WORKING PAPERS

Castellón
(Spain)

UNIVERSITAT
JAUME·I

Ethical strategy focus and mutual fund management: performance and persistence

Economics Department

Juan Carlos Matallín-Sáez
Amparo Soler-Domínguez
Emili Tortosa-Ausina

2016 / 01

Ethical strategy focus and mutual fund management: performance and persistence

Juan Carlos Matallín-Sáez
Universitat Jaume I
Department of Finance & Accounting
matallin@uji.es

Amparo Soler-Domínguez
Universitat Jaume I
Department of Finance & Accounting
adomingu@uji.es

Emili Tortosa-Ausina
Universitat Jaume I
Department of Economics & Ivie
tortosa@eco.uji.es

2016 / 01

Abstract

Over the last few years academics and practitioners alike have been analyzing the relative performance of different types of mutual funds, with a particular emphasis on comparing the performance of conventional versus socially responsible investment (SRI). The methods and samples used, as well as the results obtained are diverse, but they generally point to the difficulties found by SRI to yield an equivalent performance as that of its conventional peers—given the investment constraints they face. In this study we focus on the comparative performance of a sample of SRI funds, which we decompose mainly into Environmental, Social and Governance (ESG), environmental, and religious, and which invest in three different geographical areas. For these funds we measure not only performance but, more importantly, their persistence—i.e., whether the best (worst) funds are past winners (losers) as well. This twofold objective turns out to be essential to uncover some trends in the industry. Specifically, whereas ESG, in general, outperform their environmental peers, a deeper scrutiny focusing also on performance persistence reveals that this claim should be tempered, since investing in the best past environmental funds yields superior performance than investing in the best past ESG funds. This result, which holds for the two main geographical regions analyzed (Europe and US/Canada), would indicate that the comparison between these two types of funds is more intricate than what we might a priori expect, being particularly relevant to factor in the comparison an evaluation of performance persistence.

Keywords: environmental, ESG, mutual fund, performance, persistence, SRI.

JEL classification: G2, N25, Z12.

Ethical strategy focus and mutual fund management: performance and persistence[*]

Juan Carlos Matallín-Sáez
Universitat Jaume I

Amparo Soler-Domínguez
Universitat Jaume I

Emili Tortosa-Ausina
Universitat Jaume I and Ivie

December 16, 2015

Abstract

Over the last few years academics and practitioners alike have been analyzing the relative performance of different types of mutual funds, with a particular emphasis on comparing the performance of conventional versus socially responsible investment (SRI). The methods and samples used, as well as the results obtained are diverse, but they generally point to the difficulties found by SRI to yield an equivalent performance as that of its conventional peers—given the investment constraints they face. In this study we focus on the comparative performance of a sample of SRI funds, which we decompose mainly into Environmental, Social and Governance (ESG), environmental, and religious, and which invest in three different geographical areas. For these funds we measure not only performance but, more importantly, their persistence—i.e., whether the best (worst) funds are past winners (losers) as well. This twofold objective turns out to be essential to uncover some trends in the industry. Specifically, whereas ESG, in general, outperform their environmental peers, a deeper scrutiny focusing also on performance persistence reveals that this claim should be tempered, since investing in the best past environmental funds yields superior performance than investing in the best past ESG funds. This result, which holds for the two main geographical regions analyzed (Europe and US/Canada), would indicate that the comparison between these two types of funds is more intricate than what we might a priori expect, being particularly relevant to factor in the comparison an evaluation of performance persistence.

Keywords: environmental, ESG, mutual fund, performance, persistence, SRI

JEL Classification: G2, N25, Z12

Communications to: Emili Tortosa-Ausina, Departament d'Economia, Universitat Jaume I, Campus del Riu Sec, 12071 Castelló de la Plana, Spain. Tel.: +34 964387168, fax: +34 964728591, e-mail: `tortosa@uji.es`

1. Introduction

Mutual funds have experienced unprecedented growth over the last two decades worldwide. The parallel development of financial systems, markets, and institutions has followed an extraordinary pattern of continuous growth. Investors and investment managers are aware of the opportunities provided by Socially Responsible Investment (SRI) or sustainable investing. This specific investment typology (or practice) is presented as a long-term competitive financial returns seeker that integrates ethics or a commitment to social concerns into business. Thus, the ethical strategy focus is embedded into organizations and is associated with social, ecological, religious, ethical and corporate governance; all these components make up what is widely-known today as ESG (Environmental, Social and Governance) criteria.

Socially Responsible (SR) mutual funds that are aligned with this philosophy have become very popular due to several features. First, they are a very attractive alternative to investing characterized by a well-balanced return-liquidity; second, they are a sophisticated option that adds value to the investment by following a non-purely financial orientation as other parameters are also considered (such as reputation, good corporate governance practice and environmental responsibility, among others). From a long-term perspective, it appears that the future investment scenario will be aligned with the progressive integration of ethical values into decision-making investment, and recent literature forecasts that this scenario will have a huge impact. Koellner et al. (2005) propose the basic principles and methods on which a sustainability rating for mutual funds could be based; they state that a variety of impacts—economic, social and ecological—should be considered in order to embed sustainability into investment processes. Moreover, Helminen (2000) introduces the concept of "eco-efficiency" linked to sustainable development as the integration of ecological, economic and ethical dimensions at the firm level; indeed, ethics have also been integrated into mainstream business as a competitive strategy. In this sense, some studies highlight the impact of integrating ethics into business strategy (see Key and Popkin, 1998; Behnam and Rasche, 2009; Singer, 2010; Woiceshyn, 2011, among others).[1]

---

[1] According to the Global Sustainable Investment Association (GSIA) report, the global sustainable investment market has experienced significant growth, rising to $21.4 trillion at the start of 2014 from $13.3 trillion at

From the financial perspective, SR mutual funds are investment vehicle that are easy for investors to access; moreover, its returns are comparable to those of conventional funds. Indeed, numerous studies have analyzed the financial performance of these portfolios by comparing them to their conventional peers. Although the evidence is mixed, most of the literature concludes that there are no significant differences between SR mutual funds and their conventional counterparts (see Bauer et al., 2005, 2007, among others). On the one hand, some studies argue that SR funds outperform conventional funds (Galema et al., 2008; Kempf and Osthoff, 2007, among others). However, Renneboog et al.'s (2008) exhaustive review finds that SRI funds underperform their conventional counterparts. Nonetheless, it appears that socially responsible investors are less sensitive to poor performance and the overall implicit benefit to the SRI practice dilutes any negative impact, as postulated by Bollen (2007), Benson and Humphrey (2008) and Renneboog et al. (2011), among others.

In this context, and in contrast to previous literature, our main goal is not to compare SR vs. conventional funds but rather to analyze the performance of SR funds with respect to their ethical strategy focus. In this regard, Morningstar distinguishes the following ethical strategy focuses: multidimensional or ESG focus, environmental focus, religious focus and "undefined" (as residual). Our study attempts to contribute to the literature in several ways. Firstly, we are interested in comparing the performance of the SR fund categories according to ethical strategic focus. With the exception of studies dealing with the assessment of green funds (see, among others Mallett and Michelson, 2010; Climent and Soriano, 2011; Chang et al., 2012) the available evidence on the subject is scant, and is confined to few studies such as Muñoz et al. (2014) or Nofsinger and Varma (2014). Secondly, to avoid any local bias related to the investment geographical area, we build groups of funds and repeat the analysis for each of them. Thirdly, apart from estimating the differences for in the average performance of the different SR funds' categories, we apply a nonparametric approach based on comparing kernel estimates of the densities. As far as we know, this methodology has not been applied to analyze the differences in

the beginning of 2012; in terms of professionally managed assets the percentage rises from 21.5% to 30.2% over this two-year period. The United States has experienced the most notable development, followed by Canada and Europe; these three regions account for 99% of global sustainable investing assets.

performance with regard to the ethical strategy focus of the SR funds. Fourthly, following the recursive portfolio approach by Carhart (1997), we estimate the SR funds' performance persistence. This methodology has been applied commonly to analyze the persistence of conventional funds but not in the case of SR funds. Finally, from the results of these two methodologies, i.e. kernel densities and recursive portfolio analysis, we conclude that the comparatively worse performance of environmental SR funds is driven by the worst funds, but best environmental funds perform the same or better that SR funds which follow other ethical strategies.

