STOCKHOLM SCHOOL OF ECONOMICS

Performance Evaluation of Swedish Ethical and Non-Ethical Funds

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In this thesis we investigate whether there is a difference in performance between Swedish ethical and non-ethical funds. We use the Portfolio Change Measure of Performance developed by Grinblatt and Titman (1993) which is based on fund holdings and Jensen's alpha obtained from the CAPM on an index level and on a fund level. This is done to see if our results differ if we weigh the funds according to value or if we weigh them equally. We conclude that there is a difference in the performance of ethical and non-ethical funds and that non-ethical funds outperform ethical funds on both levels. However, when we run cross-sectional regressions of the performance measures on several fund characteristics we conclude that the difference in performance between ethical and non-ethical funds partly is due to the fact that ethical funds are smaller. In line with this, we also conclude that ethical funds would benefit from becoming larger by an inflow of capital. Further we conclude that non-ethical funds are riskier on average and benefit in terms of higher performance from having a larger exposure toward idiosyncratic and systematic risk. Hence we conclude that the difference in performance between the two types of funds is not solely due to the fact that ethical funds invest in assets their fund managers deem to be ethical.

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1. Introduction

How well do ethical funds perform in comparison to non-ethical funds? In this thesis we investigate whether there is a difference in performance between Swedish ethical and non-ethical equity funds and if there is, which type of fund performs better than the other. This is done over the time period September 2000 to November 2009. We use the Portfolio Change Measure of Performance developed by Grinblatt and Titman (1993) which is based on data on fund holdings and we compare our results to Jensen's alpha developed by Jensen (1968) which we obtain from the Capital Asset Pricing Model (CAPM). We use both performance measures on an index level and on a fund level to see if our results differ if we weigh the funds according to value or if we weigh them equally. We conclude that there is a difference in the performance of ethical and non-ethical funds. We also conclude that non-ethical funds outperform ethical funds. We find this interesting since previous research indicates that there is no difference in the performance of ethical and non-ethical funds (Hamilton et al (1993), Diltz (1995), Guerard (1997)).

Thereafter we investigate if the difference in performance between ethical and non-ethical funds depends on whether the funds are ethical or not or whether it depends on other factors such as different fund characteristics. To test this we run cross-sectional regressions of the performance measures on a number of control variables. The control variables we use are; size, age, cash, systematic risk in terms of betas, idiosyncratic risk in terms of standard deviation of residuals from the CAPM, net flow and a dummy that indicates whether a fund is ethical or not. We conclude that the difference in performance between ethical and non-ethical funds is partly due to the fact that ethical funds are smaller and less risky and not only due to the fact that ethical funds invest in ethical securities. Among others, Mallin et al (1995) and Kreander et al (2005) perform matched pair analyses for evaluating the difference between ethical and non-ethical funds. This method controls for differences in fund characteristics. They find no significant difference in performance between the two types of funds.

We also isolate the years of the current/recent crisis to see whether the relationship between performance of ethical funds and non-ethical funds changes during this time period. Doing so we find similar results as those for the whole sample, except for the fact that one out of four performance measures indicates that ethical funds outperform non-ethical funds during the crisis. The ethical funds in our sample are less risky both in terms of systematic risk and idiosyncratic risk, which could support such a finding for the years of the crisis.

We use the Portfolio Change Measure of Performance since it has not been tested on Swedish data before and not used in the same context as we use it, namely for comparing performance of ethical and non-ethical funds and doing so both on an index level and on a fund level. Running cross-sectional regressions of the Portfolio Change Measure of Performance on different fund characteristics to see if they

can explain the difference in performance between ethical and non-ethical funds also contributes to the uniqueness of this study. This has been done for Jensen's alpha by Gregory et al (1997) who use age expressed as a dummy variable called youth for young funds, size, a dummy variable that indicates whether a fund is ethical or not, and two variables that represent systematic risk from a monthly multi-factor time-series regression as independent variables in their regressions. Hence we have slightly different variables. We have added some independent variables which they do not use in their regressions, skipped others and our age variable and betas variable differ from theirs. We have the variables size and net flow in common with Dahlquist et al (2000) who look at performance of Swedish funds using an alpha that allows for time varying betas in line with Ferson and Schadt (1996), but they use additional variables that we do not use and we use variables not included in their paper.

The outline for this thesis is the following: After this introduction there is a section where we present previous literature that has been written within the area of both performance evaluation models and methods, and within the area of sustainable investments and ethical funds (section 2). In section 3 we present a description of the data we use and our modifications of it. In section 4 we present the methodology we have chosen to use in this thesis and we also present the hypotheses to be tested. Thereafter follows a section where we present our results (section 5) and in section 6 there is a discussion of our results and the findings from our hypotheses. Finally, we sum up our conclusions in section 7.

2. Theoretical framework and review of relevant literature

2.1 Models and performance evaluation methods

In this section we review previous literature on asset pricing models and performance measures.

The CAPM

There are numerous methods for evaluating performance of investment portfolios and funds. What is usually taught in basic investments classes is the CAPM. It was developed by Sharpe (1964), Lintner (1965a) and Mossin (1966), building on the earlier work of Harry Markowitz, who wrote about modern portfolio management in 1952 (Markowitz (1952)). Bodie, Kane and Marcus (2008) summarize their work and state that the model gives a prediction of the relationship one should observe between an asset's expected return and its risk. An important assumption is that all investors hold the market portfolio. If an intercept is included, the CAPM equation looks as follows (Bodie, Kane and Marcus (2008: 307)):

$$E(r_i) - r_f = \alpha_i + \beta_i[E(r_M) - r_f] \quad (1)$$

The CAPM predicts that alpha should be equal to zero. Since the CAPM contains expected returns, some stocks will have returns that are higher or lower than those that are predicted by the CAPM during certain

periods of time, in other words, they will have positive or negative alphas (Bodie, Kane and Marcus (2008)). The alpha is not an original part of the CAPM model since the intercept is expected to be equal to zero, but it is observed as a way of measuring performance by Jensen (1968) and it is described more in depth below in sub-section 4.2. We use it as a robustness check for our results from Grinblatt and Titman's (1993) Portfolio Change Measure of Performance.

The CAPM has been widely criticized for a number of reasons. Roll (1977) argues that the true market portfolio is unobservable and using different proxies for the market portfolio leads to different conclusions. This problem is often called the benchmark error. Among others, Roll and Ross (1994), Kandel and Stambaugh (1987, 1989, 1995) and Grinblatt and Titman (1994) have further developed the critique against the CAPM, in particular the benchmark error. Despite the severe critique, CAPM is widely used.

Performance Measures

Mutual fund performance has been an area of debate over many years. There have been discussions regarding if fund managers' active management adds any value compared to the passively managed indices they set out to beat. As mentioned above, the CAPM was developed in the mid 1960s and the application of the CAPM implemented by Jensen (1968) for evaluating performance is widely used, despite the fact that the CAPM has been subject to criticism over the years. The major critique regarding the fact that the model is highly sensitive to the choice of benchmark (Roll (1978), Roll and Ross (1994), Kandel and Stambaugh (1987, 1989, 1995) and Grinblatt and Titman (1994)) is an important reason for why we have chosen another performance measure as our main approach. In this thesis, we primarily use a method that does not require a benchmark portfolio (Grinblatt and Titman, (1993)). We also compare the results of the Grinblatt and Titman (1993) model with the results of the traditional Jensen model. The reason why we use Jensen's alpha (1968) as a robustness check despite the severe critique against it and against the CAPM, is because it is well-recognized and still widely used among economic scientists (Grinblatt and Titman (1993)), both in its original form and with different extensions in terms of for example multi-factor models (Cochrane (1999)).

Several authors have previously found that fund managers cannot yield better performance for the investors who invest in the funds they manage than the performances of passive index funds once trading costs and fees are taken into account (Jensen (1968), Henriksson (1984), Lehmann and Modest (1987), Elton et al (1993) and Carhart (1997)). There are however other authors who have found more positive results regarding fund managers' ability to pick the right stocks. Controlling for risk, these authors find that some funds can outperform the market (Ippolito (1989), Gjerde and Saettem (1991), Black et al (1992), Fletcher (1995). From a Bayesian perspective, Baks et al. (2001), Pastor and Stambaugh (2002) and Avramov and Wermers (2006) discuss the advantages of investing in funds that are managed actively.

Bayesian statistics is a general inference methodology based on Bayes' theorem (Newbold (2009)). There is also a paper written by Kosowski et al (2006) in which they use a so called bootstrap technique, with which they show outperformance for some funds. Boostrapping is a statistical resampling technique, used by Kosowski et al to adjust for individual funds' non-normally distributed returns. In a very recent study, Barras et al (2010) develop a technique to control for luck in estimated alphas so there is also more recent research within the area of mutual fund performance available.

Shortly after the CAPM was founded, Jack Treynor, William Sharpe and Michael Jensen developed different performance measures (Bodie, Kane and Marcus (2008)). In 1965 Treynor wrote an article about how one can rate management of investment funds (Treynor (1965)). The Treynor measure is defined as the excess return per unit of risk where the risk constitutes of systematic risk (Bodie, Kane and Marcus, (2008)). The Sharpe measure is quite similar to the Treynor measure. The difference lies within the choice of risk, where the Sharpe measure uses ordinary standard deviation. The Sharpe measure is also called the reward-to-variability ratio since it measures the reward per unit of variability (Sharpe (1966)). The Jensen measure, or Jensen's alpha as it is usually called, has been described shortly above under the heading The CAPM and is described more in depth below in sub-section 4.2.

Multi-factor models

The CAPM, which is a one-factor model, has been extended to multi-factor models in several ways by different authors. Fama and French (1993) form a three-factor model where they add factors related to book-to-market equity and firm size in excess of the market factor. They find that the new factors help to capture the cross-section of average stock returns. Carhart (1997) develops the three-factor model further by including a fourth factor called momentum, where the factor was first developed by Jegadeesh and Titman (1993). Carhart (1997) finds that the four-factor model explains most of the pattern and spread in the portfolios of mutual funds he investigates, in contrast to the CAPM. Since a substantial part of the aggregate capital in the economy consists of human capital (Mayer (1972)), another approach tried by several authors that helps improve explanatory power is to include some sort of proxy for return on human capital as a factor (Jagannathan and Wang (1996)). From all these models, the intercept in the regressions can be used as a way of measuring performance.

Conditional CAPM

Another way of evaluating performance is presented by Ferson and Schadt (1996). According to them the traditional Jensen's alpha suffers from biases if risks and expected returns are not constant over time. This would lead to that average performance is confused with time variation in risk premiums and risks. Ferson and Schadt (1996) use conditional performance evaluation by using measures that are in line with a semi-strong form of market efficiency, a term that was coined by Fama (1970). They measure

performance using a version of conditional CAPM that includes the lagged one-month treasury bill yield, the lagged dividend yield, a lagged measure of the slope of the term structure, a lagged quality spread in the corporate bond market and a dummy variable for the month of January. Other authors that have investigated conditional forms of the CAPM are Ferson and Warther (1996) and Jagannathan and Wang (1996).

Event Study Measure

Cornell (1979) develops a performance measure which does not require the usage of a benchmark and which is further refined by Copeland and Mayers (1982). The performance measure is an alteration of an event study. The returns of assets are calculated during the event period, when the assets are included in a portfolio and from that the returns of the same assets at a later period are subtracted. The assets that informed portfolio managers hold are supposed to yield higher returns when they are included in a portfolio than during the comparison period, when they are not. A major drawback with this measure is that assets that do not have returns in the comparison period must be excluded from the computation. Hence the measure may suffer from survivorship bias for assets (Grinblatt and Titman (1993)).

Portfolio Change Measure of Performance

In this paper we focus on a method developed by Grinblatt and Titman (1993) called the Portfolio Change Measure of Performance that is based on fund holdings, which is what our dataset consists of. As far as we are concerned this method has not been used on Swedish data before. We use this method to compare returns of ethical funds to returns of non-ethical funds and then compare our results for both types of funds with the results we obtain from ordinary Jensen's alpha since it is the most common way to evaluate performance of portfolios and funds (Cochrane (1999), Grinblatt and Titman (1993)). A further description of the Portfolio Change Measure of Performance can be found below in sub-section 4.1.

