STYLE-CHANGING BEHAVIOUR IN THE SOCIALLY RESPONSIBLE MUTUAL FUND INDUSTRY: CONSEQUENCES ON FINANCIAL AND SUSTAINABLE PERFORMANCE

Purpose:

This study examines style-deviation practices in the socially responsible mutual funds (SMRF) industry i.e. how mutual funds game their stated financial objectives to earn a higher relative performance ranking. In addition, we study the consequences of such practices on sustainable scores and money flows.

Design/methodology approach:

We study a sample of 454 US equity SRMFs. We use panel regressions controlling for time and style fixed-effects.

Findings:

We find that 17.60% of SRMF managers in our sample are engaged in style deviation practices. These practices positively impact on the sustainable performance of SRMFs and negatively impact their financial performance. One effect offsets the other, and they consequently do not affect money flows. Another finding is that only investors with lower portfolio sustainability scores do show a return-chaser behaviour.

Practical implications:

We reveal that SRMF managers deviating from their stated financial style face a dilemma that is non-existent for their conventional peers, that is, style deviation practices affect financial and sustainable performance in opposing ways, whereas SRMF investor utility depends positively on both dimensions. Our findings are not conclusive about the effectiveness of style deviation practices in attracting SRMF money flows.

Social implications:

SRMF industry has experienced tremendous growth in the last decade. The increased competition in this industry has led managers to strive to attract investors, sometimes by relying on irregular practices that enhance their portfolio results. Regulators should consider how to avoid such perverse behaviour with a view to improve mutual funds transparency.

Originality:

This is the first research that analyses style deviation practices and their consequences for the SRMF industry.

Key Words: managerial decisions, socially responsible mutual funds, sustainable performance, style changes.

Article Classification: Research paper.

1. Introduction

Socially responsible investing (SRI) is gaining momentum. The latest report by the USSIF (the Forum for Sustainable and Responsible Investment in the United States) revealed that assets linked to sustainable, responsible and impact-investing (SRI) strategies had reached $12.0 trillion at the beginning of 2018, up 38% from $8.7 trillion in 2016. This represents one in four dollars out of the $46.6 trillion in total assets under professional management in the United States. Much of this growth, according to the report, has been driven by asset managers who now consider environmental, social or corporate governance (ESG) criteria across $11.6 trillion in assets, up 44% from $8.1 trillion in 2016. The report's Executive Summary (USSIF, 2018) further disclosed that $8.6 trillion, or 74% of these assets, were managed on behalf of institutional investors, and $3.0 trillion on behalf of individual investors. A total of $2.6 trillion, or 22%, were managed through registered investment companies, such as mutual funds, exchange-traded funds (ETFs), variable annuities and closed-end funds.

Socially Responsible mutual funds (SRMFs) constitute one of the main vehicles for SRI (Hernaus, 2019). The impressive growth that they experienced in the last decade has attracted the attention of researchers. We can thus find a plethora of articles focused on this type of fund, dealing with different topics. To date, most of them have focused on their financial performance (see Ferruz *et al.,* 2012; Muñoz *et al.*, 2014; Nofsinger and Varma, 2014; Statman and Glushkov, 2016; and Matallín *et at.*, 2019, amongst others) or topics related to investor behaviour (see Bollen, 2007; Benson and Humphrey, 2008; Renneboog, *et al.,* 2011; Dilla *et al.*, 2016; Riedl and Smeets, 2017; or Muñoz, 2019). However, other issues remain unexplored, such as the financial style deviation practices of SRMF managers and their consequences on both financial and sustainable performance.

Style discipline has been an important topic in conventional mutual fund literature. Investors can find a section in a fund's prospectus containing an objective statement describing that particular fund´s investment style (i.e., the type of assets in which the fund invests). Funds can be clustered under different labels, such as growth, value, small cap, large cap, etc. These labels allow

investors to understand the investment style and relative risk of funds and, in fact, these frequently appear as part of the name under which the fund is marketed (for example, the name of one of the funds in our sample is LKCM Aquinas Small Cap). As Kim *et al.* (2000) explain, regulators require mutual funds to adhere to their stated investment objectives. The decisions of most mutual fund managers are unobservable, however, thereby introducing the problem of moral hazard (Akerlof, 1978). Fund managers may thus feel incentivised to behave opportunistically and deviate from their stated financial style, aiming to take riskier positions to achieve higher returns. The objective of these practices would be to stand out from their competitors in the same financial style category.

Style deviation is an important topic for regulators and mutual fund investors and managers. In this way, Bams *et al.* (2016) explain the following (p.2): "*on March 31, 2001, the Security and Exchange Commission (SEC) reemphasized that all mutual funds must invest in accordance with their self-claimed investment style*". This is reflected in the Investment company act of 1940 (section 13 (a), item 3) that establishes the following: "*SEC. 13. (a) No registered investment company shall, unless authorized by the vote of a majority of its outstanding voting securities… (3) deviate from its policy in respect of concentration of investments in any particular industry or group of industries as recited in its registration statement, deviate from any investment policy which is changeable only if authorized by shareholder vote, or deviate from any policy recited in its registration statement pursuant to section 8(b)(3)*". Thus, regulators need to know whether fund managers are actually using such practices so that they can design additional mechanisms to impede them deviating from their stated styles. Investors, too, should be aware of this possible investment style-changing behaviour, so they can protect themselves from unexpected risks. For example, if a mutual fund manager deviates from its stated growth style and invests in value stocks, the investors of this mutual fund will probably be exposed to more risk than expected since value stocks are riskier than growth ones (Fama and French, 1993; 1995). Mutual fund managers could also be interested in this issue in order to determine whether some of their colleagues are unfairly competing with them.

Conventional mutual fund investors are return-chasers (Sapp and Tiwari, 2004) and, consequently, those funds presenting higher returns within a specific investment style will attract greater money flow. Since a mutual fund manager's reward is usually a fixed percentage of the total net assets managed, these deviation practices would allow mutual fund companies to obtain higher profits. This process might not take place in the case of SRMFs, however, because of the particular features of their investors. Therefore, the objective of this paper is to study this subject in depth, as regards SRMFs.

The analysis of financial style discipline is interesting in the specific case of SRMFs due to the particularities of this kind of collective investment vehicle. SRMF investors behave differently to their conventional peers and, consequently, the incentives for SRMF managers to deviate from their stated financial style could also work differently. SRMFs are targeted at investors worried not only about financial outcomes but also ESG performance. In fact, SRMFs investor utility function positively depends on both financial and non-financial outcomes (Bollen, 2007). The effectiveness of deviation practices in attracting money flow may thus depend on their positive impact on not only financial results but also about sustainable performance. In this research we aim to answer, for the first time, the following research questions (RQs):

RQs: Do style deviation practices occur in the SRMF industry? If so, what are the consequences of these practices?

We analyse two indicators of style discipline (style drift and style deviation) to answer the above RQs. Our results show that, in average terms, 17.60% of SRMFs in our sample (managing 14.66% of the total net assets) deviate from the financial style reported in their prospectuses. We also detect a significant positive relationship between the style drift of SR mutual funds and their sustainability scores, suggesting that fund managers systematically game their investment styles in an attempt to earn higher sustainability scores. We also find that misclassified funds obtain better sustainability scores, which leads us to the same conclusion. Conversely, we find style deviation to have a negative effect on financial performance. In this respect, we observe that greater style consistency leads to better financial outcomes. Additionally, we find that style deviation does not affect investors' money flows. We also find that fund flows have a positive

relationship with financial performance (alpha) only in the case of lower-than-median sustainability score portfolios, indicating that investors who chose portfolios with worse records on sustainability issues do increase their inflows to funds with higher alphas, showing a return-chaser behaviour.