The empirical work focuses on equity SR mutual funds around the world for the period from 2000–2013. The sample is made by 1,587 funds. Among them, only 269 funds have data for all the sample period and, therefore, the rest of the funds have either disappeared or born during this period. Therefore, our analysis is free from survivorship bias. We apply a multifactor model to these data in order to estimate abnormal performance. Results show that, in general, performance is not significantly different from zero, although the cases with negative performance outnumber those with positive performance. However, there are differences according to the different investment areas considered.

We also analyze the performance differences according to the funds' ethical strategy focus. Results show that, on average, the environmental funds are the worst performers. This result is robust to the survivorship bias effect, and holds (in general) for the different investment areas around the World considered in the study. A deeper scrutiny, based on density functions estimated via kernel smoothing, indicate these differences have an asymmetrical behavior, since environmental funds' relatively worse performance is driven by the worst funds, whereas the differences for the best funds' performance are negligible.

Actually, this behavior is corroborated by the results of the persistence analysis. According to this analysis, for those SR funds investing in Europe and Canada and the US: (i) a significant and persistent gap between the performance obtained when investing in the worst and best environmental funds; and that (ii) investing in the past (best) environmental funds yields worse (better) performance than for other funds with different ethical strategies. This result would highlight the role that the environmental funds' managers play, which is particularly essential for this type of funds.

Therefore, according to our results, environmental investment is not inefficient *per se*, as previous literature demonstrates since the onset of the recent financial crisis (Sabbaghi, 2010) for two factors: first, governments have modified their environmental politics (subsidies have been cut substantially) and, second, the price of petrol has fallen dramatically (Prior, 2009). Then environmental investment is subject to more constraints and specific risks, and demands more skilled managers. Beyond the skepticism this typology of investments arouses, we conclude that its results could be just as good as those of other SR investments, provided that managers must manage better when handling environmental funds—since we find higher dispersion in fund performance. Our results show few funds displaying very extreme negative performance, which cause slightly lower average performance. The persistence analysis carried out yields the most relevant findings, since we observe that a strategy of investing in the best past environmental funds leads to better performance; this effect is greater than in other SRI types. Thus, a successful strategy of investing in environmental funds could lead to a positive and persistent performance.

The remainder of the paper is structured as follows: Section 2 provides details on the methodologies used to measure fund performance and persistence. Section 3 describes the data used in the study, while Section 4 reports the results. Finally, Section 5 presents some concluding remarks.

2. Methodology

2.1. Performance measurement

This section is devoted to a succint description of the measurement of mutual funds' performance and their persistence, for which we consider a linear model which adjusts each fund's returns for a set of given risk factors. This is a very popular approach in the literature, based on one of its seminal contributions (Jensen, 1968), although a successive number of contributions in the field have proposed some variations of it, in order to include more factors, among which two of the most outstanding contributions are those by Fama and

French (1993) and the momentum factor proposed by Carhart (1997).[2]

Given that we aim at evaluating funds with a specific investment strategy as well as a broad geographical scope for investment, we have finally adopted a linear model with multiple benchmarks such as the following one:

$$r_{p,t} = \alpha_p + \beta_{p,w} r_{w,t} + \beta_{p,s} r_{s,t} + \beta_{p,m} r_{m,t} + \varepsilon_{p,t} \tag{1}$$

In the above expression, $r_{p,t}$ is the excess return over the risk-free asset of the assessed fund, the constant in the model, α_p, measures the fund's abnormal performance, and the risk factors are the excess returns corresponding to: (i) a global benchmark, which represents investment in different markets around the world ($r_{w,t}$); (ii) a specific benchmark, representing investment constrained by SRI fundamentals ($r_{s,t}$); and (iii) a specific benchmark for investment in the emerging markets, taking into account the characteristics of some of the funds being evaluated ($r_{m,t}$).

2.2. Performance persistence measurement

In order to measure performance persistence we will consider the so-called recursive portfolio approach (Carhart, 1997), which is probably the most popular approach in the literature to measure mutual fund performance persistence. Some successful variations of this approach have been proposed by Busse et al. (2010) and, most notably, Fama and French (2010).

Carhart (1997) proposes to evaluate persistence by analyzing the abnormal performance of portfolios that invest according to mutual funds' past performance. Persistence is then calculated for two semiannual (half-yearly) symmetrical windows. The first of these windows estimates past performance, whereas the second one *rebalances* the recursive portfolio. In addition, when estimating performance of a non-overlapping rolling window we will be allowing the model parameters to vary over time. This is an interesting feature, due to the substantial amount of literature on time-varying systematic risk.

---

[2]Some other contributions such as those by Sharpe (1992) and Elton et al. (1993) have also proposed linear models. Their variants include the returns of the benchmarks represented by the asset classes in which the evaluated funds invest as factors.

We apply the recursive portfolio approach by means of the following <u>algorithm</u>:

1. In the first step the performance of the SR funds is estimated by means of Equation (1) for the first sample period.

2. SR funds are ranked in increasing order according to the performance achieved in the period in order to form quintiles within each group of funds—according to investment area and ethical strategy focus.

3. At the start of the following period we form five equally weighted portfolios according to quintile past performance, $Q_1, \ldots, Q_5$, where the first portfolio (Q_1) invests in the worst performing funds in the previous period and, conversely, the last portfolio (Q_5) invests in the previous period's best funds. The same investment strategy is followed for the other deciles.

4. This process is repeated at the beginning of each period (i.e., we would restart in step 1). Therefore, each portfolio would represent a *dynamic* investment strategy that *rebalances* selected funds according to their previous performance.

5. We therefore compute the daily return of the five portfolios and then estimate the abnormal performance of the portfolio, also using model (1).

Our hypothesis is therefore that, should persistence in mutual fund performance exist, a portfolio with an investment strategy based on a poor (good) past performance will show a negative (positive) abnormal performance.

3. Data description

The data used in this study are from equity mutual funds with SR conditioned investment policies. Specifically, we analyze 1,587 SR equity mutual funds in the World according to Morningstar SRI categories. This database provides information on daily returns for these funds. The sample period analyzed spans from January 1, 2000 to June 30, 2013. The funds return is the result of passive and active management. The return linked to active management is the value added by managers over the return from passive management.

The return of passive management hinges critically on the funds investment objectives. For this reason mutual funds are grouped by the geographical area of their investments. Thus Europe OE refers to the Europe area, US OE Canada refers to US and Canada and Other refers to all other investment areas. We report some characteristics of the sample funds in Tables 1 through 4.