2.2 SRI investments and performance of ethical funds

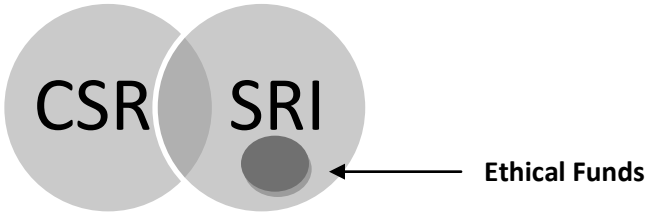
Terminology

We find it necessary to define some terms used in this thesis connected to ethical funds and socially responsible investments. Corporate Social Responsibility (CSR) is defined by the European Commission (2010) as: "A concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis." Socially Responsible Investment (SRI) is an important part of CSR but can also lie outside the scope of CSR since individuals too can invest in a socially responsible way. A great problem often acknowledged with SRI is that the term per se is interpreted differently by different people. Terminology and definitions within this field are widely debated and will continue to be so (Eurosif (2006)). We will use Eurosif's (2008: 6) definition:

"SRI [is] a generic term covering ethical investments, responsible investments, sustainable investments, and any other investment process that combines investors' financial objectives with their concerns about environmental, social and governance (ESG) issues." We consider ethical funds to be one of several possible SRI investments and will use the term ethical funds when referring to the type of funds we investigate in this thesis.

There are several approaches used by fund managers to evaluate whether an investment is ethical or not. The Ethical Investment Research Services (EIRIS (2008)) presents the following three approaches: screening, preference (or best in class) and engagement. Negative screening means that some companies get excluded due to their engagement in negative activities like heavy polluters or arms companies. Funds can also use positive screening, which means including companies for their involvement in activities assessed to be positive. Preference (or best in class) means that certain ethical guidelines are set up to get a preferred selection, holding all other factors equal. An example would be a fund with certain criteria that allows it to invest in the sector of oil and gas, but only in the companies in this sector that are best in class, or most ethical of the oil and gas companies. Engagement means that investors and fund managers take an active approach where they encourage companies to follow ethical best practices. They do not necessarily prefer, include or exclude certain companies, but rather meet with management or vote at annual general meetings (EIRIS (2008)).

Figure 1: Illustration of ethical funds' location in the area of corporate social responsibility and socially responsible investment.



SRI Investments

The first ethical fund in Sweden started in 1965 (Kreander et al (2005)). To invest money in ethical funds has since then become increasingly popular. Ethical and environmental questions are given a greater importance in society at large which leads to an increased interest in financial investments with an ethical and environmental focus. This puts a greater pressure on mutual fund companies to create funds with investment criteria that match the demand from investors (Riddselius (2010)).

The increasing interest in the area can be noticed by a growing number of articles on the subject. There have been a lot of papers written that treat the subject of whether ethical funds perform better or

worse than non-ethical funds (Hamilton et al (1993), Diltz (1995), Guerard (1997), Sauer (1997), Statman (2000), Kreander et al (2005), Bauer et al (2005)). One of the first published articles that deals with the subject of financial performance of ethical funds was written by Luther et al (1992). They find that ethical funds outperform two different market indices, but the evidence is weak.[1] They also document a bias for ethical funds towards investing in smaller companies. Luther and Matatko (1994) come to the conclusion that their results depend very much on which benchmark they use. Using a world index benchmark, 100 percent of their ethical funds underperform the benchmark and using a small cap benchmark, approximately 89 percent outperform the benchmark. In both of the cases though, only one of the alphas (positive or negative) is significant on a five percent significance level.

Hamilton et al (1993), Diltz (1995) and Guerard (1997) find no significant difference in performance between ethical and non-ethical funds. Sauer (1997) finds that ethical funds underperform in comparison with non-ethical funds until he adjusts for risk. Then there is no statistically significant difference. Bauer et al (2005) find little difference in performance, but they do find a difference between older ethical funds and younger ethical funds, where the older funds outperform the younger ones. Gregory and Whittaker (2007) examine funds in the UK and do not find a significant difference, but find that performance is time-varying. Lately, many studies on the difference in performance between ethical and non-ethical funds have used a matched pair analysis approach. A matched pair analysis is when you compare funds that on all other characteristics (size, age and so on) are as similar as possible, so that the only difference is if the fund is ethical or not. Using this method, Mallin et al (1995) Gregory et al (1997), Statman (2000) and Kreander et al (2005) draw conclusions in line with the others, namely that controlling for other variables, there is no difference between the performance of ethical and non-ethical funds. We have chosen a way to overcome the benchmark problem encountered by many conventional performance evaluation techniques not by using a matched pair analysis but by using a method developed by Grinblatt and Titman (1993) that does not require the use of a benchmark.

In their master's thesis at SSE, Stenström and Thorell (2007) write about "Evaluating the Performance of Socially Responsible Investment Funds: A Holding Data Analysis". They compare mutual fund performance between SRI funds and regular funds in line with previous research. They also decompose fund performance into two components, firm level performance and fund management performance. They use partly other performance measures than we do and test them for several types of biases. We also use partly the same data as Stenström and Thorell, but our main approach for testing performance is different, we add data for the years 2008 and 2009 to the dataset and we extend the analysis by testing our performance measures in cross-sectional regressions on different characteristics. The two years added are interesting since we had a major downturn in the economy and stock markets

[1] Their results are hard to interpret since they (among other shortcomings of the study) do not report significance levels.

during these years. To study the effects of such a downturn on performance of ethical funds and see if they are better or worse off than non-ethical funds during such a crisis is one of our robustness tests undertaken in this study and adds to the knowledge and understanding of the performance of such funds.

3. Data

3.1 Data on holdings

Our dataset consists of quarterly holdings for all Swedish mutual funds, ranging from September 30, 2000 to September 30, 2009. The data has been downloaded from the Swedish Financial Supervisory Authority's website and contains 899 funds over the whole sample period, see Table I in Appendix 1. The files of fund holdings that can be downloaded from the said authority's website also include information on the market value of each fund, the fund wealth of each fund, the net asset value of each fund, International Securities Identification Number (ISIN) and name for each asset in the fund and the market value of each holding. In our later calculations, we assume that the holdings for March will be the same in April and May, the holdings for June will be the same in July and August and so on to create monthly time-series. This is due to the Swedish Financial Supervisory Authority's demand on Swedish funds to report quarterly holdings (FFFS 2010:1), not monthly.

3.2 Data on returns

We have retrieved the monthly return index for the holdings (approximately 30 000 securities) of the Swedish funds that report their holdings to the Swedish Financial Supervisory Authority quarterly from Thomson Reuters Datastream. The return index assumes that all dividends and distributions are reinvested. We were not able to obtain returns for all the assets, so we adjusted for funds with too few obtainable returns (see sub-section 3.4 for further information). We have also downloaded the monthly compounded MSCI World Market Return Index in SEK (that we run regressions on as well as on the pooled index, which we construct using the data in our dataset and which is described further in sub-section 4.3) from Thomson Reuters Datastream, as well as a Swedish 30-days T-bill which we use as our risk-free rate.

3.3 Ethical funds

In our data we have chosen to define ethical funds as all Swedish funds that use any of the three methods for evaluating whether a fund is ethical or not defined above in sub-section 2.2. Judging from our sample, the most common method is negative screening. Negative screening is used by 67 of the 84 ethical funds in our original dataset. Whether a fund is ethical or not can be investigated by reading the fund's factsheet

that is provided by the company that manages the fund. This is how the ethical dummy we have in our dataset is created.

3.4 Modifications of the original dataset

Initially our dataset consisted of 899 funds. In this thesis we only investigate the performance of funds that mainly invest in equities and which we from now on will refer to as equity funds. The reason behind only comparing the performance of equity funds is that including all types of funds (for example interest funds) would be like comparing apples and pears, in other words two different things. Therefore, we dropped the mixed funds and the funds for which we could not obtain information on whether they are equity funds or not.

We also dropped the funds for which we could not obtain returns from Thomson Reuters Datastream for more than or equal to 70 percent of the fund market value. We merged the dataset on holdings with the dataset obtained from Thomson Reuters Datastream on returns for the assets and also the World Market Index and the Swedish 30-days T-bill. After dropping outliers in terms of returns, by dropping the 0.1th and 99.9th percentiles (which for our dataset implied dropping returns that are smaller than -55.4% or larger than 75.2% per month), we ended up with a dataset that consists of 355 equity funds out of which 66 are ethical (see Table II in Appendix 1).

4. Methodology

In this section we describe the methodology we use in this thesis more in depth, and explain why we have chosen the specific methodology. We calculate the Portfolio Change Measure of Performance developed by Grinblatt and Titman (1993) using three different lags, for ethical and non-ethical funds to see whichever performs best or if they perform equally well. We then compare our results to Jensen's alpha obtained from running monthly time-series CAPM regressions as a robustness check. We use both performance measures on an index level and on a fund level to see if our results differ if we weigh the funds according to value or if we weigh them equally. After that we split our sample into two periods to see if the performance measures are different if we isolate the years 2008-2009 for the current/recent crisis, also on the index level and on the fund level. On the fund level we then run cross-sectional regressions of our performance measures on different fund characteristics to see whether they can explain a potential difference in performance between ethical and non-ethical funds. In sub-section 4.1 we describe the Portfolio Change Measure of Performance. In sub-section 4.2 we describe the CAPM and Jensen's alpha. In sub-section 4.3 we describe the difference between the performance measures calculated on an index level and on a fund level. We also explain how we construct our indices for the Portfolio Change Measure of Performance and Jensen's alpha. In sub-section 4.4 we present the different

fund characteristics that we use as independent variables in our cross-sectional regressions of the performance measures. In sub-section 4.5 we describe our different robustness checks. We end the methodology section with sub-section 4.6 where we present our hypotheses.

4.1 The Portfolio Change Measure of Performance

Intuition

The intuition behind the Portfolio Change Measure of Performance is basically that informed and uninformed investors have different expectations on asset returns over time. For uninformed investors these expectations are constant, while for informed investors they change over time. The fact that the expectations are constant for uninformed investors implies that their portfolio holdings cannot be correlated with asset returns in the future. Informed investors, on the other hand, can predict returns and hence profit from their changed expectations by adjusting portfolio weights over time. This is done by tilting the portfolio weights toward assets with increased expected returns and away from assets with decreased expected returns. The measure can be seen as a further development of the Event Study Measure developed by Cornell (1979) and Copeland and Mayers (1982), which is described above in sub-section 2.1. The Portfolio Change Measure of Performance does not require the usage of a benchmark, just like the Event Study Measure. However there is another advantage associated with using the Portfolio Change Measure of Performance, which the Event Study Measure does not have, namely that it is constructed in a way so that it cannot suffer from survivorship bias for the assets that the different funds invest in (Grinblatt and Titman (1993)).

Further description

The sum of covariances between portfolio weights and returns over all investments in a portfolio can be described with the following formula (Grinblatt and Titman (1993: 49)):

$$\text{cov} = \sum_{j=1}^{N}\left(E\left[w_j R_j\right] - E\left[w_j\right]E\left[R_j\right]\right) \quad (2)$$

Intuitively one can think of it as expected return of a portfolio minus expected return for the same portfolio if the asset returns and weights were uncorrelated (Grinblatt and Titman (1993)). Equation (2) can be rewritten in the following way, which is the foundation for Grinblatt and Titman's (1993) performance measure which we will further refer to as the Portfolio Change Measure of Performance (Grinblatt and Titman (1993: 50)):

$$cov = \sum_{j=1}^{N} E\left[\left(w_j - E\left[w_j\right]\right)R_j\right] \quad (3)$$

Equation (3) requires a measure of actual weights, expected weights and asset returns. According to Grinblatt and Titman (1993), the expression holds for the sample covariance as well (Grinblatt and Titman (1993: 50)):

$$cov(w_j, R_j) = \sum_{t=1}^{T}(w_{jt} - \overline{w}_j)R_{jt}/T \quad (4)$$

Estimation of the measure

We use holdings for period $t-k$ (where we can use different k) as a proxy for expected holdings in period t, in line with Grinblatt and Titman's (1993) approach. Summed over all assets, the Portfolio Change Measure of Performance can then be expressed in the following way (Grinblatt and Titman (1993: 51)):

$$\sum\sum[R_{jt}(w_{jt} - w_{j,t-k})]/T \quad (5)$$

How we use our sample

From our quarterly holdings we calculate the returns of three zero cost portfolios for each mutual fund. This is done in line with the method used by Grinblatt and Titman (1993), who however only compose two different zero cost portfolios. Bodie, Kane and Marcus (2008) describe a zero-investment portfolio (which is just another term for zero cost portfolio), as a portfolio that has a zero net value and which is created by shorting and buying securities, often when executing an arbitrage strategy.