We contribute to the SRMF academic literature by revealing the existence of a trade-off between sustainable and financial performance for SRMF managers engaged in style deviation practices; when they use style deviation, managers improve their sustainable performance but, at the same time, worsen their financial outcomes. As the SRMF investor utility function depends positively on both financial and ESG outcomes, this trade-off might explain the low effectiveness of style deviation practices in attracting SRMF money flows. We also obtain empirical evidence that portfolio sustainability scores are very useful in identifying SRMF investor profiles (values-driven and profit-seeking). Compared to previous tools, sustainability scores seem to be more efficient in controlling for investor profiles. The remainder of the paper is organised as follows: Section 2 reviews the existing literature and describes the research hypotheses; Section 3 describes the data used in the empirical application; Section 4 describes the methodology; Section 5 presents the empirical findings; Section 6 discusses the empirical findings; and finally, Section 7 concludes the paper by showing the main implications of findings, the limitations of the article and some avenues for further research.

2. Theoretical Framework

2.1. The conventional mutual funds literature on style discipline

As noted in the introduction, style discipline is a regular topic in the conventional mutual fund literature. Previous studies have documented a percentage of misclassified conventional mutual funds (DiBartolomeo and Witkowski, 1997; Brown and Goetzmann, 1997; or Kim *et al*., 2000). Bams et al. (2016), for instance, have found that about 14% of the individual funds in their sample were engaged in style deviation practices. Other authors have developed measures to detect the volatility of fund style changes over time, but failed to consider how far mutual funds were from

their stated investment objective, so they have focused only on style drift in mutual funds (see Idzorek and Bertsch, 2004). More recently, Cao *et al.* (2017) reported that small-cap mutual funds allocated 27% of their portfolio on average to mid- and large-cap stocks.

There is also ample literature on the different consequences of mutual fund investment style deviation. Some studies report a positive relationship between style deviation and financial performance (see Swinkels and Tjong-A-Tjoe, 2007), while others found the opposite evidence (Bams *et al.*, 2016; Chan *et al*., 2002). For example, Bams *et al.* (2016) found that, over the long term, the misclassified funds in their sample significantly underperformed by 0.92% per year, based on the alpha Carhart model. Conversely, Kim *et al.* (2000) found, and also contrary to reports in the financial press, that the majority of funds that deviated from their stated style objective into higher-risk objectives did achieve a higher performance ranking in their stated objective groups. Bams *et al*. (2017) found that when controlling for investors′ sophistication level, style-changing behaviour had a different impact on various types of fund performance measures.

Another consequence of style deviation practices is their effect on money flows. Previous studies have obtained mixed findings. Cooper *et al.* (2005) found that a change in the stated investment objectives for mutual funds affected mutual fund flows. In particular, they showed that the year following a change in a fund's name to reflect a current hot style, funds experienced an average cumulative abnormal flow of 28%. In another study, Sensoy (2009) analysed whether performance relative to a specified and 'mismatched' benchmark significantly affected a fund's subsequent money inflow. The author showed that the incremental flows were unlikely to be rational responses to abnormal returns, and concluded that mismatched, self-designated benchmarks result from strategic fund behaviour driven by the incentive of attracting more inflows. Del Guercio and Tkac (2002) found that money market pension fund sponsors punished large deviations from the benchmark, but they did not observe the same for mutual funds. Finally, Holmes and Faff (2007) noted that the level of style drift was not related to fund flows in the Australian mutual fund market.

2.2. SRMF literature and research hypotheses

The dramatic development of the SRMF industry has increasingly attracted the interest of investors as well as academics. A number of studies have provided excellent overviews of relevant research topics for this subset of the collective investment industry (see Renneboog *et al.*, 2008a; Derwall *et al*., 2011; Revelli and Viviani, 2015; or Fabregat-Aibar *et al.*, 2019). Much of the SR mutual fund literature focuses on comparisons between the financial performance of these funds and conventional funds (see Bauer *et al.,* 2005; Signori, 2009; Leite and Cortez, 2014; or Ur Rehman *et al.*, 2016; amongst others). Other authors have analysed the effect of different approaches to integrating ESG issues into the investment process on the financial performance of SRMFs (Hernaus, 2019; or Muñoz, 2020) or the financial performance of specific subsets of SRMFs (see among others Ferruz *et al.*, (2012) who analyse religious funds, or Muñoz *et al.*, (2014) who study environmental funds). Some studies have analysed the financial performance of SRMFs controlling for investment style exposure (Das and Rao, 2013; Leite and Cortez, 2014; or Muñoz *et al.*, 2015; among others); we found no articles examining deviations from these styles and their consequences.

An analysis of these issues in the specific case of SRMFs is interesting given the special characteristics of their investors. Indeed, SRMF investors are concerned not only about financial outcomes, but also about sustainable performance. Bollen (2007) explains that the utility function of SRMF investors depends on both financial and non-financial attributes, unlike conventional mutual fund investors whose utility function depends only on financial attributes. The previous literature has thus shown that SRMF flows are less sensitive to past financial performance than conventional ones (see among others, Bollen, 2007; Benson and Humphrey, 2008; or Renneboog *et al.*, 2011). More recently, some authors have observed that sustainability scores positively affect the money inflows of SRMFs (see among others, Ammann *et al.*, 2019; or Durán-Santomil *et al.*, 2019). Whether SRMF managers engage in style deviation practices, the effectiveness of these practices to attract money flows will thus depend on their impact on not only financial outcomes, but also on sustainable performance.

SRMF managers may be tempted to manipulate the performance of their portfolios by deviating from their stated financial style. The sustainable performance of investment portfolios is usually assessed by ESG scores provided by sell-side research companies, who are specialised in reporting this type of information, such as, Morningstar. The ESG score at the portfolio level is computed using information about the companies held by these portfolios. Undisciplined managers tend to deal with fewer restrictions to increasing the exposure of their portfolios to high ESG score companies, since their investable universe is wider than that of their disciplined peers, and consequently they can select stocks with higher ESG scores, no matter the style of these stocks. These practices could allow SRMF managers to stand out from their competitors within the same financial style subset by offering a more sustainable image. The style deviation practices will also affect the financial outcomes of SRMFs, since the different types of assets (small-cap, large-cap, value, and growth) show different return-risk patterns (Fama and French 1993; 1995). When SRMF managers deviate from their stated financial style, they thus not only modify their sustainability outcomes but also their financial performance.

In this paper, we want to test for the first time the existence of style deviation practices in the SRMF industry. Thus, we firstly pose the following null research hypothesis:

RH1: Some SRMF managers in the sample deviate from their stated financial investment style.

Whether the RH1 is not rejected, it will be interesting to analyse the impact of style deviation practices on both sustainable and financial performance. SRMFs' managers engaged in deviation practices should seek to achieve better sustainable and financial performance since SR funds' investors value positively both parameters (Bollen, 2007). Thus, although these issues have not been previously explored in academic literature, one might expect that style deviation practices will impact positively on both types of performance of SR funds. In this way, we pose the following two directional research hypotheses:

RH2: Style deviation impacts positively the sustainability performance of SRMFs.

RH3: Style deviation impacts positively the financial performance of SRMFs.

The objective of style deviation practices is to attract money flows. However, the success of these practices will depend on the nature of their impact on both sustainable and financial performance. In this regard, it is also necessary to take into account the heterogeneity of SRMF investors profiles. As Derwall *et al.* (2011, p. 2137) argued, 'much of the confusion emerges from researchers' implicit assumption that socially responsible investors form a homogeneous group so that only one SRI doctrine can hold'. These authors presented a breakdown of the SRI movement to identify the segment of the SRI market in which social and personal values rather than financial considerations formed the basis of investment decisions (values-driven investors). They found that SR investors in this segment would accept a loss in financial performance in exchange for the non-financial utility derived from the SRI attribute of their investment. In another segment of the SRI market, however, investors using their SR investment as a profit-seeking strategy (profit-seeking investors) mainly pursued traditional financial goals. Other studies have also documented the different motivations of SRMF investors (e.g., Heinkel *et al.*, 2001; Fama and French, 2007; Statman *et al.*, 2008; Hong and Kacperczyk, 2009; Pantzalis and Park, 2009; Gross and Roberts, 2011).

