Performance and Performance Persistence of European Socially Responsible Funds: French Evidence

Paulo Leite [a], Maria Céu Cortez [b]

[a] School of Management, Polytechnic Institute of Cávado and Ave, 4750-180 Barcelos, Portugal

Email: pleite@ipca.pt

Tel: + 351 253 802500

Fax: + 351 253 821111

[b] School of Economics and Management, University of Minho, Gualtar, 4710-057 Braga, Portugal

Email: mccortez@eeg.uminho.pt

Tel: +351 253 604554

Fax: +351 253 601380

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ABSTRACT

In this paper, we investigate the performance, performance persistence, investment styles and timing abilities of French Socially Responsible Investment (SRI) funds investing in European equities, in comparison with characteristics-matched conventional funds.

Based on robust conditional multi-factor models, which control for home biases and spurious regression biases, our results show that differences in the overall performance of French SRI funds and their matched-samples are, in general, not statistically significant. However, SRI funds are significantly better market timers and significantly worse stock pickers than their conventional peers. With regard to investment styles, SRI funds show significantly higher market betas and significantly lower exposure to small-caps than conventional funds, in clear contrast with most previous SRI fund studies. Furthermore, we do not find evidence of performance persistence for French SRI funds, whereas conventional funds exhibit significant persistence in performance at short-term horizons. In general, the difference between funds with good past performance and bad past performance is significantly lower for the SRI funds than for their conventional counterparts.

Keywords: Socially responsible funds; Fund performance evaluation; Performance persistence; Style analysis; Matched-pairs approach.

EFM Codes: 380, 750

1. Introduction

The main objective of this paper is to investigate the performance and performance persistence of French Socially Responsible Investment (SRI) funds. According to recent statistics, France has surpassed the UK and is currently the most important European SRI fund market in terms of assets under management. In fact, from 1999 to 2010, the weight of the UK SRI market on the total European assets under management has decreased from 42% to 15%, while the weight of the French market has increased from 1% to 35% (Vigeo, 2010). In the period of 2007 to 2010 alone, despite difficult times for the financial markets, the growth rate of SRI assets under management in France reached an astonishing 198%, rising from €8.9 billion to €26.5 billion. In addition, from 2006 to 2009, France was also the leading European SRI market in terms of number of funds and was only narrowly surpassed by Belgium in 2010. Nevertheless, the number of French SRI funds increased from 93 in June 2007 to 215 in June 2010, which represents a growth rate of 131% in just three-years.[1]

Despite this remarkable growth, very few attempts have been made to analyse the performance of French SRI funds and the few studies we are aware of present some important limitations. These are mainly associated with the performance evaluation models used, which do not allow for time-varying risk, time-varying performance and/or do not control for common investment styles, and the lack of any comparisons between SRI and conventional funds. Hence, we contribute to the international mutual fund performance literature by performing a comprehensive investigation of the performance and investment styles of 33 French SRI funds investing in European equities, over the period of January 2000 through December 2008, in comparison with characteristics-matched samples of conventional funds. As far as we are aware of, this is the first investigation to use the matched-pairs approach in the French SRI fund market. To overcome many of the shortcomings of previous research, we evaluate performance by means of robust conditional multi-factor models, which allow for time-varying alphas and betas. In fact, the use of a proper multi-factor model is critical to distinguish between returns that are related with the social screens employed by SRI funds and returns that are solely due to common investment styles. Besides, several recent SRI fund studies (e.g.: Bauer, Otten & Rad, 2006; Bauer, Derwall & Otten, 2007; Cortez, Silva &

[1] Another important aspect to mention is that France was the first European country to make ethical reporting mandatory. In fact, since 2001, all listed companies in France must publish information regarding their social, environmental and ethical initiatives in their annual reports (Renneboog, Horst & Zhang, 2008a). Besides, recently approved laws require companies to offer at least one solidarity fund, which is often an SRI fund, in employee savings plans (EUROSIF, 2010).

Areal, 2009, *forthcoming*; Gregory & Whittaker, 2007; Liedekerke, Moor & Vanwalleghem, 2007) have found evidence of time-varying betas, which clearly supports the use of conditional models. Moreover, we also control for home biases in portfolio composition, as well as spurious regression biases, which are avoided through an appropriate econometric treatment of the public information variables used in the conditional models.

Another important aspect we address, which remains practically unexplored in the French SRI fund market, is the decomposition of fund's overall performance in its selectivity and timing components. In terms of selectivity, our main objective is to evaluate if screening activities can generate valuable information, which otherwise would not be available, and help SRI fund managers in their search for undervalued securities. In terms of market timing, we want to investigate if the superior knowledge of firms in the investment universe allows SRI fund managers to be better market timers than their conventional peers or if the more long-term perspective of SRI funds, combined with them trading securities for non-financial reasons, leads to poorer market timing abilities.

Furthermore, to the best of our knowledge, the issue of performance persistence of SRI funds has only been studied for the UK market (e.g.: Gregory & Whittaker, 2007). In this way, another objective of this paper is to evaluate and compare the performance persistence of French SRI and conventional funds over both short and longer time horizons. We assess performance persistence by means of performance-ranked portfolio strategies using several alternative evaluation models, including conditional specifications that consider time-varying betas, as well as time-varying alphas and betas. In fact, if SRI funds have a more long-term perspective than conventional funds, they may exhibit higher performance persistence at longer than at shorter time horizons. Besides, if SRI funds constitute a more homogeneous group than conventional funds, differences in performance between SRI fund portfolios of past winners and past losers should be lower than for their conventional peers, meaning that investment strategies consisting of buying past winners and selling past losers ought to be less important in the SRI context.

The paper is organized as follows: Section 2 provides a critical discussion of the literature on performance and performance persistence of SRI funds, with special emphasis on the few studies that examine the French market. Section 3 presents the (overall) performance and market timing models used. Section 4 describes the data. Section 5 presents and discusses our empirical results. Finally, section 6 summarizes our main findings and presents some concluding remarks.

2. Prior Research

2.1 SRI Fund Performance

The financial literature on SRI fund performance has increased considerably over the last decade, following the development of SRI fund markets around the world. Most empirical studies conducted so far show that imposing ethical restrictions to a funds' investment policy does not seem to generate inferior performance, since no statistically significant differences have been found between the performance of SRI and conventional funds in many world markets.[2] On the other hand, SRI and conventional funds seem to significantly differ in terms of their investment styles, with the majority of empirical studies showing that SRI funds are significantly more exposed to small caps than their peers (e.g.: Bauer *et al.*, 2006; Gregory *et al.*, 1997; Gregory & Whittaker, 2007), whereas exposures to value/growth stocks seem to significantly differ from one market to another.[3]

The French market, though, has not received much attention in the SRI fund performance literature. The only studies we are aware of that focus on the performance of French SRI funds are Le Sourd (2010) and Amenc and Le Sourd (2010). Le Sourd (2010) examined the performance of 62 SRI funds distributed in France,[4] during the six-year period of January 2002 to December 2007. Her sample included funds that invested in French (5 funds), Eurozone (25 funds), European (12 funds) and world (20 funds) equities. Although the author has also used Sharpe (1966) ratios and Jensen's (1968) alphas, according to the more robust Fama and French (1993, 1996) 3-factor model only the European funds presented statistically significant negative alphas, while in all other categories average alphas were not statistically different from zero. In terms of investment style, this study has documented a clear small-cap bias for SRI funds in France, but no biases towards growth or value stocks. In a subsequent work, Amenc and Le Sourd (2010) updated the results of Le Sourd's (2010) earlier study to include the years of 2008 and 2009, but conclusions on performance remained

[2] See, for example, Gregory, Matatko and Luther (1997) and Gregory and Whittaker (2007) for the UK market, Hamilton, Jo and Statman (1993) and Statman (2000) for the US market, Bauer *et al.* (2007) for the Canadian market, Bauer *et al.* (2006) for the Australian market, Scholtens (2005) for the Dutch market and Liedekerke *et al.* (2007) for the Belgian market.

[3] In fact, while some studies show that SRI funds have higher exposures to growth stocks (e.g.: Bauer, Koedijk & Otten, 2005; Cortez *et al.*, in press; Gregory & Whittaker, 2007), others report that SRI funds are more value-oriented (e.g.: Bauer *et al.*, 2006; Renneboog, Horst & Zhang, 2008b; Scholtens, 2005).

[4] It is worth to mention that this sample included equity funds distributed in France, whether they were registered in France, Belgium or Luxembourg.

unchanged, with French SRI funds presenting negative, but not statistically significant, alphas in most cases.

In addition, there are also a couple of very recent multi-country studies that include SRI funds domiciled in France. Renneboog *et al.* (2008b) analysed the performance of 59 French SRI funds and 790 conventional funds, during the period of January 1991 to December 2003. Based on both unconditional and partial conditional versions of the Carhart (1997) 4-factor model they found that French SRI funds significantly (at the 10% level) underperformed their peers by approximately 4% per year, but they did not find any significant differences in their investment styles. Moreover, they found little evidence of market timing abilities of French SRI fund managers, based on a conditional multi-factor version of the Treynor and Mazuy (1966) model.

In another recent study, Cortez *et al.* (2009) examined the performance of 30 French SRI equity funds during the period of August 1996 to February 2007. According to their more robust model specification - a conditional single-factor model with time-varying alphas and betas - French SRI funds investing in European equities significantly underperformed their benchmarks (at the 10% level) by 0.238% per month, while funds investing in Global equities presented neutral performance. In addition, they found that French SRI funds were more exposed to conventional than to SRI benchmarks.[5]

Therefore, in line with the argument that the costs of imposing SRI constraints can be substantial and lead to significantly lower returns (e.g.: Geczy, Stambaugh & Levin, 2005), some of the most recent empirical studies conducted have reported evidence of significant underperformance of French SRI funds, both in relation to market indices and conventional funds (e.g.: Cortez *et al.*, 2009; Renneboog *et al.*, 2008b).

In addition, all of the above mentioned studies regarding French SRI funds present important limitations. First, in terms of the methodology used, Amenc and Le Sourd (2010) and Le Sourd (2010) not only do not control for the effect of momentum strategies, but also do not use conditional performance evaluation models. In this way, their results may be biased, since they assume expected returns and risk to be constant along the evaluation period. On the other hand, Cortez *et al.* (2009) use a conditional single-factor model, which does not control for size, book-to-market or momentum effects, while Renneboog *et al.* (2008b) allow for time-varying betas in their conditional model but disregard the possibility that performance itself may be time-varying. In fact, according to Ferson, Sarkissian and Simin

[5] In a subsequent work, Cortez *et al.* (*forthcoming*) have analysed the performance of SRI funds investing globally using conditional multi-factor models, but their sample included only 2 French funds.

(2008), if the conditional model is estimated without the time-varying alpha term, conditional betas may be biased.

Second, although the construction of an appropriate control group of conventional mutual funds is crucial to assess the performance of SRI funds, the studies of Amenc and Le Sourd (2010), Cortez *et al.* (2009) and Le Sourd (2010) evaluate the performance of French SRI funds only in relation to market indices and do not make any comparisons between SRI and conventional funds. On the other hand, Renneboog *et al.* (2008b) use samples of conventional funds that are not characteristics-matched, meaning that their results may be influenced by specific fund characteristics.

Third, although several recent studies have reported significant home biases from international SRI funds (e.g.: Bauer *et al.*, 2006; Cortez *et al.*, *forthcoming*; Gregory & Whittaker, 2007), none of these studies controlled for this issue and all of them use samples that are mainly composed by funds investing outside France.

2.2 Performance Persistence

The performance persistence of conventional mutual funds has been well documented in the finance literature. However, empirical evidence is mixed. In some cases, conclusions differ depending on the time horizon used, with some studies documenting fund return predictability over short-term horizons (e.g.: Brown & Goetzmann, 1995; Hendricks, Patel & Zeckhauser, 1993) and others over longer term horizons (e.g.: Allen & Tan, 1999; Elton, Gruber & Blake, 1996; Grinblatt & Titman, 1992). In other cases, the conclusions depend on the sample period.[6] Additionally, while some studies found evidence of performance persistence only for the best performing funds (e.g.: Elton *et al.*, 1996; Hendricks *et al.*, 1993), most studies have found it essentially a phenomenon driven by the worst performing funds (e.g.: Brown, Goetzmann, Ibbotson & Ross, 1992; Christopherson, Ferson & Glassman, 1998; Gruber, 1996; Silva, Cortez & Armada, 2005).

