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Do Socially Responsible Fund Managers Really Invest Differently?

Karen L. Benson
Timothy J. Brailsford
Jacquelyn E. Humphrey

ABSTRACT. To date, research into socially responsible investment (SRI), and in particular the socially responsible investment funds industry, has focused on whether investing in SRI assets has any differential impact on investor returns. Prior findings generally suggest that, on a risk-adjusted basis, there is no difference in performance between SRI and conventional funds. This result has led to questions about whether SRI funds are really any different from conventional funds. This paper examines whether the portfolio allocation across industry sectors and the stock-picking ability of SRI managers are different when compared to conventional fund managers. The study finds that SRI funds exhibit different industry betas consistent with different portfolio positions, but that these differences vary from year to year. It is also found that there is little difference in stock-picking ability between the two groups of fund managers.

KEY WORDS: socially responsible investment, managed funds, portfolio composition, ethical investment

Karen Benson is a Lecturer in Finance at the UQ Business School at the University of Queensland. She holds phD, Master and Honours degrees in finance and commerce. Karen's research focus is on fund flows, performance evaluation, and behavioral issues relevant to the mutual fund industry.

Tim Brailsford is currently Professor of Finance and Foundation Head of the UQ Business School at the University of Queensland. He holds a phD, Master and Honours degrees and is a Fellow of the Australasian Institute of Banking & Finance, the Australian Institute of Management and CPA Australia. Tim's area of expertise is in investments and valuation, corporate finance and financial management. He is the Managing Editor of the Accounting Research Journal, and a member of the editorial boards of several journals in accounting and finance.

Jacquelyn Humphrey is a phD student at the UQ Business School at the University of Queensland Business School. She holds a first class honours degree. Her research interests include funds management and socially responsible investment.

ABBREVIATIONS: SRI: Socially responsible investment; S&P: Standard and Poor's

Introduction

Socially responsible investment (SRI) has been practised for many years, albeit not widely recognised until the last two decades. Today, SRI is recognised as a major investment style occupying a significant segment of the funds management market. According to the Social Investment Forum, in 2003, 11.3% of total assets (representing around US$2.16 trillion) under professional management in the USA was invested using a socially responsible philosophy. Further, US$151 billion was invested directly in SRI mutual funds. This figure represents just over 2% of the total mutual funds market.[1]

The underlying philosophy behind SRI is that investment decisions take into account both financial and non-financial considerations, with the focus of non-financial matters given to ethical, environmental and moral concerns. The usual procedure for creating a SRI portfolio is to begin with the universe of investments and then apply a screening process, using non-financial criteria, to determine which investments are acceptable in terms of the investor's ethical, social, religious or other preferences. Generally there are two types of screens applied. First, negative or exclusionary screens are applied that are designed to exclude firms involved with products or processes that are considered undesirable. Examples include firms involved in armaments production, alcohol, tobacco, possessing a poor environmental performance record, engaging in offensive advertising and practising cruelty to animals. Second, positive or inclusionary screens can be applied that seek to include firms with desirable products or processes. Examples include firms that are environmental

aware, such as firms that seek to reduce pollution, have progressive hiring policies, are responsible corporate citizens, possess a good human rights record and exercise good labour relations.

A key theme that underpins all SRI funds is that they market themselves as having ethical values of a higher standard than their conventional counterparts. Investors may be attracted to SRI funds because they possess personal values that are consistent with the underlying philosophy of the SRI fund. In such cases, the investors are making a deliberate choice to concentrate on a sub-set of investment assets. In a mean–variance theoretical framework, such a strategy can result in a sub-optimal portfolio.[2] Rudd (1981) also conjectures that a constrained portfolio such as one constructed through a socially responsible strategy will suffer poorer performance as a result. The rationale is that the socially responsible guidelines inherently introduce biases such as size that consequently impact on the covariation in returns. Nevertheless, such a portfolio may be a rational outcome if the investor derives sufficient compensatory utility from holding SRI assets.

In contrast, investors may be attracted to SRI funds because those funds are perceived to be superior performers, irrespective of the assets underlying the investment portfolio. For instance, it is well-known that past fund performance is often used as an investment decision input despite the lack of strong time-series correlation in fund returns (see, for example, Capon et al., 1996). Arguably, the financial performance of the natural types of firms that SRI funds are likely to invest in may exhibit correlations with the business cycle. In such circumstances, SRI fund performance may appear to be superior at certain points in the cycle. Moreover, it may simply be that SRI fund managers are better stock pickers than their industry counterparts, and these superior skills are manifest in higher SRI fund returns. This latter point is consistent with SRI fund managers having fewer assets to select from and thereby having a better knowledge of specific investments in their potential investment set.

The distinction as to why investors select SRI funds is important as it impacts on the long-term future of the industry. If investors simply chase returns, then SRI fund managers must be able to adopt strategies that consistently result in superior performance. Conversely, if investors are mainly interested in the SRI philosophy, then does this have implications for SRI fund managers' ability to survive even if their performance is inferior to that of conventional funds? In reality, the marginal investment decision is probably driven by a combination of both sets of these factors.

To date, research into the SRI industry has concentrated on the relative performance of fund returns; that is, whether investing in a socially responsible manner has any impact on the investment returns. The majority of studies have compared the realised risk-adjusted returns of SRI funds to those of conventional funds (see for example Asmundson and Foerster, 2001; Cummings, 2000; Statman, 2000). In summary, prior research indicate that on a risk-adjusted basis, there is no difference in performance between SRI and conventional funds. This is a reasonably consistent result across the range of studies, although there is some sample and annual variation.

For instance, Mallin et al. (1995) study ethical and non-ethical funds in the UK and compare the groups by counting the number of funds in each group that have a risk-adjusted performance greater than the market.[3] They conclude that both groups of funds ''tend to underperform the market''. Hamilton et al. (1993) and Goldreyer and Diltz (1999) compare the performance measure of alpha of SRI funds to those of conventional funds and find that the alphas of the two groups are not significantly different. Bauer et al. (2005) apply Carhart's (1997) four-factor model and Ferson and Schadt's (1996) conditional beta model to assess SRI funds in Germany, the UK and USA and report no significant differences in risk-adjusted returns over the period 1990–2001. Bauer et al. (2003) and Bauer et al. (2004) use similar methodologies to assess the Canadian and Australian markets respectively.

The conclusion that there is no overall difference in performance between SRI funds and their conventional counterparts raises some interesting further questions. Specifically, if there is no substantial differences in performance, then are the portfolios of SRI funds any different from the portfolios of conventional funds? This question is of fundamental relevance as it drives at the heart of the reason for the existence of SRI funds.

The key purpose of this study is to provide an analysis of the relative portfolio composition of SRI funds. Specifically, the study focuses on the industry composition of the investment portfolio comparing SRI funds to conventional mutual funds. In so doing, we provide an empirical analysis of SRI fund investment practices. After assessing the industry allocations we also consider the stock selection abilities of the fund managers.

The study does not examine the composition of SRI funds in terms of their underlying stocks. Rather, we take the portfolio as given and rely on the reported classification of the funds, which in the study, is provided through an independent agency. Thus, we do not question the integrity of the SRI classifications and assume that appropriate selection criteria have been applied. However, the adoption of a SRI policy does not necessarily result in a set of portfolios that are different from conventional funds in terms of the industries that are represented or importantly the resultant exposures of the funds. This is an assumption, indeed a myth, in investor circles that does not necessarily hold.

