Centre for Social and Environmental Accounting Research
Accountability Transparency Sustainability

Evaluating the Performance of Ethical and Non-Ethical Funds: A Matched Pair Analysis

N.Kreander, R.H.Gray, D.M.Power, and C.D.Sinclair

N.Kreander is a PhD student at the University of Glasgow. R.H.Gray is Professor of Accounting and Director of The Centre for Social and Environmental Accounting Research (CSEAR) at the University of Glasgow. D.M.Power is the Professor of Finance at the University of Dundee and C.D.Sinclair is a senior lecturer at the University of Dundee, Corresponding author is N.Kreander.

Address: N.Kreander, The Department of Accountancy & Finance, The University of Glasgow, 65-71 Southpark Avenue, Glasgow G12 8LE.

Telephone: 0370 367 960

E-mail: 9912327k@student.gla.ac.uk

Abstract

This paper investigates the comparative financial performance of 80 investment funds from seven European countries, over a recent time period, 1996-1998. Of these funds, 40 select securities according to ethical criteria while the remainder do not. The paper extends the matched pair approach to ethical fund performance developed in previous papers by Mallin, Saadouni and Briston (1995) and Gregory, Matatko and Luther (1997). The matching in this investigation was done by age, country, size and investment universe of the fund. An analysis of the results reveals that no significant difference in financial performance exists between the two groups of funds despite the fact that ethical funds choose securities from a restricted universe of investments. Irrespective of whether the Jensen alpha, the Sharpe ratio or the Treynor measure is employed, the matched pairs perform equally well.

However, while there is not a significant difference in returns, there is some evidence that ethical funds are less risky as measured by volatility of returns and fund beta than their non-ethical counterparts. This may indicate that for a risk averse British investor an ethical fund may be more appropriate than a conventional fund which ignores non-financial issues. It also supports the view that ethical funds may have less risky portfolios than a market index. The findings demonstrate that no fund manager has been able to significantly outperform the market by timing variations in market movements. The non-ethical funds seemed to be slightly better at timing the market than their ethical counterparts according to the Henriksson-Merton (1981) model, although the difference is not statistically significant. Cross sectional analysis indicated that fund performance as measured by Jensen alpha and returns did not seem to be significantly related to the age, size or ethical status of the fund. However, ethical status was significant in explaining the Henrikkson-Merton alphas, thus providing some evidence of superior stock selection skills for ethical fund managers compared to the managers of conventional funds.

1. Introduction

This paper studies the performance of European ethical investment funds over the recent period from January 1996 to December 1998. These funds are growing in importance throughout Europe although in some countries such as Sweden they have been in existence since 1965. This fast growing area of European equity investment, involves investment funds selecting securities according to ethical and environmental criteria. The amount of resources which they have available for investment has risen dramatically. For example, according to Ethical Investment Research Service (EIRiS) there were 44 ethical funds in the UK with £2.8 billion under management in February 2000 compared to £0.67 billion in July 1994 (EIRiS, 2000). The spread of European countries where such funds have been established has also increased over the last ten years. There are around 20 ethical funds in Sweden and at least 40 ethical funds in the rest of Europe. For example, ethical funds now operate in Belgium, France, Germany, Norway, Switzerland, and the Netherlands, while a small number flourish in Austria, Finland, France and Spain.

The term "ethical fund" which is widely used in the academic and professional literature actually includes investments with a diverse set of aims and objectives. Some funds do not hold shares in firms which operate in the alcohol, pornography and tobacco industries, while others forbid the purchase of equities of firms with poor environmental track records. What characterises these funds is that the maximisation of the financial returns is not their sole aim. Rather they offer investors the chance to invest in a menu of securities which might accord more with their ethical beliefs and values. Whatever these differences, this paper adopts the usual convention of defining those funds which employ non-financial ethical criteria for security selection as ethical funds because some companies are excluded from their portfolios for ethical reasons. All funds which do not meet this definition are grouped together as "non-ethical" funds.

Only a few published studies have investigated the financial performance of ethical funds. These studies have focused primarily on the UK and the US, involved small sample sizes and considered relatively short time spans. They have employed conventional measures of performance which were developed in the late 1960s; in particular, (i) the Jensen measure, which evaluates the returns earned by a fund relative to the risk adjusted return achieved on a benchmark portfolio; (ii) the Sharpe ratio which is a reward to total risk ratio and (iii) the Treynor measure which is a reward to market risk ratio have all been used in these investigations. Most of the empirical investigations employ a market portfolio as a benchmark against which to judge fund performance and encounter difficulties in deciding on the appropriate benchmark to use.

One of the questions which these studies have raised is whether the ethical investment strategies adopted by these funds are achieved by foregoing some of the return which subscribers might otherwise have obtained by investing in non-ethical funds. The present paper also addresses this issue; it examines the financial performance of European ethical and non-ethical funds over a recent three-year period from 1996 to 1998. The benchmark problem (Roll, 1977, Roll, 1978; Grinblatt and Titman, 1994; Luther and Matako, 1994; Mallin, Saadouni, and Briston, 1995; Gregory, Matatko, and Luther, 1997) is mitigated by a direct comparison of 40 matched pairs of ethical and non-ethical funds. The lack of ethical fund performance research in other European countries than the UK, is addressed by including

funds from six other countries in the analysis in this paper. The present investigation also employs a larger sample of ethical funds than any previously published study and examines a more recent data set than other studies such as Allen and Tan (1999).

Formally, four empirical questions are addressed. First the paper examines whether the funds -whether ethical or not- provide the same risk-adjusted financial return as an international benchmark portfolio. Second, the paper investigates whether the financial performance of ethical and non-ethical funds differ to a significant extent. Specifically, one might expect that non-ethical funds outperform their ethical counterparts since they operate without the same investment constraints. Third, the paper studies whether the market timing ability of ethical and non-ethical funds differ; non-ethical funds are expected to be more adroit at timing market trends, since ethical funds may buy and sell stocks for non-financial reasons. Finally, an attempt is made to explain what factors affect the fund performance. In particular, factors such as the age of the fund, the size of the fund and the ethical status of a fund are considered.

There are a number of reasons why such an analysis is worth undertaking. First, it is important for society to determine whether funds can invest ethically without sacrificing a significant portion of the risk-adjusted returns. For example, the pension fund of BT employees with £30 billion under management and the pension fund for university academics in the UK which is worth £19 billion, have recently adopted ethical policies; their ability to pay pensions in the future is a topic of concern for a large number of their contributors. Indeed, the question of whether there is significant difference in performance between ethical and non-ethical products may be of interest for many stakeholder groups (Nicholls, 2000) .

Second, new ethical investment products such as ethical index funds and ethical pension funds have recently been launched by National Provident Institution (NPI) in the UK. A study of these funds is therefore topical as consumers can now choose between ethical and non-ethical investments for most investment products. At present few comparisons of the performance of ethical and non-ethical funds have been undertaken.

Third, ethical funds differ from their non-ethical counterparts in a number of ways. The most obvious difference is that because of the criteria which they employ, ethical funds select securities for inclusion in their portfolio from a restricted investment universe. The exclusion of certain companies and the focus on others may pose a challenge to efficient diversification, especially for funds which avoid several sectors and are restricted to the equities traded in the stock markets of only a few countries. This could put some ethical funds at a disadvantage when compared to non-ethical funds.

A fourth reason for analysing the performance of these investments is that some ethical funds exhibit a bias towards investment in smaller companies. Larger firms may place more emphasis on profits and maximising shareholder wealth at the expense of the environment than some of their smaller sized counterparts. This may be partly due to the fact that the non-ethical funds focusing solely on maximising returns tend to focus on the largest companies. A related effect may be a bias towards companies with low dividend yields, since many ethical funds invest in environmental pioneers or innovators of green technology. These companies tend to be relatively young and fast growing with a high demand for capital investment; therefore they may pay smaller dividends than firms in less environmentally friendly sectors (Luther and Matatko, 1994).

A final reason for examining ethical fund performance is that these investments have spread throughout continental Europe and to date little or no research has been undertaken on these newer funds; most investigations have focused on UK and US ethical funds using conventional performance evaluation methods. This study considers ethical and non-ethical funds from seven countries and addresses the benchmark problem by adopting a matched pairs approach.

The remainder of this paper is organised as follows. The next section reviews the current literature on the performance of ethical funds; the majority of studies in this literature focuses on the financial performance of a small number of UK and US ethical funds. Section three describes the broader data set employed in this study and outlines the matched pair method used to investigate the financial performance of the funds examined. The results are analysed in section four, while section five offers a number of conclusions.