On the other hand, several studies (e.g.: Malkiel, 1995) argue that findings on performance persistence could be a result of data related problems, particularly survivorship bias. Authors like Brown *et al.* (1992) suggest that survivorship-biased samples can lead to the appearance of performance persistence when, in fact, there is none. In contrast, after

[6] For example, Malkiel (1995) found evidence of persistence in the US market during the 1970s but not during the 1980s, while Rhodes (2000) found that the performance persistence of UK unit trusts was substantially weaker in the 1990s than in the early 1980s.

empirically comparing their results for survivor-only samples and samples including all funds, Hendricks *et al.* (1993) and Carhart (1997) have both found weaker evidence of persistence in the former. In fact, Carpenter and Lynch (1999) showed that when survival depends on performance over several periods, survivorship bias can create reversal effects and lead to no evidence of persistence. In this way, while some authors suggest that survivorship bias creates an upward bias in measures of performance persistence, others point in the opposite direction.

To the best of our knowledge, the only study on the performance persistence of SRI funds is that of Gregory and Whittaker (2007), which focused on the performance persistence of a sample of 32 UK SRI funds (20 investing in domestic equities and 12 in international equities) relative to a control group of 160 conventional funds, matched on age and investment category, over the period of January 1989 to December 2002. Gregory and Whittaker (2007) examined persistence at several different ranking and evaluation periods and by means of different methodologies, such as tests for differences in performance between top and bottom-ranked portfolios and contingency tables. Overall, their results support the existence of positive performance persistence at the 6, 12 and 36 month horizons, especially when using the test for differences in performance, but mainly for their domestic fund samples. Their conclusions on the existence of persistence hold when funds are ranked and evaluated on the basis of the Fama and French (1993, 1996) 3-factor model or the Carhart (1997) 4-factor model, but not when using absolute (excess) returns, meaning that conclusions on the degree of persistence seem to depend on the performance metric chosen. Additionally, and most importantly, the authors found significant differences between the persistence of SRI and conventional funds: the difference between funds with good past performance and bad past performance was considerably higher for SRI funds than for conventional funds.

3. Performance Evaluation Models

3.1 Overall Performance

To evaluate fund performance and, subsequently, performance persistence, we use unconditional and conditional versions of a 5-factor model, which incorporates an additional local factor into the well-known Carhart (1997) 4-factor model. Since we are dealing with French funds with an European investment universe, this specification allows us to take

potential home biases into account. In this way, the unconditional 5-factor model is based on the following regression:

$$r_{p,t} = \alpha_p + \beta_p\, r_{m,t} + \beta_{1p}\mathrm{SMB}_t + \beta_{2p}\,\mathrm{HML}_t + \beta_{3p}\,\mathrm{MOM}_t + \beta_{4p}\left(r_{lm,t} - r_{m,t}\right) + \varepsilon_{p,t} \qquad [1]$$

where $r_{p,t}$ represents the excess return of portfolio *p* over period *t*, $r_{m,t}$ represents the market's excess return during the same period, β_p is the systematic risk of the portfolio, SMB_t is the return difference between a portfolio of small caps and a portfolio of large caps, HML_t is the return difference between a portfolio of high book-to-market stocks and a portfolio of low book-to-market stocks, MOM_t is the return difference between a portfolio of past winners and a portfolio of past losers, $\left(r_{lm,t} - r_{m,t}\right)$ is the return difference between a local (in this case, French) market index and a European market index and $\varepsilon_{p,t}$ is a residual term. A statistically significant positive (negative) alpha indicates superior (inferior) performance.

Since expected returns and risk are, in reality, time-varying, unconditional models can generate biased performance estimates, particularly when fund managers exhibit market timing abilities or follow dynamic investment strategies that result in time-varying risk (e.g.: Dybvig & Ross, 1985; Grinblatt & Titman, 1989; Jensen, 1972). In this way, following Ferson and Schadt (1996), we also use a partial conditional version of our 5-factor model, in which betas are allowed to vary over time as linear functions of a vector of predetermined information variables, Z_{t-1}. This vector represents the public information available at time *t-1* relevant for predicting returns at time *t*. In this way, our partial conditional 5-factor model is based on the following regression:

$$\begin{aligned} r_{p,t} = {} & \alpha_p + \beta_{0p}\, r_{m,t} + \beta'_p\left(z_{t-1}\, r_{m,t}\right) + \beta_{1p}\mathrm{SMB}_t + \beta'_{1p}\left(z_{t-1}\,\mathrm{SMB}_t\right) + \beta_{2p}\mathrm{HML}_t + \beta'_{2p}\left(z_{t-1}\,\mathrm{HML}_t\right) + \\ & + \beta_{3p}\mathrm{MOM}_t + \beta'_{3p}\left(z_{t-1}\,\mathrm{MOM}_t\right) + \beta_{4p}\left(r_{lm,t} - r_{m,t}\right) + \beta'_{4p}\left[z_{t-1}\cdot\left(r_{lm,t} - r_{m,t}\right)\right] + \varepsilon_{p,t} \end{aligned} \qquad [2]$$

where z_{t-1} is a vector of the deviations of Z_{t-1} from the (unconditional) average values, $\beta'_p, \beta'_{1p}, \beta'_{2p}, \beta'_{3p}$ and β'_{4p} are vectors that measure the relationship between the conditional betas and the information variables, and $\beta_{0p}, \beta_{1p}, \beta_{2p}, \beta_{3p}$ and β_{4p} are average betas, which represent the (unconditional) mean of the conditional betas. In this model, if the

manager uses only publicly available information, his/her conditional alpha will be zero, consistent with the semi-strong form of market efficiency of Fama (1970).

Furthermore, if alphas are also allowed to vary over time as a linear function of vector Z_{t-1}, as proposed by Christopherson *et al.* (1998), the partial conditional model can be extended to its full conditional version, where both alphas and betas are time-varying. The full conditional 5-factor version writes as:

$$r_{p,t} = \alpha_{0p} + A_p' z_{t-1} + \beta_{0p} r_{m,t} + \beta_p'(z_{t-1} r_{m,t}) + \beta_{1p}\mathrm{SMB}_t + \beta_{1p}'(z_{t-1}\mathrm{SMB}_t) + \beta_{2p}\mathrm{HML}_t + \beta_{2p}'(z_{t-1}\mathrm{HML}_t) +$$
$$+ \beta_{3p}\mathrm{MOM}_t + \beta_{3p}'(z_{t-1}\mathrm{MOM}_t) + \beta_{4p}(r_{lm,t} - r_{m,t}) + \beta_{4p}'[z_{t-1}\cdot(r_{lm,t} - r_{m,t})] + \varepsilon_{p,t} \quad [3]$$

where α_{0p} is an average alpha and vector A_p' measures the relationship between the conditional alphas and the information variables.[7]

3.2 Selectivity and Market Timing

To decompose overall performance in its timing and selectivity components, we use conditional multi-factor versions of the Treynor and Mazuy (1966) and the Henriksson and Merton (1981) models, the two most widely used market timing models in finance literature.

Our conditional 5-factor version of the Treynor and Mazuy (1966) model is based on Ferson and Schadt (1996), Bollen and Busse (2001) and Ferson and Qian (2004). First, combining the conditional approach of Ferson and Schadt (1996) with the multi-factor approach of Bollen and Busse (2001), we add the quadratic term of the original Treynor and Mazuy (1966) regression to equation [2]. Then, following Ferson and Qian (2004), we allow the timing coefficient itself to vary over time as a function of the predetermined information variables and, consequently, replace the fixed timing coefficient of the original regression for a time-varying one. This yields the following market timing model:

$$r_{p,t} = \alpha_p + \beta_{0p} r_{m,t} + \beta_{0p}'(z_{t-1} r_{m,t}) + \beta_{1p}\mathrm{SMB}_t + \beta_{1p}'(z_{t-1}\mathrm{SMB}_t) + \beta_{2p}\mathrm{HML}_t + \beta_{2p}'(z_{t-1}\mathrm{HML}_t) +$$
$$+ \beta_{3p}\mathrm{MOM}_t + \beta_{3p}'(z_{t-1}\mathrm{MOM}_t) + \beta_{4p}(r_{lm,t} - r_{m,t}) + \beta_{4p}'[z_{t-1}\cdot(r_{lm,t} - r_{m,t})] + \gamma_{0p} r_{m,t}^{\,2} + \gamma'_{0p}(z_{t-1} r_{m,t}^{\,2}) + \varepsilon_{p,t} \quad [4]$$

[7] With L information variables and K factors, regression [2] will have a total of $(L + 1) \times K + 1$ regressors, while regression [3] will include an additional L regressors, in a total of $(L + 1) \times (K + 1)$.

where α_p measures conditional selectivity, γ_{0p} measures conditional market timing, vector γ'_{0p} captures the variability (if it exists) in the manager's market timing ability over different states of the economy and $\varepsilon_{p,t}$ is an error term.[8]

For the conditional 5-factor version of the Henriksson and Merton (1981) model we use a similar procedure. First, we pick up the conditional version of this model developed by Ferson and Schadt (1996) and extend it to a multi-factor framework by adding the additional size, book-to-market, momentum and local factors, as well as their cross products with each of the predetermined information variables. As a result, we obtain the following regression:

$$r_{p,t} = \alpha_p + b_{dp}\, r_{m,t} + \beta'_{dp}\left(z_{t-1}\, r_{m,t}\right) + \beta_{1p}\mathrm{SMB}_t + \beta'_{1p}\left(z_{t-1}\,\mathrm{SMB}_t\right) + \beta_{2p}\mathrm{HML}_t + \beta'_{2p}\left(z_{t-1}\,\mathrm{HML}_t\right) + \beta_{3p}\mathrm{MOM}_t +$$
$$+ \beta'_{3p}\left(z_{t-1}\,\mathrm{MOM}_t\right) + \beta_{4p}\left(r_{lm,t} - r_{m,t}\right) + \beta'_{4p}\left[z_{t-1}\cdot\left(r_{lm,t} - r_{m,t}\right)\right] + \gamma_p\left(D_t\, r_{m,t}\right) + \Delta'_p\left(z_{t-1}\, D_t\, r_{m,t}\right) + \varepsilon_{p,t} \qquad [5]$$

where α_p measures conditional selectivity and γ_p measures conditional market timing. D_t is a dummy variable that equals one if the difference between the market excess return and the conditional mean of that excess return, $r_{m,t} - E\left(r_{m,t}|z_{t-1}\right)$, is positive, and zero otherwise. The conditional mean is estimated by regressing the market excess return on the lagged information variables. In this way, following Ferson and Schadt (1996), we suppose that the manager attempts to forecast the deviation from the expected excess return, conditional on the public information variables. If this forecast is positive, the portfolio conditional beta will be of $\beta_{up}(Z_{t-1}) = b_{up} + \beta'_{up}\, z_{t-1}$, while if this forecast is negative the portfolio conditional beta will be of $\beta_{dp}(Z_{t-1}) = b_{dp} + \beta'_{dp}\, z_{t-1}$. Therefore, in regression [5], $\gamma_p = b_{up} - b_{dp}$ and $\Delta'_p = \beta_{up} - \beta_{dp}$. Under the null hypothesis of no market timing ability, coefficients γ_p and Δ'_p will be zero.

[8] In general, a model with *L* information variables and *K* factors will have (*L* + 1) × (*K* + 1) + 1 regressors (a constant, the *K* factors, the cross-products of the *L* information variables with the *K* factors, the quadratic term and the cross-products of the quadratic term with each of the *L* information variables).

4. Data

4.1 Sample

To identify existing French SRI funds we used the "SRI funds service", provided by Vigeo and Morningstar Europe,[9] which classifies funds according to Morningstar categories. Since the most important segment of the French SRI fund market is clearly the one investing at a European level, we focus our analysis in the fund categories which invest in European or Eurozone equities. Our sample period covers January 2000 to December 2008.