Studies have generally not focussed on portfolio composition, but rather on investment performance. Nevertheless, some studies have provided some basic analysis of the issue. For instance, Schwartz (2003) compares SRI mutual funds with other funds and addresses the ethical obligations of SRI mutual funds, the screens currently implemented and considers a code of ethics for ethical investment. By reviewing reports and web sites of relevant organisations, Schwartz concludes the ethical obligations of some funds are not met and some screens are not ethically justified. Bauer et al. (2004) note that the SRI fund styles may be changing over time with socially responsible funds becoming more like conventional funds as time passes. Our study is unique in that we focus on the industry loadings of the funds. We review standard performance and fee issues but consider the return of the fund as being determined from stock selection and industry selection. Appendix 1 demonstrates this relationship.

If we find that the resultant industry allocations (as measured by the betas) are no different between SRI and conventional funds then one conclusion is that there appears to be no downside to SRI investment. An alternative interpretation is that the SRI policy is not generating a set of stocks that when aggregated look any different from a conventional fund and that SRI funds may be merely exploiting a marketing opportunity. However, if the contrary result is obtained, then investors need to consider both the ethical evaluation of selecting an SRI fund in addition to the consequent impact it has on investment exposure. Thus, either finding poses interesting ethical implications for both the funds management industry and investors at large.

The study begins with an overview of fund performance, risk and fees. The initial results are similar to previous studies indicating that there is no significant difference between the performance of SRI funds and conventional funds. These results then lead to the key focus of the study which is to examine portfolio composition and industry betas. This analysis has not previously been applied in the literature and it provides a test of whether SRI funds are really, as Bauer et al. (2004) remark, ''conventional funds in disguise''. To investigate whether there are systematic differences between the two groups of funds, a factor model is used in which the returns on industry indices proxy for the return generating factors. The industry betas of SRI and conventional funds are compared first to each other and then to a broad market index. Next, given their industry beta, manager skill is assessed and a comparison is made to determine whether SRI fund managers are more or less skilled at stock selection than conventional managers by examining the performance alphas for the two groups of funds.

In brief, the study documents that industry betas are significant and that they vary across funds and fund types. We find that 92% of all funds exhibit at least one beta statistically significantly different from one, with the majority of funds having positive betas on the information technology industry. In tests of differences between SRI and conventional funds, the study shows that the estimated industry betas between the two groups are significantly different for the telecommunications, energy and utilities industries. In terms of stock-picking skill, the study finds that the vast majority of all fund managers are unable to demonstrate positive alphas. There is no significant difference between the performance of SRI funds and their conventional counterparts.

Data and sample selection

The focus of the study is on the world's largest mutual fund market, found in the USA. The sample is drawn initially from all US retail domestic equity funds with available data at the end of 2003.[4] Domestic equity funds are chosen because they comprise by far the largest proportion of the mutual funds industry.[5] Retail funds are examined as the comparison between SRI and conventional funds needs to control for other factors and most of the SRI funds are targeted at the retail market.

Our main data source is the Morningstar database where in total, there are 6705 retail domestic equity funds available. We identify SRI funds by relying on the classification from an independent body, the Social Investment Forum (SIF). The use of an independent classification avoids at least some of the problems associate with self-classification. The SIF is the main organisation in the US that provides research and education on SRI. It is a non-profit organisation that produces a report on the SRI industry in the US every second year. In 2003 the SIF obtained their mutual funds information from a variety of sources including Morningstar, Wiesenberger, Lipper, GoodMoney, SIMFUND, First Affirmative Financial Network, other public media sources, as well as their own research. The classification also involves the SIF contacting each fund to ensure that screens were in existence at the end of the prior year.

There are 186 socially responsible funds listed in the SIF report. Our task is to reconcile our listing of funds from the SIF with the Morningstar database. Further, the Morningstar database contains only surviving funds, therefore we need to consider the impact of any survivorship bias. Working from the SIF report 108 of the 186 funds are classified as domestic equity and 97 of these are available from the Morningstar database. We investigate the 11 funds not available from Morningstar. Four were institutional and could be excluded, five had merged or changed names so were added into the sample and for two we could find no information. This gives a sample of 102 funds. This sample has a survivorship bias of less than 0.5%.[6] To this sample we add funds whose inception was post-31 December 1998. From the SIF 2003 report we identify 83 SRI retail funds that have information available on Morningstar. Our final sample comprises 185 SRI funds.

From the Morningstar database we extract, for each fund, annual industry allocations, monthly returns, and a point estimate of fees. Morningstar reports the percentage of each fund's holding across 12 industries on an annual basis. The benchmarks for industry composition are Standard and Poor's (S&P) indices, which divide stocks into ten industry groups.[7] In order to achieve a consistent level of industry classification, the two sets of industry classifications are matched and eight industry groups are created which are subsequently used in the analysis. Appendix 2 demonstrates how the industry groups are formed. Monthly data on the market capitalisation of each industry index are obtained from Standard & Poor's. Funds not invested in the industry groups are invested in cash, and the 3-month Treasury bill rate is used as a proxy for the return on cash.[8]

Research method

There are two sections of the empirical analysis. The first part compares SRI funds with conventional funds on a number of dimensions, including return characteristics, Sharpe ratios (developed by Sharpe 1966), industry exposure and fees. To enable comparisons with prior research we use data from 1994 through to 2003 for the performance based variables. For the industry allocations adopted by each fund we have access to data only from 1999 to 2002. These data represent the amount each fund had invested in 12 industries at the beginning of each year. We report annual descriptive statistics. The number of funds varies in each year and the respective sample sizes are noted in the tables. The second part of the analysis contains a more formal assessment of the times series of fund returns using a method that assesses the relative industry allocations of SRI funds, and a test of the level of management skill of SRI managers given their industry weightings. For this section of the study we use monthly fund returns and S&P industry classification data from 1999 to 2003.

SRI and conventional fund characteristics

We begin with a re-examination of the characteristics of SRI funds. In essence, this section is initially a replica of previous research but it provides a test of the consistency of our sample with prior work. This is important if we want to claim some external validity in relation to our findings. We compare the performance of SRI and conventional funds using raw returns and Sharpe ratios. The Sharpe ratio is calculated in the standard manner as

$$S_i = \frac{\bar{R}_i - R_f}{\sigma_i}$$

where

$\bar{R}_i$ is the annualised average return of fund i
R_f is the risk-free rate
σ_i is the annualised standard deviation of fund i.[9]

The level of fees is also compared across the two groups of funds. It has been argued that the search costs in the SRI industry are much higher because of the need for managers to undertake enhanced levels of due diligence before investment. Further, it has also been proposed that SRI is a particularly specialist style resulting in higher remuneration costs. Consequently, fees in the SRI industry may be higher than conventional fees.

Finally, as a precursor to the main empirical tests, we undertake some univariate comparisons between the investment allocations across industries for the SRI and conventional fund samples using the Morningstar annual asset allocations.

The differences between the fund groups are examined using a two-sided Wilcoxon rank sum test for differences in medians. This non-parametric test avoids distributional assumptions. However, we note that the relatively larger conventional sample size may lead to spurious results, and therefore we adopt a bootstrap technique. That is, the unbalanced sample sizes may result in significant findings being attributable to the large sample size of the conventional funds in comparison to the SRI funds. The bootstrap we adopt involves sub-sampling the conventional funds sample 100 times where the sample size is set equal to the SRI sample size. We then calculate the relevant measure for each of the 100 sub-samples and report summary measures as relevant. Next, we perform a Wilcoxon rank sum test for the difference between the SRI sample and each of the 100 conventional sub-samples. We report the median Wilcoxon test statistic and count the number of comparisons (out of 100) that are significant. The effect of this approach is that there are effectively 100 independent tests of equal sample sizes.

