPerf	logTNA	logAGE	std(ret)	ExpRatio	TurnRatio	logFamTNA	logFamNum	R^2a	N
Panel A: SRI											
av(R-Rf)	coef	**0.003**	**-0.012**	**-0.014**	0.110	**-3.594**	-0.003	**0.014**	**-0.013**	4.429	6436
	p-value	0.003	0.000	0.000	0.226	0.000	0.501	0.001	0.023		
av(R-Rm)	coef	**0.018**	**-0.012**	**-0.010**	-0.022	**-3.166**	-0.002	**0.015**	**-0.013**	6.243	6436
	p-value	0.000	0.000	0.001	0.778	0.000	0.580	0.000	0.015		
Sharpe	coef	**0.015**	**-0.012**	**-0.014**	0.169	**-3.538**	-0.003	**0.014**	**-0.013**	4.565	6436
	p-value	0.007	0.000	0.000	0.123	0.000	0.548	0.001	0.015		
Treynor	coef	0.000	**-0.013**	**-0.013**	0.007	**-3.472**	-0.002	**0.015**	**-0.013**	4.024	6436
	p-value	0.193	0.000	0.000	0.932	0.000	0.555	0.000	0.026		
Panel B: SRI retail											
av(R-Rf)	coef	**0.004**	**-0.014**	**-0.008**	0.050	**-2.407**	-0.007	**0.004**	-0.010	5.988	5226
	p-value	0.000	0.000	0.038	0.615	0.009	0.122	0.006	0.151		
av(R-Rm)	coef	**0.017**	**-0.013**	**-0.005**	-0.098	**-2.003**	-0.006	**0.005**	-0.008	7.689	5226
	p-value	0.000	0.000	0.228	0.298	0.032	0.176	0.001	0.268		
Sharpe	coef	**0.019**	**-0.014**	**-0.008**	0.132	**-2.363**	-0.007	**0.004**	-0.011	6.408	5226
	p-value	0.000	0.000	0.034	0.222	0.009	0.121	0.008	0.118		
Treynor	coef	**0.000**	**-0.014**	**-0.007**	-0.054	**-2.129**	-0.007	**0.004**	-0.009	5.417	6436
	p-value	0.023	0.000	0.091	0.599	0.020	0.161	0.003	0.227		
Panel C: SRI institutional											
av(R-Rf)	coef	**0.003**	**-0.004**	**-0.007**	-0.069	**-3.743**	0.000	**0.007**	-0.013	0.352	3959
	p-value	0.026	0.034	0.076	0.633	0.082	0.990	0.065	0.284		
av(R-Rm)	coef	**0.016**	**-0.004**	-0.004	-0.161	**-3.555**	-0.001	**0.008**	-0.014	1.115	3959
	p-value	0.000	0.042	0.373	0.212	0.069	0.937	0.039	0.249		
Sharpe	coef	**0.011**	**-0.004**	-0.007	-0.050	**-3.746**	0.000	**0.008**	-0.015	0.280	3959
	p-value	0.069	0.027	0.114	0.730	0.080	0.963	0.061	0.242		
Treynor	coef	0.000	**-0.005**	-0.006	-0.185	**-3.632**	0.001	**0.008**	-0.015	0.898	6436
	p-value	0.199	0.016	0.160	0.189	0.092	0.920	0.040	0.257		

Notes: Table B4 presents the estimation results (coefficient estimates along with p-values) of panel regressions for the flow of funds. Panel regressions are conducted separately for a sample of all SRI funds (Panel A), SRI retail funds (Panel B) and SRI institutional funds (Panel C). The dependent variable is the flow of funds between month $t+1$ and $t+2$. Explanatory variables include: past performance ($PastPerf$), log TNA ($logTNA$), log of fund's age ($logAGE$), standard deviation of fund return ($std(ret)$), expense ratio ($ExpRatio$), turnover ratio ($TurnRatio$), log of fund's family TNA ($logFamTNA$)and the log of the number of funds under management for the fund's family ($logFamNum$) . The explanatory variables are all measured for month t and are computed or estimated based on data before (and including) month t. We measure past performance with simple performance measures such as average returns in excess of risk free rate av(R-Rf) and in excess of market return av(R-Rm) as well as Sharpe and Treynor ratios, all computed over the 12 months prior to a given month-end. We report as well the adjusted R square (R^2a) and the total number of observations (N). In all regressions we include time fixed effects and we used robust, clustered standard errors. Statistically significant parameters (at least at 10% significance level) are in bold. The data span the period Dec1999–Mar2021.

