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Financial Penalty?”

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# Ethical Investing in Australia; Is there a Financial Penalty?

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# **Ethical Investing in Australia; Is there a Financial Penalty?**

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**JEL Classification:** *G12, G20, G23*

## **ABSTRACT**

This study provides new evidence on the performance and investment style of retail ethical funds in Australia. By applying a conditional multi-factor Carhart (1997) model we solve the benchmark problem most prior ethical studies suffered from. After controlling for investment style, time-variation in betas, bond exposure and home bias, we confirm previous US and UK evidence on ethical fund performance for both domestic and international funds in Australia. That is, we find no evidence of significant differences in risk-adjusted returns between ethical and conventional funds during the 1992-2003 period. This result however is sensitive to the chosen time period. During 1992-1996 domestic ethical funds under-perform their conventional counterparts significantly. During 1996-2003 the ethical funds match the performance of conventional funds more closely. This suggests there is a learning effect for the relatively young ethical investment industry.

## 1 INTRODUCTION

Although investing based on ethical criteria appeals to many investors, the general perception is that it most likely reduces portfolio performance. For instance financial theory argues that ethical investing will under-perform over the long term because ethical portfolios are subsets of the market portfolio, which lack sufficient diversification. Another frequently posed argument is that selecting stocks according to ethical screens can be an expensive practice that may ultimately have a negative impact on net return. Therefore the general perception has been that ethical portfolios are likely to under-perform their conventional peers.

The relevant literature provided up to this point however has not been able to find a significant performance gap between ethical and non-ethical portfolios. For instance Diltz (1995), Guerard (1997) and Sauer (1997) concluded that there were no statistically significant differences between the returns of ethically screened and unscreened universes in the US. Evidence on the performance of ethical mutual funds confirms this finding. Using single factor Jensen alpha models Statman (2000) and Gregory, Matatko and Luther (1997) respectively find no significant difference between the financial performance of ethical and non-ethical unit trusts in the US and UK. In a more recent paper Bauer, Koedijk and Otten (2002) extend previous research in this field by applying more elaborate conditional multi-factor models. Using an international database containing 103 US, UK and German ethical mutual funds they find no significant differences in risk-adjusted returns between ethical and conventional funds.

As most of these studies investigate similar markets and time periods the evidence to date could be sample-specific. To tackle this critique, the analysis should be carried over to other countries. The Australian market is particularly interesting as recently two important pieces of regulation were introduced. In March 2003 Australia introduced its new ethical disclosure requirements under the Financial Services Reform Act (FSRA). The ethical amendment is to oblige issuers of financial products (investment and superannuation) to disclose the extent to which labour standards or environmental, social or ethical considerations are taken into account in the selection, retention or realisation of an investment. Furthermore the Australian Securities and Investments Commission (ASIC) now requires advisors providing personal financial advice to enquire whether environmental, social or ethical considerations are important to their clients. This makes Australia the first country to extend the ethical related regulations to the financial advisory process.

The objective of this study is twofold. First, we intend to provide significant complementary evidence on ethical mutual fund performance. This paper examines the Australian ethical fund market, which has attracted little attention in the academic literature. As far as we are aware, only two published academic studies exist. Cummings (2000) examined the performance of 7 ethical Australian equity funds compared to common market benchmarks. He finds an insignificant difference in return to for instance the ASX and a small cap benchmark for the 1986-1994 period. On the other hand, Tippit (2001) finds that the average of the three largest Australian ethical mutual funds significantly under-performs the All Ordinaries index by 1.5% per year during 1991-1998. Next to research on ethical mutual funds, a study by Ali & Gold (2002) tests the effect of removing shares in companies that operate in the so-called "sinful industries" from the market portfolio. Over a seven-year period (ending 2001), their analysis concludes that Australian domestic investors avoiding shares in the "sinful industries" sacrificed returns of approximately 0.70% per annum. Our study investigates Australian ethical fund performance during a more recent time period (1992-2003) for more ethical funds (25) with different kinds of investment objectives (domestic and international) while correcting for survivorship bias.

The second purpose of our paper is to address potential benchmark problems when assessing the relative performance of ethical mutual funds in Australia. Among others, Dibartolomeo (1996), Guerard (1997), Kurtz (1997) and Bauer, Koedijk and Otten (2002) find ethical portfolios to be tilted towards small-cap growth stocks. This potentially biased some of the previous results for the Australian market. In this study we follow Bauer, Koedijk and Otten (2002) and consider the well-known CAPM-framework as well as multifactor models in the spirit of Carhart (1997) and Ferson and Schadt (1996). In doing so, we are able to investigate both ethical mutual fund performance *and* their investment style relative to conventional funds.

The remainder of this paper is organized as follows: in section 2 we provide an overview of the Australian ethical mutual fund market and discuss the data set. In section 3 we present our empirical results. Robustness tests are carried out in section 4 before we conclude in section 5.

## **2 DATA**

### **2.1 Overview of the Ethical fund market**

Table 1 presents some Figures on the size of the retail ethical fund market in several selected countries. While the US market for ethical mutual funds has risen from \$12 billion in 1995 to \$136 billion at the end of 2001, the European market for ethical funds is still in an early stage of development. For instance in France, Germany and Italy ethical funds do not even account for 1% of the total domestic market for mutual funds. Frontrunners in Europe are the Netherlands and the United Kingdom. In Australia the size of the retail ethical market is still well below average. Overall, it can be said that the entire ethical mutual fund market still represents only a marginal part of the traditional market.

[Table 1: Overview of Ethical Mutual Fund Market as end 2001]

### **2.2 Ethical mutual funds**

Using Morningstar we constructed portfolios of retail equity mutual funds that invested their assets based on ethical screening. As a reference group we selected all other equity mutual funds that did not explicitly claim to use ethical screening. Furthermore we divided funds into investment categories based on regional focus (domestic versus international), to enhance comparability. We restrict our sample to pure retail equity funds with at least 12 months of data, excluding balanced and guaranteed funds.

Return data was then collected from Morningstar Australia. All returns are inclusive of any distributions, net of annual management fees and in AU\$. This leads to a total sample of 25 ethical open-ended equity mutual funds and 281 conventional funds with monthly returns from November 1992 through April 2003.

As pointed out by Brown, Goetzmann, Ibbotson and Ross (1992), leaving out dead funds leads to an overestimation of average performance. To avoid a possible survivorship bias we add back funds that were closed at any point during the sample period. This information was provided by the Morningstar dead fund database. Dead funds were included in the sample until they disappeared. After that the portfolios are re-weighted accordingly.

The influence of this becomes clear if we compare the mean returns of all funds (dead + surviving) with the return on surviving funds only. Restricting our sample to surviving funds would lead us to overestimate average returns for the domestic funds by 0.20% and for international funds by 1.13% per year.