Industry composition and stock selection

The formal tests seek to analyse whether SRI funds invest in different industries to conventional funds. As a result of these tests, we are able to ascertain whether managers in the two markets earn additional returns given their industry selection. Managers can earn returns in excess of a benchmark in two ways: first by overweighting industries that are expected to perform well and underweighting industries expected to perform poorly, and second by selecting stocks which are expected to outperform within those industries.

Industry selection is assessed by reference to the S&P 500. If the manager invests exactly in the underlying S&P 500, then the weight of an industry index in a given fund should be equal to the weight of that industry index in the S&P 500. Goetzmann and Massa (2003) explain that investors who follow the S&P 500 industry allocations are speculating only on the outlook of the aggregate market, and not on specific economic information related to industry differentials. To investigate whether funds weight industries differently to the S&P 500, the allocations of the SRI and conventional funds are compared to the S&P 500 composition wherein the sum of the industry indices weighted on market capitalisation make up the S&P 500.

It is expected that most funds will have different industry weights to the S&P 500 as managers attempt to earn excess returns by overweighting industries that they believe will perform well and underweighting industries they believe will perform poorly. If the manager does not exactly replicate the S&P 500 then it is assumed that they have engaged in industry selection, consistent with an active management style.

A manager's choice of which industries to overweight, and which to underweight, will have an effect on the fund's return. If the manager is correct

in their prediction of the industry return, then the fund will earn higher returns than the S&P 500. If however, the manager is incorrect, then the fund will earn returns below the S&P 500. Scenario 1 in Appendix 1 provides a worked example of how industry selection can result in returns that are different to the returns of the S&P 500.

The fund's return will also be impacted by the manager's ability to select stocks given their industry allocations. That is, irrespective of the manager's industry weights, the selection of stocks within each industry will contribute to the overall portfolio return. A passive strategy would involve mimicking the S&P stock weights. Scenario 2 in Appendix 1 shows how a manager can earn additional return by stock selection, given their industry allocations.

Thus, we have three main tests. First, we examine whether there is a difference in the industry allocation of SRI and conventional (domestic) funds. Second, we test whether SRI fund managers and conventional fund managers attempt to earn additional returns by industry selection by benchmarking against the industry composition of the S&P 500 index. Third, given the industry allocations, we test whether there is a difference in the skill of SRI and conventional fund managers.

The following regression model is used as the basis for the tests:[10]

$$R_{it} = \alpha_i + \gamma_i R_{ft} + \sum_{j=1}^{8} \beta_i Z_{jt} + \varepsilon_{it} \qquad (1)$$

where

R_{it} is the monthly return on fund i
R_{ft} is the monthly risk free rate
Z_{jt} is the monthly return on industry index j multiplied by the weight of industry index j in the S&P 500 index in month t where the industries are represented as:
Z_1 is the weighted return on information technology
Z_2 is the weighted return on consumer products
Z_3 is the weighted return on industrials
Z_4 is the weighted return on telecommunications
Z_5 is the weighted return on healthcare
Z_6 is the weighted return on financial services
Z_7 is the weighted return on energy
Z_8 is the weighted return on utilities.

In the time series regressions, a minimum of 24 months of observations are required. As a consequence, the sample size is reduced to 92 socially responsible funds and 2719 conventional funds.

The estimated coefficients from Eq. (1) from each fund are grouped into SRI and conventional categories to give a series of industry betas across funds in each category. These industry betas are then used in a Wilcoxon rank sum test to examine which betas, if any, are significantly different across the two groups.

Again we employ a bootstrap technique to ensure our results from the comparisons are not spurious. We take 100 sub-samples each comprising 92 funds from the sample of conventional funds. Equation (1) is estimated on each of the 100 sub-samples and the coefficient estimates from each sub-sample are compared to the SRI sample.

Further, recognise that the return on the S&P 500 market index can be expressed as a function of the weighted returns on each underlying industry in the S&P 500, viz

$$R_{\mathrm{S\&P},t} = \sum_{j=1}^{8} Z_{jt} \qquad (2)$$

where

$R_{\mathrm{S\&P},t}$ is the monthly return of the S&P 500 index
Z_{jt} is the market capitalisation weighted monthly return on industry index j in month t.

Therefore, a manager who mimicks the S&P 500 will select industry weights that are exactly the same as the S&P 500 industry weights, in which case the estimated coefficients from the estimation of (1) will jointly equal unity and consequently the overall portfolio return is the weighted S&P 500 return, such that

$$\beta_1 = \beta_2 = \cdots = \beta_8 = 1$$

For each fund it can be determined whether that fund invests exactly in the underlying industry index (i.e. the manager weights each stock in the same way that the stock is weighted in the S&P index). A t-test is then run on the estimated betas for each

fund to determine whether these betas are different from unity. This test examines whether managers derive returns different from the S&P 500 through industry allocation.

Finally, we turn to manager skill and stock selection. Sharpe (1992) argues that a manager's selection return is the difference between a fund's return and the return on a passive index. ter Horst et al. (1998) adapt Sharpe's methodology by including an intercept in the regression and show that this intercept captures manager selection ability. Using ter Horst et al.'s (1998) methodology, manager selection skill is the α_i term from Eq. (1). This term captures the return that cannot be explained by the industry weighting the manager has chosen to adopt, and it reflects the residual performance due to stock-picking, given the selected industry weights. If this term is significant and positive then managers, through their stock-picking skill, are able to earn excess returns. A Wilcoxon rank sum test is subsequently used to determine whether there is a difference between the estimated alphas of the SRI and conventional funds.[11] This difference is assessed by comparing the SRI sample and the conventional funds sample as well as comparing the SRI sample with each of the 100 sub-samples of conventional funds.

Results

SRI and conventional fund comparisons

Performance

Table I presents the comparison of performance between SRI and conventional funds over each year between 1994 and 2003. The table documents both raw returns in Panel A and Sharpe ratios in Panel B. Both means and medians are reported, and the conclusions from the two performance measures are very similar. Note that the means of the bootstrapped conventional fund sample are very close the actual sample mean giving us confidence that the number of bootstrap iterations is sufficient.

The annual difference in annual returns between the SRI and conventional fund samples is always less than 2%. Although this could be economically significant if such a return persisted, the statistical comparisons show that the returns between the two groups are indistinguishable. The comparisons show statistically significant differences only in 1996 and 2003; however, the bootstrapped results reveal that the Z-statistic in 1996 is spurious and a function of the larger conventional fund sample size. Nevertheless, the 2003 result is convincing, allowing us to conclude that in only one of the 10 years was there a difference in performance when the conventional funds outperformed the SRI funds.

Similarly in Panel B of Table I, the Sharpe ratios reveal that the two groups of funds exhibit similar attributes, with statistically significant differences again observed only in 2003. As the Sharpe ratio benchmarks the excess return per unit of variability, Panel B is arguably a more relevant comparison for investors. Of note is the consistency of the results using the return measure and the Sharpe ratios which suggests there is little difference in the standard deviations between the two groups of funds. Nevertheless, the general conclusion remains that there is little difference in performance between SRI funds and conventional funds. As noted above, these results are consistent with much of the prior literature.