2. Literature Review

This literature review focuses on studies which examine the performance of ethical funds and especially those which directly compare ethical and non-ethical investment funds. A substantial literature has already documented the financial performance of non-ethical funds, but this literature is not considered here. Instead we concentrate on those investigations which have examined the risk adjusted returns that ethical funds have achieved. Early studies of UK ethical fund performance only compared ethical funds with market-wide benchmarks such as the Financial Times All Share Index. For example in the first published article on this topic in the UK, Luther, Matatko and Corner (1992) provided weak evidence that the ethical funds outperformed two market indeces.

In a subsequent study, Luther and Matatko (1994) addressed some of the concerns raised in this early work. Since the ethical funds tended to invest a larger part of the funds in smaller companies with lower dividend yields they argued that a small company index should be employed as a market proxy for ethical funds in addition to a broad based stock market index. The authors investigated the sensitivity of their findings to the benchmark index examined; the findings demonstrated that ethical funds performed much better when evaluated against a small company benchmark, than when only the Financial Times All Share index (FTSA) was used.

Kreander, Gray, Power, and Sinclair (2000) extended this analysis to consider European funds from a small number of countries, but encountered the problem of selecting an appropriate benchmark against which to judge the funds. The authors eventually chose the Morgan Stanley Capital International World Index, primarily on the pragmatic grounds that this index was commonly adopted as benchmark for ethical funds. The authors recognized that their findings that European ethical funds performed at least as well as the benchmark were open to question. Indeed, they pointed out that when Swedish ethical funds were evaluated against a Swedish benchmark their performance was outstanding, while the performance was much more modest when compared to a global index.

The study of Mallin *et al.* (1995) overcame the benchmark problem of the early studies by using a matched pairs analysis in their UK investigation. They compared the performance of a group of ethical funds with a sample of non-ethical funds, matched on the basis of age and size. They studied the returns earned by 29 UK ethical funds and 29 UK non-ethical funds between 1986-1993 using the Jensen, Sharpe and Treynor performance measures and concluded that a small majority of funds from both groups underperformed the market as measured by the FTSA index. Ethical funds performed as well as their non-ethical counterparts and better than the non-ethical funds when the Jensen performance measure was used. Specifically, 4 ethical funds and 3 of the non-ethical funds had positive alphas, which were significant at the 5% level. These findings were remarkable, since Luther et al. (1992) argued that ethical funds have a large number of small companies in their portfolios and yet Gregory *et al.* (1997) had shown that these small companies performed substantially worse than large firms between 1989-1993.

A more recent study of UK ethical fund performance by Gregory *et al.* (1997) adopted a matched pair approach which was similar to that

used in the Mallin et al. (1995) investigation. They compared the performance of a smaller sample of 18 UK ethical funds with 18 non-ethical UK funds between 1986 and 1994. They also employed a size- adjusted measure of performance. An analysis of their results revealed that one ethical and one non-ethical fund had a negative Jensen alpha which was significant at the 5% level. There was no significant difference between the returns earned by the ethical and non-ethical funds, and both groups underperformed the FTSA benchmark index. Their cross-sectional analysis examined possible variables that might influence each fund's alpha measure and concluded that the age of a fund appeared to be an important factor, whereas the size of a fund and its ethical status were not significant.

UK results mirror the findings of studies which analyse the performance of US ethical funds. For example, using monthly data from 1994 to 1997, M'Zali and Turcotte (1998) compared the performance of 18 American and Canadian ethical funds with 10 non-ethical funds which were managed by the same companies. They employed the Sharpe and Treynor measures to assess fund performance and demonstrated that 4 of the ethical funds outperformed the market index. However, the majority of all funds underperformed the Standard & Poor (S&P) 500 and the Toronto Stock Exchange (TSE) 300 market indices. The earlier investigation by Hamilton, Jo and Statman, (1993) examined the performance of a larger sample of 32 American ethical funds, using the Jensen alpha measure. The 32 ethical funds were compared with 170 ordinary funds over the ten-year period 1981-1990. The average return for the ethical funds was found to be higher than the average returns for the "ordinary" funds allowing the authors to conclude that: "[i]nvestors can expect to lose nothing by investing in socially responsible mutual funds" (p.66). This finding was later confirmed by Reyes and Grieb (1998), when they compared the performance of 15 American ethical funds with peer indeces using monthly data from 1986 to 1995. The Sharpe ratio was employed to measure fund performance and no significant difference in performance between the two groups was documented. These findings are all in line with the results of earlier studies by Rudd (1979), Grossman and Sharpe (1986), and WM Company (1996), as well as EIRiS (1999).

This section has attempted to summarise the studies on ethical fund performance and in particular those using the 'matched pairs' technique. While the results of different investigations into ethical fund performance are not in complete agreement, it appears as if there is no significant penalty for investing in ethical funds. Indeed some evidence suggests that the risk adjusted performance of certain ethical funds may outperform comparable funds which do not have any ethical criteria for selecting the equities which they include in their portfolios. This question is addressed using data on European funds over a recent time period in the next section.

3. Data and Method

$$r_{it} = Ln\left(\frac{P_{it}+D_{it}}{P_{it-1}}\right) \qquad (1)$$

This section reports on the data employed in the empirical investigation and discusses the different methods used. The financial performance of a sample of 80 funds, were examined from January 1996 to December 1998; 156 observations were studied for 40 ethical and 40 non-ethical matched pairs of funds. For each fund returns were calculated according to equation [1]:

where r_{jt} is the return earned for fund j over week t, P_{jt} is the price of share j in week t, D_{jt} is the dividend paid for the fund in that week and P_{jt-1} is the price in the preceding

week. These weekly returns were adjusted for currency differences with the pound Sterling and then logged to help reduce the effect of any skewness in the return distribution. Therefore, a UK outlook is adopted in this paper; all returns are converted into pound Sterling when analysing financial performance. This conversion has the advantage of facilitating greater comparison between the various funds because currency differences are accounted for in the analysis.

The sample included open-ended funds from 7 countries although just under half of these funds in the final selection operated in the UK; 36 UK funds, 22 Swedish funds, 8 German funds, 4 Dutch funds, 4 Norwegian funds, 4 Swiss funds and 2 Belgian funds were included for analysis. Table 1 reports the name, code and country for each fund. Ethical funds do exist in other European countries, but information was not available for these portfolios on a consistent basis throughout the whole time period and so they are not examined here.

Weekly price data were gathered from every Wednesday to mitigate for anomalies, especially the well known weekend effect. Dividend information were also collected. Details for Hypobank Ecotech was supplied by Micropal while all other data were obtained from Datastream, Six, The Unit Trust Yearbook 2000 and from some of the funds directly. The market index selected was the Morgan Stanley Capital International World Index (MSCIWI), which includes securities from 49 countries. The JP Morgan Global bond index was selected as the risk free rate. This information was obtained from Datastream.

The 40 ethical funds were matched according to four criteria; age, size, country and investment universe. Age was measured as age in months up to 31.12.1998 from the date of inception. Size was calculated as fund size in millions of Pound Sterling at the year end 1998. The funds varied in size ranging from a low of £2.1 million for the German Focus Umwelttechnologie Fund to a high of £473 million for the UK Friends Provident Stewardship Unit Trust; this latter fund is the biggest ethical fund in Europe. Most funds had a market value of less than £60 million. The financial company managing the matched pair came from the same country as the original fund. The geographic investment universe was identical for most pairs. With one exception all funds were open ended equity funds. This matching process is similar to the strategy adopted by Mallin *et al.* (1995) and Gregory et al. (1997). However, Gregory *et al.* (1997) matched fund size at the end of the year of the inception date; this resulted in significant divergences in fund size towards the end of the Gregory *et al.*'s sample period.

In the present investigation the same performance measures are calculated for all funds and these are then compared with t-tests and the non-parametric Friedman test for the ethical and non-ethical groups. The traditional risk-adjusted Sharpe, Treynor and Jensen measures are employed. In particular, the Sharpe reward to risk measure which estimates the ratio of the average return to the standard deviation of the fund return was estimated according to equation [2]:

$$SHARPE = \frac{\bar{r}_j - \bar{r}_f}{\sigma_j} \qquad (2)$$

where σ_j is the standard deviation of the weekly returns of fund j and r_f is the return earned by a risk free asset which is proxied for by

the JP Morgan Global bond index.

This ratio has been criticised because it focuses on total risk (standard deviation) rather than market risk (as measured by the fund beta); portfolio theory suggests that the unique risk of a security should be diversified away in a large fund and only the remaining undiversifiable risk should be priced by the market. Therefore the Treynor ratio is also estimated which calculates the ratio of the average return to the Beta of the fund (β_j) according to equation [3]:

$$TREYNOR = \frac{\overline{r}_j - \overline{r}_f}{\beta_j} \qquad (3)$$

where, β_j is estimated by equation [4] below.

$$r_{jt} - r_{ft} = \alpha_j + \beta_j (r_{mt} - r_{ft}) + \mu_{jt} \qquad (4)$$

The Jensen measure assesses whether a fund has outperformed or underperformed a market portfolio by testing whether the constant (alpha) in equation [4] is significantly different from zero.