Table 2 describes the data we use in our subsequent analyses. Based on raw returns it seems domestic ethical funds under-perform both their conventional peers and the Australian index. The international ethical funds out-perform their conventional counterparts but under-perform the international index. If we look at some basic features of ethical mutual funds their smaller size becomes apparent. Finally domestic ethical funds charge higher fees than conventional funds, while the opposite is true for international ethical funds.

[Table 2: Summary Statistics on Australian Mutual Funds 1992:11 - 2003:04]

### **2.3 Benchmarks**

In the basic single factor Jensen alpha analysis we make use of market wide equity indices supplied by Worldscope. In comparison to for instance MSCI indices, Worldscope aims at covering up to 98% of market capitalisation, while MSCI mainly serves as a large cap proxy.<sup>1</sup> In constructing our version of the Carhart (1997) 4-factor model we consider all stocks in the Worldscope universe for each region (domestic and international). For the excess market return we select all stocks in the Worldscope universe that have a market capitalization of at least AU\$5 million, minus the 1-month inter-bank rate. We then rank all stocks based on size and assign the bottom 20% of total market capitalization to the small portfolio. The remaining part goes into the large portfolio. SMB is the return difference between small and large. For the HML factor all stocks are ranked on their book-to-market ratio. In line with Fama and French (1992) we then assign the top 30% of market capitalization to the high book-to-market portfolio and the bottom 30% to the low book-to-market portfolio. HML is obtained by subtracting the low from the high book-to-market return. The momentum factor portfolio is formed by ranking all stocks on their prior 12-month return. The return difference between the top 30% and bottom 30% by market capitalization then provides us with Mom, momentum

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<sup>1</sup> Alternatively we used the relevant MSCI indices. Based on results not reported in the paper we conclude this did not have an influence on our results.

factor returns.<sup>2</sup> This procedure is repeated every month to get to a rolling momentum factor. All factor portfolios are constructed value-weighted.

### 3 EMPIRICAL RESULTS

#### 3.1 CAPM model

The main model used in studies on ethical mutual fund performance is a CAPM based single index model. The intercept of such a model,  $\alpha_i$ , gives the Jensen alpha, which is usually interpreted as a measure of out- or under-performance relative to the used market proxy.<sup>3</sup>

$$R_{it} - R_{ft} = \alpha_i + \beta_i(R_{mt} - R_{ft}) + \varepsilon_{it} \quad (1)$$

where  $R_{it}$  is the return on fund  $i$  in month  $t$ ,  $R_{ft}$  the return on a local one month T-bill in month  $t$ ,  $R_{mt}$  the return on the relevant equity benchmark in month  $t$  and  $\varepsilon_{it}$  an error term.

Table 3 presents the results of applying equation (1) on our database. Per regional objective (domestic and international) we compute Jensen's alpha for both the portfolio of ethical funds and the portfolio of conventional funds. To enhance comparability we also add a portfolio which is constructed by subtracting conventional fund returns from ethical fund returns. This portfolio is then used to examine differences in risk and return between the two investment approaches.

[Table 3: Results CAPM model]

The single factor analysis based on Jensen alpha provides two different views. Domestic ethical funds under-perform both the index and their conventional counterparts by respectively (-0.91%) and (-1.32%). International ethical funds however out-perform their conventional peers by (+3.36%). The differences in risk-adjusted return between ethical and conventional funds however are statistically insignificant in all cases. A more pronounced observation stems from the estimated market risk, beta, for all funds. For both regional objectives the ethical funds exhibit significantly less market risk. This was also observed by

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<sup>2</sup> The construction of these factor portfolios was done using the on-line research tool by Style Research Ltd.

<sup>3</sup> See Jensen (1968)

Tippet (2001), who attributes the lower market risk to the conservative nature of the management of ethical funds in Australia.<sup>4</sup>

As ethical funds are constructed using several ethical, social and environmental screens, the common equity benchmarks used before might not be perfectly suited for measuring performance. To assess such possible bias we alternatively use an ethical index to measure ethical fund performance. For that purpose we substitute the Worldscope Australia index by the Westpac Monash Eco index. This index was launched in 1999 to track the performance of about 75 Australian companies that exhibit relatively higher scores on several environmental criteria. The ranking process is performed by Monash, while BT Financial (formerly Westpac) creates the index.

[Table 4: Results CAPM model using Eco index]

Table 4 presents the results of applying the Eco index using a 1-factor model. For reasons of comparison we only investigate the 1999:01-2003:04 period, as the Westpac Monash Eco index was launched in 1999. Accordingly, the results on the CAPM model with a common index are also based on the 1999:01-2003:04 period. Furthermore only domestic funds are investigated, as the Westpac Monash Eco index only captures Australian companies.

By using an eco index three striking observations emerge. First, the eco index is not more powerful in explaining fund performance compared to the standard, non-ethical index as the  $R^2_{adj}$  for the model with the Westpac Monash Eco index is lower than the  $R^2_{adj}$  of the standard CAPM model. Second, in contrast to our previous results in Table 3, ethical funds do not exhibit significantly lower market betas anymore. When using both the standard index and the Eco index the difference in beta is insignificant.<sup>5</sup> Third, the conclusions based on the CAPM model with standard, non-ethical indices with respect to performance, seem to be quite robust to the use of an eco index instead. The difference in performance is statistically insignificant at (-0.48%).

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<sup>4</sup> For the Australian domestic funds we also used both the ASX All Ordinaries and ASX Small cap as an alternative for the Worldscope Australia index. This did not alter our conclusions with respect to alpha, beta and  $R^2_{adj}$ .

<sup>5</sup> In section 4.4 we explore this in more detail

### 3.2 Multi-factor model

The need for a multi-factor asset-pricing model is derived from the recent literature on the cross-sectional variation of stock returns (see, e.g. Fama & French (1993, 1996) and Chan, Jegadeesh & Lakonishok (1996)). The results of these studies lead us to question the adequacy of a single index model to explain mutual fund performance. Therefore the Fama & French (1993) 3-factor model has been considered to give a better explanation of fund behaviour. Besides a value-weighted market proxy, two additional risk factors are used, size and book-to-market. Although this model already improves average CAPM pricing errors, it is not able to explain the cross-sectional variation in momentum-sorted portfolio returns. Therefore Carhart (1997) extends the Fama-French model by adding a fourth factor that captures the Jegadeesh & Titman (1993) momentum anomaly. The resulting model is consistent with a market equilibrium model with four risk factors, which can also be interpreted as a performance attribution model, where the coefficients and premia on the factor-mimicking portfolios indicate the proportion of mean return attributable to four elementary strategies.

A recent study by Faff (2001) confirms the notion that multifactor models are also able to explain the cross-sectional variation in Australian equity returns.