The first portfolio's quarterly weights are calculated by subtracting the weights one quarter before time t from the weights at time t. The second portfolio's quarterly weights are calculated by subtracting the weights one year before time t from the weights at time t. In the same manner, the third portfolio's quarterly weights are calculated by subtracting the weights one-and-a-half years before time t from the weights at time t.

We then multiply the difference between the weights of the current portfolio (the portfolio at time t) and some previous portfolio (the holdings a quarter ago, a year ago or one-and-a-half years ago), with current monthly stock returns (returns at time t) for the holdings in the zero cost portfolio.

Since we use monthly stock returns and quarterly holdings due to the Swedish Financial Supervisory Authority's demand on Swedish funds to report quarterly holdings (FFFS 2010:1), the returns will vary over the months while the holdings in our sample will change every third month. Hence we create a monthly time series for each type of zero cost portfolio (with quarterly lags, yearly lags and one-and-a-half-year lags).

The Portfolio Change Measures of Performance does not equal the actual abnormal returns of the mutual funds. However they show what an investor could have gained by shorting the stocks the fund held in the previous quarter or year before time t, and buying the stocks held by the fund at time t. The

Portfolio Change Measures of Performance provide average returns of zero cost portfolios with no systematic risk. The expected values of the measures are then zero (Grinblatt and Titman (1993)).

The intuition behind having three different measures with lags of different lengths is in line with Grinblatt and Titman's (1993) intuition of having two different measures with lags of different lengths, namely that we do not know how long it takes for the market to fully reveal a mutual fund manager's superior information to the market. If it is fully revealed within one quarter, the one quarter lag is probably more appropriate to use than the yearly lag or the one-and-a-half-year lag. Then the full excess returns can be measured with as little noise as possible. When we write revealed to the market we mean fully incorporated into prices, in line with Grinblatt and Titman (1993). If it takes longer than a quarter for the superior information to be fully revealed, the yearly lag or the one-and-a-half-year lag could be better. The reason behind why we use quarterly lags and yearly lags is partially due to the fact that we cannot obtain shorter lags due to the quarterly data on holdings and partially due to the fact that we follow Grinblatt and Titman's approach closely to be able to compare our results with theirs. The intuition behind including one more lag is that the time it takes for the market to fully reveal a mutual fund manager's superior information to the market may be even longer than a year. In their paper, Grinblatt and Titman (1993) are surprised to find that their yearly lag proves to be better than their quarterly lag. A better yearly lag would imply that an investor can gain from replicating a fund manager's portfolio, since fund holdings are reported quarterly. Then the investor could earn the excess return less fund fees. To be more specific we here describe exactly how we calculate the three measures for the first and second period of holdings in our data set, which starts with mutual fund holdings on September 30, 2000.

Quarterly lag: The returns from January, February and March 2001 are multiplied by the difference between the holdings on December 31, 2000 and the holdings on September 30, 2000. The returns from April, May and June, 2001 are multiplied by the difference between the holdings on March, 2001 and the holdings on December 31, 2000.

Yearly lag: The returns from October, November and December 2001 are multiplied by the difference between the holdings on September 30, 2001 and the holdings on September 30, 2000. The returns from January, February and March 2002 are multiplied by the difference between the holdings on December 31, 2001 and December 31, 2000.

One-and-a-half-year lag: The returns from April, May and June 2002 are multiplied by the difference between the holdings on March 31, 2002 and the holdings on September 30, 2000. The returns from July, August and September 2002 are multiplied by the difference between the holdings on June 30, 2002 and December 31, 2000.

Motivating the usage of the Portfolio Change Measure of Performance

We started off writing this thesis with a large dataset based on holdings and wanted to find a method for evaluating the performance of ethical and non-ethical funds that requires the holdings of the funds and not just the returns of the funds and that has not been tested on Swedish data before. Grinblatt and Titman's (1993) Portfolio Change Measure of Performance matches our requirements. The Portfolio Change Measure of Performance overcomes the problem with survivorship bias for the assets the funds invest in, which the Event Study Measure suffers from (Grinblatt and Titman (1993)). We also feel that we can contribute to the area of evaluation of ethical and non-ethical fund performance, since the method has neither been used to compare the performance of ethical and non-ethical funds, nor been tested on Swedish data before and since we have chosen to apply thorough robustness tests by regressing our results from the Portfolio Change Measure of Performance on a number of different control variables described more in depth below in sub-section 4.4.

Drawbacks

A key assumption which the Portfolio Change Measure of Performance builds on is constant mean returns for the assets held by the funds over the entire sample period. The Portfolio Change Measure of Performance will thus be positive if a portfolio holds assets when the expected returns of those assets are higher than normal, which may happen during a temporary increase in risk (Grinblatt and Titman (1993)). We try to see if systematic risk affects our Portfolio Change Measures of Performance by regressing them on, among other control variables, obtained betas from the CAPM on the pooled market index (described further in sub-section 4.3) which would be an indicator of systematic risk.

Another problem may occur if the sample is too small. If a fund manager increases the beta repeatedly and hence increases the expected return for a fund over the sample period, then the zero-cost portfolio within the Portfolio Change Measure of Performance will have an average beta that is positive. This implies that the expected performance measure is positive although the fund manager may not have superior information. However, for samples of a reasonable size, this problem should be negligible (Grinblatt and Titman (1993)).

Worth mentioning is also the fact that this measure is harder to apply since additional collection of data and more computer time is needed than for traditional measures of performance and since holdings are only reported every quarter, we are calculating a hypothetical portfolio for eight months per year.

4.2 CAPM and Jensen's alpha

Background

Jensen (1968) writes about performance of mutual funds and concludes that when other people have written about performance of portfolios, almost all of them have developed relative measures of

performance so that portfolios can be ranked. Jensen however develops an absolute measure of performance. Jensen's measure of portfolio performance is derived from the theoretical results of the capital asset pricing models that Sharpe (1964), Lintner (1965b) and Treynor (-) develop independently. Assuming that the capital market is in equilibrium yields the following expression for all three models (tilde indicates random variables) (Jensen (1968: 390)):

$$E(\tilde{R}_j) = R_F + \beta_j[E(\tilde{R}_M) - R_F] \quad (6)$$

If the manager of a portfolio can predict future prices of securities, he can earn higher returns than the returns implied by equation (6). In his article from 1968, Jensen refers to his previous work (Jensen (1967)) in which he shows that the models by Sharpe (1964), Lintner (1965b) and Treynor(-) that are for a single period can be extended to a multi-period model. Equation (6) can then be rewritten in the following way (Jensen (1968: 391)):

$$E(\tilde{R}_{jt}) = R_{Ft} + \beta_j[E(\tilde{R}_{Mt}) - R_{Ft}] \quad (7)$$

Jensen's (1968) measure of performance allows for forecasting ability among portfolio managers by allowing the CAPM regression to not pass through the origin. A non-zero constant is thus allowed. The estimating equation can then be written in the following way (Jensen (1968: 393)):

$$\tilde{R}_{jt} - R_{Ft} = \alpha_j + \beta_j[\tilde{R}_{Mt} - R_{Ft}] + \tilde{u}_{jt} \quad (8)$$

If a portfolio manager can forecast prices of securities, the intercept α_j in equation (8) will then, according to Jensen (1968), be positive. Continuing Jensen's argumentation, α_j is negative if a manager is performing worse than a random selection of securities that are just bought and held.

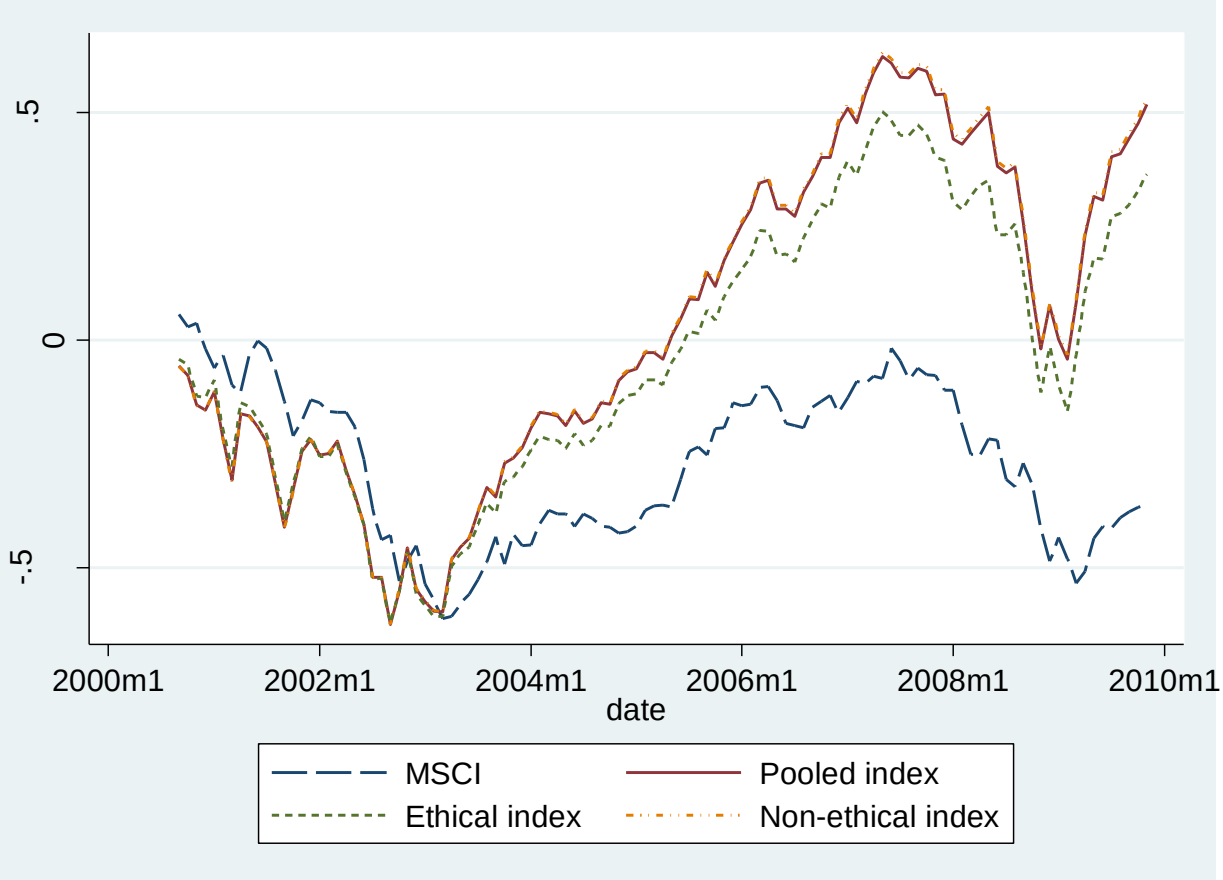
How we use Jensen's alpha

Our main approach is to compare the performance of ethical funds and non-ethical funds using Grinblatt and Titman's (1993) Portfolio Change Measure of Performance. However, one of the most basic and common ways to measure portfolio performance is to use the CAPM and Jensen's alpha (Cochrane (1999), Grinblatt and Titman (1993)) and hence we do so as well. This can be seen as our main robustness check. We calculate the Jensen's alpha in two different ways by running a monthly time-series regression of the excess returns of assets on the excess return of the pooled market index which we describe below in sub-section 4.3 and by running a monthly time-series regression of the excess returns of assets on the excess return of the MSCI World Market Index.

4.3 Index and fund level

Both our performance measures (the Portfolio Change Measure of Performance and Jensen's alpha) are calculated on an index level and on a fund level. On the index level we first create three different indices, one for all funds, one for ethical funds and one for non-ethical funds. The indices can be seen as the returns of three portfolios containing, respectively, all holdings in our dataset, all holdings of the ethical funds and all holdings of the non-ethical funds for each time period. These indices are value-weighted; each asset is weighed according to its share of the whole market value of the index in each time period. The index containing all holdings is therefore the returns of what Swedish fund managers have actually been investing in, for each time period. The cumulative return of the three different indices and the World Market Index are plotted in Graph 1 below. We will further on refer to the index we have constructed for the whole sample of funds as the pooled market index or simply the pooled index.