Where, μ_{jt} is a random error term.

In addition a measure of market timing, developed by Henrikkson-Merton is calculated. Black, Fraser and Power (1992) demonstrate that if fund managers are timing the market, equation [4] may be mis-specified because the Beta coefficient is held constant in the regression whereas in practice it varies over time; the resulting alpha term may be incorrectly estimated and wrong inferences about fund performance may be drawn. Equation [5] which was developed by Henriksson and Merton (1981) overcomes this difficulty:

$$r_{jt} - r_{ft} = \alpha_{2j} + \beta_{2j} (r_{mt} - r_{ft}) + c_j \left[(r_{mt} - r_{ft})^2 \right] + \xi_{jt} \qquad (5)$$

where the coefficient D_j captures the market timing ability of the fund manager; if D_j is positive, it suggests that the manager is increasing the risk profile of the portfolio when a bull market occurs. Dj is a dummy variable with a value of 0 when $r_{mt} > r_{ft}$ and -1 when $r_{mt} < r_{ft}$, x_{jt} is a random error term.

$$Alpha = \lambda_0 + \lambda_1 Size + \lambda_2 Age + \lambda_3 Universe + \Omega \qquad (6)$$

Finally, a cross sectional regression is estimated according to equation [6] to analyse why measures of fund performance vary from one fund to another.

Where three performance measures are examined: (i) the Jensen alpha which is the estimated measure of fund performance from equation [4]; (ii) the R_j which is the return of the fund and (iii) the Henriksson Merton alpha from equation [5]. Each of these 3 are in turn used as the dependent variable Fundperformance. The Size variable is measured as the size of a fund in Sterling at the 31.12.1998, while the Age variable measures the age of a fund in months from the month of inception until 31.12.1998. Ethical is a dummy variable taking a value of 0 for funds investing ethically and 1 for funds ignoring non-financial issues. W is a random disturbance term. The fund characteristics are reported in Table 2.

These tests represent a comprehensive analysis of the financial performance of these funds over a recent 3-year period from 1996 to 1998 and enable us to investigate whether these funds offer investors returns which are significantly less than those available from investing in a broadly-based market portfolio that is not restricted to the selection of ethical securities. The tests also allow us to compare the performance of ethical with similar non-ethical funds and to study whether the fund managers attempt to time the market. Finally, some preliminary analysis on what determines ethical fund performance is conducted.

4. Results

This section analyses the results of calculating different performance measures and relates these results to the findings from previous studies of ethical funds. Summary information for the funds are reported in Tables 1 and 2. In particular, the name of each fund in the sample, the code of the fund derived from its name, the country for each fund, the size of each fund as of 31.12.1998 in millions of pounds Sterling and the start date of each fund are reported in these Tables. The average ethical fund was 9 years old and valued at £44 million. The average age for a typical non-ethical fund was 10 years and its average size was £54 million. For 75% of the pairs of funds the difference in age was less than 3 years, while for 90% of the pairs the differences in size was less than £40 million. These differences in age and size were not significant at the 5% level. This matching on size and age is similar to the pairing employed by Mallin *et al.* (1995) and Gregory *et al.* (1997), but with the added complexity of the sample being chosen from seven countries rather than just one. The sample in this study was also matched for investment universe. However, because of the less mature nature of some of the continental European capital markets, the matching was not as good for some of the European funds as for the UK ones.

The average weekly return, the standard deviation of these returns and the beta for each fund is reported in Table 3. The average weekly returns earned by the ethical funds was 0.16% which was slightly lower than the mean of 0.18% achieved by their non-ethical counterparts. However, this difference is not significant at the 5% level. In fact the MSCIWI index outperformed both groups over the test period with its mean return of 0.21%. The highest return of 0.45% was achieved by HSBC, a non-ethical fund. This excellent return was associated with high levels of risk as the volatility of the fund was 0.024 compared to 0.023 for the index and the average of 0.021 for non-ethical funds. The best ethical fund, NPIP, had a return of 0.35% with a volatility of only 0.0158 and a beta of just 0.61. Two ethical funds ORBI and VGRN achieved negative returns of -0.03% and -0.07% for a British investor over this period. However, non-ethical funds had a greater incidence of negative returns over the period with five of them recording negative mean values (ADIG, BAIL, CERA, DNBR and VHOR). This picture of lower risk for the ethical funds is strengthened by an analysis of the standard deviations: the average value for the non-ethical funds was 7.8% higher than the corresponding figure for the ethical funds. This difference is significant at the

5% level using a one tailed t-test, since the p-value is 0.03. The ethical funds also had lower systematic risk; the average beta for ethical funds was 0.62 compared to 0.79 for their non-ethical counterparts. Indeed 10 non-ethical funds had betas of 1.00 or more compared to only 5 of the ethical funds. Again this difference in Beta risk was significant at the 5% level between ethical and non-ethical funds according to a one sided t-test (t-value was 1.69). Mallin *et al.* (1995) reported similar conclusions; 5 of the 29 non-ethical funds in their sample had beta values that were greater than unity, whereas all ethical funds had beta estimates below 1.00.

The risk adjusted performance measures were not significantly different for the two groups. In fact, they were surprisingly similar on average with a mean Sharpe measure of 0.100 for the ethical funds and 0.102 for their non-ethical counterparts and an average Treynor measure of 0.004 for both groups. The risk adjusted Sharpe, Treynor and Jensen measures for each fund are reported in Table 4.

Mallin *et al.* (1995) reported that for both the Sharpe and the Treynor measure 14 of the 29 ethical funds examined outperformed their non-ethical counterparts. In this investigation 18 ethical funds had a higher Sharpe ratio than their non-ethical pairs. The highest Sharpe ratio of 0.24 was recorded by the ethical fund NPIP, while the smallest ratio of -0.058 was achieved by the German non-ethical fund ADIG. In this study 35 of the funds had a higher Sharpe ratio than the market, 15 of them ethical and 20 non-ethical. These findings are in line with Reyes and Grieb (1998), they found no significant difference between 15 ethical funds and peer indexes when the Sharpe measure was employed. With the Treynor measure 21 ethical funds outperformed their non-ethical counterparts. Of the funds in this sample 52 outperformed the market with the Treynor measure; 25 of these were ethical and 27 were non-ethical funds. The findings therefore confirm that the performance of ethical and non-ethical funds was similar according to these two measures.

The average for the Jensen measure was again very similar for the two groups. The ethical funds had an average alpha of 0.0005 while the non-ethical funds had a mean alpha of 0.0003; this difference was not significant. Some 18 ethical funds had a higher Jensen measure than their matched non-ethical pair. These results are similar to the findings documented by Gregory *et al.* (1997) since there was no significant difference in the Jensen measures between ethical and non-ethical funds. The results also support those reported by Luther and Matatko (1994) in their two index model as there was neither significant over nor underperformance compared to a market benchmark. An analysis of the Jensen measure reveals that 55 funds outperformed the market in this investigation, 27 ethical and 28 non-ethical funds. Two ethical funds (ASNA, NPIP) and three non-ethical funds (INGG, HSBC and POST) had significant positive Jensen measures at the 5% level. Interestingly all these funds were from the Netherlands and the UK. Only one non-ethical fund, CERA, had a significantly negative Jensen alpha. The highest alpha 0.0032 was recorded for the Dutch ethical fund ASNA.

This finding is slightly different from the results of Mallin *et al.* (1995). In their study the ethical funds performed better than the non-ethical funds when the Jensen measure was employed; specifically, 62% of the UK ethical funds in their investigation outperformed their non-ethical matched pairs. The Mallin *et al.* study also provided some evidence that funds in general outperformed the market as 8 of their 58 funds had a significantly positive Jensen alpha. It therefore seems as if the funds in general and the ethical funds in particular performed better in Mallin *et al.* (1995) than in this examination. On the other hand the fund performance in this investigation is slightly better than that documented in Gregory *et al.* (1997) where all funds tended to underperform the market and the ethical funds seemed to do worse than non-ethical funds although this difference was not statistically significant.