In addition, there is now evidence confirming that ethical mutual fund performance is indeed attributable to style tilts, which cannot be accounted for in a single-index environment. For example, Gregory, Matatko and Luther (1997) found that the small firm effect is significant in explaining U.K. ethical trust performance. Bauer, Koedijk and Otten (2002) found evidence suggesting that ethical mutual funds are less exposed to the market portfolio compared to conventional funds, but more small cap- and growth stock-oriented. Estimates of a mutual fund's factor loadings and alpha are therefore likely to be more reliable in a multivariate framework.

Formally we estimate:

$$R_{it}-R_{ft}=\alpha_i+\beta_{0i}(R_{mt}-R_{ft})+\beta_{1i}SMB_t+\beta_{2i}HML_t+\beta_{3i}Mom_t+\epsilon_{it} \quad (2)$$

where

$SMB_t$	=	the difference in return between a small cap portfolio and a large cap portfolio at time t
$HML_t$	=	the difference in return between a portfolio of high book-to-market stocks and one of low book-to-market stocks at time t
$Mom_t$	=	the difference in return between a portfolio of past 12 months winners and a portfolio of past 12 month losers at time t

Table 5 summarizes the results of applying the multi-factor model. First, all ethical funds exhibit significantly less market exposure compared to conventional funds, which corroborates our previous 1-factor results. Second, domestic ethical funds are relatively more exposed to small caps. Third, domestic ethical funds are more value-oriented than growth-oriented, if compared to conventional funds. This is in sharp contrast to Guerard (1997) and Bauer, Koedijk and Otten (2002) for instance who find a growth bias for ethical funds.<sup>6</sup> Again, the significance of this value-tilt is not overwhelming. Fourth, all ethical funds are more momentum driven than their conventional peers, although the significance of this difference is rather low. Finally, after controlling for market risk, size, book-to-market and momentum the difference in return between ethical and conventional funds remains negative for domestic funds (-1.56%) and positive for international funds (+2.98%). None of these differences however are statistically significant.

[Table 5: 4-factor Carhart Model]

### 3.3 The influence of fund characteristics on performance

In the literature on conventional mutual funds it has been argued that specific fund characteristics like for instance expense ratio, asset size and fund age have an impact of performance. For instance Elton, Gruber, Das & Hlavka (1993) and Carhart (1997) find a negative correlation between expense ratios and risk-adjusted performance of US mutual funds. Otten & Bams (2002) confirm this finding for European funds. In addition to that the latter study documents a positive influence of asset size and a negative for fund age. To

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<sup>6</sup> A reason for the high proportion of growth stocks may lie in the exclusion of traditional value sectors like chemical, energy and basic industries. As these represent a higher environmental risk, ethical portfolios are often under-weighted in them, which leads to a growth focus

investigate the influence of these characteristics on Australian ethical funds we ran the following regression:

$$\alpha_i = c_0 + c_1 \text{Expense Ratio}_i + c_2 \text{Log Assets}_i + c_3 \text{Log Age}_i + \varepsilon_i \quad (3)$$

where

$\alpha_i$	=	4-factor alpha for fund i
$\text{Expense Ratio}_i$	=	Expense ratio for fund i (at 2003:04)
$\text{Log Assets}_i$	=	Log of total fund assets for fund i (at 2003:04)
$\text{Log Age}_i$	=	Log of fund i's Age in number of years (at 2003:04)

The results in Table 6 indicate a strong relationship between risk-adjusted performance and fund size, fund age and to a lesser extent expense ratio. Both domestic and international ethical funds show a significantly positive relationship between the log of fund assets and risk-adjusted performance. Possibly there are still economies of scale available in the relatively small ethical fund market. The influence of age is significant for both domestic and international ethical funds. The nature of the relationship is however quite different. Among the domestic ethical funds younger funds perform better, while for the international funds the opposite is true.<sup>7</sup> Finally the influence of the expense ratio is positive but insignificant for all funds.

(Table 6: The influence of fund characteristics on ethical fund performance)

### 3.4 Screening approach

One of the most important features that enables ethical funds to distinguish themselves from conventional funds is the type of ethical screening they perform. Basically funds can apply three screenings, positive, negative or best-of-sector. Negative screeners delete stocks from the universe that display a poor ranking on certain ethical indicators. Positive screeners on the other hand reward companies that are regarded to have superior scores on similar ethical indicators. Best-of-sector (also called best-in-class) finally combine both positive and

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<sup>7</sup> This in contrast to Cummings (2000), who finds older domestic Australian ethical funds to perform better.

negative screening on a sector basis. For instance they search for the best scoring company within the oil sector, although this sector is generally thought to be a rather polluting one. The best-of-sector approach has mainly been developed to overcome the difficulty most fund managers are faced with when trying to limit deviations from general benchmarks (tracking error). By including stocks from all sectors the best-of-sector approach leads to smaller sector biases, compared to for instance negative screening, and thus a more diversified portfolio.

Obviously different kinds of screening lead to different performance and investment style patterns. Most academic studies on ethical fund performance until now have studied the average performance of ethical funds *as a group*, ignoring the influence the type of screening might have. The reason for that is obvious, a lack of comprehensive data and information on the exact approach followed by the funds. For the funds in our sample we went through the annual reports and brochures to finally distinguish three major types of screens, positive/negative, best-of-sector and negative. However, as the number of funds and the covered data period is too limited it is difficult to test for any differences between these 3 types of screens in a statistically meaningful way. Based on results not reported in the paper we are able to identify two major differences.<sup>8</sup> The negative screeners deviate more clearly from conventional funds with respect to investment style than positive/negative and negative screeners do. Obviously this is what we would expect to find. The influence of screening on performance provides a second observation. While positive/negative and negative screeners perform slightly worse than conventional funds, the negative screens clearly out-perform their conventional peers. Again, because of the low number of funds (for instance only 3 out of 25 funds are negative screeners) we cannot draw strong conclusions based on this analysis. Interesting to note however is that all three negative screeners are from the same asset manager, Hunter Hall. It seems that one of the oldest and largest ethical fund managers in Australia is indeed able to add value through applying strict negative screens.

## **4 ROBUSTNESS TESTS**

### **4.1 Conditional multi-factor model**

It is well known that biases can arise if managers trade on publicly available information, in other words if dynamic strategies are employed. Average alphas calculated using a fixed beta estimate for the entire performance period are highly unreliable if expected returns and risks

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<sup>8</sup> Available upon request with the authors.

vary over time. Therefore Chen & Knez (1996) and Ferson & Schadt (1996) advocate conditional performance measurement.<sup>9</sup>

Consider the following case where  $\mathbf{Z}_{t-1}$  is a vector of lagged pre-determined instruments. Assuming that the beta for a fund varies over time, and that this variation can be captured by a linear relation to the conditional instruments, then  $\beta_{it} = \beta_{i0} + \mathbf{B}'_i \mathbf{Z}_{t-1}$ , where  $\mathbf{B}'_i$  is a vector of response coefficients of the conditional beta with respect to the instruments in  $\mathbf{Z}_{t-1}$ . For a single index model the equation to be estimated then becomes

$$R_{it} - R_{ft} = \alpha_i + \beta_{i0} (R_{mt} - R_{ft}) + \mathbf{B}'_i \mathbf{Z}_{t-1} (R_{mt} - R_{ft}) + \varepsilon_{it} \quad (4)$$

This equation can easily be extended to incorporate multiple factors, which results in a conditional Carhart 4-factor model with time-varying betas. The instruments we use are publicly available and proven to be useful for predicting stock returns by several previous studies.<sup>10</sup> Introduced are (1) the 1-month T-bill rate, (2) dividend yield on the market index, (3) the slope of the term structure and finally (4) the quality spread, by comparing the yield of government and corporate bonds. All instruments are based on local values and lagged 1 month.

