Importance of the Fund Management Company in the Performance of Socially Responsible Mutual Funds

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Abstract

We compare the performance of a sample of UK based SRI funds with similar conventional funds using a matched pair analysis based on size, age, investment universe and fund management company (FMC). We find that both the SRI and conventional funds outperform the market index about 50% of the time, even after fees. Sub sample tests show that the SRI funds in our sample perform better in the pre and post financial crisis periods while underperforming during the financial crisis period. Importantly, we find that the FMC plays a major role in the outperformance of both SRI and conventional funds.

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I. INTRODUCTION

Socially responsible investment (SRI) funds, whereby managers filter their investments based on environmental, social and governance (ESG) criteria, originated as a niche complement to conventional portfolio diversification. Since then it has grown by leaps and bounds to become a mainstream strategy in its own right. For example, as of 2015 SRI accounted for 11% ($3.74 trillion out of $33.7 trillion) of assets under management in the US[4] and 27% (£1.235 trillion[5] out of £4.5 trillion[6]) of assets under management in the UK. The sheer size of the SRI market and the increasing attention that a growing number of retail and institutional investors are devoting to the theme makes it important to understand the extent to which SRI affects investment performance. This study looks at a sample of UK based Socially Responsible Investment (SRI) funds and compares their performance with general market indices as well as with similar conventional funds that have been carefully matched with respect to a set of criteria designed to isolate the effect of the socially responsible aspect of the investment.

Theory suggests that since SRI fund managers face a smaller or more restricted investment universe than conventional fund managers, the latter should be able to outperform the former. Studies of whether socially responsible investment (SRI) mutual funds outperform or underperform relative to conventional funds have provided inconclusive results. Numerous studies that find no conclusive evidence of over or underperformance have simply ignored the effect that factors such as fund size, age, investment universe, etc. could have on fund performance. For example, Hamilton et. al. (1993) compared the performance of US SRI funds with randomly selected conventional funds. Luther et. al. (1994) compared the performance of UK SRI funds with the FTSE all share index. Bauer et. al. (2005) compared US, UK and German SRI funds with a large number of conventional funds (both dead and alive) in each country. Other studies, such as Mallin et. al. (1995), Gregory et. al. (1997) and Kreander et. al. (2005), used a matched pair approach whereby they first match the SRI funds with similar conventional funds based on size, age, investment universe and country and then compare their performance. None of these studies, however, consider the effect that the fund management company (FMC) could have on performance. Elton et. al.

[4] The Forum for Sustainable and Responsible Investment is the US (2015)

[5] The UK Sustainable Investment and Finance Association (2015)

[6] Investment Management Association (2015)

(2007), however, have shown that fund returns are closely correlated within fund families. The FMC influences investment practices, access to research, the institutional framework and the ability to attract and retain talented fund managers based not only on remuneration but also on the work culture and intellectual freedom offered to the managers within the organisation. Thus, differences in performance between SRI and conventional funds could be due to the company managing the fund and not the nature of their investment universe.

In this paper we investigate the role that the FMC plays in the relative performance of SRI versus conventional funds. We proceed in two steps. First, to neutralize the effect of the FMC on fund performance, in the matching exercise we include the FMC as a selection criterion along with size, age, investment universe and country. In step 2, we test whether the FMC is a significant determinant of the performance results obtained in step 1.

One salient characteristic of the SRI literature is the use of risk-adjusted returns to measure fund performance in asset pricing models such as the Capital Asset Pricing Model – CAPM (Sharpe, 1966; Lintner, 1965), the Fama-French 3 factor model (Fama & French 1993), the Carhart 4 factor model (Carhart, 1997), etc. in order to calculate excess returns reflected in alpha, which is then compared across SRI and conventional funds as well as the benchmark market index. The shortcomings of these models are well known. They introduce their own set of assumptions into the analysis, such as model specification and the normality of returns. They also neglect the higher moments beyond the mean and variance of return distributions. Since Mandelbrot (1963) raised the issue, it has been well documented that asset returns are generally not normally distributed. Furthermore, it has been shown that the third and the fourth moments of return distributions – skewness and kurtosis respectively – do matter to investors, who show a preference for positive skewness and an aversion to kurtosis (see, Kraus and Litzenberger 1976; Fang and Lai 1997; Dittmar 2002; Post et. al. 2008). Importantly, Clark and Kassimatis (2013) have shown that when all moments of return distributions are considered, diversification opportunities increase significantly.

To address this issue and account for the non-normality that we find in the vast majority of the fund return distributions in our sample, we follow Belghitar et al. (2014) and use marginal conditional stochastic dominance (MCSD) as well as the mean, the variance and the Carhart four factor model to measure performance.[7] Under the general assumption that investors are risk averse, MCSD provides the probabilistic conditions under which all risk-

[7] See Shalit and Yitzhaki (1994) for a derivation of the MCSD methodology.

averse investors prefer one risky asset to another. This preference, or "dominance", reflects the "outperformance" of one asset over another and means that the utility of all risk averse investors can be improved by increasing the share of the dominant asset at the expense of the dominated asset.[8] The advantage of MCSD analysis is that there are no assumptions regarding the model specification, the efficiency of the market portfolio or the distributions of returns. The only assumption is that the investor utility functions are concave, i.e., investors prefer more to less and are risk averse.

Our contribution is threefold. First, this is the first study to account for the non-normality that we find in the distribution of the SRI fund returns. Using MCSD, a methodology that is robust to non-normally distributed returns, we find that both the SRI funds and the sample of carefully matched conventional funds outperform the market index about 50% of the time. These results are robust to management fees and entry loads. They stand in contrast to the absence of outperformance found in most past studies and what we ourselves find in this paper when using the alpha criterion in the Carhart four factor model. Thus MCSD captures what traditional measures could not. In our second contribution, we find that the FMC is a major determinant of outperformance for both SRI and conventional funds. Our third contribution is an outcome of sub sample testing, where we find that the SRI funds in our sample perform better in the pre and post crisis periods while underperforming during the crisis period.