Graph 1: Illustrating cumulative returns for the MSCI World Market Index, the pooled market index, the ethical index and the non-ethical index. The y-axis shows cumulative returns expressed in decimals (for example 0.5 is 50 percent).



It is visible in the graph that our dataset consists mainly of non-ethical funds, since the pooled market index (the returns of all funds) and the non-ethical index (the returns of all non-ethical funds) follow each

other closely. We can see that the large trends are similar for the World Market Index and the pooled index, but from 2003 and forward it seems like Swedish fund managers have been investing in assets with higher returns than the World Market Index. It is also visible that the ethical index follows the pooled index closely until 2004, when it starts to yield a lower return than the pooled index and the non-ethical index.

On the fund level, all funds within each group (ethical, non-ethical and all funds) are weighed equally and hence small funds will have a larger impact on the results than they have on the index level.

Portfolio Change Measure of Performance

As mentioned above, we calculate the Portfolio Change Measure of Performance both on an index level and on a fund level. Our first way to calculate the Portfolio Change Measure of Performance is by using two of the indices, the ethical and non-ethical index. More specifically, we calculate:

$$\left(\frac{market\ value\ of\ asset_{i,t}}{total\ index\ market\ value_t} - \frac{market\ value\ of\ asset_{i,t-1}}{total\ \ index\ market\ value_{t-1}}\right) x\ return\ of\ asset_i \quad (9)$$

where $asset_i$ is one of the assets in the ethical or non-ethical index. Then we sum up all the measures in each time period t. To get the mean of the measure, we divide it by the number of time periods the measure exists. We do this for each lag. Our second way of obtaining the Portfolio Change Measure of Performance is to do the exact same thing but to sum it up for each fund in each time period instead of summing it up for the whole index in each time period. By summing up for each fund and time period instead we get an equally-weighted measure. Then we divide that measure with the number of time periods the measure exists, which differs depending on how long the lag is. The intuition behind creating an average per fund is for running cross-sectional regressions on them. We also take an average of all measures for each type of fund (ethical or non-ethical) and the intuition behind this is that we have to be able to compare them with each other and the other performance measures. To sum up, we obtain (for each lag) one value weighted measure for ethical funds, one value weighted measure for non-ethical funds, one equally weighted measure for ethical funds and one equally weighted measure for non-ethical funds.

Jensen's alpha

Jensen's alpha is also calculated both on an index level and on a fund level. On the index level, the time-series regression is run following this equation:

$$r_{(non)-ethical\ index} - r_f = \alpha + \beta r_{the\ pooled\ index} - r_f + \varepsilon \quad (10)$$

Hence, we get one alpha per index. On the fund level we obtain alphas for each fund following the same time-series regression method but we calculate it per fund instead:

$$r_{fund} - r_f = \alpha + \beta r_{the\ pooled\ index} - r_f + \varepsilon \quad (11)$$

We report the mean, medians and standard deviations of alphas over the number of funds for ethical and non-ethical funds. The same thing is done for obtaining alphas using the MSCI World Market Index instead of the pooled index, on both an index level and on a fund level.

4.4 Control variables

There are several fund characteristics that may affect the performance of funds. In this sub-section we present seven such characteristics and motivate why we use them as control variables. We run cross-sectional regressions of our performance measures on the control variables to see if they are significant and hence can explain the performance of the different funds. The seven control variables are; size, age, cash, betas, idiosyncratic risk, net flow and a dummy that indicates whether a fund is ethical or not. Each variable is calculated per fund. After testing and comparing the performance of ethical funds and conventional funds using the Portfolio Change Measure of Performance (Grinblatt and Titman (1993)) and Jensen's alpha (Jensen (1968)) on a value weighted and equally weighted basis, we investigate the seven fund characteristics presented below and how they affect the performance according to the Portfolio Change Measure of Performance and Jensen's alpha on the fund level.

Size

Size is measured as the logarithm of fund wealth, and an average is taken over the time period the fund exists. In the summary statistics in Table I, however, it is not a logarithm but the actual average fund wealth. Looking through previous literature on fund performance motivates the usage of size as a control variable. For example, Gregory et al (1997) state that one may expect better performance from larger funds since they can benefit from economies of scale. Indro et al (1999) draw the conclusion that size can explain mutual fund performance and that there is an optimal fund size since firms must be at least so big that they can validate their costs of trading and since there is also a diminishing marginal return to trading which becomes negative if the best size is exceeded. Dahlquist et al (2000) conclude that for Swedish equity funds, small funds outperform large funds.

Age

Age is for how many months throughout our sample period each fund exists. We have chosen to include age as a control variable since older funds that have proven to be able to yield a sufficient rate of return to their investors (and thus have survived) might be more likely to be able to yield sufficient returns in the future, in other words a test of persistency. Several authors have written about findings of persistency in fund performance (Hendricks, Patel and Zeckhauser (1993), Grinblatt and Titman (1993), Brown and Goetzmann (1995), Dahlquist et al (2000)). We believe that there might also be a learning effect for older

funds in terms of that fund managers that have managed the same fund for a while have learnt the best tactic for that particular fund or if there has been a change of fund manager, that at least some of the knowledge has been transferred from the former to the later before the change. Gregory et al (1997) also suspect *a priori* that there might be a learning effect which can explain performance. They also state that new funds might suffer from high start-up costs.

Cash

We calculate cash as the difference between fund wealth and fund market value, divided by fund wealth for each fund (which we have obtained from the Swedish Financial Supervisory Authority in the same dataset as we have for the holdings of the different funds described more in depth above in sub-section 3.1). We have checked that the difference between fund wealth and fund market value is cash by asking the Swedish Financial Supervisory Authority (Ode (2010)). Cash is included as a control variable since it is interesting to see whether a large percentage of the fund's value held in cash instead of other assets improves the performance or not. It should be so that if all the assets except for cash together yield a higher rate of return than the risk-free rate that an investment in cash can yield, less cash should increase the return. On the other hand, if the risk-free rate the fund manager can get for the fund investors by having cash is higher than the return for all the other assets held by the fund together, more cash should help increasing the return.

Betas

We have obtained the betas from running the CAPM time-series regression monthly on the pooled market index and saved the coefficients as a new variable. Beta is included as a control variable to see if a higher exposure towards systematic market-risk can explain a higher return measured in terms of the Portfolio Change Measure of Performance or alpha.

Idiosyncratic risk

From the CAPM regression mentioned under the previous sub-heading we have also obtained the residuals, for which we have taken the standard deviation. This can be seen as a measure of idiosyncratic risk. Since the CAPM is subject to severe critique we think that if the critique is justifiable and the CAPM does not hold, investors might not only be rewarded for their exposure towards systematic risk. Then exposure towards idiosyncratic risk might also explain fund performance.

Net flow

Net flow is calculated as fund market value at time t less the net asset value at t divided by the net asset value at t-1 (the time period a quarter ago) multiplied by fund market value at t-1. Then we divide it by the fund's market value at t-1. It is thus the amount of money that has been put into the fund or taken out of it

by investors during the period, measured in percent of market value at t-1. We found it interesting to investigate if fund performance can be explained by the net flow of money to a fund, since there are previous studies that show that net flows to funds are positively correlated with performance. Ippolito (1992) finds positive correlation between net flow of money to funds and past returns, and Warther (1995) finds positive correlation between net flow of money to funds and subsequent returns. Dahlquist et al (2000) investigate the effect of, among other variables, net flow on performance for Swedish funds and find no significant effect of net flow on performance.

Ethical dummy

The ethical dummy is a dummy variable taking on the value one if the fund is considered to be ethical and otherwise zero. Including a dummy which takes on the value one if the fund is ethical and otherwise zero helps us see if the fact that a fund is ethical has a positive or negative effect on performance measured by the Portfolio Change Measure of Performance and Jensen's alpha.

Table I: Mean, median and standard deviation for the six control variables (the dummy not included) on an equally weighted basis (fund level).

Control Variable	Ethical funds			Non-ethical funds		
	Mean	Median	St. dev.	Mean	Median	St. dev.
Size*	514	250	698	2030	578	3690
Age in months	97.05	105.00	22.89	77.04	93.00	36.04
Cash in percent	3.9104	2.3684	5.2591	4.2245	2.6590	8.2607
Betas	0.9392	0.9653	0.1608	0.9822	0.9737	0.2555
Idiosyncratic risk in percent	1.8624	1.7361	0.7058	2.6391	2.2547	1.5020
Net flow in percent	19.5447	2.2979	59.8985	16.6688	2.3426	79.3571

*MSEK

4.5 Robustness checks

Our main robustness check is to use the performance measure Jensen's alpha developed by Jensen (1968) for both ethical and non-ethical funds so that we can compare the results obtained from that method with the results we get from Grinblatt and Titman's (1993) Portfolio Change Measure of Performance. However we have also chosen to perform two other robustness checks.

First we have chosen to extend our usage of Grinblatt and Titman's (1993) Portfolio Change Measure of Performance by constructing a third zero cost portfolio with a one-and-a-half-year lag, since they only use quarterly lags and yearly lags in their study. The intuition for doing this is the same as for using two different lags in their approach, namely that we do not know how long it takes for the market to fully reveal a mutual fund manager's superior information to the market. If it is fully revealed within one quarter, the one quarter lag is probably more appropriate to use than the yearly lag or the one-and-a-half-year lag. Then the full excess returns can be measured with as little noise as possible. If it takes longer than a quarter for the superior information to be fully revealed, the yearly lag or the one-and-a-half-year

lag could be better. It is also motivated since Grinblatt and Titman (1993) find their yearly lag better than their quarterly lag and hence we want to investigate an even longer lag to see if it is even better.

Since we have such a large sample that stretches from September 2000 to November 2009 and thus includes a large part of today's/the recent crisis, we have decided to split the sample into two parts to see how the different market conditions affect our results. We thus compare our Portfolio Change Measure of Performance with Jensen's alpha for the time periods 2000-2007 and 2008-2009 on an index level and on a fund level, to see if the results within the two time periods differ.

4.6 Development of hypotheses

In this section we present the hypotheses that we test in this thesis. First and foremost we want to investigate if and how performance for ethical funds differs from performance for non-ethical funds throughout the whole sample period (2000-2009) on an index level and on a fund level. This is done by using the Portfolio Change Measure of Performance developed by Grinblatt and Titman (1993). Our **first hypothesis** is thus that there is no difference in the performance of ethical and non-ethical funds on the index level. The alternative hypothesis then becomes that there is a difference in the performance of ethical and non-ethical funds on the index level. Our **second hypothesis** is that there is no difference in the performance of ethical and non-ethical funds on the fund level. The alternative hypothesis is that there is a difference in the performance of ethical and non-ethical funds on the fund level. Our **third hypothesis** is that non-ethical funds perform better than ethical funds on the index level, and thus our third alternative hypothesis is that ethical funds perform better than non-ethical funds on the index level. Our **fourth hypothesis** is that non-ethical funds perform better than ethical funds on the fund level, and our fourth alternative hypothesis is that ethical funds perform better than non-ethical funds on the fund level. Then we check if our results are consistent with the results we obtain by using Jensen's alpha developed by Jensen (1968).

Table II: Our four hypotheses.

Hypotheses	
H1	There is no difference in the performance of ethical and non-ethical funds on the index level.
H2	There is no difference in the performance of ethical and non-ethical funds on the fund level.
H3	Non-ethical funds perform better than ethical funds on the index level.
H4	Non-ethical funds perform better than ethical funds on the fund level.

Except for our hypotheses we also investigate if the control variables presented in sub-section 4.4 affect performance in terms of the Portfolio Change Measure of Performance and Jensen's alpha on a fund level. We have however chosen not to express this in terms of hypotheses since we think that it would yield too many different hypotheses in excess of those stated above.

5. Results

In this section we present our results. More in depth comparisons between the results and discussions of them can be found in section 6. We start off presenting the performance measures on an index level in sub-section 5.1. We also present the results we obtain when we divide the sample into two sample periods, 2000-2007 and 2008-2009 on an index level. After that we proceed with presenting the performance measures on a fund level in sub-section 5.2 and the results we obtain when we split the sample in the same way as for the index level. We then present the results from our cross-sectional regressions of the performance measures on different control variables on the fund level.