Table 7 presents the results of the conditional Carhart 4-factor model for Australia. While column 2 repeats the unconditional alphas from Table 5, the conditional alphas are in column 4. In all cases the hypothesis of constant betas can be rejected at the 5% level (see Wald test statistics in column 6), indicating strong time-variation in betas. The conditional alphas however strengthen our previous observations. Domestic ethical funds under-perform conventional funds (-0.73%), while international ethical funds out-perform their conventional funds (+6.07%). Again however, none of these differences are statistically significant.

[Table 7: Unconditional versus Conditional performance evaluation]

## 4.2 Bond exposure

Although we restrict our sample to pure equity funds only, we still have to determine whether funds exhibit a fixed-income exposure. For instance, Elton, Gruber, Das and Hlavka (1993)

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<sup>9</sup> Sawicki and Ong (2000) and Gallagher (2003) provide evidence on the added value of conditional performance measures for Australian funds.

<sup>10</sup> Pesaran and Timmerman (1995) discuss several studies that emphasize the predictability of returns based on interest rates and dividend yields.

and Elton, Gruber and Blake (1996) find that almost 50% of US equity mutual funds have an exposure to a local government bond index. A fixed-income exposure either serves to provide the necessary liquidity or relates to the managerial attempts to either time the market or follow a conservative investment style.<sup>11</sup> As we found particularly low market betas for ethical funds this might be an important factor missing in our analysis.

While cash exposures are covered by the inclusion of the risk-free rate in equations (1) – (4), we additionally include a local government bond index, following Elton, Gruber, Das and Hlavka (1993) and Elton, Gruber and Blake (1996).

$$R_{it}-R_{ft}=\alpha_i+\beta_{0i}(R_{mt}-R_{ft})+\beta_{1i}SMB_t+\beta_{2i}HML_t+\beta_{3i}Mom_t+\beta_{4i}(R_{bt}-R_{ft})+\varepsilon_{it} \quad (5)$$

where

$R_{bt}$  = the return on a local government bond index at time t

The results of this exercise are summarized in Table 8. It appears that international ethical funds are heavily exposed to government bonds, while this holds for none of the other conventional and ethical funds. As we are dealing with pure equity funds this bond exposure would not be expected up front. Our previous observations with respect to differences in alpha estimates however remain unchanged.

[Table 8: Bond Exposure]

### 4.3 Home Bias

In our previous analysis we compared the international funds to an international (global) benchmark. Based on informational advantages we could however expect fund managers to prefer local investments over international investments. The evidence on such a home bias is overwhelmingly present in the finance literature.<sup>12</sup> To test for this we add a local benchmark to the Carhart 4-factor model. Note that we now construct the Market, SMB, HML and Momentum factors based on an ex-country index. That means, for Australia we construct all

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<sup>11</sup> Open-end mutual funds always stand ready to buy or sell additional shares in the fund. This obviously means the fund has to maintain a certain liquidity to be able to react to investors entering or leaving the fund. Often this liquidity is obtained by keeping cash.

<sup>12</sup> For a comprehensive overview on the home bias puzzle, see Lewis (1999).

factors using the Global ex-Australia universe, and then add the Australia index as a final factor.

$$R_{it}-R_{ft} = \alpha_i + \beta_{0i} (R_{mt} - R_{ft}) + \beta_{1i} \text{SMB}_t + \beta_{2i} \text{HML}_t + \beta_{3i} \text{Mom}_t + \beta_{4i} (\text{AU}_t - R_{ft}) + \varepsilon_{it} \quad (5)$$

where

$\text{AU}_t$  = the return on the AU Worldscope equity benchmark at time  $t$

The results in Table 9 indicate a strong and significant home bias for the international ethical funds. All our previous observations however are still valid. The difference in return between ethical and conventional funds remains insignificantly positive for the international funds at (+2.91%).

[Table 9: Home Bias]

#### 4.4 Sensitivity to time period

The final robustness test that is performed relates to the development of relative performance through time. In order to detect whether the rather young ethical investment industry is undergoing changes, we divide our sample period into three equal, non-overlapping sub-periods. Table 10 reports the results for the Carhart 4-factor model using 3 different sub-periods.<sup>13</sup>

Examining the differences in alpha between ethical and conventional funds provides an interesting development. Where the domestic ethical funds under-perform their conventional peers significantly during the first 3.5 years of our sample period (-3.36%), this difference turns significantly positive during the second 3.5 years (2.91%). During the last 3.5 years the difference again turns slightly negative (-0.34%), but now insignificantly different from zero. It appears the domestic ethical funds went through a learning phase in which they first trailed conventional funds significantly while more recently they matched conventional fund performance more closely. This is in line with evidence for the US, UK and German ethical funds examined in Bauer, Koedijk & Otten (2002). Australian international ethical

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<sup>13</sup> Adding a bond index or local index to the Carhart 4-factor model does not change our results with respect to sub-periods.

funds out-perform their conventional peers throughout the entire sample period, but insignificantly.

[Table 10: Difference between Ethical and Conventional fund alpha for 3 equal Sub-periods]

To investigate this finding in more detail we additionally performed rolling regressions for the Carhart 4-factor model. This enables us to investigate the development of alpha, market beta, SMB, HML and Momentum through time. The results of this exercise are reported in Figure 1 (domestic) and Figure 2 (international), where the rolling *differences* in alpha and factor exposures between ethical and conventional fund are displayed. Next to the point estimates we report the 95% confidence bounds to assess the significance of the observed time variation.

The results in Figures 1 and 2 reveal significant changes in performance and investment style of all ethical funds, if compared to their conventional peers. For instance, domestic ethical funds first under-perform the conventional funds significantly, turning into a significant out-performance during 1998-2000, after which a period of no significant difference emerges. This obviously is in line with our previous sub-period results. More interestingly however we also witness a drastic change in investment style over time. The significantly lower market beta, lower SMB and higher momentum factor all revert into a significantly higher market beta, higher SMB and lower Momentum during the last few years of our sample period. A similar development holds for the international funds in Figure 2. The lower market beta, higher SMB and Momentum factor all revert back to point where there is no significant difference. Finally the difference in alpha for the international funds slowly decays to an insignificant value, after a significant out-performance for the ethical funds during the first few years of our sample period.

