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Do Social Responsibility Screens Really Matter when Assessing Mutual Fund Performance

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Do Social Responsibility Screens Matter when Assessing Mutual Fund Performance?

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Abstract

This paper questions the contribution that socially responsible (SR) screening makes to mutual fund performance. We propose a new decomposition of the variability of SR mutual fund returns allowing to isolate the contribution of SR screening and compare it with the other traditional sources of performance. Our results, based on a sample of SR equity mutual funds show that SR screening does contribute to the variability of mutual fund performance, alongside asset allocation decisions and active management. This contribution is on average between 4% and 10%, roughly two times lower than that made by active portfolio choices.

Keywords: Active Management, Asset Allocation, Mutual Funds, Performance Attribution, Socially Responsible Investment

JEL classification: G11, G23, G24

1. Introduction

Socially responsible (SR) mutual funds have grown rapidly worldwide in just over a decade. They have become a major market for the asset management industry, representing in the US more than USD 8 trillion under management in 2016 (Social Investment Forum, 2016 Report). Our paper addresses some important research issues that are not yet fully understood. What does SR screening contribute to SR mutual fund performance? How big are these contributions compared with traditional sources of performance, i.e., market movements, asset allocation choices and active management?

In this paper, we propose a new methodology that relies on decomposing mutual fund performance to isolate the contribution of SR screening and compare it with alternative sources of performances. Following the seminal work of Brinson et al. (1986), and in line with Xiong et al. (2010) and Aglietta et al. (2012), we decompose the total return of SR mutual funds into three components, namely market return, asset allocation policy return in excess of the market, and the return from active portfolio management. However, the novelty of our approach consists in adding a fourth component that measures the contribution of SR screening to the funds' return variability and disentangles it effectively from the effect of the other sources of performance.

The approach used in this paper contrasts with previous studies investigating SR funds' performances, which compare the average performance of a sample of SR funds with a matched sample of conventional peers or to a benchmark index (Hamilton et al., 1993; Statman, 2000; Bauer et al., 2005; Kreander et al., 2005; Gil-Bazo et al., 2010; Renneboog et al., 2011 among others). These studies have concluded that the difference between the average performance of conventional and SR mutual fund performances is both small and

hardly significant.[i] But the fact that SR funds' total performances are on average statistically indistinguishable from those of regular funds does not mean that the contribution of SR screening is necessarily irrelevant in explaining the variability of returns. There are two reasons for this. First, average performances may hide considerable time-series and cross-sectional dispersions in SR funds' returns. These funds cater to various SR investor motives (Derwall et al., 2011) and display heterogeneous performances (Geczy et al., 2005). Also, SR screening may be a source of performance in some situations (for example during financial crises; Nofsinger and Varma, 2014) but detrimental in others. Second, SR screening may often result in under- or overweighting some countries, industries or styles (Benson et al., 2006) and thus lead to indirect asset allocation choices that should be disentangled in the performance analysis. For example, stocks with high aggregate SR scores tend to be large growth stocks concentrated in certain industries (Statman and Glushkov, 2009). Capelle-Blancard and Monjon (2014) have shown that SR screens do not have the same impact if they induce a sector reallocation or are sector-neutral.[ii] When assessing performance variability, therefore, it is particularly important to disentangle the contributions made by SR screening and by other sources. Most studies assume that the pairing approach, used to compare the returns of SR funds and conventional funds, controls for different performance-affecting characteristics such as the size, style and age of funds, investment area, and managerial skills. Several studies (e.g. Bauer et al., 2005, 2006) compare Carhart's four-factor alpha of SR funds with that of conventional funds. Alpha comparisons account for the funds' differences in style exposures, but not in country or industry exposures. Moreover, alpha aggregates both the funds' SR screening and the active management contributions. Finally, a handful of papers attempt to single out the specific effect of SR screens on funds' performance from the effect of active management by analyzing the impact of artificial SR

constraints imposed on portfolios (Geczy et al., 2005; Stenström and Thorell, 2007). While providing interesting insights, the constraints that are tested may differ from those that SR funds' managers use in practice. This approach also leaves open the possibility that artificial SR portfolios have a different sector or style exposure than their conventional counterparts.

Our paper aims to contribute to this area. We suggest using a fourth component in the classical decomposition of SR funds' returns and we quantify the effective contribution of SR screens, in excess of traditional performance sources, to a sample of US and international equity funds. Hence, we intend to provide a simple measure of SR screening contribution, which should be useful to portfolio and risk managers.

2. Data

Our dataset is composed of two portfolio peer groups of SR mutual funds: 54 U.S. equity funds and 230 global equity funds from October 2004 to August 2015. Our data come from Bloomberg and consist of the total monthly returns (net of fees) of mutual funds classified as "socially responsible" and "ESG".[iii] We collected data for both active and inactive/dead funds over our sample period, thus removing survivorship bias. Following Statman (2000) and Climent and Soriano (2011), among others, we removed duplicate share classes that are created for regulatory and accounting reasons but are virtually identical to one another, and we retained the class fund with the most assets.

Not all of the funds in our database provide information about the strategic benchmark that determines their policy allocation. Moreover, fund managers might cite a benchmark that is not strictly the one they apply (Sensoy, 2009). To determine SR and conventional benchmarks for the funds, we perform a return-based style analysis (Sharpe, 1992; Ibbotson

and Kaplan, 2000; Vardharaj and Fabozzi, 2007).[iv] This methodology allows us to identify the conventional and SR style exposures that best characterize the performances of SR funds.

For global funds, in line with Xiong et al. (2010), who also worked on international mutual funds, we use five regional conventional and SR benchmarks corresponding to five potential geographical exposures of the funds: North America, Eurozone, U.K, Japan and World ex U.S. The five conventional benchmarks are the FTSE North America, the Euro STOXX, the FTSE ALL Share, the FTSE Japan and the FTSE ALL World ex U.S. The SR benchmarks include the Dow Jones Index North America ex ALL (excluding alcohol, tobacco, gambling and firearms), the Dow Jones Index Eurozone ex ALL, the FTSE4Good UK Index, the FTSE4Good Japan Index and the Dow Jones Index World ex U.S. ex ALL. Our chosen regional SR indexes are well-known in the field (Curran and Moran, 2006; Ziegler and Schröder, 2010) and have the longest available history. DJSI indexes (World ex U.S., North America and Eurozone) practice a best-in-class approach.[v] The FTSE4Good indexes (U.K and Japan) promote positive environmental, social and human rights criteria.[vi] In addition, all indexes apply negative screening criteria to companies involved in "sin" activities, such as alcohol, gambling, tobacco, firearms, and nuclear energy. A robustness check using several alternative SR indexes, whether focused on other geographical areas or based on different screening practices, did not significantly alter our results.[vii]

