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Centre for Economic Policy Research
90–98 Goswell Rd
London EC1V 7RR
Tel: (44 171) 878 2900
Fax: (44 171) 878 2999
Email: cepr@cepr.org

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ABSTRACT

Performance and Characteristics of Swedish Mutual Funds 1993–7*

The performance, and its characteristics, of Swedish-based equity and bond mutual funds are studied in detail. Accounting for survivorship biases, regular equity funds have a slight overperformance, equity funds with certain tax advantages have a negative performance (before tax) and bond funds a clear underperformance. The performance is related to fund-specific characteristics such as netflows of new money into funds, past performance, expense measures, commissions paid by the funds, turnover and the size of funds. The economic importance of the cross-sectional differences is quantified by investigating various trading strategies.

JEL Classification: G11, G12, G23
Keywords: in- and outflows, persistence, portfolio evaluation, survivorship bias, style analysis

Magnus Dahlquist, Stefan Engström and Paul Söderlind
Stockholm School of Economics
PO Box 6501
SE-11383 Stockholm
SWEDEN
Tel: (46 8) 736 9156
(46 8) 736 9163
(46 8) 736 9601
Fax: (46 8) 312 327
(46 8) 313 207
Email: magnus.dahlquist@hhs.se
stefan.engstrom@hhs.se
nepso@hhs.se

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NON-TECHNICAL SUMMARY

The recent flow of money into the Swedish mutual fund industry has been tremendous. During 1997, the amount invested in mutual funds increased by 43%. Out of this, 52% were net flows into the industry. Today, savings in funds constitute as much as 20% of the financial savings of households and every second Swede saves in mutual funds. In fact, savings in funds are larger than both bank deposits and direct equity ownership. This increased attention for mutual funds has lead to a demand for information about how funds perform and how this savings vehicle can be characterized.

In this paper we provide extensive evidence on the performance and characteristics of Swedish-based mutual funds for the period from 1993 to 1997. The analysis is divided into two parts. The first part of the Paper complements US studies of mutual fund performance. First, a large number of studies on US data have found that the mutual fund industry has, on average, underperformed. Interestingly, Ferson and Schadt (1996) document a more neutral performance of funds when they account for time variation in risk and expected return via conditional information. In a similar setting, Dahlquist and Söderlind (1998) find no overall evidence of inferior performance on a smaller set of Swedish equity funds. In this study we extend their analysis to include a larger set of equity and bond funds. Second, despite the fact that bond funds have become popular and the interest in these is growing, most empirical work on mutual fund performance concerns funds that invest in equity and to a lesser extent debt securities. We assess bond funds as well as equity funds. We also have access to data on equity funds which are taxed (and operate) differently. Third, our sample of funds is not contaminated by a survivorship bias since we are using a data set which consists of virtually all funds that have existed. Hence, we are also able to quantify the survivorship bias in the fund market. Finally, we address issues related to market timing and the persistence in performance.

The second part of the Paper recognizes recent efforts to study the relation between performance and fund-specific attributes. In this part of the Paper, we pursue two different routes. The first route is to treat the performance over time as given and characterize the funds in the cross-section. More specifically, we use variables like past performance, in- and outflows, size, turnover and various proxies for expenses to assess the performance of funds in relation to these fund-specific attributes. The second route is to economically quantify the cross-sectional differences and evaluate trading strategies based on the attributes. The past performance is of interest for analysing the persistence in performance and to add to the 'repeat winner'

evidence. The in- and outflow data are used to study how flows into funds are related to performance and provide evidence of so called ‘smart money’.

Our evaluation of the performance suggests that regular equity funds have had a slight overperformance. The equity funds with certain tax advantages appear to have had a negative relative performance (before tax) and the bond funds show a significant underperformance. There is only little evidence of market timing ability. We also document and quantify a survivorship bias in the sample of Swedish mutual funds. In our cross-sectional analysis of fund characteristics, we find evidence of a ‘size effect’. For equity funds, it seems that larger funds perform worse than smaller funds. The contrary seems to be the case for bond funds: larger bond funds tend to perform better than smaller bond funds. Further, we find some evidence of smart money for equity funds, that is, funds with high net inflows appear to perform better than funds with low net inflows. The evidence on trading activity is not as clear, but there seems to be a positive relation between performance and trading activity. We find little evidence of persistence in performance.

1 Introduction

The recent flow of money into the Swedish mutual fund industry has been tremendous. During 1997, the amount invested in mutual funds increased by 43%.[1] Out of this, 52% were net flows into the industry. Today, savings in funds constitute as much as 20% of the financial savings of households, and every second Swede save in mutual funds. In fact, savings in funds are larger than both bank deposits and direct equity ownership. This increased attention for mutual funds has lead to a demand for information about how funds perform and how this savings vehicle can be characterized.

In this paper we provide extensive evidence on the performance and characteristics of Swedish-based mutual funds for the period from 1993 to 1997. The analysis is divided into two parts. The first part of the paper complements U.S. studies of mutual fund performance. First, a large number of studies on U.S. data have found that the mutual fund industry has, on average, underperformed. Interestingly, Ferson and Schadt (1996) document a more neutral performance of funds when they account for time-variation in risk and expected return via conditional information. In a similar setting, Dahlquist and Söderlind (1998) find no overall evidence of inferior performance on a smaller set of Swedish equity funds. In this study we extend their analysis to include a larger set of equity and bond funds. Second, despite the fact that bond funds have become popular and the interest in these are growing, most empirical work on mutual fund performance concern funds that invest in equity, and to a less extent debt securities. We assess bond funds as well as equity funds. We also have access to data on equity funds which are taxed (and operate) differently. Third, our sample of funds is not contaminated by a survivorship bias since we are using a data set which consists of virtually all funds that have existed. Hence, we are also able to quantify the survivorship bias in the fund market. Finally, we address issues related to market timing and the persistence in performance.

The second part of the paper recognizes recent efforts of studying the relation between performance and fund-specific attributes. In this part of the paper, we pursue two different routes. The first route is to treat the performance over time as given and characterize the

[1] Numbers presented in the text are taken from various sources, including publications from the Swedish Mutual Fund Association, Sweden Fund Statistics, Statistics Sweden, Finansinspektionen, and the Swedish National Debt Office.

funds in the cross-section. More speci…cally, we use variables like past performance, in and out‡ows, size, turnover and various proxies for expenses to assess the performance of funds in relation to these fund-speci…c attributes. The second route is to economically quantify the cross-sectional di¤erences and evaluate trading strategies based on the attributes. The past performance is of interest for analyzing the persistence in performance and to add to the 'repeat winner' evidence. The in and out‡ow data are used to study how ‡ows into funds are related to performance, and provide evidence of so called 'smart money.'[2]

Our evaluation of the performance suggests that regular equity funds have had a slight overperformance. The equity funds with certain tax advantages appear to have had a negative relative performance (before tax), and the bond funds show a signi…cant underperformance. There is only little evidence of market timing ability. We also document and quantify a survivorship bias in the sample of Swedish mutual funds. In our cross-sectional analysis of fund characteristics, we …nd evidence of a 'size e¤ect.' For equity funds, it seems that larger funds perform worse than smaller funds. The contrary seem to be the case for bond funds – larger bond funds tend to perform better than smaller bond funds. Further, we …nd some evidence of smart money for equity funds, that is, funds with high net in‡ows appear to perform better than funds with low net in‡ows. The evidence on trading activity is not as clear, but their seem to be a positive relation between performance and trading activity. We …nd little evidence of persistence in performance.

The rest of the paper is organized as follows. In Section 2 we give a brief description of return on funds and their characteristics, portfolio benchmarks, and information variables used in the analysis. The results of the performance evaluation is presented in Section 3. In Section 4 the focus is on the cross-sectional characterization of funds. We also implement and analyze trading strategies based on the cross-sectional di¤erences. Finally, in Section 5 we conclude.

[2] The persistence in performance has for long been of interest (starting by Jensen (1969), and Carlson (1970), and more recently in studies by Grinblatt and Titman (1992), Hendricks, Patel, and Zeckhauser (1993), and Brown and Goetzmann (1995), among others). Moreover, there are recent evidence on ‡ows into and between funds by Warther (1995), Gruber (1996), Sirri and Tufano (1998), and Zheng (1998).

2 Data

2.1 Swedish Mutual Funds

The Swedish mutual fund industry is relatively young, but has recently received increased interest. For instance, in 1995 the bank deposits of households were about 386 billion SEK, whereas their mutual fund holdings were worth 242 billion SEK. (During the sample period, the price of one USD has been about 8 SEK.) Two years later, bank savings were about the same, 392 billion SEK, but holdings in mutual funds had almost doubled (to 456 billion SEK).