II. DATA AND METHODOLOGY

2.1 Data

In this study we focus on the UK population of fund management companies that provide both conventional and SRI actively managed equity funds. To create the data set we first identify all the SRI mutual funds (also known as unit trusts and investment trusts) listed in the UK. For this we use the Vigeo-Eiris website which lists names and details of UK SRI funds. Vigeo-Eiris defines an SRI fund as "any fund where the choice of investment is influenced by one or more social, environmental or other selection criterion". We exclude index funds since these are passive investments that are not actively managed. We also exclude funds that do not meet the standard threshold of a minimum of 70% of assets

[8] The size of the diversification adjustment can also be calculated (see: Clark and Jokung, 1999 and Clark et. al., 2011). Shalit and Yitzakhi (2010) show how MCSD rules can be easily applied for portfolio choices. In this paper we are only interested in identifying dominance.

invested in shares to qualify as an equity fund in the financial services industry (Kreander et. al. 2005; Renneboog et. al. 2008). We cross check our list for robustness with the list of SRI funds available on the Investment Management Association (IMA) website.

For the matched pair methodology employed in this paper we use management company, age, size, investment objective and investment universe to identify the conventional funds to be matched with the SRI funds. To this end we consult the prospectuses of each SRI fund to determine the relevant information, including investment objectives, countries and sectors where they invest, benchmarks used, size and age. We then use this information to find non-SRI funds run by the same management company with similar characteristics. Fund management companies of SRI funds that have no corresponding conventional fund match are excluded. Appendix 1 lists names of the fund management companies together with the name of the SRI fund and the matched conventional fund. There are 14 fund management companies, of which 23 closely matched pairs of SRI and conventional funds. Of the twenty-three SRI funds in our sample, only two funds use a specialised SRI screen. The Aberdeen Responsible UK Equity fund, run by Aberdeen Asset Management, uses a negative screen to exclude stocks associated with alcohol, tobacco, gambling, weapons and pornography. The Allianz RCM Global Eco Trends fund, run by Allianz Global Investors, uses a positive screen to include only stocks that are associated with the environment and climate change, such as companies engaged in renewable energy or organic farming. The other twenty-one funds use an all-inclusive SRI strategy that employs both positive and negative screens.

For the market index to rank the wealth outcomes in the MCSD procedure, we use the common benchmark index for both types of funds in each pair. Hence each closely matched pair is comprised of one market index, one SRI fund and one conventional fund. Table 1 presents the fund characteristic statistics for the 46 funds used in this study. We use the paired sample sign test to evaluate if there are statistically significant differences between the two sets of fund matching characteristics. The tests for all matching characteristics are not significant at the 5% level, suggesting that the two samples are closely matched.

[PLEASE INSERT TABLE 1 HERE]

Next we collect monthly closing prices for the 46 funds from DataStream. Monthly closing prices are declared by the mutual fund companies after deducting their day to day expenses of transactions costs, depository fees, management fees and other administrative

expenses. Mutual funds issue two main classes of units based on dividend payouts, i.e. income versus accumulating; the former pay out regular cash dividends to the investors while the latter reinvest the said dividends back into the fund. While collecting data we ensure that we collect prices for similar types of fund units for both the SRI and conventional fund in each pair, i.e. if we have an income type of SRI fund then we collect data for the income class of units for the conventional fund as well. Each pair has its own data period over which performance is compared and the data period is self-selected by the age of the younger fund within the pair. Next, following Shalit and Yitzhaki (1994) and Clark et. al. (2011), we calculate an arithmetic return series for each fund and benchmark index.[9]

Using the Shapiro-Wilk test, we test each series for normality, skewness and kurtosis. Table 2 lists the descriptive statistics for the market benchmarks and the 23 matched pairs in our sample. We find that the return series are non-normally distributed in 88% of the cases (61/69 return series are non-normally distributed) with statistically significant (at the 5% level) negative skewness in 67% of the cases (46/69 return series) and statistically significant (at the 5% level) excess kurtosis in 80% of the cases (55/69 return series). These findings substantially weaken the case for using a Mean-Variance (MV) approach to measure performance. Since it has been argued that equity data is more likely to be log-normally distributed, we also use the Shapiro-Wilk test to see if the data is log-normally distributed. We find similar results in both cases. We list here test results for the arithmetic return series that are used in our study.

[PLEASE INSERT TABLE 2 HERE]

2.2 Methodology

2.2.1 Marginal Conditional Stochastic Dominance

Under the general assumption that investors are risk averse, MCSD analysis makes it possible to identify the cases where one type of fund is preferred to another by all risk averse, utility maximizing investors. MCSD preference, called "dominance" in MCSD terminology, means that the preferred (dominant) fund has outperformed the other. Stated more formally,

[9] We must use arithmetic returns while working with MCSD because they are additive across asset weights within a portfolio, whereas log returns are not.

given a portfolio α, asset k MCSD dominates asset j for all concave utility functions if and only if:

$$ACC(k) \geq ACC(j) \text{ with at least one strong inequality} \quad (1)$$

Where:

ACC = Absolute Concentration Curves

In other words, asset k dominates asset j if the ACC of asset k lies above the ACC of asset j.[10]

To implement the MCSD test we follow Shalit and Yitzhaki (1994) and proceed as follows. Each fund pair is matched to its corresponding market index. This gives three assets for each fund comparison: one SRI fund, one conventional fund and one market index with N monthly return observations in each series. The market index represents the wealth index.[11] We sort the monthly returns of the wealth index from lowest to highest and match them with the monthly return of the respective fund for the same month. Next, each of the terms in both fund return series (SRI and conventional) is multiplied by 1/N to obtain equally weighted returns. We now take the cumulative sum of this weighted returns series for each fund i.e. each term in the cumulative sum series is the sum of all previous terms of the weighted returns series. For example, the third term of the cumulative return series of fund A is the sum of the first, second and third terms from the weighted return series for fund A. This cumulative return series for fund A is known as the ACC for fund A. Similarly we calculate the ACC for the other fund. Next we compare the two ACCs calculated above at each of the N points. According to MCSD criteria, a fund dominates the other if its ACC is either equal to or lies above the ACC of the other at all the points, with at least one point where it lies above. The absence of dominance indicates the absence of outperformance. We repeat the aforementioned procedure for all the 23 pairs of SRI and conventional funds.