By the end of the sample period, the "SRI funds service" reported the existence of 50 SRI French funds investing at a European level, divided in the following Morningstar categories: "Europe Large Cap Blend Equity" (11 funds), "Europe Large Cap Growth Equity" (1 fund), "Europe Large Cap Value Equity" (3 funds), "Europe Mid Cap Equity" (1 fund), "Europe Small Cap Equity" (1 fund), "Eurozone Large Cap Equity" (31 funds) and "Eurozone Mid Cap Equity" (2 funds).[10]

Since we want to focus our analysis on diversified, actively managed retail funds, we verified each fund's investment policy, through information available at the "SRI funds service" or, whenever necessary, from the individual funds' prospectuses.[11] With this procedure, we identified 4 funds of funds, 1 index fund and 4 institutional funds, which were excluded. In this way, all funds in our samples (both SRI and conventional) are retail funds, directly available to individual investors. Besides, they all have an initial investment amount lower or equal to €5.000. In addition, to avoid duplications, whenever we had an accumulation and an income part of the same fund, only one was included in our sample. One additional fund was excluded on the basis of this criteria. Finally, only funds with records available on Datastream and with at least 24 monthly observations across our sample period were selected, which resulted in the exclusion of another 4 funds. For the remaining funds, we

[9] The free version of this service is available online at http://customer.morningstareurope.com/it/avanzi/fundselect/index_free.aspx, accessed in January 2009.
[10] It should be mentioned that, by the end of December 2008, the "SRI funds service" also reported the existence of 3 French SRI funds investing in Global equity, one of which was an index fund.
[11] The individual funds' prospectuses were obtained from the Morningstar website, the management companies' websites or through the website of the French National Securities Market Commission – Autorité des Marchés Financiers (http://www.amf-france.org).

used the "SRI funds service" to collect their respective inception dates[12] and International Securities Identification Numbers (ISIN).

To be able to create our matched-samples, we used the French Morningstar website[13] to identify all conventional funds available to investors in France within the same investment categories of each of our SRI funds. Then, we collected their inception dates and ISIN. After taking into account the same selection criteria as in the SRI fund sample, we began our matching procedure based on fund age and investment category.[14] In this way, for each SRI fund we selected a portfolio of three conventional funds with the same Morningstar category (i.e., with the same investment universe and style) and inception dates that had to be within 12 months of that of the SRI fund with which they were matched. Despite our efforts, we could not create matched-samples for 3 SRI funds and had to exclude them from our sample as well. As a consequence, our final sample consists of 33 French SRI funds investing in European/Eurozone equities (described in detail in Appendix 1) and 99 characteristics-matched conventional funds.[15]

4.2 Fund Returns, Benchmark Indices and Factors

For each fund in our sample, we began by collecting the end of month total return index from Datastream. Monthly fund returns, including reinvestment of dividends, were continuously compounded and denominated in Euros. Returns are net of operating expenses, but gross of any sales charge, with the risk-free rate being proxied by the 1-month Euribor (Euro Interbank Offered Rate).

To conduct some of our empirical tests, we created two equally-weighted portfolios, one for the SRI funds and another for the conventional funds. Appendix 2 presents some summary statistics for the excess returns of these portfolios. Monthly excess returns are, on average, negative and not normally distributed for both portfolios (according to the Jarque-Bera test statistic). Although mean excess returns are lower for the SRI funds than for their matched-samples, we cannot reject the hypothesis of equal means between the two series at

[12] Therefore, we assume that the inception date provided by the "SRI funds service" is the date when each fund began adopting an SRI investment policy.
[13] Available at http://www.morningstar.fr.
[14] Since we were not able to gather information on each funds' Total Net Assets, we did not match on size. Nevertheless, some studies have shown that size does not seem to have a significant influence on SRI fund performance (e.g.: Gregory *et al.*, 1997; Kreander, Gray, Power & Sinclair, 2005; Renneboog *et al.*, 2008b), unlike age (e.g.: Gregory *et al.*, 1997; Renneboog *et al.*, 2008b). Additionally, matching on size would also have involved a trade-off with the other criteria, and would have inhibited the creation of many of our matched-samples.
[15] Since we were not able to identify non-surviving SRI funds, we recognize that both our SRI and conventional fund samples can suffer from survivorship bias. However, since we also match on fund age, both types of funds will have identical life spans, reason for which we believe this shortcoming won't significantly distort our matched-pairs analysis.

the usual significance levels. Moreover, SRI funds have a higher overall volatility than their peers.

Market returns were also continuously compounded and proxied by the MSCI AC Europe Total Return (TR) index. As additional risk factors, we use a size, a book-to-market, a momentum and a local factor. The small minus big (SMB) factor is the difference in return between a portfolio of small caps, represented by the MSCI AC Europe Small Cap index, and a portfolio of large caps, proxied by the MSCI AC Europe Large Cap index. The high minus low (HML) factor is the difference in return between a portfolio of high book-to-market stocks (value stocks) and a portfolio of low book-to-market stocks (growth stocks), represented by the MSCI AC Europe Value and MSCI AC Europe Growth indices, respectively. Momentum (MOM) is the difference in return between a portfolio of past winners and a portfolio of past losers. Following Banegas, Gillen, Timmermann and Wermers (2009), we constructed a European momentum factor that corresponds to the return difference between the top 6 and the bottom 6 sectors of the 18 Dow Jones Stoxx 600 Supersector indices.[16] Top and bottom sectors were chosen based on their previous 12-month performance, with portfolios being rebalanced on a monthly basis. Finally, the local factor was estimated as the return difference between the MSCI France TR index and the MSCI AC Europe TR index. Data for the construction of all these factors was collected from Datastream.

Appendix 3 presents some summary statistics for the risk factors, as well as their correlation matrix. The results show that the hypothesis of normality is rejected for the market, size and book-to-market factors, whereas the momentum and local factors exhibit a normal distribution according to the Jarque-Bera test. In addition, given the reasonably low correlations between the factors (ranging from -0.4101 to 0.2772), multicollinearity will not significantly affect our results.

4.3 Information Variables

As public information variables we use a set of 1-month lagged instruments that previous studies (e.g.: Avramov & Chordia, 2006; Fama & French, 1989; Pesaran & Timmermann, 1995) have shown useful in predicting stock returns: a measure of the slope of the term structure, the dividend yield of a market index and a default spread. Although we are

[16] Although there are actually 19 Dow Jones Supersector indices, the Real Estate index is only available from 2001.

studying European-based funds, with European investment universes, we use Global information variables, because our (unreported) stock return predictability tests showed that these present a much higher explaining power of stock returns than the European variables.[17] An additional argument to justify the use of global information variables is the increasing degree of integration of financial markets. In this line of reasoning, the SRI fund studies of Cortez *et al.* (2009, *forthcoming*), Schröder (2004) and Liedekerke *et al.* (2007) also use global information variables.

The slope of the term structure variable corresponds to the annualized yield spread between 10-year US Government bonds and 3-month US Treasury bills. The dividend yield variable is the dividend payments in the prior 12 months divided by the current price of the MSCI AC World index. The default spread variable is the difference between the Moody's US BAA-rated and AAA-rated corporate bond yields. Data on these public information variables was obtained from Datastream and MSCI.

To avoid spurious regression biases and also solve non-stationarity problems associated with these variables, they were stochastically detrended by subtracting a trailing moving average of their own past values, as suggested by Campbell (1991) and Ferson, Sarkissian and Simin (2003a). The number of lags used in the detrendings was determined for each individual series, after a detailed study of their characteristics. In this way, to solve the persistence and non-stationarity problems and, simultaneously, try not to lose any long-term relationships that really exist between the variables, each series was stochastically detrended with the maximum number of lags that allowed us to obtain a stationary time series.[18] As a result, we used a 3-month lag for the default spread variable, a 6-month lag for the dividend yield and a 12-month lag for the term structure variable. Another important aspect of this procedure was that it led to first-order autocorrelation coefficients below 0.90, the level in which spurious regressions become a problem, as suggested by Ferson, Sarkissian and Simin (2003b). Furthermore, the information variables were also demeaned, as in Ferson and Schadt (1996), to permit an easier interpretation of the estimated coefficients and minimize scale problems. Appendix 4 presents some summary statistics for the variables, where we can see

[17] The results of the stock return predictability tests are not reported here for reasons of space but are available upon request from the authors. In these tests, we have also analysed the predictive power of another standard predictor variable: the short-term interest rate level. However, our results showed that this variable was the one with the smallest explaining power of stock returns. Moreover, it was highly correlated with the term structure variable, which was clearly the most important of all information variables. Consequently, to keep the correlations between the instruments in levels that avoid multicollinearity concerns, we chose not to use the short-term rate variable on our conditional models.

[18] Consistent with the results of Leite and Cortez (2009), we found that using shorter detrending periods decreases the first-order autocorrelation coefficients of the series and also the correlations between the variables. However, as shown by these authors, this may also compromise the significance of the information variables, meaning that we may lose valuable long-term relationships between the variables if we use too short detrending periods.

that the correlations between the instruments range from 0.2758 to 0.6716. Thus, we should avoid multicollinearity concerns.

5. Empirical Results

5.1 Fund Performance

Table 1 presents the results of applying unconditional and conditional versions of our 5-factor model to the equally-weighted portfolios of SRI and conventional funds. To further enhance comparability we also estimate the results for a "difference" portfolio, constructed by subtracting the returns of the matched-portfolios from the returns of the SRI funds, to explore the differences in performance and investment styles in detail.[19] Our conclusions are six-fold.

[Insert Table 1 here]

First, in terms of model specifications, the results of the Wald tests for the unconditional model confirm the importance of controlling for the additional factors, especially the size and local factors. As expected, the explanatory power of the conditional models is higher than with the unconditional version, with SRI funds presenting higher adjusted R^2's with the full conditional specification and conventional funds with the partial conditional model. The results of the Wald tests clearly show the existence of time-varying betas for both fund groups, but no evidence of time-varying alphas. However, the joint time-variation of alphas and betas cannot be rejected for both fund portfolios, as well as for our "difference" portfolios, which exhibit both time-varying alphas and betas.

Second, in terms of performance estimates, the results of the unconditional model show that both SRI and conventional funds exhibit significantly negative alphas at the 5% level, but differences are not statistically significant. With the partial conditional model, the significant underperformance of French SRI funds investing at a European level, which is consistent with the results of Le Sourd (2010) and Cortez *et al.* (2009), is maintained, but

[19] It is worth to mention that all results reported for the "difference" portfolios are from regressions that present significant *F*-tests at conventional levels.

conventional funds now exhibit neutral performances. As a result, differences in the alphas of both fund groups reach an average of 0.1143% per month and are now significant, although only at the 10% level, in line with the results of Renneboog *et al.* (2008b). In fact, we observe that alpha estimates improve from the unconditional to the partial conditional model and from the latter to the full conditional specification. In the latter case the performance of both fund groups improves considerably and becomes neutral.[20] In this way, unlike Cortez *et al.* (2009), French SRI funds do not present significantly negative alphas after controlling for time-varying alphas and betas. With the full conditional model, differences in performance between French SRI funds and their matched-samples are smaller and not statistically significant. Therefore, although SRI funds perform slightly worse than their matched-samples according to all three models, differences in alphas are not statistically significant in most cases and, especially, in our more robust specification.[21]

Third, under all specifications, French SRI funds have significantly higher market exposures than their conventional peers. This evidence is in contrast with the results of Renneboog *et al.* (2008b), who found no significant differences between the market exposures of French SRI and conventional funds, but is consistent with the results reported by Amenc and Le Sourd (2010) for the period of 2008-2009. In addition, as in Cortez *et al.* (2009), we have also found not only that French SRI funds are more exposed to conventional than to SRI benchmarks, but also that conventional indices have a higher explaining power of SRI fund returns than SRI indices, as we can confirm in Appendix 5. However, in our case, differences are marginal.