We believe that the reactions of fund investors to style deviation may be conditioned by the sustainability score of the SRMF portfolios. Investors in high sustainability scores-portfolios might thus be especially worried about non-financial issues (values-driven investors); conversely, investors who put their money in SR funds with poor sustainability scores may be more worried about financial issues. We expect investors in funds with higher sustainability scores not to accept deviation or drift from the declared investment style unless this is motivated by an SR attribute.

The relationship between money flows and style deviation practices will depend on the results of the previous RHs still unexplored in previous SRMF literature. We thus propose the following generic research hypothesis that would be further specified once we have tested the RH1-RH3 (see Section 5.4):

RH4: Style deviation will impact SRMF money flows, depending on the effect of the style deviation practices on the financial and sustainability outcomes, and the profile of SRMF investors.

3. Data description

We analyse a sample of SRMFs investing in domestic equity and domiciled in the US market. We focus on the US market since it is the oldest and most developed SRMF industry worldwide, and consequently the most mature market. The first religious fund, the Pioneer Fund, appeared in the US market in the 1920s (Ferruz, *et al.*, 2012); the first "modern" SRMF, the PAX world fund, also appeared in the US market in the 1970s (Renneboog *et al.*, 2008b). When the US SRMF industry started to consolidate, this segment of the collective investment industry still represented a marginal proportion of the total market in other countries. For example, Bauer *et al.* (2005) point out that (p.1754) "while the US market for ethical mutual funds rose from $12 billion in 1995 to $153 billion at the end of 2000, the European market for ethical funds is still in an early stage of development". The first studies of SRMFs were focused on the US market but other markets were then analysed (Fabregat-Aibar *et al.*, 2019). US SRMFs prospectuses are publicly available in the SEC Edgar Database that provides the required information to conduct the analyses that allow us to answer the RQs raised and to test the RHs posed. The US SRMF market is thus the ideal laboratory to shed light for the first time on the issues dealt with in this research.

The sample is formed of 454 mutual funds during the period 2012–2018. The sample size of this research is larger than that of other studies examining the US market. For example, Muñoz (2016) analysed 194 SRMFs; the sample in Utz and Wimmer (2014) contained 230 SRMFs; and Nofsinger and Varma (2014) identified 240 domestic equity SRMFs in the US market in the period 2000-2011. The data was obtained from the Morningstar Direct database. Our sample is free of survivorship bias and starts in 2012 because this is the first year for which data on the portfolio sustainability score is available[(1)]. We collected data on fund returns and other fund

characteristics, including net expense ratio, total net asset value (TNA), turnover ratio, inception date, and sustainability score.

Table 1 presents the main descriptive statistics for our sample. It displays, on a yearly basis, the mean, median, twenty-fifth percentile, seventy-fifth percentile and standard deviation of the fund characteristics.

Insert Table 1

The average total net assets of the funds are around $451million (this variable shows a high standard deviation). The mean age of the funds is high (more than 11 years). Over the period considered, the mean turnover ratio is around 70%, the average net expense ratio 1.29%, the average annual return 8%, and the median 11%. The sustainability score reflects the level of sustainability of the funds and is explained in detail in Section 4.2. It shows an average of 47.3 points, with all scores ranging between 40 and 60 points. These results are similar to those obtained by Durán-Santomil *et al.* (2019) for the same variable.

4. Methodology

In this section we present the research methods and show how we quantify the different measures used to answer our research questions.

4.1 Style-changing measures

Our first objective is to determine whether the SRMF industry exercises discipline over its own stated financial styles. In accordance with Bams *et al.* (2017), we employ two approaches to measure this: style drift and style deviation. The style drift measure captures the style consistency of the mutual funds. We use Idzorek and Bertsch's (2004) Style Drift Score (SDS). This measure is calculated as the volatility of a fund´s investment style over time.

The SDS is calculated within the framework of the Carhart four-factor (1997) model:

$$R_{it} = \alpha_{it} + \beta_{1t}RMRF_t + \beta_{2t}SMB_t + \beta_{3t}HML_t + \beta_{4t}PR1YR_t + u_{it} \quad (1)$$

where R_{it} is the return on mutual fund i in excess of the one-month T-bill return; $RMRF_t$ is the excess return on a value-weighted aggregate market proxy; SMB_t, HML_t and $PR1YR_t$ are returns on value-weighted, zero-investment, factor-mimicking portfolios for size, book-to-market equity, and one-year momentum in stock returns(2), β_{kt} is the style exposure coefficient or the sensitivity of fund i´s return to the factor-mimicking portfolio return of index k; and u_{it} is the error term.

The $SDS_{i,t}$ for fund i in year t is calculated as the square root of the sum of the variances of the daily style coefficients of this fund. In accordance with previous studies, these coefficients are computed using a 'rolling window' technique with daily observations over 36 months.

$$SDS = \sqrt{var(\beta_{1t}) + var(\beta_{2t}) + \cdots . + var(\beta_{kt})} \quad (2)$$

SDS is an effective and time-efficient measure of style consistency, providing a mean value for the variation in style index coefficients for each fund. A high SDS means that the fund shows greater style inconsistency compared with funds with a low SDS.

With regard to style deviation, we use our own approach(3).We thus classify fund i in the year t based on its exposure to Fama and French's (1993) SMB and HML style factors:

$$R_{it} = \alpha_{it} + \beta_{1t} RMRF_t + \beta_{2t} SMB_t + \beta_{3t} HML_t + u_{it} \quad (3)$$

Fund i in year t is assigned to style classes based on the sensitivity of its returns to the three Fama and French (1993) factors(4), using daily returns. We then compare the stated investment style of the fund on a yearly basis as reported in its prospectus, with the assigned style class. We obtain the prospectus for each fund in each year from the SEC EDGAR database(5). Based on those comparisons, we create a dummy variable (style deviation dummy, SDD) which takes the value 0 if the fund is misclassified and 1 if not. For example, if the prospectus of fund i states that it invests in large stocks but we find the estimated beta coefficient on the SMB factor to be positive, we conclude that the fund deviated from its own declared financial style in that year. In the same way, if the prospectus of fund j reports that it invests in growth stocks, but we find the estimated

beta coefficient in HML factor to be positive, we determine that in that year the fund deviated from its own stated financial style.

4.2 Sustainable and financial performance

Another objective of this study is to examine the effect of style discipline on the sustainable and financial performance of SR funds. We use a variable obtained from Morningstar Direct (Sustainalytics) to measure sustainable performance. In 2016, Morningstar launched a measure for scoring mutual funds and ETFs on ESG risks and opportunities. This Morningstar Portfolio Sustainability Score (SustsScore) is defined as follows:

$$SustsScore = Portfolio\ ESG\ Score - Portfolio\ Controversy\ Deduction \quad (4)$$

According to Morningstar, the portfolio ESG Score is '*an asset-weighted average of normalized company-level ESG scores with deductions made for controversial incidents by the issuing companies, such as environmental accidents, fraud, or discriminatory behavior*'. To compute this variable, at least 67% of a portfolio's assets under management must have these scores.

The Morningstar Portfolio ESG Score is calculated as follows:

$$Portfolio\ ESG = \sum_{i=1}^{n} w_i ESGNorm_i \quad (5)$$

where $ESGNorm_i$ is the normalised ESG score of company i, n is the number of securities in the portfolio and w_i is the asset weight of security i.

Company-level ESG scores, as Morningstar indicates, '*reflect how well a firm is addressing ESG issues based on a series of indicators measuring preparedness, disclosure and performance*'.

Sustainalytics assesses a company's performance in ESG issues relative to others in the same global industry peer group, on a 0–100 scale. Given that the importance of ESG issues varies across peer groups, each one uses its own combination of indicators to determine its company-level ESG score. This means that the same score shared by two companies in different peer groups

may not be equivalent. To render ESG scores comparable across peer groups, Morningstar normalises the scores of each group with a z-score transformation, as follows:

$$Z_{peer} = \frac{ESG_X - \mu_{peer}}{\sigma_{peer}} \quad (6)$$

where ESG_X is the Sustainalytics Company ESG score, μ_{peer} is the peer group mean ESG score and σ_{peer} is the peer group standard deviation of ESG scores.