5.1 Results on the index level

In this section we present the results we obtain for our performance measures on the index level for the entire sample and when we split the sample. We first present the results we obtain if we compute the Portfolio Change Measure of Performance and alpha for an index of ethical funds, which constitutes of all the ethical funds in our sample, and then for an index of non-ethical funds, which constitutes of all the non-ethical funds in our sample (see sub-section 4.3 for a description of the construction of indices). We run two different monthly time-series CAPM regressions for our ethical and non-ethical indices, one on the pooled index, and one on the MSCI World Market Index to obtain Jensen's alpha. We calculate the Portfolio Change Measure of Performance for our ethical and non-ethical indices using three different lags (quarterly, yearly and a one-and-a-half-year lag). Computing the Portfolio Change Measure of Performance for an index this way, makes the measure value-weighted as opposed to the method we use in sub-section 5.2 where we calculate the Portfolio Change Measure of Performance per fund, sum them up and take an average, which makes it equally weighted over the funds.

Performance measures

Table III: Monthly alphas and Portfolio Change Measures of Performance for the index of ethical funds and the index of non-ethical funds.

Performance Measure	Ethical funds			Non-ethical funds		
	Mean	Median	St. dev.	Mean	Median	St. dev.
Alpha (Pooled Market Index)	-0.2359	-0.2359	0.5247	0.0186	0.0186	0.0432
Alpha (MSCI World Market Index)	-1.3159	-1.3159	6.6332	-1.0498	-1.0498	6.9746
PCMP Quarterly lag	0.0029	0.0076	0.6107	0.0340	0.0000	0.5618
PCMP Yearly lag	-0.1540	0.0000	0.9200	-0.0666	0.0000	0.9460
PCMP One-and-a-half-year lag	-0.0795	0.0000	0.9967	0.0450	0.0000	1.1094

All measures in percent, 111 observations

The alphas in this table are taken from two time-series regressions, one for each benchmark. That is the reason why the mean and the median are the same, namely that there is only one measure for each benchmark. The standard deviations for these measures are calculated by taking the standard error of the coefficient and multiplying it by the square root of the number of observations. On the index level, the

Portfolio Change Measure of Performance is smaller for ethical funds than for non-ethical funds using all three lags. The results are consistent with the alphas which are also smaller for ethical funds than for non-ethical funds. For ethical funds, the Portfolio Change Measure of Performance is small but positive (0.00% per month) when the quarterly lag is used. Using the yearly lag or the one-and-a-half-year lag yields negative Portfolio Change Measures of Performance (-0.15% per month and -0.08% per month respectively). The alphas for ethical funds are both negative (-0.24% when the pooled market index is used and -1.32% when the MSCI World Market Index is used). For non-ethical funds, the Portfolio Change Measure of Performance with a quarterly lag is positive (0.03% per month). With a yearly lag it is negative (-0.07% per month) and with a one-and-a-half-year lag it is once again positive (0.05% per month).The alpha for non-ethical funds is positive when the pooled index is used (0.02% per month) and negative when the MSCI World Market Index is used (-1.05% per month).

Splitting the sample

In this sub-section we present the results that we obtain for four of our different performance measures and two different groups of funds (ethical and non-ethical) on the index level, after splitting the sample into two time periods, 2000-2007 and 2008-2009. We have decided to use only the version of alpha that we obtain from running the CAPM regression on the pooled market index. Graph 1 in sub-section 4.3 plots the market indices against each other and shows that the large trends are similar for the pooled market index and the MSCI World Market Index. The pooled index shows what the Swedish fund managers really invest in and hence it is better to use this index when evaluating the performance of the Swedish ethical and non-ethical indices and the individual funds.

Table IV: Monthly alphas and Portfolio Change Measures of Performance for the index of ethical funds and the index of non-ethical funds with the sample split into two periods.

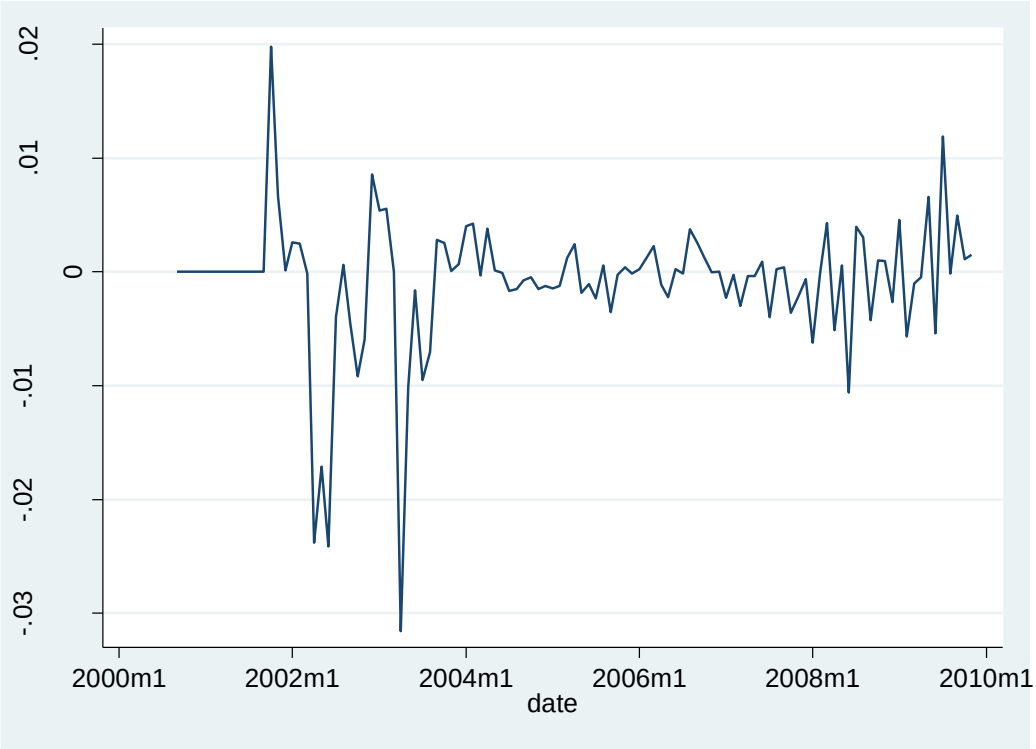
Performance Measure	Ethical funds			Non-ethical funds		
2000-2007	Mean	Median	St. dev.	Mean	Median	St. dev.
Alpha (Pooled Market Index)	-0.2609	-0.2609	0.4306	0.0195	0.0195	0.0328
PCMP Quarterly lag	0.0099	0.0102	0.6414	0.0528	0.0067	0.6003
PCMP Yearly lag	-0.1161	0.0000	0.9072	-0.0027	0.0000	0.9429
PCMP One-and-a-half-year lag	-0.0088	0.0000	1.0532	0.1518	0.0000	1.1576
	Ethical funds			Non-ethical funds		
2008-2009	Mean	Median	St. dev.	Mean	Median	St. dev.
Alpha (Pooled Market Index)	-0.1376	-0.1376	0.7908	0.0134	0.0134	0.0716
PCMP Quarterly lag	-0.0240	-0.0037	0.4870	-0.0380	-0.0266	0.3822
PCMP Yearly lag	-0.2989	-0.2844	0.9744	-0.3111	-0.2345	0.9381
PCMP One-and-a-half-year lag	-0.3500	-0.2789	0.6962	-0.3637	-0.3414	0.7965

All measures in percent, 88 observations 2000-2007, 23 observations 2008-2009

During the years 2000-2007, all four performance measures are larger for non-ethical funds than for ethical funds. However, during the time period 2008-2009, all three Portfolio Change Measures of Performance are larger for ethical funds than for non-ethical funds. The alpha is however larger for non-

ethical funds than for ethical funds like in the earlier period. For the whole period, we plot the difference between the ethical index's Portfolio Change Measure of Performance with a yearly lag and the non-ethical index's Portfolio Change Measure of Performance with a yearly lag. We can see that between the years 2000 and 2002, the ethical index outperforms the non-ethical. Between 2002 and 2004, the non-ethical index outperforms the ethical index most of the time. Since then, the difference between the performances of the two indices has been lower. It seems like the ethical and non-ethical indices have been taking turns in outperforming the other. We can also see an increase in the performance of ethical funds relative to non-ethical funds in the most recent years (2008-2009).

Graph2: Illustration of the difference between the ethical index and the non-ethical index (ethical – non-ethical) in terms of the Portfolio Change Measure of Performance with a yearly lag between 2000 and 2009. The y-axis shows the difference in monthly PCMP between ethical and non-ethical funds.



5.2 Results on the fund level

In this section we present the results we obtain for our performance measures on the fund level for the entire sample and when we split the sample. We then proceed with presenting the results we obtain from running cross-sectional regressions of our performance measures on a fund level on the different control variables described above in sub-section 4.4. The control variables are; size, age, cash, betas, idiosyncratic risk, net flow and a dummy that indicates whether a fund is ethical or not. All regressions are run so that heteroskedasticity-robust standard errors are obtained.

Performance measures

Table V: Monthly alphas and Portfolio Change Measures of Performance for ethical funds and for non-ethical funds on the fund level.

Performance Measure	Ethical funds			Non-ethical funds		
	Mean	Median	St. dev.	Mean	Median	St. dev.
Alpha (Pooled Market Index)	-0.3160	-0.1862	0.6976	-0.0197	0.0105	0.9228
Alpha (MSCI World Market Index)	-0.0109	-1.0654	0.5652	-1.0238	-1.0129	1.8734
PCMP Quarterly lag	0.0038	-0.0041	0.0672	-0.0192	0.0090	0.3692
PCMP Yearly lag	-0.0815	-0.0900	0.1359	-0.0021	0.0000	0.2451
PCMP One-and-a-half-year lag	-0.0421	-0.0707	0.1852	-0.0057	0.0000	0.9131

All measures in percent, 355 observations

On the fund level, the Portfolio Change Measure of Performance is smaller for ethical funds than for non-ethical funds using the yearly lag and the one-and-a-half-year lag. However, when the quarterly lag is used it is larger for ethical funds than for non-ethical funds. The alphas are smaller for ethical funds than for non-ethical funds when the pooled market index is used and larger for ethical funds than for non-ethical funds when the MSCI World Market Index is used. For ethical funds, the Portfolio Change Measure of Performance is small but positive (0.00% per month) when the quarterly lag is used. Using the yearly lag or the one-and-a-half-year lag yields negative Portfolio Change Measures of Performance (-0.08% per month and -0.04% per month respectively). The alphas for ethical funds are both negative (-0.31% per month when the pooled market index is used and -0.01% per month when the MSCI World Market Index is used). For non-ethical funds, the Portfolio Change Measure of Performance is negative using all three lags (-0.02% per month with the quarterly lag, -0.00% per month with the yearly lag and -0.01% per month with the one-and-a-half-year lag). The alpha for non-ethical funds is negative both when the pooled index is used (-0.02% per month) and when the MSCI World Market Index is used (-1.02% per month).

To make sure that our results on the fund level are not biased due to outliers in terms of funds we draw histograms for ethical funds and non-ethical funds that show the Portfolio Change Measure of Performance with a yearly lag for the different funds within the two groups of funds. We can thus conclude that such a problem does not exist (see Graph 1 in Appendix 2).

Splitting the sample

Table VI: Means of monthly alphas and Portfolio Change Measures of Performance on fund level with the sample split into two separate periods.

Performance Measure	Ethical funds			Non-ethical funds		
2000-2007	Mean	Median	St. dev.	Mean	Median	St. dev.
Alpha (Pooled Market Index)	-0.2615	-0.1852	0.5432	-0.0339	0.0032	0.9194
PCMP Quarterly lag	0.0038	-0.0043	0.0677	-0.0039	0.0107	0.3597
PCMP Yearly lag	-0.0827	-0.0904	0.1365	-0.0006	-0.0024	0.2285
PCMP One-and-a-half-year lag	-0.0427	-0.0747	0.1866	-0.0032	0.0000	0.9383
	Ethical funds			Non-ethical funds		
2008-2009	Mean	Median	St. dev.	Mean	Median	St. dev.
Alpha (Pooled Market Index)	-0.2946	-0.1294	0.6664	0.0189	0.0458	0.7793
PCMP Quarterly lag	-0.0020	-0.0075	0.0639	-0.0044	0.0121	0.1701
PCMP Yearly lag	-0.0897	-0.1018	0.1348	-0.0057	-0.0098	0.2030
PCMP One-and-a-half-year lag	-0.0559	-0.0761	0.1660	-0.0175	-0.0109	0.1742

All measures in percent, 88 observations 2000-2007, 23 observations 2008-2009, 355 funds

Table VI shows that alpha, the Portfolio Change Measure of Performance with a yearly lag and the Portfolio Change Measure of Performance with a one-and-a-half-year lag are lower for ethical funds than for non-ethical funds in both time periods (2000 to 2007 and 2008 to 2009). The Portfolio Change Measure of Performance computed with a quarterly lag is however larger for ethical funds than for non-ethical funds in both time periods.