For U.S. equity funds, we conduct two types of analysis. The first uses industry factors and the second is based on style factors (size/value). Statman and Glushkov (2009) show that industry and size are important factors in the SR mutual fund industry because stocks with high aggregate SR scores tend to be larger growth stocks concentrated in certain industries. To the best of our knowledge, SR industry and style benchmarks have not yet been

established, so we constructed these industry and style benchmarks by applying SR screens to conventional indexes.[viii]

3. Methodology

The total return of each SR fund can be decomposed into four components: (1) market return, (2) return from the conventional asset allocation policy (its deviation from the market), (3) return from SR screening (the difference between SR and conventional-policy returns) and (4) return from active portfolio management (funds' ability to tactically overweight or underweight regions, sectors or stocks relative to the asset allocation policy).

$$R_{it} = M_t + (CP_{it} - M_t) + (SRP_{it} - CP_{it}) + (R_{it} - SRP_{it}) \quad (1)$$

with R_{it} fund i's total return at date *t*, M_t the market return, CP_{it} the return of the conventional asset allocation policy, and SRP_{it} the return of the SR asset allocation policy.

The definition of market return is far from obvious, so we use different measures for market movements to cross-check the robustness of our results. For the SR equity funds investing in the U.S., we consider two alternative measures: (1) the return of the MSCI U.S. Index,[ix] and (2) the equally weighted average return of all the SR U.S. equity funds in our sample (Xiong et al., 2010). For the SR funds investing globally, we also use two alternative measures: (1) the market-capitalization-weighted average return of our five conventional, geographical stock market indexes and (2) the equally weighted average return of all the SR international equity funds in our sample.

The conventional asset allocation policy return of a fund i at date t, i.e. the portfolio performance that the fund manager would have achieved without SR screening, is computed as follows:

$$CP_{it} = b_{C1,i}F_{C1,t} + b_{C2,i}F_{C2,t} + ... + b_{Ck,i}F_{Ck,t} \quad (2)$$

where $b_{Cj,i}$ measures fund i's exposure to its conventional benchmark C_j, $j = 1,...,k$, in Sharpe's (1992) style analysis regression, and $F_{Cj,t}$ the benchmark return at date t. To obtain the exposure of each SR fund to conventional benchmarks, we perform several regressions. First, for the international equity funds, we use the five conventional regional benchmarks. Second, for the U.S. equity funds, we use the ten U.S. industry factors and then the six U.S. size/value benchmarks.

To measure the SR allocation policy of each SR fund we replace conventional factors with their corresponding SR benchmarks. Similarly, the SR asset allocation policy of fund i at date t is given by:

$$SRP_{it} = b_{SR1,i}F_{SR1,t} + b_{SR2,i}F_{SR2,t} + ... + b_{SRk,i}F_{SRk,t} \quad (3)$$

where $b_{SRj,i}$ measures fund i's exposure to its SR benchmark SR_j, $j = 1,...,k$, in Sharpe's (1992) style analysis regression, and $F_{SRj,t}$ the benchmark return at date t.

Using a distinct specification for the conventional and SR allocation strategies, along with industry and size/value factors, makes it possible to take into account potentially different exposures of SR funds to conventional and SR benchmarks.

As mentioned previously, while conventional and SR geographical benchmarks are available, this is not the case for SR-industry and size/value benchmarks. We thus have to construct

them. To do so, we start from the MSCI U.S. conventional industry and size/value factors. MSCI provides ten sector indexes (energy, materials, industrials, consumer discretionary, consumer staples, health care, financials, information technology, telecom and utilities) and six style indexes based on the size/value characteristics of the companies in the MSCI U.S. index (large-cap value, mid-cap value, small-cap value, large-cap growth, mid-cap growth and small-cap growth).[x] We then construct SR industry and style benchmarks. More specifically, starting from the dynamic stock-level composition of these ten sector and six style indexes at a monthly frequency, we adopted a best-in-class approach and included all the companies that were rated strictly above BBB by the MSCI ESG STATS database for corporate social responsibility. The MSCI ESG data have been extensively used in academic research (Jo and Na, 2012; Attig et al., 2013; Kim et al., 2014) and are widely accepted measures of ESG performance used by the vast majority of institutional money managers (98 of the 100 largest, according to MSCI). MSCI ESG STATS provides monthly SR ratings for a broad universe of stocks on a scale from AAA to CCC. Each firm is evaluated on the basis of strengths and concerns in seven qualitative areas that include corporate governance, the community, diversity, employee relations, environment, human rights, and products. Six specific exclusionary screens (alcohol, gambling, firearms, military, nuclear power, and tobacco) are considered by MSCI ESG as concerns. We use the final ratings computed by MSCI ESG as weighted averages of the scores recorded for each individual qualitative area according to the industry in which companies operate.[xi] In line with the construction methodology of the MSCI USA ESG index, we reconstructed market-cap weighted style and industry indexes based on the sub-sample of highly rated socially responsible firms since 2004, the starting date of our ESG rating database.[xii]

In line with Xiong et al. (2010) and Aglietta et al. (2012), and according to our objective of disentangling the returns due to SR screening from other sources of performance, we run four separate univariate time-series regressions. We regress the total SR fund's return R_{it} on a constant and each of the four components of total performance: market return M_t, asset allocation policy return in excess of the market return $(CP_{it} - M_t)$, SR policy return $(SRP_{it} - CP_{it})$, and active management return $(R_{it} - SRP_{it})$. $\beta_{iM}, \beta_{iCP}, \beta_{iSRP}$ and β_{iS} denote the estimated coefficients of the univariate regressions. Thus the total return of each SR fund is decomposed as follows:

$$R_{it} = \alpha + \beta_{iM} M_t + \beta_{iCP}(CP_{it} - M_t) + \beta_{iSRP}(SRP_{it} - CP_{it}) + \beta_{iS}(R_{it} - SRP_{it}) + \varepsilon_{it} \quad (4)$$

where ε_{it} stands for the residual term, i.e., the difference between the actual, observed total return of the SR fund and the return predicted by the model.