The normalised ESG scores are then calculated on a 0–100 scale with a mean of 50, as follows:

$$ESGNormalized = 50 + \left(Z_{peer} \times 10\right) \quad (7)$$

A normalised ESG score higher (lower) than 70 (30) means that a company's scores are at least two standard deviations above (below) average in its peer group.

Once the ESG scores are normalised, they are aggregated to obtain a Portfolio ESG Score by computing an asset-weighted average of all covered securities. The percentage of assets under management of the covered assets is rescaled to 100% before computation of the Portfolio ESG Score.

Companies can be involved in ESG-related incidents. Sustainalytics tracks such incidents, which are called 'controversies', and computes a controversy score for each company, taking into account the impact of each incident on the environment and society. Where companies are involved in multiple controversies, Sustainalytics scores them based on the highest level of involvement in such incidents, on a 0–100 scale where a 0 (100) score means a severe impact on the environment or society (no evidence of controversy) and serious (no) risk to the company. Morningstar uses these controversy scores to create its Morningstar Portfolio Controversy Score (MContr), as follows:

$$MContr = 100 - \sum_{i=1}^{n} w_i \, SCont_i \quad (8)$$

where $SCont_i$ is the Sustainalytics controversy score for company i.

Again, a minimum of 67%[6] of a portfolio's assets under management must receive a company controversy score in order to obtain a Portfolio Controversy Score. The percentage of assets of the covered securities is also rescaled to 100%. Finally, to calculate the Portfolio Sustainability Score, the Portfolio Controversy Score is rescaled to create the Portfolio Controversy Deduction.

We compute for fund i in year t the average value of all portfolio sustainability scores available for that fund in that year. This is our proxy for non-financial or sustainable performance.

With regard to financial performance, each year, we take the alpha from equation (1) computed for each fund in the sample using daily data. Then, we annualise these alphas.

4.3 Money flows of SR funds

Finally, we compute the mutual fund flows in year t as per Sirri and Tufano (1998):

$$PFlow_{i,t} = \frac{TNA_{i,t} - TNA_{i,t-1}(1+R_{i,t})}{TNA_{i,t-1}} \quad (9)$$

where $TNA_{i,t}$ is total net assets of fund i at the end of the year t, and R_{it} is the return on fund i over the year t.

Fund flows[7] are defined as the percentage growth in total assets under management of the fund at time t, assuming the reinvestment of dividends and distributions.

5. Empirical results

In this section, we present the empirical results of the analyses. First, we report the results for the style-changing behaviour measures, then we examine the relationship between the investment style discipline of fund managers and sustainable performance. Next, we examine the effect of style deviation on financial performance. Finally, we analyse how investment style-changing

behaviour affects SRMF money flows, controlling for investor profiles (values-driven or profit-seeking).

5.1 Style-changing behaviour measures in the SR mutual fund industry

Table 2 presents summary statistics for the SDS and SDD indicators.

Insert Table 2

The mean, median, maximum, minimum, 25th quartile, 75th quartile and standard deviation for the funds considered in each year of our sample are presented for the SDS indicator. The SDS measure serves as a proxy for the style consistency of the fund, as explained above, but this indicator does not allow the funds that deviate from their stated financial style to be identified. The higher the SDS measure, the greater the style inconsistency during the period considered. The greatest style inconsistency in the SR funds was in 2012, with a mean SDS of 2.5%. The SDS measure shows similar values in all the other years, 2017 being the year with most style consistency. The mean, standard deviation, percentage of deviated funds and percentage of total net assets managed by deviated funds are presented for the SDD indicator. Figure 1 illustrates the number of funds that deviated from their stated style in each year, and Figure 2 reports the total net assets managed by the deviated mutual funds in each year.

Insert Figures 1 and 2

The results indicate that the percentage of funds deviating from their stated investment objective ranges from 10.22% (2014) to 21.11% (2016) (see Table 2, Panel B). In average terms, 17.60% of SRMFs in our sample (managing 14.66% of the total net assets) deviated from the financial style reported in their prospectuses. These results lead us to not reject the RH1 and show the convenience of testing the other research hypotheses.

5.2 Sustainability fund performance and style deviation/drift

Some SRMFs in our sample were found to have deviated from their self-declared investment style. In this section, we empirically test whether these deviations have an impact on sustainable

performance. To this end, we regress the Morningstar Portfolio Sustainability Score (SustScore) of fund i at year t on each of our proxies for style discipline (SDS and SDD), and on several fund control variables that might also be relevant for explaining sustainable performance. Specifically, our control variables include the following: the financial performance (ALPHA) of the fund that year (measured using the estimated Carhart four-factor alpha, using daily returns and expressed in annual terms); the money flows experienced by the fund in that year (FLOW) (computed according to Equation 9); the size of the fund in that year (SIZE) (measured by the natural logarithm of fund average total net assets in that year); the age of the fund (AGE) (measured by the natural logarithm of years since the fund's inception date); the expense ratio of the fund (ER) (obtained from Morningstar); the turnover ratio of funds (TR) (also obtained from Morningstar); and the standard deviation of daily returns of funds in that year (SDR). We construct panel data with these variables and estimate the model controlling for time-fixed effects only, and for both time-fixed and style-fixed effects.(8)

The model is shown in the following equation:

$$SustScore_{i,t} = a + b_1 \times SDD_{i,t} + Controls + \varepsilon_{i,t} \qquad (10)$$

$$SustScore_{i,t} = a + b_1 \times SDS_{i,t} + Controls + \varepsilon_{i,t}$$

In Table 3, Columns 1 (3) and 2 (4) show the results when considering the SDD (SDS) measure. In Columns 1 and 3 we control for time-fixed effects and in Columns 2 and 4 for both time-fixed and style-fixed effects. In general terms, we can conclude that financial style inconsistency has a significant positive effect on sustainable performance. More specifically, we observe a significant positive relationship between the style drift measure and the sustainable performance for our SRMF sample. We also find a significant negative relationship between the style deviation dummy and sustainable performance; however, given that the dummy variable takes the value 0 if the fund is misclassified and 1 otherwise, this means that well-classified funds obtain worse sustainability scores than do misclassified ones. Put together, these results indicate that those managers who deviate from their reported investment style when making their investment

decisions can achieve better sustainable performance. These findings mean that we do not reject RH2.

Although the main objective of this section is to determine the relationship between style discipline and sustainable performance, the remaining fund control variables also reveal some interesting results. Table 3 reports indeed, the existence of a certain trade-off between a good sustainable record and good financial performance, showing a significant negative relationship between the SustScore and the alpha of the funds. Other variables, such as the size and age of the SRMFs, positively impact the portfolio sustainability score in a significant way. However, the expense ratio, the turnover ratio, and the standard deviation of daily returns have a negative impact on this score.

Insert Table 3

5.3 Financial performance of funds and style deviation/drift

In this section, we examine the effect of the style deviation/drift behaviour of SRMF managers on their financial performance. To do so, we regress financial performance, measured as the Carhart four-factor alpha (ALPHA), on style deviation (SDD), style drift (SDS) and the control variables defined above. The model is shown in the equation below:

$$ALPHA_{i,t} = a + b_1 \times SDD_{i,t} + Controls + \varepsilon_{i,t} \qquad (11)$$

$$ALPHA_{i,t} = a + b_1 \times SDS_{i,t} + Controls + \varepsilon_{i,t}$$

Table 4 shows a significant positive relationship between the style deviation measure and the alpha for our SR mutual fund sample, meaning that well-classified funds are the better performers. At the same time, we observe a negative but non-significant relationship between the style drift measure and the alpha. When we consider mutual fund returns as a proxy for financial performance and replace the alpha with them in the regression, we obtain (in unreported results)[(9)] the same significant positive relationship between style deviation and financial performance; however, this time we also observe a significant negative relationship between the style drift

measure and mutual fund returns. This would seem to indicate that the higher the volatility of a fund's investment style exposure over time, the worse its financial performance. Thus, we reject the RH3 since we empirically observe the opposite.