The rolling regressions performed here create an interesting picture of ethical fund performance and investment style through time. While during the beginning of the 90's ethical funds clearly deviated from conventional funds with respect to performance and investment style, this difference largely disappears during the last part of our sample period. By 2003 ethical funds provide an investment style that does not seem to differ that much from conventional funds, which inevitably leads to a performance that also does not deviate too much. There remains of course the question whether nowadays ethical funds are really following distinct ethical investment styles, or whether they are conventional funds in disguise.

[Figure 1: Rolling alpha, market beta, SMB, HML and momentum for the *difference* between domestic ethical and conventional funds]

[Figure 2: Rolling alpha, market beta, SMB, HML and momentum for the *difference* between international ethical and conventional funds]

## 5 CONCLUSION

This study provides new evidence on the performance and investment style of retail ethical funds. By comparing 25 ethical equity funds to several benchmarks and their conventional peers we examine whether there is a financial penalty for being an ethical investor in Australia. While most of the previous work on ethical mutual fund performance is conducted using market wide indices, we explore the added value of more elaborate multi-factor models. This not only improves performance measurement but also enables us to investigate ethical mutual fund investment styles in more detail.

After employing a standard CAPM single factor model, we consider a Carhart (1997) 4-factor asset-pricing model that controls for size, book-to-market and stock price momentum. From this four interesting results emerge. First, Australian domestic ethical funds underperform domestic conventional funds by -1.56% per year. International ethical funds outperform their international peers by +3.31% per year. None of these differences however are statistically significant. Second, ethical funds exhibit distinct investment styles if compared to conventional funds. For instance, all ethical funds exhibit significantly less market exposure compared to conventional funds and domestic funds are relatively more exposed to small caps. Third, we explore the added value of including a bond index and a local benchmark. This revealed a significant exposure of the Australian international ethical funds to a local government bond index. Further, we document a strong and significant home bias for all international ethical funds.

Fourth, we investigate the relative returns of ethical versus conventional funds through time, using 3 equal sub-periods. This provides support for the idea that the under-performance of the Australian domestic ethical funds is mainly caused by a strong and significant under-performance during the first sub-period. During the second sub-period they even outperform their conventional peers significantly, while the last sub-period does not lead to a significant difference. In addition, we perform rolling regressions, which create another interesting

picture of ethical fund performance and investment style through time. While during the beginning of the 90's ethical funds clearly deviated from conventional funds with respect to performance and investment style, those differences largely disappear during the last part of our sample period. By 2003 ethical funds provide an investment style that does not seem to differ that much from conventional funds, which inevitably leads to a performance that also does not deviate too much. It looks like the Australian domestic ethical funds went through a so-called learning phase. After significant under-performance in the beginning of the 1990's, they match conventional fund performance more closely during the 1996-2003 period.

In conclusion, using Australian data we document corroborative evidence for the result that Australian ethical funds do not under-perform relative to conventional funds. This suggests there is no financial penalty for being an ethical investor in Australia during the 1992-2003 period.

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**Table 1: Overview of Ethical Mutual Fund Market as of end 2001**

Country	# of Ethical Mutual funds	Ethical assets under management in billion Euro	As a % of total mutual fund assets
The Netherlands	24	1.70	1.93 %
United States	181	136.00	1.74 %
United Kingdom	62	5.90	1.66 %
Belgium	37	1.20	1.56 %
Italy	9	1.80	0.45 %
Germany	22	0.80	0.33 %
Australia	74	0.90	0.20 %
France	38	1.10	0.01 %

*Notes:*

This Table presents the characteristics of several selected retail ethical mutual fund markets. The first column presents the total number of ethical mutual funds within a country. These include equity, bond and balanced funds. The second column provides the amount of total ethical mutual fund assets under management (in Euro). The last column presents the % of the total domestic fund market that is possessed by ethical funds. Sources: Avanzi, VBDO, EIRIS, Morningstar, Ethical Investment Association and Socialinvest.

**Table 2: Summary Statistics on Australian Mutual Funds 1992:11 – 2003:04**

<i>Objective</i>	Excess Return	Standard deviation	Size	Expense ratio	# of Funds
<b>Australia</b>					
<i>Domestic</i>					
Ethical	1.73	8.30	25	1.75	15
Conventional	4.95	10.92	110	1.64	195
Worldscope Australia index	5.92	12.97			
<i>International</i> <sup>§</sup>					
Ethical	0.33	14.89	52	1.67	10
Conventional	-2.64	12.61	91	1.96	86
Worldscope Global index	1.46	13.40			

*Notes:*

Table 2 reports summary statistics of the funds in our sample. Funds are grouped by regional objective. Ethical and conventional fund returns are calculated based on an equally weighted portfolio of all funds. The return data are annualised with reinvestment of all distributions, based on AU\$. All returns are net of expenses. Besides fund returns we also provide summary statistics on relevant market-wide benchmarks for each region. Average fund sizes are in millions AU\$ as of 2003:04. Costs are presented as a percentage of the assets invested.

<sup>§</sup> 1994:06 – 2003:04

**Table 3: Results CAPM model**

<i>Objective</i>	Alpha	Market Beta	R <sup>2</sup> <sub>adj</sub>
<b>Australia</b>			
<i>Domestic</i>			
Ethical	-0.91	0.45***	0.48
Conventional	0.41	0.77***	0.83
Difference	-1.32	-0.32***	0.46
<i>International</i> <sup>§</sup>			
Ethical	-0.37	0.48***	0.18
Conventional	-3.73*	0.79***	0.71
Difference	3.36	-0.31***	0.09

*Notes:*

The Table reports the results of the estimation of equation (1) for the 1992:11 – 2003:04 period. Reported are the OLS estimates for each regional objective, and within objectives for both ethical and conventional funds. Difference is a portfolio which is constructed by subtracting conventional from ethical fund returns.

$$R_{it} - R_{ft} = \alpha_i + \beta_i(R_{mt} - R_{ft}) + \varepsilon_{it} \quad (1)$$

Where  $R_i$  is the fund return,  $R_{ft}$  the risk-free rate and  $R_{mt}$  the return on the relevant benchmark. All returns are in AU\$ and net of costs. All alphas are annualised. T-stats are heteroskedasticity consistent.