We also compare the performance of both types of funds with the respective market index. To this end we calculate the ACC of the market index following the same procedure detailed above. The ACC of the market is called Absolute Lorenz Curve – ALC (Shorrocks, 1983; Shalit & Yitzhaki, 1994). We now compare this ALC at each point in time with the

[10] See Shalit and Yitzhaki (1994).

[11] It should be noted that following Shalit and Yitzhaki (1994), the returns on the market index proxy for monthly changes in individual wealth. In this setting, any monotone transformation of individual wealth is appropriate.

ACC of the two funds (SRI and conventional) within each of the 23 sets. The decision criteria are the same. Dominance indicates outperformance. The absence of dominance indicates the absence of outperformance.

2.2.2 Four Factor Alphas

To allow for comparison with previous studies and to check the robustness of our results, we calculate alphas for all funds using the Carhart (1997) four factor model:[12]

$$r_{i,t} - r_{f,t} = \alpha_i + \beta_{i,mkt}(r_{m,t} - r_{f,t}) + \beta_{i,val}VAL_t + \beta_{i,size}SIZE_t + \beta_{i,mom}MOM_t + \epsilon_{i,t} \quad (2)$$

Where: $r_{i,t}$ = return of fund i at time t; $r_{f,t}$ = risk free rate at time t; $r_{m,t}$ = return of the market at time t; α_i = excess return or 4 factor alpha for fund i; $\beta_{i,mkt}$ = market beta for fund i; $\beta_{i,val}$ = value factor beta for fund i; $\beta_{i,size}$ = size factor beta for fund i; $\beta_{i,mom}$ = momentum factor beta for fund i; $\epsilon_{i,t}$ = random error term at time t.

The alphas represent the excess return remaining after the effect of the 4 risk factors has been accounted for. Significant positive alphas indicate that the asset has outperformed the market and significant negative alphas indicate that the asset has underperformed it. We test the statistical significance of the alphas using the t-test and the White and Newey-West standard errors which are robust to heteroskedasticity and serial correlation.

[PLEASE INSERT TABLE 3 HERE]

III. RESULTS AND ANALYSIS

3.1 Comparative Performance

Column 3 of Table 3 reports the four factor alphas. There is no under-performance and very little evidence of out-performance by either type of fund. This is consistent with previous studies conducted on the UK market (Mallin et. al. 1995, Gregory et. al. 1997 and Kreander et. al. 2005). In six of the twenty-three cases significant positive alphas suggest that conventional funds outperform the market, while there is only one case where the SRI fund out-performs it. In the only case where the SRI alpha is significant the conventional alpha is

[12] For more details on calculating the factors see Carhart (1997). In our case, the four factors for Global portfolios were obtained from the Kenneth French website (2014) and the four factors for UK were obtained from Gregory et. al. (2013).

also significant but lower. Based on this, we can conclude that SRI funds outperform the market and the conventional funds in only one case, while the conventional funds outperform the market in six cases and the SRI funds in five cases.

When we use MCSD to make the comparison, there are 3/23 cases where the conventional fund dominates the SRI and 2/23 cases where the SRI fund dominates the conventional. In all other cases there is no dominance. This implies that there is no widespread outperformance either way, which is consistent with previous studies conducted on the UK market (Mallin et. al. 1995, Gregory et. al. 1997 and Kreander et. al. 2005).

The situation changes considerably when we compare fund performance with market performance. In 11/23 cases the SRI fund dominates the market index while conventional funds dominate the market index in 12/23 cases. Interestingly, the market index never dominates any fund, either SRI or conventional. This finding is contrary to previous studies, such as Mallin et. al. (1995) and Kreander et. al. (2005), who find that on average both the SRI and conventional funds underperform the market. This result also runs counter to Mean-Variance intuition and the efficient market hypothesis that a well-diversified market index should not be dominated by any other asset. One potential explanation for why the MCSD results differ so markedly from the Mean-Variance (MV) results is that the MV approach fails to capture the effects of non-normality in the return distributions documented above that are reflected in the higher moments, such as skewness and kurtosis.[13]

The implication of our results is that, although there is little evidence of outperformance associated with a specific fund type, half the funds in our sample, both SRI and conventional, are managing their portfolios efficiently enough to outperform the market over long periods. We pursue this reasoning in the next section where we deal with entry loads.

3.2 Controlling for Entry Loads

Mutual funds charge two types of fees, operational expenses and entry loads. Operational expenses are day to day expenses, such as depository fees, salaries, bonuses, data, research and trading costs, which are reported as a percentage of assets under

[13] For example, successful active management could produce a more non-normal return distribution. It has also been shown that risk-averse investors show a preference for positive skewness and an aversion to kurtosis (see, Kraus and Litzenberger (1976), Fang and Lai (1997), Dittmar (2002) and Post et. al. (2008)).

management in the total expense ratio (TER). Since the TER fees are incorporated into the Net Asset Value (NAV) or closing price that the funds declare on a daily basis, our results already reflect this aspect of fees. Entry loads, however, have not been accounted for.

Entry loads are one time fees paid when units are first purchased. These do not apply to institutional investors since they buy in bulk, but do apply to retail investors. Entry loads typically represent around 5% of the purchase price. Table 1 summarizes the entry loads charged to retail investors by the funds in our study. To account for entry loads, we spread their costs on a monthly basis over the entire data period of the fund using the formula: Monthly load = Entry load/N, where: N = the number of months in the data period under consideration. We then deduct the monthly load from the monthly returns of the fund to obtain the retail investor's monthly net return. The effect of this procedure is that the effect of the entry load diminishes as the holding period increases. Thus, after accounting for all fees, fund outperformance for institutional investors and those exempted from entry loads is unaffected. For retail investors subject to entry loads, however, fund outperformance might be affected.