Table B5: Shape of the flow-performance relation (piecewise performance ranks based on alphas)

		Low	Mid	High	H-L	R^2a	N
Panel A: SRI							
CAPM	coef	-0.009	**0.022**	**0.106**	**0.115**	9.713	5168
	pv(NW)	0.779	0.000	0.000	0.003		
FF	coef	0.027	**0.012**	**0.108**	**0.081**	9.485	5168
	pv(NW)	0.348	0.060	0.000	0.019		
Carhart	coef	0.008	**0.012**	**0.112**	**0.104**	9.491	5168
	pv(NW)	0.718	0.077	0.001	0.005		
Panel B: SRI retail							
CAPM	coef	-0.013	**0.018**	**0.103**	**0.116**	9.488	4345
	pv(NW)	0.614	0.000	0.000	0.000		
FF	coef	0.007	**0.012**	**0.094**	**0.087**	8.941	4345
	pv(NW)	0.812	0.023	0.000	0.017		
Carhart	coef	0.005	**0.010**	**0.095**	**0.091**	8.965	4345
	pv(NW)	0.850	0.022	0.003	0.014		
Panel C: SRI institutional							
CAPM	coef	0.036	**0.025**	0.029	-0.006	3.199	3042
	pv(NW)	0.554	0.024	0.271	0.925		
FF	coef	0.021	**0.023**	**0.062**	0.042	3.344	3042
	pv(NW)	0.709	0.019	0.071	0.587		
Carhart	coef	0.014	**0.019**	**0.075**	0.061	3.313	3042
	pv(NW)	0.789	0.048	0.030	0.367		

Notes: Table B5 presents the estimation results of panel regressions investigating the shape of the flow-performance relation. Panel regressions are conducted separately for a sample of all SRI funds (Panel A), SRI retail funds (Panel B) and SRI institutional funds (Panel C). The dependent variable is the percentage flow of money over the month $t+1$. Explanatory variables include piecewise performance ranks Low, Mid, $High$ and a set of control variables: log TNA ($logTNA$), log of fund's age ($logAGE$), standard deviation of fund return ($std(ret)$), expense ratio ($ExpRatio$), turnover ratio ($TurnRatio$), log of fund's family TNA ($logFamTNA$) and the log of the number of funds under management for the fund's family ($logFamNum$). The explanatory variables are all measured for month t or are computed based on data before (and including) month t. Piecewise performance ranks are assigned to mutual funds based on past performance measured as alpha which represents the intercept from a specified benchmark model estimated over the 36 months prior to a given month-end. We use three benchmark models: CAPM, Fama-French three-factor model (FF) and Carhart four-factor model. For brevity, we report in this table only the coefficients (along with its p-values) for the three piecewise performance ranks Low, Mid, $High$ as well as the difference between the coefficients for $High$ and Low piecewise performance ranks (column "H-L"). We test the null of equality between the $High$ and Low coefficients using Wald test and report the related p-values underneath the difference. We report as well the adjusted R square (R^2a) and the total number of observations (N). In all regressions we include time fixed effects and we used robust, clustered standard errors. Statistically significant parameters (at least at 10% significance level) are in bold. The data span the period Dec1999–Mar2021.

Table B6: Shape of the flow-performance relation (piecewise performance ranks based on simple performance measures)

		Low	Mid	High	H-L	R^2a	N
Panel A: SRI							
av(R-Rf)	coef	0.023	**0.010**	**0.139**	**0.116**	10.506	6433
	pv(NW)	0.343	0.066	0.000	0.007		
av(R-Rm)	coef	0.023	**0.010**	**0.139**	**0.116**	10.506	6433
	pv(NW)	0.343	0.066	0.000	0.007		
Sharpe	coef	0.024	**0.015**	**0.085**	0.061	9.772	6433
	pv(NW)	0.322	0.009	0.009	0.125		
Treynor	coef	0.011	**0.012**	**0.091**	**0.080**	9.612	6433
	pv (NW)	0.684	0.005	0.005	0.067		
Panel B: SRI retail							
av(R-Rf)	coef	0.009	**0.010**	**0.122**	**0.113**	12.262	5224
	pv(NW)	0.519	0.069	0.000	0.001		
av(R-Rm)	coef	0.009	**0.010**	**0.122**	**0.113**	12.262	5224
	pv(NW)	0.519	0.069	0.000	0.001		
Sharpe	coef	0.019	0.011	**0.081**	**0.062**	11.506	5224
	pv(NW)	0.288	0.109	0.019	0.096		
Treynor	coef	-0.003	**0.009**	**0.105**	**0.107**	11.682	5224
	pv (NW)	0.870	0.075	0.003	0.008		
Panel C: SRI institutional							
av(R-Rf)	coef	**0.062**	0.009	0.038	-0.024	2.967	3957
	pv(NW)	0.009	0.197	0.225	0.499		
av(R-Rm)	coef	**0.062**	0.009	0.038	-0.024	2.967	3957
	pv(NW)	0.009	0.197	0.225	0.499		
Sharpe	coef	**0.062**	0.008	0.041	-0.021	2.910	3957
	pv(NW)	0.025	0.224	0.111	0.563		
Treynor	coef	**0.059**	**0.007**	**0.045**	-0.014	2.893	3957
	pv (NW)	0.008	0.302	0.088	0.670		