A ranking of the funds based on the traditional performance measures and fund returns is presented in Table 5. Three key findings emerge from this table. First the performance between ethical and non-ethical funds is similar since the proportion of ethical funds outperforming their matched pair is close to 50% with all the risk-adjusted measures. Second, the strong performance of the Dutch funds ASNA, ING and POST is worth noting. According to the Jensen alpha 3 of the 4 Dutch funds are in the top ten and two of the Dutch funds are in the top ten when the Sharpe measure and the return data are employed. It is interesting to note the strong performance of UK funds according to the Sharpe and Treynor measures (15 and 14 of the top twenty funds were from the UK) and contrast this with the weaker performance of UK funds when returns are studied; only 6 of the top 20 funds being British. In particular the Swedish funds perform well as measured by returns, but this good performance vanishes once risk for British investors is accounted for. Finally, there is a high positive correlation between all the traditional risk adjusted measures.

Market timing ability was assessed using the Henriksson Merton (HM) model and the results of this assessment are shown in Table 6. The HM model evaluates whether fund managers vary the risk of their funds according to whether a bull or a bear market is present. Specifically the timing coefficients are shown in this table. The results show that none of the funds had significant positive market timing ability. Instead 13 ethical and 10 non-ethical funds had negative market timing coefficients which were significant at the 5% level. Instead of increasing fund betas when the market was expected to rise and decreasing the betas when the market was expected to fall, managers tended to alter risk in the wrong direction. Funds from all countries except Belgium had significantly negative timing coefficients and the largest number of funds with a significantly negative timing coefficient came from Sweden. However, Germany had the worst relative performance with 4 of 8 funds having a significantly negative timing coefficient. The small sample of German funds prevents any conclusions to be drawn from this result.

Tests were also conducted to investigate whether there were any significant differences between the group of ethical funds and the matched group of non-ethical funds. The results of these tests are reported in Table 7. These tests show that in most cases there was no significant difference between the two groups. For example the age, size, mean returns and the Sharpe, Treynor and Jensen alphas were not significantly different between the groups. With one of the measures of risk, the natural logarithms of the standard deviations of the returns the ethical funds were significantly less risky than the non-ethical funds (t-value of 2.23). In the case of risk it is justified to use a one-tailed test as one would expect ethical funds to be more risky due to investment in small companies and a restricted investment universe. Then the ethical funds surprisingly have significantly lower standard deviations and betas than the non-ethical funds (t-values of 1.92 and 1.69). This result is confirmed by the non-parametric Friedman tests with p-values of 0.002 and 0.027.

These findings suggest that returns and risk adjusted performance measures are not significantly different for ethical and non-ethical funds in the sample. Surprisingly, the risk is significantly lower for ethical funds for all risk measures when a one tailed t-test and the Friedman non-parametric test were employed. The results from the timing models suggest that in those cases when ethical funds underperform non-ethical funds this is due to market timing ability and not stock selection. These findings therefore support previous studies which have concluded that there does not seem to be a penalty for investing in ethical funds. Indeed as measured by the risk adjusted performance measures it seems just as likely that the ethical funds will outperform the non-ethical funds. Despite the restricted investment universe for ethical funds it also seems as if they are less risky than similar non-ethical funds.

As there was no significant difference in the average values for the risk adjusted performance measures and the market benchmark, the first hypothesis that there is no difference between the performance of a market benchmark and the funds was supported. Indeed with the Treynor and Jensen measures there was weak evidence of both ethical and non-ethical funds performing slightly better than the benchmark. The results did not support the second hypothesis; non-ethical funds did not perform better than their ethical counterparts as

expected. This supports the results of Hamilton *et al.* (1993), Mallin *et al.* (1995) and Reyes and Grieb, (1998), which found no significant difference in performance between a group of ethical and ordinary funds. In this study there was evidence that ethical funds are a better choice for the risk averse investors than non-ethical funds, since the fund betas and the volatility were significantly lower for the ethical funds. This was confirmed by the study of the market timing ability of the fund managers. When the Henrikkson-Merton model was employed there was not a significant difference in performance and therefore the results did not support the third hypothesis that non-ethical funds are better at timing the market.

Finally, an attempt was made to explain cross-sectional differences in performance measures such as the Jensen Alpha, returns and the HM Alpha. Regressions were employed using variables such as; fundsize at the 31.12.98, age of fund in months and a dummy variable for the ethical status of the fund with a code of 1 for an ethical fund and a 0 for a non-ethical fund. These factors were used by Gregory *et al.* (1997) who found none of the variables to be significant. Our findings are similar to those obtained by Gregory *et al.* (1997) and are reported in Table 8. The findings in this study indicate that a greater fund size may be associated with better performance but not significantly so. The age of the fund did not have explanatory power. The Ethical status of a fund was not significant in explaining Jensen alphas or Ln-returns. However when the Henriksson Merton alpha was explained ethical status was highly significant. The coefficients of determination, R^2 were low ranging from 4-5% for most of the models. However the model explaining the Henriksson Merton alphas had a higher R^2 of 27%. It thus seems as if this partial model is unable to fully explain the cross section of the fund performance. Other variables such as portfolio turnover and expense ratios might have greater explanatory power, but unfortunately such data were not available for many of the sample funds.

5. Conclusions

This paper has examined whether managers of investment funds can employ various ethical criteria in selecting their portfolio without sacrificing risk-adjusted returns to a significant extent. The financial performance of 40 ethical funds from 7 countries is compared against a market benchmark and a matched group of 40 non-ethical funds. The results demonstrate that there has been no statistical difference in either returns or risk adjusted performance as measured by the Sharpe, Treynor and Jensen measures (i), between the ethical funds and the market benchmark nor (ii) between ethical funds and their matched group of non-ethical funds. Despite the restricted investment universe of ethical funds, the results do not support the hypothesis that non-ethical funds perform better than ethical funds. Surprisingly, there is some evidence that ethical funds were less risky than the non-ethical funds.

The vast majority of fund managers displayed negative market timing ability. The market timing ability seemed to be slightly worse for the ethical funds. This is to be expected as ethical fund managers may have to buy and sell securities for non-financial reasons and because they may have a longer time-horizon for investing than their non-ethical counterparts. This underperformance of ethical fund managers in market timing was not statistically significant and may be compensated for by the significantly higher coefficients for stock selection. This supports the view that ethical and environmental research may add value to the stock selection process.

Finally, the cross-sectional analysis indicated that although none of the variables were significant at the 5% level, the size of the fund may have some power in explaining variations in fund performance, with larger funds performing somewhat better than smaller ones. The ethical status variable was insignificant in explaining returns and the Jensen measure, confirming the results from previous analysis which had indicated that there is not a statistically significant difference in financial performance between the two groups. The significant coefficient for ethical status in explaining the Henriksson Merton alpha and the significantly lower risk levels documented for ethical funds support the view that risk averse private and institutional investors may achieve higher risk adjusted returns by including ethical funds in their portfolios.

References

Allen.D.E, and Tan M.L. (1999) A Test of the Persistence in the Performance of UK Managed Funds, *Journal of Business Finance and Accounting*, **26** (5), 559-583.

Black.A , Fraser.P and Power, D. (1992) UK Unit Trust Performance 1980-1989: A Passive Time-Varying Approach, *Journal of Banking and Finance*, September, 1015-1033

EIRiS, (1997) Money & Ethics: A guide to pensions, PEPs, endowment mortgages and other ethical investment plans, London, UK.

EIRiS (1999) Does Ethical Investment Pay? London, UK

EIRiS (2000) The Ethical Investor, March-April, London, UK

Gregory, A., Matatko, J. and Luther, R. (1997) Ethical Unit Trust Financial Performance: Small Company Effects and Fund Size Effects, *Journal of Business Finance and Accounting*, **24** (5), 705-725.

Grinblatt, M. and Titman, S. (1994) A Study of Monthly Mutual Fund Returns and Performance Evaluation Techniques, *Journal of Financial and Quantitative Analysis,* 3, 419-444.

Hamilton, S., Jo, H. and Statman, M. (1993) Doing Well While Doing Good? The Investment Performance of Socially Responsible Mutual Funds, *Financial Analysts Journal*, **November-December**, 62-66.

Harrington, J.(1992) Investing with your Conscience, John Wiley & Sons, USA.

Harte, G, Lewis, H. and Owen, D.(1991) Ethical Investment and the Corporate Reporting Function, *Critical Perspectives on Accounting*, **2**, 227-253.

Henriksson, R. and Merton, R.(1981) On Market Timing and Investment Performance II. Statistical Procedures for Evaluating Forecasting Skills, *Journal of Business,* **54**(4), 513-533.

Henriksson, R. (1984) Market Timing and Mutual Fund Performance: An Empirical Investigation, *Journal of Business*, **57**(1), 73-96.

Kreander, N., Gray R., Power, D. and Sinclair, D. (2000) The Financial Performance of European Ethical Funds 1996-1998, Dundee University Discussion Papers, Acc 0001

Luther, R., Matatko, J.and Corner,D. (1992)The Investment Performance of UK "Ethical" Unit Trusts, *Accounting Auditing & Accountability Journal*, **5** (4), 57-70.