Cross-sectional regressions

In this section, we present the results from our regressions of the different performance measures on our control variables. The relation between t-values and significance levels or p-values can be found in Appendix 1, Table III.

In Table VII below we present the results from the regressions of the Portfolio Change Measure of Performance with the quarterly lag. For all funds, size is significant and positive on a one percent significance level. This holds for non-ethical funds as well. For ethical funds, the size variable is insignificant on a ten percent significance level. Age is positive and significant on a ten percent significance level for all funds and for non-ethical funds. Age is economically and statistically insignificant for ethical funds on a ten percent significance level. The cash variable is insignificant for all groups of funds on a ten percent significance level. The variable betas is insignificant for all funds and for non-ethical funds. For ethical funds, the coefficient for betas is positive and significant on a ten percent significance level. Idiosyncratic risk is negative and significant on a five percent significance level for all funds and for non-ethical funds. For ethical funds, it is insignificant. Net flow is insignificant for all three groups of funds. The ethical dummy is insignificant on a ten percent significance level for all funds.

Table VII: Results from regressions of the Portfolio Change Measure of Performance with a quarterly lag on fund characteristics for all funds, ethical funds and non-ethical funds.

Independent variables	All funds		Ethical funds		Non-ethical funds	
	Coefficient	t	Coefficient	t	Coefficient	t
Size	0.0019	2.68	0.0002	0.19	0.0022	3.32
Age	0.0001	1.71	0.0000	0.42	0.0001	1.74
Cash	-0.0996	-0.95	0.0108	0.49	-0.1070	-0.94
Betas	-0.0159	-0.81	0.0139	1.80	-0.0165	-0.82
Idiosyncratic risk	-0.5367	-2.40	-0.0766	-0.52	-0.5371	-2.41
Net flow	-0.0001	-0.06	0.0005	0.50	0.0001	0.11
Ethical dummy	-0.0032	-1.30	-	-	-	-

R^2 all funds: 0.2007, R^2 ethical and non-ethical funds: 0.2135, 355 observations

In Table VIII we present the results we obtain from running regressions of the Portfolio Change Measure of Performance with a yearly lag on the different control variables. Size is positive and significant on a ten percent significance level for all funds and for non-ethical funds. For ethical funds, it is insignificant. Age is insignificant for all three groups of funds and so is cash. The variable betas is positive and significant on a ten percent significance level for ethical funds but insignificant for all funds and non-ethical funds. Idiosyncratic risk is insignificant for all three groups of funds and so is net flow. The ethical dummy is negative and significant on a ten percent significance level for all funds.

Table VIII: Results from regressions of the Portfolio Change Measure of Performance with a yearly lag on fund characteristics for all funds, ethical funds and non-ethical funds.

Independent variables	All funds		Ethical funds		Non-ethical funds	
	Coefficient	t	Coefficient	t	Coefficient	t
Size	0.0020	1.85	0.0007	0.62	0.0021	1.91
Age	-0.0001	-1.21	0.0000	0.36	-0.0001	-1.23
Cash	-0.0023	-0.23	0.0217	0.90	-0.0026	-0.25
Betas	0.0076	1.03	0.0201	1.90	0.0061	0.74
Idiosyncratic risk	0.1687	1.24	0.0186	0.07	0.1868	1.28
Net flow	0.0011	0.78	0.0000	0.00	0.0014	0.88
Ethical dummy	-0.0052	-1.80	-	-	-	-

R^2 all funds: 0.0489, R^2 ethical and non-ethical funds: 0.0530, 355 observations

When we run regressions of the Portfolio Change Measure of Performance computed with a one-and-a-half-year lag on the different control variables we obtain the results presented in Table IX. The size variable is insignificant on a ten percent significance level for all funds and for ethical funds. For non-ethical funds, size is positive and significant on a ten percent significance level. Age is negative and significant on a five percent significance level for all funds and for non-ethical funds. For ethical funds, it is both economically and statistically insignificant on a ten percent significance level. Cash is insignificant on a ten percent significance level for all three groups of funds and so is betas. Idiosyncratic risk is negative and significant on a five percent significance level for all funds and for non-ethical funds. Net

flow is insignificant on a ten percent significance level for all three groups of funds. The ethical dummy is negative and significant on a five percent significance level for all funds.

Table IX: Results from regressions of the Portfolio Change Measure of Performance with a one-and-a-half year lag on fund characteristics for all funds, ethical funds and non-ethical funds.

Independent variables	All funds		Ethical funds		Non-ethical funds	
	Coefficient	t	Coefficient	t	Coefficient	t
Size	0.0024	1.33	-0.0015	-0.66	0.0031	1.68
Age	-0.0002	-2.18	-0.0000	-0.18	-0.0002	-2.13
Cash	-0.2164	-1.25	-0.0264	-0.54	-0.2281	-1.23
Betas	-0.0278	-0.82	0.0119	0.68	-0.0283	-0.82
Idiosyncratic risk	-0.7657	-2.18	0.0509	0.09	-0.7817	-2.27
Net flow	0.0007	0.16	0.0014	0.44	0.0009	0.18
Ethical dummy	-0.0097	-2.02	-	-	-	-

R^2 all funds: 0.1695, R^2 ethical and non-ethical funds: 0.1794, 355 observations

In Table X, we present the results we obtain from running regressions of alpha (obtained from the CAPM regression run on the pooled market index) on the different control variables. The size variable is positive and significant on a one percent significance level for the group of all funds and for non-ethical funds. For ethical funds, the size variable is insignificant. The age variable is insignificant for all funds and for non-ethical funds, while it is positive and significant on a five percent significance level for ethical funds. Cash is insignificant for all three groups of funds on a ten percent significance level. Betas are positive and highly significant for all three groups of funds. Idiosyncratic risk is positive and significant for the group consisting of all funds and for non-ethical funds on a five percent significance level. For ethical funds it is insignificant on a ten percent significance level. Net flow is insignificant on a ten percent significance level for all funds and for non-ethical funds, while it is positive and significant on a one percent significance level for ethical funds. The ethical dummy is negative and highly significant for the group consisting of all funds.

Table X: Results from regressions of the alphas obtained by the CAPM (on the pooled market index) on fund characteristics, for all funds, ethical funds and non-ethical funds.

Independent variables	All funds		Ethical funds		Non-ethical funds	
	Coefficient	t	Coefficient	t	Coefficient	t
Size	0.0071	3.53	-0.0003	-0.11	0.0076	3.52
Age	-0.0000	-0.20	0.0009	2.05	-0.0001	-0.72
Cash	0.0430	0.83	-0.0228	-0.26	0.0609	1.13
Betas	0.3154	12.35	0.3841	15.80	0.3040	10.64
Idiosyncratic risk	1.1680	2.28	-0.0230	-0.03	1.2512	2.27
Net flow	0.0077	1.47	0.0222	3.05	0.0061	1.12
Ethical dummy	-0.4803	-9.41	-	-	-	-

R^2 all funds: 0.5718, R^2 ethical and non-ethical funds: 0.5829, 355 observations

6. Discussion

In this section we discuss the results presented in section 5 and evaluate our four hypotheses as well as how different fund characteristics affect the performance of ethical and non-ethical funds. Our **first hypothesis** is that there is no difference in the performance of ethical and non-ethical funds on the index level. Our **second hypothesis** is that there is no difference in the performance of ethical and non-ethical funds on the fund level. Our **third hypothesis** is that non-ethical funds perform better than ethical funds on the index level, and our **fourth hypothesis** is that non-ethical funds perform better than ethical funds on the fund level.

Since the Portfolio Change Measure of Performance is larger in absolute terms in three out of four of the cases when it is computed with the yearly lag than with the other two lags, we will focus our analysis on that measure, in line with Grinblatt and Titman (1993). The fact that the measure is largest in absolute terms for the measure with the yearly lag indicates that it takes about a year for an informed fund manager's superior information to be revealed to the market and fully incorporated into market prices. Grinblatt and Titman (1993) find this puzzling since an investor could then mimic a fund by looking at the fund's reported quarterly holdings, invest in the same assets and thus earn the same return as the fund less fund fees.

6.1 Performance measures

In this sub-section we discuss and elaborate on the two different performance measures we are left with, namely the Portfolio Change Measure of Performance with the yearly lag and Jensen's alpha using the pooled market index. From now on we will refer to the Portfolio Change Measure of Performance with the yearly lag as the Portfolio Change Measure of Performance and we will refer to the alpha we obtain from running the CAPM regression on the pooled market index as alpha.

Portfolio Change Measure of Performance

Looking at the Portfolio Change Measure of Performance, the results on the index level show that non-ethical funds outperform ethical funds when analyzing the data for the whole sample period 2000-2009. On the fund level, we can conclude the same. Both ethical and non-ethical funds show underperformance on the index level with a Portfolio Change Measure of Performance of -0.15% per month and -0.07% per month respectively. On the fund level both types of funds show underperformance as well with a Portfolio Change Measure of Performance of -0.08% per month for ethical funds and -0.00% per month for non-ethical funds. It is interesting to observe that the performance measures for both groups of funds are less negative on the fund level. On the fund level, funds are weighed equally, while they are value-weighted on the index level, and hence this could indicate that small funds perform better than large funds. This is in line with previous research on Swedish funds, done by Dahlquist et al (2000) where they find that small

Swedish equity funds outperform large ones. The finding that fund managers do not show outperformance is in line with previous research on mutual fund performance (Jensen (1968), Lehman and Modest (1987) and Carhart (1997)).

Hence, answering our four hypotheses using the results for the Portfolio Change Measure of Performance means that we reject our first hypothesis since there is a difference in the performance between ethical and non-ethical funds on the index level. This can also be seen in Graph 2 in sub-section 5.1 where the difference in the Portfolio Change Measure of Performance between ethical and non-ethical funds on an index level is plotted over time. In the graph, we can see that ethical funds underperform non-ethical funds in terms of the Portfolio Change Measure of Performance between 2002 and 2004. The difference during the recent crisis is also visible, where we can see that the ethical and non-ethical funds perform more similar. The second hypothesis is rejected too since there is a difference in the performance of ethical funds and non-ethical funds on the fund level as well. Continuing, we fail to reject our third and fourth hypotheses since non-ethical funds outperform ethical funds both on the index level and on the fund level, looking at the whole sample period.

Jensen's alpha

Here we compare our results from the Portfolio Change Measure of Performance with those we obtain from Jensen's alpha to see if they are consistent. Alpha shows that non-ethical funds outperform ethical funds on both an index level and on a fund level, in line with the results for the Portfolio Change Measure of Performance. On the index level, alpha is positive for non-ethical funds and negative for ethical funds. Hence non-ethical funds perform better according to alpha than according to the Portfolio Change Measure of Performance on the index level. On the fund level, alpha is however negative for both non-ethical funds and for ethical funds, just like the Portfolio Change Measure of Performance. This indicates that large non-ethical funds perform better in terms of alpha than small non-ethical funds since the performance on the fund level is worse for this type of fund and smaller funds are given a greater importance on the fund level than on the index level.

From analyzing the results we obtain for Jensen's alpha, we can draw the same conclusions as we do when we analyze the results for the Portfolio Change Measure of Performance, namely that we reject our first and our second hypotheses since there is a difference in the performance between ethical and non-ethical funds both on the index level and on the fund level. We fail to reject our third and fourth hypotheses since non-ethical funds outperform ethical funds both on the index level and on the fund level.

Splitting the sample

In this sub-section we discuss how the performance measures are affected on both the index level and the fund level, after splitting the sample into two time periods, 2000-2007 and 2008-2009, so that the years for the current/recent crisis are isolated in the latter.