Notes: Table B6 presents the estimation results of panel regressions investigating the shape of the flow-performance relation. Panel regressions are conducted separately for a sample of all SRI funds (Panel A), SRI retail funds (Panel B) and SRI institutional funds (Panel C). The dependent variable is the percentage flow of money over the month $t+1$. Explanatory variables include piecewise performance ranks Low, Mid, $High$ and a set of control variables: log TNA ($logTNA$), log of fund's age ($logAGE$), standard deviation of fund return ($std(ret)$), expense ratio ($ExpRatio$), turnover ratio ($TurnRatio$), log of fund's family TNA ($logFamTNA$) and the log of the number of funds under management for the fund's family ($logFamNum$). The explanatory variables are all measured for month t or are computed based on data before (and including) month t. Piecewise performance ranks are assigned to mutual funds based on simple past performance measures such as average returns in excess of risk free rate av(R-Rf) and in excess of market return av(R-Rm) as well as Sharpe and Treynor ratios, all computed over the 12 months prior to a given month-end. For brevity, we report in this table only the coefficients (along with its p-values) for the three piecewise performance ranks Low, Mid, $High$ as well as the difference between the coefficients for $High$ and Low piecewise performance ranks (column "H-L"). We test the null of equality between the $High$ and Low coefficients using Wald test and report the related p-values underneath the difference. We report as well the adjusted R square (R^2a) and the total number of observations (N). In all regressions we include time fixed effects and we used robust, clustered standard errors. Statistically significant parameters (at least at 10% significance level) are in bold. The data span the period Dec1999–Mar2021.

Table B7: Shape of the flow-performance relation over longer horizons (piecewise performance ranks based on alphas)

	p:	1	3	6	9	12	18	24
Panel A: SRI								
CAPM	H-L	**0.115**	**0.079**	0.053	0.023	0.017	-0.034	0.046
	p-value	0.003	0.035	0.211	0.635	0.678	0.617	0.261
FF	H-L	**0.081**	**0.058**	0.045	0.023	0.038	-0.046	0.039
	p-value	0.019	0.079	0.128	0.534	0.233	0.314	0.237
Carhart	H-L	**0.104**	**0.066**	**0.063**	0.014	0.039	-0.025	0.019
	p-value	0.005	0.026	0.010	0.660	0.138	0.501	0.538
Panel B: SRI retail								
CAPM	H-L	**0.116**	**0.082**	**0.054**	0.009	0.023	-0.065	0.021
	p-value	0.000	0.005	0.063	0.803	0.430	0.146	0.536
FF	H-L	**0.087**	**0.052**	0.014	0.017	0.004	-0.094	-0.024
	p-value	0.017	0.012	0.670	0.620	0.903	0.291	0.467
Carhart	H-L	**0.091**	**0.066**	0.032	0.010	0.016	-0.059	-0.042
	p-value	0.014	0.049	0.296	0.757	0.610	0.066	0.225
Panel C: SRI institutional								
CAPM	H-L	-0.006	-0.001	-0.040	0.013	-0.043	-0.114	-0.035
	p-value	0.925	0.985	0.650	0.888	0.686	0.433	0.740
FF	H-L	0.042	0.045	0.025	0.044	0.043	0.061	0.061
	p-value	0.587	0.611	0.801	0.660	0.715	0.556	0.501
Carhart	H-L	0.061	0.026	0.030	0.053	0.017	0.017	0.043
	p-value	0.367	0.731	0.753	0.551	0.875	0.860	0.609

Notes: Table B7 presents the differences between the coefficients on $High$ and Low piecewise performance ranks ("H-L") and the p-values associated with testing, using Wald test, the null of the equality between the two coefficients. The coefficients are estimated from panel regressions. In panel regressions, separately run for a sample of all SRI funds (Panel A), SRI retail funds (Panel B) and SRI institutional funds (Panel C), we regress a percentage flow of money over the consecutive p months on piecewise past performance and a set of control variables as given in equation (13). We consider future flow of money over horizons up to 12 months, i.e. $p \in \{1, 3, 6, 9, 12, 18, 24\}$ and each column in the table represents the results for a different horizon p. The dependent variable is the percentage flow of money between the end of months t and $t + p$. Explanatory variables include piecewise performance ranks Low, Mid, $High$ and a set of control variables: log TNA ($logTNA$), log of fund's age ($logAGE$), standard deviation of fund return ($std(ret)$), expense ratio ($ExpRatio$), turnover ratio ($TurnRatio$), log of fund's family TNA ($logFamTNA$) and the log of the number of funds under management for the fund's family ($logFamNum$). The explanatory variables are all measured for month t or are computed based on data before (and including) month t. Piecewise performance ranks are assigned to mutual funds based on past performance measured as alpha which represents the intercept from a specified benchmark model estimated over the 36 months prior to a given month-end. We use three benchmark models: CAPM, Fama-French three-factor model (FF) and Carhart four-factor model. In all regressions we include time fixed effects and we used robust, clustered standard errors. Statistically significant parameters (at least at 10% significance level) are in bold. The data span the period Dec1999–Mar2021.