Table 1 presents some summary statistics for all Swedish mutual funds for each year (as of December) during the period from 1992 to 1997. The mutual funds are broadly categorized by the Swedish Financial Supervising Authority, Finansinspektionen, according to primary investment objectives. Equity funds are divided into regular equity funds (labeled Equity I) and special equity funds (labeled Equity II). The Equity II funds are so called Allemansfonder which have some tax advantages.[3, 4] The bond funds invest in mortgage and government bonds (labeled Bond). Statistics for funds which invest in both equity and debt instruments (labeled Mixed) are also shown. The last category (labeled All) is the aggregate of Equity I, Equity II, Bond, and Mixed funds.

Over the sample period, the number of funds have increased dramatically – so has the invested amount. There were 435 mutual funds at the end of 1992, and 764 funds at the end of 1997. About 58% of the funds were registered in Sweden (as opposed to abroad) in 1992 and 45% in 1997. Out of these, 46% of the equity funds invested more than 90% of their assets in Sweden. Most of the bond funds invest only in Sweden. The total assets under management has increased from 128 to 456 billion SEK.

[3] The Equity II funds are funds within the public savings program. During 1993, 1995, and 1996 the tax rate on capital gains for these funds were 20% which should be compared with the tax rate on other funds of 30%. In 1994 and 1997 the tax rate on these funds were the same as other funds, that is, 12.5% and 30%, respectively.

[4] There are further differences in the Equity I and II funds due to restrictions on their portfolios. During our sample period, Equity I funds have not been allowed to hold a single stock to a value of more than 10% of their total assets. Moreover, they have only been allowed to hold stocks with more than 5% of total assets to a maximum of 40% of total assets. The restrictions for the Equity II funds have been that they were not allowed to invest more than 10% of total assets in a single stock. That is, if the share of total assets has exceeded 10% due to changes in market prices, Equity II funds have not been forced to sell their shares. These restrictions have potentially been binding for two firms (Astra and Ericsson). We find the difference between the returns on a general market index with or without these restrictions imposed to be small. We do not, however, elaborate further on this.

2.2 Fund Returns and Characteristics

Our sample of mutual funds covers the period from the end of 1992 to the end of 1997. The reason for studying this recent period is that before 1991 only a few funds existed. We partition the data set into primary investment objectives using the classifications by Finansinspektionen (as discussed above).

We exclude funds which are not Swedish-based, or invest heavily in foreign markets.[5] The reason for including only Swedish-based funds is that we believe that it is hard to take into account different tax regulations applicable to the funds and/or their holders. The reason for excluding funds which invest internationally is that these funds have different risk exposures which would require additional benchmarks to span the investment opportunity set. It is noteworthy that most Mixed funds are classified as 'Swedish' by Finansinspektionen, though a closer look reveals that they have significant portions of their assets in foreign markets. Therefore we do not consider Mixed funds. In total we consider 80 Equity I funds, 46 Equity II funds, and 85 Bond funds. Even though we only consider Swedish-based funds investing in Sweden (about 1/5 of the funds), we cover a large part of the mutual fund industry. For instance, we cover about $2/3$ of the total net asset values for equity funds.

For all studied funds, we have obtained net asset values (NAVs) from the TRUST database of Findata sampled on a weekly basis. The NAVs account for dividends (reinvested) and management fees (subtracted). From the NAVs, weekly returns were calculated. The gross return of fund i over the period from $t - 1$ to t is then

$$R_{it} = NAV_{it}/NAV_{it-1}; \tag{2.1}$$

where NAV_{it} is the net asset value for fund i at time t.

For most of the funds we have been able to (manually) collect various characteristics/attributes of funds from quarterly reports obtained via Nya Finans and Sparöversikt (the publications of Finansinspektionen, and Swedish Fund Statistics, respectively), and via annual reports of the funds. The attributes are size, flows, administrative fees, exit and loading fees, turnover, and commissions.

[5] In some of the regressions below, we do not consider funds which we observe for less than 30 weeks.

The size of a fund is measured as the total net asset value of each fund's portfolio. The total net asset value, denoted by TNA_{it}. The net flows (or new money) during a year are approximated from the returns and the total net asset values under the assumption that all new money is invested in the beginning of the year. The flow of new money into fund i over the period from $\tau - 1$ to t, $F_{i\tau}$, is calculated as

$$F_{i\tau} = \frac{TNA_{i\tau} - TNA_{i\tau-1} \times NAV_{i\tau}/NAV_{i\tau-1}}{TNA_{i\tau-1}}; \qquad (2.2)$$

which measures the net growth in a fund's assets beyond reinvested capital gains and dividends.

The administrative fees are expressed as a percentage of assets invested, and are included in the net asset values. Size, flows, and exit and loading fees are computed on a yearly basis.

The turnover is expressed as the minimum of purchases and sales over average assets (in %) during a year. The commissions are the costs paid by the equity funds for their trading, and are here expressed as the percentage of average assets. The turnover and commission figures are only available for a smaller set of funds in 1997.

In Table 2 we present some descriptive statistics for the funds in the three categories. The aggregated total net asset values in December 1997 are about the same for Equity I and II funds, even if the average Equity I fund is only a third of the average equity II fund. The net flow into our sample of funds has in the aggregate been positive (positive for Equity I funds and negative for Equity II funds). The administrative fees are about the same magnitude for the equity categories (about 1.5%), which is more than twice as high as for the bond fund category (about 0.7%). It is interesting to see the differences in turnover across the categories. Bond funds have typically the highest turnover – about 210% of their average asset values are purchased or sold over a year. Money-market funds (part of the Bond funds) are excluded since turnover are not reported for them. The corresponding figures for Equity I and Equity II funds are 75% and 47%, respectively, indicating that Equity II funds are less active than Equity I funds. Consequently, the commission costs for Equity I funds are consistently higher than for Equity II funds. Notice that since bond funds pay no commission, it is zero throughout for them.

The average return in excess of a riskfree rate (detailed below) over the period (not reported in the table) is highest for Equity I funds (about 21.5% on an annual basis), and somewhat lower for Equity II funds (about 19%). This is the case despite the same level of volatility for equity funds. The bond funds show a slightly positive excess return during the period, and a very low volatility.

2.3 Benchmarks and Conditional Information

When we undertake the performance evaluation we want to compare the returns on a fund with the returns on certain benchmarks. For tractability and to facilitate interpretations, we use returns on broad asset classes to represent the investment opportunity set. We allow, however, for dynamic strategies according to some predetermined information variables.

More specifically, to capture the developments in the stock market we use the returns on two equity indices. The first index is the general stock market as measured by the Findatas Avkastningsindex. The index is a value-weighted index (which accommodates buy-and-hold strategies) and with dividends reinvested. It includes stocks on the so called A-list at the Stockholm Stock Exchange (SSE).[6] The second index we use is on a small firm index which we have constructed. We have used the same population as Carnegie Small Cap Index which consists of smaller stocks (that are on other lists at the SSE), and a similar weighting method.[7] The main difference between the two indices is that our index includes dividends.[8]

To capture the development in the bond market, we use two bond indices provided by Findata. The indices are a total bond index with an average duration of four years and a money-market index consisting of (approximately) 180-day T-bills. The bond index consists of both government and mortgage bonds.

[6] Stocks are traded under different listings, and the official A-list has the most stringent listing requirements on the records and stability of the company, as well as on the distribution and the liquidity on the company's stock. Stocks on the A-list correspond to on average 97% of the total market value and 96% of the total trading volume at the SSE over the sample period.

[7] The small stock index contains 262 companies. It is a value-weighted index and repopulated twice a year. The largest company in the beginning of the sample had a market capitalization of about 1.2 billion SEK and in the end of the sample about 4.2 billion SEK.

[8] It is worth noting that the index without dividends is the benchmark which most funds with a focus on small firms compare their performance with. The effect of ignoring dividends results, however, in a seemingly overperformance of about 3% per year during our sample period.

The returns on the above benchmarks are measured in excess of a 7-day interbank rate (STIBOR) which is used as a proxy for a riskfree investment.[9]

Table 3 presents some summary statistics of the benchmark excess returns. The average returns on the two equity indices are 20% to 30% (on an annual basis), with a corresponding volatility of about 17% per year. The return on the equity indices show no skewness. For small stocks there is significant excess kurtosis. The first-order autocorrelations in the returns are fairly low (and insignificant). The average excess returns on the money-market and total bond indices are 4% and close to zero, respectively. The corresponding volatilities are 0.7% and 5%. Both bond portfolios show excess kurtosis. The correlations among the benchmarks are high for the two equity portfolios (77%), and also high across the bond portfolios (67%). The correlations between the equity and the bond portfolios are in the range of 30% and 48%.

