Stockholm School of Economics
Department of Finance
Master Thesis in Finance

Sizing up Your Portfolio Manager:

Mutual Fund Activity & Performance in Sweden

Abstract: We examine the characteristics of active management and its effects on performance among Swedish equity mutual funds investing in the Nordic region. In line with Fama (1972), we consider stock selection and factor timing to distinguish between different aspects of active management. Based on holdings data between 2003 and 2011, we apply a methodology developed by Cremers and Petajisto (2009) and categorize funds according to Active Share and tracking error. We find evidence for differences in active management styles that cannot be recognized using conventional measures of active management. Further, it seems like those differences can be linked to fund performance. The results show that tracking error is negatively related to future returns with statistical significance, suggesting that factor bets are not rewarded in the market. Some evidence for a positive correlation between Active Share and performance persistence in fund returns is also found. For investors, this would mean that there is more to consider than the traditional measures of active management in fund selection. This is especially true when comparing fund performance between stock pickers and factor bets, two active management styles that are almost impossible to distinguish between using tracking error alone.

Keywords: Active Share, Tracking error, Active management**,** Mutual fund performance, Performance persistence

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1 Introduction

When evaluating mutual fund performance, the general consensus is that low-cost index funds deliver higher returns compared to actively managed funds, net of fees and expenses. This implies that active asset selection does not add sufficient value to investors. In contrast, investors rightfully expect premium returns for funds with higher fees and administrative costs. Mutual funds and fund managers are, however, not homogenous and differ in their degree of active management as well as style. Utilizing this, funds could be separated depending on type of active management in evaluating fund performance.

Mutual fund activity has traditionally been measured by tracking error volatility (or simply *tracking error)*. However, this approach only takes into account one dimension of active management. Fama (1972) concludes that fund managers can generate risk-adjusted returns in two ways; through stock selection or factor timing. Stock selection is the practice of picking stocks that are believed to outperform the market, while factor bets, also known as tactical asset allocation, are time-varying exposures to systematic risk factors relative to the benchmark index. These factors could be a sector of the economy, an entire industry, value stocks or any other systematic risk exposure towards the benchmark. In practice, even holding cash instead of investing in equities would generate factor exposure. These two distinctive ways of active management can both contribute to generating a positive risk-adjusted return but do not appear in a similar manner when estimating tracking error. For example, a fund could be very careful in their stock selection within industries but simultaneously have a diversified portfolio across industries. In contrast, another fund may choose industries or sectors that are believed to outperform the market and hold diversified positions within them. If this example was to be evaluated using tracking error alone, the latter fund would be considered more active. Clearly, this is not the whole story.

Considering the drawbacks of tracking error, Cremers and Petajisto (2009) developed *Active Share* as a complementary measurement of active management. Active Share simply measures the difference in terms of weighted holdings for a mutual fund in comparison to its benchmark index. The relative weight of a stock in the fund portfolio contra the benchmark determines if there is an active position. If the fund holds a higher weight in a particular stock compared to the index, it intuitively has an active long position in that stock. In contrast, if the fund does have less weight or none at all relative to the index, it has an active short position. Using this logic, fund holdings can be decomposed into two separate components; a position in the benchmark index as well as a zero-net-investment long-short portfolio. The subsequent portfolio portion of the fund is called Active Share, and is

essentially the fraction of fund holdings that differs from the benchmark index. Active Share will always be between zero and 100% for a mutual fund that never shorts a stock and never buys on margin. However, for hedge funds the long-short position is usually not a zero-cost investment. Because of this, the Active Share of a hedge fund can easily exceed 100%. Returning to the example outlined above, the diversified stock picker can now be seen as very active due to a high Active Share despite the low tracking error. Alternatively, taking systematic factor bets can generate high tracking error but a low deviation with regard to the positions relative to the benchmark index. It is clear that in combination with tracking error, Active Share gives a much broader view of the degree of active management than tracking error alone.

The purpose of this study is to examine the characteristics of active management and its effect on performance amongst Swedish mutual funds. In line with the suggestion of Fama (1972), we consider both stock selection and factor-timing to distinguish between different aspects of active management. Based on holdings data between 2003 and 2011, we apply Active Share to equity mutual funds investing in the Nordic region. Funds are categorized according to Active Share and tracking error to study the characteristics of active management and to determine if fund performance can be linked to specific investment styles. Our research is thereby of value for private as well as institutional investors in the process of making informed investment decisions.

The Swedish market is particularly interesting since all employed adults in Sweden passively invest in the fund market through the premium pension system[1]. In addition, 82% of the Swedish population is today actively investing in the fund market. As a consequence, assets under management of Swedish fund companies grew from 888 billion SEK in 2000 to over 1'900 billion SEK in 2010, according to Fondbolagens Förening (2012).

Our main contribution will be to the research of active management styles and fund performance. To our knowledge, Cremers and Petajisto (2009) and Petajisto (2010) are the only academics that have applied Active Share in previous research. We extend their research in the cross section with a sample of Swedish data, and in the time-series by looking at a sample period extending to December 2011. Also, few studies on active management and fund performance have previously been made on the Swedish market. The most significant is that of Dahlquist, Engström and Söderlind (2000). However they primarily look at performance persistence and do not apply any similar method of characterizing

[1] Dahlquist, Martinez, Söderlind (2011) gives a more detailed description. A further look at the Swedish fund industry can be found in section 10.3 of the appendix.

active management. Furthermore, we construct a dataset that can be used in future studies of Active Share.

We find evidence for differences in active management styles among mutual funds that cannot be distinguished using conventional measures of active management[2]. Furthermore, it seems like these differences can be linked to fund performance. We find tracking error to be negatively related to future returns with statistical significance, suggesting that factor bets are not rewarded in the market. In addition, some evidence suggests a positive correlation between Active Share and performance persistence in fund returns. For investors, this implies that there is more to consider than the traditional measures of fund activity when selecting funds.

The rest of the study will be outlined as follows; we begin with a review of related research (Section 2) before laying out the hypotheses in section 3. In section 4 we define the theoretical framework used throughout our paper. Section 5 describes our data sources, and the construction of the dataset. Results are presented in section 6 and section 7 concludes the thesis.

2 Previous Research

The literature review begins with a brief introduction to previous studies on mutual fund performance. We then continue with research that quantifies degree of active management before discussing the studies that most closely related to our subject.

2.1 Mutual Fund Performance

Vast research on the topic of fund performance has previously been made on different datasets and in various markets. In general, the performance of actively managed funds has shown to be weak. On average, fund managers underperform their benchmark indexes by the fee that they charge to investors. Before costs the best managers seem to add some value, however most of the excess returns vanish when expenses are taken into consideration. Sharpe (1991) calls it *the arithmetic of active management* and French (2008) refers to the phenomenon as *the negative sum game*; as an industry it seems like active managers underperform.

Jensen (1968) examines 115 funds in the period between 1945 and 1964. He does not find the average fund to predict security prices well enough to outperform a passive

[2] By *conventional measures* we mean tracking error or measures based on tracking error, such as the information ratio. Swedish funds are in general evaluated using such measures. Morningstar that is the world's largest independent publisher of information regarding mutual funds use tracking error as a measurement of degree of active management and active risk.

strategy. Furthermore, Jensen finds very little evidence that any fund in the sample was able to perform significantly better than what was expected from random chance.

Grinblatt and Titman (1992) do find evidence of performance persistence among mutual funds. They conclude that the differences in performance between funds are consistent with the ability of fund managers to generate abnormal returns. In their model, the persistence in fund returns cannot be explained by size, dividend yield, past return, skewness, interest rate sensitivity or the CAPM beta. In contrast, Carhart (1997) finds that fund performance does not reflect superior stock picking skill. Rather, common factors in stock returns and differences in transaction costs and expenses explain most of the predictability in fund returns.

A few more recent studies related to the subject of active management and fund performance. Kacperczyk and Seru (2007) looks at deviations from a passive benchmark formed on past analyst recommendations. They find that skilled managers are less sensitive to changes in information in the public domain. They conclude that this is evidence supporting that some fund managers may be more skillful than others. The findings of Cohen, Polk and Silli (2010) also suggest some evidence for cross sectional differences in fund manager skill. They examine fund manager bets, and conclude that some fund managers have stock picking ability. However, the industry makes it optimal for managers to include stocks in their portfolios that are not expected to outperform the market.

2.2 Degree of Active Management

Wermers (2003) evaluate active management and fund performance using tracking error with respect to the S&P500 index. He examines the relation between active bets and fund performance and finds that funds with higher levels of return volatility provide better performance. He concludes that fund managers that take larger active bets have better stock-picking skills.

Amihud and Goyenko (2010) use the R^2 from a regression of fund return on a multi-factor model that is considered a common benchmark for fund performance. They find that funds with low R^2, or greater deviation of its return to common factors, exhibit higher returns. This suggests that the most active managers have ability to generate abnormal returns.

Recently, an interesting approach to quantify degree of active management has been developed. Cremers and Petajisto (2009) investigate the U.S. market between 1980 to 2003 with regards to both tracking error and Active Share. By looking at the difference in asset weights between funds and their benchmark indices, Cremers and Petajisto measures the

ability of active mutual funds to generate returns by deviating from the benchmark. This approach gives a more detailed distinction of the funds type of active management since it differentiates stock picking ability from factor timing. Cremers and Petajisto find significant return differences along both dimensions of active management. While a significant relationship between Active Share and fund performance seem to exist, active management as measured by tracking error does not predict higher returns. Further, the funds with the highest Active Share outperform their benchmark indexes before and after costs, while the funds with the lowest Active Share underperform after expenses.

The study closest related to our paper is the one of Petajisto (2010), who sorts mutual funds into different categories of active management using Active Share and tracking error to investigate fund performance. He finds the most active stock pickers to outperform their benchmarks after transaction costs and fees. In contrast, funds with low degree of active management as well as funds utilizing factor bets tend to lose to their benchmarks. Petajisto also investigate the relationship between Active Share and future fund performance. The results suggest that investors can time their investments in stock picking mutual funds by using information in the cross section of stocks to estimate the opportunity set currently available to active managers. In doing so, the investor can predict *stock-pickers' markets* where opportunities are widespread among individual stocks and active managers are adding value.

3 Hypotheses

The underlying research question in this paper is whether some mutual funds perform better than others, and if so, how we can identify them using differences in style of active management. As mentioned, the results from previous research on this topic are ambiguous, but the general conclusion is that the average mutual fund underperforms when expenses have been accounted for. However, since some funds in fact seem to beat the market, we want to further examine how active managers add value through stock selection and factor timing.

H1: There are differences in active management styles among Swedish actively managed mutual funds that are difficult to distinguish using conventional measurements of active management.

Using Active Share in conjunction with tracking error, we investigate if there are evident differences in the dimensions of stock picking and factor timing among Swedish funds investing in the Nordic region. Having in mind the study by Petajisto (2010), we would expect to find evidence for cross sectional differences in active management. We further consider the following hypothesis.

H2: Differences in active management styles can be linked to fund performance.

If there are differences in performance between specific investment strategies of actively managed mutual funds, this could emphasize that some fund managers are more skillful than others. Moreover, we would expect that funds with higher levels of Active Share yield greater returns given the previous research.

H3: A relationship exists between performance persistence in fund returns and active management style.

One of the disadvantages of being active is obviously the risk of underperformance in comparison to the benchmark index. As a consequence, there should be some self-selection amongst actively managed funds, where funds with higher degree of active management differ either by having more skilled managers, better investment opportunities or in other ways that would make it beneficial for investors to choose those funds. If this is true, we would expect to find at least some performance persistence linked to level of active management. Since Dahlquist, Engström and Söderlind (2000) do not find any general evidence of performance persistence among Swedish equity mutual funds, such a relationship in our study would give even stronger evidence that Active Share and tracking error could be used jointly by investors to pick the best performing funds.

4 Method

Outlined below is the theoretical framework used to test our hypotheses. We apply an approach of using Active Share and tracking error as proxies to categorize actively managed funds in terms of stock picking and factor timing in such a manner as suggested by Fama (1972). We use this framework to study the characteristics of active management, and ultimately if variation in the degree of active management can be used as an indicator for differences in mutual fund returns.

4.1 Active Share

The computation of Active Share is outlined below for fund *i*, stock *j* and time *t*.

$$Active\ Share_{i,t} = \frac{1}{2}\sum_{i=1}^{N}\left|\omega_{fund_{j,t}} - \omega_{index_{j,t}}\right| \quad (1)$$

Where

- $\omega_{fund_{j,t}}$ is the weight of a specific stock in a fund's portfolio
- $\omega_{index_{j,t}}$ is the corresponding weight of the stock in the fund's benchmark index

For each period, the sum is computed across the universe of all assets[3]. Hence, Active Share measures the percentage of the fund portfolio that differs from the benchmark at a certain point in time.

4.2 Tracking Error

Tracking error measures the part of fund return volatility that is not explained by movements in its benchmark index. It is essentially the time-series standard deviation of the difference between the fund return and the benchmark return defined below for fund i and time t.

$$Tracking\ Error_{i,t} = StDev\left[R_{fund_{i,t}} - R_{index_t}\right] \quad (2)$$

Where

- $R_{fund_{i,t}}$ is the fund log return,
- R_{index_t} is the benchmark index log return.

We use daily returns within the six months prior to the holding reports to obtain reasonable estimations of tracking error and further require at least 100 trading days of return data in that period. Tracking error is annualized using 252 trading days per year[4]. Intuitively, a high tracking error indicates a large deviation of fund returns relative to benchmark returns. Thereby, tracking error will be greater than zero as soon as the fund holdings deviate from those of the benchmark index.