Table B8: Shape of the flow-performance relation over longer horizons (piecewise performance ranks based on simple performance measures)

	p:	1	3	6	9	12	18	24
Panel A: SRI								
av(R-Rf)	H-L	**0.116**	**0.091**	**0.065**	0.052	0.014	0.030	-0.027
	p-value	0.007	0.028	0.078	0.124	0.664	0.410	0.530
av(R-Rm)	H-L	**0.116**	**0.091**	**0.065**	0.052	0.014	0.030	-0.027
	p-value	0.007	0.028	0.078	0.124	0.664	0.410	0.530
Sharpe	H-L	0.061	0.038	0.015	0.032	-0.019	0.026	0.000
	p-value	0.125	0.314	0.657	0.295	0.613	0.491	0.996
Treynor	coef	**0.080**	**0.073**	0.054	0.059	0.022	0.020	0.034
	pv (NW)	0.067	0.082	0.129	0.118	0.540	0.633	0.510
Panel B: SRI retail								
av(R-Rf)	H-L	**0.113**	**0.092**	**0.083**	0.045	0.047	0.030	0.012
	p-value	0.001	0.009	0.018	0.206	0.145	0.303	0.748
av(R-Rm)	H-L	**0.113**	**0.092**	**0.083**	0.045	0.047	0.030	0.012
	p-value	0.001	0.009	0.018	0.206	0.145	0.303	0.748
Sharpe	H-L	**0.062**	0.047	0.025	0.020	0.015	0.009	0.003
	p-value	0.096	0.179	0.455	0.567	0.636	0.772	0.938
Treynor	coef	**0.107**	**0.092**	**0.065**	0.053	0.046	0.010	0.023
	pv (NW)	0.008	0.008	0.057	0.142	0.151	0.740	0.582
Panel C: SRI institutional								
av(R-Rf)	H-L	-0.024	-0.004	-0.009	0.018	-0.059	-0.002	-0.093
	p-value	0.499	0.920	0.810	0.545	0.132	0.967	0.208
av(R-Rm)	H-L	-0.024	-0.004	-0.009	0.018	-0.059	-0.002	-0.093
	p-value	0.499	0.920	0.810	0.545	0.132	0.967	0.208
Sharpe	H-L	-0.021	-0.037	-0.041	-0.016	**-0.074**	-0.008	-0.080
	p-value	0.563	0.375	0.315	0.640	0.078	0.899	0.438
Treynor	coef	-0.014	-0.016	-0.018	0.000	-0.052	0.004	-0.048
	pv (NW)	0.670	0.633	0.569	0.995	0.168	0.951	0.621

Notes: Table B8 presents the differences between the coefficients on $High$ and Low piecewise performance ranks ("H-L") and the p-values associated with testing, using Wald test, the null of the equality between the two coefficients. The coefficients are estimated from panel regressions. In panel regressions, separately run for a sample of all SRI funds (Panel A), SRI retail funds (Panel B) and SRI institutional funds (Panel C), we regress a percentage flow of money over the consecutive p months on piecewise past performance and a set of control variables as given in equation (13). We consider future flow of money over horizons up to 12 months, i.e. $p \in \{1, 3, 6, 9, 12, 18, 24\}$ and each column in the table represents the results for a different horizon p. The dependent variable is the percentage flow of money between the end of months t and $t+p$. Explanatory variables include piecewise performance ranks Low, Mid, $High$ and a set of control variables: log TNA ($logTNA$), log of fund's age ($logAGE$), standard deviation of fund return ($std(ret)$), expense ratio ($ExpRatio$), turnover ratio ($TurnRatio$), log of fund's family TNA ($logFamTNA$) and the log of the number of funds under management for the fund's family ($logFamNum$). The explanatory variables are all measured for month t or are computed based on data before (and including) month t. Piecewise performance ranks are assigned to mutual funds based on simple past performance measures such as average returns in excess of risk free rate av(R-Rf) and in excess of market return av(R-Rm) as well as Sharpe and Treynor ratios, all computed over the 12 months prior to a given month-end. In all regressions we include time fixed effects and we used robust, clustered standard errors. Statistically significant parameters (at least at 10% significance level) are in bold. The data span the period Dec1999–Mar2021.