To complete the analysis, we recognize that there are costs involved with investing in the market portfolio. Hence, we adjust the returns on the market portfolio to reflect these costs. To this end, we select the market index tracking fund with the lowest TER in the UK[14] and allocate these costs month by month in the formula: Monthly cost = TER/12. Finally, we deduct the monthly costs from the monthly returns on the market index. We use the returns on the market index to avoid issues associated with tracking error.[15] For example, if the tracking error of the tracking fund with respect to the market is large, then the poor performance of the market could be attributed to the inefficiency of the tracking fund rather than the market itself.

Using the series net of fund fees, we repeat the entire procedure as detailed above, i.e. we make MCSD comparisons between SRI versus conventional funds, SRI funds versus the market and conventional funds versus the market. We find that the results remain unchanged

[14] To estimate the costs of investing in the market index, we use the following index funds; respective TERs are stated in brackets. L&G UK (0.56%) for the FTSE all share, the L&G Global (1.15%) for the MSCI world, the L&G EU (0.84%) for the FTSE World EU ex UK and the Aviva International (0.96%) for the FTSE World.

[15] Tracking error is an estimate of how much the returns of an index fund deviate from the returns of the actual market index that the said fund aims to mimic.

in all but one case, i.e. pair ID 18, where dominance disappears after fees are taken into account. However, even in this case the market does not dominate the fund.

These results that include the all-in-costs are further evidence of fund management ability for both fund types and are indirect evidence that the dominant funds are earning their fees. This conclusion is reinforced by the fact that our sample includes only surviving funds. Funds with inferior performance that do not justify their fees disappear. Although this survivorship bias is making the fund industry as a whole look better than it really is, we cannot ignore the fact that many actively managed funds are routinely outperforming the market. Furthermore, each of the 23 pairs have varying data periods ranging from a minimum of 55 months to a maximum of 286 months, which implies that our results are not sample based i.e. outperformance of the market is not limited to a particular period in time.

IV. FURTHER ANALYSIS

4.1 Comparative Fund Management Ability

To compare the relative abilities of SRI and conventional fund management in our sample we draw on the results of Belghitar et. al. (2014), who find that SRI indices MCSD underperform similar and carefully matched conventional indices. The implication is that the SRI investment universe is inferior to that of the conventional universe and that SRI funds start off with an inherent disadvantage. However, our results show that the performance of SRI and conventional funds is similar. Overall, there is no systematic dominance of either type of fund (only three cases of dominance in total) and each type of fund dominates the market in almost equal proportions (about 50%). This is preliminary evidence that the SRI fund management in our sample is superior to conventional fund management because, despite choosing from an inferior investment universe, they manage to match the performance of the conventional funds.

To pursue this hypothesis we use MCSD to compare the performance of SRI funds with the matched conventional indices used in Belghitar et al. (2014). Belghitar et al. (2014) find that these matched conventional indices (MCI) dominate the SRI indices, which constitute the investment universe for SRI funds. Thus, if SRI funds do indeed have superior management ability then the MCI should not be able to dominate them. This is exactly what we find; in 20/23 cases there is no dominance either way. In 2/23 cases an SRI fund dominates the matched conventional index (MCI), while in 1/23 cases the matched

conventional index dominates an SRI fund. This is strong evidence in favour of SRI fund management ability, since the MCIs were able to dominate the SRI indices but fail to dominate the SRI funds. This is especially impressive given that we have incorporated fund management fees and expenses into our calculations. Thus, it seems that "the price to be paid by risk averse investors for socially responsible investing" indicated by Belghitar et al. (2014) is offset in practice in our sample by fund management ability.

4.2 Sub-Sample Testing

We now turn to the question of whether our results are sensitive to differing economic conditions. More specifically, we look at the last ten years of data that roughly span one complete trade cycle and divide it into three sample periods, namely, the pre-crisis period from August 2001 to December 2006, the financial crisis period from January 2007 to December 2009 and the post crisis period from January 2010 to July 2011. In each of the sub-periods we first compare the performance of the selected SRI funds with their matched conventional counterparts. We then compare the performance of both the selected SRI and conventional funds with the market index.

4.2.1 Financial Crisis Period

We start with the financial crisis period from January 2007 to December 2009. The results in table 4 show that in 2/23 cases an SRI fund dominates the matched conventional fund, while in 4/23 cases the matched conventional fund dominates the SRI fund. In the remaining cases there is no dominance. This is consistent with our previous results for the entire period that show there is no strong evidence in favour of dominance either way.

When we compare funds with the market index, a conventional fund dominates the market index in 13/23 cases, while the latter never dominates the former. This is also consistent with earlier findings for the entire period when the conventional funds dominate the market in 12/23 cases. Interestingly, eleven of the twelve dominant funds over the entire period also dominate over the crisis period. The situation changes when we look at SRI funds. An SRI fund dominates the market index in only 3/23 cases, down from 11/23 cases over the entire period. Thus, it looks like the SRI funds are sensitive to financial crises while conventional funds are not. Also, conventional funds that dominate over the whole period tend to dominate during the crisis as well.

[PLEASE INSERT TABLE 4 HERE]

4.2.2 Pre-Crisis Period

Over the pre-crisis period things are different. Table 5 reports the results for the pre-crisis period from August 2001 to December 2006. An SRI fund dominates the matched conventional fund in 5/21 cases (up from 2/23 over the whole period), while in 2/21 cases (down from 3/23) the matched conventional fund dominates the SRI fund. In the rest of the cases there is no dominance. This is preliminary evidence that SRI funds perform better than their conventional counterparts during the good times. In 9/21 cases an SRI fund dominates the market index (down from 11/21 over the entire period), which is consistent with earlier findings for the entire period, while the latter never dominates the former. Of the nine dominant funds, six are the same ones that dominate over the entire period. A conventional fund dominates the market index in only 4/21 cases (down from 13/23 in the crisis period and 12/23 when the whole sample period is considered), while the market dominates a conventional fund in 1/21 cases. Thus, the present evidence suggests that during the pre-crisis good times SRI funds performed better than they did during the crisis and better than conventional funds, who performed much worse than they did during the crisis.

