Success Factors in Asset Management

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Contents

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Stockholm, November 2001
Stefan Engström

Introduction and Summary

Today there exists a rich body of literature that deals with many important issues in asset management. Part of the literature covers methodological issues on how performance should be measured. This part has its roots in the 1960s, when Treynor (1965), Sharpe (1966), and Jensen (1968) developed the first evaluation methods. These methods remain popular evaluation tools. The traditional Jensen alpha measure is estimated by the following regression equation

$$R_{it} - R_{ft} = \alpha_i + \beta_i \left(R_{bt} - R_{ft}\right) + \varepsilon_{it}, \tag{1}$$

where R_{it}, R_{bt}, and R_{ft} denote the gross return on fund i, the gross return on the benchmark during the period t, and the return on the risk-free asset, respectively. The intercept α_i is the Jensen alpha measure, or the systematic pricing error. A positive (negative) alpha can be interpreted as a superior (inferior) performance. The beta coefficient measures the exposure against the benchmark and is a measure of the fund's systematic risk. The ε_{it} is a fund-specific error term.

Treynor and Mazuy (1966) and Henriksson and Merton (1981) developed performance measurement further by decomposing performance into two components reflecting asset selectivity and market timing. However, these traditional evaluation methods suffer from several drawbacks and, hence, more advanced techniques have been developed. For example, Ferson and Schadt (1996) use predetermined information variables, thereby allowing for time-varying expected returns and risk, instead of the constant risk level assumed in the traditional measures. Recent developments have mainly exploited more detailed data, such as portfolio composition. This trend has created new opportunities

for a thorough analysis of asset managers.

The empirical part of the literature applies the different evaluation methods and provides evidence on the performance of managed portfolios, especially mutual funds. A vast number of studies of fund performance have been conducted since the first studies in the 1960s. The results, which are mainly based on U.S. studies, seem to suggest that the average fund does not outperform a relevant benchmarks. Indead, many studies provide evidence of inferior performance. Similar results have been obtained from other markets besides the U.S. In contrast to these earlier studies, some new studies find evidence that supports the value of active portfolio management, see e.g., Wermers (2000).

The studies on the performance of mutual funds have also showed that there is a significant dispersion in fund performance. This result has raised the question of whether systematic factors associated with the fund and its managment can explain the observed differences in performance. Recent studies have explored this issue and have been able to characterize successful and less successful asset management. The literature mainly covers attributes related to the fund, such as fees, size (assets under management), past performance, and trading activity. The evidence suggests that high-fee funds do not perform as well as low-fee funds. The results also show that there is a weak relation between past and future performance. New studies have examined attributes related to the fund manager and attributes related to the fund portfolio. For example, Chevalier and Ellison (1999) show that managers who attended higher-SAT undergraduate institutions have systematically higher risk-adjusted excess returns, and Chen, Jegadeesh, and Wermers (2000) find that poor-performing and high-performing fund managers have similar stock selection abilities when they examine portfolio holdings.

This thesis consists of four self-contained chapters that examine the Swedish mutual fund industry and enrich the current literature by providing out-of-sample evidence. The thesis also extends the literature on the performance of mutual funds by examining new performance measures and new determinants of performance.

In the first chapter, "Performance and Characteristics of Swedish Mutual Funds," co-authored with Magnus Dahlquist and Paul Söderlind, we measure and characterize the performance of equity, bond, and money-market funds that

invest in Sweden between 1993 and 1997. Performance is measured as the alpha in a linear regression of fund returns on several benchmark assets, allowing for time-varying betas. The estimated performance is then used in a cross-sectional analysis of the relation between performance and fund characteristics such as past performance, flows, size, turnover, and proxies for expenses and trading activity. In contrast to international evidence, this study shows that performance is fairly high for standard equity funds. However, other results are consistent with international evidence: equity funds within the public savings program, bond, and money-market funds have zero performance prior the deduction of fees and expenses. The findings also show that high performance is to be found among small equity funds, low-fee funds, funds whose trading activity is high, and in some cases, funds with good past performance.

The second chapter, "Does Active Trading Create Value? An Evaluation of Fund Managers' Decisions," extends previous evidence on the value of active portfolio management by performing a detailed analysis of fund managers' strategic and tactical decisions. This analysis is based on portfolio holdings data for virtually all actively managed equity funds that invested in the Swedish market between 1996 and 2000. New measures of the value of active portfolio management are obtained by forming replicating portfolios of the funds. These measures allow for a separate evaluation of fund managers' strategic and tactical decisions. The study also extends previous evidence on the value of trading by decomposing trading into components attributable to long-term trading decisions, short-term trading decisions, and trading that is the result of regulatory restrictions. The overall results support the value of active portfolio management and trading. We distinguish between funds investing in the broad Swedish stock market (Sweden funds) and those focusing on small companies (Small Cap funds). The average manager of a Sweden fund creates value for its investors by making good strategic *and* tactical decisions wheras the positive performance of Small Cap funds derives only from good tactical decisions. Further, the findings suggest that there exist a positive relation between the value created and trading activity. In particular, the fund managers' voluntary trading decisions create value. However, there is some evidence of inferior trading decisions when fund managers are forced to trade due to regulations.

The third chapter, "Investment Strategies, Fund Performance and Portfolio

Characteristics," examines the relation between the performance of Swedish equity funds and fund managers' investment strategies. These strategies, which are based on the characteristics of the fund portfolio, are related to previous findings of asset pricing anomalies, such as the momentum effect, the firm size effect, and the valuation of stocks. The chapter also examines strategies related to the diversification of assets in the portfolio and cash holdings. The results show that neither momentum characteristics nor the valuation of stocks can explain differences in fund performance. However, the results suggest that a negative firm-size effect partly explains previous findings of a negative fund-size effect. Further, the results show that there is a positive relation between performance and the degree of diversification of the fund portfolio.

The final chapter, "Costly Information, Diversification, and International Mutual Fund Performance," deviates from the first three chapters by examining international mutual funds. In particular, it studies the performance of actively managed equity funds that invested in Asia and Europe between 1993 and 1998. The results show, as earlier international evidence suggest, that the average fund, both in Asia and Europe, has underperformed. However, the Europe funds have provided diversification benefits for international investors. This chapter also examines hypotheses related to the costly search for information and finds that large international mutual fund companies is similar to that of their small competitors. This suggests that there are no economies of scale in the costly search for information. The study also shows that fund managers who select stocks from a smaller set of Asia stocks perform better than those who select from a larger set. Finally, the costly screening of funds conducted by unit link companies is not successful.

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Chapter 1

Performance and Characteristics of Swedish Mutual Funds

with Magnus Dahlquist and Paul Söderlind

1 Introduction

Investors have an obvious interest in evaluating their portfolios. As a result, a large number of fund performance evaluations have been carried out. Recently, several studies have gone one step further by considering the relation between performance and fund-specific attributes to enable a better understanding of performance. This is also a first step toward forecasting, and perhaps even toward explaining, performance. Most studies have been of U.S. fund data, and they have often found that flows, current performance and fees may predict future performance (see, e.g., Ippolito (1989), Elton, Gruber, Das, and Hlavka (1993), Gruber (1996), Carhart (1997), Sirri and Tufano (1998), and Zheng (1999)).

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This paper studies the relation between fund performance and fund attributes in another market, namely the Swedish market. There are two main motivations. First, by looking at a different market, but one with a similar institutional setting (discussed in some detail in the paper), we can provide the existing literature with out-of-sample evidence. Second, the Swedish data are comprehensive, allowing us to analyze interesting hypotheses and to avoid a number of pitfalls. For instance, we have a rich dataset of attributes including fund size, various fees and measures of trading activity as well as the more standard attributes such as lagged performance and flows. We also have data on virtually all the funds that existed at any time during the sample period and therefore no survivorship bias should exist.

We first estimate the performance of Swedish funds for the period 1993 to 1997 as a Jensen's alpha in a linear regression of the fund return on a constant and several benchmark returns. The slope coefficients (betas) are allowed to vary with information variables as in Ferson and Schadt (1996). This can be viewed as measuring performance relative dynamic strategies which are linear in the information variables, and therefore easily implemented by investors. This conditional evaluation of the funds suggests that the performance of regular equity funds has been neutral. The equity funds in the public savings program (with certain tax advantages) appear to have had a negative relative performance (before tax). Moreover, the bond and money market funds have significantly underperformed.

The estimated performance is then used in a cross-sectional study of the relation between performance and fund attributes such as past performance, inflows and outflows, size, turnover and various proxies for expenses and trading activity. We make a strong effort to establish robust results by using a range of different statistical methods and by comparing the performance of different trading strategies based on the attributes. The latter also provides an economically meaningful measure of the magnitude of the relation between performance and attributes.

A number of results emerge from the cross-sectional analysis. First, large equity funds tend to perform less well than small equity funds, while the opposite holds for bond funds. One potential explanation might be that large

equity funds are actually very large in relation to the Swedish equity market, whereas the bond funds are fairly small players on the bond market. Even if some returns to scale are to be found in fund management, as suggested by the results for the bond funds, the large equity funds may simply be too large for aggressive trading. Second, performance is negatively related to fees, that is, high-fee funds tend to underperform relative to low-fee funds. In some cases, however, high-fee funds perform better than low-fee funds before fees are deducted. This suggests that high fees—or expensive management—may be able to generate good performance, but not enough to cover the fees. (This is in line with the next finding.) Third, actively managed equity funds perform better than more passively managed funds. Fourth, we find evidence of persistence in performance for money market funds, but not for the other fund categories.

The rest of the paper is organized as follows: Section 2 provides a brief description of the data and Section 3 presents the performance results. In Section 4, performance is related (in a panel/cross-sectional analysis) to fund attributes and trading strategies based on the set of attributes. Finally, Section 5 offers our conclusions.

2 Data

2.1 Swedish Mutual Funds

The public interest in the Swedish mutual fund industry has grown rapidly. For instance, in 1995 households' bank deposits amounted to some SEK 386 billion, whereas mutual fund holdings were worth SEK 242 billion. (During the sample period, one USD was worth about SEK 8.) Two years later, bank deposits had risen only slightly to SEK 392 billion, but holdings in mutual funds had almost doubled by 1997 to SEK 456 billion. In 1998, savings in funds constituted as much as 20% of the financial savings of households, and more than 50% of the population saved in mutual funds. The increased interest in saving in mutual funds can perhaps be explained by high savings ratios in general, and the deregulation of the credit market and the move toward private pension plans in particular.

This study looks at Swedish mutual funds from the end of 1992 to the end

of 1997. The choice of period is simple: only a few funds existed before 1991. Swedish mutual funds are open-end funds and investment policy regulations have been harmonized within the European Union through UCITS (Undertakings for Collective Investments in Transferable Securities), which is similar to the U.S. Investment Company Act of 1940. The funds are broadly categorized by *Finansinspektionen*, the Swedish Financial Supervising Authority, according to primary investment objectives. Equity funds are divided into regular equity funds (Equity I) and *Allemansfonder* (Equity II). The latter are part of a public savings program and offer tax benefits.[1] [2] The investment style of the funds is either general market funds or small stocks. Bond funds invest in mortgage and government bonds, while mixed funds invest in both equity and debt instruments.

We divide the dataset into Finansinspektionen's classifications, with the exception of money market funds which we place in a separate category. We exclude funds that invest in foreign markets since they have different risk exposures that would require additional benchmarks to span the investment opportunity set. We focus on Swedish-based funds as it is difficult to take into account the different tax regulations that apply to the funds and/or their holders. In total we consider 80 Equity I funds, 46 Equity II funds, 42 Bond funds, and 42 Money Market funds. Although we only consider Swedish-based funds investing in Sweden (about 20% of all funds), we cover a large part of the mutual fund industry. For instance, we cover about 65% of the total net asset values of equity funds.

We have obtained net asset values (NAVs) for all funds from the *TRUST* database of *Findata*. The NAVs account for capital gains, dividends (reinvested) and administrative fees (subtracted), and were used to calculate weekly

[1] During 1993, 1995, and 1996 the tax rate on capital gains for Equity II funds was 20% compared with 30% on other funds. In 1994 and 1997 the tax rate on these funds was the same as on other funds, that is, 12.5% and 30% respectively.