Fees

Table II provides the statistics on fees and loads. Data are as reported at year end of 2003, with data unavailable for prior years. The table reports actual fees and two types of load fees. Actual fees represent the costs investors pay over the fund's fiscal year. Table II shows that on the full sample comparison, conventional funds charged significantly higher actual fees than SRI funds.[12] However, the bootstrapped results are not convincing. Only 43 of the 100 generated Z-statistics are significant indicating a large variation in the fees charged by the conventional funds. We do not investigate this issue any further, other than to note that this result is somewhat contrary to the market myth that greater competition in the conventional market keeps fees down.[13]

The absolute differences in the actual expenses equates to only six basis points which appears immaterial in the context of the return figures in Table I. Notwithstanding, we undertake the formal analysis that follows using returns net of expenses.

In addition to charging fees, some funds also charge front-end loads, deferred loads or both.

TABLE I

Performance comparisons between SRI and Conventional funds

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Number of Funds										
SRI	36	50	60	75	97	107	123	154	167	184
Conventional	1084	1400	1719	2160	2716	3310	3863	4671	5327	6074
Panel A: Raw Returns										
Mean										
SRI	−1.69	25.48	16.37	23.16	14.93	18.58	1.37	−8.05	−21.91	25.71
Conventional	−0.81	27.00	18.04	21.90	15.57	22.46	2.89	−8.99	−21.91	27.84
Bootstrapped conventional	−0.82	27.03	18.06	21.86	15.44	22.50	3.04	−9.07	−21.94	27.88
Median										
SRI	−2.18	26.79	14.46	21.80	16.59	14.21	0.99	−9.14	−21.99	24.57
Conventional	−0.83	27.06	17.9	22.72	15.76	17.11	1.88	−8.72	−21.8	26.42
Bootstrapped conventional	−0.77	26.80	17.80	22.65	15.45	17.41	2.11	−8.89	−21.68	26.51
Z-statistic: SRI and conventional samples	1.55	1.42	2.22*	0.95	0.03	1.46	0.94	0.36	0.28	3.74*
Median *Z*-statistic: SRI and bootstrapped conventional samples	1.17	0.97	1.58	0.72	0.44	1.08	0.80	0.64	0.63	2.70*
Number of bootstrap tests with significant *Z*-statistic	10	8	30	3	1	8	4	3	1	82
Panel B: Sharpe Ratios										
Mean										
SRI	−0.68	3.17	1.04	1.28	0.45	0.7	−0.22	−0.52	−1.24	2.11
Conventional	−0.56	3.13	1.17	1.18	0.47	0.84	−0.10	−0.53	−1.16	2.17
Bootstrapped conventional	−0.56	3.14	1.16	1.18	0.46	0.84	−0.10	−0.54	−1.16	2.17
Median										
SRI	−0.72	3.03	1.01	1.33	0.53	0.78	−0.2	−0.67	−1.21	2.05
Conventional	−0.52	3.11	1.17	1.29	0.54	0.93	−0.2	−0.64	−1.19	2.15
Bootstrapped conventional	−0.51	3.18	1.17	1.29	0.53	0.96	−0.18	−0.64	−1.19	2.15
Z-statistic: SRI and conventional samples	1.89	0.06	2.47*	0.86	0.12	1.87	1.25	0.02	1.18	3.27*
Median *Z*-statistic: SRI and bootstrapped conventional samples	1.32	0.38	1.73	0.70	0.55	1.34	0.90	0.55	1.04	2.41*
Number of bootstrap tests with significant *Z*-statistic	20	0	39	3	0	28	9	0	11	71

The table provides a comparison of performance measured as raw returns and (annual) Sharpe ratios across individual years between 1994 and 2003 between SRI and conventional funds. The sample size in each year varies due to the availability of data. Data are drawn from the Morningstar database using the SIF SRI classification. In Panel A, the numbers represent annual percentage returns. For the bootstrapped conventional funds, the reported mean (median) is the mean (median) of the 100 samples. The *Z*-statistic is the Wilcoxon rank sum test for differences in medians. *Z*-statistics are reported as absolute values. The *Z*-statistic for the comparison between SRI and the bootstrapped conventional samples is the median *Z*-statistic from 100 tests. *denotes significance at the 5% level.

TABLE II

Fee comparisons between SRI and Conventional funds

	SRI funds	Conventional funds	Bootstrapped conventional funds
Actual fees			
Number of funds	172	5731	100×172
Mean	0.65	0.71	0.71
Median	0.69	0.75	0.75
Z-statistic	2.58*		
Median *Z*-statistic: SRI and bootstrapped conventional samples	1.88		
Number of bootstrap tests with significant *Z*-statistic	43		
Front Load Fees			
Number of funds	185	6428	100×185
Mean	1.42	1.44	1.48
Median	0	0	0
Z-statistic	0.16		
Median *Z*-statistic: SRI and bootstrapped conventional samples	0.50		
Number of bootstrap tests with significant *Z*-statistic	8		
Deferred load fees			
Number of funds	185	6428	100×185
Mean	1.17	1.22	1.24
Median	0	0	0
Z-statistic	0.78		
Median *Z*-statistic: SRI and bootstrapped conventional samples	0.67		
Number of bootstrap tests with significant *Z*-statistic	0		

The table provides a comparison of fee levels as at 31 December 2003. Prior year data are unavailable. The sample size by fee type varies due to disclosure. Data are drawn from the Morningstar database using the SIF SRI classification. The numbers represent percentage of assets under management. For the bootstrapped conventional funds, the reported mean (median) is the mean (median) of the 100 samples. The *Z*-statistic is the Wilcoxon rank sum test for differences in medians. *Z*-statistics are reported as absolute values. The *Z*-statistic for the comparison between SRI and the bootstrapped conventional samples is the median *Z*-statistic from 100 tests. *denotes significance at the 5% level

Table II shows that as at year end 2003, SRI and conventional funds did not charge significantly different load fees. The median load amount for both groups of funds is zero, consistent with most funds in both markets not charging load fees.

Industry allocations

The univariate comparison of SRI and conventional funds' industry weights is reported in Table III. This table uses the 12 Morningstar industry classifications and hence the classification is consistent across the two groups of funds. The year-by-year comparisons of percentage of allocations are shown in the table. A test for statistical difference in specific industry allocations between SRI and conventional funds is provided by the Wilcoxon test. Note that bootstrapped results are also presented wherein the number of conventional funds is set equal to the number of SRI funds and 100 independent draws are made. In the table, the percentages invested across all industries do not add to 100% as the percentage invested in cash or non-standard equity investments is not included. However the sum of the mean total allocation for each year is around 90% which is consistent with the funds being essentially equity funds but less than fully invested at any one point in time.