[PLEASE INSERT TABLE 5 HERE]

4.2.3 Post Crisis Period

Table 6 reports results for the post crisis period from January 2010 to July 2011. In 7/23 cases an SRI fund dominates the matched conventional fund (up from 5/23 in the pre-crisis period) while in 2/23 cases the matched conventional fund dominates the SRI fund. In the rest of the cases there is no dominance. This provides more evidence that SRI funds do better during good times.

When we compare individual funds with the benchmark we find that in 19/23 cases an SRI fund dominates the market index (up from 3/23 in the crisis period and 11/23 over the entire sample period), while the latter never dominates the former. Conventional funds dominate the market index in 8/23 cases (down from 13/23 in the crisis period and 12/23 overall), while the latter never dominates the former.

Over the entire sampling period the performance of SRIs and conventional funds are equivalent. However, SRI funds performed relatively worse during the crisis period and

relatively better pre and post crisis. The weakness in SRI performance during the crisis period is consistent with Munoz et. al. (2014), who find a similar result for European green fund managers during the financial crisis period. Since SRI funds exclude "sin" stocks and conventional funds do not, it is also consistent with Hong and Kacperczyk (2009), who have shown that "sin" stocks are resilient to economic downturns and Ferruz et. al. (2012) who find that the exclusion of "sin" stocks, hurts the performance of religious SRI funds.

[PLEASE INSERT TABLE 6 HERE]

4.3 Investment Strategy – Market Timing

Our findings suggest that shrewd investors can benefit from a strategy that chooses to invest in SRI funds during good times i.e. during the pre-crisis and post crisis sub periods while switching their investments to conventional funds during bad times i.e. during the financial crisis period. In order to test this strategy we form two equally weighted portfolios, one comprised of all the SRI funds (EWP-S) and the other of all the conventional funds (EWP-C). Next we assume that a shrewd investor would invest their money in EWP-S from August 2001 to December 2006, switch their investments into EWP-C from January 2007 to December 2009 and switch it back again to EWP-S from January 2010 to July 2011. We name the latter Switching Strategy Portfolio (SSP). Using MCSD we now compare the performance of SSP over the entire ten year period from August 2001 to July 2011 with two global broad based market indices viz. FTSE All World and MSCI World. We find that SSP dominates both the market indices. Thus, the SSP strategy is utility increasing. Table 7 reports the MCSD test results and descriptive statistics. The strategy's mean return is 57.69% higher than the FTSE World and 86.36% higher than the MSCI World. Thus, besides being utility increasing the SSP strategy is also wealth increasing.

[PLEASE INSERT TABLE 7 HERE]

4.4 Determinants of Dominance

To test the role of the fund management company (FMC) in fund outperformance we run a logistic regression where the dependent variable is "MCSD dominance" which is a binary variable that takes the value 1 when dominance exists and 0 otherwise. To proxy for fund management ability we follow Livingston and Zhou (2015), who find a positive and significant relationship between fund expenses and fund performance, and use the TER. The

intuitive rationale for this is that rational investors would pay a higher fee only if the fund offered better management. The practical rationale is that the TER reflects the FMC's influence on investment practices, access to research, the institutional framework and the ability to attract and retain talented fund managers. Since dominance is established over several years we must use cumulative TER in order to estimate the total fees paid by the investors. The control variables are mean, standard deviation, age and size. Mean and standard deviation are included since they represent the necessary conditions for dominance. Age captures the survivorship bias and size captures any scale economies.

Table 8 reports results for the logistic regression. We find that after controlling for fund age and size and the necessary MCSD conditions, Cumulative TER is a statistically significant explanatory variable with a p-value of 0.03. This is evidence that the fund management company is an important determinant of outperformance and fund management ability.

[PLEASE INSERT TABLE 8 HERE]

V. CONCLUSION

This study compares the performance of a sample of UK based Socially Responsible Investment (SRI) funds with similar conventional funds and investigates the role that the Fund Management Company (FMC) plays in the performance of these funds. Using marginal conditional stochastic dominance criteria to account for the non-normality reflected in the empirical distributions of the sample funds and indices, we find that both the SRI funds and the sample of carefully matched conventional funds outperform the market index about 50% of the time. There is, however, no evidence that one type of fund outperforms the other. SRI funds perform relatively better in the pre and post crisis periods while conventional funds perform relatively better in the crisis period. These results are robust to management fees and entry loads. They stand in contrast to the absence of outperformance found in most past studies and what we ourselves find in this paper when using the alpha criterion in the Carhart four factor model. Furthermore, our findings suggest that shrewd investors can benefit from investing in SRI funds during good times while switching their investments to conventional funds during bad times.

Importantly, we find that the FMC is a major determinant of outperformance for both fund types. Thus, the outperformance is due to common characteristics shared by both types

of funds, which reinforces the finding that neither type of fund outperforms the other. Belghitar et. al. (2014) show that SRI indices underperform similar conventional indices. Thus SRI funds start off with a disadvantage i.e. they are generated from an inferior investment universe. Hence although there is no evidence of dominance by either type of fund, the aforementioned fact suggests that the FMC is more important to the success of the SRI funds in our sample than it is to the success of the conventional fund.

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Table 1: Descriptive statistics of the fund characteristics

	SRI funds			Conventional funds			Paired sample sign test p-values
	Mean	**Median**	**SD**	**Mean**	**Median**	**SD**	
Size (£M)	175.26	138.00	143.33	241.52	199.00	235.34	0.093
Age (years)	15.62	13.37	7.82	18.47	15.97	10.61	0.210
Fees (TER %)	1.26	1.50	0.42	1.40	1.50	0.37	0.180
Entry load (%)	4.28	5.00	1.43	4.87	5.00	0.41	0.143

Table 1 lists the key characteristics (size, age and fees) of the funds studied as well as the results of a paired sample sign test which checks for statistically significant differences between the two sets of funds.