[2] Equity I and II funds also differ with regard to portfolio restrictions. Equity I funds have not been allowed to *hold* a single stock worth 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 meant that they were not allowed to *invest* more than 10% of total assets in a single stock. These restrictions have potentially been binding for two firms (Astra and Ericsson). We find that the difference between the returns on a general market index, with or without these restrictions, to be small, and we therefore do not elaborate further on this.

returns. We have been able to (manually) collect various fund characteristics/attributes from quarterly reports obtained via *Nya Finans* and *Sparöversikt* (the publications of Finansinspektionen, and Swedish Fund Statistics respectively), and from annual reports of the funds. The attributes are size, net flows, administrative fees, exit and loading fees, turnover and commission, and they are all computed on an annual basis.

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

$$F_{i\tau} = TNA_{i\tau} - TNA_{i\tau-1} \times NAV_{i\tau}/NAV_{i\tau-1}, \tag{1.1}$$

where NAV_{it} and TNA_{it} denotes the net asset value and total net asset value of fund i at time t. Hence, $F_{i\tau}$ measures the change in a fund's assets beyond reinvested capital gains and dividends. Administrative fees are expressed as a percentage of assets invested. Exit and loading fees are expressed as a percentage of assets invested; turnover is expressed as the minimum of purchases and sales over average assets (in %) during a year. Commission is the fee the equity funds pay for their trading, and are expressed here as the percentage of average assets. Notice that all returns used in the evaluation are net of administrative fees and commissions, but before exit/loading fees and taxes.

Table 1 on the following page presents some descriptive statistics on the four categories of funds. 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 size of the average Equity II fund. The overall net flow into our sample of funds has in the aggregate been positive. The cost of administrative fees is about 1.5% in both equity categories, which is more than twice as high as that in the bond fund category (about 0.7%). The differences in turnover across the categories are interesting. Bond funds have the highest turnover—about 180% of their average asset values are purchased or sold over one year. 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.

Table 1: Individual Fund Characteristics

Fund Category	N	TNA	Size	Flow	Adm. Fee	Turn-over	Comm.
Equity I	80	90,739	568	108	1.4	75	0.4
			(171)	(22)	(1.3)	(55)	(0.2)
Equity II	46	107,151	1,862	-91	1.5	47	0.2
			(1,224)	(-20)	(1.5)	(40)	(0.2)
Bond	42	19,338	404	-8	0.7	180	—
			(228)	(-2)	(0.8)	(165)	—
Money Market	42	13,481	321	15	0.7	—	—
			(152)	(4)	(0.7)	—	—

This table shows characteristics for the sample of funds for the period 1992 to 1997. N and TNA refer to the number of funds and the total net assets in SEK million of each fund category on December 31, 1997. The table also contains means and medians (in parentheses) across funds for various attributes: size refers to the market capitalization (in SEK million) of the fund during its sample period; flow is the average net flow (in SEK million) into the fund per year; adm. fee refers to the administrative fees as a percentage of assets invested; turnover is the minimum of purchases and sales over average assets (in %), and commission is the fee paid by the fund at purchases and sales and is related to average assets (reported in %). Turnover is not reported for Money Market funds. Bond and Money Market funds pay no commission.

The fund characteristics can be compared to those of U.S. funds. In terms of expenses, investment fees, portfolio turnover and trading costs, they are about the same as for U.S. funds (see Ippolito (1992), and Pozen (1998)). Passive management fees in the U.S. are about 50% lower than traditional active management fees. We believe that Equity II funds are more like passive pension funds, but in contrast to passive funds in the U.S., their fees are similar to those of active funds. Overall, we find our sample of funds to be rather similar to U.S. funds.

2.2 Benchmarks and Conditional Information

In the performance evaluation, our aim is 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 *Findatas Avkastningsindex*. This index is a value-weighted index (which accommodates buy-and-hold strategies) with reinvested dividends. It includes stocks with the most stringent listing requirements on the Stockholm Stock Exchange (SSE). The second index is a small firm index which we have constructed. We have used the same population as the (Swedish) Carnegie Small Cap Index, and a similar weighting method. The main difference is that the index we have constructed includes dividends.

To capture the development in the bond market, we use two bond indices (consisting of both government and mortgage bonds) provided by Findata. One is a total bond index with an average duration of four years, and the other is a money market index consisting of (approximately) 180-day T-bills. The returns on benchmarks and funds are measured in excess of a 7-day interbank rate (STIBOR) that is used as a proxy for a riskfree investment.

Predetermined conditional information variables are used to capture potential time-variation in risk and expected returns. Following Dahlquist and Söderlind (1999), we use as instruments the lagged market return and the level of the yield curve (stochastically de-trended to dampen the otherwise extreme autocorrelation).

3 Evaluating Fund Performance

In this section we evaluate the performance of Swedish-based mutual funds investing in Swedish assets during the period 1993 to 1997. As our sample contains virtually all the funds that existed during this period, the results should not be affected by a survivorship bias. Later in this section, we quantify

the size of the survivorship bias that would have occurred if we had *only* used funds that were still alive at the end of the period.

3.1 Results of the Performance Evaluation

In the 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 the non-systematic part which can be referred to as the risk-adjusted performance. Naturally, we 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.

In the unconditional model constant betas are used, whereas the conditional model allows for time-variation in betas through predetermined information variables. In both cases we obtain an alpha (the deviation from the benchmark model). A positive (negative) alpha is interpreted as overperformance (underperformance), and it measures the performance in comparison with simple trading rules that individual investors could implement. 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.

The results of the evaluation are summarized in Table 2 on the next page.

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 (1999) suggests that the small sample distribution of the t-statistics for neutral performance are well approximated by the asymptotic distribution. To offer some insights into how the mutual funds—as an industry—have performed, we also include value-weighted alpha measures in the table. We choose to focus the discussion on the performance results obtained from the conditional model. This can be justified by considering the Wald statistics in the table—the hypothesis of no time-variation in the betas is rejected for 53% to

Table 2: Performance Measures

Unconditional		Conditional					
α	R^2	α	R^2	α^w	Wald$^-$	Wald$^+$	Wald
			Equity I				
0.24	0.86	0.52	0.88	1.02	0.04	0.10	0.61
(-0.27)	(0.89)	(0.08)	(0.89)				
			Equity II				
-1.30	0.91	-1.02	0.92	-1.68	0.12	0.07	0.77
(-2.17)	(0.94)	(-1.71)	(0.94)				
			Bond				
-0.95	0.84	-0.53	0.87	-0.45	0.24	0.02	0.54
(-0.85)	(0.88)	(-0.49)	(0.89)				
			Money Market				
-0.85	0.60	-0.94	0.65	-0.80	0.90	0.00	0.53
(-0.67)	(0.67)	(-0.80)	(0.71)				

This table shows the results from unconditional and conditional evaluations of funds for the sample period 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 of the performance measures are given in the text. The alpha, α, refers to the average and median (in parenthesis) of the cross-sectional alphas for each category. R^2 is the average and median (in parenthesis) coefficient of determination across funds in the categories. The α^w in the conditional model refers to the weighted average of the individual alphas (where the weights are proportional to the total net asset values of each fund). The Wald$^-$ and Wald$^+$ statistics in the conditional model refer to tests of zero alphas, where the percentages of rejected null hypotheses at the 10% significance level is reported for negative alphas (Wald$^-$) and positive alphas (Wald$^+$). 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% significance level is reported.

77% funds in the four fund categories.

Equity I funds have, on average, an alpha of 0.5% per year. In other words, on average, the funds have outperformed the market. The overperforming funds deviate more than the underperforming funds, thus the median is only 0.1% per year. Furthermore, only 10% of Equity I funds show statistically significant positive alphas. Note that administrative fees directly affect the return on the funds. For Equity I, the fees have averaged 1.4% per year, and therefore, an alpha of about 0.5% against costless benchmarks is quite substantial.

Equity II funds have performed less well, with an average conditional alpha of -1% per year. The distribution of Equity II funds is also skewed (the median is about -1.7% per year). The administrative fees for these funds are about 1.5%, and if they were excluded the performance would be more neutral. One explanation for the weaker performance of Equity II funds is that the competitive pressure is low because of the tax advantages they offer.

The Bond and Money Market funds show inferior performance. The average (and median) is about -0.5% per year for Bond funds, and about -0.9% per year for Money Market funds. Interestingly, about 90% of the Money Market funds have significantly negative alphas, whereas only 24% of the Bond funds have significantly negative alphas. The underperformance for Money Market funds is 0.2% higher than their average administrative fee.

We analyze the robustness of the performance results by changing the set of benchmark assets and adding non-linear terms as proxies for market timing as in Henriksson and Merton (1981) and Treynor and Mazuy (1966). (These results are not reported in a table.) The overall findings show that the previous results are not sensitive to these changes.

3.2 Survivorship Biases

The results presented above should not suffer from survivorship biases since we make use of virtually all the funds that existed between 1993 and 1997. By the same virtue, our dataset 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.

We first considered the entry and exit of funds on a year-by-year basis together with attrition and mortality rates of the funds (not reported in a table). The attrition rate is the percentage of funds that left the sample. The attrition rates for the Equity I, Bond, and Money Market categories range from 2% to 21%. The average rate for Equity II funds is much lower, about 2% to 3% (1997 is an exception). The attrition rates can be compared with those found in U.S. mutual fund databases, where Grinblatt and Titman (1989), and Brown, Goetzmann, Ibbotson, and Ross (1992) find attrition rates that range from 2.6% to 8.5%, with an average of about 4.5%. That is, the average attrition rates in our database are about the same, although they seem to be more volatile over the years. The majority of the funds that exit the sample are merged into other funds (80%), but in some cases the funds change investment objective (go global), and cease to exist. When the funds merge into another fund family, the return history of the old fund is discarded.

Table 3 on the following page presents estimates of the survivorship biases. We construct a direct measure of the bias by comparing two different portfolios. The first portfolio (labeled All) is the return on an equally-weighted portfolio of all the 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 exist at the end of the sample period. The measure of survivorship bias is the difference between the two portfolios (Surviving and All).

We find that non-surviving funds perform less well than surviving funds. The return difference, however, varies across the fund categories. For the Equity I funds, it is fairly high, about 0.6% to 0.7% per year, whereas the estimated bias for the other fund categories is lower (on average about 0.1% per year). The biases on a year-by-year basis fluctuate considerably. To infer the survivorship bias for the industry as a whole, we also consider value-weighted portfolios. We then find a somewhat smaller bias, indicating that smaller funds are typically more likely to leave the sample.

The estimated biases can be compared to findings using U.S. mutual fund data. For instance, Grinblatt and Titman (1989) find a survivorship bias of

Table 3: Estimates of Survivorship Biases

	1993	1994	1995	1996	1997	1993 to 1997	
	Averages of Excess Returns					Average	α
Equity I							
Surviving	41.50	3.65	9.05	28.48	23.37	21.06	1.12
All	38.56	3.11	9.06	28.46	23.37	20.36	0.52
Surviving–All	2.94	0.54	-0.01	0.02	0.00	0.70	0.60
						(0.26)	(0.23)
Equity II							
Surviving	35.60	1.66	8.75	27.32	24.78	19.46	-0.97
All	34.55	1.49	9.03	27.05	24.87	19.24	-0.99
Surviving–All	1.05	0.17	-0.28	0.28	-0.10	0.22	0.02
						(0.17)	(0.13)
Bond							
Surviving	9.30	-10.33	8.29	9.59	2.01	3.72	-0.57
All	8.36	-9.58	8.01	9.54	2.01	3.62	-0.48
Surviving–All	0.94	-0.75	0.28	0.05	0.00	0.10	-0.09
						(0.15)	(0.10)
Money Market							
Surviving	0.09	-1.71	-0.10	1.36	-0.69	-0.22	-0.77
All	-0.16	-1.74	-0.15	1.33	-0.69	-0.29	-0.82
Surviving–All	0.25	0.03	0.05	0.03	0.00	0.07	0.05
						(0.02)	(0.02)

This 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 difference between the average portfolio returns for surviving and all funds. For the full period 1993 to 1997, the average difference as well as a conditional alpha measure are reported. The standard errors associated with the average difference and the alpha are given in parentheses.

about 0.5% per year, and Brown and Goetzmann (1995) estimate the survivorship bias at 0.8% per year. However, when returns 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 returns are used, whereas the bias is about 0.7% on a risk-adjusted basis. Finally, in a large sample of funds, Carhart (1998) documents 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 compared with estimated biases in the U.S. market.