Luther, R. and Matatko, J. (1994) The Performance of Ethical Unit Trusts: Choosing an appropriate benchmark, *British Accounting*

Review, **26**, 77-89.

Mackenzie, C. (1997): Ethical Investment and the Challenge of Corporate Reform, unpublished PhD Thesis, the University of Bath, United Kingdom

Mallin, C., Saadouni, B. and Briston R. (1995)The Financial Performance of Ethical Investment Trusts,*Journal of Business Finance and Accounting,* **22** (4), 483-496.

Newey, W. and West, K. (1987) A Basic, Positive Semi-Definite, Heteroscedasticity and Autocorrelation Consistent Covariance Matrix, *Econometrica*, **55**, 347-370

Nicholls, M.(1999) Dow Initiative Ignites Debate, *Environmental Finance*, **October**, 12-13.

Nicholls, M.(2000) Pensions sector shows green tinge, *Environmental Finance*, May, 16-18.

Owen, D. (1990)Towards a Theory of Social Investment: A Review Essay, *Accounting, Organizations and Society*, **15** (3), 249-265.

Perks, R.W., Rawlinson, D. H. and Ingram, L. (1992): An Exploration of Ethical Investment in the UK, *British Accounting Review*, **24**, 43-65.

Porter, M. and Van der Linde, C. (1995) Green and competitive: Ending the stalemate, *Harvard Business Review,* **73**(5), 120-134.

Reyes, M. and Grieb, T. (1998) The External Performance of Socially -Responsible Mutual Funds, *American Business Review*, **January**, 1-7.

Rockness, J. and Williams, P. (1988) A Descriptive Study of Social Responsibility Mutual Funds, *Accounting, Organizations and Society*, **13** (4), 397-411.

Roll, R. (1977) A Critique of the Asset Pricing Theory's Tests, Part 1: On past and potential testability of the theory, *Journal of Financial Economics*, **4** (2), 129-176.

Roll, R.(1978) Ambiguity when Performance is Measured by the Securities Market Line,*Journal of Finance,* **33** (4), 1051-1069.

Rudd, A. (1981) Social Responsibility and Portfolio Performance, *California Management Review*, 23, 55-61.

Sandvall, T. (1999) Essays on Mutual Fund Performance, Licentiate Thesis, Swedish School of Economics and Business Administration, Helsinki, Finland

Sharpe, W. (1966) Mutual Fund Performance, *Journal of Business,* **39** (1), 119-138.

Sparkes, R. (1995) The Ethical Investor, Harper Collins, London, UK.

SustainAbility (2000)A Responsible Investment? An Overview of the Socially Responsible Investment Community, Sebastian Beloe, London, UK, SustainAbility Ltd.

Treynor, J. (1965) How to Rate Management of Investment Funds, *Harvard Business Review*, **43**, January-February, 63-75.

Treynor, J. and Mazuy, K. (1965) Can Mutual Funds Outguess the Market?, *Harvard Business Review,* 131-136.

White, M. (1993) Investing in the Environment: The Performance of 'Green' Mutual Funds in the United States and Germany, working paper, University of Virginia, USA.

White, H. (1980) A Heteroscedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Hetescedasity, *Econometrica,* **48**, 817-838.

WM Company (1996) Is there a cost to Ethical Investing ? Working paper, November, UK, 12 pages.

Woodward, R.S. (1983) The Performance UK Investment Trusts as Internationally Diversified Portfolios Over the Period 1968-1977, *Journal of Banking and Finance*, **September**, 417-426.

TABLE 1 The Sample Funds

ETHICAL FUND	CODE	COUNTRY	NON-ETHICAL FUND	CODE	COUNTRY
Abbey Ethical Trust	ABBE	UK	Sovereign Income	SOVI	UK
Aberdeen Ethical	ABER	UK	Cavendish Worldwide	CAVE	UK
ABF Andere Beleggingsfond	ABFA	Netherlands	Ing Bank Global	INGG	Netherlands
AktieAnsvar Myrberg	AKTA	Sweden	Handelsbanken Utlandsfonden	HAUT	Sweden
Allchurches Amity	ALLC	UK	Credit Suisse Growth Portfolio	CSGP	UK
ASN Aandelensfonds	ASNA	Netherlands	Postbank Aandelenfonds	POST	Netherlands
Banco Hjalpfond	BHJA	Sweden	SEB Allemansfond Chans/Risk	SEBA	Sweden
Banco Humanfond	BHUM	Sweden	Lansforsakringar Wasa Sverigefond	WASS	Sweden
Banco Ideella Miljofond	BIDM	Sweden	Lansforsakringar Wasa Allemansfond	WAAA	Sweden
Banco Miljofond	BMIL	Sweden	Handelsbanken Radiohjalpfond	HARA	Sweden
Banco Samarit Fond	BSAM	Sweden	SE Bankens Allemansfond smabolag	SEBS	Sweden
CIS Environ Trust	CISE	UK	HSBC European Growth Fund	HSBC	UK
City Acorn Ethical	CITY	UK	City Financial International Fund	CITI	UK
Clerical Medical .Evergreen	CLEM	UK	Sunlife of Canada Worldwide Growth	SUNC	UK

Commercial Union Environmental	COMM	UK	Consistent Unit Trust	CONS	UK
Equitable Ethical	EQUI	UK	Dresdner RCM International Equity	DRGE	UK
Family Charities Ethical	FAMI	UK	Guardian Income	GUAR	UK
Focus Umweltechnologie	FOCU	Germany	Nordinvest Wekanord	NORW	Germany
Framlington.Health fund	FRAM	UK	Lloyds Bank Continental Europe	LLOY	UK
Friends Provident Stewardship inc.t.	FPSI	UK	Henderson UK Capital Growth Fund	HEND	UK
Friends Provident Stewardship unit t.	FPSE	UK	Equitable high income trust	EHIT	UK
Hypobank Ecotech	HYPO	Germany	Walser Aktien International	WALS	Germany
Jupiter Ecology	JUPE	UK	Scottish Life Worldwide	SCLW	UK
KBC Eco-fund	KBCE	Belgium	CERA Invest Emerging Markets	CERA	Belgium
KD Fonds Okoinvest	KDOE	Germany	Nordinvest Global	NORD	Germany
Luxinter Oekolux	LUXI	Germany	ADIG Fondiro	ADIG	Germany
NPI Global Care Income	NPI	UK	AES UK General Unit Trust	AESU	UK
NPI Global Care Pension	NPIP	UK	Baillie Gifford European Small Cos	BAIL	UK
Oekosar (Bank Sarasin)	OEKO	Switzerland	UBS Equity inv. Global Select	UBSE	Switzerland
Orbitex Health and Biotech	ORBI	Switzerland	UBS Lux Equity Mid Caps Europe	UBSM	Switzerland
Robur Miljöfonden	ROBU	Sweden	Handelsbanken Bofonden	HABO	Sweden
Scottish Equitable Ethical	SCOT	UK	Laurence Keen Income&Growth Fund	LAKE	UK
SEB Miljofond	SEBM	Sweden	Lansforsakringar Wasa Globalfonden	WASG	Sweden
Sovereign Ethical Fund	SOVE	UK	Scottish Equitable UK Blue Chip	SCEU	UK
TSB Environmental	TSB	UK	Martin Currie UK Growth	MCUG	UK
Varldsnaturfonden	VARL	Sweden	SE Bankens Global	SEBG	Sweden
Vesta Gront Norden	VGRN	Norway	DNB Realinvest	DNBR	Norway
Vesta Miljoinvest	VMIL	Norway	Vesta Horisont	VHOR	Norway
Wasa Miljofond	WASA	Sweden	Banco Global	BGLO	Sweden
Wasa U Hjälpsfond	WASU	Sweden	Handelsbanken Seniorbofond Aktie	HASA	Sweden

This table provides summary information about each fund in the sample. It provides the name of the fund, the code of the fund and the country of the fund. The first three columns present the ethical funds and the three latter columns report the same information for the non-ethical matched pair funds. 36 funds were from the UK, 22 from Sweden, 8 from Germany, 4 from the Netherlands, 4 from Norway, 4 from Switzerland and 2 from Belgium.