Predetermined conditional information variables are used to capture potential time-variation in risk and expected returns. Following Dahlquist and Söderlind (1998), we use the lagged market return and the level of the yield curve (stochastically detrended to dampen the otherwise extreme autocorrelation) as instruments.

3 Evaluating Fund Performance

In this section we undertake an evaluation of the performance of Swedish-based mutual funds for the period from 1993 to 1997. Our sample contains essentially all funds that existed during this period, so the results should not be affected by a survivorship bias. Later in this section, we also try to quantify the size of the survivorship bias that would occur if we had used only funds still alive at the end of 1997.

3.1 Performance Evaluation

In the performance evaluation, we want to decompose a manager's return into the part that is systematic (and can be replicated by benchmarks or broad market indices), and a non-systematic part which can be referred to as the risk-adjusted performance. Hence, we

[9] We have also considered the return on a 30-day T-bill instead of the interbank rate – fortunately the results are very similar and hence not sensitive to our choice of the riskfree rate.

are interested in evaluating the part of the return which cannot be attributed to general risk taking. Following Ferson and Schadt (1996), we consider two benchmark models – one unconditional and one conditional.

Consider first the unconditional model, and recall that R_{it} denotes the gross return on fund i over the period from time $t - 1$ to t. Initially, consider only one benchmark with a return denoted by R_{bt}, and a riskfree asset with a return of R_{ft}. The following regression gives the traditional Jensen's alpha measure

$$R_{it} - R_{ft} = \alpha_i + \beta_i (R_{bt} - R_{ft}) + \varepsilon_{it}; \qquad (3.1)$$

where ε_{it} is a fund-specific error term. The slope, or the beta, measures the exposure versus the benchmark and constitute the systematic risk of the fund. The intercept, or the alpha, is the systematic pricing error (the deviation from the benchmark model). A positive (negative) alpha can then be interpreted as a measure of superior (inferior) performance.

The unconditional risk-adjustment can easily be extended to include time-variation in the beta, yielding a conditional model. Let x_{t-1} be a vector of predetermined information variables with zero means. Assuming that the beta for each fund varies over time, and that this variation can be captured by a linear relation to the conditional information variables, we have that

$$\beta_{it-1} = b_{i0} + b_i' x_{t-1}; \qquad (3.2)$$

where b_{i0} is a parameter, and b_i is a vector of parameters. Notice that the expected value of β_{it-1} equals b_{i0}, since the information variables have zero means. An augmented regression can then be written as

$$R_{it} - R_{ft} = \alpha_i + b_{i0} (R_{bt} - R_{ft}) + b_i' x_{t-1} (R_{bt} - R_{ft}) + \varepsilon_{it}; \qquad (3.3)$$

where again ε_{it} is an error term. A positive alpha is interpreted as overperformance. The interpretation of the alpha in (3.3) is that it measures the overperformance in comparison with simple trading rules (linear in x_{t-1}), which individual investors could easily implement.

Equations (3.1) and (3.3) can easily be extended to allow for several benchmarks.[10] As detailed earlier, we use broad benchmarks to capture the investment styles of the funds. For equity funds we use the general market portfolio and a small firm index. For bond funds we use the returns on the two bond indices – each capturing different segments of the maturity structure. As conditional information we use the lagged market return and the level of the yield curve.

3.2 Results of the Performance Evaluation

The results of the performance evaluation are summarized in Table 4. We estimate the coefficients with least squares, but the standard errors are designed to allow for heteroskedasticity and serial correlation (as in White (1980) and Newey and West (1987)). The simulation evidence in Dahlquist and Söderlind (1998) suggests that the small sample distribution of the t-statistics for neutral performance in (3.1) and (3.3) are well approximated by the asymptotic distribution. All results are annualized (for instance, an alpha of 1% means an overperformance of 1% per year).

The results from the unconditional model gives a first hint of the performance of the funds – there seems to be an overperformance of Equity I funds, and an underperformance of Equity II and Bond funds. Interestingly, the performance measures using dynamic benchmarks (allowing for time-variation in betas) show overall better results than performance measures based on constant betas. The discussion of the fund performance below is based on the results obtained when we allow for time-variation in betas. The justification for using a benchmark model with time-varying betas can also be inferred from the table. The hypothesis of zero time-variation (using a Wald-statistic) can be rejected for 60% of the Equity I funds, 77% of the Equity II funds and 53% of the Bond funds. Based on this we focus on the results from using the conditional benchmark model, reported below.

Equity I funds have, on average, an overperformance of 0.5% per year. The distribution of the conditional alphas is shown in the first panel of Figure 1. The bars in the figure show the percentage of funds within a performance bin (each bin covers the performance of one

[10] As shown in Chen and Knez (1996) and Dahlquist and Söderlind (1998) there is a mapping between the linear beta specification and general performance measures based on stochastic discount factors.

percentage point). The numbers above the bars are the actual number of funds within each bin. The good funds deviate more than the bad funds from neutral performance, so the median is only 0.1%. Moreover, only 10% of the Equity I funds show a statistically significant overperformance. It is worth noting that 33% of the funds focusing on small sized firms, and only 6% of the funds which mainly focuses on large sized firms have significant overperformance (at the 10% level). Note that administrative fees directly affect the return of the funds. For Equity I, the fees have been on average 1.4% per year, so an overperformance of about 0.5% against costless benchmarks is quite substantial.

The Equity II funds which have some tax advantages, show a worse (before tax, at least) performance compared to the Equity I funds. On average, the conditional alpha is about -1% per year. As seen in the second panel in Figure 1, the distribution of the Equity II funds is skewed as that for Equity I funds, but the dispersion is smaller. The median performance is worse than the mean (about -1.7% per year). The administrative fees are about 1.5% for these funds, and if they were excluded the performance would be more neutral. One argument raised for the bad performance of the Equity II funds is that the competitive pressure is low because of the tax advantages.

Bond funds show inferior performance. The average (and median) underperformance is about -0.7% on an annual basis. This underperformance is very significant – as many as 57% of the funds show underperformance at the 10% significance level. The distribution, shown in the third panel in Figure 1 is fairly symmetric and has relatively little dispersion. Interestingly, 90% of the money-market funds show significant underperformance, whereas only 12% of the funds in the intermediate group, and 33% of the funds with the highest duration show significant underperformance at the 10% significance level. The underperformance is slightly more than the average administrative fee.

To get an idea of how the mutual funds – as an industry – have performed, we also consider value-weighted alpha measures. For Equity I funds, the value-weighted performance measure 1.0% per year (unweighted: 0.5%); for Equity II funds the weighted mean is -1.7% (unweighted: -1.0%); and Bond funds it is -0.6% (unweighted: -0.7%). We get similar results if we instead weight with the fund's sample length.

3.3 Robustness of the Performance Results

This section studies the robustness of the performance results, by changing the set of benchmark assets and adding non-linear terms as proxies for market timing to the regression equations. The overall finding is that the previous results are not sensitive to these changes.

3.3.1 Style Analysis and Choice of Benchmarks

In this section we undertake a style analysis, as in Sharpe (1992), of the funds. A style analysis is a regression equation like (3.1) (with several benchmarks), but where the coefficients are restricted to sum to one, and to be non-negative. The fitted portfolio can thus be thought of as a portfolio of the benchmarks where short-selling is ruled out.

The most important result, for our purposes, is that the performance measures from these restricted regressions are similar to the unconditional alphas reported before. However, we notice a few other interesting features.

The quasi R-squares (one minus the ratio of the variances of the residuals and the returns) for these restricted regressions are typically very high: our limited number of benchmarks seems to be able to capture most of the movements in the fund returns. A clear majority of the funds have an R-square larger than 80%, and as many as 41% of the funds have an R-square larger than 90%. The R-squares are higher for Equity II funds than for Equity I funds. One reason for this may be the fact that Equity II funds typically invest in larger companies. Another reason is that Equity I funds have a higher trading activity than Equity II funds. Both of these reasons will cause the Equity II funds to be more closely linked to the general market index. The bond funds show a much more disperse distribution of R-squares; most bond funds with low R-square are money-market funds.

When we repeat the style analysis on a rolling data window of 40 weeks, then the weights vary substantially for some of the funds. This suggests that many of the funds have time-variation in their exposure to the various benchmarks. This strengthens our belief that it is important to account for dynamic strategies in the portfolio evaluation.