To capture the percentage of total variance of each SR fund explained by each of the four components, we take the covariance with R_{it} on both sides of the previous equation and divide it by the variance of R_{it} (Vardharaj and Fabozzi, 2007; Ibbotson and Kaplan, 2000; Xiong et al., 2010; Aglietta et al., 2012). We thus obtain for each fund *i* :

$$R^2_{iM} + R^2_{iCP} + R^2_{iSRP} + R^2_{iS} + R^2_{i\varepsilon} = 1 \quad (5)$$

where $R^2_{iM}, R^2_{iCP}, R^2_{iSRP}$ and R^2_{iS} are the R-squared of the univariate regressions and $R^2_{i\varepsilon}$ is a balancing term making the three components add up to 100%, also called an "interaction effect" (Xiong et al., 2010). This last term is computed as the difference between 1 and the sum of the four R-squared values. It measures the percentage of total variance of each SR fund that is explained by the interaction between market returns, asset allocation policy, SR

policy and active management.[xiii] We then report the average R-squared as well as several percentiles.

4. Descriptive statistics

Tables 1, 2 and 3 exhibit descriptive statistics of both the SR and the conventional benchmarks, for industry, style and geographical indexes respectively.

Insert Table 1 about here

Insert Table 2 about here

Insert Table 3 about here

Several interesting observations emerge. First, the rating-based screen approach used to constitute our SR benchmarks per industry (Table 1) includes, on average, about 35% of the companies that compose their conventional counterpart index in terms of market capitalization. The percentage of SR firms kept in our SR indexes varies slightly depending on the sector. These percentages are lower for financials (26%) and utilities (27%); they are higher for consumer staples (46%). When we apply the rating-based screening to the style indexes (Table 2), we observe that stocks with high SR ratings tend to be concentrated in the large-cap class (55% of large-cap value and 61% of large-cap growth stocks are kept in our SR indexes), followed by the mid-cap class. Within the small-cap class, only 12% of stocks qualify for inclusion in the SR benchmark. This result is in line with previous literature, which points out that stocks with high SR scores are mostly large market-capitalization growth stocks (Statman and Glushkov, 2009). Since large companies generally disclose more ESG information, small companies may not qualify because they lack a rating and not necessarily because they perform badly on ESG criteria (Manescu, 2011).

We observe from Tables 1, 2 and 3 that SR stock market indexes show slightly lower returns than their conventional peers (on average 10.91% vs. 11.88%, respectively, for U.S. industry factors, 10.25% vs 11.88% for U.S. style factors and 4.13% vs. 5.47% for international geographical factors), but these differences are not significant. The results are less clear-cut for volatility. While U.S. industry and style benchmarks show slightly lower volatility than their conventional counterparts (on average 19.24% vs 20.03% for industry indexes, 18.07% vs 20.03% for style indexes, see Table 1 and 2), the opposite is true for geographical benchmarks (18.12% vs 16.61%, see Table 3). However, the differences are statistically insignificant at a 5% confidence level (except for the volatilities of the SR and conventional small-cap value and Japanese indexes). These results are in line with previous empirical evidence showing that SR and conventional benchmarks have similar average financial performances (Sauer, 1997; Statman, 2006).

Insert Table 4 about here

Table 4 displays the main descriptive statistics of the SR funds' returns from October 2004 to August 2015. Over the study period, funds investing in the U.S. are the top performers, with an annualized total return of 6.21% and a volatility of 16.12%, while global funds have an average annualized return of just 4.36% and a volatility of 17.51% over the same period. The performances of individual mutual funds were highly dispersed around these averages for both categories of funds over the period. Funds investing globally form the most varied group (the cross-sectional dispersion of annualized returns is 7.55%, dispersion of volatility is 9.52%), while U.S. funds focusing on a restricted geographical area are more homogenous, with a cross-sectional dispersion of annualized returns and volatilities close to 2%. These

figures highlight the interest of focusing on the sources of observed variability in SR fund returns.

The conventional and SR factor loadings in the Sharpe (1992) style analysis are illustrated in Tables 5, 6 and 7.[xiv] The exposures to our estimated SR industry factors show slight differences when compared with the loadings on conventional industry benchmarks. U.S. funds (Table 5) have larger exposures to the energy, materials, consumer discretionary and health care SR sectors than to their conventional counterparts, and lower exposure to the consumer staples SR sector than to its conventional peer. In the same vein, U.S. funds load less strongly on the small-cap growth SR benchmark than on its conventional counterpart while being more exposed to mid-cap growth SR index than to its conventional peer (Table 6). Finally, the exposures of our sample of global SR funds to SR and conventional geographical factors are very similar (Table 7).

Insert Table 5 about here

Insert Table 6 about here

Insert Table 7 about here

5. Results

Tables 8 and 9 summarize the contribution of each component to the variability of U.S. SR funds' total returns, as measured by the cross-fund average of time-series R-squared.

Insert Table 8 about here

Insert Table 9 about here

On average, market movements explain more than three-quarters of the variability of the funds' total performance across time, substantially outweighing all the other sources of performance. This result is consistent with several previous studies on conventional funds (Vardharaj and Fabozzi, 2007; Xiong et al., 2010; Aglietta et al., 2012). Together, asset allocation policy, SR policy and active management explain on average around one-third of the fund's total return volatility. Furthermore, the average contribution of SR screens is roughly two times lower than the contribution of active portfolio choices, regardless of whether we use industry or style factors. Indeed, SR screening explains around 4% of total performance variability while the contribution of active asset allocation amounts to 10% on average when we use industry exposures and 8% on average with style exposures. Finally, conventional asset allocation manages to capture around 15% of total return variability (13% and 18% respectively with industry factors and 12% and 17% respectively with style factors, depending on the market definition). Our results remain robust whatever the measure used for market movements (see panels A, B of Tables 8 and 9).[xv]

For global funds, the results are in line with those reported for U.S. SR funds, as illustrated in Table 10. The contribution of the market remains dominant, albeit lower than for U.S. funds. The market contribution explains on average slightly more than one-half of the total return of the SR funds (54% and 68% respectively, depending on the market definition). The contributions of the three other sources of return variability, namely SR screening, asset allocation and active management, account for 33% and 39% respectively. Again, SR screens' contribution is around one-half of active portfolio choices (10% against 17% respectively, whatever the market definition).