<sup>§</sup> 1994:06 – 2003:04

\*\*\* Significant at the 1% level

\*\* Significant at the 5% level

\* Significant at the 10% level

**Table 4: Results CAPM model using Eco index.**

	<b>Worldscope Australia Index</b>			<b>Westpac Monash Eco Index</b>		
<i>Objective</i>	Alpha	Market Beta	R <sup>2</sup> <sub>adj</sub>	Alpha	Market Beta	R <sup>2</sup> <sub>adj</sub>
<b>Australia</b>						
<i>Domestic</i>						
Ethical	0.46	0.72 <sup>***</sup>	0.58	0.83	0.56 <sup>***</sup>	0.52
Conventional	0.96	0.68 <sup>***</sup>	0.66	1.31	0.53 <sup>***</sup>	0.58
Difference	-0.50	0.04	0.46	-0.48	0.03	0.00

*Notes:*

Table 4 reports the results of using the Westpac Monash Eco Index in estimating equation (1). As the Westpac Monash Eco Index was launched in 1999 we only consider the 1999:01-2003:04 period for both the CAPM and Eco benchmark results. Reported are the OLS estimates for Australian ethical and conventional funds. Difference is a portfolio which is constructed by subtracting conventional from ethical fund returns.

$$R_{it} - R_{ft} = \alpha_i + \beta_i(R_{mt} - R_{ft}) + \varepsilon_{it} \quad (1)$$

Where  $R_t$  is the fund return,  $R_{ft}$  the risk-free rate and  $R_{mt}$  the return on the relevant benchmark. All returns are in AU\$ and net of costs. All alphas are annualised. T-stats are heteroskedasticity consistent.

\*\*\* Significant at the 1% level

\*\* Significant at the 5% level

\* Significant at the 10% level

**Table 5: 4-factor Carhart Model**

<i>Objective</i>	4-factor Alpha	Market Beta	SMB	HML	Mom	R <sup>2</sup> <sub>adj</sub>
<b>Australia</b>						
<i>Domestic</i>						
Ethical	-2.17	0.47 <sup>***</sup>	-0.06 <sup>**</sup>	0.08 <sup>**</sup>	0.10 <sup>***</sup>	0.53
Conventional	-0.61	0.79 <sup>***</sup>	-0.11 <sup>***</sup>	0.00	0.07 <sup>***</sup>	0.86
Difference	-1.56	-0.32 <sup>***</sup>	0.05 <sup>**</sup>	0.08 <sup>**</sup>	0.03	0.48
<i>International<sup>§</sup></i>						
Ethical	-1.42	0.47 <sup>***</sup>	-0.21 <sup>*</sup>	-0.13	0.03	0.19
Conventional	-4.40	0.77 <sup>***</sup>	-0.11 <sup>*</sup>	-0.11	0.01	0.72
Difference	2.98	-0.30 <sup>***</sup>	-0.10	-0.02	0.02	0.08

*Notes:*

This Table reports the results of the estimation of equation (2) for the 1992:11 – 2003:04. Reported are the OLS estimates for each regional objective, and within objectives for both ethical and conventional funds. Difference is a portfolio which is constructed by subtracting conventional from ethical fund returns.

$$R_t - R_{f_t} = \alpha + \beta_0 (R_{m_t} - R_{f_t}) + \beta_1 \text{SMB}_t + \beta_2 \text{HML}_t + \beta_3 \text{Mom}_t + \varepsilon_{it} \quad (2)$$

Where  $R_t$  is the fund return,  $R_{f_t}$  the risk-free rate,  $R_{m_t}$  the return on the total Universe according to Worldscope, and SMB and HML the factor-mimicking portfolios for size and book-to-market. Mom is a factor-mimicking portfolio for the 12-month return momentum. All alphas are annualised. T-stats are heteroskedasticity consistent.

<sup>§</sup> 1994:06 – 2003:04

\*\*\* Significant at the 1% level

\*\* Significant at the 5% level

\* Significant at the 10% level

**Table 6: The influence of fund characteristics on ethical fund performance**

<i>Objective</i>	Intercept	Expense Ratio	Log Assets	Log Age	$R^2_{adj}$
<b>Australia</b>					
<i>Domestic ethical funds</i>	-0.61	0.33	0.11 <sup>***</sup>	-0.24 <sup>**</sup>	0.29
<i>International ethical funds</i>	-2.70 <sup>*</sup>	0.03	0.14 <sup>**</sup>	1.27 <sup>***</sup>	0.73

*Notes:*

Reported are the results for the following estimation:

$$\alpha_i = c_0 + c_1 \text{Expense ratio}_i + c_2 \text{Log Assets}_i + c_3 \text{Log Age}_i + \varepsilon_i \quad (3)$$

where  $\alpha_i$  is the 4-factor alpha for fund  $i$ ,  $\text{expense ratio}_i$  is the funds's expense ratio (as of 2003:04),  $\text{Log Assets}_i$  is based upon total fund assets at the end of 2003:04 and  $\text{Log Age}_i$  is a fund's Age in years. T-stats are heteroskedasticity consistent.

<sup>\*\*\*</sup> Significant at the 1% level

<sup>\*\*</sup> Significant at the 5% level

<sup>\*</sup> Significant at the 10% level

**Table 7: Unconditional versus Conditional performance evaluation**

<i>Objective</i>	Unconditional 4f-alpha	$R^2_{adj}$	Conditional 4f-alpha	$R^2_{adj}$	Wald (p-value)
<b>Australia</b>					
<i>Domestic</i>					
Ethical	-2.17	0.53	-1.13	0.70	0.00
Conventional	-0.61	0.86	-0.40	0.88	0.03
Difference	-1.56	0.48	-0.73	0.52	0.00
<i>International<sup>§</sup></i>					
Ethical	0.46	0.22	2.81	0.36	0.00
Conventional	-2.85	0.70	-3.26	0.78	0.04
Difference	3.31	0.01	6.07	0.19	0.00

*Notes:*

This Table presents the results from the unconditional (column 2 and 3) and conditional (column 4 and 5) performance model. The results from the unconditional model are imported from Table 5 column 2, the conditional model results stem from the multifactor version of equation (4). Here we allow the market, SMB, HML and Mom betas to vary over time as a function of (1) the 1 month T-bill rate, (2) dividend yield (3) the slope of the term structure and (4) the quality spread. The last column of Table 7 provides results for heteroskedasticity-consistent Wald tests to examine whether the conditioning information adds marginal explanatory power to the unconditional model. All alphas are annualised.