We have also studied the performance results from a larger sets of benchmarks. For the equity funds we consider a set of 8 industry portfolios, and for the bond funds three maturity based indices.[11] The performance results are also in this case fairly similar to those reported before. From style analysis on the larger set of benchmarks, we also note that both Equity I and Equity II funds seem to use portfolio weights which are fairly close to the market weights. We also find that no bond fund is even moderately linked to the long bond index (more than five years). This is partly the motivation to only consider two return indices for the bond fund category.

3.3.2 Market Timing

In this section, we would like to go beyond the above performance measures which are not able to distinguish security selection from market timing. By selectivity we typically mean that a portfolio manager has the ability to pick the 'right' securities, whereas market timing ability means that a manager has the ability to predict market-wide movements.

We use two common measures for estimating market timing ability, which add proxies for the market timing ability to the regressions above.[12] The first model is the 'dummy regression' of Henriksson and Merton (1981)

$$R_{it} - R_{ft} = \alpha_i + \beta_{it-1}(R_{bt} - R_{ft}) + \gamma_i D_t (R_{bt} - R_{ft}) + \varepsilon_{it}, \qquad (3.4)$$

where D_t is a dummy variable for a positive excess return (one if $R_{bt} > R_{ft}$, and zero otherwise). The hypothesis of no timing ability implies that γ_i is zero. The second model is based on the 'quadratic regression' of Treynor and Mazuy (1966)

$$R_{it} - R_{ft} = \alpha_i + \beta_{it-1}(R_{bt} - R_{ft}) + \gamma_i (R_{bt} - R_{ft})^2 + \varepsilon_{it}. \qquad (3.5)$$

The hypothesis of no timing ability implies again that γ_i is zero. In either model, a positive γ_i can be interpreted as market timing ability, and the security selection ability is measured by the intercept (the 'alpha'). Notice that the timing measures above allow for conditional information via time-variation in β_{it-1}, and can potentially also be extended

[11] The industry portfolios, from Findata, are manufacturing, pulp and paper, retail trade, banking, investment companies, shipping, construction and real estate, and miscellaneous. The bond indices are a money-market index (180-day T-bills), an intermediate index (bonds with 1 to 3 years to maturity), and a long index (bonds with more than 5 years to maturity)

[12] For further elaborations of conditional market timing measures, see Becker, Ferson, Myers, and Schill (1998).

to allow for time-variation in the $°_i$-coe¢cients (as in Ferson and Schadt (1996)). This turns out to be non-signi…cant in most cases, however, and we report only results from an unconditional timing model. In our regressions with several benchmarks, we let the non-linearities be in one broad portfolio. We use the general market portfolio and the total bond portfolio for equity and bond funds, respectively.

The results from the market timing speci…cations above are presented in Table 5. Overall, the evidence suggests that there are only a few funds, if any, that appear to have market timing ability. About 15% of the Equity I funds seem to have had signi…cant positive timing ability (at the 10% level). Moreover, signi…cant negative timing ability is only detected in about 5% to 10% of the funds. Our analysis further suggest that the timing ability for Equity II fund managers is very similar to the timing ability of Equity I fund managers. Bond fund managers seem to have the highest degree of both positive and negative market timing. About 20% of the Bond funds have signi…cant and positive timing ability, but almost as many funds seem to have signi…cant and negative timing ability.

In sum, we do not …nd much evidence in favor of market timing ability (positive as well as negative). This is independent of which method for timing ability that is used. We also note that the performance measures from the two market timing regressions (not shown) are very similar to those from the linear models (3.1) and (3.3).

3.4 Survivorship Biases

The results presented above should not su¤er from survivorship biases, since we make use of essentially all funds that existed any time between 1993 and 1997. By the same virtue, our data set allows us to investigate what kind of performance a sample of only surviving funds would give.

A number of studies have noted that estimates of performance are biased upwards because of survivorship. An upward bias is a likely outcome if it is the poor performers that are liquidated or merged into other funds, which leads to an omission of these funds past history in historical data bases. Hence, if it is the case that only the funds which have performed well during the studied period that are in the sample, we can expect an upward bias in the performance measures. In our data set we can, however, study this phenomenon and quantify the bias. The reason is that we have access to the history of virtually all funds that have existed – defunct funds as well as surviving funds.

Table 6 shows the entry and exit of funds during the sample period. The attrition rate is the percentage of funds which left the sample (disregarding funds which enter and exit during the same year). The attrition rates for the Equity I and Bond categories are in the range from 3:5% to 19%. The rate for Equity II funds is much lower on average and about 2% to 3% (the year of 1997 is an exception). The table also shows a mortality rate, that is, the rate of non-surviving funds over a longer time period. Naturally, it is higher in the early years, and steadily decreasing over time. This is due to the fact that the fund market and the number of funds have grown. Again, this measure show a larger number of exiting funds for Equity I and Bond funds.

The attrition rates can be compared with those found in U.S. mutual fund data bases, where Grinblatt and Titman (1989), and Brown, Goetzmann, Ibbotson, and Ross (1992) …nd attrition rates in the range from 2:6% to 8:5% with an average of about 4:5%. That is, the average attrition rates in our data base are about the same magnitudes, though they seem to be more volatile over the years.

In Table 7 we present estimates of the survivorship biases. We construct a direct measure of the bias by comparing two di¤erent portfolios. The …rst portfolio (labeled All) is the return on an equally-weighted portfolio of all funds in existence each week. This portfolio has, by construction, the same survivorship experience as the overall sample. The second portfolio, however, only consists of surviving funds (labeled Surviving), that is, funds that are existing in December 1997 – at the end of the sample period. It is constructed in a similar manner as the All portfolio, but since no funds exits, the number of funds in the portfolio only increases. The measure of survivorship bias is then the di¤erence between the two portfolio (All and Surviving).

We …nd that non-surviving funds exhibit worse performance than surviving funds. The di¤erence between surviving and non-surviving funds, however, vary across the three investment objectives. For the Equity I funds, it is fairly high, about 0:6% to 0:7% per year, whereas the estimated bias for the Equity II and Bond funds are lower (on average about 0.15% per year). The biases on a year-by-year basis fluctuate considerable. Interestingly, when a risk-adjustment is undertaken, we find that the measured biases are about the same magnitudes as the average bias in the returns. To infer the survivorship bias for the industry as a whole (and not for the average fund), we also consider value-weighted portfolios. We then find a somewhat smaller bias, indicating that it is typically smaller funds that leave the sample.

The estimated biases can be compared to findings on U.S. mutual fund data. For instance, Grinblatt and Titman (1989) find a survivorship bias of about 0.5% per year. Brown and Goetzmann (1995) estimate the survivorship bias to 0.8% per year. When returns, however, are scaled by the funds market capitalizations the bias is only 0.2% per year. Moreover, Malkiel (1995) reports a bias as high as 1.4% per year. Blake, Elton, and Gruber (1996) also find large biases (above 1% per year) when raw return are used, whereas the bias is about 0.7% on a risk-adjusted basis. Finally, Carhart (1998) documents in a large sample of funds lower survivorship biases of about 0.2% per year. Overall, we conclude that the survivorship bias in the Swedish market is in the lower range of estimated biases in the U.S. market.

4 Cross-Sectional Characteristics and Trading Strategies

In this section we relate the performance of the funds to various cross-sectional characteristics/attributes. This is done by measuring the performance of the funds on a year-by-year basis, and then relating this to annual data on fund characteristics.[13]

Our first approach is to run panel data regressions

$$\alpha_{i\tau} - \overline{\alpha}_{\tau} = \gamma_0 + \gamma_1 (x_{i\tau} - \overline{x}_{\tau}) + \xi_{i\tau}; \qquad (4.1)$$

where $\alpha_{i\tau}$ is the estimated alpha for fund i in year τ and $x_{i\tau}$ denotes (possibly a vector of) fund characteristics. We allow for fixed (year) effects by subtracting the mean of the alpha and the characteristic during a year, denoted $\overline{\alpha}_{\tau}$ and $\overline{x}_{\tau}$, respectively. The alphas are, of course, generated variables which contain measurement errors. This is not

[13] We undertake the cross-sectional regressions using characteristics measured as averages over the sample period as well. These results are consistent with the results presented below.

a problem for consistency, but will introduce heteroskedasticity since the different alphas are measured with varying degree of precision. We therefore use a weighted least squares approach where each observation is weighted by the reciprocal of its residual standard deviation from the performance regression in Section 3.1. (If the measurement error was the only reason for the residual in (4.1), then this is the same as the generalized least squares method.) Interestingly, the performance measure, the alpha, then becomes an appraisal ratio.