Insert Table 10 about here

Table 11 displays the 5%, 25%, 50%, 75% and 95% percentiles of the four R-squared components for the sample of SR funds investing in the U.S., when a sector decomposition is used to assess the funds' strategic allocation. Panels A and B provide robustness checks for different definitions of market movements. Table 12 provides the same information when a style decomposition is used. The range of R-squared values reveals differences between funds in the contribution made by the different sources of SR fund performance variability across time. These values confirm a rather modest contribution from SR screens in most of the funds, regardless of whether we use industry or style benchmarks. Indeed, for 50% of the SR U.S. equity funds, the contribution of SR screens is below 1% (resp. 2%) when a sector (resp. style) decomposition is used to measure the conventional and SR allocation of the funds. The contribution of SR screens is higher than 16% (resp. 14%) with a sector (resp. style) decomposition for only 5% of the SR U.S. equity funds. As an illustration, the contributions of the conventional asset allocation and active management to the time-series variability of returns are much larger: for 50% of the funds they are above 9% (resp. 8%) on average for the conventional allocation and above 7% (resp. 8%) for active management with sector (style) decomposition.

Insert Table 11 about here

Insert Table 12 about here

Table 13 displays the same percentiles of the R-squared components for the sample of global funds. The results are similar to those reported previously. SR screens make a modest contribution to variability for the majority of SR funds' returns, i.e. below 5% for 50% of the funds. Again, the contribution of the other components is larger; as such, for 50% of the funds the contribution of active portfolio choices in explaining the time-series dispersion of

returns is above 14% on average. The contribution of SR screening is quite large, i.e. 40%, for only 5% of the SR global funds.

Insert Table 13 about here

These results shed fresh light on the debate about the performance of SR mutual funds compared with their conventional peers. Previous empirical evidence has shown that, on average, SR fund performances are very close to those of traditional funds. Looking at the sources of variability of these performances, we confirm that the contribution of SR screening is relatively modest for most funds and we also show that it is about two times less than the contribution of active portfolio choices. Our results may suggest that SR screens play a minor role in explaining the performance evolution of many mutual funds. This means that investors can obtain performances equivalent to those of conventional funds while also achieving socially responsible objectives. Moreover, given the diversity of SR screens' contributions, investors may also choose SR funds for which screening is a non-negligible source of performance. Our method allows to detect these funds.

6. Conclusion

Using a sample of 284 SR equity mutual funds over the period October 2004 - August 2015, and a new methodology for decomposing mutual funds' performances, our results highlight that the variability of a typical fund's performances across time that can be attributed to SR screens is roughly two times lower than the part that can be attributed to active portfolio choices. The exact contributions (between 4% and 10% for SR screening and between 8% and 17% for active management) depend on the type of fund. They are lowest for U.S. funds and highest for global funds. This modest average contribution of SR screens to equity funds' performances may seem disappointing. But it also means, rephrasing Hamilton et al. (1993),

that investors can "do equally well or badly while doing good." Moreover, average contributions hide a substantial disparity among funds: 25% of them have a SR screening contribution lower that 1%. We may thus argue, in line with Henke (2016), or Statman and Glushkov (2016) for example, that some mutual funds may be misclassified as SR. By contrast, several funds are very "active" in terms of SR, with a screening contribution that exceeds 14%.

Finally, SR screens are likely to be significantly related to industry and style; as such, it is important to disentangle the contribution of SR screening to performance variability from other sources: asset allocation choices, and active management. Our work thus proposes a simple model that can be used both by SR fund managers and investors to check for the intensity of mutual funds' social responsibility.

This paper sets forth some findings that could fuel further research. Aglietta et al. (2012) have shown that market movements play a far smaller role in explaining funds' performances in the fixed income universe than in equity markets, which leaves greater room for asset allocation and active management.[xvi] While SR screening makes a limited contribution to explaining the performance of equity mutual funds, it may play a greater role for fixed income funds (Henke, 2016) – a topic that warrants further investigation.

Appendix: SR index characteristics

Name of the index	Creation date	Universe	Number of components	SR methodology	Revision
Dow Jones Sustainability Index World ex US ex All	1999	2500 companies composing the Dow Jones Global Stock Market except for American companies	278	· Exclusion of assets involved in alchohol, gambling, tobacco and firearms · Best-in-class approach (top 10% of the companies with the best extra-financial ratings for each industry)	Quarterly
Dow Jones Sustainability Index North America ex All	2005	600 largest Canadian and American companies composing the Dow Jones Global Stock Market	140	· Exclusion of assets involved in alchohol, gambling, tobacco and firearms · Best-in-class approach (top 20% of the companies with the best extra-financial ratings for each industry)	Quarterly
Dow Jones Sustainability Index Eurozone ex All	2005	600 largest Euro zone companies composing the Dow Jones Global Stock Market	96	· Exclusion of assets involved in alchohol, gambling, tobacco and firearms · Best-in-class approach (top 20% of the companies with the best extra-financial ratings for each industry)	Quarterly
FTSE4Good UK Index	2001	630 English companies composing the FTSE All-Share Index	50	· Exclusion of assets involved in tobacco, firearms and nuclear energy · Selected companies must promote environmental protection, human rights and develop positive relationships with all the stakeholders	Semi-annual
FTSE4Good Japan Index	2001	460 Japanese companies composing the FTSE Japan Index	50	· Exclusion of assets involved in tobacco, firearms and nuclear energy · Selected companies must promote environmental protection, human rights and develop positive relationships with all the stakeholders	Semi-annual

References

Aglietta, M., Brière, M., Rigot, S., Signori, O. (2012). Rehabilitating the role of active management for pension funds. *Journal of Banking & Finance* 36(9), 2565-2574.

Attig, N., El Ghoul, S., Guedhami, O., Suh, J. (2013). Corporate social responsibility and credit ratings. *Journal of Business Ethics* 117(4), 679-694.

Avramov, D., Barras, L., Kosowski, R. (2013). Hedge fund predictability under the magnifying glass: the economic value forecasting individual fund returns. *Journal of Financial and Quantitative Analysis* 48(4), 1057-1083.

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

Bauer, R., Otten, R., Rad, A.T. (2006). Ethical Investing in Australia; is there a Financial Penalty?. *Pacific-Basin Finance Journal* 14(1), 33-48.

Benson, K.L., Brailsford, T.J., Humphrey, J.E. (2006). Do social responsible fund managers really invest differently?. *Journal of Business Ethics* 65(4), 337-357.

Bloomberg (2013), Bloomberg Fund Classifications, Guide to our new funds classification system, 38 p.

Brière, M., Szafarz, A. (2008). Crisis robust bond portfolios. *Journal of Fixed Income* 18(2), 57-70.

Brinson, G.P., Hood, L.R., Beebower, G.L. (1986). Determinants of portfolio performance. *Financial Analysts Journal* 42(4), 39–44.