Fourth, conventional funds show significant small-cap biases according to all models, whereas SRI funds only exhibit a similar tilt under the unconditional model. This evidence suggests that the small-cap bias found by Le Sourd (2010) for French SRI funds may hold only when unconditional performance evaluation models are used.[22] In clear contrast with most previous studies on SRI funds, conducted in many worldwide markets, French SRI funds are significantly less exposed to small caps than their matched-samples and differences are significant at the 1% level in all models. This is certainly one of the most surprising findings of our study and is also in contrast with the results of Renneboog *et al.* (2008b), who

[20] Therefore, in line with Christopherson *et al.* (1998), the performance of our fund portfolios is significantly better with the full conditional model than with the unconditional model.

[21] It is worth to mention that we have also used unconditional, partial conditional and full conditional versions of both the Carhart (1997) 4-factor model and the Fama and French (1993, 1996) 3-factor model and obtained very similar results. With the 4-factor model, significant differences between the performance of SRI and conventional funds were only found with the partial conditional model and only at the 10% level. On the other hand, with the 3-factor model, none of the differences in performance was statistically significant.

[22] In addition, since all of our funds are classified as "Large Cap" funds, our results seem to uncover some misclassification issues in the Morningstar classification scheme.

found no significant differences in size factor exposures of French SRI and conventional funds, with both fund categories exhibiting clear small-cap biases.

Fifth, we find no significant exposures from both SRI and conventional funds to either the book-to-market or momentum factors. These results are in line with those of Le Sourd (2010), who has also reported an absence of any growth or value tendencies for French SRI funds. Renneboog *et al.* (2008b) have also found no significant exposures to the book-to-market factor for both fund categories and to the momentum factor from the conventional funds. However, they found that French SRI funds had significantly (at the 5% level) negative exposures to the momentum factor, in contrast with our findings. Nevertheless, we do not find any significant differences between French SRI and conventional funds in terms of their exposures to both the book-to-market and momentum factors, in line with the results of this last study.

Sixth, all models show that French SRI and conventional funds are both significantly biased towards local stocks, but differences between the two groups are not statistically significant. Nevertheless, we corroborate previous findings of significant home biases from internationally-oriented SRI funds, in line with the results of Bauer *et al.* (2006), Gregory and Whittaker (2007) and Cortez *et al.* (*forthcoming*), among others.[23]

5.2 Selectivity and Market Timing

Even if we have not found many significant differences between the performance of French SRI funds and their matched-samples, performance metrics used so far have assessed fund managers' overall performance skills only. Hence, despite overall performance being comparable between both fund groups, it is interesting to decompose it into selectivity and timing components and check if these skills are also similar among them or if one group offsets the other. To evaluate and compare the selectivity and market timing abilities of SRI and conventional French fund managers, we use conditional multi-factor versions of the original Treynor and Mazuy (1966) and Henriksson and Merton (1981) models. Our results are presented in Table 2.

[23] We have also analysed if differences in performance and investment styles were somewhat related to market states, but we found no clear evidence of such a relationship. Unlike most fund studies, which identify bull and bear market periods by just looking at the evolution of market returns, we used the econometric algorithm of Pagan and Sossounov (2003) to determine the bull and bear market states across our sample period. Nevertheless, our results showed that the performance of SRI and conventional funds was similar across bull and bear market states and the only difference in terms of investment styles was that French SRI funds seemed less risk-averse than their peers during bull market phases, but presented similar market exposures during bear market phases. In this way, the significantly higher market betas displayed by the SRI funds during our overall sample period seem to be a consequence of their lower risk-aversion during bull market phases. The results of these tests are not reported here for the sake of brevity, but are available upon request from the authors.

[Insert Table 2 here]

At conventional levels, the results of the Wald tests confirm the existence of time-varying betas for both SRI and conventional funds with both the Treynor-Mazuy (TM) and the Henriksson-Merton (HM) model. With the TM model we also find evidence of time-varying timing coefficients for the SRI funds,[24] but not for their matched-samples. However, using the same model, we cannot reject the joint time variation in all coefficients for both fund categories. In addition, our difference portfolios unequivocally (at the 1% level) exhibit both time-varying betas and time-varying timing coefficients, evidence that corroborates the use of our conditional multi-factor models.

With regard to selectivity, Table 2 shows that all estimates are negative, but the only statistically significant coefficient is found for the SRI funds with the TM model, meaning that selectivity estimates are neutral in most cases. If we focus on the estimates of our "difference" portfolios, we can see that French SRI funds significantly underperform their peers under both model specifications. With the TM model the selectivity estimates of the SRI funds are significantly lower (at the 5% level) by approximately 0.17% per month, on average. With the HM model this difference is even higher (approximately 0.22% per month, on average), but only significant at the 10% level. Therefore, it seems like the additional information provided by screening activities does not compensate for the fact that, with a restricted investment universe, undervalued securities should have less importance in absolute terms.

In terms of market timing, it seems that both SRI and conventional fund managers in our samples do not have the ability to successfully time the market, in line with the findings of Renneboog *et al.* (2008b), who have also found little evidence of market timing abilities from French SRI fund managers. With the TM model both timing coefficients are positive, while with the HM model SRI funds present a positive gamma and conventional funds exhibit a negative gamma, although all these coefficients are statistically insignificant. In this way, our results are in line with those of Girard, Rahman and Stone (2007) for US SRI funds. On the other hand, unlike many previous studies on conventional funds (e.g.: Cumby & Glen, 1990; Ferson & Schadt, 1996; Fletcher, 1995; Sawicki & Ong, 2000) and most of the existing

[24] It is worth to mention that these results are in line with those of Ferson and Qian (2004), who report significant time-varying conditional timing abilities for US conventional funds, associated with variables like dividend yields and the slope of the term structure, among others.

studies on SRI mutual funds (e.g.: Ferruz, Muñoz & Vargas, 2010; Ferruz, Muñoz & Vicente, 2010; Gregory & Whittaker, 2007; Kreander, Gray, Power & Sinclair, 2002; Kreander *et al.*, 2005; Renneboog *et al.*, 2008b), we do not find evidence of any significantly negative or "perverse" timing abilities, which possibly reflect some sort of model misspecification. Furthermore, consistent with previous studies on conventional mutual funds (e.g.: Bollen & Busse, 2001; Ferson & Schadt, 1996), the results of the two market timing models are very similar.

However, when we look at the estimates of our "difference" portfolios, we find a very interesting result: French SRI fund managers exhibit significantly better timing abilities than conventional fund managers and this inference in valid with both the TM (at the 5% level) and the HM (at the 10% level) models.[25]

5.3 Performance Persistence

In this section, we assess and compare the performance persistence of French SRI and conventional funds. The methodology we use follows most recent studies on performance persistence and focuses on portfolios of funds sorted by past performance. In fact, after comparing the specification and power of several persistence tests, using alternative return-generating processes, Carpenter and Lynch (1999) conclude that "*both the t-test for the difference between the top and bottom-ranked portfolios without overlapping evaluation periods and the chi-squared test on counts of winners and losers are well specified and powerful*" (Carpenter & Lynch, 1999, p. 342) against the alternatives considered.[26] In addition, they also recognize that difference *t*-tests are more powerful than chi-squared tests,[27] reason for which we chose to use performance-ranked portfolio strategies to assess the persistence phenomenon within our SRI and conventional fund samples.

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[25] Additionally, we have also studied the style timing abilities of French SRI and conventional fund managers. To do this, we followed Lu (2005) and modified our conditional multi-factor versions of the TM and the HM models to allow an investigation of timing abilities not only in relation to the market factor, but also in relation to the size, book-to-market, momentum and local factors. However, we did not find significant differences between French SRI and conventional funds in their abilities to time the size, book-to-market, momentum and local factors. Moreover, in line with our previous inferences, French SRI funds presented significantly (at the 5% level) better market timing abilities than their conventional counterparts in both of our models. The results of these tests are not reported here for reasons of space, but are available upon request.

[26] These alternatives included cross-sectional regressions, another widely used persistence evaluation methodology. In fact, Carpenter and Lynch (1999) showed that "*the t-test for the slope coefficient in the cross-sectional regression of current performance on past performance is neither well specified nor powerful*" (Carpenter & Lynch, 1999, p. 342), reason for which we chose not to use this methodology.

[27] Although Carpenter and Lynch (1999) find that difference *t*-tests are more powerful than chi-squared tests, they also recognize that "*chi-squared tests with one-year ranking and evaluation periods are the most robust to the presence of survivorship bias*" (Carpenter & Lynch, 1999, p. 367), a problem that affects both our SRI and conventional fund samples. Therefore, besides performance-ranked portfolios, we have also used the contingency tables methodology, which is common in the finance literature. However, as in Gregory and Whittaker (2007), the results of these tests were broadly consistent with those obtained with the more powerful difference *t*-tests and are not reported here. Nevertheless, the results of our contingency table analysis (including all z-tests and chi-squared tests) are available upon request.

We begin by ranking all funds in both categories in quartiles,[28] based on their previous 6, 12 and 36-month excess returns (selection period).[29] Funds with the highest (lowest) previous period return go into a portfolio of winners (losers), while the remaining funds are put into the two middle portfolios. Then, we estimate the equally-weighted monthly excess returns for each portfolio over the subsequent 6, 12 and 36 months (evaluation period), i.e., we use symmetrical ranking and evaluation periods. This procedure is followed throughout our entire sample period, generating a time series of monthly excess returns on all four quartile portfolios.[30]

The performance of each quartile portfolio was then evaluated using unconditional alphas from our 5-factor model and also both partial and full conditional alphas based on the same model. We use conditional alphas to control for the possibility that performance persistence can also reflect the co-movement between expected returns and risk.[31] To assess persistence, we then measure the difference in performance between the top (Q_1) and bottom (Q_4) portfolios. Under the null hypothesis of no persistence in performance, the performance of portfolio Q_1-Q_4 should equal zero. Our results are presented in Table 3.

[Insert Table 3 here]

As we can see in column 2, there is a sizeable difference in mean excess returns from the Q_1 and Q_4 portfolios, which is considerably higher for the conventional funds than for the SRI funds. For the conventional funds, the monthly excess returns of the quartile portfolios decrease monotonically along portfolio rankings and indicate a considerable annualized spread between upper and lower quartiles of, approximately, 5.16%. For the SRI funds, mean excess returns do not decrease monotonically, with the third quartile presenting a higher return than the second quartile. The annualized spread between past winners and past losers is of only 1.2% approximately, i.e., more than four times smaller than that of the characteristics-matched conventional funds. The pattern in mean monthly excess returns is consistent with

[28] Given the relatively low number of SRI funds in our sample, it would not be feasible to use deciles, as in Carhart (1997), Carpenter and Lynch (1999) or Otten and Bams (2002), among others. In addition, in one of the few studies that used both decile and quartile portfolios, Fletcher and Forbes (2002) reported very similar results between the two in terms of UK unit trust performance persistence.

[29] We use three different time periods in order to analyse if conclusions on performance persistence depend on the evaluation horizon used, as reported by many previous studies on conventional mutual funds.

[30] The time series of monthly excess returns on the quartile portfolios is eight and a half years long (July 2000 to December 2008) with 6-month ranking and evaluation periods, eight years long (January 2001 to December 2008) with the 12-month period and six years long with the 36-month alternative (January 2002 to December 2008). Furthermore, it is worth to mention that the quartile portfolios include only funds with records available throughout the entire ranking and evaluation periods.

[31] In addition, some mutual fund studies (e.g.: Christopherson *et al*., 1998; Christopherson, Ferson & Turner, 1999; Otten & Bams, 2002) show that conditional measures are better able to detect performance persistence than unconditional ones.

significant persistence for the conventional funds, as confirmed by our (unreported) contingency table analysis. For the SRI funds, although the portfolio of past winners (Q_1) has also a higher monthly excess return than the portfolio of past losers (Q_4), we do not find a similar pattern in returns.

To analyse the sensitivity of the persistence phenomenon to different levels of risk and also to the time-variation of risk and performance measures, we applied the unconditional 5-factor model (columns 4 and 5), as well as both partial (columns 6 and 7) and full conditional (columns 8 and 9) versions of the same model to our quartile portfolios. The results of this analysis confirm our previous observations. At the 6-month horizon, the spread between winners and losers (Q_1-Q_4) is relatively small and not statistically significant for the SRI funds in all three model specifications, meaning that they do not exhibit performance persistence. On the contrary, for a 5% level, we find a significantly positive spread between the upper and lower quartiles for the conventional funds in the two conditional models, which is evidence of performance persistence. This spread is considerably high, reaching values of more than 0.40% per month.