4.3 Active Share in Comparison to Tracking Error

As previously outlined, fund managers can outperform the market through stock selection and factor timing. Thereby, tracking error alone does not give a complete representation of active management. To see why, consider a market with two fund managers that are equal except for their investment philosophy. The investment universe consists of only twenty stocks; ten value stocks and ten growth stocks. In this market, the first fund manager makes six equally weighted and carefully made stock picks, three of which are value stocks and three of which are growth stock. The second fund manager instead picks six value stocks in an effort to outperform the market. The fund that overweighs value stocks, creating a large exposure towards a systematic risk factor, would clearly have a higher tracking error. This exposure is diversified away by the first fund manager who takes positions across the dimensions of value- and growth. This would lead to the faulty conclusion that the second

[3] We only consider equity securities in our calculations. Cash and other interest-bearing assets are excluded.
[4] Standard deviation is essentially a measurement of volatility and scales in proportion to the square root of time. Hence, we obtain the annualized tracking error by multiplying daily observations with the square root of 252 according to the formula $TE^{year} = TE^{day} \times \sqrt{252}$.

fund manager is more active than the first. However, introducing Active Share, both managers would appear equally active assuming that their stock picks deviate from the benchmark in the same way. Together, tracking error and Active Share provide a much more comprehensive view of a fund's active management. In this context, tracking error can be seen as a representation for systematic factor risk while Active Share is a reasonable proxy for stock selection.

4.4 Fund Categories

Using the two dimensions illustrated in Figure 1, fundamentally all types of conventional active management styles can be categorized into five groups. Diversified stock pickers are in the left-hand corner, with high Active Share but low tracking error. This category of funds take active positions within industries leading to a high Active Share, but since they do not overweigh any particular sector they keep tracking error fairly low. The opposite corner demonstrates factor bets with low Active Share but high tracking error. Those are the funds that take active bets on entire sectors of the economy without deviating much from their benchmarks otherwise, due to their relatively small active positions in individual stocks. The management style that combines high Active Share and high tracking error is categorized as concentrated stock pickers. A concentrated stock picker utilize both individual stock picks and factor bets, generating high values in both dimensions of active management. Mutual funds with low Active Share and tracking error are labeled closet indexers. Closet indexers typically almost replicate the benchmark index while claiming to be active. Last are pure index funds which have virtually zero Active Share and tracking error[5].

There are no straightforward boundaries for separating the different categories of active management outlined above. We split our sample into a 5 by 5 matrix in the Active Share and tracking error dimensions. Different styles of active management are then assigned according to the groups in Table 12. This approach is used mainly for two reasons. First, we suggest that level of active management to some extent is related to market characteristics such as size of investment universe[6]. Hence, applying some universal cut-off levels for determining type of active management is probably not of great use. Second, by dividing the sample into quintiles, we make sure to have enough funds in both dimensions to make further analysis meaningful.

[5] Index funds are included in Figure 1 only for illustrative reasons. No index funds are included in our sample.
[6] The importance of investment universe for comparison of Active Share between samples are further discussed in section 6.2.2.

4.5 Benchmark-Adjusted Net Return

In the analysis we use benchmark-adjusted net returns as measurements of fund performance in all calculations. There are several reasons for this choice. First, fund managers are typically evaluated against the benchmark index. Furthermore, investors do not care about fund performance in terms of some factor model since the alternative typically is to invest in a passive strategy. Moreover, it is potentially possible for an investor to tailor the exposure towards a particular index using Exchange Traded Funds (ETF's) or other types of index-contracts. This should be put in contrast to factor portfolios, which are usually not tradable for the average investor. Extending the line of reasoning, gross returns are of little interest in this context as it is the net return that ultimately is collected by investors. Gross returns are usually used when examining if fund investment strategies exhibits overall profitability, but net return is the true indicator whether the strategy survives expenses such as manager fees and trading costs. Cremers and Petajisto (2009) also show that the benchmark-adjustment accounts for most of the style difference across funds, and that the benchmark-adjusted returns generally have four-factor betas close to zero[7]. Hence, using the four-factor model would have a very little impact on overall results.

4.6 Regression Models

Two different regression models are used in our analysis. The first model is applied to investigate if Active Share can be explained by other fund characteristics such as tracking error and fund size. The purpose of this analysis is to establish if Active Share itself is a proxy for other explanatory variables of active management. The second regression model aims at explaining future benchmark-adjusted returns with Active Share included as a predictor.

4.6.1 Determinants of Active Share

In order to explain determinant factors of active management, we run a panel regression of Active Share on several explanatory variables. To capture fund-specific characteristics that might affect the level of Active Share but are not observed, for instance manager personality, skill, policy or culture, we apply a fixed-effects model. Thereby each fund is assigned a particular intercept. All variables are measured at the end of each quarter, which is the reporting date of fund holdings. With the intention of capturing within quarter fixed effects, quarterly binary variables are included.

[7] Cremers and Petajisto (2010) show that using the Carhart (1997) four-factor model makes little difference for benchmark adjusted returns across Active Share groups.

Standard errors are clustered by fund to account for persistence in Active Share (see Figure 3) as well as in several of the independent variables. The model is specified below for each fund i at end of quarter t.

$$\begin{aligned} AS_{i,t} = \alpha_i &+ \beta_1 TE_{i,t} + \beta_2 Stocks_{i,t} + \beta_3 Size_{i,t} + \beta_4 FundAge_{i,t} \\ &+ \beta_5 PrevRet1_{i,t} + \beta_6 PrevRet2_{i,t-4} + \beta_7 TE_{i,t-4} \\ &+ \gamma_t Q_t + \delta_i Fund_i + \varepsilon_{i,t} \end{aligned} \qquad (3)$$

Where

- $AS_{i,t}$ is the Active Share,
- $TE_{i,t}$ is the tracking error,
- $Stocks_{i,t}$ is the number of stocks in the fund's portfolio,
- $Size_{i,t}$ is the $\log_{10}$ of Net Total Assets,
- $FundAge_{i,t}$ is the fund age measured from the start date of the fund,
- $PrevRet_{i,t}$ is the net benchmark-adjusted return over the previous year (T-1 to T),
- $PrevRet2_{i,t-4}$ is the net benchmark-adjusted return over the two years prior to the previous year (T-3 to T-1),
- $TE_{i,t-4}$ is the prior one year tracking error,
- Q_t are quarterly time dummies,
- $Fund_i$ are fund dummies.

Because the first two independent variables, tracking error and number of stocks, are under the fund manager's direct control, they are clearly endogenous. This can further be deduced from that fact that Active Share and tracking error are in part jointly defined. In addition, the causality between Active Share and tracking error may be reversed. We address endogeneity problems by using explanatory variables that are beyond control of the fund manager. These are fund size, age and prior benchmark-adjusted returns. Also, we add the one year prior tracking error as an instrumental variable. Table 19 shows the results from Durbin and Wu-Hausman tests suggesting that tracking error is endogenous.

In identifying the determinants of Active Share, the fixed effects estimator is the most appealing approach in both a theoretical and statistical sense. Nevertheless, some of the unobserved variables may not be constant over time. For example, a fund investment policy and culture is more likely to be constant over time in comparison to manager skill since the management team could change over time. Further, because the design of fixed-effects models are aimed at studying causes of changes within entities, observed but time-invariant fund characteristics cannot be utilized. For example, we do not have time varying data over fund expenses and this variable is thereby excluded from the analysis.

It could be argued that fund manager fixed effects would be more appropriate in our situation, especially since Cremer and Petajisto (2009) show that different managers at a certain fund can vary substantially in their level of Active Share. However, because we did not have access to historical data on fund management and tenure this has not been taken into account.

4.6.2 Predictive Regression

In examining the predictive power of Active Share on future returns, we apply pooled panel regressions where the one year benchmark-adjusted net returns measured over year T is regressed on predictors measured at the end of T-1. Thereby, returns are computed to capture the cumulative one year return following the observed explanatory variables. Because we use benchmark-adjusted returns we do not include time dummies. Standard errors are clustered by fund to account for persistence in returns as well as explanatory variables. The following baseline model specification is used for fund i and quarter t.

$$\begin{aligned} Ret_{i,t} = \alpha_i + \beta_1 AS_{i,t-1} + \beta_2 TE_{i,t-1} + \beta_3 Expenses_{i,t-1} + \beta_3 Size_{i,t-1} \\ + \beta_4 Stocks_{i,t-1} + \beta_5 FundAge_{i,t-1} \\ + \beta_7 PrevRet1_{i,t-1} + \beta_7 PrevRet2_{i,t-4} + \varepsilon_{i,t} \end{aligned} \quad (4)$$

Where

- $Ret_{i,t}$ is the cumulative one year benchmark-adjusted net return following quarter t,
- $AS_{i,t-1}$ is Active Share,
- $TE_{i,t-1}$ is tracking error,
- $Stocks_{i,t-1}$ is the number of stocks in the fund's portfolio,
- $Size_{i,t-1}$ is $\log_{10}$ of net total assets,
- $FundAge_{i,t-1}$ is the fund age measured from the start date divided by 100,
- $PrevRet1_{i,t-1}$ is the net benchmark-adjusted return over the previous year (T-1 to T),
- $PrevRet2_{i,t-4}$ is the net benchmark-adjusted return over the two years prior to the previous year (T-3 to T-1).

All variables are measured at the end of each quarter. To check robustness, we later apply this same model on yearly observations of explanatory variables (section 6.6.2), setting the year end to be in June to include as many observations as possible. Further, we examine the same yearly model using fund fixed-effects (section 6.6.3).

5 Data

5.1 Return Data

We compute mutual fund log returns from daily Net Asset Values adjusted for reinvested dividends gathered from the SIX-TRUST database. We obtain returns after expenses, brokerage commissions and fees but excluding any front- or back-end-loads, i.e. net returns. This return measurement is chosen since we are mainly interested in fund performance from an investor's point of view. The net return is what investors ultimately collect, and is hence of most interest. From daily returns, we compute cumulative monthly and yearly returns. To a large extent, the database includes dead funds, limiting the problem of survivorship bias. However, we discovered certain anomalies in the NAV-series from the SIX-TRUST database, leading to daily returns well beyond 300%. Incorrectly reported observations were removed and we also drop daily returns exceeding 15%. Further on, we also exclude all tracking error observations above 40%. For all benchmark indices, we compute returns in the same manner from daily index prices adjusted for reinvested dividends collected from the SIX-TRUST database.

5.2 Holdings Data

End-of-quarter fund holdings have been acquired from the Swedish Financial Authority (*Finansinspektionen*). The data is available from March 2000 to December 2011 and new holdings reports are published quarterly, publicly available at the authority's webpage. Also, this data is to our knowledge free of survivorship bias. Index weights- and holdings reports have been gathered from the SIX-TRUST database.

5.3 Index Asset Weights

For the benchmark indices, specific asset weights in each index are available from index weight reports. However, for the mutual funds we calculate them separately. For each fund and report date, we sum the market value of all fund assets to get total market capitalization. We then divide each asset's market value with the market capitalization to obtain the individual security weights in the fund portfolio. We only include equity securities in the computation of asset weights (cash and other interest-bearing securities are excluded). However, since we only consider all-equity funds this will not be of major concern for our results.

5.4 Control Variables

We also use the fund holdings reports to compute some of the control variables used in our regressions. For fund size we use the total market capitalization of the fund, calculated as

described above. The number of assets is simply calculated as the total number of securities for a specific fund at a given point in time.

Yearly mutual fund ongoing charges have been obtained from fund prospectuses. As we have not been able to obtain historical data, the most recent available values have been used as a proxy over the entire sample period. Thereby we assume that the level of fund ongoing charges do not significantly vary over time. Ongoing charges include operating costs, fees, marketing and distribution costs but exclude transaction costs and performance fees. For many funds, it is thereby closely linked to the Total Expense Ratio.

5.5 Dataset Formation

Benchmark indices have primarily been chosen based on the most recent self-reported benchmarks in the funds' fact sheets. These have been gathered from numerous places but mainly from the fund companies' websites. The advantage of using the prospectus benchmark is that it is what the fund has publically committed to outperform, thereby making investors and manager inclined to focus on this index in performance evaluation. On the other hand, funds may have methodically tilted away from their benchmark in order to, for example, capture the value premium. The chosen benchmark indices all belong to the SIX and OMX index families, which are chosen based on data availability. Table 11 shows descriptive statistics for the benchmarks. For the funds where we do not have data on weights for their corresponding benchmarks, we use the index that produces the lowest time-series average Active Share. Although not ideal, this method cannot be completely incorrect because we choose the index that is the most closely related to the fund's portfolio. In that sense it could also be used to track style changes for a fund over time. The index that is assigned to each fund using the method above is also applied in the calculations of tracking error and benchmark-adjusted return.

To compute Active Share, we first merge the quarterly fund reports with the index reports, making sure that fund report dates match the balance dates in the index reports. Second, all individual assets held by the funds are matched to the assets held by the benchmark indices. Matching is done using International Security Identification Numbers (ISIN-codes). ISIN-codes are available for all assets over the complete sample period in the fund reports, but missing prior to 2006 in the index reports. To solve this issue, we use company ticker and ISIN-code to construct a dataset of unique ticker/ISIN-code combinations using a sample of index report data past 2006 as well as ticker lists provided by Nasdaq OMX. We then use this dataset to assign ISIN-codes to assets in the period 2000 to 2006. If a ticker cannot be matched to a specific ISIN-code, we treat the observation as

missing. We note that this may lead to estimation error in Active Share since unmatched assets may or may not be present in the funds with weights different from the index weights. Due to this, we set a 90% lower cut-off for matched index-holdings and thereby limit our sample period to extend from March 2003 to December 2011[8].

Active Share is calculated using the equation above for all funds with respect to all five benchmark indices. Whenever possible, we use the Active Share calculated against the benchmark from the fund prospectuses. When this is not available, we use the method outlined in paragraph one above.

5.6 Sample Selection

The original holdings dataset consists of a total of 899 unique funds[9]. We include only Swedish all-equity funds investing in the Nordic region that claim to be actively managed, looking at fund prospectuses to determine asset class and geographic concentration[10]. Further, index- and sector funds have been excluded. The final sample consists of 129 Swedish funds and six benchmark indices between March 2003 and December 2011. The dataset contains quarterly observations on number of assets, market capitalization, tracking error and Active Share as well as monthly return series. Table 20 show time series averages for our sample. The average fund has a total market capitalization of 2380 million SEK and 62 assets in its portfolio, however the cross sectional dispersion is large in both dimensions. The same is true for Active Share and tracking error, which range between 21-91% and 6-19% respectively. Annualized net returns are in the range of -29 to 30% while the average benchmark-adjusted annual return is -0.15%, suggesting that funds on average slightly under perform in comparison to their benchmarks.