The evolution of the number of funds from 2000 to 2013 is reported in Table 1. The number of funds varies over the sample period because some funds disappear and new ones are incorporated. The net balance of all SR funds since inception shows that the number of funds generally increases. The annual increase in the number of funds was positive over the 2000–2013 period, with an annual average of 6.72%. However the impact of the crisis has been such that the number of funds has virtually stood still since 2008 (1,134 in 2008 vs. 1,097 in 2013). In fact, the average of the inter-annual change of the number of funds was negative, –0.65%, during the period 2008–2013.

Since both surviving and non-surviving mutual funds are considered in the study, there is no survivorship bias in the results for performance and persistence. Rohleder et al. (2011) reviewed this bias in relation to mutual fund performance, including all existing funds during the sample period in the analysis. However, avoiding survivorship bias may also lead to other problems that are not addressed in the literature. Specifically, the inclusion of funds with limited data may reduce the robustness of the analysis. In this regard, Rohleder et al. (2011) pointed out how individual fund performance measurement requires a return history of a certain length to generate reliable regression estimates. In addition, comparing funds with different periods of existence could add some bias if the mutual funds performance is correlated with the period for which data are available—for instance, the performance could differ depending on the economic cycle or for bull and bear markets (Kacperczyk et al., 2009; Kosowski, 2011; Sun et al., 2013). In order to avoid this type of problem, our empirical strategy will take into account the following: we present performance and persistence results for both groups, i.e., all mutual funds and survivor funds only.

Table 2 reports information on the fund sub-types considered in the study according to their survivorship characteristics. We create five categories of mutual funds. First, we split

the funds into two sets, survivors (S) and non-survivors (NS). The difference between the two sets is that the first (second) includes all the mutual funds with (without) a net asset value as of June 30th 2013. Considering the number of semesters for which data for mutual funds are available, we distinguish three subgroups for S mutual funds: $S = 27$, when the fund shows data for the whole sample period, i.e., 27 semesters; $S \geq 4$ for survivor mutual funds with at least four semesters of data, and $S < 4$ for survivors less than four semesters old. Also, considering semesters with data, non-survivor mutual funds are collated into two groups: $NS \geq 4$ comprises mutual funds with at least four semesters of data, and $NS < 4$, the rest.

As indicated in Table 2, only 16.95% (269/1,587) of the SR funds have complete data over sample period. The largest group is that denoted by $S \geq 4$, specifically 43.79% (695/1,587) for the funds. Table 2 also shows the survival characteristics of the mutual fund sample according to their ethical issue strategy focus as provided by the Morningstar mutual fund database. Specifically, we consider four groups: the first, *ESG*, includes funds that define their ethical strategy as environmental, social and governance jointly; the second, *Environmental*, comprises mutual funds that focusing their ethical strategy in environmental issues; the third one, *Religious* includes those funds with investment objectives according to a religious profile, and finally, fourth, *Undefined*, covers funds that do not focus on specific ethical strategy.

Table 3 reports some summary statistics corresponding to the mutual funds' sample. Regarding geographical area of investment, most funds focus on Europe, the US and Canada; specifically, 85.76% (1,361/1,587). A mean-variance analysis reveals that *Europe OE* SR funds perform better than *US OE and Canada funds* since, on average, they show a higher net return and lower risk. It is also notable that *Europe OE* funds are generally bigger than *USA OE and Canada* funds. Furthermore, funds investing in other geographical areas are those with higher average risk and return, and are roughly 3.5 and 6.3 times the size of European and North-American funds. These descriptive statistics give an idea of both the segmentation and disparate evolution of the SR fund industry in different locations.

As mentioned in the methodology section, to evaluate mutual fund performance we apply the linear model (1) where funds' excess returns are adjusted to the excess returns

8

corresponding to the types of assets in which the funds invest. Note that because the analyzed funds invest in very different geographical areas, the first benchmark is a global index representing global investments, specifically the FTSE World. We selected the DJ Sustain World to represent investments under SR conditions. A number of funds invest in less mature and developed markets, so we also included the FTSE index for emerging markets. For these indices we calculate daily returns from information provided by Morningstar. We compute the excess return using the one-month Treasury bill rate as the risk-free asset, obtained from Ken French's website.

Table 4 reports the indexes used in expression (1). We also show some summary statistics for these indexes. For the analyzed sample period, the most globalized indexes (for which financial markets in more advanced economies weigh more) show a more conservative mix of average return and risk than those for emerging markets (FTSE Emerging) for which there is higher risk and average return.

4. Results

4.1. SRI mutual fund performance performance

In Table 5 we report results on funds' performance, not only for all funds (last row of the table), and also split for Europe OE, US OE and Canada, and "other". Within each of these three categories we also consider results for ESG, environmental, religious and "undefined" fund sub-categories. The table is also split vertically in two panels, the left-hand panel indicating the percentage of funds in each category and sub-category for which results were either positive or negative (and whether these results were significant or not), and the right-hand panel reporting the annualized performance, considering both unweighted and weighted (by fund size and fund life) averages.

Results indicate that, on average, and during the period of analysis, the performance has been *negative* (–0.54%). However, there is a remarkable size effect, since weighting by funds' size leads to a much improved average performance (1.99%), i.e., large funds outperform small funds. Moreover, this effect is found across all sub-categories. Underlying the overall unweighted negative performance (–0.54%) we find that, as indicated in the four central

columns of Table 5, the percentage of funds with negative performance was slightly higher than that corresponding to funds with positive performance (55.07% vs. 44.93%). However, the percentage of funds for which results were significant was very low in both cases— 6.93% and 3.47%, respectively.

Results differ depending on the geographical investment area. On average, they are particularly bad for US and Canada (–1.44%), whereas for Europe they were only slightly negative (–0.06%). In contrast, for the rest of the world ('other'), average performance was positive (0.74%). As expected, and as shown in the central columns of Table 5, the percentage of funds showing positive performance is lower for funds investing in US and Canada (61.99% vs. 38.01%), whereas for those investing in 'other' areas is the other way round (40.27% vs. 59.73%). However, in this case the percentage of funds with (either positive or negative) significant performance is particularly low (1.77%).

As indicated above, the information included in Table 5 is much richer than the average results in the bottom row, since we split the sample of funds according to different criteria, including ESG, environmental, religious, as well as "undefined". The analysis is presented in the following subsections.

4.2. Performance and ethical strategy focus

The specific comparisons between funds' categories, regardless of the geographical investment areas, are reported in Table 6 which shows that comparisons between the different fund categories are intricate. A comparison of ESG funds and their environmental counterparts reveals that the former outperform the latter, and differences are statistically significant at the usual levels (1% or 5%), regardless of the geographical investment area. Specifically, the gap between the two fund categories is 5.92%, 4.91% and 2.55% for funds investing in Europe, US and Canada, and 'other', respectively. When the comparison is between ESG funds and the 'undefined' category, again, and regardless of the geographical investment area, ESG performance is higher, although in this case significance is only found for Europe OE (p-value=0.000). In contrast, the comparative performance analysis of ESG vs. religious funds indicates the former underperform the latter, although, in this case, differences are not significant—they are *almost* significant (5% level) for US and Canada.

Environmental funds also perform worse than their religious counterparts. As shown in Table 6 differences are remarkable for the US and Canada, and for 'other' (–5.75% and –5.53%), although for the latter the differences are only significant at the 10% level. Indeed if we look at the third panel only, corresponding to funds investing in 'other' areas outside Europe, US and Canada, the differences are only significant (at the 5% significance level) when comparing ESG vs. environmental funds.

We also report the densities, estimated via kernel smoothing methods, for the results obtained (Figure 1). The three subfigures display the densities corresponding to the performance of Europe OE funds (Figure 1a), US OE and Canada (Figure 1b) and 'Other' (Figure 1c). These figures complement the results reported in the preceding paragraphs, since we focus not only on the *average* performance but on the entire distribution of performance, which facilitates a deeper understanding of the existing trends.