C Performance-flow relation

Table C1: Performance of High and Low flow portfolios formed on past month pdollar flow

Low/High flow portfolios						
Panel A: SRI						
	Flow-weighted			**Equally-weighted**		
	Low 50%	**High 50%**	**High-Low**	**Low 50%**	**High 50%**	**High-Low**
alpha CAPM (%)	0.012	-0.070	-0.082	-0.035	-0.082	-0.047
pv CAPM	0.899	0.314	0.297	0.608	0.148	0.267
alpha FF (%)	-0.006	-0.082	-0.076	-0.044	-0.096	-0.052
pv FF	0.945	0.224	0.310	0.471	0.063	0.216
alpha Car (%)	0.019	-0.066	-0.084	-0.025	-0.079	-0.054
pv Car	0.818	0.365	0.280	0.690	0.133	0.237
av(R-Rf)	0.573	0.486	-0.087	0.513	0.465	-0.048
av(R-Rm)	-0.013	-0.100	-0.800	-0.072	-0.120	-0.761
Sharpe	0.127	0.109	-0.075	0.118	0.108	-0.068
Treynor	0.598	0.511	10.696	0.548	0.497	41.592
Panel B: SRI retail						
	Flow-weighted			**Equally-weighted**		
	Low 50%	**High 50%**	**High-Low**	**Low 50%**	**High 50%**	**High-Low**
alpha CAPM (%)	-0.035	**-0.122**	-0.087	-0.081	**-0.143**	-0.063
pv CAPM	0.662	0.083	0.166	0.261	0.007	0.248
alpha FF (%)	-0.048	**-0.127**	-0.079	-0.088	**-0.150**	-0.061
pv FF	0.520	0.071	0.166	0.178	0.004	0.218
alpha Car (%)	-0.024	**-0.105**	-0.080	-0.071	**-0.133**	-0.062
pv Car	0.752	0.161	0.169	0.289	0.012	0.221
av(R-Rf)	0.537	0.441	-0.097	0.478	0.413	-0.065
av(R-Rm)	-0.048	-0.145	-0.809	-0.107	-0.173	-0.778
Sharpe	0.117	0.098	-0.088	0.108	0.094	-0.090
Treynor	0.550	0.459	5.762	0.501	0.434	15.005
Panel C: SRI institutional						
	Flow-weighted			**Equally-weighted**		
	Low 50%	**High 50%**	**High-Low**	**Low 50%**	**High 50%**	**High-Low**
alpha CAPM (%)	-0.056	**-0.182**	**-0.126**	-0.026	**-0.142**	**-0.115**
pv CAPM	0.507	0.022	0.026	0.670	0.010	0.033
alpha FF (%)	-0.065	**-0.190**	**-0.125**	-0.032	**-0.147**	**-0.115**
pv FF	0.418	0.017	0.035	0.547	0.008	0.020
alpha Car (%)	-0.042	**-0.173**	**-0.131**	-0.013	**-0.133**	**-0.120**
pv Car	0.607	0.032	0.020	0.804	0.015	0.016
av(R-Rf)	0.504	0.391	-0.113	0.523	0.420	-0.103
av(R-Rm)	-0.081	-0.195	-0.826	-0.062	-0.166	-0.816
Sharpe	0.112	0.085	-0.097	0.120	0.095	-0.132
Treynor	0.527	0.400	-5.419	0.557	0.438	-5.184

Notes: Table C1 presents the performance measures (alphas) along with their p-values for portfolios formed on past dollar flo of moneyw. Each month funds are grouped into 2 portfolios: Low flow portfolios ("Low 50%") that include half of funds with the lowest dollar flow over the previous month and High flow portfolios ("High 50%") that include half of funds with the highest dollar flow over the previous month. Then the portfolio flow-weighted and equally-weighted net returns are computed. We provide as well the estimation results for the zero-cost portfolios, which are constructed by subtracting the returns of Low flow portfolio from the returns of High flow portfolio ("High-Low"). We consider portfolios formed within a sample of all SRI funds (Panel A), SRI retail funds (Panel B) and SRI institutional funds (Panel C). Portfolio performance is evaluated based using alpha from a specified benchmark model. We use three benchmark models: CAPM, Fama-French three-factor model (FF) and Carhart four-factor model. Finally, we report as well the simple performance measures for the aforementioned portfolios: average returns in excess of risk free rate av(R-Rf) and in excess of market return av(R-Rm) as well as the Sharpe ratio. Finally, we report as well the simple performance measures for the aforementioned portfolios: average returns in excess of risk free rate av(R-Rf) and in excess of market return av(R-Rm) as well as Sharpe and Treynor ratios. Statistically significant parameters (at least at 10% significance level) are in bold. The data span the period Dec1999–Mar2021.

Table C2: Difference in performance of Positive vs Negative flow portfolios formed on past dollar flow over different horizons (equally-weighted portfolios)