5.7 Data Quality and Limitations

Data biases are usually a problem when measuring fund performance. Even if the dataset acquired from *Finansinspektionen* ought to be complete, some irregularities were found that might impact the quality of the dataset. Some of the 899 funds in the original dataset are duplicates that changed fund name or got acquired by a different fund company during the sample period. As far as we know, such cases were resolved by manual matching. Also, a few funds disappeared irregularly for some single periods in the dataset. Although *Finansinspektionen* regularly requests information from Swedish mutual fund companies, it is

[8] A detailed motivation for the 90% limit is presented in section 10.5.
[9] Some of the 899 funds are duplicates that changed fund name or got acquired by a different fund company during the sample period. This issue is further discussed in section 5.7.
[10] A few exceptions have been included but all with very few investments outside of the Nordic countries.

the fund companies themselves that are responsible for reporting the correct data. Thus, the correctness of the data is not guaranteed, but Finansinspektionen (2012) states that the authority completes the sample when erroneous information is found.

Furthermore, we were not able to obtain NAV series for four of the funds in the sample and they were therefore excluded. This will probably lead to some minor survivorship bias since the problem only occurred amongst dead funds.

The choices of benchmark indices among Swedish mutual funds were under debate a couple of years ago. The critique arose from funds using benchmarks that excluded dividends in order to appear as if they outperformed their index. As a result, funds changed their benchmarks to include dividends. Any potential discrepancies from this is neither problematic since we always use the total return series of the benchmark indices. Nevertheless, fund managers choosing benchmarks that are easier to beat could still distort the results to some degree.

Moreover, using observation of ongoing charges in the most recent year as an explanatory variable in analysis would lose credibility if a fund has undergone any major policy change regarding its cost or fee structure during the sample period. In addition, performance fees could have a large influence on the total expenses for certain funds. Having this in mind, we are moderate in our conclusions regarding fund fee levels. In this study, ongoing charges are referred to as *expenses*.

6 Empirical Results and Analysis

We begin the analysis by exploring Active Share over time. We then investigate the two aspects of active management and how they are related to fund size before looking at possible determinants of Active Share. We then proceed to investigate the relationship to fund performance. We examine performance persistence and the link between active management, fund performance and size. Finally, we explore if the variables at hand can be used as predictors for future returns.

6.1 Active Management over Time

Figure 2 shows the time series progression of active management between March 2003 and December 2011. Prior to 2007, funds in the 0-20% range of Active Share were rare. The majority of funds showed an Active Share between 20-40% with approximately 20% of all funds at levels above 60%. However, during 2007 and 2008 the share of funds in the lowest range of Active Share increased noticeably from virtually zero to 20%. While the fraction of funds with Active Share above 60% decreased somewhat, it was mainly the middle segment that decreased their level of Active Share during this period. Funds with an Active Share in

the range of 40-60% shrunk as portion of aggregate fund asset value, from 25% in December 2006 to less than 10% in July 2008. The same trend was evident among funds in the 20-40% range of Active Share, which decreased their portion of aggregate fund asset value with about 10% during the same period. Thereby, the moderately active funds converged towards their benchmark indices during a period of market turmoil and financial instability. The same trend is not evident among the funds in the 60-100% range of Active Share, suggesting that the most active managers stayed active during the crisis.

After December 2008, the share of funds with Active Share in the range of 40-60% increased on the expense of the funds in the lower range. We consider this further evidence of that it mainly was the funds in the lower segment of Active Share that converged towards their benchmarks during 2007 to 2008. At the end of the sample period, we observe an increased level of Active Share throughout the sample. In this sense, it seems like Active Share is somewhat correlated with the overall market climate as an increased volatility yields additional career risk for the fund manager.

6.2 Active Share and Tacking Error

Table 7 shows the average number of funds divided into groups depending on Active Share and tracking error in 2011. Regardless of level of Active Share, there is a wide distribution of tracking error. Even the funds that show Active Share in the 10-20% interval exhibit a tracking error in the range of 12-14%. The same pattern is evident with regards to tracking error, with both high and low Active Share funds represented in the highest and lowest tracking error percentage groups.

Most funds in our sample end up in the 12-14% range of tracking error. This is rather high, but can in part be explained by the sample period. Nordic stock markets were exposed to high volatility during the second half of 2011 due to financial instability in the Eurozone, a phenomenon which naturally resulted in high tracking errors for virtually all funds in our sample.

In terms of Active Share, the majority of funds fall into a range of 20-50%, but the dispersion is large for all tracking error percentage groups. We believe the rather low level of Active Share to some extent is explained by the medium segment of funds that tend to decrease their level of Active Share when the economic climate is tough. This probably led to a decline in the average level of Active Share across funds. We investigate the level of Active Share in more detail in section 6.2.2.

6.2.1 Fund Size

Table 1 below shows how Active Share, tracking error and fund size are related. Each quarter we sort funds into Active Share and tracking error quintiles (in that sequential order) and compute median values over the time for the 25 portfolios. Within Active Share quintiles, we find the largest median net asset value among the funds with lowest Active Share. The funds in the bottom quintile of Active Share have a median size of 1250 million SEK, which is more than double the size of the funds in quintile two. The funds in the middle range of Active Share exhibit a median size of 759 to 1160 million SEK, while the funds in the top quintile are significantly smaller at about 472 million SEK. In terms of Active Share, it seems like the most active funds also are the smallest. The same pattern shows up within tracking error quintiles where the smallest or second smallest funds are to be found in the highest Active Share quintile in all five subgroups. In total, the evidence suggests that the smallest funds are the most active in terms of Active Share.

TABLE 1. MEDIAN FUND SIZE
The table shows time-series median fund size for each category. Each quarter, funds are sorted into quintiles first by Active Share and then by tracking error. The sample period is 2003 to 2011. All variables are calculated as before. Size is measured as total market capitalization of fund assets in MSEK.

Median Net Asset Value (MSEK)						
Active Share Quintile	Tracking Error Quintile					
	Low (1)	2	3	4	High (5)	All
High (5)	1240	463	414	279	332	472
4	1610	870	671	564	293	759
3	2410	2210	1440	349	293	1160
2	1900	1560	326	269	268	514
Low (4)	3410	1110	1020	982	979	1250
All	1990	1060	615	429	326	750

When considering tracking error as the measurement of active management, the trend is more apparent. At the aggregate level, fund size is strictly decreasing with tracking error. Median net asset value in the lowest tracking error quintile is 1990 million SEK, more than six times larger than the median size of the funds in the highest quintile. Within Active Share quintiles, tracking error is decreasing for all but one subgroup. To sum up, fund size seem negatively related to both Active Share and tracking error, with the most active funds being notably smaller.

6.2.2 Categories of Active Management

Table 2 shows time-series averages of funds grouped into different categories by level of Active Share and tracking error sorted by month[11]. 67% of all funds end up in the two least active categories. These are the moderately active funds and the closet indexers. The moderately active funds have an average Active Share and tracking error of 41% and 10% respectively. They have an average number of 66 stocks in their portfolios and holdings of 2660 million SEK. Only closet indexes are larger, with an average of 3220 million SEK in assets and 74 stocks. In terms of expenses, the moderately active funds are slightly more expensive than the factor bets, while closet indexers stand out as the cheapest. The most expensive funds are the stock pickers and the concentrated funds.

Factor bets are the fund category with the second largest average tracking error (13.9%). Only concentrated funds present a higher value of 15.6%. Factor bets have a relatively lower Active Share than the moderately active funds, suggesting that their volatility mainly is driven by small individual stock picks that generate exposure to general economic factors. Together with the concentrated funds, they have the smallest average number of stocks.

TABLE 2. CATEGORIES OF ACTIVE MANAGEMENT: DESCRIPTIVE STATISTICS
The table shows time-series mean values of number of funds, size, Active Share, tracking error, expense ratio and number of stocks for each group. Each month, funds are sorted into groups of active management first by Active Share and then by tracking error. All variables are calculated as before.

		Mean Values					
Group	Label	Number of Funds	Assets (MSEK)	Active Share (%)	Tracking Error (%)	Expense Ratio (%)	Number of Stocks
5	Stock Pickers	15	1870	74	9.6	1.47	57
4	Concentrated	3	933	77	15.6	1.52	43
3	Factor Bets	13	1590	36	13.9	1.35	47
2	Moderately Active	47	2660	41	10.1	1.40	66
1	Closet Indexers	16	3220	23	9.5	1.18	74
	All	94	2420	44	10.6	1.37	63

Interestingly, we find the stock pickers to have a lower average tracking error than moderately active funds, at the same magnitude as the closet indexers. As previously discussed, we believe this to be a consequence of the sample period, since both indices and mutual funds experienced high volatility during the 2008 financial crisis. This would lead to a higher level of tracking error even for the least active fund categories.

Concentrated funds are the smallest group in the sample, including only 3 funds on average through the time-series. While being the most expensive type with an average

[11] A more detailed description of how funds are grouped is to be found in section 5.6.

expense ratio of 1.52%, they are also typically the smallest funds with an average of 933 million SEK in assets and 43 stocks.

It seems like Swedish mutual funds have a relatively low level of Active Share in general, but display quite high tracking error. We do not believe that this is evidence for that Swedish fund managers in generally are less active, rather this is a consequence of fundamental differences between markets. First, consider the two most active categories in our sample, the stock pickers and the concentrated funds, which on average have 57 and 43 stocks respectively in their portfolios. The same measure for the same two categories in the Petajisto (2010) study is 66 and 59 stocks. In terms of number of assets, it seems like the fund categories are comparable between samples. However, the difference in investment universe between the Nordic region and the U.S. market is huge. According to Swedbank (2012), the possible number of investments is at the moment approximately 80 different stocks for a fund investing in Swedish large cap stocks. At the same time, the equivalent U.S. fund manager, investing domestically in the U.S. market, can at least choose among the 500 constituents of the S&P 500[12]. Hence, a possible explanation for the lower level of Active Share is simply that there is not enough attractive stock picks available to Swedish fund managers in order to deviate much from their benchmarks, unless they are fairly aggressive in their investment style. Also, consider what would happen if the Swedish fund manager picked roughly the same percentage of stocks as his U.S. equivalent. In this case, his portfolio would have a total of only 8-10 stocks, which is rather unlikely due to the obvious lack of diversification. Further, according to Granit Fonder (2012), a mutual fund is required to have at least 16 constituents in its portfolio to follow the UCITS directive.

6.3 Determinants of Active Share

We apply panel regressions of Active Share on several of explanatory variables to examine if Active Share can be described by other common fund characteristics[13]. In table 3, we see that tracking error is the noticeably strongest explanatory variable of Active Share and is quite robust to the addition of other explanatory variables with a t-statistic ranging from 4.01 to 4.19. Economically, this means that a 10% increase in annualized tracking error increases Active Share by roughly 6.03% when controlling for other variables. However, tracking error alone explains only a small proportion of the variance in Active Share. Among the other predictors, the number of stocks comes up as significant in a statistical but not

[12] Usually, the Russell 1000 Index is considered to be a large-cap index which increase the investment universe even more.
[13] A detailed description of the regression model can be found in section 6.4.

economically meaningful way. The results regarding fund age are ambiguous, with low statistical significance as well as low economic value. Previous year's benchmark-adjusted net returns come in as statistically significant with a positive coefficient.

Last, we see that Active Share is hard to explain in terms of other variables. Our most comprehensive model specification only accounts for a R^2 of 14.4%. Thus, Active Share seems to be an aspect of active management that cannot easily be clarified by other variables.

TABLE 3. DETERMINANTS OF ACTIVE SHARE

The table shows coefficients of regressions of quarterly observations of Active Share on explanatory variables using fund- and time-specific fixed effects. All variables have been calculated as before. Time dummies have been suppressed. Return over index represents a fund's net return in excess of its benchmark index. The constant is the average value of the fixed effects. Index funds have been excluded from the sample. The *t*-statistics (in parentheses) are based on standard errors clustered by fund. *, ** and *** denote significance at the 10%, 5% and 1% level respectively.

	Active Share				
	(1)	(2)	(3)	(4)	(5)
Tracking Error	0.723***	0.719***	0.719***	0.645***	0.603***
	(4.19)	(4.15)	(4.15)	(4.03)	(4.01)
log_{10}(TNA)		-0.011	-0.011	-0.023	-0.018
		(-0.49)	(-0.49)	(-0.85)	(-0.67)
Number of Stocks				-0.001***	-0.001***
				(-2.74)	(-2.82)
Fund Age			0.001	0.003	0.005*
			(0.51)	(1.28)	(1.80)
Return over Index (T-1 to T)				0.065***	0.060***
				(2.79)	(2.63)
Return over Index (T-3 to T-1)				0.065***	0.060***
				(2.79)	(2.63)
Tracking Error (T-1)					0.348***
					(2.86)
Constant	0.335***	0.420**	0.413**	0.544**	0.451**
	(11.02)	(2.22)	(2.26)	(2.44)	(2.00)
Quarterly dummies	Yes	Yes	Yes	Yes	Yes
Errors clustered by	Fund	Fund	Fund	Fund	Fund
N	3369	3369	3367	3144	3144
R^2	0.064	0.064	0.064	0.134	0.144

6.4 Active Management and Fund Performance

Table 8 show benchmark adjusted average net returns for 25 portfolios of funds arranged by Active Share and tracking error. Each month, all funds in our sample are sorted into quintiles, first by Active Share, and then by tracking error. We then compute monthly benchmark adjusted net return for each portfolio and finally annualize the time-series averages.

At the aggregate level, it seems like there exists a weak positive relationship between Active Share and fund performance. Beginning at the top quintile, average benchmark-adjusted net returns decrease as we move towards lower values of Active Share. The top quintile exhibits an annualized benchmark-adjusted net return of 0.73%. The same figure for quintile four and three are 0.22% and -1.38% respectively. However, only one of our five aggregate portfolios is statistically significant at the 5% level. Also, the magnitude of returns is low in our sample.

The low level of significance makes us less suspicious about the fact that the portfolio with lowest Actives Share displays a small positive benchmark-adjusted net return (0.15%, t-statistic of 1.2). Examining the return difference between portfolios in the highest and lowest quintiles of Active Share reveals the pattern somewhat more clearly. All groups except for the highest tracking error quintile show strictly positive benchmark-adjusted net returns in the range of 0.32% to 1.84%. It seems like it is among funds with moderately high tracking error that the return differences are most prominent. However, since the t-statistics are low, we cannot draw any further conclusions from the results although there seem to exist some dispersion in average net returns that is dependent on Active Share after tracking error has been accounted for.