Figure 1 provides a clearer view of the tendencies. Performance varies greatly depending on the investment area as well as the type of fund, as commented on in the preceding paragraphs. However, the figure also reveals some hitherto undetected features. Of particular interest is the higher dispersion found for funds investing in 'other' areas (Figure 1c), evidenced in the way probability mass is more spread along the OX axis, regardless of the type of fund—ESG, environmental, undefined, or religious. In contrast, for funds investing in Europe, US and Canada (Figures 1a and 1b) the performance of the funds in each category is much more similar, particularly for ESG funds and, to a lesser extent, undefined and religious categories, as shown by the much tighter densities. However, the performance of environmental funds is worse, with the majority of the probability mass concentrated below zero, and several bumps between –0.4 and –0.1 (in both Figures 1a and 1b.

Some specific environmental funds perform particularly badly in Europe, as shown by the lower tail stretching to –0.6 for Europe OE funds (Figure 1a), and also in US OE and Canada funds (Figure 1b) and 'other' (Figure 1c), where the lower tail stretches below –0.3. However, at the other extreme, the best environmental funds are also as good as the best ESG funds, as shown by the relatively long tails corresponding to the solid and dashed lines in each of the three subfigures. This result highlights the asymmetry in the

performance differences according to ethical strategy focus—i.e., the main driver of the differences found is the behavior of the worst funds. The trend for religious funds (dotted-dashed line in Figure 1b) is especially noteworthy: its behavior is more moderate, with the majority of funds' performance lying in the $(-0.1, 0.1)$ range.

Table 7 reports analogous results to Table 6 for survivor funds only—those surviving for at least four semesters. The survivor-only counterparts to the densities shown in Figure 1 are reported in Figure 2. Therefore, the tables and the figures give the analysis additional robustness. The total number of surviving funds is 964, representing 61% of total funds in our sample. The comparison of results between all funds (Table 6, Figure 1) and nonsurviving funds only (Table 7, Figure 2) indicates that, in general, the tendencies are maintained, since the sign of the difference in annualized performance is virtually the same in most instances—all of them except ESG vs. undefined in Europe OE, and environmental vs. undefined in US OE and Canada, for which the sign is reversed. However, the results for these two particular comparisons are not significant. Therefore, it seems that the results achieved in Table 6 and Figure 1 are robust in the sense that they have not been driven by the performance of non-surviving funds.

4.3. Performance persistence and ethical strategy focus

We will now analyze whether funds' performance *persists* over time. As explained in the methodology section, we applied the recursive portfolio approach (Carhart, 1997). Then, we form portfolios with investment strategies based on past performance. Should performance exist, we expect that the quintile-portfolio that invests in the worst (best) funds in the past obtains a worst (best) performance. Results are shown in Figure 3 and Table 8.

Figure 3 shows, for each ethical strategy focus and investment area, the performance of the quintile-portfolios. Should persistence exist then we will expect lines with positive slopes. In general, this positive slope exists, especially for the environmental funds in Europe and US and Canada areas. More specifically, Table 8 reports the performance of the extreme quintile-portfolios (Q1 and Q5), and the magnitude and significance of the difference between both of them. For all the cases being analyzed the difference is positive, implying that investing in the best past funds yields better performance the worst past

funds. However, differences are only significant for environmental funds in the case of Europe (7.82%) and US and Canada (6.42%). Therefore, we can conclude that, in these cases, the value added by fund managers persists over time.

Results reported in Figure 3 and Table 8 have also an interesting interpretation when considering comparisons among SR funds based on their ethical strategy focus. For instance, in the previous section, results reported in Table 6 shown that the environmental funds performed comparatively worse, but Figure 1 shown that this difference was particularly relevant for the worst funds. In the same vein, comparing European (Figure 3a) and US and Canada (Figure 3b) funds is complex, since we observe that ESG funds are not always better than their environmental peers. When we invested in those funds with the worst past performance, then ESG funds are better than their environmental peers. However, the opposite occurs when comparing the funds with the best past performance—i.e., environmental funds are better than ESG funds. This could be suggesting that the problem is not related to investing in either environmental or ESG funds but, rather, how managers actually perform. It could be the case that a particular fund with an environmental focus faces more constraints than an ESG fund, which has fewer constraints to invest in SR funds lying within the range of ESG possible investment alternatives. In contrast, investing in environmental funds is more restrictive and demands more skilled managers.

Therefore, we may infer that an investor interested in environmental funds should be more careful when selecting which funds to invest in, since their generally tighter constraints imply that managers' skills play a more essential role when dealing with these constraints—and provide their management with more value added. In sum, the effect of the ethical strategy of the SR fund seems to be more strongly related to the *management* of the fund rather than to the *type of investment*, or the investment constraints. This clearly gives a new perspective to the results commented on in the preceding paragraphs, i.e., that environmental funds yield worse results than their ESG counterparts—at least on average.

In contrast, whereas these trends are shared by European (Figure 3a) and US and Canada funds (Figure 3b), results are not mimicked for funds investing in 'other' regions (Figure 3c). In this case, the gap between the lines representing the performance of ESG and environmental funds remains the same regardless of the quintile considered. Neither

environmental nor ESG funds show remarkable persistence (i.e., their corresponding lines do not show a clear upward tendency), and the trend is similar for both types of funds. In fact, the third panel in Table 8 reports information for funds investing in 'other' regions and shows that results are what we might *a priori* expect given the analysis of Figure 3c—i.e., low or no performance persistence.

Results on persistence for survivor funds are reported in Figure 4 and the corresponding subfigures, and in Table 9; in general, the tendencies observed are similar to those obtained when all funds were considered in the analysis of persistence. This is particularly apparent in the last column of Table 9, which reveals the only significant differences for the first and fifth quantiles for environmental funds in Europe (8.69%) and US and Canada (10.18%, upper and central panel in Table 9). Given these values are higher than their Table 8 counterparts, it seems that considering non-survivor funds reduced the gap of the results of investing in past worst and best funds. Finally, for those funds investing in 'other' regions the differences between the two quintiles are never significant, regardless of the type of fund.

5. Conclusions

The performance of SR funds has been and continues to be an issue of interest worldwide. The popularity and reputation that these ethically oriented assets have been experiencing for decades brings to academics and investors a wide variety of research and investment opportunities, respectively. For both groups the issue as to the likely underperformance of SRI when compared to their conventional peers has always been at stake, and contributions in this particular field are diverse, being this question far from consensus.

The fact that SR investors are less sensitive to poor past performance (Bollen, 2007; Renneboog et al., 2008, 2011) suggests that social, environmental or ethical issues are prioritized in their investment decisions. This approach looks beyond the economic dimension and the mere pursuit of competitive returns to encompass the investment strategy as non-financial attributes are taken into consideration. This point, coupled with the evidence about its positive impact on societal concerns with no extra charges involved when integrating ethics

or moral values into the investment choices justifies its extraordinary development and relevance within the international investment arena.