4 Fund Performance and Fund Attributes

In this section we characterize the performance of the funds using cross-sectional attributes, namely fund size, fee structure, trading activity and net flows. 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 attributes. We are looking for results that are qualitatively the same across different methods and subsamples, and for this reason we explore several different approaches.

Our first approach is to run panel data regressions

$$\hat{\alpha}_{i\tau} - \overline{\hat{\alpha}}_{\tau} = \gamma_0 + \gamma_1 \left(x_{i\tau} - \overline{x}_{\tau} \right) + \xi_{i\tau}, \tag{1.2}$$

where $\hat{\alpha}_{i\tau}$ is the estimated alpha for fund i in year τ, and $x_{i\tau}$ denotes a fund attribute. We allow for fixed (year) effects by subtracting the mean of the alpha and the attribute during a year, denoted by $\overline{\hat{\alpha}}_{\tau}$ and $\overline{x}_{\tau}$ respectively. The alphas are, of course, generated variables which contain measurement errors. While this does not affect the consistency of the estimators of the regression coefficients, it introduces heteroskedasticity since the different alphas are measured with varying degrees of precision. This means that ordinary least squares (OLS) is inefficient and that the traditional estimates of the standard errors are misleading. We therefore use a weighted least squares (WLS) approach where each observation is weighted by the reciprocal of its residual standard deviation from the performance regression.

Our second approach is to measure the performance of trading strategies based on the fund attributes. This gives further evidence on the cross-sectional differences and helps us to quantify them economically. The funds are first ranked according to the attribute and then formed into equally-weighted portfolios of the funds below the 40th percentile and above the 60th percentile respectively. We then construct a fictitious zero-cost portfolio by buying the "high" portfolio financed via a short-selling of the "low" portfolio. This zero-cost portfolio is held for one year. After one year, the sorting procedure is repeated, new portfolios are created, held for the subsequent year, and so on. The main results are reported in Table 4 on page 15.

We attempt to establish the robustness of the findings by comparing results

from different subsamples and from different estimators. We comment on these results in the text.[3] We also considered regressions where administrative fees are not debited against the funds' NAVs prior to calculating returns. The results were very similar.

4.1 Size of Funds

In this subsection, we study the static relation between fund size and performance. In later subsections, we will take a closer look at how performance is related to the flow of new money into the fund.

Our results show that size has little effect on Equity I funds; some methods suggest small positive effects while other methods suggest small negative effects. However, *size has a strong and robust negative relation to the performance of Equity II funds.* The regression, where alpha is regressed on a constant and size, has a significant slope coefficient of -0.88. The trading strategy of buying large funds and selling small funds generates a significant underperformance of 2.33% per year. This appears to be a robust result: the coefficients from every possible subsample, with two observations excluded, are all negative; other estimation methods (OLS, LAD, and LTS) also give negative coefficients; the rank correlation is negative; and size has a negative coefficient in a multiple regression.

There are some indications that size has a weak positive relation to the performance of Bond and Money Market funds. For the Money Market funds, all regression coefficients, and also the rank correlation, are slightly but significantly positive. However, the trading strategy of buying large funds and selling small funds generates neutral performance. For the Bond funds, only the trading strategy signals a significantly positive relation, and some of the regression coefficients are even negative, although not significantly so. Overall, we consider this to be weak evidence of a positive relation to size.

[3]First, we reestimate the WLS regressions on every possible subsample of size $N-2$ drawn from the entire sample of N observations and study the distribution. Second, we reestimate all regressions using robust estimators such as the method of least absolute deviations (LAD) and the method of least trimmed squares (LTS) which put less weight on outliers. Third, we estimate multiple panel data regressions, that is, to let $x_{i\tau}$ in (1.2) be a vector of all available fund attributes. To use all available data, we apply the two-step approach in Griliches (1986). Fourth, we estimate the correlations of the relative ranks (for each year) of the fund's alpha and attribute.

Table 4: Cross-Sectional Analysis of Alphas versus Attributes

	Size	Adm. Fee	Load Exit Fee	Turn Over	Comm.	Flow	Lagged Alpha
Equity I							
Single Panel Regressions†							
N	226	230	232	121	112	170	168
Coefficient	-0.08	*-1.40*	0.07	*0.70*	*1.21*	-0.05	0.07
	(0.12)	(0.60)	(0.31)	(0.27)	(0.69)	(0.11)	(0.07)
Performance of Trading Strategies‡							
Alpha	-0.62	*-2.50*	-2.54	1.86	4.01	0.12	1.82
	(0.97)	(1.24)	(1.98)	(3.62)	(2.54)	(0.81)	(1.30)
Equity II							
Single Panel Regressions†							
N	171	176		99	112	138	134
Coefficient	*-0.88*	-0.73		0.15	0.70	-0.05	0.00
	(0.42)	(0.77)		(0.32)	(0.43)	(0.11)	(0.07)
Performance of Trading Strategies‡							
Alpha	*-2.33*	0.07		-1.29	1.70	*1.99*	-0.19
	(1.14)	(0.86)		(2.10)	(2.07)	(1.09)	(1.61)
Bond							
Single Panel Regressions†							
N	145	149	149			113	113
Coefficient	-0.02	-0.60	-0.16			0.00	-0.01
	(0.03)	(0.54)	(0.16)			(0.00)	(0.06)
Performance of Trading Strategies‡							
Alpha	*0.52*	0.43				0.14	-0.10
	(0.29)	(0.40)				(0.36)	(0.79)
Money Market							
Single Panel Regressions†							
N	126	134	134			99	95
Coefficient	*0.04*	*-0.24*	*-0.27*			0.00	*0.38*
	(0.02)	(0.11)	(0.16)			(0.00)	(0.12)
Performance of Trading Strategies‡							
Alpha	-0.02	*-0.57*				0.10	*0.31*
	(0.10)	(0.10)				(0.15)	(0.09)

This table relates estimated annual alphas to annual fund attributes. There is, by law, no variation in load/exit fees for Equity II funds. There is too little data on turnover and commission fees for Bond funds and Money Market funds for a meaningful study.
†The single panel regression is a regression of the alpha on a constant and each attribute individually allowing for fixed year effects, see equation (1.2). The equation is estimated with weighted least squares, where each observation is weighted by the inverse of the standard deviation of the estimated alpha. The slope coefficient is reported and is *emphazised* if it is statistically significant at the 10% level. The corresponding heteroskedasticity-consistent standard error is shown in parenthesis below the coefficient. N is the number of observations available.
‡The trading strategy is to buy (with equal weights) funds above the 60th percentile of the attribute, and sell (with equal weights) funds below the 40th percentile. The performance of the trading strategy is estimated in the same way as the performance of the funds, and the conditional alpha is reported and is *emphazised* if it is statistically significant at the 10% level. The corresponding heteroskedasticity-consistent standard error is shown in parenthesis below the alpha.

There are also some indications that size is important in a comparison across fund categories—at least for Equity I and II. Equity II funds are typically much larger than Equity I funds, trade less, and perform less well.

These findings could perhaps be explained by the fact that Equity I funds, Bond funds, and Money Market funds are quite small compared with their respective markets, whereas Equity II funds are relatively large compared with the equity market. The largest Equity II funds may simply be too large to adopt aggressive trading strategies.

4.2 Fee Structure

The direct effect of the administrative fee is to weaken performance one for one (the fee is in percent per annum) since the fee is subtracted from the fund wealth to generate the net asset values. Indeed, we find that *the administrative fee has a robust negative relation to the performance of Equity I funds and Money Market funds.* For Equity I funds the regression coefficient is actually less than minus one (-1.40). For Money Market funds, the regression coefficient is -0.24, which suggests that efficient management offset three quarters of the direct effect of the fee. There is also some evidence of a weak negative relation for Equity II funds, but no significant results for Bond funds.

The exit and loading fees are not directly subtracted from the fund wealth, but they decrease the return to the investor. To compensate investors for a one-year round-trip, the performance would need to increase one for one by the sum of these fees, which is the measure we use. However, our results show the hypothesis of a coefficient of one can easily be rejected for all fund categories. Rather, some evidence suggests a negative relation to performance for the Bond and Money Markets funds.

The evidence from U.S. data is somewhat mixed. On the one hand, Ippolito (1989) finds that high-fee U.S. funds also perform relatively well—even well enough to offset the higher fees. However, in their reinterpretation of this evidence, Elton, Gruber, Das, and Hlavka (1993) and Carhart (1997) argue that high-fee funds do not perform as well as low-fee funds.

4.3 Trading Activity

We use two different measures of trading activity. The first measure is turnover, which we calculate as the minimum of purchases and sales divided by the fund size. This definition allows us to capture the active management of the portfolios, and not just whether a fund is growing or shrinking. The second measure is commission fees paid by the fund (trading costs), divided by the fund size. Like the administrative fees, the commission fees paid by the fund have a direct one for one (negative) effect on performance. However, the active management of the portfolio might be able to offset this effect.

We limit the analysis to equity funds, since it proved to be very difficult to obtain useful data for the Bond and Money Market funds. *For Equity I funds, a positive and reasonably robust relation exists between trading activity and performance.* For Equity II, we find no relation. Again, it is also worth noting the differences across the fund categories. Equity II funds are typically much larger and trade less than Equity I funds—and they also perform less well.

4.4 Net Flows into Funds

In this subsection, we study if money flows into funds which will overperform in the near future. Gruber (1996) and Zheng (1999) provide evidence of such "smart money" in U.S. data.

We find very little evidence of a relation between lagged flows and performance. The results reported are from an analysis of net flows, but they are very similar to those obtained with growth in flows (net flows divided by total net assets). The only significant result is for the trading strategy for Equity II funds, where buying funds with high lagged flows and selling funds with low lagged flows generates an overperformance of about 2% per year. However, this does not appear to be a very robust result since the other approaches give very mixed results.

4.5 Persistence in Performance

A large literature addresses persistence in U.S. mutual fund performance. The results seem to suggest some persistence, mainly for the worst-performing funds.[4] We estimate persistence in performance by treating the alpha for the previous year as an attribute and then proceed as we did earlier.

We measure performance in excess of the annual industry average, which means that we are effectively looking for persistence in relative performance. The results in Table 4 on page 15 suggest that there is no significant persistence for Equity I funds, Equity II funds, or Bond funds. This is verified by the results from an IV estimator (to account for the measurement errors in the regressor; rank index used as instrument) and the other estimators.

However, a *robust persistence is found in the performance of Money Market funds.* The first order autocorrelation is 0.38. Once again this result is verified by the IV method and the other methods. The persistence is concentrated to winners: the probability of remaining a winner is 0.35 while the probability of remaining a loser is 0.25. The persistence results for Money Market funds are even stronger when administrative fees are not debited against funds' NAVs.

It is worth noting that Swedish stocks—contrary to most developed markets—have not shown significant evidence of so called momentum (see Rouwenhorst (1998)). Hence, the documented exposure to momentum strategies of U.S. mutual funds reported in Grinblatt, Titman, and Wermers (1995) and Daniel, Grinblatt, Titman, and Wermers (1997) does not seem to be present in Sweden.

4.6 Domestic Funds versus Offshore Funds

Finally, we consider 9 equity funds (corresponding to Equity I), 14 bond funds, and 6 money market funds which are based in Luxembourg and invest in Swedish assets only. The difference between Sweden-based and foreign-based funds lies in the tax rules that apply to them. It is, however, difficult to draw

[4]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)).

firm quantitative conclusions regarding the tax benefits of foreign-based funds.

The Luxembourg-based equity funds perform less well than Sweden-based funds; their median attributes are similar, but they are on average much smaller and charge higher loading and/or exit fees. The Luxembourg-based equity funds also show a higher exposure to smaller stocks.

The Luxembourg-based bond and money market funds perform much the same as the Sweden-based funds. However, they are 3 to 6 times larger, and they charge much higher loading and/or exit fees. When we include them in the cross-sectional analysis above, we find no qualitative differences compared with the results obtained with only Sweden-based funds. Hence, the performance and characteristics of the Luxembourg-based funds are on the whole similar, but they typically charge higher fees.