Furthermore, these results are robust to the use of several alternative performance evaluation models, such as unconditional and (both partial and full) conditional versions of the Jensen (1968) measure, the Fama and French (1993, 1996) 3-factor model and the Carhart (1997) 4-factor model. The results of these tests, presented in Table 4, show that the difference between top and bottom quartiles is never statistically significant for the SRI funds under all nine alternative performance evaluation models. On the other hand, for the conventional funds, the spread between the portfolio of winners and the portfolio of losers is significant, at the usual levels, for 8 of the 9 alternative models (the only exception is the unconditional 4-factor model). In this way, we do not find evidence of performance persistence for our SRI fund sample, but the persistence phenomenon clearly characterizes their matched-samples.

[Insert Table 4 here]

Table 3 also allows us to see that all quartile portfolios of SRI funds exhibit significantly negative alphas (at the usual levels) with all 5-factor models. As with mean excess returns, there is not a clear pattern in these alphas. With the conditional models, the portfolios of winners outperform the portfolios of losers, but with the unconditional model it's

exactly the opposite, with evidence of reversals in performance. However, none of these spreads between top and bottom portfolios are statistically significant.

For the conventional funds, the alphas of the quartile portfolios exhibit the same monotonic pattern as observed with mean excess returns, with evidence of significant underperformance, at the 5% level, being registered for the two bottom quartiles with the unconditional model or just the bottom quartile with both conditional models. However, no matter what performance evaluation model we use, none of the quartile portfolios presents significantly positive alphas. This means that the performance of the winners-losers portfolio is due to the underperformance of the bottom quartile portfolio and suggests that performance persistence does not reflect superior manager ability. In this way, we do not find evidence of "hot hands" (i.e., persistently out-performing funds). Instead, the persistence in the performance of our conventional fund sample is mostly a consequence of "icy hands", meaning that funds that underperform significantly in one period are most likely to continue to present significantly negative alphas in the following period.

To explain performance persistence in our sample of conventional funds, Table 5 presents the detailed performance and risk estimates for our quartile portfolios using our more robust specification, the full conditional 5-factor model. At the 5% level, the results of the Wald tests clearly confirm the existence of time-varying betas for all quartile portfolios. In addition, none of these rejects the joint time-variation of alphas and betas. Although only one quartile portfolio exhibits time-varying alphas (for a 5% level), we use the full conditional version to avoid biases in the conditional betas, as shown by Ferson *et al.* (2008).[32]

[Insert Table 5 here]

Estimates from the 5-factor model show that the top quartile portfolio of conventional funds has significant positive exposures to the size, book-to-market and local factors, while the bottom quartile portfolio has significant positive exposures to the size and local factors and a significant negative exposure to the momentum factor. This means that both the top and bottom quartile portfolios are exposed to small caps and significantly invested in local securities, but differences are not statistically significant. However, the top quartile is significantly (although only at the 10% level) more exposed to value stocks than the bottom quartile. On the other hand, the bottom quartile is significantly (at the 5% level) more exposed

[32] Anyway, we have also used our partial conditional model and obtained very similar results.

to stocks with poor recent returns than the top quartile. Additionally, funds in the upper quartile have significantly (at the 5% level) lower market exposures than funds in the bottom quartile. Therefore, the spread between the performance of conventional fund portfolios of past winners and past losers is related to their sensitivities to the market, book-to-market and momentum factors.

Since previous studies on performance persistence have shown that conclusions may differ depending on the evaluation horizon used, we have also analysed symmetrical ranking and evaluation periods of 12 and 36 months. Table 6 presents the results of our tests for the 12-month horizon. We can observe that the annualized spread between past winners and past losers in terms of mean excess returns is substantially higher for the conventional funds than for the SRI funds (approximately 3.84% for the conventional funds and 1.2% for the SRI funds). Although not as high as with the 6-month ranking and evaluation periods, this spread is still more than three times smaller for the SRI funds than for the characteristics-matched conventional funds. Once again, only the conventional funds exhibit an almost monotonic decrease in mean monthly excess returns along the portfolio ranking.

[Insert Table 6 here]

At the 12-month horizon, we do not find evidence of performance persistence for the SRI funds, with the spread between winners and losers (Q_1-Q_4) being statistically insignificant in all situations. For the conventional funds, our previous evidence of positive performance persistence is reinforced with the 12-month horizon. In fact, we find statistically significant positive spreads, at the 1% level, between the upper and lower quartiles in all three evaluation models,[33] ranging from 0.24% to 0.30% per month, approximately. Once again, the spread between winners and losers is driven by the underperformance of the bottom quartile portfolio.

The results of our performance persistence tests for the 36-month horizon are presented in Table 7.

[Insert Table 7 here]

[33] In addition, unreported results showed that in all of our nine alternative performance evaluation models, conventional funds exhibited a significant positive spread between the portfolio of winners and the portfolio of losers.

In terms of means excess returns, there is an interesting finding at the 36-month horizon. Now, it is the SRI funds that exhibit a monotonic decrease in mean monthly excess returns, while conventional funds exhibit an almost monotonic pattern. For both fund categories, portfolio 1 outperforms portfolio 4. In addition, the annualized spread between past winners and past losers is much smaller and very similar between SRI and conventional funds (approximately 1.8% and 2.16%, respectively).

Once again, we do not find any significant spreads between the upper and lower quartiles for the SRI funds. For the conventional funds, our previous evidence of positive performance persistence is substantially weakened with the 36-month horizon. At the 5% level, we only find a statistically significant positive spread between top and bottom quartile portfolios with the partial conditional model.[34] Furthermore, differences in performance between upper and lower quartiles are much more similar for SRI and conventional funds. Therefore, expanding the ranking and evaluation periods to 36 months reduces the evidence of significant performance persistence. In line with the findings of Hendricks *et al.* (1993) and Brown and Goetzmann (1995), among others, it looks like persistence is short lived and tends to fade at longer horizons.

Nevertheless, our previous persistence tests have all been focused on quartile portfolios formed on lagged excess returns. Following Carhart (1997) and Gregory and Whittaker (2007), among others, we also assess performance persistence on the basis of alpha-sorted portfolios. Since the number of observations in each 6 or 12 month time period does not allow a robust estimation of alphas, even with an unconditional 1-factor model,[35] we restrict this analysis to the 36-month horizon, as in Carhart (1997). In these tests, we use the same model to rank and estimate performance. Our results are presented in Table 8.

[Insert Table 8 here]

If we compare the results above with those from Table 7, we can see two major differences. First, there is no evidence of positive performance persistence for the SRI funds under both conditional models, in line with our previous findings. However, when funds are ranked and evaluated with the unconditional 5-factor model, there is a significantly positive

[34] In addition, unreported results showed that only three of our nine alternative performance evaluation models (all partial conditional models) continued to exhibit significant positive spreads between the conventional fund portfolios of past winners and past losers. None of the unconditional or full conditional models exhibited significant spreads between top and bottom quartiles.

[35] In fact, even using unconditional Jensen's (1968) alphas and 12-month time periods, many of the *F*-tests for the individual fund regressions failed to be significant at conventional levels.

spread between upper and lower quartile portfolios. Second, there is no evidence of positive performance persistence for the conventional funds, no matter what model is used to sort and evaluate performance. In this way, at the same 36-month horizon, previous evidence of positive performance persistence for the conventional funds, obtained when the quartile portfolios are formed on the basis of lagged excess returns, disappears when we use lagged risk-adjusted measures of performance instead.

Although we find evidence of significant persistence for the SRI funds when using the unconditional 5-factor model, this result can be a consequence of using the same measure to sort and, subsequently, evaluate performance. As Carhart (1997) puts it, "*using the same asset pricing model to sort and estimate performance will also pick up the model bias that appears between ranking and formation periods*" (Carhart, 1997, p. 76). To find out if our inferences remain valid when different models are used to sort and evaluate performance, we performed an additional robustness check. In this test, presented in Appendix 6, we evaluated the performance of the quartile portfolios, sorted on the basis of their previous 36-month unconditional 5-factor alphas, using all three model specifications (i.e., the unconditional and both conditional models). Our results not only showed a clear superiority of the conditional specifications, as confirmed by the results of the Wald tests, but also that the persistence of the SRI funds only holds when they are ranked and evaluated with the same (unconditional 5-factor) model. In fact, when the quartile portfolios are evaluated using conditional models, we find no evidence of significant spreads between upper and lower quartile portfolios.

6. Conclusions

In this paper we have examined the performance and performance persistence of French SRI funds investing in European equities, in comparison with characteristics-matched samples of conventional funds. Our concluding comments can be divided into those concerning overall performance, investment styles, timing abilities and performance persistence.

In terms of overall performance, we find little evidence of statistically significant differences between French SRI and conventional funds for the period of January 2000 to December 2008. Although SRI funds perform slightly worse than their matched-samples according to all of our model specifications, differences in alphas are only significant with the partial conditional model and only at the 10% level. According to our remaining model

specifications, including the more robust full conditional multi-factor model, we find no significant differences in performance.

However, there are some significant differences in the investment styles of SRI and conventional funds. First, French SRI funds present significantly higher market exposures than their conventional peers. Besides, in line with the findings of Bauer *et al.* (2005), Bauer *et al.* (2007) and Cortez *et al.* (2009, *forthcoming*), we find that conventional benchmarks have a higher explaining power of French SRI fund returns than SRI benchmarks. Second, we find that French SRI funds are significantly less exposed to small caps than their matched-samples. This is a surprising finding, since the vast majority of previous SRI fund studies on international markets show that SRI funds are more tilted towards small caps than their conventional peers (e.g.: Bauer *et al.*, 2006; Gregory *et al.*, 1997; Gregory & Whittaker, 2007). We do not find significant differences between both fund groups in terms of their exposures to the book-to-market, momentum and local factors, although both exhibit significant home biases. A possible explanation for the absence of significant differences in these factor loadings may be the use of the "best-in-class" screens, the more common screening approach in the French fund market.

When we decompose overall performance, we find that French SRI funds perform significantly better than conventional funds in terms of market timing and significantly worse in terms of selectivity. Since significant differences between the overall performance of both fund groups are scarce, these results seem to indicate that the selectivity and timing components tend to offset each other. Consistent with the results of Girard *et al.* (2007), but in contrast with Kreander *et al.* (2002, 2005), our results suggest that any weak performance from SRI funds seems to be a result of poor stock selection abilities rather than poor market timing abilities.

In terms of performance persistence, portfolios of funds formed on lagged excess returns show evidence of significant positive persistence for the conventional funds, but not for their SRI counterparts, at the 6 and 12-month horizons. This evidence is robust to the use of many alternative performance evaluation models, with differences in performance between upper and lower quartile portfolios being significantly lower for the SRI funds than for conventional funds in practically all situations. The significant spread found between the performance of conventional fund portfolios' of past winners and past losers is related to their sensitivities to the market, book-to-market and momentum factors. In relation to the bottom quartile, the top quartile is significantly more exposed to value stocks, significantly more exposed to momentum strategies and significantly less exposed to the market.

At the 36-month horizon, evidence of performance persistence is weakened, but we still find significant positive differences between upper and lower quartiles for the conventional funds when using return-sorted portfolios. At this longer-term horizon, differences in performance between upper and lower quartile portfolios are much more similar between SRI and conventional funds. However, when we use alpha-sorted portfolios, practically all previous evidence of performance persistence at this horizon is removed.

As in Gregory and Whittaker (2007), we also find significant differences between the persistence of SRI and conventional funds, but in the opposite direction of their findings. In fact, when using return-sorted portfolios, the difference between funds with good past performance and bad past performance is, in practically all situations, significantly higher for the conventional funds than for the SRI funds, especially at the shorter-term horizons.

Overall, our results suggest that the performance of French SRI funds is comparable to that of their conventional peers. Hence, French socially responsible investors do not need to sacrifice financial performance in order to satisfy their environmental, social and ethical concerns. Nevertheless, we find evidence of significant differences in the performance persistence, investment styles and timing abilities of French SRI and conventional funds.