Table 2 Summary information About the Sample Funds

ETHICAL CODE	START DATE	SIZE(£) 31.12.98	INVESTMENT UNIVERSE	NONethical CODE	START DATE	SIZE (£) 31.12.98	INVESTMENT UNIVERSE
ABBE	Oct-87	40.4	UK	SOVI	May-87	39	UK
ABER	Sep-92	6.7	International	CAVE	Jul-94	5.4	International
ABFA	Oct-90	35.0	International	INGG	Oct-89	128.1	International
AKTA	Jul-65	32.7	Sweden	HAUT	1959	97.8	Sweden
ALLC	Feb-88	35.3	UK	CSGP	Jul-88	59.5	UK
ASNA	Mar-93	68.2	International	POST	Mar-92	223.2	International
BHJA	Oct-95	11.3	Sweden	SEBA	Apr-95	23.4	Sweden
BHUM	Jun-90	137.1	Sweden	WASS	Dec-90	135.5	Sweden
BIDM	Dec-92	24.9	Sweden	WAAA	Jan-90	34.6	Sweden
BMIL	Sep-94	5.7	Sweden	HARA	Mar-95	3.4	Sweden
BSAM	Feb-94	33.8	Sweden	SEBS	Apr-95	21.8	Sweden
CISE	May-90	146.3	International	HSBC	Mar-88	129.6	Europe
CITY	Nov-88	3.9	International	CITI	Aug-86	3.3	International
CLEM	Feb-90	18.3	International	SUNC	Apr-87	16.6	International
COMM	Apr-92	24.0	International	CONS	Mar-88	23.9	International

EQUI	Jan-94	17.7	International	DRGE	Feb-95	15.5	International
FAMI	Mar-82	9.5	UK	GUAR	Sep-87	11.1	UK
FOCU	Oct-90	2.1	International	NORW	Jun-69	9.3	International
FRAM	Apr-87	71.4	International	LLOY	Nov-86	73.6	Europe
FPSI	Oct-87	73.6	UK	HEND	Jan-87	76.8	UK
FPSE	Jun-84	473.0	UK	EHIT	Dec-84	426.7	UK
HYPO	Apr-90	18.2	International	WALS	Feb-92	49.8789	International
JUPE	Mar-88	61.2	International	SCLW	Oct-87	60.3	International
KBCE	Mar-92	3.0	International	CERA	Jun-94	13.09	International
KDOE	Aug-91	2.8	International	NORD	Jan-91	17.8	International
LUXI	Feb-92	37.2	International	ADIG	May-87	23	International
NPI	Jul-95	31.0	UK	AESU	Jul-92	31.5	UK
NPIP	Mar-94	45.4	International	BAIL	Oct-93	45.8	Europe
OEKO	Feb-94	51.4	Int. mixed	UBSE	Jun-68	42.3	International
ORBI	Jun-91	12.1	International	UBSM	Jan-95	30.6	Europe
ROBU	Nov-91	36.6	Nordic	HABO	Oct-87	48.6	Sweden
SCOT	Apr-89	44.9	UK	LAKE	Oct-89	25.4	UK
SEBM	Oct-91	37.5	International	WASG	Dec-90	39.6	International
SOVE	May-89	19.8	UK	SCEU	Nov-89	16.1	UK
TSB	Jun-89	21.8	UK	MCUG	Mar-88	22	UK
VARL	May-88	20.9	Sweden	SEBG	1993	37.8	International
VGRN	Nov-89	33.4	Nordic	DNBR	Oct-83	75.4	Norway
VMIL	Dec-89	2.1	International	VHOR	Nov-94	12	Nor/Internat
WASA	Dec-90	10.4	International	BGLO	Jul-88	12.5	International
WASU	Jan-96	5.5	International	HASA	May-91	5	International

This table provides the code for each fund, the year and month in which each fund commenced operations and the fund size as at 31.12.98 in millions of British pounds. For three funds, AKTA, HAUT and SEBG, the month is unknown and July is an estimate of the month. For five funds, NORD, NORW, ORBI, UBSE, UBSM, it was not possible to obtain the size as at 31.12.98, instead the size reported for these funds is from the last 3 months in 1998, due to the end of the fiscal year for these funds.

TABLE 3 Descriptive Statistics for the Funds

FUND	MEAN	SDEV	BETA	FUND	MEAN	SDEV	BETA
ABBE	0.0009	0.0145	0.46	SOVI	0.0014	0.0158	0.60
ABER	0.0011	0.0150	0.57	CAVE	0.0005	0.0186	0.12
ABFA	0.0012	0.0158	0.14	INGG	0.0039	0.0254	1.01
AKTA	0.0028	0.0315	1.05	HAUT	0.0023	0.0222	0.84
ALLC	0.0016	0.0136	0.51	CSGP	0.0020	0.0175	0.72
ASNA	0.0012	0.0158	0.76	POST	0.0038	0.0237	0.92
BHJA	0.0033	0.0287	1.02	SEBA	0.0036	0.0288	1.01
BHUM	0.0028	0.0288	1.02	WASS	0.0020	0.0305	1.09
BIDM	0.0027	0.0288	1.03	WAAA	0.0024	0.0297	1.02
BMIL	0.0014	0.0254	0.78	HARA	0.0022	0.0296	1.03
BSAM	0.0028	0.0287	1.01	SEBS	0.0021	0.0261	0.83
CISE	0.0022	0.0145	0.53	HSBC	0.0045	0.0242	0.90
CITY	0.0011	0.0200	0.14	CITI	0.0001	0.0227	0.84
CLEM	0.0012	0.0206	0.73	SUNC	0.0022	0.0200	0.84
COMM	0.0009	0.0221	0.63	CONS	0.0021	0.0155	0.08
EQUI	0.0012	0.0207	0.76	DRGE	0.0012	0.0147	0.11

FAMI	0.0016	0.0160	0.52	GUAR	0.0023	0.0178	0.65
FOCU	0.0013	0.0212	0.46	NORW	0.0024	0.0236	0.87
FRAM	0.0005	0.0346	0.51	LLOY	0.0035	0.0228	0.73
FPSI	0.0014	0.0108	0.37	HEND	0.0020	0.0172	0.66
FPSE	0.0020	0.0126	0.40	EHIT	0.0019	0.0171	0.65
HYPO	0.0008	0.0226	0.67	WALS	0.0034	0.0233	0.81
JUPE	0.0017	0.0183	0.58	SCLW	0.0006	0.0246	1.01
KBCE	0.0031	0.0195	0.77	CERA	-0.0022	0.0341	1.24
KDOE	0.0012	0.0226	0.65	NORD	0.0028	0.0255	0.88
LUXI	0.0008	0.0249	0.67	ADIG	-0.0019	0.0260	0.65
NPI	0.0021	0.0158	0.61	AESU	0.0025	0.0188	0.74
NPIP	0.0035	0.0158	0.61	BAIL	-0.0001	0.0144	0.40
OEKO	0.0005	0.0144	0.26	UBSE	0.0022	0.0221	1.00
ORBI	-0.0003	0.0293	0.82	UBSM	0.0023	0.0196	0.46
ROBU	0.0009	0.0248	0.14	HABO	0.0020	0.0295	1.02
SCOT	0.0017	0.0158	0.48	LAKE	0.0034	0.0183	0.73
SEBM	0.0008	0.0225	0.63	WASG	0.0019	0.0231	0.95
SOVE	0.0017	0.0178	0.45	SCEU	0.0020	0.0180	0.68
TSB	0.0034	0.0198	0.75	MCUG	0.0013	0.0190	0.71
VARL	0.0035	0.0278	0.95	SEBG	0.0017	0.0224	0.92
VGRN	-0.0007	0.0312	0.41	DNBR	-0.0005	0.0322	0.98
VMIL	0.0011	0.0247	0.62	VHOR	-0.0003	0.0316	0.91
WASA	0.0007	0.0206	0.59	BGLO	0.0017	0.0218	0.89
WASU	0.0021	0.0202	0.67	HASA	0.0022	0.0270	1.01
AVERAGE	0.0016	0.0212	0.62	*AVERAGE*	0.0018	0.0229	0.79
MSCIWI	0.0021	0.0218	1.00	*MSCIWI*	0.0021	0.0218	1.00

Descriptive statistics for the 80 funds and the Morgan Stanley World Index. The first four columns provide information on the ethical funds and the last four on the non-ethical funds. This table shows the average weekly rate of return for each fund (MEAN) calculated using equation [1], the standard deviation (SDEV), and the fund beta (BETA) estimated from equation [4]. The data for all funds is weekly Wednesday to Wednesday, dividends fully reinvested from 1996 to 1998, 156 observations are available for each fund, except for ROBU which has only 152 observations and WASS 150 observations. For one fund HYPO, Friday to Friday data is used, due to data-availability.