On the index level, the Portfolio Change Measure of Performance indicates that non-ethical funds outperform ethical funds for the years 2000-2007. However, during the time period of the current/recent crisis 2008-2009, it indicates the opposite, namely that ethical funds outperform non-ethical funds. This is illustrated in Graph 2 in sub-section 5.1, where the difference between ethical funds and non-ethical funds in terms of the Portfolio Change Measure of Performance is plotted for the years 2000-2009. It is visible that the ethical funds are doing better compared to the non-ethical funds in later years than in earlier years. On the fund level, the Portfolio Change Measure of Performance indicates that non-ethical funds outperform ethical funds during both time periods, in line with the results for the entire sample period. When we give small funds a greater importance which is done on the fund level, ethical funds do not perform better than non-ethical funds anymore during the time period 2008-2009, when we compare to the index level. It is worth noticing that small funds seem to outperform large funds (both within the groups of ethical and non-ethical funds) during the time period 2008-2009 when performance is measured in terms of the Portfolio Change Measure of Performance. This is in line with what we concluded for funds in general for the whole sample period (2000-2009), that small funds perform better than large funds. This is also in line with Dahlquist et al (2000) and their conclusion that small Swedish equity funds seem to outperform large Swedish equity funds during the time period 1992-1997.

When we compare our results for the Portfolio Change Measure of Performance with our results for alpha to see if they are consistent we find that alpha indicates that non-ethical funds outperform ethical funds during both time periods both on the index level and on the fund level. An interesting question is thus: is the Portfolio Change Measure of Performance on the index level or the Portfolio Change Measure of Performance on the fund level and alpha on both an index level and on a fund level right for the years 2008-2009? It is difficult to answer this question, although one might argue that what the majority of the performance measures indicate probably is right. However, if we for a while suppose that the Portfolio Change Measure of Performance on the index level is right and that ethical funds actually outperform non-ethical funds during the time period 2008 to 2009, it is interesting to discuss the implications of this. One possible explanation for ethical funds to outperform non-ethical funds during the crisis could be that they are less risky both in terms of idiosyncratic risk (or standard deviation of residuals) and systematic risk (or betas), obtained from our CAPM regressions (see summary statistics for both in Table I in sub-section 4.4).

To sum up, non-ethical funds seem to outperform ethical funds during the time period 2000-2007 both on the index level and on the fund level. During the time period 2008-2009, alpha indicates that non-ethical funds outperform ethical funds on the index level while the Portfolio Change Measure of Performance indicates that ethical funds outperform non-ethical funds. On the fund level both performance measures indicate that non-ethical funds outperform ethical funds. Hence we can conclude that during the time period 2000-2007 non-ethical funds outperform ethical funds according to our performance measures, in line with the conclusions we draw by looking at the whole sample (2000-2009). During the period of the current/recent crisis the findings are however more ambiguous, but three out of four measures (considering the results on both the index level and the fund level) indicate that non-ethical funds still outperform ethical funds as for the rest of the sample.

6.2 Control variables

In this section we discuss and elaborate on the results we obtain from running cross-sectional OLS regressions of our two performance measures on a fund level on the different control variables described above in sub-section 4.4. The control variables are; size, age, cash, betas, idiosyncratic risk, net flow and a dummy that indicates whether a fund is ethical or not. We discuss one of the control variables at a time and compare the sign and significance of the coefficients of these control variables when they are used as independent variables in the regressions presented in Table VIII and Table X above in sub-section 5.2 (when we run regressions of the Portfolio Change Measure of Performance with a yearly lag on the control variables and when we do the same for alpha obtained from the CAPM regression with the pooled market index). The R-squares from our cross-sectional regressions of alpha on the independent variables are strikingly high although the cross-sectional variation in alpha is higher (see Table V). This might be due to the fact that our results for the cross-sectional regressions of Jensen's alpha suffer from a bias, since the systematic risk in terms of betas and the idiosyncratic risk in terms of standard deviation of residuals are derived from the same time-series regressions as the alphas. When running cross-sectional regressions of the alphas on the independent variables excluding betas and idiosyncratic risk, we get contradicting results. Results from cross-sectional regressions of both the Portfolio Change Measure of Performance and Jensen’s alpha excluding betas and idiosyncratic risk as independent variables are presented in Table IV and Table V in Appendix 1, and discussed below under the sub-heading Cross-sectional regressions without betas and idiosyncratic risk.

Size

When we run regressions of the Portfolio Change Measure of Performance on the different control variables, the size variable is insignificant on a ten percent significance level for ethical funds. For non-ethical funds, the size variable is however significant on a ten percent significance level and has a positive

coefficient, which indicates that non-ethical funds benefit from being large. For the whole group of funds the size variable is also positive and significant on a ten percent significance level, which is not surprising since the non-ethical funds make up the lion's share of all the funds in our sample. This goes against what we find for the whole group of funds using the Portfolio Change Measure of Performance on the index and fund level, namely that the performance is higher when small funds are given a larger importance. This also goes against the results of Dahlquist et al (2000) who find that small Swedish equity funds outperform large Swedish equity funds. They believe that their findings might be due to the fact that large funds might be unable to trade aggressively. Instead the results from our regressions imply that Gregory et al (1997) might be right in their *a priori* beliefs that larger funds can benefit from economies of scale.

Running regressions of alpha on the control variables yields similar results as for the Portfolio Change Measure of Performance. For the whole group of funds and for non-ethical funds, the size variable is positive and significant on a one percent significance level and for ethical funds it is insignificant. Hence there is evidence that larger funds show better performance within the group of all funds and within the group of non-ethical funds.

Age

Running regressions of the Portfolio Change Measure of Performance for ethical funds on the control variables, the age variable becomes insignificant on a ten percent significance level. When this is done for alpha, however, the age variable is positive and significant on a five percent significance level which indicates that older ethical funds perform better than younger ethical funds when performance is measured in terms of alpha. The ethical funds in our sample are older than the non-ethical funds on average (97 and 77 months respectively, see Table I in sub-section 4.4), hence it might be possible that the fact that ethical funds are older on average can explain some of their performance. As mentioned in sub-section 4.4 there is a possibility that older funds that have proven to be able to yield a sufficient rate of return to their investors (and thus have survived) might be more likely to be able to yield sufficient returns in the future, in other words a test of persistency. As we also mention in sub-section 4.4 we believe that there might also be a learning effect for older funds in terms of that fund managers that have managed the same fund for a while have learnt the best tactic for that particular fund or if there has been a change of fund manager, that at least some of the knowledge has been transferred from the former to the later before the change of manager. For the group of all funds and for non-ethical funds, the age variable is insignificant when the Portfolio Change Measure of Performance is used, as well as when alpha is used.

Cash

The cash variable is insignificant on a ten percent significance level for all three groups of funds both when we run regressions of the Portfolio Change Measure of Performance on the control variables and

when we run regressions of alpha on the control variables. Hence we cannot draw any conclusions regarding how much of a fund's wealth that is not invested in securities that can explain performance.

Betas

The betas from the CAPM regression are significant on a ten percent significance level with a positive coefficient for ethical funds and insignificant on a ten percent significance level for the non-ethical funds and for the group of all funds when the Portfolio Change Measure of Performance is used as the dependent variable in the cross-sectional regressions. This indicates that ethical funds benefit from having a larger exposure toward systematic risk. When alpha is used as the dependent variable in the regressions, the coefficients are positive and highly significant (even on a 0.1 percent significance level) for the betas for all three groups of funds. That the betas are highly significant when we run regressions of the alphas on different control variables is in line with what we expected since they are derived from the same regression. To conclude, we can observe a statistically significant, positive relationship between performance in terms of alpha and systematic risk for all groups of funds, as well as a positive relationship between performance in terms of the Portfolio Change Measure of Performance and systematic risk for ethical funds.

Idiosyncratic risk

The idiosyncratic risk variable (the standard deviation of the residuals from the monthly CAPM time-series regression on the pooled market index on a fund level) is insignificant on a ten percent significance level in the regressions of the Portfolio Change Measure of Performance on the control variables for all three groups of funds (all funds, ethical funds and non-ethical funds). In the regressions of alpha on the control variables, idiosyncratic risk is insignificant on a ten percent significance level for ethical funds. For the group of all funds and the group of non-ethical funds, idiosyncratic risk is however significant on a five percent significance level with a positive coefficient. Hence our results indicate that funds with higher idiosyncratic risk within the group of all funds and within the group of non-ethical funds perform better when performance is measured in terms of alpha. We find this interesting since according to the CAPM investors should be rewarded only for holding systematic risk (Sharpe (1964), Lintner (1965a), Mossin (1966)) and our results show that investors may be rewarded for holding idiosyncratic risk as well when performance is measured in terms of alpha.

Net flow

Net flow is insignificant in the regressions of the Portfolio Change Measure of Performance on the control variables for all three groups of funds, and hence we cannot conclude whether net flow affects the performance according to this measure or not. When we run regressions of alpha on the control variables, net flow is insignificant for all funds and for non-ethical funds on a ten percent significance level. For

ethical funds net flow is significant on a one percent significance level and has a positive coefficient. This indicates that ethical funds perform better when new capital is invested in them if performance is measured in terms of alpha. Increasing the size would thus make the ethical funds perform better (since a flow of money to a fund increases its size in terms of capital). This is in line with our findings for the size variable from our cross-sectional regressions. However it was for the non-ethical funds and static size, while this shows that increasing the size of ethical funds might be beneficial for them.

Ethical dummy

The ethical dummy has a negative coefficient and is significant on a ten percent significance level when the Portfolio Change Measure of Performance is used as the dependent variable. When alpha is used as the dependent variable in the cross-sectional regression, the coefficient for the ethical dummy is negative as well and significant on a one percent significance level. This indicates that ethical funds underperform compared to non-ethical funds, which is in line with the values of our performance measures. This is thus in line with the conclusions we drew for our hypotheses earlier. The difference in performance between the two types of funds is more significant when alpha is used as the performance measure than when the Portfolio Change Measure of Performance is used.

Cross-sectional regressions without betas and idiosyncratic risk

The results from these regressions can be found in Appendix 1, Table IV and Table V. When we exclude betas and idiosyncratic risk from our cross-sectional regressions we get results that are quite similar to those that we obtain when they are included for the Portfolio Change Measure of Performance with a yearly lag. The size variable is still positive and significant on a five percent significance level for the group of all funds and for non-ethical funds. However, the ethical dummy is now significant on a five percent significance level and not just on a ten percent significance level, as it is when betas and idiosyncratic risk are included as independent variables. Hence our results from the cross-sectional regressions of the Portfolio Change Measure of Performance are robust to an exclusion of the two risk-variables.

However, when we run regressions of Jensen's alpha on the fund characteristics, but exclude betas and idiosyncratic risk, we get results that are somewhat different from those we obtain when they are included. The R^2 decreases considerably, from around 58 percent to around 4 percent which indicates that a much smaller part of the variation in performance measured by alpha is explained by the variation in the independent variables. When the risk-variables are excluded, the size variable is no longer significant for all funds and non-ethical funds, even on a ten percent significance level. The age variable which is positive and significant on a five percent significance level for ethical funds when the risk-variables are included, becomes insignificant when they are excluded, even on a ten percent significance level.

However, the cash variable has suddenly become significant on a five percent significance level for non-ethical funds, with a positive coefficient. In Table I it is visible that the non-ethical funds in our sample hold more cash than the ethical funds on average and hence from this we draw the conclusion that one of the reasons for why non-ethical funds outperform ethical funds could be because they hold more cash when performance is measured in terms of alpha. The ethical dummy is now smaller and significant on a five percent significance level when the risk-variables are excluded, as opposed to on a one percent significance level when the risk variables are included.

The conclusion that the difference in performance between ethical and non-ethical funds cannot be explained solely by the difference between the two groups of funds in terms of the different control variables we include in our regressions still holds. Hence there is still a need to find other control variables that can explain more of the difference between the two groups of funds in terms of performance in order to get similar results as much of the previous literature, namely that there is no difference in the performance between ethical and non-ethical funds.

6.3 Drawbacks

Our most prominent downsides with this thesis are due to the fact that we could not get returns for all the assets reported in the holdings for the funds we investigate and the fact that we have dropped funds from our sample that we did not know whether they are equity funds or not. We had to drop 396 out of the 899 funds we had originally because of this (see Table I in Appendix 1). The first problem with the returns that we could not obtain was dealt with by dropping all the funds for which we were only able to obtain returns for less than 70 percent of the total fund market value. We chose the level 70 percent by investigating how many ethical funds we lost when applying different percentage levels for the dropping of funds. On the 70 percent level which we apply we are left with 66 ethical funds (see Table II in Appendix 1).