When inspecting benchmark-adjusted net returns using tracking error quintiles, no clear relationship is found. The highest tracking error quintile shows a negative benchmark-adjusted net return of -0.78%, which actually is statistically significant at the 10% level. Quintile four and three show annualized returns of 0.09% and -0.17% respectively, none of which are statistically significant at any reasonable level. Quintile two and one exhibits returns close to zero with low t-statistics. If there is a weak positive relationship between fund return and Active Share, such a relationship clearly does not exist between fund performance and tracking error. Rather, it seems like tracking error is negatively related to fund performance, with the highest tracking error quintile showing in this context a quite large negative benchmark-adjusted net return.

Investigating the return difference between portfolios in the highest and lowest quintiles of tracking error reveals the pattern more clearly. All groups except for the lowest

Active Share quintile show negative benchmark-adjusted net returns. However, it seems like the funds in the medium range of Active Share exhibit the largest return difference. Quintile three shows a negative benchmark-adjusted net return of -3.84%, which is statistically significant at the 5% level. In comparison to the analysis of Active Share, it seems like tracking error is somewhat negatively correlated with fund performance. Before drawing any further conclusions, we will next examine if return differences can be related to fund size.

6.4.1 Size and Performance

Our findings suggest that fund size and style of active management to some extent are correlated. In short, we find fund size to decrease in both dimensions, suggesting that the most active funds in general are smaller than the less active ones. Considering the weak evidence of a relationship between fund performance and active management, we now turn to investigate if this relationship can be explained by size. This is primarily done because previous evidence of how fund size and return is related is ambiguous. Grinblatt and Titman (1989) finds varied evidence that fund returns decline with size, while Chen et al. (2004) actually concludes that fund size erodes performance.

Each month, we sort funds into quintiles, first by Active Share and then by size. Table 9 shows the time-series average benchmark-adjusted net returns for funds in each of the 25 portfolios. At the aggregate level, we find no evidence that size have an effect on average benchmark-adjusted net returns. All values are close to zero with very low t-statistics. Looking within Active Share quintiles, there is no clear evidence for size as predictor of benchmark-adjusted returns. The smallest size quintiles seem in general to earn somewhat higher returns, however this difference is not statistically significant. Within each quintile, high Active Share funds earn slightly higher returns even if this effect not is statistically significant. In total, we find no evidence that funds size should explain differences in benchmark-adjusted net returns. The same weak pattern showing high Active Share funds earning slightly higher average returns show up when sorting by size quintiles.

6.4.2 Performance by Fund Category

Table 4 shows times-series average benchmark-adjusted net returns for the five categories of active management sorted by month. As previously mentioned, the average fund slightly underperforms its benchmark by -0.12%. However, when we group funds into different categories of active management, return differences are more evident

The group that seems to produce the highest mean benchmark-adjusted net return is the stock pickers who on average outperform their benchmark with 0.82% annually. However, the t-statistic is not high enough to show statistical significance at the 10% level. In contrast, funds utilizing factor bets seem to lose to their benchmarks indices. On average, they experience a negative benchmark-adjusted annual net return of -1.02%, significant at the 5% level.

None of the remaining groups show any significant evidence of ability to produce returns different from their benchmarks. The concentrated funds and closet indexers show slightly positive returns. However, the t-statistics are too low to draw any conclusion about the results.

TABLE 4. CATEGORIES OF ACTIVE MANAGEMENT: FUND PERFORMANCE
This table shows time-series mean returns for each of the five categories of active management. Each month, funds are sorted into quintiles first by Active Share and then by tracking error. All funds are then grouped into different categories of active management dependent on level of Active Share and tracking error. Boundaries for different groups are presented in table 12. The sample period is 2003 to 2011. All variables are calculated as before. T-statistics are shown in parenthesis.

Group	Label	Benchmark-adjusted Net Return	
5	Stock Pickers	0.82	(1.21)
4	Concentrated	0.26	(0.12)
3	Factor Bets	-1.02	(-1.94)
2	Moderately Active	-0.24	(-0.97)
1	Closet Indexers	0.02	(0.06)
	All	-0.12	(-0.60)
5 - 1	Difference	0.80	(0.60)

Return differences cannot be due to differences in fund size, since we found size to be more or less uncorrelated to fund performance. The results are mainly in line with previous studies, finding the average fund manager unable to outperform the market. However, our results suggests that there are differences in fund performance, that at least to some extent can be explained by style of active management in terms of Active Share and tracking error. In this context, an investor should clearly avoid funds utilizing factor bets and instead turn to the most active stock pickers. Other fund categories described merely performs as their benchmarks when fees have been accounted for, and are hence of less interest.

6.5 Performance Persistence

Concluding that there seems to be at least some variation in benchmark-adjusted net returns among different groups of active management, we now investigate if there are any differences in performance persistence related to our measurements of active management. Our findings consistently propose a negative relationship between fund performance and tracking error. Hence, we naturally consider Active Share as the measure worth further study in trying to select superior performing funds. Each month, funds are sorted into quintiles first by Active Share and then by their cumulative benchmark-adjusted net return over the previous 12 months. Table 10 shows the annualized monthly mean benchmark-adjusted net returns for the 25 portfolios.

On average, the funds in our sample show clear evidence of performance persistence. Looking solely in the dimension of previous 12-month returns, all five portfolios in the highest return quintile show positive average benchmark-adjusted net returns regardless of level of Active Share in the range of 2.13% to 4.68%. All values but one is statistically significant at the 5% level. At the aggregate level, the highest return quintile earn on average 2.87% in excess of the benchmark compared to -2.11% for the lowest return quintile (t-statistics of 5.22 and -4.70 respectively). We consider this evidence of performance persistence in fund returns where past winners continue to beat their benchmarks, while past losers on average continue to perform poorly.

Moreover, it seems like performance persistence is related to Active Share. At the aggregate level, we find the top Active Share quintile to earn a yearly average benchmark-adjusted net return of 0.65%. However, the t-statistic is somewhat low (1.30) so the result is not statistically significant at the 10% level. In the highest return quintile, returns are almost strictly increasing in level of Active Share and all but one are statistically significant at the 5% level. The same pattern is, however, not as evident among the rest of the return quintiles. Even if return quintile one and two shows the highest values in the top Active Share group, the same is not true for return quintile four. In total, there seem to be some variation in performance persistence due to Active Share even if the pattern is somewhat indistinct. On the other hand, the group with highest prior return suggests that return persistency increase in level of Active Share.

In relation to the results from the determinant regression, the statistically significant and positive coefficients of previous returns could thereby mean that fund managers that are skilled decide on a high Active Share and persistently thrive in performance.

6.5.1 Performance Persistence by Fund Category

Table 5 shows time-series mean yearly benchmark-adjusted net returns over for the five groups of active management. The highest return quintile does yet again show evidence of performance persistence. On the aggregate level, prior winners beat their benchmarks by 3.19% annually. With a t-statistic of 6.28 this result is highly significant. Moreover, the stock pickers are the funds that show highest performance persistence. On average, they beat their benchmark by 5.09% compared to 3.65% for the moderately active funds and 1.64% for the closet indexers. All results are statistically significant at the 5% level. However, factor bets does not show evidence of positive performance persistence. Among their past winners, funds on average show positive average benchmark-adjusted net returns (1.28%), but the t-statistic suggests that this result not is different from zero. Concentrated funds are too few for any meaningful analysis.

TABLE 5. CATEGORIES OF ACTIVE MANAGEMENT: PERFORMANCE PERSISTENCE
The table shows annualized benchmark-adjusted net returns. Each month, funds are sorted into quintiles first by Active Share and then by tracking error. Boundaries for different groups are presented in Table 12. Each group are then further split into quintiles depending on their cumulative benchmark-adjusted net return over the previous 12 months. The sample period is 2003 to 2011. T-statistics are shown in parenthesis.

Benchmark-Adjusted Net Return (%)								
Group	Label	Prior 1-Year Return Quintile					All	High - Low
		Low (1)	2	3	4	High (5)		
5	Stock Pickers	0.18	-1.38	0.77	-0.06	5.09	0.78	4.91
		(0.11)	(-0.88)	(0.58)	(-0.04)	(3.04)	(1.21)	(1.53)
4	Concentrated	0.87	-4.60	24.32	2.45	.	0.04	.
		(0.25)	(-1.21)	(0.71)	(0.68)	(.)	(0.12)	(.)
3	Factor Bets	-2.38	-3.58	-0.31	-0.22	1.28	-1.11	3.66
		(-2.07)	(-3.26)	(-0.31)	(-0.18)	(0.85)	(-1.94)	(1.80)
2	Moderately Active	-3.17	-2.25	-0.58	1.27	3.65	-0.27	6.82
		(-5.59)	(-4.28)	(-1.21)	(2.39)	(5.32)	(-0.97)	(3.74)
1	Closet Indexers	-0.65	-0.61	-0.25	0.21	1.64	0.02	2.29
		(-1.02)	(-1.09)	(-0.40)	(0.32)	(2.24)	(0.06)	(1.64)
All		-1.88	-2.13	-0.19	0.75	3.19	-0.16	5.07
		(-4.21)	(-4.77)	(-0.49)	(1.70)	(6.28)	(-0.80)	(4.04)
Difference		0.83	-0.77	1.02	-0.27	3.44	0.75	
		(0.47)	(-0.57)	(1.00)	(-0.08)	(1.14)	(1.03)	

Both factor bets and moderately active funds show negative performance persistence in the two lowest prior return quintiles. All four results are statistically significant at the 5% level. The closet indexers show small negative returns in the three lowest prior return quintiles; however the t-statistics suggests that those results are not different from zero. The stock pickers do not show any significant evidence of negative return persistence whatsoever.

6.6 Future Return Predictions

6.6.1 Quarterly Predictive Regression

Last, we examine if Active Share and tracking error can be used as predictors for future returns. Table 6 shows the results from pooled panel regressions of cumulative benchmark-adjusted net returns on lagged explanatory variables[14].

TABLE 6. QUATERLY PREDICTIVE REGRESSION

The table shows estimated coefficients for regressions of cumulative net return in excess of benchmark index return in year on explanatory variables. The dependent variable is measured as of quarter *t* whereas the independent variables are measured at the end quarter *t*-4. All variables are computed as before. Return over index is the benchmark-adjusted return in the previous 1-3 years. Index funds have been excluded from the sample. The *t*-statistics (in parentheses) are based on standard errors clustered by fund. *, ** and *** denote significance at the 10%, 5% and 1% level respectively.

	Benchmark-Adjusted Net Return				
	(1)	(2)	(3)	(4)	(5)
Active Share	0.0118	0.0083	-0.0027	-0.0002	
	(0.96)	(0.67)	(-0.24)	(-0.01)	
Tracking Error		-0.0984***	-0.1010**	-0.0922**	
		(-2.67)	(-2.39)	(-2.09)	
Stock Pickers					0.0046
					(0.83)
Concentrated					-0.0342***
					(-2.86)
Factor Bets					-0.0113**
					(-2.22)
Moderately Active					-0.0021
					(-0.56)
Expenses				-0.9453	-0.8436
				(-1.61)	(-1.48)
log_{10}(TNA)			-0.0009	0.0008	0.0016
			(-0.31)	(0.23)	(0.52)
Number of Assets				-0.0000	-0.0000
				(-0.60)	(-0.79)
Fund Age / 100				-0.0364	-0.0513
				(-0.80)	(-1.19)
Return over Index (t-1 to t)			0.0020	-0.0031	-0.0086
			(0.04)	(-0.07)	(-0.21)
Return over Index (t-3 to t-1)			0.0025	-0.0006	-0.0003
			(0.21)	(-0.05)	(-0.03)
Constant	-0.0082	0.0030	0.0148	0.0171	0.0037
	(-1.45)	(0.46)	(0.58)	(0.58)	(0.14)
Errors clustered by	Fund	Fund	Fund	Fund	Fund
N	3144	3099	2942	2939	2939
R^2	0.001	0.008	0.008	0.014	0.023

[14] A detailed description of the regression model can be found in section 6.4.

In columns 1 through 4, Active Share does not come up as a significant predictor of return. This may be due to the respectable performance of funds categorized as closet indexers that we observe in the previous analysis, implying that any predictive power of higher levels of Active Share on future returns would be reduced. Nevertheless, tracking error comes up as a highly significant negative predictor with t-statistics in the range of -2.09 to -2.67. The predictive power is to some extent reduced as other variables are added to the model. Economically, a 10% increase in tracking error decreases the following year's benchmark-adjusted net return by approximately 0.92%, controlling for other variables.

In column 5, closet indexers are taken as the benchmark fund category. Concentrated funds have underperformed the closet indexers by -3.42% per year net of fees. This result is highly significant with a t-statistic of -2.86. Nevertheless, it could be argued that there are too few funds assigned to this category in order to reliably estimate their performance. Similar to concentrated funds, the factor bet category has underachieved the benchmark category with -1.13% (t-statistic of -2.22). Thus, factor bets do not seem to be rewarded in the market. Expenses as well as fund age enter as negative coefficients to future return but are, like all other explanatory variables, statistically insignificant.

6.6.2 Yearly Predictive Regression

In Table 16, we apply the predictive model specification to use only yearly observations. Controlling for tracking error, Active Share comes up as a significant predictor with a t-statistic of 1.87, implying that a 10% increase in Active Share would increase net return in future years by 0.24%. However, the effect is subsumed by adding other variables and Active Share loses its predictive power but the coefficient remains positive.

Nevertheless, tracking error comes in as a strong predictor of future benchmark-adjusted net returns where a 10% increase in tracking error decreases future returns by 2.99% controlling for other variables. Expenses enter as a negative predictor with a t-statistic of -1.95. Economically, this indicates that a 1% increase in expenses is followed by a 1.22% decline in future excess return. Thereby fund performance is decline more than the actual percentage level of expenses, implying that other additional costs are associated with a higher expense ratio.