Although the main objective of this section is to analyse the relationship between style discipline and SRMFs financial outcomes, some of the results from the control variables are also interesting. Thus, the estimated coefficients on the control variables reveal that the financial performance of SRMFs is positively (negatively) related to the money flows and size (expense ratio, turnover ratio, and the standard deviation of daily returns).

Insert Table 4

5.4 Investor sensitivity to style deviation/drift

In this section, we analyse the effect of the style-changing behaviour of SRMFs managers on investors' money flows. This effect will depend on the consequences of these deviations for both sustainable and financial performance. According to previous results, style deviation practices affect SRMFs investor utility both positively and negatively, and the two effects could offset. However, SRMFs investors do not behave in a homogenous way, as we have explained in previous sections. In that respect, we might expect that profit-seeking investors who are especially worried about financial performance would divest from SRMFs deviating from their stated financial style, since this practice has a negative impact on the financial performance of the fund. However, value-driven investors, interested mainly in sustainability performance, would keep, or increase their investment in those SRMFs, due to the positive impact of deviation practices on the sustainable performance of the fund. Now that we have tested the RH1-RH3, we can more precisely define RH4:

RH4a: Style deviation practices would positively affect money flows in SRMFs having higher sustainability scores.

RH4b: Style deviation practices would negatively affect money flows in SRMFs having lower sustainability scores.

One might expect that investors in top sustainability score funds would be values-driven, whereas investors in low sustainability score funds would be more sensitive to financial attributes (profit-seeking investors). To test these conjectures, we examine the relationship between investor fund flows with style deviation and style drift in mutual funds, separately for higher-than-median sustainability score funds (value-driven investors) and for lower-than-median ones (profit-seeking investors). We consider the fund flow at year t+1 (FLOW) as the dependent variable of the regression, and performance at year t (ALPHA), the style deviation/drift variable (SDD/SDS) at year t and the control variables (at year t) defined above as the explanatory variables. The model is shown in equation 12 below:

$$FLOW_{i,t+1} = a + b_1 \times ALPHA_{i,t} + b_2 \times SDD_{i,t} + Controls + \varepsilon_{i,t} \quad (12)$$

$$FLOW_{i,t+1} = a + b_1 \times ALPHA_{i,t} + b_2 \times SDS_{i,t} + Controls + \varepsilon_{i,t}$$

Table 5 shows the results of these analyses. Columns 1 (3) and 2 (4) show the results for the SDD (SDS) measure, Columns 1 (2), and 3 (4) the results for the funds with a sustainability score above (below) the median. The results show that the fund investors in our sample are insensitive to style deviation and style drift regardless of the sustainability score of the portfolio since the coefficients of the SDD and SDS indicators remain non-significant across the models. We thus reject RH4a and RH4b.

Above and beyond the main objective of this section, namely the analysis of the effect of style deviation practices on money flows, the control variables reveal some interesting results. Table 5 shows that there is a significant positive relationship between financial performance (Carhart four-factor alpha) of the funds with lower-than-mean sustainability scores and flows in the following year. Besides, other findings from the control variables show that the size, the age, and the net expense ratio of SRMFs impact negatively the money flows.

Insert Table 5

6. Discussion

Our empirical findings show that, in average terms, 17.60% of SRMFs in our sample deviated from the financial style reported in their prospectuses. If we compare these figures with those in previous literature for conventional funds, we can see that the percentage of SRMFs managers deviating from their financial style is similar to that previously found by Bams *et al.* (2016) for conventional equity mutual funds in the US market, who noted that 14% of managers committed these practices. Our research thus reveals that in the SRMF industry, managers engage in deviation practices in a similar proportion to their peers in the conventional mutual fund industry. Once we have detected the existence of style deviation practices in the SRMF industry, the next step is to analyse the impact of these practices on both sustainable and financial performances to understand the motivations of such an opportunistic behaviour.

About the sustainability performance, we detect that SRMFs' managers engaged in style deviation practices achieve better portfolio sustainability scores. This finding could be explained by a lower style discipline that would allow SRMF managers to invest more freely in companies with high ESG scores, no matter the financial style of these companies. More disciplined SRMFs managers fulfilling their stated financial style could face more restrictions on increasing their exposure to companies with high ESG scores since their investable universe is only composed of stocks belonging to their stated financial style. This would be the first time that the impact of style deviation on SRMF sustainable performance has been examined and demonstrated. Control variables results reveal a significant negative relationship between the SustScore and the alpha of the funds detecting a certain trade-off between a good sustainable record and good financial performance. This relationship is in line with a strand of the SRI literature which argues that this type of investment has financial costs beyond those associated with conventional investments, affecting the financial performance of these portfolios (Girard *et al*., 2007). However, there is no real consensus on this issue. Many different studies have demonstrated a positive, negative or

neutral relationship between SRI and financial performance. Durán-Santomil *et al.* (2019) found that sustainability scores had a positive effect on financial performance, which is consistent with the idea that mutual funds invested in companies with better sustainability scores generate better performance. Besides, the sustainability score is positively (negatively) related to the size and age (the expense ratio, the turnover ratio, and the standard deviation of daily returns) of SRMFs. This means that, in our sample, SRMFs that were larger, older, with lower turnover and net expense ratios, and with more stable daily returns, display higher sustainability scores. These results reveal that the more consolidated SRMFs seem to achieve better sustainable performance, suggesting that the economies of scale and economies of learning detected in mutual fund administration (Latzko, 1999; Khorana *et al*., 2009; Gil-Bazo and Ruiz-Verdú, 2009; and Navone and Nocera, 2016) also work in the case of the sustainable performance of SRMFs.

With regards to financial performance, our results reveal that style deviation practices jeopardise the financial outcomes of SRMFs. Previous research analysing the relationship between style discipline and financial performance for conventional mutual fund managers has found mixed results (see among others, Chan *et al.*, 2002; Swinkels and Tjong-A-Tjoe, 2007; and Bams *et al*., 2016). Our results align with those that have shown a negative effect from style deviations on financial performance (Chan *et al.*, 2002; Bams *et al*., 2016). These results together with those obtained for the sustainability performance indicate that SRMF managers who deviate from their stated financial styles improve their sustainable performance but in exchange for worsening their financial outcomes. The reason for this result could be the existence of a trade-off between the most financially profitable styles and those that allow the achievement of better sustainable scores. Small-cap and value stocks have thus traditionally shown a positive return premium in financial markets (Brown *et al*., 1983; Bauman *et al.*, 1998; Dimson *et al.*, 2003). In fact, in recent years, some of the most popular smart-beta strategies have been based on overweighting small-cap and/or value stocks in investment portfolios (Kahn and Lemmon, 2015). On the other hand, value stocks have shown a negative correlation with sustainability scores (Melas *et al.*, 2017) and small-cap stocks receive less attention from sustainability analysts, as large-cap companies

receive ESG scores more frequently (Borgers *et al*., 2015; or Joliet and Titova, 2018). A style deviation strategy to achieve better sustainable performance could therefore consist of divesting from value and/or small-cap companies and overweighting growth and large-cap stocks into investment portfolios. However, this strategy could jeopardise financial outcomes. This finding casts doubt on the effectiveness of style deviation practices to attract money flows in the SRMF industry since the SRMF investor utility function depends positively on both financial and sustainability outcomes. This dilemma would not arise for conventional mutual fund managers since their investors are only interested in financial outcomes. The results from the control variables shown in Table 4 also provide interesting insights. Thus, we can see that SRMFs showing better financial performance are detected by investors since they receive more money flows. This result could be reflecting the existence of the smart-money effect among SRMFs in our sample (Renneboog *et al.*, 2008a, Renneboog *et al.*, 2011; or Muñoz, 2019). The largest funds also obtain better financial outcomes, suggesting the existence of economies of scale in our sample (Latzko, 1999). Additionally, the turnover ratio and the net expense ratio negatively affect the financial outcomes of SRMFs. These findings are not striking if we consider that previous studies have found that higher operational and trading costs harm the financial outcomes of the more active fund managers (Khorana, 2001; Mansor *et al*., 2015).