TABLE 4 An Analysis of the Financial Performance of the Sample Funds

Ethical Fund	Sharpe	Treynor	Jensen Alpha	Jensen T-value	Non-Ethical Fund	Sharpe	Treynor	Jensen Alpha	Jensen T-value
ABBE	0.088	0.0028	0.0002	0.12	SOVI	0.108	0.0025	0.0003	0.24
ABER	0.095	0.0025	0.0000	0.04	CAVE	0.046	0.0074	0.0006	0.32
ABFA	0.097	0.0112	0.0012	1.33	INGG	0.168	0.0042	0.0018	**2.77**
AKTA	0.101	0.0030	0.0007	0.46	HAUT	0.120	0.0032	0.0006	1.07
ALLC	0.141	0.0037	0.0007	0.67	CSGP	0.137	0.0033	0.0006	0.62
ASNA	0.097	0.0020	0.0032	**2.37**	POST	0.174	0.0045	0.0019	**2.71**
BHJA	0.126	0.0035	0.0012	0.78	SEBA	0.137	0.0039	0.0015	1.03
BHUM	0.110	0.0031	0.0008	0.51	WASS	0.082	0.0022	0.0002	0.12
BIDM	0.108	0.0030	0.0003	0.18	WAAA	0.093	0.0027	0.0003	0.19
BMIL	0.068	0.0022	-0.0001	-0.04	HARA	0.088	0.0025	0.0001	0.06
BSAM	0.110	0.0031	0.0008	0.52	SEBS	0.095	0.0030	0.0004	0.24
CISE	0.174	0.0047	0.0012	1.10	HSBC	0.201	0.0054	0.0027	**2.30**
CITY	0.071	0.0099	0.0011	0.54	CITI	0.020	0.0005	-0.0016	-1.86
CLEM	0.076	0.0021	-0.0002	-0.17	SUNC	0.128	0.0031	0.0005	0.92

COMM	0.057	0.0020	-0.0003	-0.14	CONS	0.156	0.0320	0.0022	1.51
EQUI	0.074	0.0020	-0.0003	-0.28	DRGE	0.108	0.0141	0.0013	1.38
FAMI	0.124	0.0038	0.0003	0.17	GUAR	0.149	0.0041	0.0011	1.14
FOCU	0.079	0.0036	0.0006	0.43	NORW	0.118	0.0032	0.0007	1.19
FRAM	0.025	0.0017	-0.0008	-0.28	LLOY	0.169	0.0053	0.0021	1.83
FPSI	0.158	0.0046	0.0005	0.43	HEND	0.139	0.0036	0.0008	0.85
FPSE	0.189	0.0060	0.0011	0.75	EHIT	0.130	0.0034	0.0007	0.63
HYPO	0.052	0.0017	-0.0008	-0.83	WALS	0.163	0.0047	0.0018	1.80
JUPE	0.112	0.0035	0.0006	0.39	SCLW	0.041	0.0010	-0.0014	-1.79
KBCE	0.176	0.0044	0.0015	1.91	CERA	-0.053	-0.0015	-0.0048	**-2.48**
KDOE	0.071	0.0024	0.0000	0.01	NORD	0.124	0.0036	0.0010	1.07
LUXI	0.045	0.0017	-0.0005	-0.36	ADIG	-0.058	-0.0020	-0.0031	-1.59
NPI	0.157	0.0041	0.0010	1.00	AESU	0.153	0.0039	0.0011	1.15
NPIP	0.243	0.0063	0.0024	**2.36**	BAIL	0.020	0.0007	-0.0007	-0.42
OEKO	0.062	0.0035	0.0003	0.34	UBSE	0.114	0.0046	0.0001	0.25
ORBI	0.001	0.0000	-0.0020	-1.16	UBSM	0.134	0.0026	0.0013	0.92
ROBU	0.049	0.0087	0.0009	0.35	HABO	0.080	0.0023	-0.0001	-0.07
SCOT	0.131	0.0043	0.0009	0.57	LAKE	0.206	0.0052	0.0020	1.86
SEBM	0.053	0.0019	-0.0002	-0.16	WASG	0.099	0.0024	0.0000	-0.05
SOVE	0.114	0.0045	0.0006	0.36	SCEU	0.133	0.0040	0.0008	0.76
TSB	0.191	0.0050	0.0020	1.80	MCUG	0.088	0.0023	-0.0001	-0.05
VARL	0.140	0.0041	0.0017	1.06	SEBG	0.093	0.0023	-0.0001	-0.28
VGRN	-0.010	-0.0008	-0.0012	-0.48	DNBR	-0.004	-0.0001	-0.0025	-1.17
VMIL	0.060	0.0024	0.0001	0.05	VHOR	0.001	0.0000	-0.0022	-0.96
WASA	0.051	0.0018	-0.0003	-0.17	BGLO	0.095	0.0023	-0.0001	-0.18
WASU	0.122	0.0037	0.0009	0.83	HASA	0.096	0.0026	0.0001	0.11
Average	0.100	0.0036	0.0005	0.44	Average	0.102	0.0039	0.0003	0.53
MSCIWI	0.111	0.0024	0.0000	NA	MSCIWI	0.111	0.0024	0.0000	NA

This table provides an analysis of the performance of the sample funds. The first five columns refer to the ethical funds and the last five to the non-ethical funds. The first column gives the code of the fund. The second and third columns report the Sharpe and the Treynor measures. The remaining columns report the results of the Jensen alpha and its t-value. The reported t-values are adjusted for autocorrelation and heteroscedasity with the Newey-West procedure using 4-lags. Values in **Bold** are significant at the 5% level. For one fund, HYPO Friday data was used due to data availability.

TABLE 5 Ranking of Funds with Risk Adjusted Performance Measures

Ethical Fund	Sharpe	Treynor	Jensen	Non-Ethical Fund	Sharpe	Treynor	Jensen
ABBE	51	47	51	SOVI	38	52	48
ABER	46	53	56	CAVE	69	6	40
ABFA	43	3	18	INGG	10	21	10
AKTA	41	44	32	HAUT	31	40	38
ALLC	17	29	34	CSGP	20	38	36
ASNA	44	64	1	POST	7	18	8
BHJA	27	34	16	SEBA	21	26	13
BHUM	37	42	29	WASS	54	61	50
BIDM	40	45	49	WAAA	49	48	45
BMIL	61	62	60	HARA	53	51	53
BSAM	36	41	28	SEBS	48	46	44
CISE	8	13	17	HSBC	3	9	2

CITY	59	4	21	CITI	73	74	75
CLEM	57	63	64	SUNC	26	43	42
COMM	64	66	66	CONS	14	1	4
EQUI	58	65	68	DRGE	39	2	14
FAMI	28	28	47	GUAR	16	22	19
FOCU	56	31	41	NORW	32	39	33
FRAM	72	70	72	LLOY	9	10	5
FPSI	12	15	43	HEND	19	32	30
FPSE	5	8	22	EHIT	25	37	35
HYPO	66	69	71	WALS	11	14	9
JUPE	35	35	37	SCLW	71	72	74
KBCE	6	19	12	CERA	79	79	80
KDOE	60	54	57	NORD	29	33	23
LUXI	70	71	69	ADIG	80	80	79
NPI	13	24	24	AESU	15	27	20
NPIP	1	7	3	BAIL	74	73	70
OEKO	62	36	46	UBSE	34	16	55
ORBI	76	76	76	UBSM	22	49	15
ROBU	68	5	27	HABO	55	59	62
SCOT	24	20	26	LAKE	2	11	6
SEBM	65	67	65	WASG	42	55	58
SOVE	33	17	39	SCEU	23	25	31
TSB	4	12	7	MCUG	52	58	59
VARL	18	23	11	SEBG	50	60	63
VGRN	78	78	73	DNBR	77	77	78
VMIL	63	56	54	VHOR	75	75	77
WASA	67	68	67	BGLO	47	57	61
WASU	30	30	25	HASA	45	50	52
	Sharpe	*Treynor*	*Jensen*				
Sharpe	1						
Treynor	0.76003282	1					
Jensen	0.8454993	0.8450774	1				

This table provides the rankings of the 80 funds with the traditional risk adjusted performance measures and the correlations between them. The first four columns reports the rankings for the ethical funds alphabetically and the latter four columns for the non-ethical matched pair funds.