Panel A: SRI												
	Positive-Negative flow portfolio											
p:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
alpha CAPM (%)	-0.038	-0.038	-0.088	-0.062	-0.019	-0.051	-0.055	-0.058	-0.039	-0.027	-0.019	-0.073
pv CAPM	0.448	0.418	0.112	0.370	0.739	0.241	0.387	0.261	0.462	0.638	0.759	0.148
alpha FF (%)	-0.043	-0.034	-0.085	-0.048	-0.007	-0.047	-0.046	-0.049	-0.034	-0.021	-0.013	-0.065
pv FF	0.402	0.461	0.117	0.459	0.891	0.289	0.463	0.346	0.508	0.722	0.835	0.199
alpha Car (%)	-0.049	-0.039	-0.088	-0.047	0.002	-0.047	-0.041	-0.048	-0.030	-0.019	-0.012	-0.056
pv Car	0.341	0.384	0.106	0.442	0.964	0.267	0.526	0.363	0.551	0.758	0.848	0.260
av(R-Rf)	-0.048	-0.041	-0.095	-0.076	-0.032	-0.058	-0.061	-0.063	-0.051	-0.031	-0.032	-0.064
av(R-Rm)	-0.244	-0.220	-0.246	-0.247	-0.245	-0.253	-0.251	-0.245	-0.249	-0.249	-0.259	-0.275
Sharpe	-0.058	-0.053	-0.124	-0.087	-0.042	-0.077	-0.079	-0.084	-0.074	-0.041	-0.044	-0.085
Treynor	2.979	8.230	8.100	3.251	1.517	5.045	6.764	8.044	2.592	4.669	1.597	-4.889
Panel B: SRI retail												
	Positive-Negative flow portfolio											
p:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
alpha CAPM (%)	-0.057	-0.048	-0.089	-0.060	-0.037	-0.014	-0.036	-0.052	-0.082	-0.062	-0.027	-0.089
pv CAPM	0.280	0.370	0.110	0.283	0.567	0.783	0.567	0.302	0.155	0.231	0.620	0.156
alpha FF (%)	-0.052	-0.041	-0.082	-0.050	-0.026	-0.007	-0.030	-0.045	-0.074	-0.055	-0.019	-0.081
pv FF	0.297	0.428	0.114	0.340	0.663	0.889	0.631	0.364	0.190	0.279	0.722	0.165
alpha Car (%)	-0.053	-0.043	-0.076	-0.037	-0.008	0.007	-0.017	-0.040	-0.063	-0.041	-0.010	-0.063
pv Car	0.272	0.398	0.132	0.453	0.887	0.890	0.780	0.416	0.233	0.420	0.853	0.246
av(R-Rf)	-0.066	-0.049	-0.087	-0.065	-0.036	-0.004	-0.031	-0.045	-0.073	-0.050	-0.024	-0.063
av(R-Rm)	-0.280	-0.273	-0.292	-0.290	-0.279	-0.263	-0.276	-0.268	-0.286	-0.286	-0.293	-0.297
Sharpe	-0.087	-0.058	-0.109	-0.077	-0.043	-0.006	-0.037	-0.062	-0.091	-0.067	-0.034	-0.069
Treynor	4.621	27.086	-23.062	8.429	-20.004	-0.264	-3.785	-3.624	-4.717	-2.717	-6.723	-1.585
Panel C: SRI institutional												
	Positive-Negative flow portfolio											
p:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
alpha CAPM (%)	-0.075	**-0.124**	-0.077	-0.037	-0.039	-0.026	-0.075	-0.053	-0.026	-0.034	0.008	-0.033
pv CAPM	0.175	0.022	0.182	0.473	0.509	0.655	0.276	0.415	0.669	0.636	0.910	0.617
alpha FF (%)	-0.087	**-0.127**	-0.076	-0.031	-0.032	-0.028	-0.070	-0.053	-0.026	-0.040	-0.001	-0.043
pv FF	0.102	0.018	0.167	0.534	0.555	0.620	0.283	0.381	0.658	0.559	0.992	0.522
alpha Car (%)	**-0.089**	**-0.126**	-0.077	-0.025	-0.012	-0.022	-0.052	-0.037	-0.010	-0.020	0.025	-0.031
pv Car	0.092	0.022	0.169	0.617	0.825	0.708	0.431	0.531	0.863	0.761	0.705	0.620
av(R-Rf)	-0.072	-0.118	-0.078	-0.036	-0.033	-0.028	-0.069	-0.045	-0.027	-0.027	0.010	-0.031
av(R-Rm)	-0.266	-0.262	-0.262	-0.256	-0.262	-0.241	-0.264	-0.249	-0.226	-0.242	-0.257	-0.270
Sharpe	-0.080	-0.144	-0.091	-0.044	-0.036	-0.039	-0.077	-0.054	-0.032	-0.030	0.012	-0.035
Treynor	-14.119	-12.097	143.917	-22.139	-3.735	6.144	-7.077	-3.499	23.684	-2.523	2.743	-13.018

Notes: Table C2 presents the differences in performance measures (alphas) along with their p-values for Negative vs Positive flow portfolio for various horizons p up to 12 months. At the end of each p-month period mutual funds are grouped into 2 portfolios: Negative and Positive flow portfolios, based on the sign of their dollar flow over the preceding p months. Then the portfolio equally-weighted net returns are computed for both portfolios and we subtract the returns of Negative flow portfolio from the returns of Positive flow portfolio. We consider portfolios formed within a sample of all SRI funds (Panel A), SRI retail funds (Panel B) and SRI institutional funds (Panel C). Portfolio performance is evaluated using alpha from a specified benchmark model. We use three benchmark models: CAPM, Fama-French three-factor model (FF) and Carhart four-factor model. Finally, we report as well the simple performance measures for the aforementioned portfolios: average returns in excess of risk free rate av(R-Rf) and in excess of market return av(R-Rm) as well as Sharpe and Treynor ratios. Statistically significant parameters (at least at 10% significance level) are in bold. The data span the period Dec1999–Mar2021.