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Tables

Table 1 – Performance and Risk Estimates of French SRI and Conventional Funds

This table presents estimates of performance (alphas and average conditional alphas expressed in percentage) and risk (betas and average conditional betas) for the equally-weighted portfolio of SRI funds and the characteristics-matched portfolio of conventional funds using three 5-factor models: the unconditional model of equation [1], presented in Panel A, the partial conditional model (with time-varying betas only) of equation [2], presented in Panel B, and the full conditional model (with time-varying alphas and betas) of equation [3], presented in Panel C. *Difference* is a portfolio constructed by subtracting the returns of the matched portfolios from the returns of the SRI funds. $r_{m,t}$ is the excess return of the MSCI AC Europe TR index. SMB_t, HML_t and MOM_t are factor-mimicking portfolios for the size, book-to-market and momentum factors, respectively. $r_{lm,t} - r_{m,t}$ is the return difference between the local (French) market index and the European market index used as benchmark. The predetermined information variables are the default spread, the dividend yield and the slope of the term structure. All these variables are demeaned, lagged 1-month and stochastically detrended by subtracting a trailing moving average of their own past values. *Wald* corresponds to the probability values of the χ-square statistic of the Newey and West (1987) Wald test for the null hypothesis that the coefficients of the size, book-to-market, momentum and local factors are jointly equal to zero. W_1, W_2 and W_3 correspond to the probability values of the χ-square statistic of the Newey and West (1987) Wald test on the existence of time-varying alphas, time-varying betas and the joint time-variation in alphas and betas, respectively. R^2 *adj.* is the adjusted coefficient of determination. The asterisks are used to represent the statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroskedasticity and autocorrelation adjusted errors (following Newey and West, 1987).

Panel A: Unconditional 5-Factor Model								
	α_p	$\beta_{p\,(MKT)}$	$\beta_{1p\,(SMB)}$	$\beta_{2p\,(HML)}$	$\beta_{3p\,(MOM)}$	$\beta_{4p\,(HBIAS)}$	*Wald*	R^2 *adj.*
SRI Funds	-0.2488 ***	0.9687 ***	0.1111 **	0.0134	-0.0422	0.5265 ***	0.0000	96.67%
Matched-Sample	-0.1736 **	0.9263 ***	0.2127 ***	0.0320	-0.0231	0.5179 ***	0.0000	96.83%
Difference	-0.0752	0.0424 ***	-0.1016 ***	-0.0187	-0.0191	0.0086	0.0000	29.67%
Panel B: Partial Conditional 5-Factor Model								
	α_p	$\beta_{p\,(MKT)}$	$\beta_{1p\,(SMB)}$	$\beta_{2p\,(HML)}$	$\beta_{3p\,(MOM)}$	$\beta_{4p\,(HBIAS)}$	W_2	R^2 *adj.*
SRI Funds	-0.2367 ***	0.9680 ***	0.0640	0.0508	-0.0022	0.4242 ***	0.0000	96.73%
Matched-Sample	-0.1223	0.9275 ***	0.2035 ***	0.0458	-0.0183	0.4438 ***	0.0000	96.99%
Difference	-0.1143 *	0.0405 ***	-0.1395 ***	0.0050	0.0161	-0.0195	0.0000	41.73%
Panel C: Full Conditional 5-Factor Model										
	α_{0p}	$\beta_{p\,(MKT)}$	$\beta_{1p\,(SMB)}$	$\beta_{2p\,(HML)}$	$\beta_{3p\,(MOM)}$	$\beta_{4p\,(HBIAS)}$	W_1	W_2	W_3	R^2 *adj.*
SRI Funds	-0.1347	0.9795 ***	0.0767	0.0045	-0.0199	0.4145 ***	0.1223	0.0000	0.0000	96.85%
Matched-Sample	-0.0809	0.9357 ***	0.2177 ***	0.0325	-0.0280	0.4374 ***	0.6769	0.0021	0.0000	96.94%
Difference	-0.0539	0.0438 ***	-0.1410 ***	-0.0280	0.0081	-0.0229	0.0163	0.0000	0.0000	47.54%

Table 2 – Selectivity and Market Timing Abilities of French SRI and Conventional Funds

This table presents estimates of estimates of selectivity (alphas expressed in percentage) and market timing (gammas and average conditional gammas) for the portfolio of SRI funds and the characteristics-matched portfolio of conventional funds, using two model specifications: (1) the conditional 5-factor version of the Treynor-Mazuy Model of equation [4], presented in Panel A; (2) the conditional 5-factor version of the Henriksson-Merton Model of equation [5], presented in Panel B. $r_{m,t}$ is the excess return of the MSCI AC Europe TR index. SMB_t, HML_t and MOM_t are factor-mimicking portfolios for the size, book-to-market and momentum factors, respectively. $r_{lm,t} - r_{m,t}$ is the return difference between the local market index and the European market index used as benchmark. The predetermined information variables are the default spread, the dividend yield and the slope of the term structure. All these variables are demeaned, lagged 1-month and stochastically detrended by subtracting a trailing moving average of their own past values. W_1, W_2 and W_3 are the probability values of the χ-square statistic of the Newey and West (1987) Wald test on the existence of time-varying betas (for the 5 factors), time-varying market timing coefficients and the joint time-variation in all coefficients, respectively. R^2 *adj.* is the adjusted coefficient of determination. The asterisks are used to represent the statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroskedasticity and autocorrelation adjusted errors (following Newey and West, 1987).

Panel A: Conditional Multi-Factor Treynor-Mazuy Model						
	α_p	γ_{0p}	W_1	W_2	W_3	R^2 *adj.*
SRI Funds	-0.2676 **	0.4612	0.0029	0.0527	0.0000	96.83%
Matched-Sample	-0.1011	0.0151	0.0622	0.5321	0.0000	96.93%
Difference	-0.1665 **	0.4461 **	0.0000	0.0006	0.0000	44.84%
Panel B: Conditional Multi-Factor Henriksson-Merton Model						
	α_p	γ_p	W_1			R^2 *adj.*
SRI Funds	-0.2639	0.0712	0.0000			96.90%
Matched-Sample	-0.0396	-0.0257	0.0000			96.96%
Difference	-0.2244 *	0.0969 *	0.0000			46.51%

Table 3 – Performance Persistence: Quartile Portfolios Formed on Lagged 6-Month Returns

In this table all equally-weighted portfolios of SRI and conventional funds are ranked in quartiles on the basis of their previous 6-month excess returns. Funds with the highest previous 6-month return go into portfolio Q1 (winners), while funds with the lowest previous 6-month return go into portfolio Q4 (losers). The remaining funds are put into the two middle portfolios (Q2 and Q3). Columns 2 and 3 present some descriptive statistics for the quartile portfolios, specifically their monthly excess return (in relation to the risk-free rate, proxied by the 1-month Euribor) and standard deviation. Columns 4 and 5 present the results for the unconditional 5-factor model of equation [5.1], columns 6 and 7 the partial conditional 5-factor model of equation [5.2] and columns 8 and 9 the full conditional 5-factor model of equation [5.3] (alphas and average conditional alphas expressed in percentage). The bottom row of the table reports the results for a zero-cost portfolio (Q_1-Q_4) which is long in the top quartile portfolio and short in the bottom quartile portfolio of funds. R^2 *adj.* is the adjusted coefficient of determination. The asterisks are used to represent the statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroskedasticity and autocorrelation adjusted errors (following Newey and West, 1987). Panel A presents the results for the SRI funds, while Panel B refers to the characteristics-matched conventional funds.

Panel A: SRI Funds								
			Unconditional 5-Factor Model		**Partial Conditional 5-Factor Model**		**Full Conditional 5-Factor Model**	
	Monthly Excess Return	**Standard Deviation**	α_p	R^2 *Adj.*	α_p	R^2 *Adj.*	α_{0p}	R^2 *Adj.*
Q1 (Winners)	-0.85%	5.06%	-0.2354 **	96.10%	-0.2194 **	96.61%	-0.1758 *	96.52%
Q2	-0.94%	5.19%	-0.3265 ***	96.34%	-0.3012 ***	96.39%	-0.2054 **	96.45%
Q3	-0.86%	5.43%	-0.1739 **	96.80%	-0.2514 **	97.24%	-0.1957 *	97.28%
Q4 (Losers)	-0.95%	5.55%	-0.2130 **	94.66%	-0.2312 **	95.06%	-0.1838 *	95.03%
Q1-Q4 spread	0.10%	1.30%	-0.0224	20.15%	0.0118	27.92%	0.0081	26.90%
Panel B: Conventional Funds								
			Unconditional 5-Factor Model		**Partial Conditional 5-Factor Model**		**Full Conditional 5-Factor Model**	
	Monthly Excess Return	**Standard Deviation**	α_p	R^2 *Adj.*	α_p	R^2 *Adj.*	α_{0p}	R^2 *Adj.*
Q1 (Winners)	-0.57%	4.95%	-0.0735	91.89%	0.0882	91.75%	0.0458	91.47%
Q2	-0.72%	4.99%	-0.1054	96.66%	-0.0832	96.96%	-0.0295	96.90%
Q3	-0.84%	5.26%	-0.1901 **	97.16%	-0.1516 *	97.31%	-0.1002	97.28%
Q4 (Losers)	-0.99%	5.45%	-0.3374 ***	94.55%	-0.3696 ***	94.77%	-0.3552 **	94.82%
Q1-Q4 spread	0.43%	1.83%	0.2639	12.89%	0.4578 **	19.39%	0.4010 **	18.73%

Table 4 – Performance Persistence: Quartile Portfolios Formed on Lagged 6-Month Returns with Alternative Evaluation Models

This table presents the results for the zero-cost portfolios (Q_1-Q_4), which are long in the top quartile portfolio and short in the bottom quartile portfolio (alphas and average conditional alphas expressed in percentage), using alternative performance evaluation models.[36] Specifically, we use unconditional, partial conditional and full conditional versions of the Jensen (1968) measure, the Fama and French (1993, 1996) 3-factor model and the Carhart (1997) 4-factor model. Funds were ranked in quartiles on the basis of their previous 6-month excess returns. R^2 *adj.* is the adjusted coefficient of determination. The asterisks are used to represent the statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroskedasticity and autocorrelation adjusted errors (following Newey and West, 1987). Panel A presents the results for the SRI funds and Panel B for the characteristics-matched conventional funds.

Panel A: SRI Funds						
	Unconditional 4-Factor Model		**Unconditional 3-Factor Model**		**Unconditional 1-Factor Model**	
	α_p	R^2 *Adj.*	α_p	R^2 *Adj.*	α_p	R^2 *Adj.*
Q1-Q4 spread	-0.0287	20.41%	0.0213	11.10%	0.0411	9.15%
	Partial Conditional 4-Factor Model		**Partial Conditional 3-Factor Model**		**Partial Conditional 1-Factor Model**	
	α_p	R^2 *Adj.*	α_p	R^2 *Adj.*	α_p	R^2 *Adj.*
Q1-Q4 spread	-0.0200	26.70%	-0.0257	23.39%	-0.0552	16.08%
	Full Conditional 4-Factor Model		**Full Conditional 3-Factor Model**		**Full Conditional 1-Factor Model**	
	α_{0p}	R^2 *Adj.*	α_{0p}	R^2 *Adj.*	α_{0p}	R^2 *Adj.*
Q1-Q4 spread	-0.0104	26.05%	-0.0280	23.06%	-0.0747	15.58%
Panel B: Conventional Funds						
	Unconditional 4-Factor Model		**Unconditional 3-Factor Model**		**Unconditional 1-Factor Model**	
	α_p	R^2 *Adj.*	α_p	R^2 *Adj.*	α_p	R^2 *Adj.*
Q1-Q4 spread	0.2589	13.61%	0.3069 *	9.78%	0.3486 **	8.38%
	Partial Conditional 4-Factor Model		**Partial Conditional 3-Factor Model**		**Partial Conditional 1-Factor Model**	
	α_p	R^2 *Adj.*	α_p	R^2 *Adj.*	α_p	R^2 *Adj.*
Q1-Q4 spread	0.4305 **	18.41%	0.4442 **	15.32%	0.4157 ***	15.86%
	Full Conditional 4-Factor Model		**Full Conditional 3-Factor Model**		**Full Conditional 1-Factor Model**	
	α_{0p}	R^2 *Adj.*	α_{0p}	R^2 *Adj.*	α_{0p}	R^2 *Adj.*
Q1-Q4 spread	0.3624 **	18.34%	0.4326 **	14.65%	0.3767 ***	16.72%

[36] It is important to mention that none of the *F*-tests for all these regressions failed to be significant at conventional levels.