When analysing the impact of style deviation practices on SRMFs' flows, we do not detect significant evidence. The reasons of these results could be that the effects of the style deviation practices on the financial and sustainable performance of SRMFs are not strong enough for one of them to dominate the other, at least if we consider a global perspective aiming to describe the average behaviour of SRMF investors. Another interesting finding in Table 5 is that there is a significant positive relationship between the financial performance (Carhart four-factor alpha) of the funds with lower-than-mean sustainability scores and flows in the following year, indicating that investors who chose portfolios with worse records on sustainability issues do increase their inflows to funds with higher alphas, showing a return-chaser behaviour. This is consistent with the idea that investors who invest in portfolios with worse sustainability scores are more worried

about the financial attributes of their investments, and as such would move their funds to obtain at least similar returns to those achieved through conventional investments. Additionally, in the case of higher-than-median sustainability score funds there is no significant relationship between financial performance and investor fund flow which reinforces the idea of Derwall *et al.* (2011) concerning the segmentation of the SRI movement in terms of a values-versus-profit orientation. These findings validate the use of the portfolio sustainability scores of SRMFs to segregate investors. Other findings from the control variables show that smaller, younger, and cheaper SRMFs attract more money flows, and these results are consistent with those obtained by other authors, such as El Ghoul and Karoui (2017).

7. Conclusion

In recent years, socially responsible investment, which embodies ethical values, environmental protection, better social conditions, and good governance, has attracted the interest of investors as well as that of academics. In the last decade, research into SRI has focused on performance in an attempt to determine whether this type of investment has financial costs beyond those associated with conventional investments, and whether it affects the financial performance of portfolios (see Bauer *et al.*, 2005; or Nofsinger and Varma, 2014). However, up until now the topics dealt with in this research have not been explored. We have analysed, for the first time, as far as we know, the financial style discipline in the SRMF industry and its consequences.

Our results show that SRMF managers do not differ from their conventional peers (Bams *et al.*, 2016), at least, regarding their involvement in style deviation practices. Given the important growth of SRMFs in the US market and the amount of money managed by this segment of the collective investment industry, these results are of interest to regulators who should enforce the requirement to adhere to the stated financial style of collective investment vehicles. We can find in the past some examples of fines imposed by the SEC to SRMFs' advisors for investing in companies belonging to controversial economic sectors that mutual fund companies claimed to exclude. For example, in 2008, the SEC imposed a fine of $ 500,000 to New Hampshire-based

Pax World Management Corp. alleging that the company invested in at least ten securities that the Funds' socially responsible investing (SRI) restrictions impeded them from selecting[10]. Recently, the SEC has sent examination letters to know whether SRMFs fulfill their promises and invest in more sustainable companies (Chung and Michaels, 2019) [11]. Our empirical findings reveal that the SEC should also monitor whether SRMFs' managers are involved in financial style deviation practices. Nowadays, the SEC requires that mutual fund companies disclose quarterly portfolio holdings information[12]. Besides, mutual fund companies usually reveal this quarterly information with a delay. In a recent press article in the specialised financial markets website investopedia.com, Blokhin (2020) [13] explains that mutual funds have sixty days after their quarter ends to submit the portfolio holdings information to the SEC. Thus, given the delays in reporting, the quarterly portfolio holdings disclosed do not reflect the current portfolio composition meaning that "*the SEC is not looking at the most recent holdings nor is an investor accurately aware of where their money is being invested*" (Blokhin, 2020). One possible measure to hinder the deviation style practices could be to increase the frequency with which mutual fund companies have to disclose their portfolio composition. Additionally, periodic random checks on a fund's portfolio may also help to discourage these practices. Parida and Teo (2018) explain the benefits of increasing the disclosure frequency, being one of these advantages that (p. 87) "*shareholders would be able to better monitor whether, and how, a fund is complying with its stated investment objective*". Blokhin (2020) explains that some investment advocacy groups have proposed that mutual funds report their holdings monthly, but the SEC has not yet made a decision on this proposal. However, the approval of this measure will not be easy given the strong opposition of most investment fund managers. Mutual fund companies are reluctant to increase the portfolio holdings disclosure frequency, because of the costs and the revealing of informational advantages to the competitors (Parida and Teo, 2018).

Another relevant finding of this research is that style deviation practices allow SRMF managers to improve their sustainable performance, which contributes to the literature by showing, for the first time, that this relationship is positive, at least, in the sample analysed. However, style

deviation practices are, in exchange, worsening the financial results of SRMFs. This finding is not striking since we detect the existence of a certain trade-off between a good sustainable record and good financial performance, showing a significant negative relationship between the SustScore and the alpha of the funds. Previous literature (Navone and Nocera, 2016; or Durán-Santomil *et al.*, 2019, among others) has shown mixed results on this issue (see discussion section). The non-consensus on this issue makes it necessary to continue exploring the relationship between sustainable performance and financial outcomes, and should constitute one of the future lines of research in the SRMF literature.

Taking into account that the utility function of SRMF investors depends positively on the financial and sustainable outcomes of the investment, such a trade-off could make style deviation practices less effective in attracting money flows in the SRMF industry. In fact, our findings reveal that style deviation practices do not affect the money flows of SRMF investors, even after controlling for different SRMF investor profiles. Thus, another interesting contribution of this research is the empirical evidence casting doubts on the effectiveness of financial style deviation practices to attract SRMF money flows, at least, from a general perspective. These results are interesting for both SRMF managers and investors since they shed light on the consequences of style deviations practices in the SRMF industry.

At the academic level, our findings show the relevance of controlling for style deviation practices when studying the sustainable performance of SRMFs. Considering that most of the studies, to date, use sustainability indicators as an independent variable to explain other SRMF dimensions, such as their financial performance or money flow (Durán-Santomil *et al.*, 2019; Amman *et al.*, 2019), an avenue for further research in SRMF literature might be the determinants of the portfolio sustainability scores, and whether these indicators can properly capture performance relative to the ESG issues. Given our empirical evidence, future research that analyses the determinants of sustainable performance in portfolios should control for style deviation practices.

To distinguish investor profiles, we split our sample according to the sustainability score of the funds in which they invest and find that investors in SRMFs with poor ESG scores present return-chasing behaviour, whereas the investors in SRMFs with good records on sustainability scores do not. The former would thus represent profit-seeking investors and the latter would represent values-driven investors. Previous research has mainly used the type of screens (positive or negative) followed by SRMFs to make this distinction (Derwall *et al*., 2011), however, nowadays SRMFs follow different types of screens at the same time (In *et al*., 2014) since they are not exclusive, making this method useless. Our findings confirm that future research on SRMFs that want to establish investor profiles controls should use sustainability scores.

This research, however, has some limitations that might constitute avenues for further research. First, the sample period is limited due to data availability. As more information becomes available on indicators of the sustainable performance of SRMFs, studies can cover longer periods, which would allow, for example, controlling for crisis/non-crisis times that could have an effect on SRMF stakeholder behaviour (Nofsinger and Varma, 2014). We have also focused our research on the US market, which is the more developed SRMF industry worldwide. However, further research could analyse other geographical markets, since different institutional features could affect regulators, managers, and investor behaviour (Muñoz, 2019; Capelle-Blancard and Monjon, 2014; and Revelli and Viviani, 2015). Furthermore, our study focuses on deviation practices from the financial styles. However, another interesting issue to analyse could be the deviation practices regarding the ESG screens stated by SRMFs' companies (Dilla *et al.*, 2016). Moreover, our research provides empirical evidence suggesting the existence of a conflict between equity styles being more profitable from a financial point of view and those being most appropriate to achieve good sustainability records. This topic has not yet been analysed in-depth as portfolio sustainable performance indicators have only been available for a few years. Further research could explore the optimal style allocation in SRMF portfolios to maximise investor utility.