Table C3: Performance of Negative and Positive unexpected flow portfolios – past performance based on Fama-French three-factor model

Negative/Positive flow portfolios						
Panel A: SRI						
	Flow-weighted			**Equally-weighted**		
	Neg	**Pos**	**Pos-Neg**	**Neg**	**Pos**	**Pos-Neg**
alpha CAPM (%)	-0.097	-0.066	0.031	**-0.135**	**-0.164**	-0.029
pv CAPM	0.146	0.199	0.689	0.016	0.000	0.584
alpha FF (%)	-0.098	-0.059	0.038	**-0.132**	**-0.161**	-0.029
pv FF	0.159	0.251	0.646	0.024	0.000	0.592
alpha Car (%)	-0.091	-0.057	0.035	**-0.128**	**-0.157**	-0.030
pv Car	0.201	0.281	0.683	0.031	0.000	0.587
av(R-Rf)	0.774	0.731	-0.044	0.730	0.670	-0.060
av(R-Rm)	-0.117	-0.161	-1.035	-0.161	-0.222	-1.051
Sharpe	0.181	0.187	-0.037	0.173	0.165	-0.084
Treynor	0.792	0.818	0.521	0.752	0.716	1.711
Panel B: SRI retail						
	Flow-weighted			**Equally-weighted**		
	Neg	**Pos**	**Pos-Neg**	**Neg**	**Pos**	**Pos-Neg**
alpha CAPM (%)	-0.081	-0.084	-0.004	**-0.139**	**-0.169**	-0.030
pv CAPM	0.347	0.275	0.970	0.030	0.001	0.630
alpha FF (%)	-0.058	-0.067	-0.009	**-0.126**	**-0.174**	-0.048
pv FF	0.414	0.386	0.919	0.036	0.000	0.410
alpha Car (%)	-0.052	-0.052	0.000	**-0.122**	**-0.164**	-0.042
pv Car	0.475	0.498	0.998	0.045	0.001	0.460
av(R-Rf)	0.790	0.744	-0.045	0.737	0.678	-0.060
av(R-Rm)	-0.102	-0.147	-1.036	-0.154	-0.214	-1.050
Sharpe	0.183	0.180	-0.034	0.172	0.164	-0.066
Treynor	0.809	0.801	0.968	0.750	0.713	1.801
Panel C: SRI institutional						
	Flow-weighted			**Equally-weighted**		
	Neg	**Pos**	**Pos-Neg**	**Neg**	**Pos**	**Pos-Neg**
alpha CAPM (%)	-0.001	**-0.244**	**-0.243**	**-0.112**	**-0.215**	**-0.102**
pv CAPM	0.993	0.000	0.003	0.045	0.000	0.081
alpha FF (%)	-0.002	**-0.253**	**-0.251**	**-0.102**	**-0.212**	**-0.110**
pv FF	0.980	0.000	0.002	0.072	0.000	0.054
alpha Car (%)	0.001	**-0.247**	**-0.248**	**-0.098**	**-0.208**	**-0.110**
pv Car	0.991	0.000	0.002	0.084	0.000	0.052
av(R-Rf)	0.858	0.600	-0.258	0.758	0.653	-0.105
av(R-Rm)	-0.033	-0.291	-1.249	-0.134	-0.239	-1.096
Sharpe	0.203	0.145	-0.239	0.179	0.155	-0.130
Treynor	0.891	0.634	15.223	0.777	0.671	35.127

Notes: Table C3 presents the performance measures (alphas) along with their p-values for portfolios formed on past unexpected dollar flow. The unexpected dollar flow for each fund-month is the difference between the observed and fitted values of the fund's flow given in equation (14) where the performance measure used is based on Fama-French three-factor model. Each month funds are grouped into 2 portfolios: Negative and Positive flow portfolios (respectively "Neg" and "Pos"), based on the sign of their unexpected dollar flow in previous month. Then the portfolio flow-weighted and equally-weighted net returns are computed. We provide as well the estimation results the zero-cost portfolios, which are constructed by subtracting the returns of Negative flow portfolio from the returns of Positive flow portfolio ("Pos-Neg"). We consider portfolios formed within a sample of all SRI funds (Panel A), SRI retail funds (Panel B) and SRI institutional funds (Panel C). Portfolio performance is evaluated based using alpha from a specified benchmark model. We use three benchmark models: CAPM, Fama-French three-factor model (FF) and Carhart four-factor model. Finally, we report as well the simple performance measures for the aforementioned portfolios: average returns in excess of risk free rate av(R-Rf) and in excess of market return av(R-Rm) as well as Sharpe and Treynor ratios. Statistically significant parameters (at least at 10% significance level) are in bold. The data span the period Dec1999–Mar2021.