Table 2: Descriptive statistics of monthly returns for the fund pairs

Pair ID	Type	Min	Max	Mean	SD	Skew	Ex. Kurt.*	Normal	S.Test **	K.Test ***
1	M	-0.1850	0.1414	0.0013	0.0602	-.381	1.131	Yes	INSIG	INSIG
	E	-0.1797	0.1544	0.0039	0.0607	-.353	1.278	Yes	INSIG	SIG
	C	-0.1855	0.1558	0.0037	0.0616	-.384	1.421	No	INSIG	SIG
2	M	-0.1850	0.1414	0.0043	0.0466	-.424	1.420	No	SIG	SIG
	E	-0.1313	0.1363	0.0063	0.0472	-.564	.633	No	SIG	SIG
	C	-0.1452	0.1434	0.0055	0.0454	-.330	1.077	No	SIG	SIG
3	M	-0.1957	0.0931	-0.0025	0.0596	-1.090	1.594	No	SIG	SIG
	E	-0.2690	0.1683	-0.0056	0.0805	-.813	1.997	Yes	SIG	SIG
	C	-0.1443	0.1200	0.0009	0.0578	-.416	.470	Yes	INSIG	INSIG
4	M	-0.1850	0.1414	0.0007	0.0498	-.465	1.454	No	SIG	SIG
	E	-0.1438	0.1739	0.0039	0.0566	-.271	.780	No	INSIG	INSIG
	C	-0.1517	0.1317	0.0027	0.0500	-.262	.785	No	INSIG	INSIG
5	M	-0.1957	0.0931	0.0008	0.0456	-1.110	2.322	No	SIG	SIG
	E	-0.2015	0.1358	0.0005	0.0621	-.740	.943	No	SIG	SIG
	C	-0.1558	0.1322	-0.0009	0.0568	-.584	.488	No	SIG	INSIG
6	M	-0.1995	0.1800	0.0013	0.0669	-.533	1.160	No	SIG	SIG
	E	-0.1583	0.1311	0.0036	0.0522	-.796	1.337	No	SIG	SIG
	C	-0.2093	0.1733	0.0043	0.0608	-.646	1.751	No	SIG	SIG
7	M	-0.1850	0.1414	0.0016	0.0513	-.544	1.706	No	SIG	SIG
	E	-0.1363	0.1089	0.0029	0.0486	-.735	.853	No	SIG	INSIG
	C	-0.1789	0.1962	0.0055	0.0571	-.455	1.903	No	SIG	SIG
8	M	-0.1850	0.1414	0.0040	0.0465	-.300	1.232	No	SIG	SIG
	E	-0.1202	0.1263	0.0051	0.0375	-.444	1.351	No	SIG	SIG
	C	-0.1802	0.1549	0.0051	0.0432	-.418	1.846	No	SIG	SIG
9	M	-0.1957	0.0931	0.0048	0.0416	-1.118	2.472	No	SIG	SIG
	E	-0.1639	0.1670	0.0052	0.0495	-.252	.853	Yes	INSIG	SIG
	C	-0.1826	0.1636	0.0035	0.0493	-.363	1.456	No	SIG	SIG
10	M	-0.1850	0.1414	0.0007	0.0498	-.465	1.454	No	SIG	SIG
	E	-0.1646	0.1432	0.0011	0.0563	-.396	.722	No	INSIG	INSIG
	C	-0.1622	0.1178	0.0016	0.0506	-.543	.801	No	SIG	INSIG
11	M	-0.1763	0.1693	0.0041	0.0519	-.392	1.398	No	SIG	SIG
	E	-0.1682	0.1690	0.0043	0.0535	-.229	1.227	No	INSIG	SIG
	C	-0.1591	0.1436	0.0030	0.0474	-.495	1.277	No	SIG	SIG
12	M	-0.1957	0.0931	0.0010	0.0448	-.987	1.977	No	SIG	SIG
	E	-0.1802	0.1357	0.0010	0.0543	-.636	.981	No	SIG	SIG
	C	-0.2878	0.2588	0.0001	0.0930	-.157	1.026	No	INSIG	SIG
13	M	-0.1957	0.0931	0.0038	0.0446	-1.378	3.558	No	SIG	SIG
	E	-0.1195	0.0948	0.0055	0.0369	-.829	1.754	No	SIG	SIG
	C	-0.1110	0.0657	0.0056	0.0345	-.860	.771	No	SIG	INSIG

Pair ID	Type	Min	Max	Mean	SD	Skew	Ex. Kurt.*	Normal	S.Test **	K.Test ***
14	M	-0.1957	0.0931	0.0049	0.0438	-1.139	2.324	No	SIG	SIG
	E	-0.1778	0.1321	0.0042	0.0488	-.878	1.727	No	SIG	SIG
	C	-0.1899	0.1462	0.0039	0.0513	-.627	1.655	No	SIG	SIG
15	M	-0.1763	0.1693	0.0026	0.0548	-.315	1.153	No	INSIG	SIG
	E	-0.1551	0.1548	0.0041	0.0591	-.503	.651	No	SIG	INSIG
	C	-0.1565	0.1543	0.0066	0.0555	-.323	.624	Yes	INSIG	INSIG
16	M	-0.1850	0.1414	0.0022	0.0578	-.455	1.359	No	INSIG	SIG
	E	-0.1457	0.1093	0.0008	0.0508	-.731	1.378	No	SIG	SIG
	C	-0.1534	0.1289	0.0048	0.0514	-.398	1.000	Yes	INSIG	INSIG
17	M	-0.1850	0.1414	0.0004	0.0510	-.499	1.448	No	SIG	SIG
	E	-0.1700	0.1777	-0.0006	0.0573	-.429	1.287	No	INSIG	SIG
	C	-0.1439	0.1562	0.0025	0.0521	-.441	.577	No	SIG	INSIG
18	M	-0.1850	0.1414	0.0011	0.0588	-.402	1.213	No	INSIG	SIG
	E	-0.1300	0.1378	0.0014	0.0538	-.295	1.009	No	INSIG	INSIG
	C	-0.1597	0.1548	-0.0023	0.0528	-.516	1.365	No	INSIG	SIG
19	M	-0.1850	0.1414	0.0031	0.0519	-.601	1.816	No	SIG	SIG
	E	-0.1515	0.1233	0.0037	0.0453	-.725	1.914	No	SIG	SIG
	C	-0.1848	0.1871	0.0045	0.0543	-.379	2.481	No	INSIG	SIG
20	M	-0.1850	0.1414	0.0037	0.0467	-.292	1.211	No	INSIG	SIG
	E	-0.1898	0.1798	0.0053	0.0496	-.349	2.149	No	SIG	SIG
	C	-0.1334	0.1563	0.0055	0.0444	-.220	1.118	No	INSIG	SIG
21	M	-0.3975	0.1414	0.0033	0.0525	-1.658	11.836	No	SIG	SIG
	E	-0.2701	0.1548	0.0029	0.0475	-.973	4.999	No	SIG	SIG
	C	-0.3415	0.1563	0.0053	0.0493	-1.255	8.648	No	SIG	SIG
22	M	-0.1850	0.1414	0.0047	0.0505	-.621	2.247	No	SIG	SIG
	E	-0.1715	0.1248	0.0077	0.0500	-.793	2.081	No	SIG	SIG
	C	-0.1735	0.1580	0.0106	0.0530	-.444	2.060	No	INSIG	SIG
23	M	-0.1957	0.0931	-0.0035	0.0541	-1.090	1.981	No	SIG	SIG
	E	-0.1836	0.1971	0.0030	0.0686	-.147	1.573	Yes	INSIG	SIG
	C	-0.1855	0.1082	0.0017	0.0562	-.849	1.358	No	SIG	SIG