Capelle-Blancard, G., Monjon, S. (2014). The Performance of Socially Responsible Funds: Does the Screening Process Matter?. *European Financial Management* 20(3), 494-520.

Climent, F., Soriano, O. (2011). Green and Good? The Investment Performance of U.S. Environmental Mutual Funds. *Journal of Business Ethics* 103(2), 275-286.

Cortez, M.C., Silva, F., Areal, N. (2009). The performance of European socially responsible funds. *Journal of Business Ethics* 87(4), 573-588.

Curran, M., Moran, D. (2007). Impact of the FTSE4Good Index on firm price: An event study. *Journal of Environmental Management* 82(4), 529-537.

Derwall, J.N., Guenster, N., Bauer, R., Koedijk, K. (2005). The eco-efficiency premium puzzle. *Financial Analysts Journal*, 61(2), 53-64.

Derwall, J.N., Koedijk, K., Ter Horst, J. (2011). A tale of value-driven and profit-seeking social investors. *Journal of Banking and Finance* 35(8), 2137-2147.

Fama, E.F., French, K.R. (2010). Luck Versus Skill in the Cross Section of Mutual Fund Returns. *Journal of Finance* 65(5), 1915-1947.

Fung, W., Hsieh, D.A. (1997). Empirical Characteristics of Dynamic Trading Strategies: The Case of Hedge Funds. *Review of Financial Studies* 10(2), 275-302.

Geczy, C.C., Stambaugh, R., Levin, D. (2005). Investing in Socially Responsible Mutual Funds. Working Paper, University of Pennsylvania.

Gil-Bazo, J., Ruiz-Verdu, P., Portela, A.A.P. (2010). The performance of socially responsible mutual funds: the role of fees and management companies. *Journal of Business Ethics* 94(2) 243–263.

Gregory, A., Whittaker, J. (2007). Performance and performance persistence of ethical unit trusts in the U.K. *Journal of Business, Finance and Accounting* 34(7–8), 1327–1344.

Hamilton, S., Joe, H., Statman, M. (1993). Doing well while doing good? The investment performance of socially responsible mutual funds. *Financial Analysts Journal* 49(6), 62-66.

Henke, H.M. (2016). The effect of social screening on bond mutual fund performance. *Journal of Banking & Finance* 67(C), 69-84.

Ibbotson, R.G., Kaplan, P.D. (2000). Does asset allocation policy explain 40, 90, or 100 percent of performance?. *Financial Analysts Journal* 56(1), 26–33.

Jo, H., Na, H. (2012). Does CSR reduce firm risk? Evidence from controversial industry sectors. *Journal of Business Ethics* 110(4), 441-456.

Jones, S., van der Laan, S., Frost, G., Loftus, J. (2008). The investment performance of socially responsible investment funds in Australia. *Journal of Business Ethics* 80(2), 181–203.

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

Kim, Y., Li, H., Li, S. (2014). Corporate social responsibility and stock price crash risk. *Journal of Banking and Finance* 43, 1-13.

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

Kreander, N., Gray, R.H., Power, D.M., Sinclair, C.D. (2005). Evaluating the performance of ethical and non ethical funds: A matched pair analysis. *Journal of Business, Finance and Accounting* 32(7-8), 1465-1493.

Manescu, C. (2011). Stock Returns in Relation to Environmental, Social and Governance Performance: Mispricing or Compensation for Risk? *Sustainable Development* 19(2), 95-118.

MSCI U.S. Equity Indices Methodology (2011). Index Construction Objectives and Methodology for the MSCI U.S. Equity Indices, 65p.

MSCI ESG Research (2014). Executive Summary: Intangible Value Assessment (IVA) Methodology, 28p.

MSCI ESG Research (2015). ESG Ratings Methodology, Executive Summary, 9p.

Nofsinger, J., Varma, A. (2014). Socially Responsible Funds and Market Crises. *Journal of Banking and Finance*, 48(11), p. 180-193.

Renneboog, L., Ter Horst, J., Zhang, C. (2008). The price of ethics and stakeholder governance: The performance of socially responsible mutual funds. *Journal of Corporate Finance* 14(3), 302-322.

Renneboog, L., Ter Horst, J., 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.

Sauer, D.A. (1997). The impact of social-responsibility screens on investment performance: evidence from the Domini 400 Social Index and Domini equity mutual fund. *Review of Financial Economics* 6(2), 137-149.

Schröder, M. (2007). Is there a difference? The performance characteristics of SRI equity indexes. *Journal of Business Finance & Accounting* 34(1-2), 331-348.

Sensoy, B.A. (2009). Performance evaluation and self-designated benchmark indexes in the mutual fund industry. *Journal of Financial Economics* 92(1), 25-39.

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

Statman, M. (2006). Socially responsible indexes: composition, performance and tracking error. *Journal of Portfolio Management* 32(3), 100-109.

Statman, M. (2000). Socially Responsible Mutual Funds. *Financial Analysts Journal* 56(3), 30-39.

Statman, M., Glushkov, D. (2009). The Wages of Social Responsibility, *Financial Analyst Journal* 65(4), 33-46.

Statman, M., Glushkov, D. (2016). Classifying and Measuring the Performance of Socially Responsible Mutual Funds. *Journal of Portfolio Management*, 42(2), 140-151.

Stenstrom, H.C., Thorell, J.J. (2007). Evaluating the Performance of Socially Responsible Investment Funds: A Holding Data Analysis, Working Paper, Stockholm School of Economics.

Vardharaj, R., Fabozzi, F.J. (2007). Sector, style, region: Explaining stock allocation performance. *Financial Analysts Journal* 63(3), 59–70.

Xiong, J.X., Ibbotson, R.G., Idzorek, D.M., Chen P. (2010). The equal importance of asset allocation and active management. *Financial Analysts Journal* 66(2), 1-9.

Ziegler, A., Schröder, M. (2010). What determines the inclusion in a sustainability stock index? A panel data analysis for European firms. *Ecological Economics* 69(4), 848-856.

Table 1: Descriptive statistics of monthly returns of U.S. industry SR and conventional benchmarks, October 2004 - August 2015

This table presents the industry SR indexes used to compute U.S. funds' SR asset allocation policies, along with their corresponding conventional counterparts. The SR benchmarks were constructed by the authors. Column "# constituents (average)" indicates the average number of stocks that compose each index. Column "% of market cap" indicates the relative fraction of stocks in the SR benchmarks relative to their conventional counterparts in terms of market cap. Columns "Annualized mean" and "Annualized standard deviation" refer to the annualized means and standard deviations of the monthly returns of the indices over the period October 2004 - August 2015. "**" stands for the significance of the difference between the means and standard deviations of conventional and SR benchmarks at the 5% conventional risk level.