For some of the fund characteristics (size, fees, and buy/sell) we have data for almost all funds/years, but we have less data for the other characteristics (turnover, commissions and lagged flows). A multiple regression (when $x_{i\tau}$ is a vector) typically throws away all lines of data where there is a missing value in one of the regressors. This is a waste of information. To get around this problem, we apply the two-step approach in Griliches (1986), which essentially amounts to estimating each regression coefficient using all available data for that particular regressor.[14]

Our second approach is study the performance of trading strategies based on the fund characteristics. This gives further evidence on the cross-sectional differences and helps us to quantify them economically. The funds are first ranked (based on the attribute), then grouped according to low, middle, and high attribute, and finally formed into equally-weighted portfolios. We then construct a fictitious zero-cost portfolio by buying the high portfolio financed via a short-selling of the low portfolio.[15] The zero-cost portfolio is held for one year. After one year the sorting procedure is repeated, new portfolios are created, and then held for the subsequent year, and so on.[16]

Obviously, we cannot infer the underlying sources of the relations between the perfor-

[14] The approach in Griliches (1986) is as follows (see also Greene (1997), chapter 9). In the regression equation $y_i = ax_i + bz_i + \varepsilon_i$, we have data on x_i only for $i \in N_1$, but we have data on y_i and z_i for $i \in N_1 \cup N_2$ (the whole sample). First, estimate the regression on $i \in N_1$ and let $\hat{a}_{N_1}$ denote the estimate of a. Second, run the regression $x_i = \delta z_i + u_i$ on $i \in N_1$, and let $\hat{x}_i = \delta z_i$ for $i \in N_2$ and $\hat{x}_i = x_i$ for $i \in N_1$. Third, run the regression $y_i - \hat{a}_{N_1} x_i = bz_i + v_i$ on $i \in N_1 \cup N_2$. The estimate of b from the third step, and $\hat{a}_{N_1}$ from the first step, are taken to be the estimates.

[15] We have also divided the sample of funds into two categories (below and above median) based on their characteristics. This trading strategy gives similar results.

[16] It is worth noting that we follow the money approach in Elton, Gruber, and Blake (1996) to avoid survivorship bias to some extent. The idea is basically to use all funds in the strategies. That is, even if a fund exits the sample, its history of data up to that point is used in the zero-cost portfolios, and the money invested is afterwards placed equally in the surviving funds. Furthermore, if a fund merges into another fund, it is assumed that the money invested is reinvested in the new fund.

mance and attributes of mutual funds which we find. We can, however, characterize these relations. We believe that this is of help in future analysis of the cross-sectional dispersion of fund performance. To make sure that the presented results are robust to various perturbations, we do sensitivity analyses and utilize alternative estimators of the relations. For instance, we check how the results are affected by the inclusion, or not, of outliers – either in the measured performance or in the attributes. We have also reestimated all regression coefficients by using robust estimators like the method of least absolute deviations (LAD) and the method of least trimmed squares (LTS), which put less weights on outliers.[17] We have also reestimated the weighted least square regressions on every subsample of size $N - 2$ drawn from the whole sample of observations. That is, for every possible exclusion of two data points. This gives $N(N - 1)/2$ different estimates, and we report the 0th (minimum), 5th, 50th (median), 95th, and 100th (maximum) percentiles.

We discuss the evidence in the subsections below. The results from the panel regressions are reported in Tables 8–10, whereas the evidence on the persistence in performance is summarized in Table 11. The results from the trading strategies are presented in Table 12.

4.1 Size of Funds

We start by investigating the relation between the performance and the size of funds, measured as the log of the total net asset value at the start of the year. An interesting question to address is whether large funds are possibly more efficient due to returns to scale, or whether they act less efficiently due to their larger market capitalization?

Our regression results suggest that the size of the fund matters. For the bond fund category we find that larger funds perform significantly better than smaller funds. In contrast, we find a negative relation between the risk-adjusted performance and the size of Equity II funds. These findings may be explained by the fact that, in Sweden, bond funds are quite small compared to the bond market, whereas the Equity II funds are

[17] Let u_i be the residual in a regression with N observations. The least squares estimator minimizes $\sum_{i=1}^{N} u_i^2$, the least absolute deviations estimator minimizes $\sum_{i=1}^{N} |u_i|$, and the least trimmed squares minimizes $\sum_{i=1}^{n} u_i^2$; where $u_1^2 \le \cdots \le u_N^2$ and $n \le N$ (we use $n = 0.9N$, or the closest integer). See, for instance, Rousseeuw and Leroy (1987) for further details about the estimators.

relatively large compared to the equity market. It could be argued that the size of the funds may be an issue for whether larger funds really can invest in small firms (as much as they want), and/or whether it may be a problem to change their portfolios as fast as they would like to because of illiquidity in the market.

When we employ the trading strategy of buying the equally-weighted portfolio of large size funds and short-sell the small size funds, the importance of the fund size becomes clearer for Equity II funds. The Equity II funds show a negative risk-adjusted performance of about -2.57% per year. That is, larger funds appear to perform worse than smaller funds in the Equity II category. The result is statistically significant at the 5% level. However, the size based strategy on Bond funds shows also an underperformance (about -0.74% per year), indicating that larger bond funds perform worse than smaller bond funds. Hence, for Bond funds, the trading strategy and the cross-sectional regression give different results. The evidence for the Equity I funds do not suggest any significant or robust relation in the cross-sectional regressions or in the trading strategies.

4.2 Fee Structure

The next relation that we analyze is between the fee structure in the mutual fund industry and the measured performance. What does the investor pay for? Is there any signaling in high fees (that is, do good managers charge higher fees)? To shed light on these issues, we analyze the relation between fund performance and both administrative fee and exit/loading fees. On one hand, Ippolito (1989) finds evidence that U.S. funds with high fees also have high performance – even enough to offset the higher fees. On the other hand, Elton, Gruber, Das, and Hlavka (1993) and Carhart (1997) find the opposite, that is, high-fee funds do not perform as well as low-fee funds. We report results which supports the later evidence – Swedish high-fee funds do not show any superior performance.

The administrative fee should by definition worsen performance since they are included in the net asset values (loading and exit fees are not). The Equity I funds show a negative, and significant at the 10% level, relation between performance and the administrative fee. The coefficient is below -1 which indicates that funds with high administrative fees perform even worse than what is caused by the fee itself. There also seems to be a negative relation between performance and administrative fees for the Equity II funds. This is, however, signi…cant only in the multiple regression.[18] There is only little evidence of a relation between exit/loading fees for the equity funds.

For the Bond funds the relation between the performance and the administrative fee is negative and signi…cant at the 10% level. We also …nd a negative and signi…cant (at the 10% level) relation between performance and exit/loading fees. Hence, funds with higher exit/loading fees perform worse than other funds.

These cross-sectional di¤erences cannot, however, be quanti…ed by the trading strategies. When we employ the strategy where we buy the equally-weighted portfolio of high-fee funds and short-sell the low-fee funds we do not get an abnormal return which is signi…cantly di¤erent from zero (at conventional signi…cance levels).

4.3 Trading Activity

We want to measure the impact that trading activity may have on performance. That is, does the performance of more actively managed portfolios di¤er from the performance of more passive portfolios? We use two di¤erent measures of activity in the market. The …rst measure is fund turnover, which is the minimum of purchases and sales over average assets. Hence, the turnover is zero if the fund only purchases or only sells assets. The second measure is trading cost (commission fees paid by the fund) divided by the fund size.

We …nd evidence of a positive relation between trading activity and performance for Equity I funds. When we employ the trading strategy where we buy the equally-weighted portfolio of high turnover/commission funds and short-sell the low turnover/commission funds we obtain a positive and signi…cant performance for the Equity I funds (at conventional signi…cance levels). For the Equity II funds and the Bond funds we do not get any signi…cantly abnormal performance when we employ trading strategies based on turnover or commission.

[18] The administrative fees for the Equity II funds are quite similar across funds which makes it hard to characterize the cross-section of performance.

4.4 Net Flows into Funds

Another interesting characteristic is the flow of money into funds, and we analyze how it may affect performance. There are several studies on the relation between performance and net flows in the U.S. mutual fund industry. For instance, Sirri and Tufano (1998) provide evidence on the behavior of investors and address the question whether investors base their investment decisions on funds' past performance. Another approach is to analyze if new money signal overperformance. This has been referred to as 'smart money' (see Gruber (1996) and Zheng (1998)). We follow the later approach, that is, we relate performance to lagged flows.

In the cross-sectional regressions, we find no evidence that performance is affected by lagged inflows into funds. However, when we employ the trading strategy of buying an equally-weighted portfolio of high net flow funds and short-selling the low net flow funds we obtain a positive performance for equity funds. The non-neutral performance is about 2.4% per year for Equity II funds (and significant at the 10% level). Hence, we find some evidence of smart money.