Our study has analyzed the performance of a sample of SR funds by using a linear model which integrates multiple risk factors. Funds were grouped in two levels, according to two Morningstar equity categories. First, according to whether they invest in Europe, US and Canada, as well as in a third category that will be labeled as "other". Second, according to the ethical strategy focus—Environmental, Social and Governance (ESG), environmental, religious and not defined. We also examine the performance persistence of SR funds by means of an algorithm based on the recursive portfolio approach, i.e., by analyzing the performance of portfolios that invest according funds past performance

Our results indicate that, even though the number of funds which obtain significant abnormal performance is small, the average performance is negative. However, there exist performance differences according to the investment geographical area and the ethical strategy focus. In the case of funds investing in Europe, US and Canada, the most relevant discrepancy is the relatively worse behavior of environmental funds—particularly with respect to the most populated group, corresponding to ESG funds. However, according to the densities (estimated via kernel smoothing) of performance and, especially, to the persistence analysis, we observe that ESG funds do not always outperform environmental funds.

Actually when it comes to investing in the past worst funds, ESG funds outperform environmental funds, but when investing in the best past funds the opposite holds. This might suggest that investing in environmental funds does not necessarily yield a relatively lower performance but rather this will depend on their managers' skills. Therefore, although an environmentally focused fund faces more stringent constraints with respect to an ESG fund, if their managers are skilled enough (i.e., if they are able to add value) they will be able to deal with these tighter constraints and, ultimately, obtain higher performance. Moreover, we find evidence that this value added by managers persists over time, i.e., that performance persistence actually exists for environmental funds.

It follows, therefore, that an investor in environmental funds should be more careful when picking those funds in which to invest. Given these funds' tighter constraints, the role

of managers is more relevant when it comes to overcome these restrictions, adding more value to their management. Actually, although environmental funds have recently had a very adverse context (fall in oil prices and cuts in subsidies and investments in the green sector), some funds have been able to persistently provide added value to investors. This would imply that the problem might be more related to the managers' value added that to the types of ethical strategy focus. Our findings on performance persistence, therefore, would represent a severe reassessment not only of the first results obtained in this study, according to which ESG funds outperform their environmental peers, but also of results found in previous literature on the performance of green investment.

References

Bauer, R., J. Derwall, J., and Otten, R. (2007). The ethical mutual fund performance debate: New evidence from Canada. *Journal of Business Ethics*, 70:111–124.

Bauer, R., Koedijk, K., and Otten, R. (2005). International evidence on ethical mutual fund performance and investment style. *Journal of Banking & Finance*, 29(7):1751–1767.

Behnam, M. and Rasche, A. (2009). "Are strategists from Mars and ethicists from Venus?"–Strategizing as ethical reflection. *Journal of Business Ethics*, 84(1):79–88.

Benson, K. L. and Humphrey, J. E. (2008). Socially responsible investment funds: Investor reaction to current and past returns. *Journal of Banking & Finance*, 32(9):1850–1859.

Bollen, N. P. B. (2007). Mutual fund attributes and investor behavior. *Journal of Financial and Quantitative Analysis*, 42(03):683–708.

Busse, J. A., Goyal, A., and Wahal, S. (2010). Performance and persistence in institutional investment management. *Journal of Finance*, 65(2):765–790.

Carhart, M. M. (1997). On persistence in mutual fund performance. *Journal of Finance*, 52(1):57–82.

Chang, C. E., Nelson, W. A., and Witte, H. D. (2012). Do green mutual funds perform well? *Management Research Review*, 35(8):693–708.

Climent, F. and Soriano, P. (2011). Green and good? The investment performance of US environmental mutual funds. *Journal of Business Ethics*, 103(2):275–287.

Elton, E. J., Gruber, M. J., Das, S., and Hlavka, M. (1993). Efficiency with costly information: A reinterpretation of evidence from managed portfolios. *Review of Financial Studies*, 6(1):1–22.

Fama, E. F. and French, K. R. (1993). Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics*, 33(1):3–56.

Fama, E. F. and French, K. R. (2010). Luck versus skill in the cross-section of mutual fund returns. *Journal of Finance*, 65(5):1915–1947.

Galema, R., Plantinga, A., and Scholtens, B. (2008). The stocks at stake: Return and risk in socially responsible investment. *Journal of Banking & Finance*, 32(12):2646–2654.

Helminen, R.-R. (2000). Developing tangible measures for eco-efficiency: the case of the Finnish and Swedish pulp and paper industry. *Business Strategy and the Environment*, 9(3):196.

Jensen, M. C. (1968). The performance of mutual funds in the period 1945–1964. *Journal of Finance*, 23:389–416.

Kacperczyk, M., Van Nieuwerburgh, S., and Veldkamp, L. (2009). Rational attention allocation over the business cycle. Working Paper 15450, National Bureau of Economic Research, Cambridge, MA.

Kempf, A. and Osthoff, P. (2007). The effect of socially responsible investing on portfolio performance. *European Financial Management*, 13(5):908–922.

Key, S. and Popkin, S. J. (1998). Integrating ethics into the strategic management process: doing well by doing good. *Management Decision*, 36(5):331–338.

Koellner, T., Weber, O., Fenchel, M., and Scholz, R. (2005). Principles for sustainability rating of investment funds. *Business Strategy and the Environment*, 14(1):54–70.

Kosowski, R. (2011). Do mutual funds perform when it matters most to investors? US mutual fund performance and risk in recessions and expansions. *Quarterly Journal of Finance*, 1(3):607–664.

Mallett, J. and Michelson, S. (2010). Green investing: is it different from socially responsible investing? *International Journal of Business*, 15(4):395–410.

Muñoz, F., Vargas, M., and Marco, I. (2014). Environmental mutual funds: Financial performance and managerial abilities. *Journal of Business Ethics*, 124(4):551–569.

Nofsinger, J. and Varma, A. (2014). Socially responsible funds and market crises. *Journal of Banking & Finance*, 48:180–193.

Prior, A. (2009). The price of green. *The Wall Street Journal*. Retrieved from http://online.wsj.com.

Renneboog, L., Horst, J. T., and Zhang, C. (2008). The price of ethics and stakeholder governance of socially responsible funds. *Journal of Corporate Finance*, 14:302–322.

Renneboog, L., Ter Horst, J., and Zhang, C. (2011). Is ethical money financially smart? Nonfinancial attributes and money flows of socially responsible investment funds. *Journal of Financial Intermediation*, 20(4):562–588.

Rohleder, M., Scholz, H., and Wilkens, M. (2011). Survivorship bias and mutual fund performance: Relevance, significance, and methodical differences. *Review of Finance*, 15(2):441–474.

Sabbaghi, O. (2010). The behavior of green exchange-traded funds. *Managerial Finance*, 37(5):426–441.

Sharpe, W. F. (1992). Asset allocation: management style and performance measurement. *Journal of Portfolio Management*, 18(2):7–19.

Sheather, S. J. and Jones, M. C. (1991). A reliable data-based bandwidth selection method for kernel density estimation. *Journal of the Royal Statistical Society*, Ser.B,53(3):683–690.

Singer, A. E. (2010). Integrating ethics and strategy: A pragmatic approach. *Journal of Business Ethics*, 92(4):479–491.

Sun, Z., Wang, A., and Zheng, L. (2013). Only when the tide goes out: Downside returns and hedge fund performance. Working paper, SSRN. Available at SSRN: http://ssrn.com/abstract=2249033 or http://dx.doi.org/10.2139/ssrn.2249033.

Woiceshyn, J. (2011). A model for ethical decision making in business: Reasoning, intuition, and rational moral principles. *Journal of Business Ethics*, 104(3):311–323.