<sup>§</sup> 1994:06 – 2003:04

\*\*\* Significant at the 1% level

\*\* Significant at the 5% level

\* Significant at the 10% level

**Table 8: Bond Exposure**

<i>Objective</i>	4-factor Alpha	Market Beta	SMB	HML	Mom	Bond	R <sup>2</sup> <sub>adj</sub>
<b>Australia</b>							
<i>Domestic</i>							
Ethical	-1.79	0.50 <sup>***</sup>	-0.07 <sup>**</sup>	0.07 <sup>*</sup>	0.10 <sup>***</sup>	-0.04	0.55
Conventional	-0.64	0.79 <sup>***</sup>	-0.10 <sup>***</sup>	0.00	0.07 <sup>***</sup>	0.05	0.86
Difference	-1.10	-0.29 <sup>***</sup>	0.03 <sup>*</sup>	0.07 <sup>**</sup>	0.03 <sup>*</sup>	-0.09	0.53
<i>International</i> <sup>§</sup>							
Ethical	-2.04	0.25 <sup>***</sup>	-0.10	-0.09	0.05	0.39 <sup>***</sup>	0.24
Conventional	-4.12 <sup>*</sup>	0.72 <sup>***</sup>	-0.09	-0.10	0.02	0.08	0.71
Difference	2.08	-0.47 <sup>***</sup>	0.01	0.01	0.03	0.31 <sup>***</sup>	0.12

*Notes:*

The Table reports the results of the estimation of equation (5) for the 1992:11 – 2003:04. Reported are the OLS estimates for each regional objective, and within objectives for both ethical and conventional funds. Difference is a portfolio which is constructed by subtracting conventional from ethical fund returns.

$$R_t - R_{ft} = \alpha + \beta_0 (R_{mt} - R_{ft}) + \beta_1 \text{SMB}_t + \beta_2 \text{HML}_t + \beta_3 \text{Mom}_t + \beta_{4i} (R_{bt} - R_{ft}) + \varepsilon_{it} \quad (5)$$

Where  $R_t$  is the fund return,  $R_{ft}$  the risk-free rate,  $R_m$  the return on the total Universe according to Worldscope, and SMB and HML the factor-mimicking portfolios for size and book-to-market, Mom a factor-mimicking portfolio for the 12-month return momentum and  $R_b$  the return on a local Government bond. All alphas in the Table are annualised. T-stats are heteroskedasticity consistent.

<sup>§</sup> 1994:06 – 2003:04

\*\*\* Significant at the 1% level

\*\* Significant at the 5% level

\* Significant at the 10% level

**Table 9: Home Bias**

<i>Objective</i>	4-factor Alpha	Market Beta	SMB	HML	Mom	Local	R <sup>2</sup> <sub>adj</sub>
<b>Australia</b>							
<i>Domestic</i>							
Ethical							
Conventional			NA <sup>Ω</sup>				
Difference							
<i>International</i>							
Ethical	-1.50	0.32***	-0.04	-0.03	0.04	0.39***	0.29
Conventional	-4.41*	0.74***	-0.08	-0.08	0.01	0.07	0.72
Difference	2.91	-0.42***	0.04	0.05	0.03	0.32***	0.17

*Notes:*

The Table reports the results of the estimation of equation (6) for the 1994:06 – 2003:04. Reported are the OLS estimates for each investment objective, and within objectives for both ethical and conventional funds. Difference is a portfolio which is constructed by subtracting conventional from ethical fund returns.

$$R_t - R_{f_t} = \alpha + \beta_0 (R_{m_t} - R_{f_t}) + \beta_1 \text{SMB}_t + \beta_2 \text{HML}_t + \beta_3 \text{Mom}_t + \text{AU}_t + \varepsilon_{it} \quad (6)$$

Where  $R_t$  is the fund return,  $R_{f_t}$  the risk-free rate,  $R_m$  the return on the total Universe according to Worldscope, and SMB and HML the factor-mimicking portfolios for size and book-to-market, mom a factor-mimicking portfolio for the 12-month return momentum and AU the return the Worldscope Australian equity index. All alphas in the Table are annualised. T-stats are heteroskedasticity consistent.

<sup>Ω</sup> For the domestic funds home bias obviously is not relevant

\*\*\* Significant at the 1% level

\*\* Significant at the 5% level

\* Significant at the 10% level

**Table 10: Difference between Ethical and Conventional fund alphas for 3 equal sub-periods**

Country / region	4 factor alpha 1992:11- 1996:04	4 factor alpha 1996:05- 1999:10	4 factor alpha 1999:11- 2003:04
<b>Australia</b>			
<i>Domestic</i>	- 3.36 <sup>**</sup>	2.91 <sup>**</sup>	-0.34
<i>International</i> <sup>§</sup>	2.74 <sup>*</sup>	0.70	1.83

*Notes:*

Table 10 presents the results of estimating equation (2) for 3 different sub-periods. Reported are the *differences* between 4 factor alphas for ethical and conventional funds.

$$R_t - R_{f_t} = \alpha + \beta_0 (R_{m_t} - R_{f_t}) + \beta_1 \text{SMB}_t + \beta_2 \text{HML}_t + \beta_3 \text{Mom}_t + \varepsilon_{it} \quad (2)$$

Where  $R_t$  is the fund return,  $R_{f_t}$  the risk-free rate,  $R_{m_t}$  the return on the total Universe according to Worldscope, and SMB and HML the factor-mimicking portfolios for size and book-to-market. Mom is a factor-mimicking portfolio for the 12-month return momentum. All alphas in the Table are annualised. T-stats are heteroskedasticity consistent.

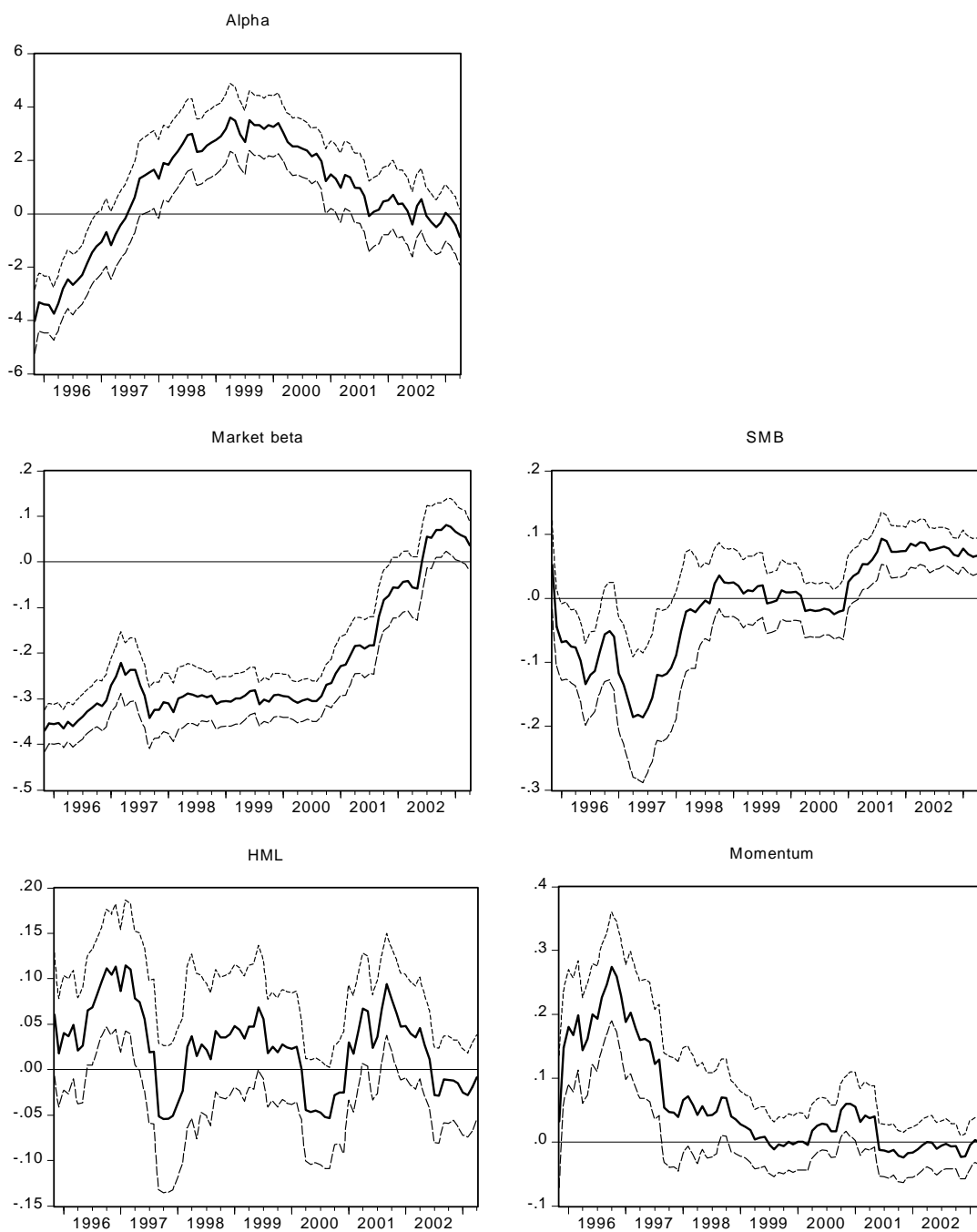
<sup>§</sup>The first sub-period runs from 1994:06-1996:04