5 Conclusion

In this paper we provide extensive evidence on fund performance and characteristics of Swedish mutual funds, and document an economically significant survivorship bias for regular equity funds. Taking this bias into account, the performance evaluation shows mixed results for different categories of funds. A conditional evaluation suggests that the performance of regular equity funds has been neutral or somewhat superior. Equity funds in the public savings program offering certain tax advantages, and bond and money market funds performed less well, and we document significantly negative alphas for these fund categories. The measured performance results are very robust.

We also relate the measured performance to fund-specific characteristics in the cross-section of funds, and evaluate trading strategies that are based on these cross-sectional differences. First, we find that larger equity funds tend to perform less well than smaller equity funds. Larger bond funds, however, seem to have performed better than smaller bond funds. Second, our results indicate that the measured performance is negatively related to fees, that is, high-fee funds seem not to perform as well as low-fee funds. Third, we find some evidence suggesting that actively managed equity funds perform better than more passively managed funds. Fourth, we find a positive relation between

lagged performance and current flows. Finally, we find evidence of persistence in performance for money market funds, but not for the other fund categories.

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Chapter 2

Does Active Trading Create Value? An Evaluation of Fund Managers' Decisions

1 Introduction

Does active portfolio management create value? The extensive literature that evaluates the performance of mutual funds suggests that the average fund does not outperform relevant benchmarks. Hence, based on this evidence, the answer to the question would be *no*. However, we need a more thorough analysis of fund managers' decisions in order to answer that question. This analysis should include an examination of what fund managers really do and, in particular, attempt to shed light on their trading decisions, since these decisions are the distinguishing features of active and passive portfolio management.

Previous evaluations of fund managers' skills have decomposed fund performance into stock selectivity and market timing ability, based on the methods developed in Treynor and Mazuy (1966) and Henriksson and Merton (1981). These methods estimate fund managers' skills by time series regressions, where aggregate data on portfolio returns are used. One obvious drawback of these methods is that the aggregation of asset returns might hide important infor-

[0]I would like to thank Magnus Dahlquist, Peter Englund, and Paul Söderlind for their helpful comments and suggestions.

mation.

Recent studies have therefore analyzed fund performance based on observed portfolio holdings. Grinblatt and Titman (1989a) and Grinblatt and Titman (1993) are two of the first articles in this field. Still today, only a few studies of this kind exist since such detailed data are not easily available.

Two recent articles, Chen, Jegadeesh, and Wermers (2000) and Wermers (2000), extend our knowledge of the value of active portfolio management. They use data on mutual funds' portfolio holdings and, contrary to many previous studies, find evidence to support the value of active mutual fund management. Chen, Jegadeesh, and Wermers (2000) show that stocks that fund managers buy perform significantly better than stocks they sell during a one-year period. The evidence in Wermers (2000) shows that fund managers who trade more are better at stock-picking than managers who trade less. Similarly, Dahlquist, Engström, and Söderlind (2000) show that the performance of Swedish mutual funds is positively related to the funds' trading activity.

In this paper, we will take one step further in the analysis of the value of active portfolio management and trading. First, I introduce new measures of the value of active portfolio management. These measures follow the recent developments in the literature and require data on the funds' portfolio holdings. Using such data, I replicate a passive strategy for each fund that also meets the regulatory restrictions of the funds and use these portfolios as benchmarks. One advantage of using a replicating portfolio or strategic portfolio as the benchmark on an individual level is that it eliminates the problems of finding a benchmark that is suitable for all funds. Moreover, this replicating portfolio also allows for a detailed analysis of performance by obtaining separate performance measures of the fund manager's strategic asset allocation decisions and tactical decisions. I define strategic decisions as investment decisions that last for more than one year. The performance of the strategic decisions are measured as the performance of one-year buy-and-hold portfolios (the strategic portfolio). Hence, tactical decisions refer to changes in the strategic portfolio during the year. Second, in contrast to previous studies that analyze aggregate trading, I extend the evidence by decomposing trading activity attributable to three components. One component captures long-term trading decisions, i.e., changes in the strategic portfolio. Another component

captures short-term trading decisions, i.e., deviations from the strategic portfolio during the year. The third component is regulatory trading. This trading occurs as a result of regulatory restrictions, which forces the fund to diversify by limits on the weight of any single stock in the portfolio.

The value of active portfolio management is explored by analyzing 112 Swedish equity mutual funds during the five-year period from 1996 to 2000. Examining Swedish mutual funds offers two main advantages. First, the Swedish data are comprehensive, and consequently allow for a detailed examination while eliminating a number of pitfalls. For instance, the funds have a homogeneous investment objective, and the sample consists of virtually all the funds that have existed during the sample period. Hence, there is no survivorship bias. Second, evaluations of Swedish funds can enrich the existing literature with out-of-sample evidence since they are exposed to similar institutional settings as U.S. funds.

We distinguish between funds investing in the broad Swedish stock market (Sweden funds) and those focusing on small companies (Small Cap funds). The results show that both Sweden funds and Small Cap funds perform well in relation to the benchmark model. The high performance of Sweden funds is attributed to strategic as well as tactical decisions. In contrast, given the significant difference between the returns of the Small Cap funds and their replicating portfolios, we conclude that these managers create performance by making tactical decisions. However, their replicating portfolios or strategic portfolios do not outperform the benchmark model. This paper, like many earlier studies, finds a positive relation between fund performance and trading activity, but the results show that this is due to a positive relation between tactical performance and trading activity. Moreover, this positive relation is based on voluntary trading, since the results show that managers make inferior trading decisions when they are forced to trade.

The remainder of this paper is organized as follows. Section 2 gives an overview of the literature on performance evaluation and the value of active portfolio management. A description of the Swedish mutual fund industry, the sample of funds, and benchmarks used in this study are presented in Section 3. The funds' performance and its components are evaluated in Section 4. In Section 5, different measures of performance are examined in a cross-sectional

setting against different measures of trading activity. Finally, Section 6 presents the conclusions.

2 Evaluating Fund Performance

This section gives an overview of methodological development in performance evaluation. It also presents the new measures of the value of active portfolio management.

2.1 Traditional Measures

Performance evaluation of mutual funds has its roots in the 1960s. Treynor (1965), Sharpe (1966), and Jensen (1968) developed the first evaluation techniques and Jensen's alpha has become the most widely used measure in the literature. It is measured as the intercept from a regression of the return, in excess of the risk-free rate, of the managed portfolio on the excess return of a benchmark portfolio. However, this measure is known to suffer from a statistical bias when fund managers successfully time the market. The implication is that successful timers can be assigned a negative performance. In response to the statistical bias problem, Grinblatt and Titman (1989) propose a new measure, the Positive Period Weighting measure, which does not suffer from this bias. Other developments have concerned the choice of benchmarks. Lehmann and Modest (1987) were the first to adapt the APT to performance evaluation and show how evaluation is affected by the choice of benchmark model. The importance of choosing the correct factor in the Jensen single factor model has also been demonstrated in Elton, Gruber, Das, and Hlavka (1993) who extend the single factor model used in Ippolito (1989) into a multi-factor model and show that the result is reversed.

The Jensen measure has traditionally been unconditional in the sense that historical average returns are used to estimate expected performance. Hence, it does not account for time-varying expected returns and risk. Ferson and Schadt (1996) extend the traditional measure of performance by using predetermined information variables. This conditional measure of performance allows for time-varying expected returns and risk. The Fearson-Schadt measure is obtained by

the regression

$$R_{it} - R_{ft} = \alpha_i + \beta_{i0}(R_{bt} - R_{ft}) + \beta_{i1}^{'} q_{t-1}(R_{bt} - R_{ft}) + \varepsilon_{it}, \qquad (2.1)$$

where R_{it}, R_{bt}, and R_{ft} are the return of fund i, the benchmark, and the risk-free asset, respectively. The intercept α_i, is Jensen's alpha measure or the systematic pricing error. This deviation from the benchmark model, if it is positive (negative), can be interpreted as superior (inferior) performance. The beta coefficient measures the exposure to the benchmark and is a measure of the fund's systematic risk. The predetermined information variables are denoted q_{t-1}. Each information variable has zero mean. The ε_{it} is a fund-specific error term.

2.2 Measures with Characteristic-Based Benchmarks

A large number of studies provide evidence on asset pricing anomalies, and show that the cross-sectional pattern of stock returns can be explained by characteristics such as size, past returns, and book-to-market ratios. Daniel and Titman (1997) show that it is the characteristic rather than the covariance structure of returns that explains the cross-sectional variation in stock returns.

Daniel, Grinblatt, Titman, and Wermers (1997) develop new measures of mutual fund performance based on the evidence in Daniel and Titman (1997). These new performance measures are obtained from a characteristic-based benchmark model. Moreover, Daniel, Grinblatt, Titman, and Wermers (1997) decompose performance into Average Style (AS), Characteristic Selectivity (CS), and Characteristic Timing (CT). The AS measure shows whether the returns earned by the fund are due to a tendency to hold stocks with certain characteristics. A CS measure of zero tells us that the average performance of a fund could have been replicated by simply purchasing stocks with the same size, book-to-market, and momentum characteristics as the stocks that the fund held. Finally, the CT measure is positive if the fund manager has been successful at timing the different investment styles.

2.3 Measures without General Benchmarks

Traditional performance evaluation methods, which measure portfolio performance in relation to benchmarks, have been the subject of considerable criticism. As Roll (1978) points out, it is difficult to distinguish between portfolio performance and benchmark inefficiency. Moreover, Elton, Gruber, Das, and Hlavka (1993) show that the choice of benchmark can significantly affect the conclusions of a performance evaluation.

In this light, an interesting development in the literature is performance measurement without general benchmarks. Grinblatt and Titman (1993), for example, measure of performance by multiplying the twelve-month change in portfolio weight by the following month's return on that stock.[1]

2.4 New Measures

Previous performance evaluation measures have mainly focused on the aggregate portfolio performance. This performance has been decomposed into selectivity and market timing based on the methods developed in Treynor and Mazuy (1966) and Henriksson and Merton (1981). This paper, will extend the literature by decomposing and referring performance to fund manager's strategic and tactical decisions. To enable performance to be decomposed, a passive replicating portfolio needs to be constructed, and this replicating portfolio requires data on the fund's portfolio holdings.

The performance of strategic decisions captures a manager's ability to make long-term investment decisions, that is, investment decisions that last one year. One way of measuring strategic performance is to take snap-shots of the portfolio and evaluate a passive strategy of this portfolio, i.e. a replicating portfolio. In contrast, tactical performance captures a manager's ability to make short-term investment decisions, that is, investment decisions during the year. One way of measuring tactical performance is to evaluate how the active decisions that the manager makes during a year affect the risk and returns in the portfo-

[1]They compute the portfolio change measure by using both 1-quarter and 4-quarter lagged portfolio weights. However, they focus on the measures from the 4-quarter lagged portfolio weights setting since 1-quarter lagged portfolio weights only generate measures close to zero. This might be due to the fact that the funds do not change their portfolios very much during a quarter.

lio. This can be done by conducting an evaluation of the returns of the managed portfolio in excess of the replicating portfolio.

The first step in the calculation of these performance measures is to form a replicating portfolio for each fund. This portfolio is calculated by investing according to the observed portfolio weights and holding on to these assets until new portfolio weights are observed. However, some trading might occur in the replicating portfolio between the observation of true portfolio weights. This trading occurs when (1) an asset ceases to exist in the market (for instance, as a result of a buy-out) and (2) when the replicating portfolio does not fulfil the regulations of mutual funds (i.e. when the weight of a single asset becomes too large). When this trading occurs, the weights of the other assets increase in a manner that keeps the relative weights between them constant. After a certain period of time (for instance a quarter or a year), new portfolio weights are observed and the replicating portfolio is rebalanced according to these weights.

This replicating portfolio is a more realistic portfolio of a passively managed fund compared with previous studies, since it fulfils the same conditions as the true fund. For instance, Grinblatt and Titman (1989a), constructed similarly a hypothetical portfolio based on observed portfolio holdings. Their approach is based on quarterly portfolio holdings and a monthly rebalancing of the assets. They calculate the hypothetical portfolio by summing the portfolio weights that have been multiplied by the monthly excess returns of securities.

Different performance measures is computed once we have the individual fund's replicating portfolio. The first measure can be computed as the difference between the fund's return and the return on the corresponding replicating portfolio. This difference can be interpreted as the value (in terms of returns) created by the fund manager's active decisions. The implication of a positive (negative) value is that the fund manager has sold inferior (superior) assets in comparison with the assets bought. Let us call this value the *return value* (RV) of active portfolio management.