4.5 Persistence in Performance

There is a large literature regarding the persistence over time in U.S. mutual fund performance. It seems like the evidence point at some persistence, but that it is mainly present for the worst-performing funds, that is, 'losers' tend to repeat.[19]

We first present evidence on the persistence of Swedish mutual funds by estimating AR(1) coefficients for the performance measured over time (for each category). The following regression gives the AR(1) coefficient

$$\alpha_{i\tau} - \overline{\alpha}_{\tau} = \delta_0 + \delta_1 \left(\alpha_{i\tau-1} - \overline{\alpha}_{\tau-1} \right) + \xi_{i\tau}; \qquad (4.2)$$

where $\alpha_{i\tau}$ is the estimated alpha for fund i in year τ, $\alpha_{i\tau-1}$ is the estimated alpha in the previous year, and $\overline{\alpha}_{\tau}$ is the average of the fund alphas in year τ. Hence, the δ_1-

[19] Evidence of persistence for negative performers is reported by Hendricks, Patel, and Zeckhauser (1993), Carhart (1997), and Christopherson, Ferson, and Glassman (1998). Positive persistence in performance is documented in, for instance, Goetzmann and Ibbotson (1994), Grinblatt and Titman (1992), Hendricks, Patel, and Zeckhauser (1993), and Malkiel (1995). The repeated winners results can, however, be attributed to survivorship biases (as discussed in Brown and Goetzmann (1995), and Brown, Goetzmann, Ibbotson, and Ross (1992)).

coefficient measures persistence in performance in excess of the industry average. In Table 11, we report the results from a standard least square regressions, as well as from an instrument variable estimation using the rank index as the instrument. The motivation for the instrument variable method is that the regressors (the lagged alphas) in (4.2) are generated variables which contain measurement errors, which typically make least squares inconsistent.

Our results suggest that there is only little evidence on persistence for ‘losers’ or ‘winners’ in performance for our sample of Swedish funds – most AR(1) coefficients are close to zero. There are, however, some indications of positive persistence relative to the industry average for the Equity I funds.

To get further evidence on the persistence, we also estimate a contingency table of alphas estimated year-by-year. The contingency table shows the relative frequency that we observe in the four states: a loser continues to be a loser, a loser becomes a winner, a winner becomes a loser, and a winner continues to be a winner. Naturally these relative frequencies sum to one. A cross-product ratio is also computed as it summarizes the information in the contingency table – the ratio is larger than one if we have persistence, and otherwise less than one.

The contingency tables confirm the results from the AR(1) representation. The frequencies of funds which either stay or change the state of performance (around the industry mean) are quite equal. However, for Equity I, the slightly positive AR(1) coefficient seems to driven by persistence among the losers.

Finally, when we employ the trading strategy where we buy an equally-weighted portfolio of high-performing funds and short sell a low-performing funds, we do not get any significantly abnormal performance for neither equity nor bond funds. Hence, our results are robust in the sense that both our two persistence measures and the trading strategy approach give the same result of only little evidence in favor of persistence in fund performance.

5 Conclusions

In this paper we provide extensive evidence on fund performance and characteristics for about 200 Swedish-based mutual funds from 1993 to 1997. The funds that we analyze are categorized into regular equity funds (Equity I), equity funds within the public savings program (Equity II), and bond funds (Bond).

In the first part of the paper we document that there seem to be a survivorship bias in the Swedish mutual fund market. This estimated bias is fairly high – about 0.6% to 0.7% per year – for the Equity I funds. The estimated biases for the Equity II and Bond funds are, however, lower. The estimates vary considerable on a year-by-year basis, indicating the imprecision in the estimated biases. Interestingly, when a risk-adjustment is undertaken, we find that the biases are somewhat lower.

The performance evaluation shows mixed results for different categories of funds. Equity I funds seem to have had a neutral or somewhat superior performance during the sample period. For Equity II funds we document a negative performance. The analysis of bond funds (especially money-market funds) shows that they have had a severe underperformance. Among the money-market funds, a clear majority appears to have had a significantly inferior performance. The measured performance results are very robust. We obtain similar results in unconditional as well as conditional evaluations, and using overall measures which take into account for the size of funds and time length in the sample of the funds. Furthermore, the analysis shows that there are only a few funds that appear to have market timing ability.

In the second part of the paper we relate the measured performance to fund-specific characteristics in the cross-section of funds. We also evaluate certain trading strategies which are based on these cross-sectional differences. First, we find evidence of an asymmetric 'size effect' in the Swedish mutual fund industry. Larger equity funds tend to perform worse than smaller equity funds. Larger bond funds, however, seem to have had a better performance than smaller bond funds. Second, our results from the cross-sectional regressions indicate that the measured performance is negatively related to fees, that is, high-fee funds seem to underperform relative low-fee funds. This is, however, hard to con…rm in a trading strategy. Third, we …nd some evidence that actively managed funds perform better than more passively managed funds. The cross-sectional regression and the trading strategy based on commissions reveal a weak but positive relation to performance for the Equity I funds. Fourth, this study adds some evidence on smart money. Our trading strategy based on lagged net ‡ows into funds suggests that ‡ows contain some information about future returns for equity funds. Finally, we …nd little evidence of persistence in performance in the Swedish mutual fund market.

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Figure 1: The Distributions of Conditional Alphas in the Performance Evaluation.

The …gures show the distributions of the conditional alphas in the performance evaluation. The top, middle, and bottom …gures depict the distribution for Equity I, Equity II, and Bond funds, respectively. The bars show the percentage of the funds within a bin (each bin covers an alpha of 1%). The numbers above the bars are the actual number of funds within each bin. The …gures are truncated at performances of -14 and +14. One Equity I fund that is considered in the analysis is outside the range.