[1] Although the Morningstar Portfolio Sustainability Score was publicly released in 2016, this indicator is retrospectively available since 2012.

[2] Carhart's factors were collected from the Kenneth French website. We thank him for making this information available on his website: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/

[3] Whereas other authors in mutual fund literature have used measures of style deviation based on the Sharpe style analysis (1992), our approach is based on the Fama and French (1993) factor styles. The Sharpe style analysis requires the benchmarks used to be independent to obtain unbiased estimations of the funds' style weights. This is difficult with equity styles that are highly correlated. Our approach also determines whether each fund belonging to a specific style group behaves similarly to the factor representing such style, independently of the behaviour of the rest of the funds in the sample analysed. However, other measures determine style deviation, comparing the exposure of each specific fund to a benchmark with the average exposure to that benchmark of the rest of funds belonging to the same style category.

[4] We use the three Fama and French (1993) factors because most funds in our sample declare financial styles related to size and book-to-market factors.

[5]https://www.sec.gov/edgar/searchedgar/mutualsearch.html

[6] Morningstar computes the portfolio sustainability score with ESG information at the company-level. The information at the company-level is obtained from Sustainalytics, which covers more than 12,000 companies worldwide. The group of assets to compute both the ESG score and the Controversy score is thus the same (the universe of companies covered by Sustainalytics).

[7] Following Bollen (2007), we eliminate the extreme observations of fund flows by removing those below –99% and above 1,000%.

[8] In order to also control for time and style, we create different dummy variables. We created six dummy variables D2012/D2013/D2014/D2015/D2016/D2017 that adopt the value 1 when the SustScore is obtained in 2012/2013/2014/2015/2016/2017 or 0 otherwise (the year 2018 is used as the base category). For style controls, we use the style assigned by Morningstar under the label 'Global Category'. We identify eight different labels: US Equity Large-Cap Blend, US Equity Mid-Cap, US Equity Small-Cap, US Equity Large-Cap Growth, US Equity Large Cap Value, Industrials Sector Equity, Global Equity Mid-/Small-Cap and Global Equity Large-Cap. We include seven dummy variables for the different styles in the controls, using the last one as the base category.

[9] We do not report these results here, for the sake of brevity, however, they can be requested from the authors.

[10] https://www.sec.gov/news/press/2008/2008-157.htm

[11] https://www.wsj.com/articles/esg-funds-draw-sec-scrutiny-11576492201

[12] https://www.sec.gov/rules/final/33-8393.htm

[13] https://www.investopedia.com/ask/answers/091715/how-often-do-mutual-funds-report-their-holdings.asp#:~:text=The%20Securities%20and%20Exchange%20Commission,they%20are%20regulated%20investment%20companies.

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Table 1: Descriptive statistics

	Mean	Median	25th percentile	75th percentile	Std. Dev
Total Net Asset (mill $)	451.54	42.36	8.12	237.45	1533.75
Age (years)	11.37	9.17	4.87	14.26	11.20
Expense Ratio	1.29	1.23	0.90	1.60	0.57
Turnover Ratio	68.68	49.82	25.00	86.00	76.05
Return	0.08	0.11	-0.01	0.19	0.19
Sustainability Score	47.31	47.33	45.79	49.02	3.00

Table 1 presents summary statistics for the SR mutual fund sample (n=454) obtained from the Morningstar database. The sample comprises all SRI funds with a domestic equity investment aim domiciled in the US market during the period 2012–2018. The information provided includes total net assets, age, net expense ratio, turnover ratio, annual return and sustainability score.

Table 2: Style drift score and style deviation dummy

	Panel A: SDS 2012-2018						
Year	2012	2013	2014	2015	2016	2017	2018
Mean	0.025	0.016	0.018	0.020	0.014	0.012	0.014
Max	0.103	0.110	0.052	0.086	0.089	0.049	0.043
Min	0.004	0.003	0.002	0.002	0.002	0.002	0.001
SD	0.014	0.011	0.011	0.015	0.009	0.007	0.008
25th quartile	0.015	0.009	0.010	0.010	0.009	0.006	0.008
Median	0.023	0.013	0.015	0.015	0.012	0.010	0.013
75th quartile	0.030	0.019	0.027	0.026	0.017	0.014	0.017
	Panel B: SDD 2012-2018						
Mean	0.8686	0.7946	0.8978	0.8170	0.7889	0.8025	0.7982
SD	0.3382	0.4045	0.3033	0.3871	0.4086	0.3988	0.4020
% of deviated funds	13.14%	20.54%	10.22%	18.30%	21.11%	19.75%	20.18%
% of total net assets managed by deviated funds	12.50%	27.55%	9.02%	12.67%	14.82%	14.14%	11.96%
Number of funds	411	404	401	399	379	324	327

Table 2 shows the yearly summary statistics of the SDS and SDD measures for our sample of SR US equity funds. Panel A shows the mean, maximum, minimum, standard deviation, 25th quartile, median and 75th quartile for the SDS measure. Panel B shows the mean, standard deviation, % of funds that deviated from their stated investment style and % of the total net assets managed by deviated funds.

Table 3: Impact of style discipline on sustainable performance

	Sustainable score on SDD	Sustainable score on SDD	Sustainable score on SDS	Sustainable score on SDS
SDD	-0.735***	-0.405***		
	(-5.79)	(-3.83)		
SDS			22.486***	15.790***
			(2.75)	(2.92)
ALPHA	-4.420*	-3.525**	-5.511**	-3.844**
	(-1.8)	(-2.05)	(-2.32)	(-2.29)
FLOWS	-0.052	0.030	-0.102	0.021
	(-0.72)	(0.69)	(-1.36)	(0.47)
SIZE	0.013	0.051**	0.018	0.055***
	(0.53)	(2.43)	(0.71)	(2.62)
AGE	0.385***	0.199***	0.316***	0.168**
	(3.44)	(2.66)	(2.78)	(2.19)
ER	-0.539***	-0.072	-0.679***	-0.105
	(-4.72)	(-0.81)	(-5.61)	(-1.18)
TR	-0.007***	-0.011***	-0.007***	-0.011***
	(-4.87)	(-7.59)	(-4.85)	(-7.84)
SDR	-945.956***	-526.248***	-983.706***	-516.168***
	(-16.20)	-10.41	(-16.73)	(-10.33)
Intercept	56.441***	46.644***	56.228***	45.940***
	(79.79)	(70.61)	(78.59)	(70.35)
Time Controls	Yes	Yes	Yes	Yes
Morningstar Category	No	Yes	No	Yes
Style controls				
Nº of observations	1791	1791	1789	1789
R-squared	0.3890	0.663	0.385	0.6651
F-test	78.25***	165.75***	76.65***	167.08***

Table 3 shows the results of the analysis of impact of style discipline on the sustainable performance (equation (10)). Columns 1 (3) and 2 (4) show the results when considering SDD (SDS) as a proxy for style discipline. Columns 1 and 3 show the results when controlling for time-fixed effects and columns 2 and 4 when controlling for both time-fixed and style-fixed effects. The information presented is the estimated coefficients, with t-ratios in brackets (computed with robust standard errors). The number of observations considered in the estimation, the R-squared and the F-test of the estimation are also shown.