The fund's replicating portfolio also allows us to evaluate the fund manager's strategic and tactical decisions on a risk-adjusted basis. We obtain a performance measure of strategic decisions by evaluating the replicating portfolio using Jensen's alpha measure. Hence, the unconditional strategic performance is estimated by the intercept in the regression

$$R_{Rit} - R_{ft} = \alpha_{Si} + \beta_{Si}(R_{bt} - R_{ft}) + \varepsilon_{Sit}, \tag{2.2}$$

where R_{Rit} is the return on the replicating portfolio of fund i at time t. In addition, the subscript S refers to strategic decisions; thus α_{Si} refers to the performance of the strategic decisions and β_{Si} refers to the risk in the strategic portfolio. Moreover, $R_{bt} - R_{ft}$ refers to the return on the benchmark in excess of the risk-free asset at time t. In a similar setting, we compute the performance of the fund manager's tactical decisions. This performance is computed by evaluating the fund's return in excess of the replicating portfolio. Tactical performance is estimated by the intercept in the regression

$$R_{it} - R_{Rit} = \alpha_{Ti} + \beta_{Ti}(R_{bt} - R_{ft}) + \varepsilon_{Tit}, \tag{2.3}$$

where $R_{it} - R_{Rit}$ is the return on the zero investment portfolio or the return on fund i in excess of its replicating portfolio. In addition, the subscript T refers to tactical decisions; thus α_{Ti} refers the performance of the tactical decisions and β_{Ti} refers to the risk in the tactical portfolio. Both the evaluation of fund manager's strategic decisions and their tactical decisions can be computed in a conditional setting, following Ferson and Schadt (1996), (see equation 2.1). This allows for time-varying expected returns and risk.

3 Swedish Mutual Funds

The Swedish mutual fund industry has grown and developed rapidly during the second half of the 1990s. Total assets managed by this industry has grown from SEK 207 billion in 1995 to SEK 898 billion in the end of 2000 (during this period, the price of one U.S. dollar has been between SEK 8 and 10). Moreover, there has been a level shift in net flows. Prior to 1997, this industry experienced positive or negative flows of a few SEK billion per year. Since 1997, the net flows have been 10 times larger than in previous years. In the year 2000, Sweden introduced a new pension system that forces the Swedish workforce to invest in mutual funds. This system will ensure net flows of about SEK 13 billion per year. Panel A of Table 1 on the next page provides more details about the Swedish mutual fund industry.

Table 1: Data Description

	Panel A. Swedish Equity Mutual Fund Industry					
	1995	**1996**	**1997**	**1998**	**1999**	**2000**
Number	286	300	330	356	394	453
TNA	152	202	307	365	592	595
Net Flow	1.3	2.1	52.6	14.1	27.1	68.7

Panel B. Characteristics of the Sample of Funds

Fund Category	**No.**	**Comm.**	**Turn-over**	**Long-term**	**Short-term**	**Reg.**
Small Cap	15	0.34	0.79	0.45	0.31	0.03
		(0.20)	(0.56)	(0.43)	(0.16)	(0.01)
Sweden	97	0.27	0.65	0.29	0.27	0.06
		(0.20)	(0.50)	(0.28)	(0.14)	(0.06)

Panel C. Excess Return on Benchmarks

Benchmarks	**1996**	**1997**	**1998**	**1999**	**2000**	**Mean**
General Market	28.68	25.54	8.70	43.39	-12.46	18.77
Small Firms	34.09	21.66	-12.91	44.45	-9.43	15.57

Panel A shows the characteristics of the Swedish equity mutual fund industry. Number refers to the number of funds, TNA is total net assets at the end of each year and net flows refers to net flows during the year. TNA and flows are expressed in SEK billion. Panel B contains means and medians (within parentheses) for various attributes of the sample of funds. The sample is divided into two groups based on their investment objective. Commission is the funds' transaction costs over average assets. Turnover is minimum of purchases and sales over average assets. Long-term trading is the change in the portfolio composition during a year. Short-term trading is the funds turnover minus long-term trading minus regulatory trading. Regulatory trading is trading that is due to regulatory restrictions. Panel C shows the return on the benchmarks in excess of the 7-day interbank rate. Mean refers to the average excess return during the period 1996 to 2000. Both benchmarks are value-weighted and include dividends.

Compared with investors in many other countries, Swedish mutual fund investors have a strong preference for equity funds. About 70% of total assets in the Swedish fund industry is invested in equity funds. Traditionally, Swedes have mainly invested in funds with an investment objective on countries or regions. However, recent trends have shown an increased interest in passively managed funds, hedge funds, and funds with an investment objective on specific industries, such as technology and pharmaceuticals.

Regulations concerning investment policies have been harmonized across the European Union,[2] and are followed by virtually all of the mutual funds within the Swedish industry. The UCITS terms in Europe are very similar to the U.S. 1940 Act defining diversification,[3] whose terms most mutual funds in the U.S. meet. Moreover, most funds have low requirements on the initial investment, typically SEK 100.

3.1 Sample of Funds

The sample of funds consists of all open-end mutual funds that have invested in the Swedish market during the time period 1996 to 2000. Hence, the sample is not contaminated by survivorship bias. All the funds are actively managed and meet the UCITS terms. We divide the funds according to investment objectives into two groups, Sweden and Small Cap funds. There are 97 Sweden funds, which invest in the broad Swedish stock market and 15 Small Cap funds, which mainly invest in Swedish firms with a small market capitalization.

The median size of Small Cap funds has grown from SEK 127 to SEK 622 million during the sample period. Sweden funds are much bigger but they have not experienced the same growth. The median size of these funds has grown from SEK 500 to SEK 1,000 million during the sample period. The average management fee is 1.5% per year for Small Cap funds and 1.4% per year for Sweden funds. Since Small Cap funds trade more than Sweden funds, their

[2]The UCITS terms were introduced in 1985 (Undertakings for Collective Investments in Transferable Securities). These terms state that the funds are not allowed to hold a single stock worth more than 10% of their total assets. Moreover, they are only allowed to hold stocks worth more than 5% of their total assets to a maximum of 40% of total assets.

[3]The terms state that as to 75% of the assets of the fund, the fund cannot acquire more than 10% of the voting securities of any issuer *and* cannot invest more than 5% of total fund assets in any one issuer. Hence, the minimum number of stocks a diversified U.S. mutual fund and a European (UCITS) mutual fund must own are 16.

investors are charged on average *another* 0.1% per year.

The average turnover (minimum of purchases and sales over average assets) for Small Cap funds and Sweden funds is 79% and 64% per year, respectively (see Panel B of Table 1). This overall turnover can be decomposed attributed to the motive behind the trade. Overall trading has been decomposed into long-term trading, short-term trading, and regulatory trading. Long-term trading captures the fund manager's trading decisions that are related to changes in the strategic portfolio, when the investment horizon becomes longer than one year. Short-term trading refers to trading activities that involve stocks that are both bought *and* sold during one year. Regulatory trading refers to the forced trading activities that are the result of regulations.

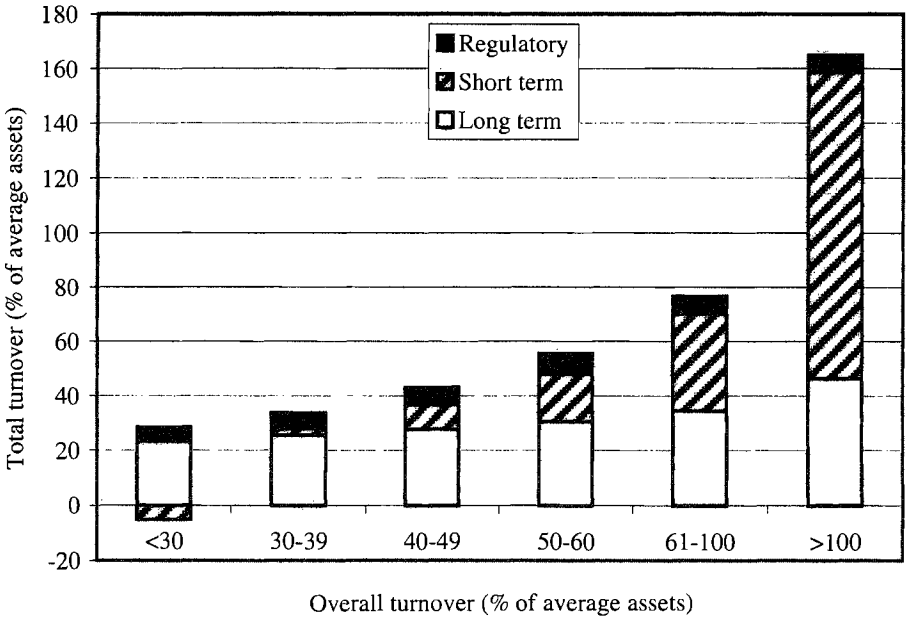
Interestingly, the higher trading observed for Small Cap funds is due to long-term trading decisions.[4] In other words, their portfolio of stocks changes much more between the years than that of Sweden funds. However, the short-term trading by Small Cap funds and Sweden funds is similar. In contrast, Sweden funds are to a larger extent forced to trade due to regulatory limits. Moreover, there is a positive time-trend in overall trading activities. That is, the average turnover measure increases every year. The average turnover for all funds (both Sweden and Small Cap funds) was 0.54 in 1996 and 0.77 in 1999.

Figure 1 on the following page shows how different trading activities is related to overall trading. We observe that funds that engage in the least overall trading activities mainly conduct long-term trading. This implies that these funds' trading activities mainly aim to rebalance their strategic portfolios. Figure 1 also shows that these funds' short-term trading is below zero. However, trading activity cannot be negative, and this negative measure only implies that the funds have been exposed to positive or negative net flows. These flows create an opportunity for the fund to rebalance the portfolio without affecting the overall turnover measure. Moreover, we can see a positive relation between long-term trading and overall trading; that is, the most active funds are involved in slightly more long-term trading than less active funds. However, the biggest difference between more active funds and less active funds is that

[4]Long-term trading, short-term trading, and trading that is the result of regulations are computed measures. Section 5 describes how they are computed.

more active funds engage to a much larger extent in short-term trading. Figure 1 also shows that average regulatory trading is not related to overall trading.

Figure 1: Overall Turnover and Decomposed Turnover
The figure shows how the decomposed turnover measures depend on overall turnover. The sample of funds has been divided into groups of about 50 funds based on overall or reported turnover. Total turnover refers to the average overall turnover within each group. Overall turnover has been decomposed into long-term trading, short-term trading and regulatory trading.



Weekly data of the funds' net asset values (NAV) were obtained from the Trust database of *Findata*. Reinvested dividends are included in the NAV and there is no tax dilution. All fund characteristics are obtained from annual reports except long-term trading, short-term trading, and regulatory trading, which are computed measures from the funds' annual portfolio holdings. The funds' portfolio holdings are obtained from annual reports.[5]

[5]I thank Morningstar for their help in putting together part of the data.

3.2 Benchmarks

Two benchmarks are used in the evaluation: the 'General market' and 'Small Firms'. The General market is a value-weighted index that covers all the stocks listed on the Stockholm Stock Exchange (SSE). This index does not allow weights above 10% for a single firm, which is the same as the regulations that apply to mutual funds. During the five-year sample period, the total return on the General Market was 170% or 19% per year in excess of the risk-free interest rate that is approximated by the 7-day STIBOR. The value-weighted Small Firms index consists of all firms traded on the SSE with a market value of less than SEK 10 billion.[6,7] Interestingly, the return on the Small firms index has been lower than on the General market: 130% during the sample period or 16% per year in excess of the risk-free interest rate. Panel C in Table 1 provides more details on the benchmarks. Weekly return data that include reinvested dividends were obtained from the Trust database of *Findata*.

4 Fund Performance and Attribution

In this section, we evaluate the fund managers' decisions by considering five measures, which are described in Section 2.1 and 2.3. The measures are:

1. the funds' return in excess of the risk-free interest rate,
2. the funds' return in excess of their replicating portfolio (RV),
3. aggregate performance (Jensen's alpha measure following Ferson and Schadt (1996)),
4. performance of fund managers' strategic decisions, and
5. performance of fund managers' tactical decisions.