Table III shows that SRI and conventional funds do appear to invest different percentages of their assets under management in different industries. However, the differences in the industry allocations between the two groups are not consistent across the

TABLE III

Industry allocation comparisons between SRI and Conventional funds

	2002									2001								
	Mean		Median		*Z*-statistic	Bootstrapped results				Mean		Median		*Z*-statistic	Bootstrapped results			
	SRI	Conv	SRI	Conv		Mean	Median	Median *Z*-statistic	No. of sig *Z*-statistics	SRI	Conv	SRI	Conv		Mean	Median	Median *Z*-statistic	No. of sig *Z*-statistics
Software	3.79	4.78	3.70	3.60	0.65	4.88	3.70	0.83	7	4.25	4.96	4.40	3.60	0.44	4.94	3.55	0.58	0
Hardware	9.15	10.13	9.20	8.10	1.62	9.95	7.90	1.33	25	11.41	11.40	11.15	9.10	2.97*	11.31	8.90	2.19*	61
Media	2.93	3.91	2.30	3.10	2.57*	3.85	3.00	1.77	35	3.03	3.56	2.50	2.70	0.77	3.58	2.75	0.67	6
Telecoms	3.10	2.56	2.80	1.50	3.85*	2.57	1.50	3.74*	100	3.98	3.33	3.40	2.20	3.98*	3.31	2.20	2.84*	88
Healthcare	13.79	14.26	12.50	12.50	1.87	14.36	12.60	1.14	16	13.85	14.25	13.30	12.25	1.83	14.16	12.10	1.48	27
Consumer services	9.86	8.47	8.70	7.90	3.00*	8.47	7.80	2.18*	61	9.19	8.39	8.20	7.70	2.40*	8.41	7.75	1.75	38
Business services	6.97	5.88	5.20	4.40	3.04*	5.88	4.40	2.18*	65	6.29	5.96	4.50	4.50	0.71	5.97	4.50	0.52	1
Financial services	16.39	17.03	15.60	14.30	1.54	17.01	14.30	1.09	13	16.58	15.68	16.60	13.80	3.85*	15.75	13.98	2.77*	89
Consumer goods	6.82	6.02	6.30	5.80	2.93*	5.95	5.80	2.21*	67	6.41	5.58	6.40	5.20	3.35*	5.57	5.15	2.46*	69
Industrial materials	8.70	8.26	7.50	7.10	1.88	8.27	7.20	1.40	15	7.90	8.51	7.20	7.80	0.75	8.42	7.83	0.67	1
Energy	5.28	5.69	5.10	4.90	0.78	5.68	4.90	0.67	3	4.43	5.12	3.65	4.10	0.19	5.13	4.10	0.47	0
Utilities	2.88	2.30	1.10	0.60	2.30*	2.25	0.70	1.58	34	3.21	2.71	2.20	1.10	3.57*	2.73	1.10	2.64*	80
	2000									1999								
Software	4.71	5.57	3.80	3.30	0.39	5.62	3.25	0.55	1	5.72	6.24	5.20	4.40	0.37	6.32	4.25	0.52	1
Hardware	14.35	13.65	13.60	10.70	3.16*	13.74	10.70	2.15*	60	15.07	15.18	16.50	13.30	1.33	14.86	12.80	1.26	17

Media	3.27	3.23	2.45	2.40	0.49	3.24	2.40	0.53	0	4.03	4.35	3.00	3.20	0.87	4.34	3.30	0.72	4
Telecoms	4.48	3.62	4.00	2.60	4.20*	3.61	2.60	2.97*	93	5.56	5.35	5.10	4.20	2.19*	5.34	4.00	1.68	35
Healthcare	12.66	13.21	12.90	11.60	1.88	13.65	11.85	1.08	13	8.58	8.95	9.40	7.60	2.25*	8.74	7.60	1.72	32
Consumer services	7.27	6.1	7.10	5.50	4.25*	6.12	5.40	3.02*	92	8.74	6.87	8.10	6.30	4.54*	6.94	6.30	3.18*	98
Business services	5.79	4.87	4.20	3.10	3.49*	4.83	3.10	2.61*	83	6.08	5.88	3.70	4.00	1.07	5.88	4.00	0.67	3
Financial services	16.13	15.61	16.50	13.50	2.88*	15.67	13.45	2.01*	52	13.85	13.62	13.60	10.50	2.92*	13.60	10.40	2.05*	57
Consumer goods	6.22	5.29	5.40	4.60	3.40*	5.30	4.60	2.43*	72	8.33	6.35	7.20	5.70	4.06*	6.42	6.00	2.70*	86
Industrial materials	7.16	8.01	5.80	7.20	1.52	8.05	7.20	1.00	13	8.31	8.93	7.10	7.70	0.59	8.31	7.70	0.60	4
Energy	5.92	6.78	5.00	5.70	0.43	6.71	5.70	0.54	1	3.67	5.07	2.60	3.60	1.24	5.19	3.70	0.94	10
Utilities	4.17	3.19	2.10	1.60	3.49*	3.10	1.55	2.69*	79	3.01	2.45	1.10	0.90	0.36	2.52	0.90	0.46	0

The table provides a comparison of industry allocations across individual years between 1999 and 2002 between SRI and conventional funds. The sample size in each year varies due to the availability of data such that in 2002: socially responsible 169, conventional 5447; 2001: socially responsible 148, conventional 4840; 2000: socially responsible 128, conventional 3941; 1999: socially responsible 101, conventional 3208. The industry groups are provided by Morningstar classification. The numbers in the columns represent the percentage of the portfolio invested in each industry as at year end. Bootstrapped results are based on 100 sub-samples where the sample size of the conventional funds equals the SRI sample size. The *Z*-statistic is the Wilcoxon rank sum test for differences in medians. *Z*-statistics are reported as absolute values. *denotes significance at the 5% level.

years and it is difficult to draw firm conclusions. Nevertheless, there do appear to be some trends across the years. Focusing on the bootstrapped results, in 1999 SRI funds invested significantly more in consumer services, financial services and consumer goods. In 2000, SRI funds invested significantly more in most industries, which perhaps is more representative of a general market sentiment than any specific socially responsible criterion. In 2001, SRI funds invested significantly more in hardware, telecommunications, financial services, consumer goods and utilities. While in 2002, SRI funds invested significantly more in telecommunications, consumer services, business services and consumer goods. Appendix 2 gives examples of the types of stocks that would be included in each of these industries.

Prima facie, there appears to be no consistent appearance of specific industries in which SRI funds take a higher weight, perhaps with the exception of consumer goods. Note that alcohol and tobacco are included in the consumer goods category so this result is unexpected. However, this category would also include many socially responsible companies. The list of 'undesirable' companies that would be disqualified using exclusionary screens in accordance with the SIF classification criteria might be expected to fall across industries rather than being concentrated in a few industries. The fact that significant differences in industry allocations are found is comforting evidence. That is, despite there being little difference in performance or any material difference in fee levels between the two groups of funds, there are differences in the industry allocations of SRI and conventional funds. The next section more formally analyses the differences in allocations to different industries.

Times-series regressions

Industry analysis

Summary results for Eq. (1) are presented in Table IV.[14] Recall for the purposes of the time-series analysis, industry groups are reformed to ensure consistency with the S&P classifications. Monthly returns for the eight industry groups are incorporated into the regression. The coefficient estimates from Eq. (1) represent industry betas and are estimated for each fund. The Wilcoxon rank sum test for the differences between the median betas of SRI and conventional funds is also reported in Table IV. Similarly Wilcoxon Z-statistics are calculated for a test of the difference between the beta estimates for the 92 SRI funds and the corresponding 100 bootstrap samples comprising 92 conventional funds.

There are large betas observed for industries 1, 2 and especially 8. These represent information technology, consumer products and utilities respectively. Of further note is the negative value on cash consistent with this asset being a minor contributor to portfolio returns. We note a higher standard deviation on the R_{ft} coefficient particularly for conventional funds. This result is consistent with a large variation between funds in the amount of cash held as part of the portfolio.[15] The standard deviation of beta estimates is also generally larger for conventional funds than SRI funds reflecting a greater diversity in their industry allocations. Overall, the largest standard deviations for the beta estimates across both fund groups are industries 4, 7 and 8 which respectively represent telecommunications, energy and utilities.