For a normal distribution, the value of the excess kurtosis statistic calculated by SPSS is zero. ** S.Test in SPSS checks to see if the skewness calculated is statistically significant. *** K.Test in SPSS checks to see if the kurtosis calculated is statistically significant. SIG = Statistically significant, INSIG = Statistically insignificant, both at the 5% level. E = SRI, C = Conventional, M = Market and SD = Standard Deviation.

Table 3: Performance Testing – Summary of Results

Pair ID	Type	4 Factor Alpha	MCSD Test (E vs C)	MCSD Test (E vs M)	MCSD Test (C vs M)
1	MARKET (M)	NA			
	SRI (E)	0.003134*			
	CONVENTIONAL (C)	0.002976*	NO DOM	NO DOM	NO DOM
2	MARKET (M)	NA			
	SRI (E)	0.001979			
	CONVENTIONAL (C)	0.001015	**E DOM C**	**E DOM M**	**C DOM M**
3	MARKET (M)	NA			
	SRI (E)	-0.004232			
	CONVENTIONAL (C)	0.001634	**C DOM E**	NO DOM	**C DOM M**
4	MARKET (M)	NA			
	SRI (E)	0.005053			
	CONVENTIONAL (C)	0.003038	NO DOM	NO DOM	**C DOM M**
5	MARKET (M)	NA			
	SRI (E)	0.002089			
	CONVENTIONAL (C)	0.001588	NO DOM	NO DOM	NO DOM
6	MARKET (M)	NA			
	SRI (E)	0.001832			
	CONVENTIONAL (C)	0.003698	NO DOM	**E DOM M**	NO DOM
7	MARKET (M)	NA			
	SRI (E)	0.001637			
	CONVENTIONAL (C)	0.004117	NO DOM	**E DOM M**	NO DOM
8	MARKET (M)	NA			
	SRI (E)	0.000284			
	CONVENTIONAL (C)	0.000552	NO DOM	**E DOM M**	**C DOM M**
9	MARKET (M)	NA			
	SRI (E)	0.002190			
	CONVENTIONAL (C)	-0.000194	**E DOM C**	**E DOM M**	NO DOM
10	MARKET (M)	NA			
	SRI (E)	0.001253			
	CONVENTIONAL (C)	0.000896	NO DOM	NO DOM	NO DOM
11	MARKET (M)	NA			
	SRI (E)	0.001239			
	CONVENTIONAL (C)	-0.000354	NO DOM	**E DOM M**	NO DOM
12	MARKET (M)	NA			
	SRI (E)	0.001467			
	CONVENTIONAL (C)	0.005289	NO DOM	NO DOM	NO DOM
13	MARKET (M)	NA			
	SRI (E)	0.002936			
	CONVENTIONAL (C)	0.002824	NO DOM	**E DOM M**	**C DOM M**

Pair ID	Type	4 Factor Alpha	MCSD Test (E vs C)	MCSD Test (E vs M)	MCSD Test (C vs M)
14	MARKET (M)	NA			
	SRI (E)	0.000660			
	CONVENTIONAL (C)	0.000696	NO DOM	NO DOM	NO DOM
15	MARKET (M)	NA			
	SRI (E)	0.002270			
	CONVENTIONAL (C)	0.004533	NO DOM	NO DOM	**C DOM M**
16	MARKET (M)	NA			
	SRI (E)	-0.000881			
	CONVENTIONAL (C)	0.002796*	NO DOM	NO DOM	**C DOM M**
17	MARKET (M)	NA			
	SRI (E)	0.000106			
	CONVENTIONAL (C)	0.003277*	**C DOM E**	NO DOM	**C DOM M**
18	MARKET (M)	NA			
	SRI (E)	0.000714			
	CONVENTIONAL (C)	-0.004106	NO DOM	**E DOM M**	NO DOM
19	MARKET (M)	NA			
	SRI (E)	0.000605			
	CONVENTIONAL (C)	0.001608	NO DOM	**E DOM M**	NO DOM
20	MARKET (M)	NA			
	SRI (E)	0.003262			
	CONVENTIONAL (C)	0.002044*	NO DOM	**E DOM M**	**C DOM M**
21	MARKET (M)	NA			
	SRI (E)	-0.000374			
	CONVENTIONAL (C)	0.002068*	NO DOM	NO DOM	**C DOM M**
22	MARKET (M)	NA			
	SRI (E)	0.003625			
	CONVENTIONAL (C)	0.007748*	**C DOM E**	**E DOM M**	**C DOM M**
23	MARKET (M)	NA			
	SRI (E)	0.006440			
	CONVENTIONAL (C)	0.003713	NO DOM	NO DOM	**C DOM M**

DOM = MCSD dominance

In 3 out of 23 cases the conventional fund dominates the SRI one and in 2 out of 23 cases the SRI fund dominates the conventional one. In rest of the cases there is no dominance. In 11 out of 23 cases the SRI fund dominates the market index. Conventional funds dominate the market index in 12 out of 23 cases. In rest of the cases there is no dominance.