*** Significant at 1%; ** significant at 5%; * significant at 10%.

Table 4: Impact of style discipline on financial performance

	Financial performance on SDD	Financial performance on SDD	Financial performance on SDS	Financial performance on SDS
SDD	0.005***	0.004**		
	(2.77)	(2.02)		
SDS			-0.126	-0.134
			(-1.5)	(-1.46)
FLOWS	0.003***	0.003***	0.003***	0.003***
	(3.45)	(3.51)	(3.48)	(3.48)
SIZE	0.001***	0.001**	0.001***	0.001**
	(2.87)	(2.64)	(2.72)	(2.49)
AGE	0.001	0.001	0.002	0.002
	(1.17)	(1.23)	(1.4)	(1.42)
ER	-0.011***	-0.012***	-0.010***	-0.012***
	(-7.92)	(-8.56)	(-7.29)	(-8.33)
TR	-0.0001***	-0.0001***	-0.0001***	-0.0001***
	(-4.36)	(-3.31)	(-4.31)	(-3.14)
SDR	-5.662***	-6.444***	-5.526***	-6.558***
	(-7.39)	(-7.63)	(-7.31)	(-7.68)
Intercept	0.051***	0.067***	0.054***	0.077***
	(5.74)	(3.14)	(6.02)	(3.59)
Time Controls	Yes	Yes	Yes	Yes
Morningstar Category Style controls	No	Yes	No	Yes
Nº of observations	1791	1791	1786	1786
R-squared	0.2103	0.2346	0.2086	0.2344
F-test	31.25***	23.56***	31.41***	23.61***

Table 4 shows the results of the analysis of the impact of style discipline on financial performance (equation (11)). Columns 1 (3) and 2 (4) show the results when considering SDD (SDS) as a proxy for style discipline. Columns 1 and 3 show the results when controlling for time-fixed effects and columns 2 and 4 when controlling for both time-fixed and style-fixed effects. The information presented is the estimated coefficients, with t-ratios in brackets (computed with robust standard errors). The number of observations considered in the estimation, the R-squared and the F-test of the estimation are also shown.

*** Significant at 1%; ** significant at 5%; * significant at 10%.

Table 5: Impact of style discipline on money flows

	Flows on SDD for funds with above-median sustainable score	Flows on SDD for funds with below-median sustainable score	Flows on SDS for funds with above-median sustainable score	Flows on SDS for funds with below-median sustainable score
SDD	0.004	-0.048		
	(0.07)	(-0.44)		
SDS			-1.156	-0.758
			(-0.51)	(-0.2)
ALPHA	1.179	2.496**	1.148	2.264**
	(1.57)	(2.51)	(1.52)	(2.3)
FLOWS_lagged	0.145**	0.236**	0.151**	0.227**
	(2.35)	(2.44)	(2.45)	(2.49)
SIZE	-0.034***	-0.098***	-0.033***	-0.098***
	(-2.74)	(-4.41)	(-2.63)	(-4.43)
AGE	-0.060*	-0.216**	-0.063**	-0.231**
	(-1.82)	(-2.32)	(-2.04)	(-2.34)
ER	-0.224***	-0.293***	-0.219***	-0.291***
	(-5.33)	(-4.76)	(-5.35)	(-4.68)
TR	0.001	0.002**	0.001	0.002**
	(1.05)	(2.26)	(1.09)	(2.35)
SDR	21.483	-9.103	22.307	-8.627
	(1.16)	(-0.23)	(1.16)	(-0.21)
SustScore	0.021	0.051	0.020	0.057
	(1.2)	(1.27)	(1.33)	(1.44)
Intercept	-0.846	-0.527	-0.781	-0.785
	(-0.99)	(-0.31)	(-0.96)	(-0.46)
Time Controls	Yes	Yes	Yes	Yes
Morningstar Category	Yes	Yes	Yes	Yes
Style controls				
Nº of observations	742	698	740	695
R-squared	0.1753	0.2515	0.182	0.2501
F-test	6.21***	3.97***	6.99***	3.79***

Table 5 shows the results of the analysis of the impact of style discipline on money flows (equation (12)). Columns 1 (3) and 2 (4) show the results when considering SDD (SDS) as a proxy for style discipline. In this analysis we control for high and low sustainable performance. Thus, columns 1 and 3 show the results when we estimated the model for funds with sustainable performance above the median ('Good sustainable performance') and columns 2 and 4 the results for funds with a sustainability score below the median ('Poor sustainable performance'). For the sake of brevity, we have presented the results when controlling for both time-fixed and style-fixed effects only. The information presented is the estimated coefficients, with t-ratios in brackets (computed with robust standard errors). The number of observations considered in the estimation, the R-squared and the F-test of estimation are also shown.

*** Significant at 1%; ** significant at 5%; * significant at 10%.

Figure 1: SDD results (number of funds)

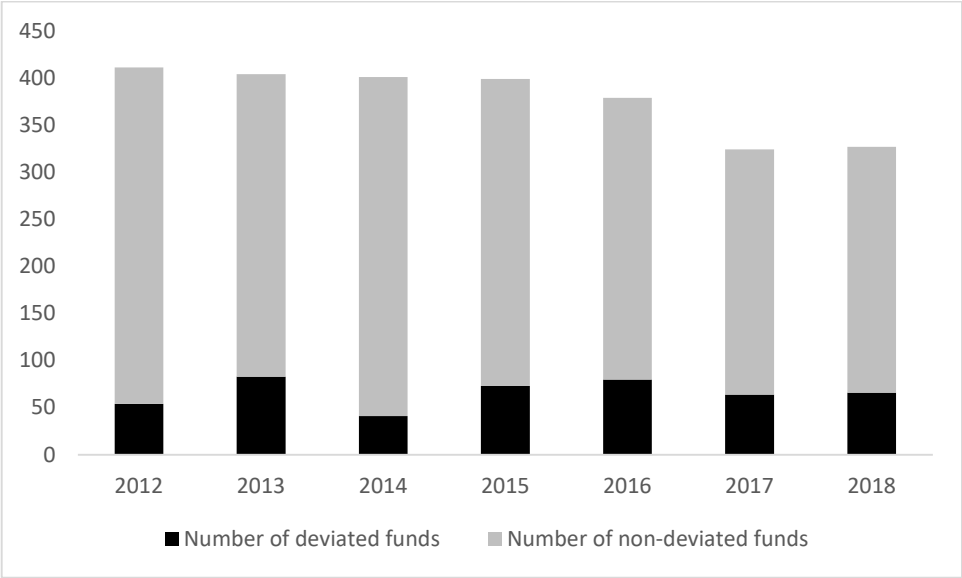

Figure 1 shows, for each year, the number of funds that deviated from their stated investment style.

Figure 2: SDD results (Total Net Assets)

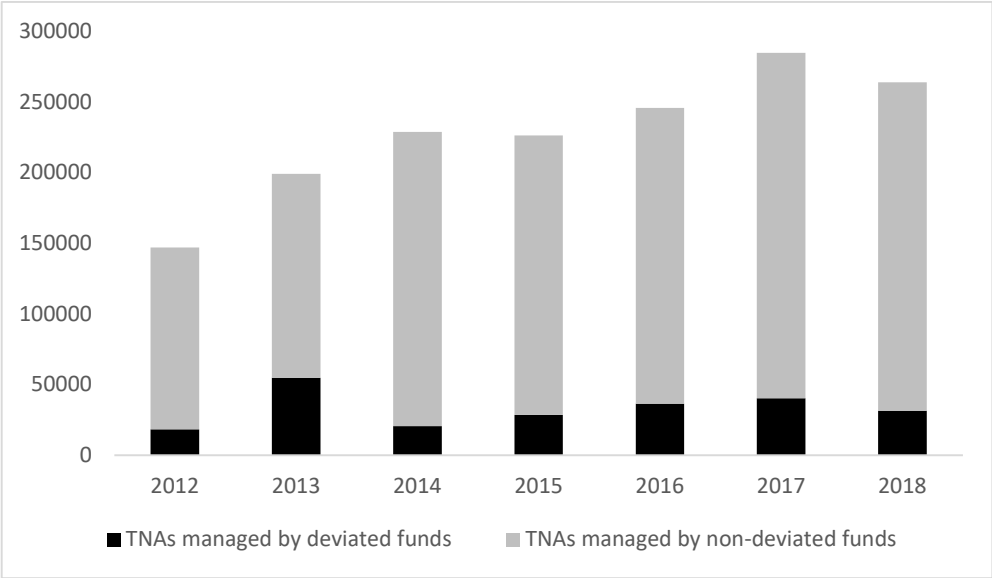

Figure 2 shows, for each year, the total net assets managed by deviated (black) and non-deviated (grey) funds. The total net assets are expressed in $ million.