Turning to the statistical tests in Panel B, the estimated betas of SRI and conventional funds are significantly different for industries 4 and 8 representing telecommunications and utilities respectively. Note that this is the case for both the standard test between the two groups of funds and the bootstrap tests. Additionally, there is evidence that industry 7, energy, shows significant differences between groups (based on the bootstrap results). This suggests that, overall, the returns of SRI funds are more sensitive to returns in telecommunications and energy than conventional funds but less sensitive to returns in utilities. Table IV also reports a significant test statistics on industry 5 in relation to the standard test but we regard this as spurious as it is not confirmed in the bootstrap tests.

The estimated betas from Eq. (1) are then tested to determine individual statistically significant difference from unity with the summary results reported in Table IV. The funds are divided into SRI and conventional fund groups and we count the number of betas that are significantly different from unity. The results vary across each industry. Generally, the majority of funds in both groups do not depart from the index. Focusing on industries 2, 3, 4, 6 and 7 we

TABLE IV

Summary statistics of fund industry betas for SRI and conventional funds

	R_{fi}			β_1			β_2			β_3			β_4			β_5			β_6			β_7			β_8			Adjusted R^2		
	SRI	Conv	Conv Boot-strap	SRI	Conv	Conv Boot -strap	SRI	Conv	Conv Boot -strap	SRI	Conv	Conv Boot-strap	SRI	Conv	Conv Boot-strap	SRI	Conv	Conv Boot-strap	SRI	Conv	Conv Boot-strap	SRI	Conv	Conv Boot-strap	SRI	Conv	Conv Boot-strap	SRI	Conv	Conv Boot-strap
Panel A																														
Summary statistics of γ_i and β_i *coefficients*																														
Mean	−0.29	−1.91	−1.76	1.32	1.53	1.55	1.4	1.38	1.37	0.32	0.29	0.29	0.12	−0.58	−0.60	0.22	−0.06	−0.03	0.7	0.69	0.71	0.36	0.37	0.32	4.88	6.1	6.07	0.84	0.79	0.79
Std. Deviation	2.42	12.69	10.76	0.95	1.48	1.48	0.86	1.35	1.29	1.16	1.53	1.48	1.45	2.27	2.16	1.16	1.87	1.80	0.84	1.18	1.16	1.63	2.75	2.50	5.46	5.54	5.46	0.15	0.16	0.16
Median	−0.72	−0.35	−0.28	1.1	1.15	1.23	1.42	1.23	1.22	0.45	0.46	0.45	0.37	−0.39	−0.41	0.29	0.02	0.04	0.86	0.73	0.74	0.2	0.25	0.19	3.39	5.02	4.98	0.88	0.83	0.83
Number of β_i significantly different from 0 (mean of 100 samples)	14	310	10.57	84	2147	73.40	60	1243	41.50	21	606	20.15	27	441	14.82	44	886	29.20	44	904	30.47	20	403	12.52	47	1401	47.06			
% of N	15%	11%	11%	91%	79%	80%	65%	46%	45%	23%	22%	22%	29%	16%	16%	48%	33%	32%	48%	33%	33%	22%	15%	14%	51%	52%	51%			
Number of β_i significantly different from 1 (% of N))	29	490	16.50	66	1877	64.27	20	505	16.86	20	249	8.24	11	531	18.01	26	1050	34.76	11	371	12.58	12	261	8.47	37	1061	35.46			
	32%	18%	18%	72%	69%	70%	22%	19%	18%	22%	9%	9%	12%	20%	20%	28%	39%	38%	12%	14%	14%	13%	10%	9%	40%	39%	39%			
Panel B – Z-statistics																														
	R_{fi}			β_1			β_2			β_3			β_4			β_5			β_6			β_7			β_8					
Z-statistic: SRI and conventional	0.92			0.43			0.64			0.26			3.97★			2.01★			1.22			1.11			2.85★					
Median *Z*-statistic: SRI and bootstrap conv	0.89			0.73			0.64			0.46			2.93★			1.37			0.86			2.63★			2.06★					
Number of bootstrap comparisons signif at 0.05	11			3			6			2			88			24			6			76			55					

This table reports the results of the estimation of the time-series regression where the conventional fund group has been bootstrapped using 100 sub samples:

$$R_{it} = \alpha_{it} + \gamma_i R_{ft} + \sum_{j=1}^{8} \beta_i Z_{jt} + \varepsilon_{it} \quad (1)$$

where R_{it} is the monthly return on each fund i, R_{ft} is the monthly risk free rate which proxies for cash and Z_{jt} is the monthly return on industry index j multiplied by the weight of industry index j in the S&P 500 index in month t. There are eight industries represented by Z_1 is information technology, Z_2 is consumer products, Z_3 is industrials, Z_4 is telecommunications, Z_5 is healthcare, Z_6 is financial services, Z_7 is energy, Z_8 is utilities. Heteroskedasticity and autocorrelation are corrected using the Newey–West procedure. The sample period is 1999–2003 and there are 92 SRI funds and 2719 conventional funds. For the conventional funds 100 bootstrap samples of 92 funds were drawn. The regression is run for each fund. Summary statistics are presented for 92 SRI funds and the 100 samples of 92 conventional funds. Comparisons using the Wilcoxon rank sum test were made between the SRI sample and each of the 100 conventional fund bootstrapped samples. The mean (median) of the means (medians) over the 100 bootstrap samples is reported. *Z*-statistics are reported as absolute values. ★denotes significance at the 5% level.

see that for the SRI funds, between 12% and 22% of the funds depart from the index which is a slightly lower variation than for conventional funds where between 9% and 20% depart from the index. In comparison, for industries 5 and 8 we see that 39% of the conventional funds depart from the index in both cases while 28% and 40% of the SRI funds depart from the index respectively. The most notable result in this section concerns industry 1, the information technology industry, wherein the majority of funds across both groups depart from the index. Recall that the sample period spans 1999–2002 which overlaps with the dot.com boom and hence the positions generated in information technology are not surprising, and this evidence is consistent with both groups of managers chasing positive alpha.

Finally, the estimated betas are examined individually for every fund. Of the 2811 funds, 2591 (or 92%) have at least one beta that is statistically different from unity. Not surprisingly, many of the 202 funds that have none of their betas different from unity classify themselves as index funds. Overall, this evidence is consistent with an active manager group of funds across both SRI and conventional classifications.

Manager skill

The evidence above suggests that most managers attempt to engage in industry selection, hence the next step is to examine whether they engage in stock selection. This is undertaken by examining the estimated alpha values from Eq. (1) which represent managers' stock selection ability.[16] A significantly positive alpha is consistent with superior returns generated by stock selection.

Table V presents the summary results and shows that 86% of SRI managers and 89% of conventional fund managers have insignificant alphas. This finding concurs with prior literature wherein it has been generally documented that most fund managers are not able to outperform broad stock market benchmarks (Brown and Goetzmann, 1995; Chang and Llewellyn, 1984; Jensen, 1969; Treynor, 1965).

There is very limited evidence of positive alphas with only 3% of SRI managers and 5% of conventional fund managers exhibiting a statistically significant positive alpha. In contrast, 11% of SRI managers and 7% of conventional fund managers exhibit a statistically significant negative alpha. A Wilcoxon rank sum test is conducted on the alphas whereby the difference in median alphas between SRI and conventional funds is examined. The median alpha for SRI funds is −0.0007 which compares to −0.0002 for conventional funds (respective means are −0.0005 and 0.0024). The median Z-statistic for the difference in the medians is insignificant. Moreover, the bootstrap results confirm these findings. Our evidence shows that there is no statistical difference between the stock selection skill of SRI and conventional fund managers. Nevertheless, we stress that at the individual fund level there are some fund managers in both groups that are able to earn positive alphas albeit in a small proportion of the funds.