In column 5, we include dummy variables for fund categories and take closet indexers as the benchmark group. We find further evidence that the factor bets category have lost to closet indexers by 1.38% per year with a t-statistic of -2.31. Further, we notice that the stock picker category has a positive coefficient which, however, is not statistically significant.

6.6.3 Yearly Predictive Regression with Fund Fixed-Effects

Adding fund fixed-effects to the yearly regression above, Active Share does not come in as a predictor of future net returns in any of the specifications in Table 17. However, tracking error once again enters in a highly significant, negative manner. The results suggest that a 10% increase in tracking error predicts a -3.48% decrease in future net returns when controlling for other variables.

Size and fund age comes in as highly significant in specification 4. The size effect is nonlinear and suggests that larger funds underperform. On the other hand, the results are ambiguous across model specifications and the effect is subsumed by other variables. The same applies to fund age. The number of stocks in a fund's portfolio is significant in a statistical way but not so in an economical context. Prior year returns show up as a strong negative predictor of future returns. A 10% outperformance in the previous year produces a -1.92% return in the following year. Nevertheless, the t-statistics of prior returns are likely to be exaggerated and this could be correlated with the fund's active exposures. For example, two funds that have persistent growth bias in relation to their benchmarks tend to outperform (or underperform) this index simultaneously and thus the error terms in their return regression will be correlated. Thereby it should be more appropriate to cluster standard errors by year when examining previous returns.

In the dummy variable regression we once again conclude that factor bets underperform closet indexers with -1.29%.

6.7 Discussion

Similar to our results, Cremers and Petajisto (2009) find a positive correlation between Active Share and tracking error. They also find the relationship between returns and Active Share to be strictly positive. In general, their results demonstrate a higher level of significance although few of their individual portfolios are statistically significant at the 10% level.

While the results in this paper essentially are in line with the findings of Petajisto (2010), there are important differences that are worth mentioning. Most importantly, the level of Active Share is significantly lower in our sample. The relatively small investment universe in this study may be a reason to our weak results regarding Active Share in explaining returns. Relative to the study by Petajisto (2010) on the U.S. market, we see a comparable number of stocks in the funds' portfolios but the scope of available securities is very different. This has a pronounced effect on the level of Active Share. Given a portfolio of 50 stocks, it is likely that we would observe a high Active Share if the number of available

assets is 5000 rather than 300. Not surprisingly, we find the mean Active Share of 44% in our sample to be almost half of the corresponding value of 81% for the U.S. market found by Petajisto (2010). With lower levels of Active Share, it is especially hard to beat the benchmark return if the expense ratio is not reduced. Table 14 provides an example, taking the sample average of Active Share (44%) and expense ratio (1.36%) into account. The active portion of the fund portfolio has to earn an excess return of 3.09% in order for the fund to perform in line with its benchmark index. Thus, it is particularly hard to beat the benchmark with a low level of Active Share.

In our sample of Swedish mutual funds, we find the level of Active Share to vary substantially over time. Petajisto (2010) finds similar results in the U.S. market, with the level of Active Share highly correlated to the VIX index. Thereby, it could be that market volatility gives managers more reason to stay close to their benchmark because of the career risk associated with underperforming during a down market when investors already are suffering losses. This conclusion is confirmed in our sample, where we see a general decrease in level of Active Share during the 2008 financial crisis.

Moreover, Petajisto (2010) finds evidence for return persistence for all groups of funds except closet indexers in his sample of U.S. mutual funds. In comparison, we find it interesting to see that factor bets yet again seems to perform significantly worse than other groups in our sample, showing no proof of positive performance persistence. Contrary, stock pickers seem to be the group that stands out, presenting positive performance persistence. Our results are thereby different from those of Dahlquist, Engström and Söderlind (2000), who do not find evidence for performance persistence amongst Swedish equity funds in the period 1993 to 1997.

6.8 Implications

Our results suggest that Active Share reveals information on fund activity that cannot be explained in a simple manner. Investors could potentially utilize this tool to take better investments decision regarding which funds to invest in. Thereby, we see a lot of potential in the use of Active Share as a measure of active management in the future. At the moment, with tracking error as a major and traditional measure of active management, funds using factor timing strategies could easily imitate stock pickers making it merely impossible for investors to tell the two apart. With Active Share included, it is not possible to falsely appear as a stock picker. Hence, we would like to see Active Share adopted by mutual fund data providers such as Morningstar. This would present the opportunity of making superior investment decision by identifying a fund's true style of active management. Furthermore,

this would definitely add a more in-depth understanding for investors of what they actually are paying for. In addition, we believe pressure would be added on fund managers to deliver profitable investment strategies instead of drifting towards closet indexing.

With regards to the results in this study, stock selecting funds clearly have the most gain from disclosing Active Share in, for example, marketing material. This could have the potential to attract greater inflow of capital to the stock picking funds. In contrast, the measure would probably be used with reluctance by factor timing funds where the opposite might occur. Broader knowledge of fund level Active Share would likely increase efficiency in asset allocation and ensure that the mutual funds that add the most value would attract capital from investors. Nevertheless, with growth in asset under management, career risk and job security are likely to be of larger concern to fund managers which consequently could cause a decrease in active positions. In addition to the investor perspective, investment management companies might apply Active Share in order to monitor and evaluate their fund managers over time.

7 Conclusion

In this study, we examine the characteristics of active management and its effect on performance amongst Swedish mutual funds investing in the Nordic region. Our sample period is March 2003 to December 2011. In line with Petajisto (2010) we find no evidence for the average actively managed fund to outperform its benchmark index. On average, the funds in our sample achieve an annual benchmark-adjusted net return of -0.15%. Active Share range from 21% to 91% for the funds in our sample, and regardless of level of Active Share, there is a wide distribution of tracking error. Over time, we see large differences in level of Active Share. While funds in the middle range of Active Share seems to converge more towards their benchmarks when the economic climate is tough, the same trend does not exist amongst the most active funds. Our evidence further suggests that the smallest funds are the most active while the largest funds score low in both dimensions of active management. In a regression of Active Share on a number of explanatory variables, tracking error stands out as the strongest predictor. However, R-squared is only 13.9% suggesting that Active Share cannot fully be explained by other variables. In total, we consider this as evidence for that there are evident differences in active management style amongst Swedish managed mutual funds investing in the Nordic markets that cannot be recognized using conventional measures of active management.

While there might exists a weak positive relationship between fund return and Active Share it rather appears like tracking error is negatively related to fund performance. When

grouped, factor bets experience a negative benchmark-adjusted annual net return of -1.02%, a result that is significant at the 5% level. Neither at the aggregate level, nor within Active Share quintiles, do we find proof for that fund size explains performance differences between funds. In total, there seems to be some evidence that differences in management style, in terms of Active Share and tracking error, can be linked to fund performance.

The funds in our sample show clear evidence of performance persistence. Interestingly, it seems like the stock pickers are the funds that show highest performance persistence. On average, they beat their benchmark by 5.09% compared to 3.65% for the actively managed funds and 1.64% for the closet indexers. All results are statistically significant at the 5% level. The factor bets does not show evidence of positive performance persistence. In a predictive regression of future returns on a number of explanatory variables, Active Share does not come up as significant predictor of returns. However tracking error is negatively related to future returns with statistical significance, yet again suggesting that factor bets are not rewarded in the market.

8 Suggestions for Further Research

First, we believe that it would be valuable to extend this study through both the cross-section and the time-series by including a broader sample of mutual funds over a longer time-horizon in Sweden as well as for other markets. Thereby a more precise perspective of the role of Active Share in explaining active management could be formed. Further, studying mutual funds that face a larger investment universe may yield improved results. On the other hand, the accessibility of reliable, survivorship bias free mutual fund holdings data is key to doing this and to our knowledge, there is no such extensive database for European mutual fund holdings as there is for the U.S. market[15].

Second, complementary mutual fund specific information, such as historical data on fees and expenses, inflows, investment policy or strategy as well as potential changes in benchmark indices over time would contribute depth to the analysis. For example, several of these variables could be included in attempting to predict mutual fund returns.

Third, a closer look at fund management team and tenure would add another interesting dimension to active management. Risk-shifting behavior by underperforming managers preceding managerial change is found by Khorana (2001). Such increase in risk could be put in relation to Active Share and tracking error pre-replacement.

[15] In particular the CDA/Spectrum mutual fund holdings database maintained by Thomson Reuters.

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10 Appendix

10.1 Tables

TABLE 7. ACTIVE SHARE AND TRACKING ERROR

Funds are sorted into groups by percentiles, first by Active Share and then by tracking error. The table shows the number of funds in each group for year 2011.

Active Share (%)	Tracking Error (% per year)						
	4-6	6-8	8-10	10-12	12-14	>14	All
90-100							
80-90		2		1			3
70-80		2		5		1	8
60-70	1	2		4	3	2	12
50-60	2	1	3		5	1	12
40-50			8		7	2	17
30-40	2		2	2	12	1	19
20-30		1	2	5	9		17
10-20		1		1	2		4
0-10							
All	5	9	15	18	38	7	92

TABLE 8. ACTIVE MANAGEMENT AND FUND PERFORMANCE

Each month funds are sorted into quintiles first by Active Share and then by tracking error. The table shows the annualized time-series average of benchmark-adjusted net returns for funds in each of the 25 portfolios. T-statistics are shown in parenthesis

Benchmark-Adjusted Net Return (%)							
Active Share Quintile	Tracking Error Quintile						
	Low (1)	2	3	4	High (5)	All	High - Low
High (5)	0.66	-0.20	1.01	1.84	0.26	0.73	-0.40
	(0.57)	(-0.15)	(0.72)	(1.18)	(0.12)	(1.20)	(-0.25)
4	0.31	0.51	-0.05	0.10	0.19	0.22	-0.12
	(0.37)	(0.49)	(-0.04)	(0.08)	(0.13)	(0.63)	(-0.08)
3	-0.11	0.36	-1.55	-2.18	-3.95	-1.38	-3.84
	(-0.15)	(0.41)	(-1.94)	(-2.60)	(-4.12)	(-2.37)	(-2.47)
2	0.09	-0.73	-0.53	0.78	-1.13	-0.27	-1.22
	(0.15)	(-1.14)	(-0.62)	(0.87)	(-1.40)	(-0.23)	(-1.26)
Low (1)	0.33	-0.56	0.29	-0.01	0.78	0.15	0.44
	(0.74)	(-1.01)	(0.44)	(-0.01)	(0.97)	(1.20)	(0.27)
All	0.25	-0.13	-0.17	0.09	-0.78	-0.12	-1.03
	(0.97)	(-0.52)	(-0.16)	(1.15)	(-1.68)	(-0.60)	(-1.50)
High - Low	0.32	0.36	0.73	1.84	-0.52	0.58	
	(0.18)	(0.15)	(0.43)	(0.80)	(-0.25)	(0.58)	

TABLE 9. SIZE, ACTIVE SHARE AND FUND PERFORMANCE

Each month, funds are sorted into quintiles first by Active Share and then by size. The table shows the annualized time-series average benchmark-adjusted net returns for funds in each of the 25 portfolios. Size is measured as total market capitalization of fund assets. T-statistics are shown in parenthesis

Benchmark-Adjusted Net Return (%)							
Active Share Quintile	Size Quintile						
	Low (1)	2	3	4	High (5)	All	High - Low
High (5)	2.13	-1.59	0.25	2.44	1.02	0.86	-1.12
	(1.45)	(-1.01)	(0.15)	(1.87)	(0.76)	(1.30)	(-0.71)
4	1.31	0.98	-0.35	-1.27	0.86	0.28	-0.45
	(1.15)	(0.79)	(-0.32)	(-1.19)	(0.83)	(0.56)	(-0.15)
3	-2.17	-1.50	-1.28	0.05	-2.74	-1.49	-0.57
	(-2.50)	(-1.76)	(-1.67)	(0.06)	(-3.54)	(-3.97)	(-0.32)
2	0.52	-0.48	-0.50	-0.53	-0.44	-0.27	-0.97
	(0.64)	(-0.58)	(-0.74)	(-0.70)	(-0.64)	(-0.78)	(-1.19)
Low (1)	-0.52	0.67	0.36	-0.19	0.54	0.15	1.06
	(-0.87)	(0.96)	(0.58)	(-0.36)	(0.88)	(0.56)	(1.71)
All	0.22	-0.39	-0.30	0.09	-0.15	-0.10	-0.38
	(0.50)	(-0.80)	(-0.66)	(0.22)	(-0.37)	(-0.49)	(-0.64)
High - Low	2.66	-2.26	-0.11	2.62	0.48	0.71	
	(1.60)	(-0.98)	(-0.34)	(1.91)	(0.36)	(0.60)	

TABLE 10. ACTIVE SHARE AND PERFORMANCE PERSISTENCE

Each month, funds are sorted into quintiles first by Active Share and then by their cumulative benchmark-adjusted net return over the previous 12 months. The table shows annualized time-series mean values for cumulative benchmark-adjusted net returns over the upcoming 3 months for the 25 portfolios. T-statistics are shown in parenthesis.

Benchmark-Adjusted Net Return (%)							
Active Share Quintile	Prior 1-Year Return Quintile						
	Low (1)	2	3	4	High (5)	All	High - Low
High (5)	-0.68	0.86	-0.76	-0.01	4.68	0.65	5.36
	(-0.42)	(0.62)	(-0.59)	(-0.01)	(2.52)	(1.30)	(1.71)
4	-2.21	-1.68	0.54	2.00	2.50	0.11	4.70
	(-2.04)	(-1.47)	(0.54)	(1.76)	(1.80)	(0.56)	(2.12)
3	-4.43	-4.32	-1.13	1.00	2.97	-1.38	7.41
	(-6.12)	(-5.62)	(-1.45)	(1.29)	(2.67)	(-3.97)	(3.82)
2	-2.40	-1.26	-0.20	0.85	2.21	-0.27	4.61
	(-3.23)	(-1.86)	(-0.29)	(1.05)	(2.51)	(-0.78)	(3.43)
Low (1)	-0.75	-0.25	-0.04	0.05	2.13	0.15	2.89
	(-1.25)	(-0.47)	(-0.07)	(0.07)	(2.82)	(0.56)	(2.16)
All	-2.11	-1.36	-0.33	0.77	2.87	-0.16	4.97
	(-4.70)	(-3.28)	(-0.82)	(1.79)	(5.22)	(-0.80)	(5.37)
High - Low	0.07	1.11	-0.72	-0.06	2.55	0.50	
	(0.02)	(0.70)	(-0.36)	(-0.11)	(1.02)	(0.72)	

TABLE 11. INDEX DESCRIPTIVE STATISTICS

The table shows the number of constituents, number funds using each index as a benchmark and the available sample period for each of the six benchmark indices used in the study.