Table 5 – Performance and Risk Estimates of Quartile Portfolios Formed on Lagged 6-Month Returns

In this table all equally-weighted portfolios of SRI and conventional funds are ranked in quartiles on the basis of their previous 6-month excess returns. Funds with the highest previous 6-month return go into portfolio Q1 (winners), while funds with the lowest previous 6-month return go into portfolio Q4 (losers). The remaining funds are put into the two middle portfolios (Q2 and Q3). Columns 2 to 7 present estimates of performance (average conditional alphas expressed in percentage) and risk (average conditional betas) for each quartile using the full conditional 5-factor model of equation [3]. $r_{m,t}$ is the excess return of the MSCI AC Europe TR index. SMB_t, HML_t and MOM_t are factor-mimicking portfolios for the size, book-to-market and momentum factors, respectively. $r_{lm,t} - r_{m,t}$ is the return difference between the local (French) market index and the European market index used as benchmark. The predetermined information variables are the default spread (DS), the dividend yield (DY) and the slope of the term structure (TS). All these variables are demeaned, lagged 1-month and stochastically detrended by subtracting a trailing moving average of their own past values. The bottom row of the table reports the results for a zero-cost portfolio (Q_1-Q_4) which is long in the top quartile portfolio and short in the bottom quartile portfolio of funds. W_1, W_2 and W_3 correspond to the probability values of the χ-square statistic of the Newey and West (1987) Wald test on the existence of time-varying alphas, time-varying betas and the joint time-variation in alphas and betas, respectively. R^2 *adj.* is the adjusted coefficient of determination. The asterisks are used to represent the statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroskedasticity and autocorrelation adjusted errors (following Newey and West, 1987). Panel A presents the results for the SRI funds, while Panel B refers to the characteristics-matched conventional funds.

Panel A: SRI Funds										
	α_{0p}	β_{p} (MKT)	β_{1p} (SMB)	β_{2p} (HML)	β_{3p} (MOM)	β_{4p} (HBIAS)	W_1	W_2	W_3	R^2 *Adj.*
Q1 (Winners)	-0.1758 *	0.9595 ***	0.0474	0.0929	-0.0055	0.3447 ***	0.7322	0.0000	0.0000	96.52%
Q2	-0.2054 **	0.9787 ***	0.0205	0.1388 *	0.0386	0.3970 ***	0.0176	0.0000	0.0000	96.45%
Q3	-0.1957 *	0.9699 ***	-0.0048	0.0825	-0.0322	0.5665 ***	0.1182	0.0000	0.0000	97.28%
Q4 (Losers)	-0.1838 *	0.9687 ***	0.1374	0.1185	-0.0379	0.4620 ***	0.5897	0.0462	0.0000	95.03%
Q1-Q4 spread	0.0081	-0.0091	-0.0900	-0.0256	0.0324	-0.1173	0.4586	0.0007	0.0000	26.90%
Panel B: Conventional Funds										
	α_{0p}	β_{p} (MKT)	β_{1p} (SMB)	β_{2p} (HML)	β_{3p} (MOM)	β_{4p} (HBIAS)	W_1	W_2	W_3	R^2 *Adj.*
Q1 (Winners)	0.0458	0.8817 ***	0.2149 ***	0.2190 ***	0.0499	0.5027 **	0.8298	0.0000	0.0000	91.47%
Q2	-0.0295	0.9220 ***	0.1544 **	0.0255	-0.0319	0.5197 ***	0.3601	0.0000	0.0000	96.90%
Q3	-0.1002	0.9643 ***	0.1231 **	0.0548	-0.0249	0.4954 ***	0.4996	0.0111	0.0000	97.28%
Q4 (Losers)	-0.3552 **	0.9768 ***	0.2367 ***	0.0630	-0.1579 *	0.3957 ***	0.3089	0.0012	0.0000	94.82%
Q1-Q4 spread	0.4010 **	-0.0951 **	-0.0218	0.1560 *	0.2078 **	0.1070	0.2503	0.0000	0.0000	18.73%

Table 6 – Performance Persistence: Quartile Portfolios Formed on Lagged 12-Month Returns

In this table all equally-weighted portfolios of SRI and conventional funds are ranked in quartiles on the basis of their previous 12-month excess returns. Funds with the highest previous 12-month return go into portfolio Q1 (winners), while funds with the lowest previous 12-month return go into portfolio Q4 (losers). The remaining funds are put into the two middle portfolios (Q2 and Q3). Columns 2 and 3 present some descriptive statistics for the quartile portfolios, specifically their monthly excess return (in relation to the risk-free rate, proxied by the 1-month Euribor) and standard deviation. Columns 4 and 5 present the results for the unconditional 5-factor model of equation [1], columns 6 and 7 the partial conditional 5-factor model of equation [2] and columns 8 and 9 the full conditional 5-factor model of equation [3] (alphas and average conditional alphas expressed in percentage). The bottom row of the table reports the results for a zero-cost portfolio (Q_1-Q_4) which is long in the top quartile portfolio and short in the bottom quartile portfolio of funds. R^2 *adj.* is the adjusted coefficient of determination. The asterisks are used to represent the statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroskedasticity and autocorrelation adjusted errors (following Newey and West, 1987). Panel A presents the results for the SRI funds, while Panel B refers to the characteristics-matched conventional funds.

Panel A: SRI Funds								
			Unconditional 5-Factor Model		**Partial Conditional 5-Factor Model**		**Full Conditional 5-Factor Model**	
	Monthly Excess Return	**Standard Deviation**	α_p	R^2 *Adj.*	α_p	R^2 *Adj.*	α_{0p}	R^2 *Adj.*
Q1 (Winners)	-0.86%	5.43%	-0.2794 **	94.49%	-0.2170 **	96.00%	-0.1631	95.91%
Q2	-0.84%	5.37%	-0.1826 **	97.61%	-0.2172 **	97.95%	-0.1922 **	97.88%
Q3	-0.77%	5.47%	-0.1342	96.80%	-0.1527	97.45%	-0.1331	97.42%
Q4 (Losers)	-0.96%	5.50%	-0.2689 ***	96.11%	-0.3211 ***	96.43%	-0.2782 ***	96.38%
Q1-Q4 spread	0.10%	1.20%	-0.0106	26.26%	0.1041	48.46%	0.1151	46.60%
Panel B: Conventional Funds								
			Unconditional 5-Factor Model		**Partial Conditional 5-Factor Model**		**Full Conditional 5-Factor Model**	
	Monthly Excess Return	**Standard Deviation**	α_p	R^2 *Adj.*	α_p	R^2 *Adj.*	α_{0p}	R^2 *Adj.*
Q1 (Winners)	-0.53%	5.23%	0.0070	96.53%	0.0140	96.85%	0.0474	96.75%
Q2	-0.60%	5.30%	-0.0510	91.91%	0.0763	91.20%	0.0245	90.91%
Q3	-0.89%	5.41%	-0.2522 **	95.92%	-0.2488 **	96.08%	-0.1862 *	96.03%
Q4 (Losers)	-0.84%	5.15%	-0.2626 ***	96.96%	-0.2285 **	97.29%	-0.2544 **	97.22%
Q1-Q4 spread	0.32%	1.06%	0.2696 ***	7.07%	0.2425 ***	22.76%	0.3019 ***	21.57%

Table 7 – Performance Persistence: Quartile Portfolios Formed on Lagged 36-Month Returns

In this table all equally-weighted portfolios of SRI and conventional funds are ranked in quartiles on the basis of their previous 36-month excess returns. Funds with the highest previous 36-month return go into portfolio Q1 (winners), while funds with the lowest previous 36-month return go into portfolio Q4 (losers). The remaining funds are put into the two middle portfolios (Q2 and Q3). Columns 2 and 3 present some descriptive statistics for the quartile portfolios, specifically their monthly excess return (in relation to the risk-free rate, proxied by the 1-month Euribor) and standard deviation. Columns 4 and 5 present the results for the unconditional 5-factor model of equation [1], columns 6 and 7 the partial conditional 5-factor model of equation [2] and columns 8 and 9 the full conditional 5-factor model of equation [3] (alphas and average conditional alphas expressed in percentage). The bottom row of the table reports the results for a zero-cost portfolio (Q_1-Q_4) which is long in the top quartile portfolio and short in the bottom quartile portfolio of funds. R^2 *adj.* is the adjusted coefficient of determination. The asterisks are used to represent the statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroskedasticity and autocorrelation adjusted errors (following Newey and West, 1987). Panel A presents the results for the SRI funds, while Panel B refers to the characteristics-matched conventional funds.

Panel A: SRI Funds								
			Unconditional 5-Factor Model		**Partial Conditional 5-Factor Model**		**Full Conditional 5-Factor Model**	
	Monthly Excess Return	**Standard Deviation**	α_p	R^2 *Adj.*	α_p	R^2 *Adj.*	α_{0p}	R^2 *Adj.*
Q1 (Winners)	-0.06%	4.59%	-0.1053	94.73%	-0.0842	96.48%	-0.0193	96.67%
Q2	-0.10%	4.42%	-0.1007	95.88%	-0.1035	96.97%	-0.1021	97.11%
Q3	-0.20%	5.04%	-0.2635 *	95.17%	-0.4304 ***	96.51%	-0.3923 ***	96.33%
Q4 (Losers)	-0.21%	4.48%	-0.2347 **	94.52%	-0.1972	95.17%	-0.0753	95.10%
Q1-Q4 spread	0.15%	0.85%	0.1293	12.98%	0.1130	36.23%	0.0560	41.88%
Panel B: Conventional Funds								
			Unconditional 5-Factor Model		**Partial Conditional 5-Factor Model**		**Full Conditional 5-Factor Model**	
	Monthly Excess Return	**Standard Deviation**	α_p	R^2 *Adj.*	α_p	R^2 *Adj.*	α_{0p}	R^2 *Adj.*
Q1 (Winners)	0.05%	4.63%	-0.0331	96.42%	-0.0137	97.04%	-0.0057	96.87%
Q2	-0.11%	4.55%	-0.1612 *	95.78%	-0.1629	96.77%	-0.1278	96.94%
Q3	-0.07%	4.56%	-0.1094	96.83%	-0.1491	97.21%	-0.1397 *	97.30%
Q4 (Losers)	-0.13%	4.44%	-0.1686 *	96.84%	-0.2003 **	97.35%	-0.1408	97.47%
Q1-Q4 spread	0.18%	0.77%	0.1355 *	42.49%	0.1866 **	47.02%	0.1352	51.49%

Table 8 – Performance Persistence: Quartile Portfolios Formed on Lagged 36-Month Alphas

In this table all equally-weighted portfolios of SRI and conventional funds are ranked in quartiles on the basis of their previous 36-month alpha. Funds are ranked and evaluated with the same performance evaluation model. Funds with the highest previous 36-month alpha go into portfolio Q1 (winners), while funds with the lowest previous 36-month alpha go into portfolio Q4 (losers). The remaining funds are put into the two middle portfolios (Q2 and Q3). Columns 2 and 3 present some descriptive statistics for these quartile portfolios, specifically their monthly excess return (in relation to the risk-free rate, proxied by the 1-month Euribor) and standard deviation. Columns 4 and 5 present the results for the unconditional 5-factor model of equation [1], columns 6 and 7 the partial conditional 5-factor model of equation [2] and columns 8 and 9 the full conditional 5-factor model of equation [3] (alphas and average conditional alphas expressed in percentage). The bottom row of the table reports the results for a zero-cost portfolio (Q_1-Q_4) which is long in the top quartile portfolio and short in the bottom quartile portfolio of funds. R^2 *adj.* is the adjusted coefficient of determination. The asterisks are used to represent the statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroskedasticity and autocorrelation adjusted errors (following Newey and West, 1987). Panel A presents the results for the SRI funds, while Panel B refers to the characteristics-matched conventional funds.