The second measure shows if the fund managers' active trading decisions have improved the returns for their investors. Since fund managers change

[6]The maximal market capitalization varies over time, 10 billion SEK is a global maximum and was observed in the beginning of the year 2000.

[7]I thank Anders Andersson and Paul Söderlind for their help in putting together the index.

their portfolios slowly, we compare the funds' return with a replicating portfolio that is rebalanced annually. Due to the same reason, Grinblatt and Titman (1993) also use annual portfolio holdings (instead of quarterly holdings) in their examination of U.S. mutual funds. The replicating portfolio is computed using weekly stock returns that are obtained from *Datastream*. The costs to pursue this passive strategy would amount to less than 0.05% per year for an investor of moderate size.

The third, fourth, and fifth measures are computed using weekly return data for the funds and the two benchmarks, 'General market' and 'Small firms'. Moreover, I use the level of the yield curve and past market returns as information variables in equation (2.1).

4.1 Empirical Results

In this section, we examine the performance of Sweden and Small Cap funds. The empirical results are reported in Table 2 on the next page. All results are annualized, that is, an alpha of 1% means that the fund has outperformed the benchmark portfolio by 1% per year.

We start by examining the funds' annual return in excess of the risk-free asset on an annual basis. Table 2 shows that both Small Cap funds and Sweden funds have provided their investors with significant excess return. The annual excess return during the sample period varies between -2% and 48% for Small Cap funds and between -11% and 46% for Sweden funds. Both Sweden funds and Small Cap funds have, on average, provided their investors with the extreme excess return of 20% per year during the sample period. However, the extreme performance disappears when we compare the return of the funds with their corresponding replicating portfolio. The return value of trading (RV) is positive every single year for Small Cap funds. Managers of Small Cap funds made profitable trading decisions, since, on average, they increased the return of the fund by more than 6% compared with their replicating portfolio. This high performance, however, is mainly due to the extreme stock market in 1999, the year of the IT boom. Fund managers of Small Cap funds took advantage of the many profitable opportunities, and hence their extreme performance that year. In contrast fund managers of Sweden funds have not made as profitable trading decisions and their average RV measure is close to zero.

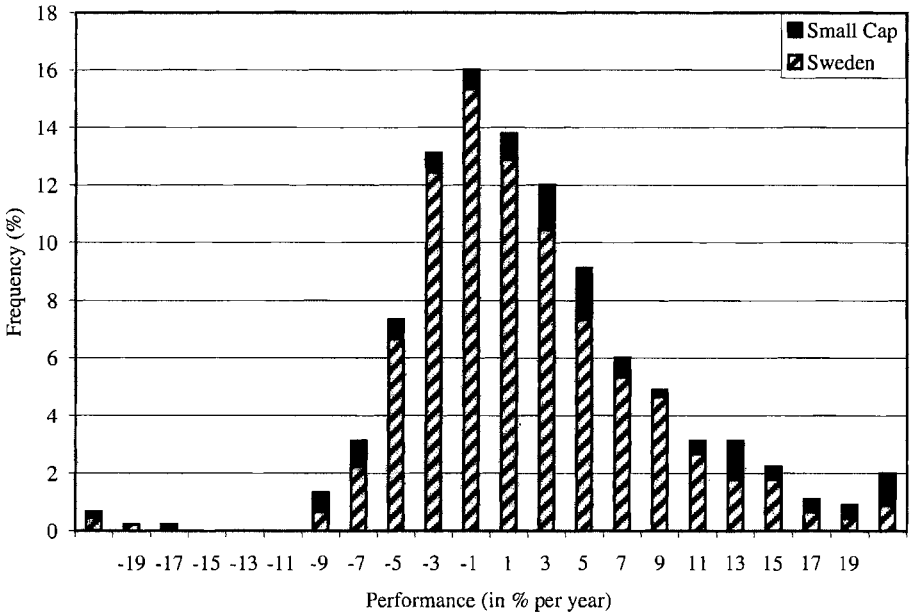
Table 2: Fund Performance

	1996	1997	1998	1999	2000	1996-2000	R^2
Panel A. Investment objective: Small Cap							
E.R.	37.69	25.10	-0.49	48.22	-2.20	21.66	
R.V.	4.24	1.26	1.73	20.66	2.62	6.10	
α_S	5.60	-0.15	4.34	-10.91	-1.16	-1.97	0.78
α_T	0.59	1.81	1.80	16.48	11.28	5.39	0.12
α	5.85	1.49	6.02	3.75	8.91	3.23	0.85
Panel B. Investment objective: Sweden							
E.R.	26.88	24.82	13.27	46.22	-11.45	19.95	
R.V.	0.22	-0.60	3.83	1.27	-2.78	0.39	
α_S	0.69	-0.25	0.85	-2.06	1.54	0.84	0.87
α_T	-1.75	-0.20	7.11	2.13	1.54	0.92	0.12
α	-1.14	-0.48	7.72	0.02	2.97	1.74	0.91

The table shows average performance across funds in The performance is separated according to investment objective. Two non-risk adjusted measures of performance are presented: the funds' return in excess of the risk-free interest rate (E.R.), and the funds' return in excess of its replicating portfolio (R.V.). Moreover, the table presents three risk adjusted performance measures. The aggregate alpha (α), which also is decomposed into strategic performance and tactical performance, strategic alpha and tactical alpha. R^2 is the average coefficient of determination across funds in the categories.

Departing from the above measures, we also evaluate the funds' performance on a risk-adjusted basis following Ferson and Schadt (1996). The aggregate performance measured as alpha (α) is strongly positive for both Small Cap and Sweden funds. On average, Small Cap funds and Sweden funds performance is 3.2% and 1.7% better than the benchmark model, respectively. These performance figures are very high since the fees and commissions are deducted from the funds' returns. In other words, the gross performance is 1.6% higher per year. Further, the alpha measures are also high compared with previous studies.

Figure 2: Distribution of Aggregate Performance
The figure shows 450 annually estimated alphas for the sample of funds. The alphas are separated on the investment objectives, Small Cap and Sweden. Nine alphas are higher than 20% and three are lower than 20%.



An examination each year separately reveals that the average performance of Small Cap funds is positive for every single year. In contrast, the average performance for Sweden funds is not as pervasive; it is negative in some years and positive in others. Figure 2 shows the distribution of the aggregate annual

performance for both Small Cap and Sweden funds. We see that many funds perform close to zero, but the distribution is positively skewed.

The aggregate alpha measure can be decomposed into a strategic alpha that is the performance of fund manager's strategic decisions, and a tactical alpha that is the performance of the fund manager's tactical decisions (see Section 2.3). The results show that managers of Small Cap funds have made good tactical decisions. Their average tactical performance is positive every single year. The performance of their tactical decisions is 5.4% per year from 1996 to 2000. Contrary to the tactical decisions, their strategic decisions do not contribute to an increased aggregate performance. On average the performance of Small Cap fund managers strategic decisions is -2.0% per year. In contrast, fund managers of Sweden funds have made, on average, both good strategic and good tactical decisions. The average performance of their strategic decisions is 0.8% per year and the corresponding performance of their tactical decisions is 0.9% per year during the sample period. This positive performance, however, is not pervasive, but the deviations between the years are small.

Figure 3 on the next page shows the distribution of annual alphas of the funds' strategic and tactical decisions. It is important to remember that the fee charged and commissions paid by the fund is deducted from the funds' tactical decisions. This means that the gross performance of the tactical decisions is 1.6% higher. If we take into account the fee charged and commissions paid by the funds; we can clearly see that the distributions deviate from each other. We can therefore conclude that fund managers create performance mainly through tactical decisions.

Figure 4 on page 43 shows a scatter plot of the relation between the funds' strategic and tactical performance. The correlation between strategic and tactical alpha is about -0.5 each year during the sample period. Hence, fund managers tend to be good at either strategic or tactical decision making. However, we observe quite a few funds in 'losers-corner', bottom-left of the figure, that neither conduct good strategic nor tactical decisions.

As mentioned before, Jensen's performance measure suffers from a statistical bias when the fund manager is a successful market-timer. To check how this bias might have affected this evaluation, I estimate fund managers timing ability by using the methods in Treynor and Mazuy (1966), and Henriksson

Figure 3: Distribution of Strategic and Tactical Performance
The figure shows the distribution of 451 annually estimated alphas for the funds' strategic decisions and the distribution of 451 annually estimated alphas for the funds' tactical decisions. Fifteen alphas are higher than 20% and five are lower than 20%. Remember that an average management fee and transaction costs of 1.6% have been deducted from the tactical performance.

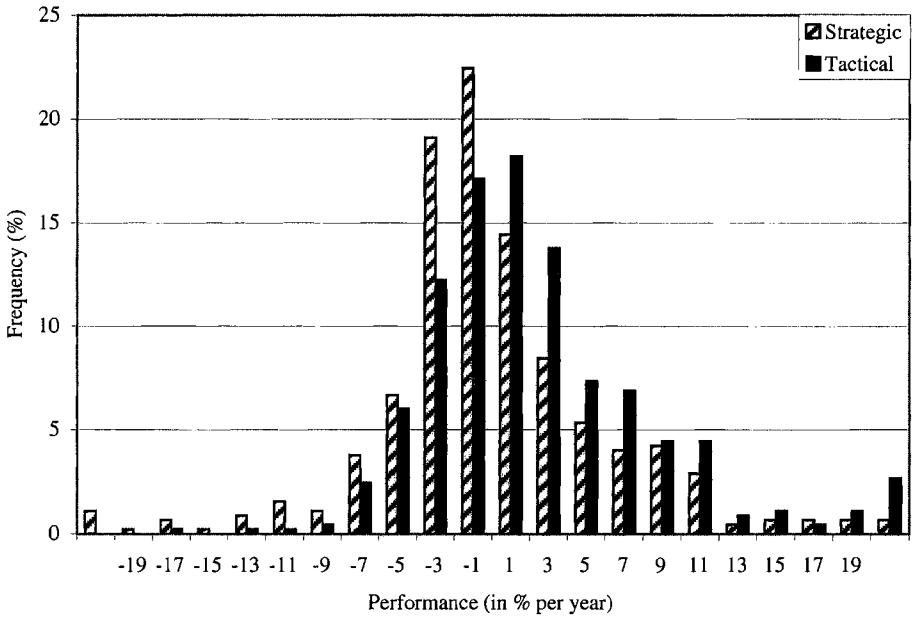
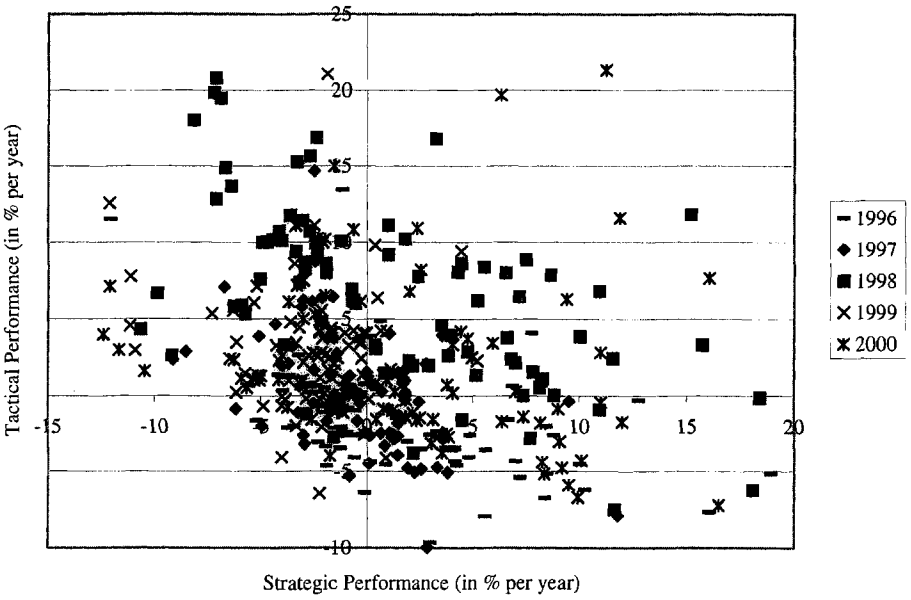


Figure 4: Scatter Plot of Strategic and Tactical Performance
The figure shows the relation between the funds' strategic and tactical performance. It covers annual alphas for 451 fund portfolios, which has been estimated between 1996 and 2000.



and Merton (1981). The results show that the fund managers possess neither a positive nor a negative timing ability. Hence, the performance measures are robust.