<sup>\*\*\*</sup> Significant at the 1% level

<sup>\*\*</sup> Significant at the 5% level

<sup>\*</sup> Significant at the 10% level

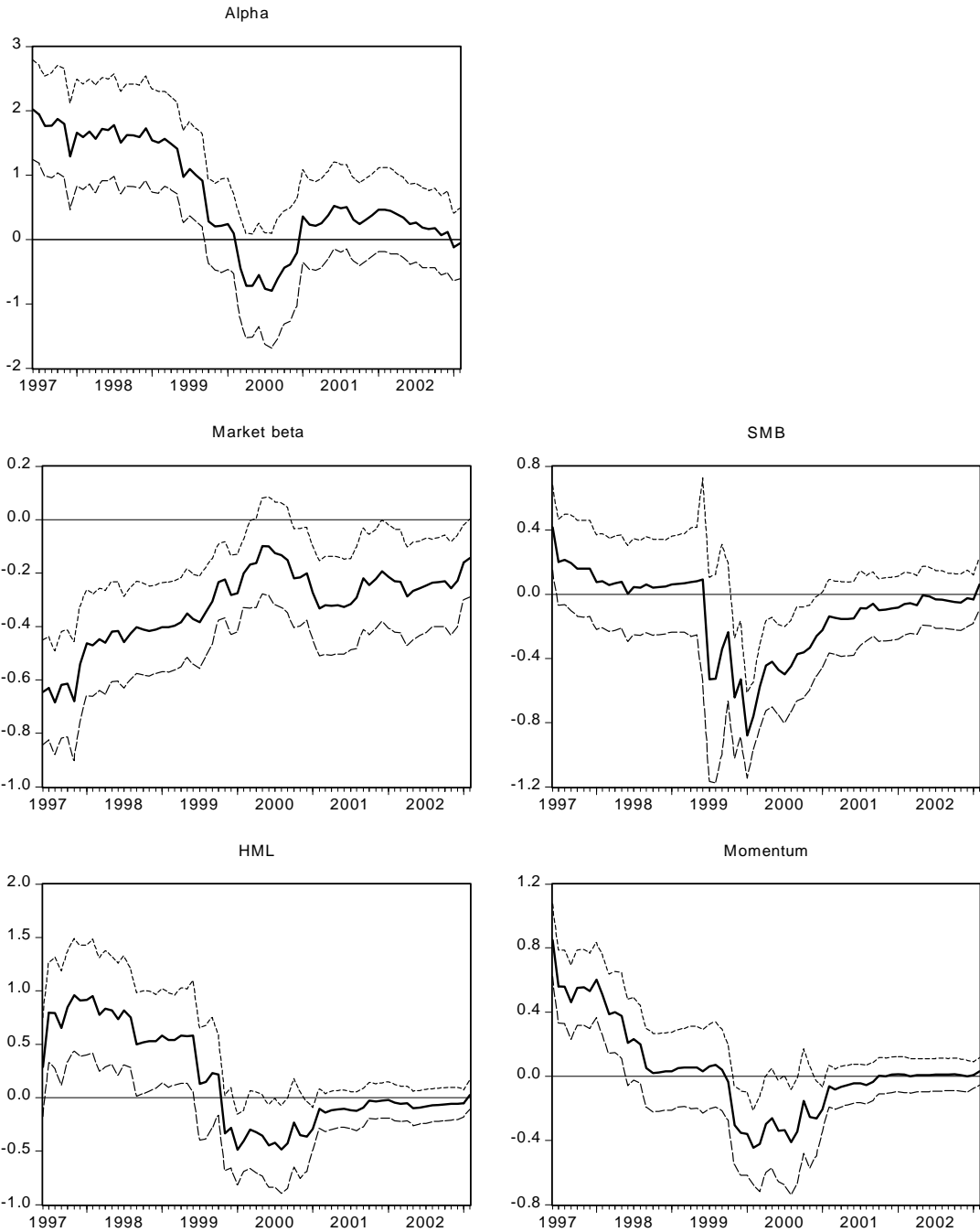
**Figure 1: Rolling alpha, market beta, SMB, HML and momentum for the *difference* between domestic ethical and conventional funds**



*Notes:*

This Figure presents the *differences* in alpha, market beta, SMB, HML and Momentum between domestic ethical and conventional funds over time. These results are obtained by performing 36-month rolling window regressions using equation (2). As input we use the difference portfolio. Given are the rolling parameter estimates (solid line), while 95% confidence bounds are presented using dashed lines.

**Figure 2: Rolling alpha, market beta, SMB, HML and momentum for the *difference* between international ethical and conventional funds**




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*Notes:*  
 This Figure presents the *differences* in alpha, market beta, SMB, HML and Momentum between international ethical and conventional funds over time. These results are obtained by performing 36-month rolling window regressions using equation (2). As input we use the difference portfolio. Given are the rolling parameter estimates (solid line), while 95% confidence bounds are presented using dashed lines.

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