Index	Number of Constituents	Number of funds	Sample Period
SIXPRX	247	75	2003.03 - 2011.12
OMXS30	30	54	2003.03 - 2011.12
AFGX	288	3	2003.03 - 2011.12
CSRXSE	217	22	2004.03 - 2004.12
CSX	228	3	2003.03 - 2011.12
CTNX	523	11	2003.03 - 2011.12
All		168	

TABLE 12. FUND CATEGORIES

Each month, funds are sorted into quintiles first by Active Share and then by tracking error to produce different categories of active management styles. The table shows cut-off levels for each category of funds in terms of Active Share and tracking error.

Active Share Quintile	Tracking Error Quintile				
	Low (1)	2	3	4	High (5)
High (5)	5	5	5	5	4
4	2	2	2	2	3
3	2	2	2	2	3
2	2	2	2	2	3
Low (1)	1	1	1	1	3

Group	Label
5	Stock Pickers
4	Concentrated
3	Factor Bets
2	Moderately Active
1	Closet Indexers

TABLE 13. CATEGORIES OF ACTIVE MANAGEMENT: DESCRIPTIVE STATISTICS

Each month, funds are sorted into quintiles first by Active Share and then by tracking error. Panel A shows time-series mean values of number of funds, size, Active Share, tracking error, expense ratio and number of stocks for each fund category. Panel B shows the standard deviation of each measurement.

Panel A: Mean Values

Group	Label	Number of Funds	Assets (MSEK)	Active Share (%)	Tracking Error (%)	Expense Ratio (%)	Number of Stocks
5	Stock Pickers	15	1870	74	9,6	1,47	57
4	Concentrated	3	933	77	15,6	1,52	43
3	Factor Bets	13	1590	36	13,9	1,35	47
2	Moderately Active	47	2660	41	10,1	1,40	66
1	Closet Indexers	16	3220	23	9,5	1,18	74
	All	94	2420	44	10,6	1,37	63

Panel B: Standard Deviations

Group	Label	Assets (MSEK)	Active Share (%)	Tracking Error (%)	Expense Ratio (%)	Number of Stocks
5	Stock Pickers	2760	9,08	3,78	0,25	43
4	Concentrated	1410	9,42	6,00	0,14	29
3	Factor Bets	2930	11,68	6,03	0,34	36
2	Moderately Active	3620	10,65	4,70	0,30	60
1	Closet Indexers	4030	3,37	4,20	0,43	30
	All	3480	19,17	5,03	0,34	51

TABLE 14. MATCHING THE BENCHMARK INDEX WITH LOW ACTIVE SHARE

The table shows and example of a fund that matches its benchmark index return after expenses. The Active Share and expense ratio are the sample averages of 44% and 1.36% respectively.

Matching the Benchmark After Expenses			
	Portion of Portfolio	Excess Return	Weighted Return
Passive Portion of Portfolio	56%	0.00%	0.00%
Active Portion of Portfolio	44%	3.09%	1.36%
Gross Return			1.36%
Expenses			-1.36%
Net Return			0.00%

TABLE 15. PAIRWISE CORRELATION COEFFICIENTS

The *t*-statistics (in parentheses) are based on standard errors clustered by fund. *, ** and *** denote significance at the 10%, 5% and 1% level respectively.

Correlation Matrix							
	Benchmark-adjusted return	Active Share	Tracking Error	Expenses	log_{10}(TNA)	Fund Age	Number of Stocks
Benchmark-adjusted return	1						
Active Share	-0.015	1					
Tracking Error	0.075***	0.008	1				
Expenses	-0.081	0.285***	0.042***	1			
log_{10}(TNA)	0.012	-0.117***	-0.146***	-0.126***	1		
Fund Age	-0.057***	-0.183***	-0.054***	0.126***	0.513***	1	
Number of Stocks	-0.051***	-0.144***	-0.058***	0.065***	0.298***	0.334***	1

TABLE 16. YEARLY PREDICTIVE REGRESSION

The table presents pooled panel regressions of benchmark-adjusted net returns on explanatory variables. Return is cumulative over year t whereas explanatory variables are measured at the end of year t-1. We pick end of June as year-end to include the most observations. All variables are calculated as before. Return over index is the benchmark-adjusted return in the previous 1-3 years. Index funds have been excluded from the sample. Dummy variables for different fund categories are included in specification 5. The *t*-statistics (in parentheses) are based on standard errors clustered by fund. *, ** and *** denote significance at the 10%, 5% and 1% level respectively.

	Benchmark-Adjusted Net Return				
	(1)	(2)	(3)	(4)	(5)
Active Share	0.0234*	0.0235*	0.0039	0.0089	
	(1.90)	(1.87)	(0.28)	(0.61)	
Tracking Error		-0.2930***	-0.3040***	-0.2991***	
		(-5.60)	(-5.03)	(-4.67)	
Stock Pickers					0.0067
					(0.97)
Concentrated					-0.0089
					(-0.53)
Factor Bets					-0.0138**
					(-2.31)
Moderately Active					0.0013
					(0.33)
Expenses				-1.2273*	-1.1617*
				(-1.95)	(-1.82)
log_{10}(TNA)			-0.0029	-0.0021	0.0008
			(-0.96)	(-0.59)	(0.25)
Number of Assets				-0.0000	-0.0000
				(-0.88)	(-0.81)
Fund Age / 100				0.0071	-0.0293
				(0.14)	(-0.60)
Return over Index (t-1 to t)			-0.0267	-0.0302	-0.0520
			(-0.46)	(-0.52)	(-1.06)
Return over Index (t-3 to t-1)			-0.0091	-0.0105	-0.0100
			(-0.63)	(-0.76)	(-0.80)
Constant	-0.0109*	0.0204**	0.0537*	0.0626*	0.0121
	(-1.92)	(2.54)	(1.87)	(1.91)	(0.41)
Errors clustered by	Fund	Fund	Fund	Fund	Fund
N	754	743	703	702	702
R^2	0.006	0.047	0.052	0.057	0.023

TABLE 17. YEARLY PREDICTIVE REGRESSION WITH FUND FIXED-EFFECTS

The table presents fund fixed-effects panel regressions of benchmark-adjusted net returns on explanatory variables. Net return is cumulative over year t whereas explanatory variables are measured at the end of year t-1. We pick end of June as year-end to include the most observations. All variables are calculated as before. Return over index is the benchmark-adjusted return in the previous 1-3 years. Index funds have been excluded from the sample. Dummy variables for different fund categories are included in specification 5. The *t*-statistics (in parentheses) are based on standard errors clustered by fund. *, ** and *** denote significance at the 10%, 5% and 1% level respectively.

	Benchmark-Adjusted Net Return				
	(1)	(2)	(3)	(4)	(5)
Active Share	0.0209	0.0109	-0.0277	-0.0078	
	(0.70)	(0.36)	(-0.83)	(-0.25)	
Tracking Error		-0.3509***	-0.2425***	-0.3483***	
		(-4.85)	(-3.31)	(-5.03)	
Stock Pickers					0.0050
					(0.46)
Concentrated					0.0015
					(0.06)
Factor Bets					-0.0129*
					(-1.80)
Moderately Active					0.0008
					(0.19)
log_{10}(TNA)			0.0023	-0.0237**	0.0033
			(0.24)	(-2.03)	(0.29)
Number of Assets				0.0001**	0.0001*
				(2.22)	(1.95)
Fund Age / 100				0.3882***	0.1359
				(3.85)	(1.18)
Return over Index (t-1 to t)			-0.2025***	-0.1929***	-0.2262***
			(-4.20)	(-3.79)	(-5.58)
Return over Index (t-3 to t-1)			-0.1148***	-0.1143***	-0.1198***
			(-7.10)	(-7.04)	(-7.18)
Constant	-0.0098	0.0321**	0.0142	0.1967*	-0.0547
	(-0.76)	(2.08)	(0.16)	(1.92)	(-0.58)
Errors clustered by	Fund	Fund	Fund	Fund	Fund
N	754	743	703	702	702
R^2	0.001	0.050	0.165	0.187	0.154

10.2 Figures

FIGURE 1. DIMENSIONS OF ACTIVE MANAGEMENT

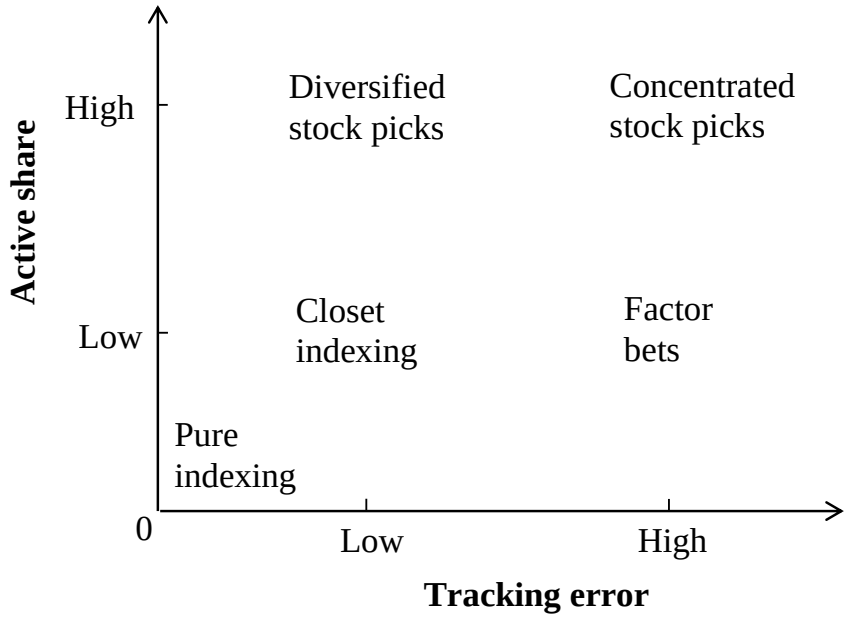


FIGURE 2. ACTIVE SHARE OVER TIME

Figure 2 shows the progression over time for each category of Swedish all equity mutual funds investing in the Nordic region as share of total fund assets. Active Share is defined as the difference, in terms of holdings, between a specific fund and its benchmark index. The sample period is March 2003 to December 2011.

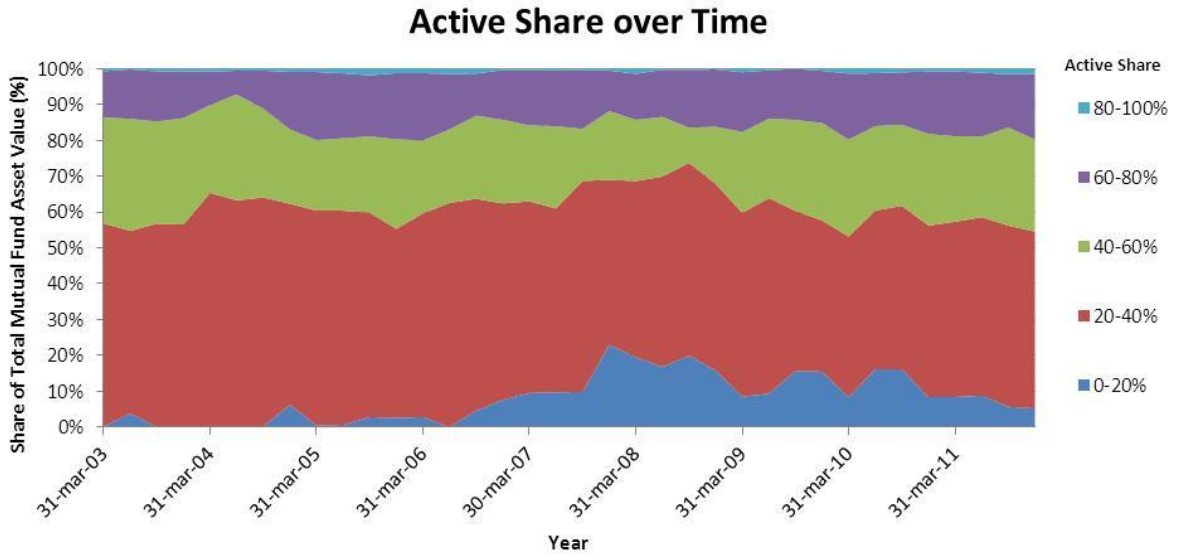
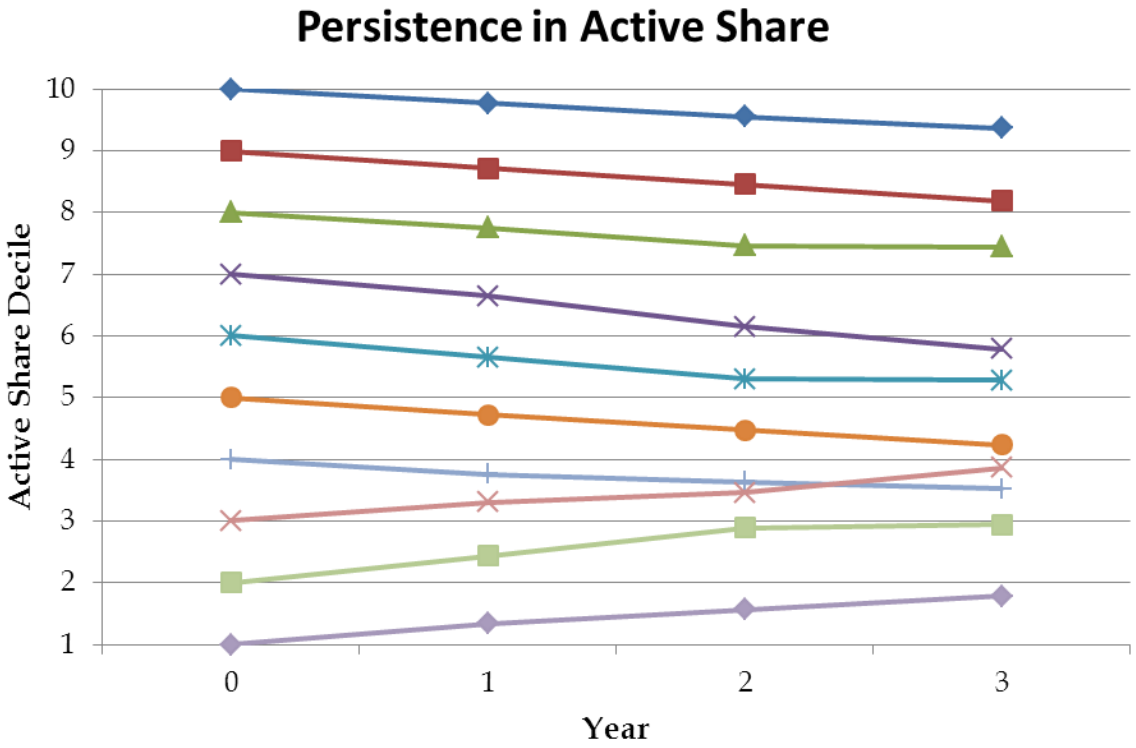


FIGURE 3. PERSISTENCE IN ACTIVE SHARE.
For each Active Share decile, the figure shows the average the average future decile in of the funds. Index funds have been excluded. The sample period is 2003 to 2011.