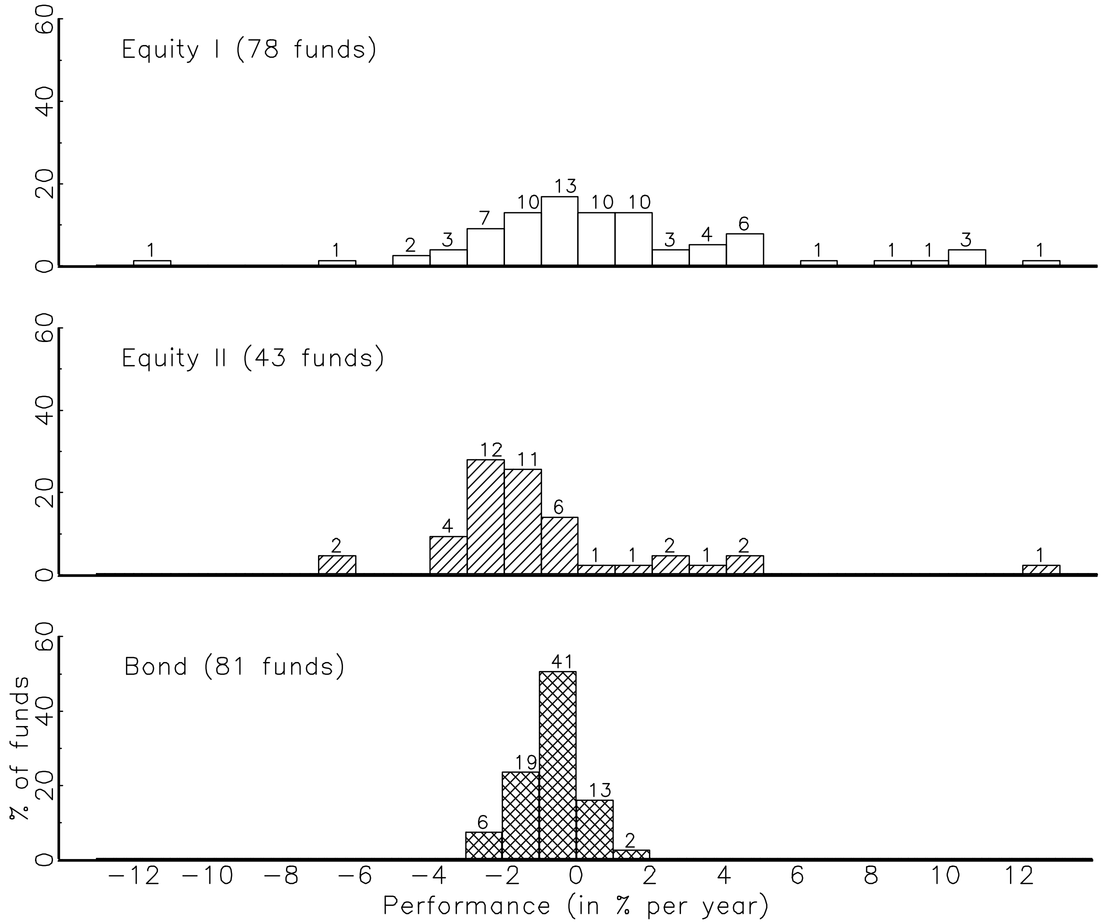

Table 1: Size and Flows of the Swedish Mutual Fund Industry

Fund Category		1992	1993	1994	1995	1996	1997
Equity I	No.	271	286	347	412	448	522
	TNA	40,038.0	71,195.7	71,939.9	80,389.6	119,846.1	198,729.3
	Flow	n/a	n/a	6,354.5	1,189.3	17,456.8	46,991.3
Equity II	No.	33	34	34	38	40	40
	TNA	47,155.5	67,440,6	60,475.2	71,379.8	82,423.8	108,413.2
	Flow	n/a	n/a	–10,646.3	149.5	–15,342.2	5,573.0
Bond	No.	109	118	147	135	145	145
	TNA	37,888.4	53,039.3	52,042.0	64,907.8	78.059.2	82,674.1
	Flow	n/a	n/a	977.4	6,599.9	7,567.2	369.9
Mixed	No.	22	29	40	44	53	57
	TNA	3,030.8	10,409.8	22,629.2	25,686.3	38,702.6	66,098.4
	Flow	n/a	n/a	10,766.2	520.6	5,727.3	18,000.8
All	No.	435	467	568	629	686	764
	TNA	128,112.7	202,085.4	207,086.3	242,363.5	319,031.7	455,915.0
	Flow	n/a	n/a	7,452	8,459	15,409	70,935

The table shows size and ‡ows of the Swedish mutual fund industry for the period from 1992 to 1997. No. and TNA refer to the total number of funds and the total net assets in millions SEK, respectively (as of December 31 each year). Flows refer to the net ‡ows during each year into the fund categories. Equity I, Equity II, Bond, and Mixed denote the fund categories as de…ned by Finansinspektionen. Category All consists of all funds (that is, all funds in the Equity I, Equity II, Bond, and Mixed categories). Aggregated ‡ow into the fund categories are not available (n/a) for 1992 and 1993. Source: Svensk Fondstatistik.

Table 2: Individual Fund Characteristics

Fund Category	No.	TNA	Size	Flow	Fees	Turnover	Commission
Equity I	80	90,754	576	105	1.4	75	0.4
			(202)	(20)	(1.3)	(55)	(0.2)
Equity II	46	107,151	1862	-90	1.5	47	0.2
			(1224)	(-21)	(1.5)	(40)	(0.2)
Bond	85	33,100	365	3	0.7	210	—
			(196)	(1)	(0.7)	(163)	—

The table shows characteristics for the sample of funds for the period from 1992 to 1997. No. and TNA refer to the number of funds and the total net assets in millions of SEK of each fund category as of December 31, 1997. The table also contains means and medians (within parentheses) across funds for various attributes; Size is the market capitalization in million SEK of the fund during its sample period, Flow is the average net ‡ow (in million SEK) into the fund per year, Fees is the administrative costs as a percentage of assets invested, Turnover is the minimum of purchases and sales over average assets (in %), Commission is the costs paid by the fund at purchases and sales and is related to average assets and reported in %.

Table 3: Summary Statistics of Benchmark Returns

Benchmarks	Mean	Standard Deviation	Skewness	Kurtosis	Auto-Correlation
General Market	20.90	16.58	–0.48	0.37	–0.03
Small Firms	29.46	16.99	0.47	2.30	0.08
Total Bond	4.25	5.05	–1.19	3.74	–0.05
Money-Market	0.21	0.60	–1.03	5.44	0.05
		Correlations			
General Market	—				
Small Firms	0.77	—			
Total Bond	0.48	0.43	—		
Money-Market	0.31	0.30	0.66	—	

The table shows summary statistics (means, standard deviations, skewness, kurtosis, and first-order autocorrelations as well as correlations) for the excess returns on the benchmarks (over a 7-day interbank rate). The mean and standard deviation of the returns are expressed in % per year. General Market refer to a value-weighted market portfolio. Small Firms is the small firm portfolio. Total Bond is a portfolio consisting of all bonds in the market. The Money-Market portfolio has a duration of about 180 days.

Table 4: Performance Measures

Fund Category	Unconditional ®	Unconditional R^2	Conditional ®	Conditional ®^{w}	Conditional R^2	Wald
Equity I	0.21	0.86	0.50	1.00	0.87	0.60
	(–0.27)	(0.88)	(0.06)		(0.89)	
Equity II	–1.30	0.91	–1.02	–1.69	0.92	0.77
	(–2.17)	(0.94)	(–1.71)		(0.94)	
Bond	–0.90	0.72	–0.73	–0.60	0.76	0.53
	(–0.74)	(0.80)	(–0.71)		(0.83)	

The table shows the results from unconditional and conditional evaluations of funds for the sample period from 1993 to 1997. In the unconditional model betas are constant, whereas the conditional model allows for time-variation in betas via instruments (the lagged market return and a detrended yield curve level variable). Details about the performance measures are given in the text. The alpha, ®, refers to the average and median (within parenthesis) of the cross-sectional alphas for each category. The ®^{w} refers to the weighted average of the individual alphas (where the weights are proportional to the total net asset values of each fund). R^2 is the average and median (within parenthesis) adjusted coe¢cient of determination across funds in the categories. The Wald statistic in the conditional model refers to a test of no time-variation in the betas, where the percentage of rejected null hypothesis at the 10% signi…cance level is reported.

Table 5: Market Timing Measures

Fund Category	Treynor-Mazuy				Henriksson-Merton			
	®	°	Wald^{i}	Wald^{+}	®	°	Wald^{i}	Wald^{+}
Equity I	0.22 (–0.41)	0.09 (–0.02)	0.10	0.13	0.07 (–0.16)	0.01 (–0.00)	0.05	0.15
Equity II	–1.64 (–1.61)	0.21 (0.16)	0.05	0.09	–2.01 (–1.30)	0.02 (–0.00)	0.07	0.16
Bond	–0.75 (–0.75)	0.02 (0.21)	0.23	0.23	–1.05 (–0.84)	0.02 (0.02)	0.14	0.20

The table shows the results of the market timing regression in the conditional model. Treynor-Mazuy and Henriksson-Merton refer to the speci…cations discussed in Treynor and Mazuy (1966) and Henriksson and Merton (1981), respectively. The alpha, ®, refers to the average and median (within parenthesis) of the cross-sectional alphas for each category. The gamma, °, refers to the average and median (within parenthesis) estimated timing coe¢cients. The Wald^{i} and Wald^{+} statistics report on the percentage of rejected null hypotheses of no market timing (negative and positive, respectively) at the 10% signi…cance level.

Table 6: Exits and Entries of Funds

Fund Category		1992	1993	1994	1995	1996	1997
Equity I	Entry	—	3	10	5	6	4
	Exit	—	3	10	9	3	1
	Year End	52	52	52	48	51	54
	Attrition Rate	—	5.77	19.23	18.75	5.88	1.85
	Survived	28	30	39	44	50	54
	Mortality Rate	46.15	42.31	25.00	8.33	1.96	0.00
Equity II	Entry	—	1	1	5	3	3
	Exit	—	0	1	1	1	4
	Year End	33	34	34	38	40	39
	Attrition	—	0.00	2.94	2.63	2.50	10.26
	Survived	27	27	28	33	36	39
	Mortality Rate	18.18	20.59	17.65	13.16	10.00	0.00
Bond	Entry	—	5	5	10	2	1
	Exit	—	4	10	7	4	2
	Year End	60	61	56	59	57	56
	Attrition	—	6.56	17.86	11.86	7.02	3.57
	Survived	35	39	44	53	55	56
	Mortality Rate	41.67	36.07	21.43	10.17	3.51	0.00

The table shows the number of funds (as of December) each year for the period from 1992 to 1997. It also reports on the number of funds which enter and exists during each year. The Attrition Rate is given by the number of exiting funds divided by the number of funds at the end of the year. Survived funds are funds still in existing in December 1997. The Mortality Rate is computed as one minus the number of survived fund divided by the number of funds at the end of the year.