Table 1: Evolution of the number of SRI funds, 2000–2013

Year	Number of funds				% Change			
	Morningstar equity category				Morningstar equity category			
	Europe OE	US OE Canada	Other	Total	Europe OE	US OE Canada	Other	Total
2000	216	229	40	485	—	—	—	—
2001	255	266	56	577	18.06	16.16	40.00	18.97
2002	285	275	65	625	11.76	3.38	16.07	8.32
2003	308	274	69	651	8.07	–0.36	6.15	4.16
2004	325	286	80	691	5.52	4.38	15.94	6.14
2005	355	314	90	759	9.23	9.79	12.50	9.84
2006	401	345	100	846	12.96	9.87	11.11	11.46
2007	435	438	142	1015	8.48	26.96	42.00	19.98
2008	467	505	162	1134	7.36	15.30	14.08	11.72
2009	469	494	152	1115	0.43	–2.18	–6.17	–1.68
2010	487	497	156	1140	3.84	0.61	2.63	2.24
2011	505	487	150	1142	3.70	–2.01	–3.85	0.18
2012	508	473	138	1119	0.59	–2.87	–8.00	–2.01
2013	499	460	138	1097	–1.77	–2.75	0.00	–1.97
Mean % change 2000–2013					6.79	5.87	10.96	6.72
Mean % change 2000–2008					10.18	10.68	19.73	11.32
Mean % change 2008–2013					1.36	–1.84	–3.08	–0.65

[a] Note, number of funds measured on December 31, except for 2013 which is measured on June 30.

Table 2: Survival characteristics of the mutual funds in the sample

Morningstar equity category	Ethical issue strategy focus	$S = 27$[a]	$S \geq 4$[b]	$S < 4$[c]	$NS \geq 4$[d]	$NS < 4$[e]	Total
Europe OE	ESG[f]	105	174	50	62	17	408
	Environmental	10	97	13	25	20	165
	Religious	—	—	—	—	—	—
	Undefined	15	25	2	53	9	104
	Total category	130	296	65	140	46	677
US OE and Canada	ESG[f]	96	145	27	93	27	388
	Environmental	11	41	6	39	9	106
	Religious	21	55	0	53	7	136
	Undefined	0	10	1	36	7	54
	Total category	128	251	34	221	50	684
Other	ESG[f]	5	86	8	15	2	116
	Environmental	2	34	7	5	2	50
	Religious	2	0	2	0	0	4
	Undefined	2	28	4	22	0	56
	Total category	11	148	21	42	4	226
All funds		269	695	120	403	100	1,587

[a] $S = 27$: total survivor (27 semesters).
[b] $S \geq 4$: mature survivor (it has value for $s27$), with at least four semesters.
[c] $S < 4$: new survivor (it has value for $s27$), with at least four semesters.
[d] $NS \geq 4$: no survivor (no value for $s27$), with at least four semesters.
[e] $NS < 4$: no survivor (no value for $s27$), with at least four semesters.
[f] Environmental, Social and Governance.

Table 3: Mutual fund summary statistics, 2000–2013

Morningstar equity category	Ethical issue strategy focus	Number of funds	Average annual-ized net return	Average annual-ized s.d.	Average size (US$)
Europe OE	ESG[a]	408	7.00%	21.56%	547,792,081.79
	Environmental	165	–0.95%	23.34%	338,801,860.29
	Religious	—	—	—	—
	Undefined	104	1.93%	22.09%	548,919,281.50
	Total category	677	4.28%	22.07%	490,219,918.31
US OE and Canada	ESG[a]	388	4.02%	22.69%	314,873,383.02
	Environmental	106	–0.20%	25.99%	60,271,020.70
	Religious	136	5.14%	22.77%	405,233,332.85
	Undefined	54	0.49%	25.78%	25,803,555.86
	Total category	684	3.31%	23.46%	271,531,577.70
Other	ESG[a]	116	7.61%	23.70%	1,012,118,302.16
	Environmental	50	0.62%	24.97%	2,623,376,916.60
	Religious	4	–0.91%	21.69%	1,129,818,023.00
	Undefined	56	4.61%	25.86%	2,636,819,803.75
	Total category	226	5.17%	24.48%	1,711,002,316.71
All funds		1,587	3.99%	23.02%	577,445,015.27

[a] Environmental, Social and Governance.

Table 4: Summary statistics for the benchmarks

Factors	Average annualized net return	Average annualized s.d.
FTSE World	4.48%	17.69%
DJ Sustain World NR USD	3.11%	19.42%
FTSE Emerging TR USD	9.99%	20.71%

Table 5: Performance

Morningstar equity category	Ethical issue strategy focus	Number of funds	Percentage of total number of funds in group				Annualized performance		
			< 0	p-value≤ 0.05	>0	p-value ≤ 0.05	Mean (un-weighted average)	Weighted average by fund size	Weighted average by fund life
Europe OE	ESG[a]	408	43.38%	3.19%	56.62%	4.41%	1.89%	2.81%	0.72%
	Environmental	165	70.30%	14.55%	29.70%	1.82%	−4.03%	−1.09%	−3.14%
	Religious	—	—	—	—	—	—	—	—
	Undefined	104	63.46%	4.81%	36.54%	2.88%	−1.44%	4.70%	−1.07%
	Total category	677	53.03%	6.20%	46.97%	3.55%	−0.06%	2.24%	−0.27%
US OE and Canada	ESG[a]	388	61.08%	7.73%	38.92%	3.87%	−0.75%	1.07%	−0.12%
	Environmental	106	80.19%	24.53%	19.81%	2.83%	−5.67%	−3.08%	−3.29%
	Religious	136	52.21%	2.94%	47.79%	6.62%	0.08%	0.34%	0.55%
	Undefined	54	57.41%	7.41%	42.59%	0.00%	−1.89%	−1.15%	−1.44%
	Total category	684	61.99%	9.36%	38.01%	3.95%	-1.44%	0.69%	−0.42%
Other	ESG[a]	116	37.07%	0.86%	62.93%	2.59%	1.69%	5.32%	1.86%
	Environmental	50	48.00%	0.00%	52.00%	0.00%	-0.85%	0.54%	−0.20%
	Religious	4	0.00%	0.00%	100.00%	0.00%	4.68%	4.68%	5.99%
	Undefined	56	42.86%	5.36%	57.14%	1.79%	−0.10%	1.29%	−0.40%
	Total category	226	40.27%	1.77%	59.73%	1.77%	0.74%	2.37%	1.11%
All funds		1,587	55.07%	6.93%	44.93%	3.47%	−0.54%	1.99%	−0.16%

[a] Environmental, Social and Governance.

Table 6: Comparative performance according to ethical strategy focus

Morningstar equity category	Difference according ethical strategy focus	Difference in annualized performance	p-value[a]
Europe OE	ESG[b]- Environmental	5.92%	0.000
	ESG[b]- Religious	—	—
	ESG[b]- Undefined	3.33%	0.000
	Environmental - Religious	—	—
	Environmental - Undefined	–2.59%	0.010
	Religious - Undefined	—	—
US OE and Canada	ESG - Environmental	4.91%	0.000
	ESG[b]- Religious	–0.84%	0.053
	ESG[b]- Undefined	1.13%	0.074
	Environmental - Religious	–5.75%	0.000
	Environmental - Undefined	–3.78%	0.001
	Religious - Undefined	1.97%	0.004
Other	ESG - Environmental	2.55%	0.031
	ESG[b]- Religious	–2.99%	0.222
	ESG[b]- Undefined	1.79%	0.053
	Environmental - Religious	–5.53%	0.076
	Environmental - Undefined	–0.75%	0.309
	Religious - Undefined	4.78%	0.112

[a] Tests for significance were run by boostrapping one-sided p-values.
[b] Environmental, Social and Governance.