10.3 The Swedish Mutual Fund Industry

As described by Pettersson, Helgesson, and Hård af Segerstad (2009), the Swedish stock market experience an downturn early in year 2000 that persisted for almost three years. During this period, total value of the Stockholm stock exchange halved. It was not until March 2003 that the market turned into a positive trend that lasted up to the middle of 2007. However in the aftermath of the 2008 credit crunch the Swedish stock market fell yet again, this time by almost 40%, and did not recover until the beginning of 2010. During 2011, financial instability among countries in the Eurozone hurt the market once again. According to Fondbolagens Förening (2012), Swedish investors have mainly invested in equity funds during the last decade. It was only during the summer of 2008 when the credit crunch increased volatility in stock markets all over the world that equity funds constituted less than 50% of the total assets under management by fund companies in Sweden.

During the last ten years, the share of premium pension money invested in the Swedish fund market has increased substantially. Pettersson, Helgesson and Hård af Segerstad (2009) estimates that the portion of net savings originating from the premium pension system have remained stable around 70-80% of aggregate investments for households in Sweden during 2000 to 2009. While net savings in mutual funds generally increased during the period, the same was true for savings in funds investing in the Swedish market.

10.4 Indices

SIX is the largest producer of stock indices in Scandinavia and responsible for the computation of several of the broad based indices used in this study.

Affärsvärldens Generalindex (**AFGX**) is a broad based index constructed to reflect the average performance of the companies on the Stockholm stock exchange. The index, which is updated daily by SIX, is value weighted and has historically been a popular benchmark index for Swedish fund managers (Affärsvärlden, 2012). Historical index data on weights and holdings is available from 2000 to 2004. In this sample AFGX contains on average 288 stocks.

Carnegie Small Cap Return Index Sweden **(CSRXSE)** is the most commonly used benchmark for Swedish small cap funds. Data on CSRXSE is available for the period 2004 to 2011. In this sample CSRXSE contains on average 217 stocks.

Carnegie Small Cap Index Sweden **(CSX)** is the essentially equivalent to CSRXSE and is included mainly because the data is available throughout the whole sample period. On average, CSX contains 228 stocks between 2000 and 2011.

Carnegie Total Index Nordic **(CTXN)** is a value weighted price index daily updated by SIX and constructed to reflect the performance of companies in Sweden, Norway, Finland and Denmark. Only companies situated in the four Nordic countries are included (Carnegie 2012**).** Data on CTXN from the SIX-TRUST database is available for the period 2000 to 2011. In this sample CTXN contains on average 523 stocks.

OMX Stockholm 30 **(OMXS30)** is a value weighted price index containing the 30 most traded stocks on the Stockholm Stock Exchange (Nasdaq OMX, 2012). It is one of the most well-known indices to Swedish investors and there exist numerous different financial contracts in the market with OMXS30 as the underlying asset. OMXS30 is updated daily by SIX, who provides data on weights and holdings for the period 2000 to 2011. In this sample OMXS30 contains on average 30 stocks.

SIX Portfolio Return Index **(SIXPRX)** is the most commonly used benchmark for funds investing in the aggregate Swedish stock market. It covers all stocks registered on the Stockholm Stock Exchange. The index is value-weighted with an upper weight bound of 10%. Further, the companies that weigh 5% or more are not allowed to constitute more than 40% of the index altogether[16]. Data on SIXPRX from the SIX-TRUST database is available for the period 2000 to 2011. In this sample SIXPRX contains on average 247 stocks.

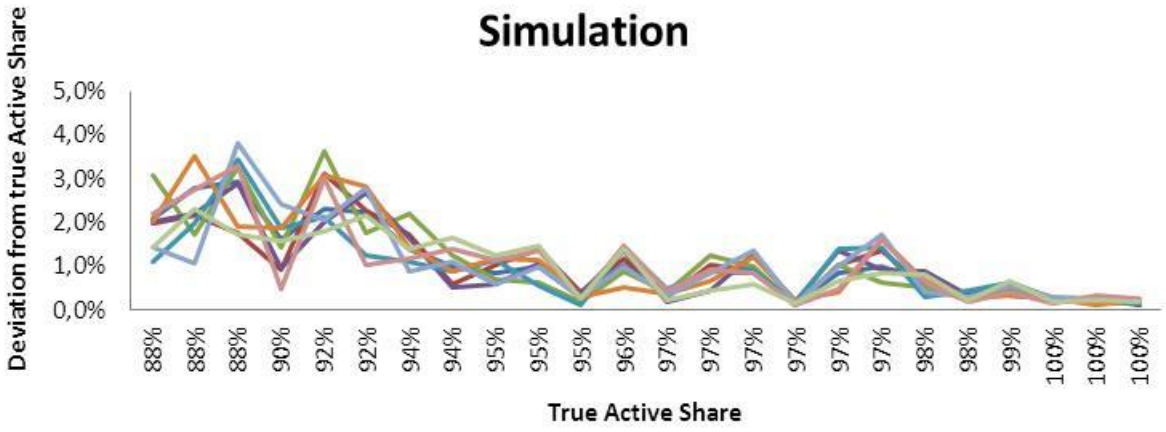
[16] Required through the UCITS-directive.

10.5 Simulation

To deal with the problem of missing ISIN-codes, we perform a simulation where index assets randomly are treated as missing. This is done to establish an acceptable level of missing observations where the discrepancy in Active Share is less than 5% from its true value. Seven funds with Active Share in the range of 35% - 95% are selected from our dataset of 129 Swedish mutual funds. For simplicity, we use SIXPRX in all simulations and choose a base date in which no assets are missing in the index to calculate Active Share for the sample of funds. We then randomly exclude some of the assets in the index (treat them as missing) and calculate new values for Active Share. The simulation is run in the range from 1-20% of stocks missing. Results for one of the simulations are shown in figure 4. We conclude that 90% of matched index-holdings are enough to ensure that the Active Share stays within a 5% range of its true value. For this to hold, we exclude all observations prior to 2003 in the dataset of index- and fund holdings.

FIGURE 4. SIMULATION

Figure 3 shows result for one of the seven funds used in the simulations. SIXPRX is used in all simulations where index constituents randomly are treated as missing. The simulation is run in the interval 1-20% stocks missing. Each line represents a simulation. December 2011 is base-date



10.6 Model Testing

Regarding the regression of determinants of Active Share, we use the Breusch-Pagan Lagrange multiplier to identify whether to use pooled OLS or a random-effects model. We reject the null hypothesis at a highly significant level in favor of the random effects model. Further, in making a decision between fixed- and random-effects models we apply the Hausman test and with a χ^2 of 3.58 we cannot reject the null in favor of fixed-effects. However, we deem the within estimator to add theoretically sound. We utilize Woolridge's test for autocorrelation in panel data and with a large *F*-statistic fail to reject the null hypothesis of no first-order autocorrelation. In addition, a highly significant modified Wald test for fixed effects models detects groupwise heteroskedasticity. Thereby, we report estimates using White's robust standard errors generalized for clustering by fund to overcome this problem. [1] Due to problems with ISIN-codes prior to 2009, we required 90% of the stocks in our indices to be matched. This will lead to an upper boundary of Active Share less than 100% and bias the distribution downwards.

For the predictive regression, the test results are similar with the difference that the Hausman test significantly rejects the null hypothesis of favoring random-effects and we thereby apply fixed effects to this model as well. When testing for skewness and kurtosis of residuals, we find that they are not normally distributed. This problem is, however, mitigated through the Central Limit Theorem.

TABLE 18. TEST STATISTICS

The table shows test statistics for the panel regression models applied in the study.

Panel A: Testing of Determinant Regression X		
Testing for Random Effects:	χ^2	31270.7
Breusch-Pagan Lagrange multiplier	Prob > χ^2	0.000
Testing for Fixed or Random Effects:	χ^2	3.58
Hausman Test	Prob > χ^2	0.7334
Testing for Time-Fixed Effects:	F(34, 112)	7.61
Linear Hypotheses Test	Prob > *F*	0.000
Testing for Serial Correlation:	F(1, 109)	182.954
Wooldridge test for autocorrelation in panel data	Prob > *F*	0.000
Testing for heteroskedasticity:	χ^2 (113)	66089.72
Wald statistic for groupwise heteroskedasticity	Prob > χ^2	0.000

Panel B: Testing of Predictive Regression X		
Testing for Random Effects:	χ^2	617.65
Breusch-Pagan Lagrange multiplier	Prob > χ^2	0.000
Testing for Fixed or Random Effects:	χ^2	706.14
Hausman Test	Prob > χ^2	0.000
Testing for Time-Fixed Effects:	F(34, 112)	23.09
Linear Hypotheses Test	Prob > *F*	0.000
Testing for Serial Correlation:	F(1, 109)	320.97
Wooldridge test for autocorrelation in panel data	Prob > *F*	0.000
Testing for heteroskedasticity:	χ^2 (113)	66638.88
Wald statistic for groupwise heteroskedasticity	Prob > χ^2	0.000

TABLE 19. TESTING FOR ENDOGENEITY.

The table shows Durbin and Wu-Hausman tests for endogeneity, presenting results before and after the inclusion of lagged tracking error as an instrumental variable.

Endogeneity Testing		
Excluding Instrumental Variable (Prior 1-year tracking error)		
Durbin score	$\chi 2$	27.839
	p -value	0.000
Wu-Hausman	F(1,3137)	28.025
	p -value	0.000
Including Instrumental Variable		
Durbin score	$\chi 2$	1.630
	p -value	0.202
Wu-Hausman	F(1,3137)	1.627
	p -value	0.202

TABLE 20. SAMPLE DESCRIPIVE STATISTICS

The table shows descriptive statistics for our sample of 129 Swedish mutual funds investing in the Nordic region. The sample period is March 2003 to December 2011.