As mentioned above in sub-section 4.1 there are also some drawbacks that come with using the Portfolio Change Measure of Performance. Here comes a short review of these drawbacks. The assumption that mean returns are constant for the assets held by the funds over the entire sample period can bias the performance measure upwards during a temporary increase in risk. If the sample is too small and a fund manager increases the beta repeatedly and hence increases the expected return, the zero-cost portfolio within the Portfolio Change Measure of Performance will have an average beta that is positive. This implies that the expected performance measure is positive although the fund manager may not have superior information (Grinblatt and Titman (1993)). However, since we have such a large sample, this problem should be negligible.

We also have a problem regarding the fact that the systematic risk in terms of betas and the idiosyncratic risk in terms of standard deviations of residuals are derived from the same regressions as the

alpha. This causes a bias when running cross-sectional regressions of alpha on the independent variables, since our results for the regressions of alpha differ depending on if we include or exclude the two risk-variables. Hence the robustness of our robustness test which is performed by comparing our results that we obtain for the Portfolio Change Measure of Performance to the results we obtain for Jensen's alpha can be questioned.

6.4 Comparing with previous literature

Previous literature on the subject shows similar performance for ethical and non-ethical funds (Hamilton et al (1993), Diltz (1995), Guerard (1997)) and this is not in line with our first findings, which show a difference in performance between ethical and non-ethical funds, both on an index level and on a fund level. Then we control our results for differences in characteristics. Our results from those regressions are on a five percent significance level more in line with previous results. That is, on a five percent significance level, our ethical dummy is unable to explain fund performance in terms of the Portfolio Change Measure of Performance in regressions on our other variables and the dummy. A number of authors try to control for differences in characteristics in another way, namely by using a matched pair analysis (Mallin et al (1995), Gregory et al (1997), Statman (2000), Kreander et al (2005) Bauer et al (2005)) and controlling for differences in characteristics in that way, they find no significant difference in performance between ethical and non-ethical funds. On the five percent significance level, our results for the Portfolio Change Measure of Performance are hence in line with these authors.

It should be noted that since abnormal performance according to the Portfolio Change Measure of Performance is before transaction costs and fund expenses are subtracted, it is not sure that investors can earn abnormal returns by investing in mutual funds even when the performance measure indicates abnormal returns. Grinblatt and Titman (1989) obtain results that indicate that transaction costs and fund expenses weaken average abnormal performance of the funds they investigate so that the performance is near zero.

Grinblatt and Titman (1993) find that the average performance for the whole sample period that they use is close to zero for the Portfolio Change Measure of Performance with the one quarter lag. They thus continue their analysis using only the Porfolio Change Measure of Performance with the yearly lag (just as we do), which yields a Portfolio Change Measure of Performance of approximately 2% per year on average for the whole sample during the time period January 1976 – March 1985. Our average Portfolio Change Measure of Performance per year is -0.95% for ethical funds and -0.02% for non-ethical funds on the fund level which is in line with how Grinblatt and Titman (1993) compute their measure.

Commenting on our results for the regressions of the performance measures on different control variables, we notice that our results for the size variable are contradictory to what Dahlquist et al (2000) find. The funds in our dataset seem to benefit from size and Dahlquist et al (2000) find that small Swedish

equity funds outperform larger funds. Our results from the net flow variable are consistent with Dahlquist et al (2000) for our Portfolio Change Measure of Performance, namely that it has no significant impact on fund performance. However, for the regression where alpha is the dependent variable, we find that net flow has a positive and significant impact on ethical funds.

7. Conclusion

Our first hypothesis that we test in this thesis is that there is no difference in the performance of ethical and non-ethical funds on the index level and our second hypothesis is that there is no difference in the performance of ethical and non-ethical funds on the fund level. Our results for both the Portfolio Change Measure of Performance and for Jensen's alpha indicate that we can reject our first two hypotheses and hence that there is a difference in the performance of ethical and non-ethical funds.

Turning to the results from our cross-sectional regressions we find that there is a difference in the performance of ethical funds and non-ethical funds on a ten percent significance level when we measure performance in terms of the Portfolio Change Measure of Performance and on a one percent significance level when we measure performance in terms of Jensen's alpha. We hence find further support for our conclusions since in both cases, the coefficient for the ethical dummy is negative and significant. Interpreting the results further we would then fail to reject our third hypothesis which states that non-ethical funds perform better than ethical funds on the index level, and our fourth hypothesis which states the same for the fund level.

However, the difference in performance between ethical funds and non-ethical funds is not solely explained by the ethical dummy variable. For the regressions of the Portfolio Change Measure of Performance on different fund characteristics, the independent variable size is significant on a ten percent significance level and positive for non-ethical funds. From this we draw the conclusion that non-ethical funds benefit from being larger and hence part of the reason for why ethical funds underperform non-ethical funds is since they are smaller on average. We also find that ethical funds benefit from exposure toward systematic risk on a ten percent significance level. Turning our attention to the regressions of alpha on the control variables we once again find that non-ethical funds benefit from being larger. We also find that ethical funds benefit from being older and that ethical funds perform better if new money is invested in them (a positive and significant coefficient for net flow in the regressions). The latter finding also supports our conclusion that ethical funds may underperform non-ethical funds since they are smaller. Further, we find that both ethical and non-ethical funds benefit from larger exposure toward systematic risk and that non-ethical funds also benefit from larger exposure toward idiosyncratic risk. The non-ethical funds are riskier both in terms of systematic risk and idiosyncratic risk than the ethical funds in our

sample. Hence the fact that the non-ethical funds in our sample are riskier may also explain part of the outperformance by non-ethical funds over ethical funds.

Splitting the sample to isolate the years of the current/recent crisis yields similar results as those for the whole sample, except for the fact that one out of four performance measures indicates that ethical funds outperform non-ethical funds during the crisis. As just mentioned, the ethical funds in our sample are less risky both in terms of systematic risk and idiosyncratic risk, which could support such a finding for the years of the crisis.

We think that we have been able to draw some interesting conclusions regarding performance of ethical and non-ethical funds using the Portfolio Change Measure of Performance that hopefully contribute to the understanding of what drives performance for these different groups of equity funds. However, the measure could be tested and used in more ways in order to try to explain the difference in performance between ethical and non-ethical funds. We find it appealing to continue using this measure since it overcomes the problem with a benchmark error and also the problem with survivorship bias for the assets held by the funds. A suggestion for future research, which we would do if we had more time, is to test the Portfolio Change Measure of Performance on other fund characteristics. For example, Dahlquist et al (2000) run cross-sectional regressions of an alpha with time-varying betas on different fund characteristics that we do not use in our regressions, for example; administrative fees, turnover, load/exit fees and a lagged alpha to see whether these variables can explain performance for different groups of funds.

Another suggestion for future research is to test persistence of performance according to the Portfolio Change Measure of Performance of Swedish funds. Grinblatt and Titman (1993) rank performance according to the Portfolio Change Measure of Performance for the funds in their sample over the first half of their sample period. They form portfolios of the funds based on their rankings and then they measure the performance using the Portfolio Change Measure of Performance during the second half of their sample period. Doing this, they find persistence in performance for the funds in their sample (for both superior performers and inferior performers) and we think that it would be interesting to test this for solely Swedish funds as well.

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Thomson Reuters Datastream.

Appendix 1

Table I: Number of funds in our dataset for different quarters within the whole sample period and with different criteria. Other are those funds for which we could not obtain information regarding whether they are equity funds or not.

Period	Total	Ethical	Equity	Mixed	Other
Whole sample period	899	84	401	102	396
Sep 2000 - Nov 2000	**648**	**78**	**332**	**70**	**246**
Dec 2000 - Feb 2001	689	77	338	76	275
Mar 2001 - May 2001	**698**	**78**	**346**	**74**	**278**
Jun 2001 - Aug 2001	682	77	341	74	267
Sep 2001 - Nov 2001	**660**	**77**	**334**	**73**	**253**
Dec 2001 - Feb 2002	652	76	329	71	252
Mar 2002 - May 2002	**678**	**75**	**330**	**77**	**271**
Jun 2002 - Aug 2002	667	77	338	78	251
Sep 2002 - Nov 2002	**675**	**77**	**336**	**76**	**263**
Dec 2002 - Feb 2003	666	80	333	77	256
Mar 2003 - May 2003	**524**	**74**	**301**	**53**	**170**
Jun 2003 - Aug 2003	509	72	295	46	168
Sep 2003- Nov 2003	**505**	**70**	**296**	**49**	**160**
Dec 2003 - Feb 2004	526	72	296	59	171
Mar 2004 - May 2004	**539**	**76**	**305**	**64**	**170**
Jun 2004 - Aug 2004	545	77	302	72	171
Sep 2004 - Nov 2004	**546**	**76**	**298**	**73**	**175**
Dec 2004 - Feb 2005	558	79	297	76	185
Mar 2005 - May 2005	**571**	**79**	**298**	**76**	**197**
Jun 2005 - Aug 2005	578	80	296	76	206
Sep 2005 - Nov 2005	**591**	**81**	**302**	**77**	**212**
Dec 2005 - Feb 2006	432	77	252	54	126
Mar 2006 - May 2006	**435**	**77**	**258**	**53**	**124**
Jun 2006 - Aug 2006	437	77	257	53	127
Sep 2006 - Nov 2006	**439**	**77**	**258**	**53**	**128**
Dec 2006 - Feb 2007	442	76	261	53	128
Mar 2007 - May 2007	**450**	**75**	**262**	**53**	**135**
Jun 2007 - Aug 2007	447	74	257	53	137
Sep 2007 - Nov 2007	**453**	**74**	**258**	**53**	**142**
Dec 2007 - Feb 2008	455	75	258	53	144
Mar 2008 - May 2008	**457**	**75**	**258**	**57**	**142**
Jun 2008 - Aug 2008	448	75	253	54	141
Sep 2008 - Nov 2008	**447**	**75**	**257**	**51**	**139**
Dec 2008 - Feb 2009	459	74	264	58	137
Mar 2009 - May 2009	**456**	**69**	**259**	**62**	**135**
Jun 2009 - Aug 2009	440	60	249	60	131
Sep 2009 - Nov 2009	**455**	**73**	**263**	**62**	**130**

Table II: Composition of our dataset after all modifications described in sub-section 4.4 are made.

Total	Ethical	Non-ethical
355	66	289

Table III: The t-distribution for regressions with over 120 observations and corresponding p-values.

	t- and p-values					
Number of observations	**t**	**p-value**	**t**	**p-value**	**t**	**p-value**
120→∞	1.645	0.10	1.960	0.05	2.576	0.01

Table IV: Results from cross-sectional regressions of the Portfolio Change Measure of Performance with a yearly lag on size, age, cash, net flow and the ethical dummy.

Independent variables	All funds		Ethical funds		Non-ethical funds	
	Coefficient	t	Coefficient	t	Coefficient	t
Size	0.0018	1.71	0.0009	0.76	0.0019	1.76
Age	-0.0001	-1.23	0.0000	0.46	-0.0001	-1.26
Cash	0.0009	0.10	0.0058	0.18	0.0012	0.13
Net flow	0.0007	0.53	-0.0009	-0.44	0.0009	0.60
Ethical dummy	-0.0068	-2.51	-	-	-	-

R^2 all funds: 0.0352, R^2 ethical and non-ethical funds: 0.0379, 355 observations.

Table V: Results from cross-sectional regressions of Jensen's alpha (obtained from the CAPM regression on the pooled market index) on size, age, cash, net flow and the ethical dummy.

Independent variables	All funds		Ethical funds		Non-ethical funds	
	Coefficient	t	Coefficient	t	Coefficient	t
Size	0.0053	1.57	-0.0011	-0.22	0.0051	1.46
Age	-0.0001	-0.48	0.0009	1.18	-0.0002	-0.92
Cash	0.1264	1.49	-0.3851	-1.74	0.1750	2.04
Net flow	-0.0022	-0.31	0.0039	0.30	-0.0043	-0.55
Ethical dummy	-0.0309	-2.46	-	-	-	-

R^2 all funds: 0.0315, R^2 ethical and non-ethical funds: 0.0582, 355 observations.

Appendix 2

Graph 1: Histogram illustrating the Portfolio Change Measure of Performance on the fund level with a yearly lag for ethical and non-ethical funds. The y-axis shows fraction of all funds within the group expressed in percent and the x-axis shows monthly Portfolio Change Measure of Performance with a yearly lag.