Table 7: Comparative performance according to ethical strategy focus (only surviving funds)

Morningstar equity category	Difference according to ethical strategy focus	Difference in annualized performance	p-value[a]
Europe OE	ESG[b]- Environmental	4.86%	0.000
	ESG[b]- Religious	—	—
	ESG[b]- Undefined	–0.29%	0.360
	Environmental - Religious	—	—
	Environmental - Undefined	–5.14%	0.000
	Religious - Undefined	—	—
US OE and Canada	ESG[b]- Environmental	3.18%	0.000
	ESG[b]- Religious	–0.25%	0.287
	ESG[b]- Undefined	5.05%	0.000
	Environmental - Religious	–3.43%	0.000
	Environmental - Undefined	1.87%	0.264
	Religious - Undefined	5.30%	0.000
Other	ESG[b]- Environmental	1.15%	0.129
	ESG[b]- Religious	–3.67%	0.160
	ESG[b]- Undefined	0.72%	0.272
	Environmental - Religious	–4.82%	0.091
	Environmental - Undefined	–0.42%	0.384
	Religious - Undefined	4.40%	0.113

[a] Tests for significance were run by boostrapping one-sided p-values.
[b] Environmental, Social and Governance.

Table 8: Performance persistence

Morningstar equity category	Ethical issue strategy focus	Performance Q1 (%)	Performance Q5 (%)	Difference Q5 − Q1 (%)	p-value[a]
Europe OE	ESG[b]	−1.58	0.87	2.45	0.163
	Environmental	−5.86	1.96	7.82	0.008
	Religious	—	—	—	—
	Undefined	−0.10	0.72	0.83	0.749
US OE and Canada	ESG[b]	−0.09	0.80	0.89	0.570
	Environmental	−4.30	2.12	6.42	0.007
	Religious	−1.03	0.80	1.83	0.413
	Undefined	−3.89	−0.65	3.23	0.522
Other	ESG[b]	−1.98	3.29	5.27	0.250
	Environmental	−5.81	−3.34	2.47	0.511
	Religious	—	—	—	—
	Undefined	−3.26	−0.92	2.34	0.811

[a] Tests for significance were run by boostrapping one-sided p-values.
[b] ESG stands for Environmental, Social and Governance.

Table 9: Performance persistence, survivors

Morningstar equity category	Ethical issue strategy focus	Performance Q1 (%)	Performance Q5 (%)	Difference Q5 − Q1 (%)	p-value[a]
Europe OE	ESG[b]	−1.37	1.32	2.70	0.130
	Environmental	−5.93	2.76	8.69	0.007
	Religious	—	—	—	—
	Undefined	0.95	3.77	2.82	0.389
US OE and Canada	ESG[b]	0.59	1.68	1.09	0.473
	Environmental	−5.50	4.68	10.18	0.004
	Religious	−0.02	1.40	1.42	0.405
	Undefined	−2.93	−5.53	−2.61	0.369
Other	ESG[b]	−0.47	3.35	3.82	0.275
	Environmental	−5.99	−3.06	2.93	0.434
	Religious	—	—	—	—
	Undefined	−0.03	−5.22	−5.19	0.541

[a] ESG stands for Environmental, Social and Governance.
[b] Environmental, Social and Governance.

28

Figure 1: Performance densities, all funds
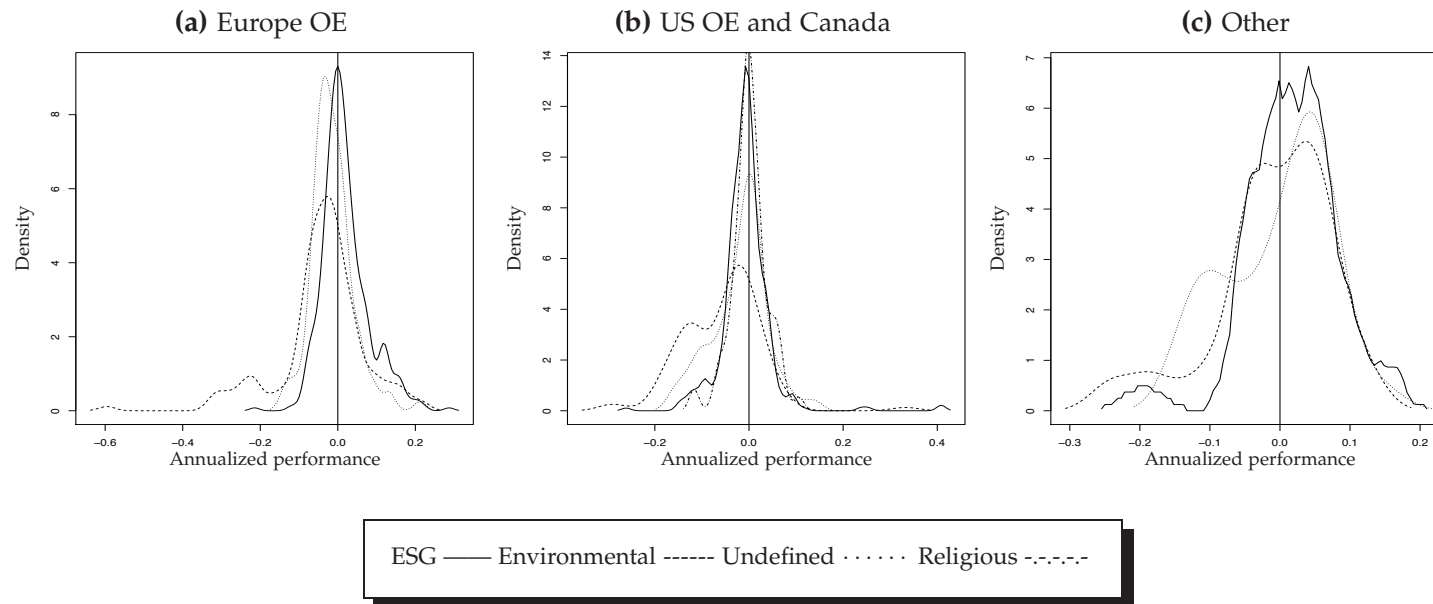
(a) Europe OE   **(b)** US OE and Canada   **(c)** Other

ESG —— Environmental ------ Undefined · · · · · · Religious -.-.-.-

Notes: All figures contain densities estimated using kernel density estimation for the three selected funds. We chose a Gaussian kernel, and the bandwidths were implemented using the plug-in methods of Sheather and Jones (1991). ESG: Environmental, Social and Governance.