	% of market cap	Annualized mean		Annualized standard deviation	
Industry	**SR relative to conventional benchmark**	**SR benchmark**	**Conventional benchmark**	**SR benchmark**	**Conventional benchmark**
Energy	33%	9.96%	12.20%	22.94%	27.05%
Materials	32%	11.34%	12.65%	22.92%	21.74%
Industrials	38%	10.01%	11.10%	19.69%	19.88%
Consumer discretionary	30%	13.42%	11.77%	19.49%	20.32%
Consumer staples	46%	9.85%	11.71%	11.18%	11.15%
Health care	35%	10.36%	13.60%	13.58%	14.57%
Financials	26%	5.36%	6.02%	20.74%	19.55%
Information technology	43%	10.86%	11.31%	18.78%	19.62%
Telecom	36%	7.41%	9.49%	17.07%	16.09%
Utilities	27%	9.05%	10.24%	13.56%	13.56%
Average		10.91%	11.88%	19.24%	20.03%

Table 2: Descriptive statistics of monthly returns of U.S. style SR and conventional benchmarks, October 2004 - August 2015

This table presents the style SR indexes used to compute U.S. funds' SR asset allocation policy, along with their corresponding conventional counterparts. The SR benchmarks were constructed by the authors. Column "# constituents (average)" indicates the average number of stocks that compose each index. Column "% of market cap" indicates the relative fraction of stocks in the SR benchmarks relative to their conventional counterparts in terms of market cap. Columns "Annualized mean" and "Annualized standard deviation" refer to the annualized means and standard deviations of the monthly returns of the indexes over the period October 2004 - August 2015. "**" stands for the significance of the difference between the means and standard deviations of conventional and SR benchmarks at the 5% conventional risk level.

	% of market cap	Annualized mean		Annualized standard deviation	
Style Factor	**SR relative to conventional benchmark**	**SR benchmark**	**Conventional benchmark**	**SR benchmark**	**Conventional benchmark**
Largecap value	55%	7.86%	12.20%	13.28%	27.05%
Midcap value	34%	9.89%	12.65%	19.36%	21.74%
Smallcap value	12%	13.53%	11.10%	24.63%**	19.88%**
Largecap growth	61%	9.17%	11.77%	14.28%	20.32%
Midcap growth	19%	10.81%	11.71%	18.80%	11.15%
Smallcap growth	12%	13.34%	13.60%	20.95%	14.57%
Average		10.25%	11.88%	18.07%	20.03%

Table 3: Descriptive statistics of monthly returns of geographical SR and conventional benchmarks, October 2004 - August 2015

This table presents the SR indexes used to compute global funds' SR asset allocation policy, along with their corresponding conventional counterparts. Columns "Annualized mean" and "Annualized standard deviation" refer to the annualized means and standard deviations of the monthly returns of the indexes over the period October 2004 - August 2015. The SR benchmarks are the DJSI North America ex All, DJSI Eurozone ex All, FTSE4Good U.K Index, FTSE4Good Japan Index and DJSI World ex U.S. ex All. The conventional benchmarks are the FTSE North America, STOXX Europe 600, FTSE U.K ALL Share, FTSE Japan and FTSE ALL World ex U.S. "**" stands for the significance of the difference between the means and standard deviations of conventional and SR benchmarks at the 5% conventional risk level.

Geographical focus	Annualized mean		Annualized standard deviation	
	SR benchmark	**Conventional benchmark**	**SR benchmark**	**Conventional benchmark**
North America	5.48%	7.45%	14.90%	14.86%
Europe	3.89%	5.79%	23.52%	20.07%
United Kingdom	3.12%	3.79%	13.67%	13.89%
Japan	3.00%	4.01%	19.51%**	15.23%**
World ex U.S.	5.14%	6.29%	18.99%	19.02%
Average	4.13%	5.47%	18.12%	16.61%

Table 4: Descriptive statistics of SR equity funds' monthly returns, October 2004 - August 2015

This table presents the descriptive statistics of the funds' monthly returns from October 2004 to August 2015. Columns "Annualized mean" and "Annualized standard deviation" refer to the annualized means and standard deviations of SR funds' returns. Median, Min and Max are respectively the median, minimum and maximum monthly return over the period (non-annualized). Numbers between brackets refer to the cross-sectional standard deviations among funds. The column "All" refers to the whole sample of 284 funds while the other two columns report the results for the two sub-samples, based on the funds' geographical focus.

	Geographical focus		All
	U.S.	Global	
Annualized mean	6.21%	4.36%	4.75%
	(2.13%)	(7.55%)	(6.91%)
Annualized standard deviation	16.12%	17.51%	17.23%
	(2.02%)	(9.52%)	(8.61%)
Median	1.05%	0.89%	0.91%
Max	20.27%	38.34%	38.34%
Min	-26.35%	-47.12%	-47.12%

Table 5: U.S. SR funds' exposures to industry factors, October 2004 - August 2015

This table presents the average exposure of U.S. SR funds in our sample to the ten industry factors. The SR benchmarks were constructed by the authors.

Industry exposure	SR allocation policy (SRP)	Conventional allocation policy (CP)
Energy	11%	8%
Materials	5%	1%
Industrials	10%	11%
Consumer discretionary	9%	6%
Consumer staples	12%	22%
Health care	15%	11%
Financials	13%	15%
Information technology	21%	19%
Telecom	3%	4%
Utilities	2%	2%
Total	100%	100%

Table 6: U.S. SR funds' exposures to style factors, October 2004 - August 2015

This table presents the average exposure of U.S. SR funds in our sample to the six size/value factors. The SR benchmarks were constructed by the authors.

Style exposure	SR allocation policy (SRP)	Conventional allocation policy (CP)
Large-cap value	28%	25%
Mid-cap value	11%	8%
Small-cap value	5%	9%
Large-cap growth	33%	34%
Mid-cap growth	18%	11%
Small-cap growth	6%	12%
Total	100%	100%

Table 7: Global SR funds' exposures to geographical factors, October 2004 - August 2015

This table presents the average exposure of global SR funds in our sample to the five geographical benchmarks.