Panel A: SRI Funds						
	Unconditional 5-Factor Model		**Partial Conditional 5-Factor Model**		**Full Conditional 5-Factor Model**	
	α_p	R^2 *Adj.*	α_p	R^2 *Adj.*	α_{0p}	R^2 *Adj.*
Q1 (Winners)	-0.1058	96.41%	-0.1697 *	96.80%	-0.0841	96.11%
Q2	-0.1148	97.09%	-0.0674	98.44%	-0.1760	96.56%
Q3	-0.1665	94.75%	-0.2499 **	96.26%	-0.1933 **	97.32%
Q4 (Losers)	-0.3171 **	92.42%	-0.3282 *	94.64%	-0.1356	96.25%
Q1-Q4 spread	0.2113 **	11.78%	0.1585	19.09%	0.0515	53.80%
Panel B: Conventional Funds						
	Unconditional 5-Factor Model		**Partial Conditional 5-Factor Model**		**Full Conditional 5-Factor Model**	
	α_p	R^2 *Adj.*	α_p	R^2 *Adj.*	α_{0p}	R^2 *Adj.*
Q1 (Winners)	-0.0831	96.54%	-0.0974	96.52%	-0.0934	96.50%
Q2	-0.0427	97.60%	-0.1494 *	98.28%	-0.0780	97.60%
Q3	-0.1675 *	96.23%	-0.1161	97.52%	-0.0659	98.21%
Q4 (Losers)	-0.1831 *	95.94%	-0.1682	96.67%	-0.1694	97.03%
Q1-Q4 spread	0.1000	9.76%	0.0708	39.82%	0.0760	27.35%

Appendices

Appendix 1 – SRI Mutual Funds in the Sample

This appendix describes our sample of French SRI / Ethical mutual funds. For each fund we present the fund name and the respective Morningstar category.

Fund Name	Morningstar Category
AG2R Actions ISR (C)	Eurozone Large-Cap Equity
AGF Euro Actions (C)	Eurozone Large-Cap Equity
AGF Valeurs Durables R (C)	Eurozone Large-Cap Equity
Atout Valeurs Durables C/D	Europe Large-Cap Blend Equity
AXA Euro Valeurs Responsables (C)	Eurozone Large-Cap Equity
BNP Paribas Etheis (D)	Europe Large-Cap Blend Equity
CAAM Actions Durables C/D	Europe Large-Cap Blend Equity
CAAM Activaleurs Durables C/D	Europe Large-Cap Blend Equity
CM-CIC Valeurs Ethiques (C)	Europe Large-Cap Blend Equity
Ecureuil Bénéfices Responsable (D)	Eurozone Large-Cap Equity
Epargne Ethique Actions C/D	Eurozone Large-Cap Equity
Ethique et Partage - CCFD (D)	Europe Large-Cap Blend Equity
Ethis Vitalité (C)	Eurozone Large-Cap Equity
Etoile Partenaires (C)	Eurozone Large-Cap Equity
Europe Gouvernance (C)	Europe Large-Cap Blend Equity
EuroSociétale (C)	Eurozone Large-Cap Equity
Fédéris ISR Euro C/D	Eurozone Large-Cap Equity
Génération Ethique (C)	Eurozone Large-Cap Equity
Groupama Euro Capital Durable Retraite (C)	Eurozone Large-Cap Equity
HSBC Développement Durable A C/D	Eurozone Large-Cap Equity
Insertion-Emplois (D)	Eurozone Large-Cap Equity
LBPAM Actions Développement Dur. R (C)	Eurozone Large-Cap Equity
LCL Actions Dev Durable Euro (C)	Eurozone Large-Cap Equity
Macif Croissance Durable & Solidaire (C)	Eurozone Large-Cap Equity
Macif Croissance Durable (C)	Eurozone Large-Cap Equity
Macif Croissance Durable Europe (C)	Eurozone Large-Cap Equity
MAM Actions Ethique (C)	Eurozone Large-Cap Equity
Natixis Impact Actions Euro R (C)	Eurozone Large-Cap Equity
Objectif Ethique Socialement Responsable C/D	Eurozone Large-Cap Equity
Orsay Croissance Responsable (C)	Eurozone Large-Cap Equity
Regard Actions Developpement Durable (C)	Europe Large-Cap Blend Equity
SGAM Invest Europe Développement Durable (C)	Europe Large-Cap Value Equity
SSgA Europe SRI Alpha Equity P (C)	Europe Large-Cap Value Equity

Appendix 2 – Summary Statistics for the Excess Returns of the French Fund Portfolios

This appendix presents some summary statistics for the monthly excess returns of two equally-weighted portfolios of French funds for the period of January 2000 to December 2008. Column 2 presents the results for the socially responsible (SRI) funds, while Column 3 refers to their matched-samples of conventional funds. The risk-free rate was proxied by the 1-month Euribor. *p-val* (JB) is the probability that the Jarque-Bera statistic exceeds (in absolute value) the observed value under the null hypothesis of a normal distribution.

	SRI Funds	Matched-Samples
Mean	-0.0082	-0.0069
Median	0.0015	0.0026
Maximum	0.1079	0.1037
Minimum	-0.1715	-0.1625
Std. Deviation	0.0520	0.0502
Skewness	-0.9343	-0.9829
Kurtosis	4.1776	4.1910
Jarque-Bera (JB)	21.7486	23.5525
***p-val* (JB)**	0.0000	0.0000
Number of Funds	33	99

Appendix 3 – Summary Statistics for the Risk Factors

This appendix presents some summary statistics for the five risk factors (denominated in Euros) during the period of January 2000 to December 2008. MKT is the monthly excess returns of the MSCI AC Europe TR index (the risk-free rate was proxied by the 1-month Euribor). SMB is the difference in the monthly returns of the MSCI AC Europe Small Cap TR and the MSCI AC Europe Large Cap TR indices, HML is the difference in the monthly returns of the MSCI AC Europe Value TR and the MSCI AC Europe Growth TR indices and MOM is the difference between the monthly returns of the top and bottom six sectors from the 18 Dow Jones Stoxx 600 Supersector indices. HBIAS is the return difference between the MSCI France TR index and the MSCI AC Europe TR index. *p-val* (JB) is the probability that the Jarque-Bera statistic exceeds (in absolute value) the observed value under the null hypothesis of a normal distribution. Table **A** presents some descriptive statistics for the risk factors, while Table **B** presents their correlation matrix.

Table A – Descriptive Statistics

	MKT	SMB	HML	MOM	HBIAS
Mean	-0.0061	0.0012	0.0038	0.0043	0.0005
Median	0.0071	0.0050	0.0035	0.0032	-0.0006
Maximum	0.1040	0.0448	0.0744	0.1047	0.0358
Minimum	-0.1502	-0.0954	-0.0752	-0.1276	-0.0267
Std. Deviation	0.0491	0.0258	0.0210	0.0416	0.0138
Skewness	-0.8908	-0.9821	-0.2723	-0.1031	0.3264
Kurtosis	3.7348	4.3206	5.1764	3.3593	2.7779
Jarque-Bera (JB)	16.5590	24.9761	22.4402	0.7649	2.1198
***p-val* (JB)**	0.0003	0.0000	0.0000	0.6822	0.3465

Table B – Correlation Matrix

	MKT	SMB	HML	MOM	HBIAS
MKT	1.0000				
SMB	0.1651	1.0000			
HML	0.2772	0.0925	1.0000		
MOM	-0.4101	0.1704	-0.3865	1.0000	
HBIAS	0.2451	-0.1719	0.0353	-0.2468	1.0000

Appendix 4 – Summary Statistics for the Information Variables

This appendix presents some summary statistics for the three Global lagged information variables during the period of January 2000 to December 2008: default spread (DS), dividend yield (DY) and slope of the term structure (TS). The instruments were all stochastically detrended by subtracting a trailing moving average of their own past values. Table **A** presents several statistics for these variables (annual, demeaned and expressed in percentage) as well as their first-order autocorrelation coefficients (AC1). Table **B** presents the correlation matrix among the instruments.

Table A – Descriptive Statistics and Autocorrelations

	DS	DY	TS
Mean	0.0000	0.0000	0.0000
Median	-0.0366	-0.0387	-0.1712
Maximum	1.4301	0.8967	1.9029
Minimum	-0.2332	-0.2515	-1.3359
Std. Deviation	0.2152	0.1800	0.8894
Skewness	4.4558	2.4834	0.4032
Kurtosis	27.9430	12.4318	2.0365
AC1	0.2200	0.4970	0.8990

Table B – Correlation Matrix

	DS	DY	TS
DS	1.0000		
DY	0.6716	1.0000	
TS	0.2758	0.2905	1.0000

Appendix 5 – SRI Fund Performance: SRI vs. Conventional Benchmarks

This appendix presents estimates of performance (alphas and average conditional alphas expressed in percentage) and risk (betas and average conditional betas of the market factor) for the equally-weighted portfolio of French SRI funds, using both SRI and conventional benchmarks. The conventional benchmark was proxied by the MSCI AC Europe TR index, whereas the SRI benchmark is the FTSE4GOOD Europe TR index. The performance evaluation models used are the unconditional 5-factor model of equation [1], the partial conditional 5-factor model of equation [2] and the full conditional 5-factor model of equation [3]. R^2 *(adj.)* is the adjusted coefficient of determination. The asterisks are used to represent the statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroskedasticity and autocorrelation adjusted errors (following Newey and West, 1987).

	MSCI AC Europe			FTSE4GOOD Europe		
	α_p / α_{0p}	β_p / β_{0p}	R^2 adj.	α_p / α_{0p}	β_p / β_{0p}	R^2 adj.
Unconditional 5-Factor Model	-0.2488 ***	0.9687 ***	96.67%	-0.1686 *	0.9573 ***	96.01%
Partial Conditional 5-Factor Model	-0.2367 ***	0.9680 ***	96.73%	-0.1773	0.9617 ***	96.08%
Full Conditional 5-Factor Model	-0.1347	0.9795 ***	96.85%	-0.0769	0.9760 ***	96.17%

Appendix 6 – Performance Persistence: Quartile Portfolios Formed on Lagged 36-Month Unconditional 5-Factor Alphas

This appendix presents the results for the zero-cost portfolios (Q_1-Q_4), which are long in the top quartile portfolio and short in the bottom quartile portfolio (alphas and average conditional alphas expressed in percentage), when funds are sorted on the basis of their previous 36-month unconditional 5-factor alpha. The performance evaluation of these portfolios is, subsequently, conducted using three alternative models: the unconditional 5-factor model of equation [5.1], the partial conditional 5-factor model of equation [5.2] and the full conditional 5-factor model of equation [5.3]. *Wald* corresponds to the probability values of the χ-square statistic of the Newey and West (1987) Wald test on the existence of time-varying betas (Column 6) or time-varying alphas and betas (Column 9), respectively. R^2 *adj.* is the adjusted coefficient of determination. The asterisks are used to represent the statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroskedasticity and autocorrelation adjusted errors (following Newey and West, 1987). Panel A presents the results for the SRI funds, while Panel B refers to the characteristics-matched conventional funds.

Panel A: SRI Funds								
	Unconditional 5-Factor Model		**Partial Conditional 5-Factor Model**			**Full Conditional 5-Factor Model**		
	α_p	R^2 *Adj.*	α_p	R^2 *Adj.*	*Wald*	α_{0p}	R^2 *Adj.*	*Wald*
Q1-Q4 spread	0.2113 **	11.78%	0.0679	29.77%	0.0000	0.0175	31.55%	0.0000
Panel B: Conventional Funds								
	Unconditional 5-Factor Model		**Partial Conditional 5-Factor Model**			**Full Conditional 5-Factor Model**		
	α_p	R^2 *Adj.*	α_p	R^2 *Adj.*	*Wald*	α_{0p}	R^2 *Adj.*	*Wald*
Q1-Q4 spread	0.1000	9.76%	0.0939	21.23%	0.0000	0.0123	25.54%	0.0000