Figure 2: Performance densities, survivor funds only
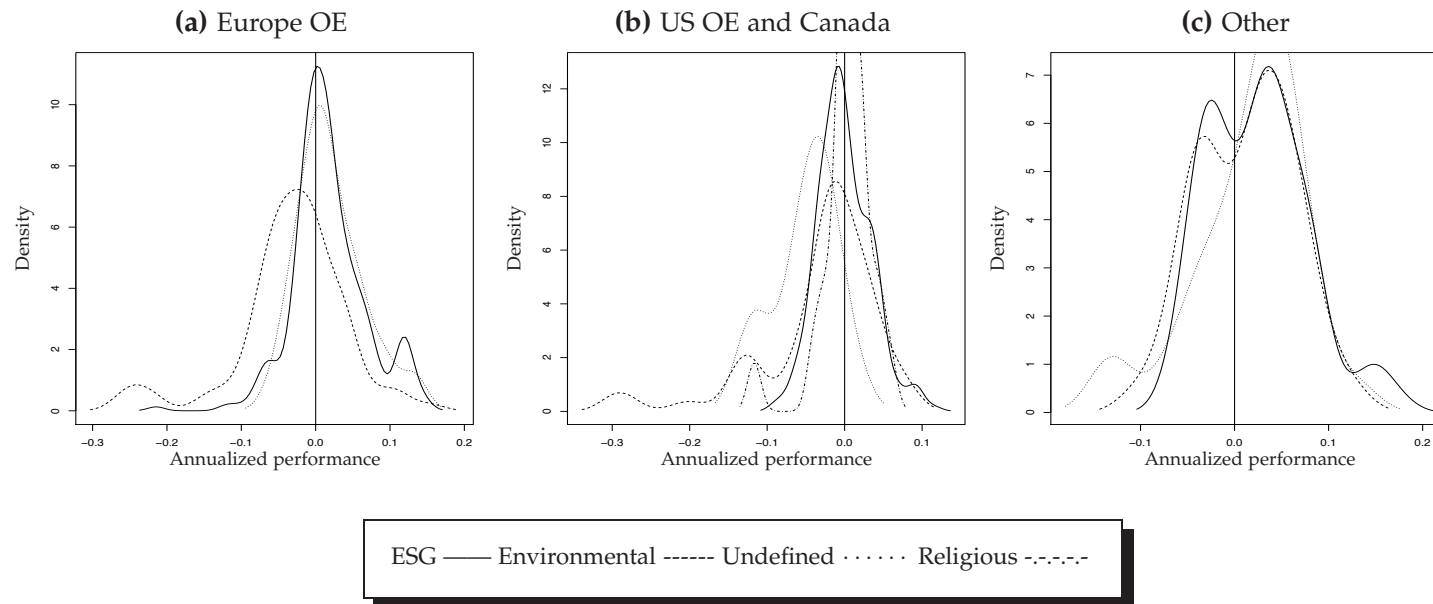
(a) Europe OE

(b) US OE and Canada

(c) Other

ESG —— Environmental ------ Undefined · · · · · · Religious -.-.-.-

Notes: All figures contain densities estimated using kernel density estimation for the three selected funds. We chose a Gaussian kernel, and the bandwidths were implemented using the plug-in methods of Sheather and Jones (1991). ESG: Environmental, Social and Governance.

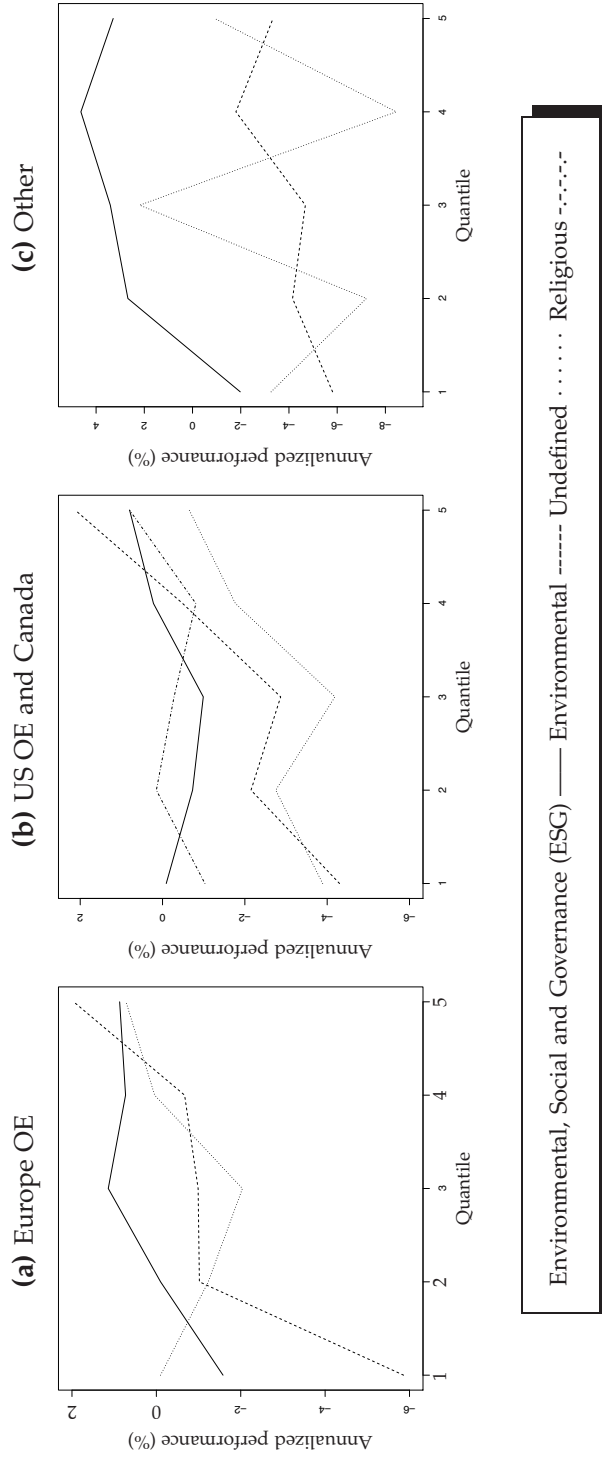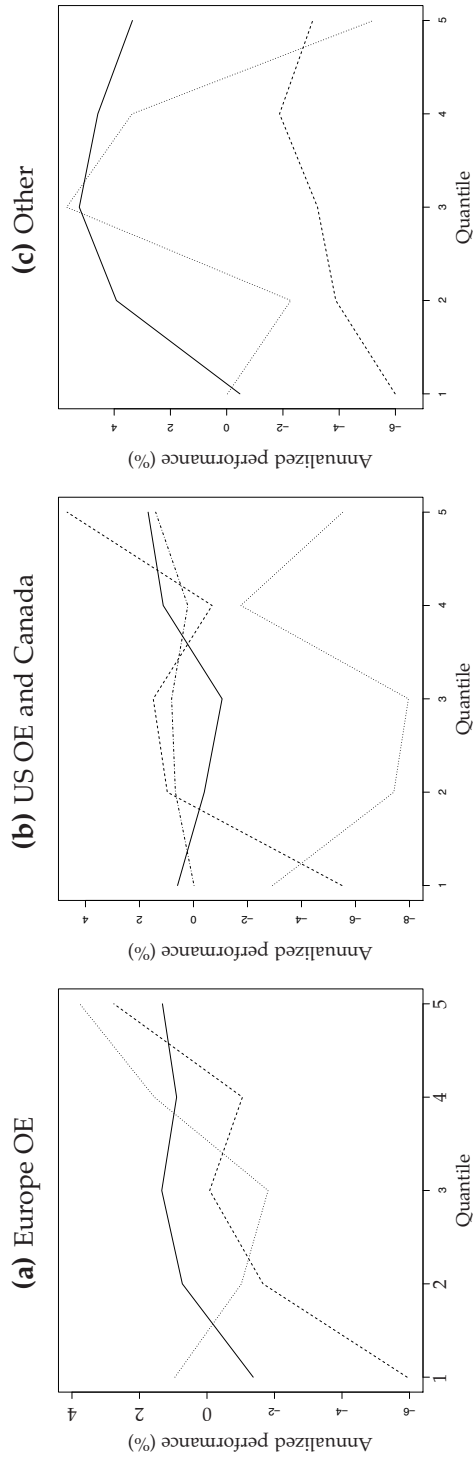**Figure 3:** Performance persistence, all funds

Figure 4: Performance persistence, survivor funds only

(a) Europe OE

(b) US OE and Canada

(c) Other

Environmental, Social and Governance (ESG) —— Environmental ----- Undefined ······ Religious -·-·-·-

32