Fund Characteristics										
Fund Name	Start Date	End Date	Number of Assets	Size (MSEK)	Active Share (%)	Tracking Error (%)	Net Return (%)	Benchmark-Adjusted Net Return (%)	Benchmark	TER (%)
Aktie-Ansvar Sverige	1990.12.17	.	43	1270	31	14.4	6.50	0.49	OMXS30	1.40
Alfred Berg Pension Sverige	2000.09.11	2004.06.30	53	20	21	11.1	-13.97	-6.71	SIXPRX	1.17
Alfred Berg Småbolagsfond	2009.06.17	.	60	112	69	9.9	13.97	-1.35	CSRXSE	1.75
Alfred Berg Sverige Extrakt	2000.06.08	2004.04.14	25	3	24	15.5	-29.50	-12.02	OMXS30	.
AMF Pensions Aktiefond - Småbolag	2004.05.17	.	63	1080	51	8.8	12.59	1.10	CSRXSE	0.60
AMF Pensions Aktiefond - Sverige	1998.12.30	.	49	11700	34	13.1	10.49	3.98	SIXPRX	0.40
Aragon Småbolagsfond	1994.04.29	.	38	175	66	11.9	3.43	-8.07	CSRXSE	1.40
Banco Hjälp	1995.10.02	.	55	138	29	13.0	2.42	0.55	OMXS30	1.74
Humanfonden	1990.06.28	.	57	1570	29	13.0	2.75	0.83	OMXS30	1.70
Banco Ideell Miljö	1990.01.15	.	47	270	38	12.9	3.96	2.01	OMXS30	1.70
Bancos Kulturfond	1996.08.16	2011.06.30	53	56	29	12.7	4.21	1.17	OMXS30	1.70
Banco Svensk Miljö	1994.09.30	2011.10.31	37	151	42	13.6	6.58	4.68	OMXS30	1.70
Banco Norden	1987.10.09	2009.09.22	39	276	62	11.7	2.50	-0.40	CTXN	1.70
Banco Human Pension	2000.09.11	2009.09.03	53	47	31	13.3	-2.17	2.98	OMXS30	0.90
Banco Samarit Pension	2000.09.11	2009.09.03	53	37	31	13.3	-2.09	3.01	OMXS30	0.90
Banco Småbolag	1989.03.09	2011.11.28	47	422	74	11.9	7.02	-2.70	CSRXSE	1.70
Banco Sverige	1994.04.12	.	50	2790	30	11.0	3.11	-3.11	SIXPRX	1.60
Banco Sverige Special	1999.06.29	2011.10.31	34	227	29	13.1	2.78	0.83	OMXS30	1.10
Banco Teknik & Innovation	1996.11.12	.	44	397	90	15.0	3.44	-6.10	CSRXSE	1.71
Alfred Berg Sverige	1994.04.12	2011.06.30	64	145	30	12.6	4.29	-3.35	OMXS30	1.60
Alfred Berg Sverige Referens	2000.05.23	.	51	114	27	12.2	-1.65	-4.53	SIXPRX	1.76
Carlson Fond Nationell Sverige	2002.06.18	.	24	394	46	14.9	2.19	-2.09	OMXS30	1.50
Carlson Småbolagsfond	1991.11.18	.	62	1370	48	9.5	9.01	-1.61	CSRXSE	1.50
Carlson Sverigefond	1992.07.31	.	36	1110	31	14.6	5.22	-1.48	OMXS30	1.25
Carlson Sweden Micro Cap	1997.05.29	.	48	123	85	12.4	8.86	-1.63	CSRXSE	1.50
Skandia Världsnaturfonden	1988.06.02	.	34	343	32	14.9	2.31	-4.47	OMXS30	1.40
Carnegie Sverige	1996.11.13	2009.06.15	32	364	31	8.8	4.86	3.58	OMXS30	1.70
Catella Reavinstfond	1998.02.16	.	58	4320	45	9.2	6.81	0.48	SIXPRX	1.65
Skandia Junior Golf Fond	2008.04.30	2010.04.28	30	10	38	16.4	4.81	1.20	OMXS30	.
Team Catella Tennisfond	2005.08.15	.	34	60	55	13.2	5.00	2.52	OMXS30	1.55
Catella Trygghetsfond	1998.02.16	.	54	602	60	10.1	6.65	-3.85	SIXPRX	1.65
Cicero Sverige fond	2000.11.06	.	29	31	35	12.6	3.31	-1.05	OMXS30	1.20
Michael Östlund Sverige	2007.02.16	2012.04.02	21	12	60	14.8	-0.79	-2.42	OMXS30	1.70
Firstnordic Sverige	1996.06.05	.	34	1770	40	16.5	7.43	0.13	OMXS30	1.33
Firstnordic Sverige Fokus	2005.09.13	.	20	659	63	19.1	5.37	2.37	OMXS30	1.53
Davegårdh & Kjäll Sverige	2008.01.28	2011.12.16	53	401	57	10.2	-1.55	-0.81	OMXS30	1.50
Didner & Gerge Aktiefond	1994.11.02	.	44	8870	69	7.9	10.58	3.96	SIXPRX	1.22
Didner & Gerge Småbolag	2008.12.23	.	37	844	83	7.9	28.90	6.15	CSRXSE	1.40
Eldsjäl 1	1997.01.24	.	26	39	33	15.3	2.17	-1.24	OMXS30	1.60
Eldsjäl 2	1997.01.24	.	26	55	33	15.4	1.80	-1.62	OMXS30	1.60
Enter Select Fokus	2004.02.06	.	27	518	64	7.7	10.95	5.79	OMXS30	0.52
Enter Select	2007.08.14	.	29	1240	68	6.1	0.55	1.47	SIXPRX	1.72
Enter Sverige	1999.12.01	.	26	458	49	7.8	5.00	0.31	OMXS30	1.75
Enter Sverige Fokus	1999.12.01	.	21	1070	42	7.3	5.45	0.78	OMXS30	0.52
Capital Focus	2001.10.01	2009.11.24	27	13	60	19.4	-21.94	-14.17	OMXS30	1.95
Folksam LO Sverige	1999.03.19	.	56	9660	22	12.3	6.23	3.67	OMXS30	0.40
Folksam LO Västfonden	1999.03.19	.	64	781	24	10.3	6.61	0.12	SIXPRX	0.40
Folksams Tjänstemannafond Sverige	2000.09.04	.	57	914	22	12.3	2.75	4.00	OMXS30	0.40
Folksams Aktiefond Sverige	1994.09.05	.	56	3510	23	12.3	6.16	3.56	OMXS30	0.70
Granit Småbolag	2010.12.30	.	35	76	74	6.5	-3.43	3.13	CSX	1.70
Granit Sverige 130/30	2010.12.30	.	30	151	54	6.9	-6.11	-1.71	OMXS30	1.30
Gustavia Sverige	2003.10.01	.	47	234	68	13.9	11.89	5.11	OMXS30	1.50
HQ Strategifond	1988.09.22	.	39	4810	70	13.6	7.59	4.91	OMXS30	1.50
HQ Sverigefond	1987.01.08	.	30	3820	50	11.1	8.38	1.96	OMXS30	1.40
Svenska Kyrkans Miljöfond Talenten	1997.12.19	2007.02.09	34	50	52	15.0	8.76	2.17	OMXS30	1.43
Lannebo Småbolag	2000.08.04	.	53	5200	66	6.9	11.69	3.36	CSRXSE	1.61
Lannebo Småbolag Select	2000.10.31	.	42	640	78	8.2	13.47	4.41	CSX	0.71
Lannebo Sverige	2000.08.04	.	29	1730	54	10.6	6.29	2.57	OMXS30	1.61
Lannebo Sverige Select	2000.10.31	.	22	107	63	11.1	6.44	7.65	OMXS30	0.72
Länsförsäkringar Småbolagsfond	1999.12.31	.	118	1640	65	11.0	7.80	-2.55	CSRXSE	1.62
Länsförsäkringar Mega Sverige	1992.07.02	2008.12.30	49	488	28	13.4	6.77	1.72	OMXS30	0.50
Länsförsäkringar Sverigefond	1999.12.31	.	39	5630	30	13.6	5.16	2.62	OMXS30	1.31
Västernorrlandsfonden	2003.10.01	.	33	185	35	10.2	9.07	2.09	OMXS30	1.44

Fund Characteristics										
Fund Name	Start Date	End Date	Number of Assets	Size (MSEK)	Active Share (%)	Tracking Error (%)	Net Return (%)	Benchmark-Adjusted Net Return (%)	Benchmark	TER (%)
Nordea Private Banking Sverige Plus	2009.06.01	.	42	512	65	13.6	9.72	0.40	OMXS30	0.75
Nordea Småbolagsfond Sverige	2011.02.14	.	43	574	60	12.5	1.10	3.00	CSRXSE	1.50
Nordea Allemansfond Alfa	1984.04.02	.	274	14200	40	12.0	3.90	-2.66	SIXPRX	1.41
Nordea Allemansfond Beta	1984.04.02	.	113	10200	41	12.1	3.19	-3.38	SIXPRX	1.41
Nordea Nordenfond	1989.04.03	.	60	6570	48	12.7	5.64	1.54	CTXN	1.41
Nordea Allemansfond Olympia	1988.01.05	.	272	514	40	12.0	3.99	-2.57	SIXPRX	1.50
Nordea Private Banking Svenska Portfölj	2001.11.26	2010.05.12	29	183	34	13.3	5.77	1.71	OMXS30	1.00
Nordea Selekta Sverige	2000.05.04	.	31	706	35	14.5	0.71	-2.46	OMXS30	1.60
Nordea Sverigefond	1978.01.11	.	55	5180	32	12.0	3.98	-2.54	SIXPRX	1.41
Nordic Equities Sweden	2009.06.01	.	29	87	45	12.3	9.72	-0.03	OMXS30	1.55
Öhman Världsinfektionsfond	2007.10.01	2011.01.11	86	46	58	11.4	-9.51	-2.07	CTXN	1.52
SalusAnsvar Öhman Nordisk Miljöfond	2003.03.31	.	44	151	54	11.5	3.32	0.74	OMXS30	1.70
SalusAnsvar Öhman Sverigefond	1996.03.26	.	46	324	30	7.7	2.75	0.16	OMXS30	1.20
Erik Penser Sverigefond	2006.12.13	.	37	21	31	12.5	0.66	-2.11	OMXS30	1.40
Roburs Etikfond Sverige MEGA	2003.01.23	.	47	1250	28	9.9	11.27	-0.57	OMXS30	0.72
Roburs Exportfond	1993.02.10	.	48	4610	64	12.0	8.92	2.18	SIXPRX	1.42
Roburs Hockeyfond	2001.09.17	2010.04.20	100	8	22	8.9	9.15	1.32	SIXPRX	1.40
Roburs Sverigefond MEGA	1994.12.30	.	103	5880	22	10.1	6.76	0.28	SIXPRX	1.42
Robur Miljöfond	1996.01.26	2011.10.31	44	1360	36	13.1	5.81	-0.90	OMXS30	1.42
Roburs Nordenfond	1991.06.04	.	123	5240	38	11.0	6.48	2.10	CTXN	1.42
Roburs Småbolagsfond Norden	1989.04.03	.	169	6090	65	9.4	8.65	0.36	CSX	1.43
Carnegie Småbolag	1996.11.13	.	52	1340	66	8.8	8.23	-3.56	CSRXSE	1.73
Roburs Småbolagsfond Sverige	1995.11.13	.	107	4110	35	8.4	9.99	-0.54	CSRXSE	1.42
Roburs Sverigefond	1984.03.27	.	103	7610	23	10.1	5.68	-0.86	SIXPRX	1.42
Swedbank Robur Stella Sverige	2007.05.15	.	15	1350	68	14.2	-2.18	2.14	OMXS30	1.83
Robur Svensk Aktieportfölj	2004.05.04	.	41	466	53	10.1	6.91	0.96	SIXPRX	1.62
Robur Vasaloppsfond	2001.10.15	2010.04.20	100	13	22	8.8	7.52	-2.00	SIXPRX	1.43
Scientia Sverige	2010.09.20	.	25	32	65	6.3	0.85	-0.48	OMXS30	0.90
SEB Nordenfond	1997.06.06	.	58	5080	42	11.7	5.08	0.97	CTXN	1.30
SEB Östersjöfond / WWF	1999.01.27	.	50	164	54	12.2	4.55	0.77	CTXN	1.54
SKF Allemansfond	2003.02.28	.	31	72	54	12.7	11.80	-1.01	SIXPRX	1.00
SEB Sverige Småbolagsfond	1987.10.09	.	81	4680	36	8.0	8.68	-1.64	CSRXSE	1.50
SEB Sverige Småbolag Chans/Riskfond	1995.04.18	.	64	2460	47	8.5	10.75	0.47	CSRXSE	1.51
SEB Sverige Stiftelsefond	1998.02.24	.	44	990	46	13.3	5.75	3.19	OMXS30	1.50
SEB Sverige Aktiefond I	1984.04.02	.	84	11800	23	10.1	4.74	-1.76	SIXPRX	1.30
SEB Sverige Aktiefond II	2001.05.21	.	63	6650	33	12.6	4.57	1.99	OMXS30	1.30
SEB Sverige Chans/riskfond	1995.08.14	.	32	1470	33	12.8	4.41	-2.11	OMXS30	1.31
SEB Enskilda Banken Svensk Aktie- portfölj	2001.10.26	.	24	224	26	11.5	5.09	1.58	OMXS30	1.16
Trevise Tillväxtfond	1994.03.04	2007.04.13	41	458	33	14.2	14.73	3.67	OMXS30	1.41
Nordea Portföljinvest Sverige	1999.04.12	2007.04.13	55	69	29	11.4	11.88	0.75	SIXPRX	1.41
Banco Etisk Sverige Pension	2000.09.11	2007.06.29	51	152	28	10.4	5.60	-2.50	SIXPRX	0.90
Banco Teknik & Innovation Pension	2000.09.11	2007.06.29	44	296	91	13.7	-11.61	-23.78	CSX	0.90
Förenade Liv Sverigefond	2002.12.09	2007.06.01	54	169	21	8.3	26.33	2.90	SIXPRX	0.40
Skandia Cancerfonden	2001.06.01	.	36	281	35	14.7	2.60	-4.16	OMXS30	1.40
Skandia Fond Idéer för Livet (Norden)	1995.10.31	.	60	200	49	12.6	4.80	0.39	CTXN	1.40
Skandia Fond Småbolag Sverige	1998.12.16	.	62	1410	48	9.3	8.29	-2.08	CSRXSE	1.40
Skandia Fond Aktiefond Sverige	1994.08.25	.	60	4030	31	12.3	0.80	-5.53	SIXPRX	1.40
AstraZeneca Allemansfond	1984.04.01	.	15	125	54	17.4	3.34	1.01	OMXS30	0.90
Bosparfonden SBC/Handelsbanken	1987.10.26	.	78	688	21	13.4	4.44	-2.08	SIXPRX	1.50
Handelsbankens Nordenfond Aggressiv	2000.09.21	.	53	232	49	12.8	-0.09	1.30	CTXN	1.85
Handelsbankens Nordenfond	1989.04.28	.	108	3200	36	13.1	5.40	1.31	CTXN	1.60
Handelsbankens Nordiska Småbolagsfond	1998.10.15	.	168	3370	70	11.1	10.06	-0.52	CSRXSE	1.60
Handelsbankens Radiohjälpsfond	1995.03.27	2009.03.09	75	76	23	13.7	-0.63	-2.06	SIXPRX	1.50
Handelsbankens Reavinstfond	1998.05.02	.	77	7250	21	13.5	4.78	-1.73	SIXPRX	1.48
Handelsbankens Seniorbofond-Aktie	1991.05.13	2008.02.22	188	117	34	12.5	3.58	-3.99	SIXPRX	1.50
Handelsbankens Småbolagsfond	1994.11.21	.	96	3920	32	9.5	9.65	-1.03	CSRXSE	1.53
Handelsbanken Sverige/Världen	1998.10.20	.	145	10600	37	13.5	3.47	-3.11	SIXPRX	1.50
Simplicity Nordic	2002.09.23	.	64	697	75	14.8	9.75	2.15	CTXN	1.60
Skandia Swedish Stars	2008.03.14	.	20	748	68	17.2	-1.09	-2.98	OMXS30	1.63
Spiltan & Pelaro Aktiefond	2002.12.02	.	27	158	79	11.4	9.82	-0.64	SIXPRX	1.50
Spiltan & Pelaro Aktiva ägare	2002.12.02	.	24	80	85	8.6	10.88	-0.82	CSRXSE	1.50
Spiltan Aktiefond Dalarna	2007.03.05	.	25	13	78	11.0	0.18	-1.02	SIXPRX	1.50
Spiltan Aktiefond Småland	2008.06.19	.	31	77	76	12.6	9.99	8.83	OMXS30	1.50
SPP Aktiefond Sverige	1996.01.15	.	59	1440	31	13.0	6.41	-0.28	SIXPRX	0.71
Systematiska Sverige	2010.03.15	.	51	328	45	13.3	2.59	-5.27	SIXPRX	1.50
Trevise Tillväxtfond II	1999.10.26	.	38	385	35	14.2	4.33	3.48	OMXS30	1.50
All			62	2380	44	11.9	5.43	-0.15		1.36