TABLE 6 Measures of Timing Ability for the Sample Funds

TIMING ETHICAL FUNDS					**TIMING NON-ETHICAL FUNDS**				
Fund	**Alpha**	**T-value**	**D**	**T-value**	**Fund**	**Alpha**	**T-value**	**D**	**T-value**
ABBE	0.0026	1.70	-0.33	-1.81	SOVI	0.0007	0.48	-0.06	-0.47
ABER	0.0022	1.92	-0.29	**-2.35**	CAVE	0.0055	**3.08**	-0.68	**-3.92**
ABFA	0.0032	**2.23**	-0.27	-1.65	INGG	0.0026	**2.15**	-0.10	-0.82
AKTA	0.0040	1.45	-0.44	-1.55	HAUT	0.0054	**2.92**	-0.60	**-3.09**
ALLC	0.0017	1.31	-0.15	-1.31	CSGP	0.0018	1.33	-0.15	-1.12
ASNA	0.0083	**4.77**	-0.69	**-4.11**	POST	0.0027	1.62	-0.12	-0.63
BHJA	0.0032	1.23	-0.26	-1.05	SEBA	0.0063	**2.43**	-0.61	**-2.26**
BHUM	0.0025	0.94	-0.23	-0.91	WASS	0.0037	1.30	-0.51	-1.68
BIDM	0.0009	0.38	-0.09	-0.41	WAAA	0.0041	1.41	-0.47	-1.63

BMIL	0.0051	**2.10**	-0.70	**-3.15**	HARA	0.0037	1.19	-0.44	-1.33
BSAM	0.0024	0.90	-0.21	-0.85	SEBS	0.0061	**2.19**	-0.72	**-2.66**
CISE	0.0036	**3.02**	-0.32	**-2.19**	HSBC	0.0054	**3.31**	-0.37	**-2.55**
CITY	0.0036	1.93	-0.34	-1.16	CITI	-0.0014	-1.06	-0.03	-0.17
CLEM	0.0015	0.91	-0.22	-1.51	SUNC	0.0017	2.09	-0.15	-1.53
COMM	0.0019	1.04	-0.29	-1.28	CONS	0.0055	**3.71**	-0.45	**-2.49**
EQUI	0.0017	1.14	-0.27	-1.69	DRGE	0.0020	1.46	-0.09	-0.64
FAMI	0.0023	1.45	-0.22	-1.26	GUAR	0.0008	0.53	0.04	0.31
FOCU	0.0050	**2.86**	-0.60	**-3.13**	NORW	0.0017	1.45	-0.13	-1.00
FRAM	0.0064	**2.16**	-1.12	**-3.78**	LLOY	0.0041	**2.34**	-0.28	-1.68
FPSI	0.0027	1.87	-0.23	-1.67	HEND	0.0007	0.52	0.01	0.10
FPSE	0.0035	**2.23**	-0.28	-1.80	EHIT	0.0010	0.64	-0.05	-0.38
HYPO	-0.0023	-1.18	0.21	0.91	WALS	0.0037	**2.41**	-0.26	**-1.98**
JUPE	0.0049	**3.18**	-0.57	**-3.60**	SCLW	-0.0001	-0.10	-0.18	-1.31
KBCE	0.0033	2.67	-0.24	-1.53	CERA	-0.0047	-1.76	-0.02	-0.06
KDOE	0.0048	**2.96**	-0.64	**-3.61**	NORD	0.0030	1.74	-0.27	-1.40
LUXI	0.0048	**2.76**	-0.72	**-3.26**	ADIG	0.0005	0.20	-0.49	-1.46
NPI	0.0023	1.94	-0.18	-1.28	AESU	0.0014	0.98	-0.05	-0.32
NPIP	0.0037	**3.04**	-0.18	-1.53	BAIL	0.0020	1.20	-0.36	-1.90
OEKO	0.0022	**1.96**	-0.26	-1.85	UBSE	-0.0002	-0.36	0.04	0.49
ORBI	0.0063	**2.42**	-1.12	**-5.36**	UBSM	0.0040	**2.12**	-0.37	-1.88
ROBU	-0.0005	-0.17	1.16	0.18	HABO	0.0008	0.28	-0.06	-0.20
SCOT	0.0032	1.77	-0.31	-1.41	LAKE	0.0026	1.74	-0.08	-0.59
SEBM	0.0058	**3.08**	-0.82	**-4.73**	WASG	0.0041	**2.10**	-0.52	**-2.45**
SOVE	0.0027	1.54	-0.28	-1.44	SCEU	0.0014	0.96	-0.09	-0.64
TSB	0.0027	1.75	-0.10	-0.61	MCUG	0.0018	1.01	-0.25	-1.87
VARL	0.0037	1.46	-0.27	-1.07	SEBG	0.0032	**2.09**	-0.41	**-2.80**
VGRN	0.0037	1.08	-0.66	-1.71	DNBR	0.0012	0.37	-0.51	-1.54
VMIL	0.0061	**2.91**	-0.81	**-3.92**	VHOR	0.0011	0.40	-0.46	-1.80
WASA	0.0034	1.76	-0.49	**-2.12**	BGLO	0.0040	**2.35**	-0.51	**-2.55**
WASU	0.0041	**2.03**	-0.43	-1.83	HASA	0.0037	1.39	-0.43	-1.48
Average	0.0033	1.86	-0.28	-1.77	Average	0.0024	1.33	-0.28	-1.38

This table reports the results of the Henriksson-Merton (HM) market timing regressions according to equation [5]. The alpha coefficient gives a measure of the stock selection ability of the fund. The D coefficients are measures of the market timing ability of the fund. The t-values are all adjusted with the Newey-West procedure to mitigate problems with autocorrelation and heteroscedasity.

TABLE 7 Matched Pair t-tests and Friedman Non-parametric Tests

	Ethical	**Nonethical**	Matched pair	2 tailed t-test	Friedman
			t-value	**P value**	**P value**
SIZE	44.2	54.2	1.952	0.058	0.343
AGE	105.3	116.3	1.557	0.128	0.206
MEAN	0.0016	0.0018	0.915	0.366	0.058
SDEV	0.021	0.023	1.922	0.062	**0.002**
LNSDVN	-3.89	-3.80	2.268	**0.029**	0.002
BETA	0.62	0.74	1.691	0.099	**0.027**
MIN	-0.080	-0.083	-0.589	0.559	**0.027**
MAX	0.066	0.071	1.019	0.315	**0.011**
SHARPE	0.100	0.102	0.214	0.831	0.343

TREYNOR	0.0036	0.0039	0.305	0.762	0.752
JENSEN ALPHA	0.0005	0.0003	-0.710	0.482	0.527
D-HM	-0.28	-0.28	0.022	0.983	0.343
HM-ALPHA	0.0033	0.0024	-1.950	0.058	0.058

This table reports the results of the t-tests between the group of non-ethical and ethical funds. Values in **bold** are significant at the 5% level with a two tailed test; in some cases such as the risk measures in this study a one-tailed test is justified. The first column begins with SIZE referring to test of significance between size of the non-ethical and ethical funds. The first column reports the tested parameter, the second column reports the average value for the ethical funds for that parameter, the third column reports the average value for the non-ethical funds, fourth column reports the t-values and the fifth column reports the two tailed significance levels. In some cases this paper refers to one tailed significance levels which are half of the two tailed significance levels. The final column reports the p-values from the Friedman non-parametric test. The table begins with tests of fund characteristics such as fund size and age. It continues with tests of descriptive statistics of fund returns such as mean, standard deviation, Ln standard deviation, beta, min, max values of fund returns. Then the tests for differences in fund risk adjusted performance by Sharpe, Treynor and Jensen measures. Finally differences between the results in market timing for ethical and non-ethical funds are tested for by testing the parameters in the Henriksson-Merton (HM) model.

TABLE 8 Cross-Sectional Regressions Explaining Fund Performance Measures

(A) Jensen Alpha explained

Jensen Alpha explained	Intercept	Size	Age	Ethical Status
Coefficient	0.0002540	0.0000033	-0.0000013	0.00021
t-value	0.79	1.73	-0.60	0.74

R^2 was 4%

(B) Fund Returns explained

Fund Ln returns explained	Intercept	Size	Age	Ethical Status
Coefficient	0.2231500	0.0004440	0.0000558	-0.0339930
t-value	**5.24**	1.51	0.17	-0.79

R^2 was 4%

(C) Henriksson-Merton Alpha explained

Henriksson Merton alphas	Intercept	Size	Age	Ethical Status
Coefficient	0.0010970	0.0000010	0.0000004	0.0005674
t-value	**2.41**	0.39	0.13	**5.33**

R^2 was 27%

These tables report the results of the cross-sectional regression explaining (A) the Jensen Alphas of all 80 funds, (B) the returns for all funds and (C) the Henriksson-Merton alphas of the funds. **BOLD** font indicates a t-value significant at the 5% level. The Size variable is measured as size of funds in GBP as at 31.12.1998. The variable Age is measured as age of funds in months since month of inception until 31.12.1998. Ethical is a dummy variable with a value of 1 for ethical funds and 0 for non-ethical funds. W is a random disturbance term. Dummy variables relating to country of origin and investment universe have also been used in different versions of equation [6], none of them were significant.

© CSEAR, School of Management - University of St Andrews -
The Gateway, North Haugh, St Andrews, KY16 9RJ. Scotland, UK
Tel: +44 (0)1334 46 2805; **Email:** csear@st-andrews.ac.uk
The University of St Andrews is a charity registered in Scotland, No SC013532.