Geographical exposure	SR allocation policy (SRP)	Conventional allocation policy (CP)
North America	25%	27%
Europe	3%	3%
United Kingdom	48%	44%
Japan	15%	15%
World ex U.S.	9%	11%
Total	100%	100%

Table 8: Decomposition of U.S. funds' total return variability in terms of average R-squared with industry exposures for the SR and conventional allocation policies, October 2004 - August 2015

This table depicts the decomposition of the total return variability of U.S. SR funds (in terms of average R-squared) over the period October 2004 - August 2015. Market return is computed as: (1) the return of the U.S. MSCI Index in Panel A and (2) the equally weighted average return of all the U.S. SR equity funds in the sample in Panel B. The asset allocation policy (both conventional and SR) is computed using the ten industry factors.

Panel A: Market return = return of the U.S. MSCI Index	
	Average R^2
Market movement: $R_{i,t}$ *vs.* M_t	77%
Asset allocation policy: $R_{i,t}$ *vs.* $CP_{i,t} - M_t$	13%
SR screening: $R_{i,t}$ *vs.* $SRP_{i,t} - CP_{i,t}$	4%
Active management: $R_{i,t}$ *vs.* $R_{i,t} - SRP_{i,t}$	10%
Interaction effect	-4%
Total	100%

Panel B: Market return = equally weighted average return of all the U.S. SR equity funds	
	Average R^2
Market movement: $R_{i,t}$ *vs.* M_t	87%
Asset allocation policy: $R_{i,t}$ *vs.* $CP_{i,t} - M_t$	18%
SR screening: $R_{i,t}$ *vs.* $SRP_{i,t} - CP_{i,t}$	4%
Active management: $R_{i,t}$ *vs.* $R_{i,t} - SRP_{i,t}$	10%
Interaction effect	-19%
Total	100%

Table 9: Decomposition of U.S. funds' total return variability in terms of average R-squared with style (size/value) exposures for the SR and conventional allocation policies, October 2004 - August 2015

This table depicts the decomposition of the total return variability of U.S. SR funds (in terms of average R-squared) over the period October 2004 - August 2015. Market return is computed as: (1) the return of the U.S. MSCI Index in Panel A and (2) the equally weighted average return of all the U.S. funds in the sample in Panel B. The asset allocation policy (both conventional and SR) is computed using the six styles (size/value) factors.

Panel A: Market return = return of the U.S. MSCI Index	
	Average R^2
Market movement: $R_{i,t}$ *vs.* M_t	77%
Asset allocation policy: $R_{i,t}$ *vs.* $CP_{i,t} - M_t$	12%
SR screening: $R_{i,t}$ *vs.* $SRP_{i,t} - CP_{i,t}$	4%
Active management: $R_{i,t}$ *vs.* $R_{i,t} - SRP_{i,t}$	8%
Interaction effect	-1%
Total	100%

Panel B: Market return = equally weighted average return of all the U.S. SR equity funds	
	Average R^2
Market movement: $R_{i,t}$ *vs.* M_t	87%
Asset allocation policy: $R_{i,t}$ *vs.* $CP_{i,t} - M_t$	17%
SR screening: $R_{i,t}$ *vs.* $SRP_{i,t} - CP_{i,t}$	4%
Active management: $R_{i,t}$ *vs.* $R_{i,t} - SRP_{i,t}$	8%
Interaction effect	-16%
Total	100%

Table 10: Decomposition of global funds' total return variability in terms of average R-squared, October 2004 - August 2015

This table depicts the decomposition of the total return variability of global SR funds (in terms of average R-squared) over the period October 2004 - August 2015. Market return is computed as: (1) the market-capitalization weighted average return of the conventional stock market indexes in Panel A (11% FTSE All World ex U.S., 27% FTSE North America, 3% STOXX Euro 600, 44% FTSE All-Share and 15% FTSE Japan), and (2) the equally weighted average return of all the global funds in the sample in Panel B.

Panel A: Market return = market-capitalization weighted average return of the conventional stock market indexes	
	Average R^2
Market movement: $R_{i,t}$ *vs.* M_t	54%
Asset allocation policy: $R_{i,t}$ *vs.* $CP_{i,t}$ - M_t	12%
SR screening: $R_{i,t}$ *vs.* $SRP_{i,t}$ - $CP_{i,t}$	10%
Active management: $R_{i,t}$ *vs.* $R_{i,t}$ - $SRP_{i,t}$	17%
Interaction effect	7%
Total	100%

Panel B: Market return = equally weighted average return of all the global SR equity funds	
	Average R^2
Market movement: $R_{i,t}$ *vs.* M_t	68%
Asset allocation policy: $R_{i,t}$ *vs.* $CP_{i,t}$ - M_t	6%
SR screening: $R_{i,t}$ *vs.* $SRP_{i,t}$ - $CP_{i,t}$	10%
Active management: $R_{i,t}$ *vs.* $R_{i,t}$ - $SRP_{i,t}$	17%
Interaction effect	0%
Total	100%

Table 11: Time series distributions of U.S. SR funds returns decomposition with industry exposures for the SR and conventional allocation policies, October 2004 - August 2015

This table depicts the 5%, 25%, 50%, 75% and 95% percentiles of the R-squared distributions for the four components of the U.S. funds total returns over the period October 2004 - August 2015. Market return is computed as: (1) the return of the U.S. MSCI Index in Panel A and (2) the equally weighted average return of all the U.S. funds in the sample in Panel B. The asset allocation policy (both conventional and SR) is computed using the ten industry factors.

Panel A: Market return = return of the U.S. MSCI Index

Percentile	Market movement	Asset allocation policy	SR screening	Active management
5	44%	0%	0%	0%
25	72%	1%	0%	3%
50	83%	9%	1%	7%
75	88%	24%	4%	13%
95	91%	36%	16%	31%

Panel B: Market return = equally weighted average return of all the U.S. SR equity funds

Percentile	Market movement	Asset allocation policy	SR screening	Active management
5	48%	0%	0%	0%
25	87%	2%	0%	3%
50	94%	13%	1%	7%
75	96%	30%	4%	13%
95	98%	54%	16%	31%

Table 12: Time series distributions of U.S. SR funds returns decomposition with style size/value) exposures for the SR and conventional allocation policies, October 2004 - August 2015

This table depicts the 5%, 25%, 50%, 75% and 95% percentiles of the R-squared distributions for the four components of the U.S. funds total returns over the period October 2004 - August 2015. Market return is computed as: (1) the return of the U.S. MSCI Index in Panel A and (2) the equally weighted average return of all the U.S. funds in the sample in Panel B. The asset allocation policy (both conventional and SR) is computed using the six styles (size/value) factors.