Conclusions

Previous research into the growing industry of socially responsible investment has generally been concerned with whether SRI funds provide returns that are commensurate with their conventional counterparts. In general, prior findings show that the performance of SRI funds is no different from the performance of conventional funds. The question then arises, if there is no substantial differences in performance then are the portfolios of SRI funds any different from the portfolios of conventional funds? This question is of fundamental relevance as it drives at the heart of the reason for the existence of SRI funds.

Prior studies have generally not focussed on portfolio composition, but rather on investment performance. The purpose of this study was to provide an analysis of the relative portfolio composition of SRI funds by examining the industry components of returns on the investment portfolio of SRI funds to conventional mutual funds. In so doing, the study has provided an empirical analysis of SRI fund investment practices.

The study first found that the performance of SRI funds is not distinguishable from conventional funds over the period 1994–2003. Moreover, using data at 2003, we found no material difference in fee

TABLE V

Summary statistics of fund alphas for SRI and conventional funds

	SRI funds		Conventional funds		Conventional funds		
					Bootstrap results of 100 samples		
Panel A							
	Number of funds	%	Number of funds	%		Number of funds	%
Total number of funds	92	100	2719	100	Number of funds in each sub sample	92	
Total significant alphas	13	14	312	11	Average number of significant alphas	10	11
Total insignificant alphas	79	86	2407	89	Average number of insignificant alphas	82	89
Positive alphas							
Total	38	41	1326	49	Average number of positive alphas	44 (Median: 44)	48
Significant	3	3	128	5	Average number of significant positive alphas	4 (Median: 4)	4
Insignificant	35	38	1,198	44	Average number of insignificant positive alphas	40	43
Negative alphas							
Total	54	59	1,393	51	Average number of negative alphas	48 (Median: 48)	52
Significant	10	11	184	7	Average number of significant negative alphas	6 (Median: 7)	6
Insignificant	44	48	1,209	45	Average number of insignificant negative alphas	42	46
Panel B							
Mean Alpha	−0.0005		0.0024		Mean of 100 alphas	0.002	
Median Alpha	−0.0007		−0.0002		Median of 100 alphas	−0.0003	
Wilcoxon							
Z-statistic				1.84	Mean *Z* Statistic	1.15	

This table reports the results of the estimation of the time-series regression:

$$R_{it} = \alpha_{it} + \gamma_i R_{ft} + \sum_{j=1}^{8} \beta_i Z_{jt} + \varepsilon_{it} \quad (1)$$

where R_{it} is the monthly return on each fund i, R_{ft} is the monthly risk free rate which proxies for cash and Z_{jt} is the monthly return on industry index j multiplied by the weight of industry index j in the S&P 500 index in month t. There are eight industries represented by Z_1 is information technology, Z_2 is consumer products, Z_3 is industrials, Z_4 is telecommunications, Z_5 is healthcare, Z_6 is financial services, Z_7 is energy, Z_8 is utilities. Heteroskedasticity and autocorrelation are corrected using the Newey–West procedure. The sample period is 1999–2002 and there are 92 SRI funds and 2719 conventional funds. The regression is run for each fund and the table reports the summary statistics of the estimated alpha coefficients. The bootstrap results represent 100 regressions on samples of 92 independently drawn conventional funds.

levels. These results confirm prior research. The preliminary analysis of portfolio composition has shown that there are differences between the weights invested in different industries between SRI and conventional funds, although these differences were not consistent over time.

Using a regression model, the study has documented that industry betas are significant and that they vary across funds and fund types. We found that 92% of all funds exhibit at least one beta statistically significantly different from one, with the majority of funds having positive betas on the information technology industry which is not surprising given that the sample period overlaps with the dot.com boom. These findings are consistent with most managers attempting to earn additional returns by industry selection and avoiding index replication.

In tests of differences between SRI and conventional funds, the results show that the estimated industry betas between the two groups are significantly different for the telecommunications and utilities industries. This is a key finding of the paper as it demonstrates that despite exhibiting similar performance, the returns of SRI funds are generated through different industry exposures when compared to conventional funds, which is consistent with SRI managers holding different portfolio positions. This result counters the public criticism that SRI funds are a marketing ploy and confirms they are not merely ''conventional funds in disguise'' (Bauer et al., 2004).

In terms of stock-picking skill, the study has found that overall, there is no significant difference between SRI managers and their conventional counterparts. Consistent with previous research, these results suggest that the majority of fund managers are unable to demonstrate positive alphas. At an individual fund level, there are a few managers in both the SRI and conventional fund groups who demonstrate positive alphas, but these represent only a small percentage.

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Appendix 1: A worked example of how managers can earn additional return by industry and stock selection

Assume there are two industries in the S&P, each with two stocks in them. The weights and returns are as follows:

	Utilities			Telecommunications	
	Weight	Return		Weight	Return
Stock 1	0.1	0.1	Stock 3	0.2	0.05
Stock 2	0.3	0.2	Stock 4	0.4	0.1
Total Weight	0.4		Total Weight	0.6	
Industry index return		0.175	Industry index return		0.08333

The return on the S&P is given by the weight of each stock multiplied by its return:

$$R_{S\&P} = 0.1 * 0.1 + 0.3 * 0.2 + 0.2 * 0.05 + 0.4 * 0.1 = 0.12$$

or equivalently the sum of the industry index returns:

$$R_{S\&P} = 0.4 * 0.175 + 0.6 * 0.08333 = 0.12$$

Scenario 1: Returns from industry selection

A fund manager invests in the underlying index, but weights the industries differently:

	Utilities			Telecommunications	
	Weight	Return		Weight	Return
Stock 1	0.2125	0.1	Stock 3	0.05	0.05
Stock 2	0.6375	0.2	Stock 4	0.1	0.1
Total Weight	0.85		Total Weight	0.15	

The total weight in each industry is different from the S&P industry weights, but the proportions invested in each stock of the underlying industry index is exactly the same as the weights in the index (i.e.,

the ratio of stock 1: stock 2 is 1:3 and stock 3: stock 4 is 1:2) only the total weight in each industry is different. The manager is not stock picking in this scenario, but is merely choosing to overweight or underweight a particular industry in the portfolio.

The return on this fund is:

$$R_i = 0.2125 * 0.1 + \cdots + 0.1 * 0.1 = 0.16125$$

However, as the fund is essentially just reweighting the industries, and not the industry components, the return on the fund can also be calculated:

$$R_i = \beta_1(R_{\text{utilities}}) + \beta_2(R_{\text{telecos}})$$

where β_i is (index weight in fund/index weight in S&P) i.e.: $\beta_1 = 0.85/0.4 = 2.125$ and $\beta_2 = 0.15/0.6 = 0.25$

Therefore

$$R_i = 2.125{*}0.07 + 0.25^{*}0.05 = 0.16125$$

Equation (1) is estimating each β_i. As can be seen from the above example, the fund under weights telecommunications and $\beta_1 < 1$ and overweights utilities and $\beta_2 1$. So the magnitude of β in Eq. (1) tells us whether the fund over- or underweights an industry. If the fund had invested exactly the same proportions in each industry, then both βs would be 1 ($H2_0$). The manager has earned higher returns by overweighting the industry that does better.