Table 7: Estimates of Survivorship Biases

Fund Category		1993	1994	1995	1996	1997	1993 to 1997		
		Averages of Excess Returns					Average	®	SE(®)
Equity I	Surviving	41.50	3.65	9.05	28.48	23.37	21.06	1.12	(1.02)
	All	38.56	3.11	9.06	28.46	23.37	20.36	0.52	(1.99)
	Surv.–All	2.94	0.54	–0.01	0.02	0.00	0.70	0.60	(0.23)
Equity II	Surviving	35.60	1.66	8.75	27.32	24.78	19.46	–0.97	(1.05)
	All	34.55	1.49	9.03	27.05	24.87	19.24	–0.99	(1.02)
	Surv.–All	1.05	0.17	–0.28	0.28	–0.10	0.22	0.02	(0.13)
Bond	Surviving	4.87	-6.28	4.42	5.48	0.57	1.75	–0.74	(0.21)
	All	4.46	-6.42	4.14	5.35	0.55	1.58	–0.88	(0.23)
	Surv.–All	0.42	0.14	0.10	0.12	0.02	0.16	0.14	(0.06)

The table shows the average excess returns in % per year for equally-weighted portfolios of surviving funds, and both surviving and non-surviving (All) funds. The estimates of the survivorship biases for the individual years (1993 to 1997) are measured by the di¤erence between the average portfolio returns for surviving, and both surviving and non-surviving funds. For the full period 1993 to 1997, the average di¤erence as well as a conditional alpha measure are reported. The standard error associated with the alpha is given within parenthesis.

Table 8: Cross-Sectional Analysis of Alphas versus Attributes, Equity I Funds

Fund Category	Size	Fees	Buy/Sell	Turnover	Commission	Lagged Flow
Simple Panel Regressions (Using Weighted Least Squares)						
N	226	231	233	121	112	170
WLS	–0.09	–1.49	0.07	0.71	1.23	–0.05
	(0.12)	(0.59)	(0.31)	(0.27)	(0.69)	(0.11)
Simple Panel Regressions (Using Other Estimators)						
OLS	–0.02	–1.60	0.10	1.18	2.43	0.02
LAD	0.06	–1.55	–0.04	0.34	0.99	–0.07
LTS	0.10	–2.14	–0.03	0.73	1.90	–0.00
Multiple Panel Regression (Using Weighted Least Squares)						
WLS	–0.02	–1.41	0.00	0.33	–0.17	–0.10
	(0.12)	(0.60)	(0.35)	(0.60)	(0.88)	(0.17)
Distribution of Reestimated WLS Regressions						
Minimum	–0.15	–2.17	–0.16	0.52	0.79	–0.16
5%	–0.10	–1.55	0.02	0.65	1.10	–0.07
Median	–0.09	–1.49	0.07	0.71	1.23	–0.05
95%	–0.07	–1.43	0.11	0.77	1.31	–0.03
Maximum	–0.02	–0.99	0.20	1.01	1.95	0.06

The table shows the results from panel data regressions of estimated annual alphas on annual fund attributes. The simple panel regressions refer to a weighted least square (WLS) regression of the alphas on each attributes individually where observations are weighted with the inverse of the standard deviation of the estmated alpha. N refers to the number of observations in the individual regressions. The results from ordinary least squares (OLS), least absolute deviations (LAD), and least trimmed squares (LTS) are shown as well. The multiple panel regression refers to a regression of the alphas on all the attributes. The number of observations in the multiple regression is 215, where the two-step approach in Griliches(1986) is utilized in order to use all availabe observation on Size, Fees, and Buy/Sell. Heteroskedasticity consistent standard errors are shown (within parentheses) for the simple and multiple panel regressions using weighted least squares, and parameters signi…cant at the 10% level are emphasized. All regressions allow for …xed (year) e¤ects, but they are not reported. The last panel shows the distribution of point estimates from reestimated simple WLS regressions on every subsample of size N ¡ 2 from the whole sample of observations (that is, for every possible exlusion of two observations). This gives N(N ¡ 1)=2 di¤erent estimates, and the 0th (minimum), 5th, 50th (median), 95th, and 100th (maximum) percentiles from this distribution are shown.

Table 9: Cross-Sectional Analysis of Alphas versus Attributes, Equity II Funds

Fund Category	Size	Fees	Buy/ Sell	Turnover	Commission	Lagged Flow
Simple Panel Regressions (Using Weighted Least Squares)						
N	171	176		99	112	138
WLS	–0.88	–0.73		0.15	0.70	–0.05
	(0.42)	(0.77)		(0.32)	(0.43)	(0.11)
Simple Panel Regressions (Using Other Estimators)						
OLS	–1.36	–0.43		0.38	1.20	–0.19
LAD	–0.21	–1.20		–0.12	0.20	0.12
LTS	–0.38	–2.12		–0.32	1.69	0.01
Multiple Panel Regression (Using Weighted Least Squares)						
WLS	–1.13	–2.11		0.32	–0.28	–0.13
	(0.53)	(0.86)		(0.73)	(0.43)	(0.19)
Distribution of Reestimated WLS Regressions						
Minimum	–1.25	–1.34		–0.32	0.43	–0.15
5%	–0.95	–0.83		0.07	0.64	–0.08
Median	–0.89	–0.73		0.15	0.70	–0.05
95%	–0.81	–0.63		0.19	0.75	–0.03
Maximum	–0.67	0.21		0.43	1.69	0.02

The table shows the results from panel data regressions of estimated annual alphas on annual fund attributes. The number of observations in the multiple regression is 171. For further details, see Table 8.

Table 10: Cross-Sectional Analysis of Alphas versus Attributes, Bond Funds

Fund Category	Size	Fees	Buy/ Sell	Turnover	Commission	Lagged Flow
Simple Panel Regressions (Using Weighted Least Squares)						
N	271	283	283	85		212
WLS	0.04	–0.25	–0.18	0.03		–0.00
	(0.02)	(0.11)	(0.11)	(0.02)		(0.00)
Simple Panel Regressions (Using Other Estimators)						
OLS	0.04	–0.35	–0.31	0.02		–0.00
LAD	0.04	–0.25	–0.13	0.00		–0.00
LTS	0.05	–0.25	–0.10	0.01		–0.00
Multiple Panel Regression (Using Weighted Least Squares)						
WLS	0.08	–0.26	–0.35	–0.05		–0.01
	(0.02)	(0.10)	(0.07)	(0.02)		(0.00)
Distribution of Reestimated WLS Regressions						
Minimum	0.03	–0.42	–0.32	0.00		0.00
5%	0.04	–0.25	–0.18	0.02		0.00
Median	0.04	–0.25	–0.18	0.03		0.00
95%	0.04	–0.25	–0.16	0.03		0.00
Maximum	0.06	–0.19	–0.08	0.14		0.00

The table shows the results from panel data regressions of estimated annual alphas on annual fund attributes. The number of observations in the multiple regression is 265. For further details, see Table 8.

Table 11: Persistence Measures

Fund Category	AR(1)	AR(1)–IV	$(L_{¿}, L_{¿+1})$ $(W_{¿}, L_{¿+1})$	$(L_{¿}, W_{¿+1})$ $(W_{¿}, W_{¿+1})$	Cross-Product Ratio
Equity I	0.15	0.12	0.26	0.24	1.66
	(0.07)	(0.07)	0.20	0.30	
Equity II	0.07	–0.04	0.28	0.23	0.77
	(0.11)	(0.09)	0.30	0.19	
Bond	0.05	0.06	0.22	0.26	0.95
	(0.08)	(0.08)	0.25	0.27	

The table shows the estimated AR(1) coe¢cients in ordinary least square regressions of an estimated annual alpha on a constant and a lagged estimated annual alpha, and in an instrument variable estimation using the rankindex as the instrument for the lagged estimated annual alpha. The alphas are measured around the overall mean for each category. An estimated contingency table of estimated annual alphas is also presented. $W_{¿}$ and $L_{¿}$ refer to winners and losers, respectively. The number for $L_{¿}, W_{¿+1}$ refers to the relative frequency that a loser in the current year becomes a winner in the next year, and so on. The cross-product ratio in the last column is given by the elements in the contingency table, (LL£WW)/(LW£WL).

Table 12: Performance Analysis of Trading Strategies

Fund Category	Size	Fees	Buy/ Sell	Turnover	Commission	Lagged Flow	Alpha
Equity I	0.35	–1.64	0.15	1.60	4.61	0.75	1.45
	(1.13)	(1.19)	(2.16)	(3.72)	(2.68)	(0.91)	(1.50)
Equity II	–2.57	0.10		–1.06	2.07	2.40	0.04
	(1.14)	(0.92)		(2.23)	(2.40)	(1.20)	(1.89)
Bond	–0.74	0.01		–2.03		0.04	0.17
	(0.37)	(0.23)		(1.55)		(0.27)	(0.98)

The table shows the alpha and its standard error (within parentheses) for the trading strategy of buying (with equal weights) funds above the 67th percentile of the attribute, and selling (with equal weights) funds below the 33rd percentile.