Panel A: Market return = return of the U.S. MSCI Index

Percentile	Market movement	Asset allocation policy	SR screening	Active management
5	44%	0%	0%	0%
25	72%	2%	0%	2%
50	83%	10%	2%	8%
75	88%	20%	5%	11%
95	91%	36%	14%	24%

Panel B: Market return = equally weighted average return of all the U.S. SR equity funds

Percentile	Market movement	Asset allocation policy	SR screening	Active management
5	48%	0%	0%	0%
25	87%	1%	0%	2%
50	94%	8%	2%	8%
75	96%	34%	5%	11%
95	98%	55%	14%	24%

Table 13: Time series distributions of global SR funds returns decomposition, October 2004 - August 2015

This table depicts the 5%, 25%, 50%, 75% and 95% percentiles of the R-squared distributions for the four components of the global funds total returns over the period October 2004 - August 2015. Market return is computed as: (1) the market-capitalization weighted average return of the conventional stock market indexes in Panel A (11% FTSE All World ex U.S., 27% FTSE North America, 3% STOXX Euro 600, 44% FTSE All-Share and 15% FTSE Japan), and (2) the equally weighted average return of all the global funds in the sample in Panel B.

Panel A: Market return = market-capitalization weighted average return of the conventional stock market indexes

Percentile	Market movement	Asset allocation policy	SR screening	Active management
5	11%	0%	0%	1%
25	41%	3%	1%	6%
50	57%	10%	5%	14%
75	68%	17%	12%	23%
95	94%	38%	40%	43%

Panel B: Market return = equally weighted average return of all the global SR equity funds

Percentile	Market movement	Asset allocation policy	SR screening	Active management
5	23%	0%	0%	1%
25	60%	1%	1%	6%
50	76%	3%	5%	14%
75	82%	8%	12%	23%
95	88%	22%	40%	43%

[i] A small number of analyses point to a significant underperformance of SR equity investments (Jones et al., 2008; Renneboog et al., 2008). A few others, by contrast, demonstrate an outperformance by portfolios constructed on the basis of ethical screening (Derwall et al., 2005; Kempf and Osthoff, 2007; Derwall et al., 2011).

[iiii] While sectorial screens (for example, those avoiding sin stocks) have a negative effect on risk-adjusted returns, this is not true for transversal ones (for example, a commitment to the UN Global Compact principles). Funds practicing the best-in-class approach are frequently indistinguishable from their conventional counterparts.

[iii] We considered alternative sources of classification such as Morningstar. In line with Climent and Soriano (2011), we finally opted for Bloomberg, since the definitions of funds in terms of both asset class focus and SR investments seemed more restrictive. Morningstar defines domestic stock funds as "funds with at least 70% of assets in domestic stocks" and international stock funds as having "40% or more of their equity holdings in foreign stocks" (Morningstar Investing Glossary, available at: http://www.morningstar.com/InvGlossary/). Bloomberg's definition is more narrow and requires an equity fund to hold at least 80% invested in equities (Bloomberg Fund Classification Guide, 2013). Moreover, Morningstar defines socially responsible funds as a group including "any fund that invests according to noneconomic guidelines. Funds may make investments based on such issues as environmental responsibility, human rights, or religious views." Hence, thematic funds on water or green energies, or even Islamic funds may be included in this category. From Bloomberg's categorization, we chose socially responsible funds defined as "investing in securities of companies meeting socially responsible standards" and "environmental, social, and corporate governance (ESG) funds investing in companies compliant with ESG criteria" and left aside thematic and religious funds.

[iv] As stated by Fung and Shieh (1997), in Sharpe's (1992) model, "the focus is on the location component of return, which tells us the asset categories the manager invests in." A limited number of asset classes are required to replicate the performance of an extensive universe of mutual funds. Fund returns are regressed on a number of chosen factors, with specific constraints (residual of the regression uncorrelated with the factors, each coefficient bounded in the [0,1] interval, sum of the coefficients equal to 1).

[v] Based on the RobecoSAM Corporate Sustainability Assessment.

[vi] Based on the ratings created by FTSE International Limited and Ethical Research Services (EIRIS). For a more detailed presentation of the different SR indices, refer to the Appendix.

[vii] Several alternative specifications were tested, all of which are less powerful in explaining SR funds' returns. We also performed all our estimations using the DJSI U.S. and DJSI Europe as proxies for the U.S. and European SR equity indices, respectively. In addition, we replaced the SR indices listed in our Appendix by their peers without sectorial exclusions. The alternative results are available upon request.

[viii] We thank an anonymous referee for this suggestion.

[ix] The MSCI index recorded an annualized average of 7.30% and an annualized standard deviation of 14.41% over the period under study, i.e. October 2004 - August 2015.

[x] MSCI uses a market-capitalization approach in conducting the size segmentation of the market. The large-cap index consists of the 300 largest companies by full market capitalization in the investable market segment, the mid-cap index comprises the next 450 companies, and the small-cap index is made up of the remaining 1,750 companies. Value and growth indices are constructed based on a segmentation of the stock universe according to various stock characteristics. Stocks are classified as value if they have a high book value to price ratio, 12-month forward earnings to price ratio and dividend yield. Growth stocks have a high growth rate for long-term and short-term forward earnings per share, current internal growth rate, long-term historical earnings per share growth trend and long-term historical sales per share growth trend. Z-scores are calculated and used to determine the overall style characteristics of each security in the MSCI value and growth 2-dimensional style space. For more details, see the MSCI U.S. Equity Indices Methodology (2011).

[xi] For a detailed presentation of the SR rating process, see the MSCI Intangible Value Assessment (IVA) Methodology (2014) and the MSCI ESG Ratings Methodology (2015).

[xii] In line with Statman and Glushkov (2009) we exclude non-rated companies from each index.

[xiii] A positive (resp. negative) interaction effect comes from the positive (resp. negative) correlation between the total return and the residual term in the regression.

[xiv] The funds in our sample exhibit significant loadings on the factors representing the difference between SR and conventional benchmarks after controlling for the market exposure. For 53% of the U.S. funds and for 56% of the global funds these loadings are statistically significant at the 5% risk level.

[xv] In practice, asset management companies use an internal non-financial rating system that can depart significantly from the public systems used by index providers. As a consequence, SR portfolio managers may depart from benchmarks when doing their SR screening. As such, active portfolio management may appear not only as a tactical allocation practice aimed at reaching the highest return-risk profile, but also as a way to introduce internal rating recommendations into the funds.

[xvi] There are significant opportunities for diversification inside the fixed income asset class (Brière and Szafarz, 2008).

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