Scenario 2: Returns from stock selection

This time, the manager does stock pick as follows:

Utilities			Telecommunications		
	Weight	Return		Weight	Return
Stock 1	0	0.1	Stock 3	0	0.05
Stock 2	0.85	0.2	Stock 4	0.15	0.1
Total Weight	0.85		Total Weight	0.15	

The manager is weighting the industries the same as in scenario 1, but this time is stock picking – in each case s/he only chooses one stock in each industry. The return on this fund is

$$R_i = 0.85 * 0.2 + 0.15 * 0.1 = 0.185$$

This return is not just a reweighted index because the manager has not invested in the underlying industry index. This manager has, therefore, earned a positive alpha of 2.375% by stock picking within each industry.

The alpha is the fund's actual return less the return the fund would have provided given its industry allocation: what Sharpe calls the 'passive index' and indicates the manager's stock-picking ability. If the manager has stock-picking skill then this alpha should be positive and significant, and if not then the alpha will be zero or negative. This is what hypothesis three tests.

In this case, however, the β values from the regressions are *not* the overweighting or underweighting of that industry. The β_is are not *only* driven by the weight of the fund in that index. They represent the sensitivity of the fund's return to the index return. This sensitivity is driven by how the manager has chosen to weight the industries as well as the stocks that the manager has chosen within each industry. If a β_i is significant, this shows that the industry does contribute to explaining returns, but no comment can be made on whether that industry is over- or underweighted.

APPENDIX 2

Construction of Merged Morningstar and S&P industry indices

Morningstar Index description		S&P Index	Merged Group	Industry number
Software	Companies engaged in the design and marketing of computer operating systems and applications. Examples include Microsoft, Oracle, and Siebel Systems.	Information technology	Information technology	1
Hardware	Manufacturers of computer equipment, communication equipment, semiconductors, and components. Examples include IBM, Cisco Systems, and Intel.			
Consumer services	Includes retail stores, personal services, home builders, home supply, travel and entertainment companies, and educational providers. Examples include Wal-Mart, Home Depot, and Expedia.	Consumer staples	Consumer products	2
Consumer goods	Companies that manufacture or provide food, beverages, household and personal products, apparel, shoes, textiles, autos, consumer electronics, luxury goods, packaging, and tobacco. Examples include PepsiCo, Ford Motor Co., and Kraft Foods.	Consumer discretionary		
Media	Companies that own and operate broadcast networks and those that create content or provide it to other media companies. Examples include AOL Time Warner, Walt Disney, and The Washington Post.			
Industrial materials	Includes aerospace and defense firms, and companies that provide or manufacture chemicals, machinery, auto parts, building materials, and commodities. Examples include Boeing, DuPont, and Alcoa.	Industrials	Industrials	3
Business services	Includes advertising, printing, publishing, business support, consultants, employment, engineering and construction, security services, waste management, distributors, and transportation companies. Examples include Manpower, R. H. Donnelley, and Southwest Airlines.	Materials		
Tele-communications	Companies that provide communication services using fixed-line networks or those that provide wireless access and services. Examples include SBC Communications, AT&T, and Alltel.	Tele-communications services	Tele-communications	4

APPENDIX 2
(Continued)

	Morningstar Index description	S&P Index	Merged Group	Industry number
Healthcare	Includes biotechnology, pharmaceuticals, research services, HMOs, home health, hospitals, medical equipment and supplies, and assisted living companies. Examples include Abbott Laboratories, Merck, and Cardinal Health.	Healthcare	Healthcare	5
Financial services	Includes banks, finance companies, money management firms, savings and loans, securities brokers, and insurance companies. Examples include Citigroup, Washington Mutual, and Fannie Mae.	Financials	Financial services	6
Energy	Companies that produce or refine oil and gas, oilfield services and equipment companies, and pipeline operators. Examples include Exxon Mobil, Schlumberger, and BP Amoco.	Energy	Energy	7
Utilities	Electric, gas, and water utilities. Examples include Duke Energy, Exelon, and El Paso.	Utilities	Utilities	8

Notes

[1] Based on the Investment Company Institute which estimates total funds under management at December 2003 at US$7,413 billion. Source: http://www.ici.org

[2] Markowitz (1952) defines a portfolio as mean–variant efficient if it has the highest expected return for a given level of variance (risk) or the lowest variance for a given level of expected return. In order to maximize the risk/return relationship, investors determine their portfolio by selecting from the universe of investments to form an efficient portfolio. Theoretically, selection from a subset of the universe (for example selecting only from SRI companies) may result in a sub-optimal portfolio.

[3] Mallin et al. (1995) refer to the fund objectives and define an ethical fund as "one which has either stated negative or positive criteria". Negative criteria may include avoidance of particular industries, for example, armaments or tobacco; while positive criteria may focus on 'environmentally friendly companies'. Note the authors do not examine the actual portfolio compositions of the funds to ensure the compliance with the criteria. Non-ethical funds comprise a sample of funds without a stated ethical objective, matched on size and date of commencement.

[4] Funds data are obtained from the November and December 2003 versions of Morningstar On-Disk.

[5] Morningstar classifies a fund as domestic equity if 60% or more of the fund's equity holdings are in domestic equities.

[6] As a caveat we note that there may be a greater survivorship bias in the conventional fund sample which we are unable to control. Nevertheless, any bias induced works against our findings.

[7] The S&P industry returns are adjusted for dividends and capital changes.

[8] Monthly data on Treasury bills are obtained from the website of the Board of Governors of the Federal Reserve.

[9] The Sharpe ratio is constructed using annualised figures. Where a fund has missing data within the year, the annualization based on a small number of observations can distort the figures, especially the standard deviation, and hence funds with missing data within a year are not included in the comparison in that year.

[10] In the reported results, heteroscedasticity and autocorrelation is corrected for using the Newey-West procedure. Multicollinearity is tested by reference to the variance inflation factors (VIF), that is, the diagonals in the inverse correlation matrix of the independent variables. Using Kennedy's (2001) rule of thumb that if the

VIF factors are less than 10 then multicollinearity is generally not a threat to the model, all VIF factors in this analysis are less than 10.

[11] Note that the test statistics for the Wilcoxon test are reported as absolute (non-signed) values.

[12] Morningstar also breaks down actual fees into management fees and 12b-1 expenses. In both cases, the conventional funds charge significantly higher fees than SRI funds.

[13] Fuchs (2001) notes that although initially SRI funds charged higher fees, they now have management expense ratios that are competitive with mainstream funds.

[14] Note that not all funds have 5 years of return data. The time-series regressions are, therefore, run on the available data, meaning that these regressions do not give the average over 5 years in all cases. For robustness, the time-series regressions are also run using only those funds that have been in existence for 5 years. In this case, Z_4, Z_6 and Z_8, telecommunications, financials and utilities are significant.

[15] The cash component can vary significantly as new money flows into the fund and requires placement. Similarly funds will have varying cash balances as they meet the liquidity requirements of their investors. This balance is likely to fluctuate as flows are an asymmetric function of prior performance, search costs and fund size (Sirri and Tufano, 1998).

[16] This interpretation of alpha relies on the industry exposures representing the common source of returns. That is, we implicitly assume that the model captures other common effects, as is the case with any such model.

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UQ Business School,
The University of Queensland,
St. Lucia, 4069, QLD,
Australia
E-mail: k.benson@business.uq.edu.au