Table C4: Performance of Negative and Positive unexpected flow portfolios – past performance based on CAPM

Negative/Positive flow portfolios						
Panel A: SRI						
	Flow-weighted			**Equally-weighted**		
	Neg	**Pos**	**Pos-Neg**	**Neg**	**Pos**	**Pos-Neg**
alpha CAPM (%)	-0.100	-0.059	0.040	**-0.129**	**-0.165**	-0.036
pv CAPM	0.125	0.278	0.599	0.019	0.000	0.477
alpha FF (%)	-0.100	-0.051	0.049	**-0.127**	**-0.160**	-0.033
pv FF	0.139	0.356	0.545	0.026	0.000	0.519
alpha Car (%)	-0.094	-0.046	0.047	**-0.123**	**-0.156**	-0.033
pv Car	0.181	0.402	0.567	0.034	0.000	0.532
av(R-Rf)	0.767	0.743	-0.024	0.733	0.671	-0.063
av(R-Rm)	-0.124	-0.149	-1.015	-0.158	-0.221	-1.053
Sharpe	0.180	0.188	-0.021	0.175	0.165	-0.091
Treynor	0.789	0.826	0.335	0.758	0.715	2.120
Panel B: SRI retail						
	Flow-weighted			**Equally-weighted**		
	Neg	**Pos**	**Pos-Neg**	**Neg**	**Pos**	**Pos-Neg**
alpha CAPM (%)	0.007	-0.073	-0.080	**-0.107**	**-0.165**	-0.058
pv CAPM	0.917	0.353	0.368	0.076	0.004	0.399
alpha FF (%)	0.004	-0.057	-0.061	**-0.109**	**-0.165**	-0.055
pv FF	0.946	0.470	0.484	0.069	0.003	0.399
alpha Car (%)	0.012	-0.042	-0.054	**-0.105**	**-0.151**	-0.046
pv Car	0.849	0.590	0.532	0.085	0.005	0.467
av(R-Rf)	0.845	0.756	-0.089	0.753	0.688	-0.065
av(R-Rm)	-0.046	-0.136	-1.080	-0.138	-0.203	-1.056
Sharpe	0.204	0.183	-0.070	0.179	0.164	-0.070
Treynor	0.898	0.813	8.468	0.781	0.719	8.287
Panel C: SRI institutional						
	Flow-weighted			**Equally-weighted**		
	Neg	**Pos**	**Pos-Neg**	**Neg**	**Pos**	**Pos-Neg**
alpha CAPM (%)	-0.029	**-0.241**	**-0.212**	**-0.141**	**-0.196**	-0.054
pv CAPM	0.700	0.000	0.008	0.018	0.000	0.372
alpha FF (%)	-0.031	**-0.251**	**-0.220**	**-0.127**	**-0.198**	-0.071
pv FF	0.688	0.000	0.006	0.030	0.000	0.223
alpha Car (%)	-0.027	**-0.246**	**-0.218**	**-0.123**	**-0.194**	-0.071
pv Car	0.724	0.000	0.006	0.036	0.000	0.220
av(R-Rf)	0.833	0.606	-0.227	0.735	0.665	-0.071
av(R-Rm)	-0.059	-0.286	-1.218	-0.156	-0.227	-1.062
Sharpe	0.196	0.146	-0.210	0.172	0.159	-0.086
Treynor	0.861	0.638	13.265	0.748	0.689	3.860

Notes: Table C4 presents the performance measures (alphas) along with their p-values for portfolios formed on past unexpected dollar flow. The unexpected dollar flow for each fund-month is the difference between the observed and fitted values of the fund's flow given in equation (14) where the performance measure used is based on CAPM. Each month funds are grouped into 2 portfolios: Negative and Positive flow portfolios (respectively "Neg" and "Pos"), based on the sign of their unexpected dollar flow in previous month. Then the portfolio flow-weighted and equally-weighted net returns are computed. We provide as well the estimation results the zero-cost portfolios, which are constructed by subtracting the returns of Negative flow portfolio from the returns of Positive flow portfolio ("Pos-Neg"). We consider portfolios formed within a sample of all SRI funds (Panel A), SRI retail funds (Panel B) and SRI institutional funds (Panel C). Portfolio performance is evaluated using alpha from a specified benchmark model. We use three benchmark models: CAPM, Fama-French three-factor model (FF) and Carhart four-factor model. Finally, we report as well the simple performance measures for the aforementioned portfolios: average returns in excess of risk free rate av(R-Rf) and in excess of market return av(R-Rm) as well as Sharpe and Treynor ratios. Statistically significant parameters (at least at 10% significance level) are in bold. The data span the period Dec1999–Mar2021.