5 Measuring the Value of Trading

In this section, I evaluate fund performance in a cross-sectional setting against measures of trading activity. This evaluation will expand the existing evidence on the value of trading by considering components of trading, which are related to the motive behind it. Two previously used measures of overall trading activity along with three components of trading are used in the cross-sectional study. The measures of trading activity in the cross-sectional study are:

(i) *Commission.* This measure is total commissions paid by the fund during a year divided by average assets, which can be viewed as a measure of the funds' *total trading activities.*

(ii) *Turnover.* This measure captures the funds' *total trading activities not caused by flows.* It is measured as the minimum of purchases and sales over average assets.

(iii) *Long-term trading.* This component captures the fund manager's trading attributable to strategic asset allocation decisions. Hence, this component is measured as the fraction of the strategic portfolio that is new and is measured by

$$LT_\tau = \sum_{i(\tau)} \max(w_{i,\tau,\tau} - w_{i,\tau,\tau-1}, 0), \tag{2.4}$$

where company i's weight in the portfolio at time τ is denoted by $w_{i,\tau,\tau}$. In a similar manner $w_{i,\tau,\tau-1}$ is the weight of company i at time τ in the strategic portfolio that was bought at $\tau - 1$. This study uses annual data of the portfolio weights, which means that there is one year between $\tau - 1$ and τ. Hence, we compute the difference between the individual weights of the stock holdings at the end of the year less the corresponding weights at the beginning of the year that have been affected by the returns during the year. [8]

[8] I have also used a measure of the funds' rebalancing, which is calculated by

(iv) *Regulatory trading.* This component captures the funds' trading that is due to the *regulatory limits* of the funds' portfolio holdings.

$$RT_\tau = \sum_t \sum_i \max(w_{i,t} - 0.1, 0), \tag{2.5}$$

where $w_{i,t}$ is the weight of company i at time t. In this paper, t represents weekly data. Hence, for each week I sum the weights above 10% for each stock.

(v) *Short-term trading* . This component is measured as the funds' turnover less long-term trading (as discussed above) and less regulatory trading. Hence, it captures the fund manager's trading deviations from the strategic portfolio during the year.

5.1 Method

In order to establish robust results of the relation between the funds' trading activity and performance, I consider several approaches. I start by running panel data regressions

$$\hat{\alpha}_{i\tau} - \overline{\hat{\alpha}}_\tau = \gamma_0 + \gamma_1 \left(x_{i\tau} - \overline{x}_\tau\right) + \xi_{i\tau}, \tag{2.6}$$

where $\hat{\alpha}_{i\tau}$ is the estimated alpha for fund i in year τ, and $x_{i\tau}$ is a measure of the funds' trading. I allow for fixed (year) effects by subtracting the mean of the alpha and the attribute during a year, denoted by $\overline{\hat{\alpha}}_\tau$ and $\overline{x}_\tau$, respectively. The relation between alpha and the trading measures is evaluated by a weighted least squares (WLS) approach where each observation is weighted by the reciprocal of its residual standard deviation from the performance regression in Section 2.1. I use the WLS approach because the alphas are generated variables that contain measurement errors. This will introduce heteroskedasticity since the different alphas are measured with varying degrees of precision. The implication is that ordinary least squares (OLS) are inefficient and that the traditional estimates of the standard errors are misleading. I also examine

$\sum_{i(\tau)} \max(w_{i,\tau} - w_{i,\tau-1}, 0)$. This measure differs from the other measure since it does not take the returns of stocks in the strategic portfolio into account. However, this measure gives similar results.

other evaluation approaches in order to explore whether the WLS estimates are robust. Specifically, I am interested to study how the regression results are affected by the inclusion or non-inclusion of outliers.[9] These robustness checks are found to have no effect on the conclusions of the relation between performance and trading that are based on the WLS approach.

The second approach is to measure the performance of trading strategies based on the fund attributes. This gives further evidence on the cross-sectional differences and helps to quantify them economically. The funds are first ranked according to the attribute and then formed into two equally weighted portfolios; one consists of funds with a low attribute and one with high attributes. The cut-off points for Sweden funds are below the 25th percentile and above the 75th percentile. This choice of cut-off points for Sweden funds strikes a good balance between getting a large number of funds in each of the two portfolios and making the two portfolios distinctly different. However, the cut-off points for Small Cap funds are below the median and above the median. These cut-off points are chosen because only a few Small Cap funds exist within the Swedish mutual fund industry. I then construct a fictitious zero-cost portfolio by buying the "high" portfolio financed via a short-selling of the "low" portfolio.[10] This zero-cost portfolio is held for one year, after which the sorting procedure is repeated, new portfolios are created and held for the subsequent year, and so on. Note that all the funds (even those that exit the sample during the period) are used in these strategies.

5.2 Aggregate Performance versus Trading Activity

In this section, I examine the relation between aggregate fund performance and the different measures of trading activity described above. The funds performance is measured in a setting similar to the one used in Ferson and Schadt (1996), and described in Section 2.1. Table 3 on page 48 presents the

[9] I have reestimated the WLS regressions on every possible subsample of size $N-2$ drawn from the entire sample of N observations. This gives $N(N-1)/2$ different estimates, and I examine the distribution of these. Other approaches are estimations using the method of least absolute deviations (LAD) and the method of least trimmed squares (LTS), which put less weight on outliers. See, for instance, Rousseeuw and Leroy (1987) or Amemiya (1985) chapter 2 for further details on the estimators.

[10] I have also tried cut-off points at 1/3 and 2/3. This trading strategy give similar results.

results of the single panel regressions using WLS and the results of the trading strategies for both Small Cap and Sweden funds.

The results show a positive relation between the funds' performance and overall trading for Small Cap funds. However, it is only the trading strategy that is statistically significant. This result is similar to Dahlquist, Engström, and Söderlind (2000), who find evidence of a positive relation between aggregate performance and overall trading (commission and turnover) for Swedish funds (joint estimation of Sweden funds and Small Cap funds). Moreover, this study also find a positive and significant relation between performance and short-term trading when the trading strategy is employed. The lack of statistical significance in the single panel regressions is due to outliers that has less impact on the trading strategies. The funds' trading that is due to regulatory limits does not seem to affect the funds' performance.

The performance of Sweden funds is similar to that of Small Cap funds in that it is positively related to both the turnover measure and to short-term trading. This result holds both in the single panel regressions and when the trading strategies are employed. In contrast to Dahlquist, Engström, and Söderlind (2000), I do not find a statistically significant and positive relation between commission paid by the fund and fund performance for Sweden funds. One explanation for this result is that Dahlquist, Engström, and Söderlind (2000) did not separate the funds based on investment objective. The fact that Small Cap funds performed better and paid higher commission than Sweden funds might have caused the positive relation in Dahlquist, Engström, and Söderlind (2000). There is mixed evidence on how trading that is due to regulatory limits affects performance for Sweden funds. The trading strategy, which is based on the funds' regulatory trading, indicates that this trading affects performance negatively, but the panel regression coefficients are positive, although not statistically significant.

5.3 Strategic and Tactical Performance versus Trading Activity

In this section, I examine the relation between strategic and tactical performance, which is described in Section 2.3, and the different measures of trading

Table 3: Cross-Sectional Analysis of Aggregate Performance versus Trading

	Commission	Turnover	Long-term	Short-term	Reg. Trading
	Panel A. Investment objective: Small Cap				
Single Panel Regressions †					
No. observations	46	47	47	47	60
Coefficient	1.47	2.21	4.64	2.89	27.09
Standard error	(4.09)	(1.91)	(6.56)	(2.61)	(21.67)
Performance of Trading Strategies‡					
Alpha	4.66	*5.81*	2.87	*6.29*	-1.15
Standard error	(3.01)	(2.57)	(2.38)	(2.25)	(2.77)
	Panel B. Investment objective: Sweden				
Single Panel Regressions†					
No. observations	281	285	301	285	391
Coefficient	0.24	*1.15*	1.98	*1.36*	2.02
Standard error	(1.40)	(0.55)	(1.78)	(0.61)	(5.92)
Performance of Trading Strategies‡					
	3.07	*3.52*	2.59	2.51	-3.14
	(2.70)	(2.15)	(1.64)	(1.75)	(2.12)

This table relates estimated annual aggregate alphas to measures of trading (commission, turnover, long-term trading, short-term trading, and regulatory trading).
†The single panel regression is a regression of the alpha on a constant and each attribute individually allowing for fixed year effects, see equation (2.6). The equation is estimated with weighted least squares, where each observation is weighted by the inverse of the standard deviation of the estimated alpha. The number of observations and the slope coefficient is reported that is *emphasized* if it is statistically significant at the 10% level. The corresponding heteroskedasticity-consistent standard error is shown in parentheses below the coefficient.
‡The trading strategy is to buy (with equal weights) funds above the 50th percentile of the attribute, and sell (with equal weights) funds below the 50th percentile for Small Cap funds. Corresponding percentiles for Sweden funds are the 25th and 75th. The performance of the trading strategy is estimated in the same way as the performance of the funds, and the conditional alpha is reported. The corresponding heteroskedasticity-consistent standard error is shown in parentheses below the alpha.

activity described above. Table 4 on the following page presents the results of the examination of the relation between tactical performance and trading activity for both Small Cap and Sweden funds.

For Small Cap funds, the statistical relation between tactical performance and trading is stronger than the relation between aggregate performance and trading. Both the single panel regression and the trading strategies suggest that a positive relation exists between tactical performance (α_T) and the funds' turnover. A trading strategy, where an equally weighted portfolio of funds with above median turnover ratios are bought and below median turnover funds is sold, generates a positive performance of 5.4% per year. Similarly, a positive relation is found between tactical performance and short-term trading, and it is statistically significant both in the single panel regressions and when the trading strategy is employed. Also, a somewhat weaker but positive relation is found to exist between long-term trading and tactical performance. Interestingly, the results show a *negative* relation between regulatory trading and tactical performance.

Hence, fund managers of Small Cap funds create tactical performance by making successful short-term bets on the stock market. However, they make inferior investment decisions when they are forced to trade compared with investing in the current portfolio.

The empirical results for Sweden funds are fairly similar to these for the Small Cap funds: there is a positive but somewhat weaker relation between aggregate trading and tactical performance. However, in contrast to the Small Cap funds, a positive relation is found between both short-term trading and tactical performance *and* long-term trading and tactical performance. Moreover, there is a negative relation between regulatory trading and tactical performance. Hence, fund managers of Sweden funds create tactical performance by making both successful short-term bets as well as rebalancing decisions. However, they make inferior investment decisions when they are forced to trade compared with investing in the current portfolio.

In contrast to tactical performance, which is based on all the trading decisions made in one year, strategic performance is based on a single decision made at the beginning of the year. Therefore, it is not likely that strategic performance will be affected by the trading decisions during the year. When

Table 4: Cross-Sectional Analysis of Tactical Performance versus Trading

	Commission	Turnover	Long-term	Short-term	Reg. Trading
	Panel A. Investment objective: Small Cap				
Single Panel Regressions†					
No. observations	46	47	47	47	60
Coefficient	-0.14	*3.27*	7.36	*3.78*	*-41.66*
Standard error	(2.30)	(1.84)	(6.07)	(2.27)	(16.80)
Performance of Trading Strategies‡					
Alpha	5.66	*5.39*	*4.00*	3.02	*-5.23*
Standard error	(2.06)	(1.88)	(1.70)	(2.01)	(2.26)
	Panel B. Investment objective: Sweden				
Single Panel Regressions†					
No. observations	281	285	301	285	391
Coefficient	1.42	*1.21*	3.20	*1.25*	-1.62
Standard error	(1.54)	(0.69)	(2.28)	(0.71)	(6.15)
Performance of Trading Strategies‡					
Alpha	2.23	1.93	*2.72*	0.79	-3.02
Standard error	(1.99)	(1.48)	(1.49)	(1.38)	(2.24)

This table relates estimated annual tactical alphas to annual measures of trading (commission, turnover, long-term trading, short-term trading, and regulatory trading).