Table 4: Sub-Sample – financial crisis period, January 2007 – December 2009. Comparing performance of SRI Funds vs Conventional Funds and Both sets of funds with their respective benchmark Market Index

Number of cases in which	
An SRI fund dominates a Conventional fund	2/23
A Conventional fund dominates an SRI fund	4/23
An SRI fund dominates the market	3/23
A Conventional fund dominates the market	13/23
The market dominates an SRI fund	0/23
The market dominates a Conventional fund	0/23

In 2 out of 23 cases an SRI fund dominates the matched conventional fund, while in 4 out of 23 cases the matched conventional fund dominates the SRI fund. In 3 out of 23 cases an SRI fund dominates its benchmark market index, while in 13 out of 23 cases a conventional fund dominates its benchmark market index. In rest of the cases there is no dominance.

Table 5: Sub-Sample – pre crisis period, August 2001 to December 2006. Comparing performance of SRI Funds vs Conventional Funds and both sets of funds with their respective benchmark Market Index

Number of cases in which	
An SRI fund dominates a Conventional fund	5/21
A Conventional fund dominates an SRI fund	2/21
An SRI fund dominates the market	9/21
A Conventional fund dominates the market	4/21
The market dominates an SRI fund	0/21
The market dominates a Conventional fund	0/21

In 5 out of 21 cases an SRI fund dominates the matched conventional fund, while in 2 out of 21 cases the matched conventional fund dominates the SRI fund. In 9 out of 21 cases an SRI fund dominates its benchmark market index, while in 4 out of 21 cases a conventional fund dominates its benchmark market index. In rest of the cases there is no dominance.

Table 6: Sub-sample – Post crisis period, January 2010 – July 2011. Comparing performance of SRI Funds vs Conventional Funds and Both sets of funds with their respective benchmark Market Index

Number of cases in which	
An SRI fund dominates a Conventional fund	7/23
A Conventional fund dominates an SRI fund	2/23
An SRI fund dominates the market	19/23
A Conventional fund dominates the market	8/23
The market dominates an SRI fund	0/23
The market dominates a Conventional fund	0/23

In 7 out of 23 cases an SRI fund dominates the matched conventional fund, while in 2 out of 23 cases the matched conventional fund dominates the SRI fund. In 19 out of 23 cases an SRI fund dominates its benchmark market index, while in 8 out of 23 cases a conventional fund dominates its benchmark market index. In rest of the cases there is no dominance.

Table 7: Comparing performance between switching strategy portfolio (SSP) and the MSCI World and FTSE World Indices

Name	Mean	Standard Deviation	Skewness	Excess Kurtosis*	MCSD Test Results
SSP	0.0041	0.0474	-0.5180	0.880	NA
MSCI World	0.0022	0.0447	-0.9820	1.748	SSP Dominates MSCI World
FTSE World	0.0026	0.0539	-0.2510	1.253	SSP Dominates FTSE World

* For a normal distribution, the value of the excess kurtosis statistic calculated by SPSS is zero.

Table 8: Determinants of Dominance

Dependent variable = MCSD dominance

	Mean	Std Dev	CumTER	Age	Size	Constant
Coefficient	1138.44*	-755.92*	28.14*	-1.07*	0.01	43.85*
P value	0.038	0.014	0.030	0.012	0.422	0.015

* indicates significance at the 5% level

Appendix 1: List of Fund Management Companies and SRI and Conventional Funds

Fund Management Company	SRI Fund	Matched Conventional Fund	Benchmark Index
Aberdeen Asset Management	Aberdeen Responsible UK Equity	Aberdeen UK Equity	FTSE all share
AEGON Asset Management	AEGON SRI Equity	AEGON UK Equity	FTSE all share
Allianz Global Investors	Allianz RCM Global Eco Trends	Allianz RCM Dynamic Growth	MSCI World
Aviva Investors	Aviva Investors UK SRI	Aviva Investors UK Growth	FTSE all share
Aviva Investors	Aviva Investors S. F. Absolute Growth	Aviva Investors World Leaders	MSCI World
Aviva Investors	Aviva Investors S. F. European Growth	Aviva Investors European Equity	FTSE W. EU ex UK
Aviva Investors	Aviva Investors S. F. UK Growth	Aviva Investors UK Focus	FTSE all share
F & C Asset Management	F&C Stewardship Income	F&C UK Equity Income	FTSE all share
F & C Asset Management	F&C Stewardship International	F&C Global Growth	MSCI World
Family Asset Management	Family Charities SRI	Family Asset Trust	FTSE all share
Henderson Global Investors	Henderson Global Care Growth	Henderson Global Innovation	MSCI World
Henderson Global Investors	Henderson Global Care Managed	Henderson Multi Manager Managed	MSCI World
Henderson Global Investors	Henderson Industries of the Future	Henderson International	MSCI World
Jupiter Asset Management	Jupiter Ecology	Jupiter Global Managed	FTSE World
Jupiter Asset Management	Jupiter Environmental Income	Jupiter Growth & Income	FTSE all share
Legal & General Investment Management	Legal & General SRI	Legal & General Growth	FTSE all share
Marlborough Fund Managers	Marlborough SRI	Marlborough UK Equity Income	FTSE all share
Premier Asset Management	Premier SRI	Premier UK Strategic Growth	FTSE all share
Scottish Widows	Scottish Widows Environmental Investor	Scottish Widows UK Select Growth	FTSE all share
Scottish Widows	Scottish Widows SRI	Scottish Widows UK Select Growth	FTSE all share
Scottish Widows	Halifax SRI	Scottish Widows Global Growth	FTSE World
Standard Life Investments	Standard Life UK SRI	Standard Life UK Opportunities	FTSE all share
St. James Place Wealth Management	St. James Place SRI	St. James Place Global	MSCI World

Data sourced from Vigeo-Eiris, Investment Management Association and Fund Fact Sheets.