†The single panel regression is a regression of the alpha on a constant and each attribute individually allowing for fixed year effects, see equation (2.6). The equation is estimated with weighted least squares, where each observation is weighted by the inverse of the standard deviation of the estimated alpha. The number of observations and the slope coefficient is reported The number of observations and the slope coefficient is reported that is *emphasized* if it is statistically significant at the 10% level. The corresponding heteroskedasticity-consistent standard error is shown in parentheses below the coefficient.

‡The trading strategy is to buy (with equal weights) funds above the 50th percentile of the attribute, and sell (with equal weights) funds below the 50th percentile for Small Cap funds. Corresponding percentiles for Sweden funds are the 25th and 75th. The performance of the trading strategy is estimated in the same way as the performance of the funds, and the conditional alpha is reported. The corresponding heteroskedasticity-consistent standard error is shown in parentheses below the alpha.

I examine the relation between strategic performance and the different measures of trading, almost no significant results appear. There is, nonetheless, one weak result that suggests that a positive relation exist between regulatory trading and strategic performance for Small Cap funds. This result is natural since regulatory trading occur when the fund hold stocks that outperform the market. Still, we need to change the setup to examine whether extensive trading causes high strategic performance. More specifically, we should evaluate the relation between lagged trading (trading prior to the strategic investment decision) and strategic performance. However, as this setup also fails to reveal any statistically significant relation between trading and strategic performance, it would appear that fund managers who are more active in the stock market do not possess superior ability to make strategic investment decisions.

6 Conclusions

Fund managers' skills have previously been decomposed into market timing ability, stock-picking ability and style. This paper deepens our understanding of how fund managers create performance by decomposing it into strategic and tactical decisions. These new measures of performance require access to data on the funds' portfolio holdings that allow us to compute a replicating portfolio.

When I evaluate the performance and apply these measures on a sample of Swedish mutual funds, I obtain new evidence that supports the value of active portfolio management. First, the results show that both the average Sweden fund and the average Small Cap fund have outperformed the benchmark model. Second, Small Cap fund managers' tactical decisions create a significant positive performance that is positive enough to offset their somewhat inferior strategic decisions. The fund managers of Sweden funds create performance through both their strategic and tactical decisions. However, a buy-and-hold strategy of observed portfolio holdings of the average Sweden fund yields almost the same performance as an investment in the fund itself.

In the second part of the paper, I examine the relation between performance and trading, and extend previous evidence by decomposing trading into long-term trading, short-term trading, and regulatory trading. The cross-sectional analysis confirms previously documented evidence of a positive relation between

aggregate performance and trading activity. This paper shows that this relation is due to a positive relation between the performance of fund managers' tactical decisions and trading. In contrast, no significant relation is found between the performance of fund managers' strategic decisions and trading. Moreover, the results show that Small Cap fund managers create performance mainly by making successful short-term bets in the stock market. Fund managers of Sweden funds create tactical performance by making short-term bets as well as by rebalancing decisions. The results also show that fund managers make inferior trading decisions when they are forced to trade due to regulatory restrictions.

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Chapter 3

Investment Strategies, Fund Performance, and Portfolio Characteristics

1 Introduction

Many recent studies have increased our understanding of mutual fund performance by trying to find some of its determinants. These studies mainly analyze the relation between fund performance and fund properties, such as fund size, fees, trading activity, flows, and past returns. However, one obviously important yet unexplored fund property is the fund's investment strategy, which we characterize based on portfolio holdings. In this study, I extend the current evidence on mutual fund performance by investigating the relation between fund managers' investment strategies and performance. This relation is examined for overall performance, based on traditional evaluation techniques, and for strategic as well as tactical performance, based on Engström (2001).

This study provides new evidence on how asset pricing anomalies might affect the performance of mutual funds, since some of the explored portfolio characteristics are related to these anomalies. Further, it examines the performance of buy-and-hold portfolios considering the effect of past asset returns,

[0]I would like to thank Magnus Dahlquist, Peter Englund, and Paul Söderlind for their helpful comments and suggestions.

firm size, and the valuation of stocks.

The empirical literature has previously found evidence of different asset pricing anomalies. For instance, Grinblatt, Titman, and Wermers (1995), and Jegadeesh and Titman (1993) show that momentum is profitable, that is, buying past winners creates abnormal returns. The results in Falkenstein (1996) show that U.S. mutual fund managers try to create abnormal performance by pursuing momentum strategies. However, Conrad and Kaul (1998), and DeBondt and Thaler (1985) show that contrarian strategies are usually profitable at long horizons. Moreover, investing in small companies seems to create abnormal returns. This 'small-firm effect' was first documented by Banz (1981), who studied small firms in the U.S. Heston, Rouwenhorst, and Wessels (1995) found that this effect also holds for international returns. Other studies have found pricing anomalies related to accounting information. Fama and French (1992) show that firms with high book-to-market values produce high risk-adjusted returns for U.S. stocks; Fama and French (1998) show that this 'value-premium' holds internationally.

This study also offers new evidence on the relation between other characteristics of the fund portfolio and performance. For instance, can a diversified portfolio aid performance? Do investments outside the fund's primary investment universe enhance performance? How do cash holdings affect performance?

These issues have not been extensively examined in the literature. However, Elton, Gruber, Das, and Hlavka (1993) show that the high performance in Ippolito (1989) is due to investments outside the fund's primary investment universe.

In order to explore how the fund manager's investment strategy affects performance, this study employs a sample of 112 equity funds that invested in Sweden sometime between 1996 and 2000. The sample is free from survivorship bias.

The results show that, contrary to U.S. evidence, investment strategies based on momentum and the valuation of stocks cannot explain observed differences in performance. However, the study finds a negative firm-size effect that partly explains previous findings of a negative fund-size effect. Further, no significant relation between performance and momentum characteristics or valuation of stocks or firm size are found for the buy-and-hold portfolio. The

results also show that funds consisting of more diversified portfolios perform better than funds with concentrated portfolios. However, this study does not find any significant relation between the fund's performance and the extent to which it invests outside its primary investment universe. Hence, diversification by including non-listed stocks does not enhance performance. This paper also shows that large cash holdings are positively related to the tactical performance of funds.

The rest of the paper is organized as follows. Section 2 presents overall characteristics of Swedish mutual funds and fund-specific data that are used in the paper. In Section 3, we evaluate the performance of the sample of funds. Section 4 explores the relation between performance and the funds' investment strategies. Finally, Section 5 presents the conclusions.

2 Data

2.1 The Swedish Industry and the Sample of Funds

Evaluations of the Swedish mutual fund industry are important for many reasons. It is a relatively young industry and consists of less sophisticated funds than the U.S. mutual fund industry. The development of the Swedish mutual fund industry mainly occurred in the 1990s, and especially during the second half. At the beginning of 1995, total assets managed within this industry amounted to SEK 207 billion; at the end of 2000 this had increased to SEK 898 billion (the price of a U.S. dollar was about SEK 10 in the year 2000). Compared with many other nationalities, Swedes prefer equity funds, which amount to 70% of the total industry. The equity fund industry has traditionally consisted of country, regional, or global funds, but funds focusing on a specific industry gained increased attention during the late 1990s.

During the fall of 2000, Sweden launched a new pension system that obliged 4.4 million Swedes to invest in mutual funds, effectively making most Swedes holders of mutual fund shares. This pension system will ensure net inflows of more than SEK 13 billion per year to the industry, and these inflows have naturally attracted many new mutual fund companies to the Swedish market.

The sample of funds consists of all mutual funds that have focused their

investments on the Swedish market sometime during the five-year period from 1996 to 2000. The total number of funds is 112; of these, 97 invest in the broad Swedish equity market (Sweden funds) and 15 focus their investments on small Swedish firms (Small Cap funds). All the funds meet the same investment policy, i.e., the UCITS terms,[1] and are therefore comparable to U.S. funds, which meet similar terms.[2] Moreover, the average fee of about 1.5% per year is also similar to the fees of U.S. equity funds. Some funds also charge exit and loading fees, but this is not very common. All funds are open-end funds and most funds have low requirements on the initial investment.

The performance evaluation is based on weekly data of the funds' net asset values (NAV) obtained from the Trust database of *Findata*. The NAV includes reinvested dividends and there is no tax dilution. I use two benchmarks in the evaluation: the 'General Market' and 'Small Firms'. The General Market is a value-weighted index that covers all stocks listed on the Stockholm Stock Exchange (SSE). This index does not allow weights of above 10% for a single firm, which is the same as the regulations that apply to mutual funds. During the five-year sample period, the total return on the General Market was 170% or 19% per year in excess of the risk-free interest rate that is approximated by the 7-day STIBOR. This can be compared with the return on the Small Firms index that was 130% during the sample period or 16% per year in excess of the risk-free interest rate. The value-weighted Small Firms index consists of all firms traded on the SSE with a market value of less than SEK 10 billion.[3, 4] Weekly return data including dividends of the benchmarks and stocks are obtained from the Trust database of *Findata*.

[1] The UCITS terms were introduced in 1985 (Undertakings for Collective Investments in Transferable Securities). These terms state that the funds are not allowed to hold a single stock worth more than 10% of their total assets. Moreover, they are only allowed to hold stocks worth more than 5% of their total assets to a maximum of 40% of total assets.

[2] The terms state that as to 75% of the assets of the fund, the fund cannot acquire more than 10% of the voting securities of any issuer *and* cannot invest more than 5% of total fund assets in any one issuer. Hence, the minimum number of stocks a diversified U.S. mutual fund and a European (UCITS) mutual fund must own is 16.

[3] I thank Anders Andersson and Paul Söderlind for their help in putting together the index.

[4] The maximal market capitalization varies over time, SEK 10 billion is a global maximum and was observed at the beginning of 2000.

2.2 Investment Strategies

In this study I examine the relation between performance and investment strategies, defined by characteristics of fund portfolios. The analysis is conducted by first calculating value-weighted averages of stock/company characteristics for the funds' portfolio holdings. The funds' portfolio holdings are obtained from annual reports[5] and data on stock characteristics taken from *Datastream*. I use characteristics that are related to the stocks, accounting information of the companies, and structure of the portfolio. The investment strategies that are evaluated are based on the following portfolio characteristics:

(i) *Past return.* I use two different horizons of past return, namely three months and one year. No return is calculated if the stock has a shorter listing history than the relevant period (three month and one year).

(ii) *Firm size.* Two measures are used:

(a) *Market value.* This is total value of the stocks, in SEK billion.

(b) *Liquidity risk.* Average traded volume in the stock market during the past year, on a daily basis, measured in SEK billion, is used as proxy for liquidity risk.

(iii) *Valuation of firms.* Two measures are used:

(a) *Book-to-market.* This is a valuation measure of the firm. Growth stocks typically have low measures, while value stocks have high measures. The measure is defined as book value divided by market value of equity at year-end.

(b) *Dividend yield.* The dividend yield is typically higher for value stocks than for growth stocks.

(iv) *Diversification ratio.* The minimum number of stocks a mutual fund is allowed to have is 16. The diversification ratio is calculated as one minus the weight of the 16 largest stock holdings over total assets. This implies that the diversification ratio can vary between 0 and 1, where a high measure indicates a well diversified portfolio.

[5]I thank Morningstar for their help in putting together part of the data.

(v) *Other investments.* This measure captures to the extent to which the fund invests in assets outside its primary investment universe. These assets are mainly non-listed Swedish companies, but foreign stocks also appear in this measure. The measure is calculated as the weight of the fund's assets outside its primary investment universe.

(vi) *Cash holdings.* This measure is defined as non-stock holdings over total assets.

Table 1: Correlation of Investment Strategies

	Other invest.	Div. ratio	Cash	Ret. 3 M	Mcap
Diversification ratio	0.27				
Cash	0.05	0.25			
Return 3 months	0.17	0.14	-0.06		
Market capitalization	0.19	-0.10	-0.10	0.67	
Book-to-Market	0.03	-0.03	-0.14	-0.65	-0.65

This table shows the correlation of funds' investment strategies, which are based on annual characteristics of the fund portfolio. The investment strategies are other investments, cash, diversification ratio, return past 3 months, market capitalization, and book-to-market ratio.

Table 1 shows the correlations of the characteristics of the portfolios across funds. We can see that the correlations of diversification ratio, other investments, and cash holdings are low. In contrast, there is a higher correlation of the investment strategies that are related to asset pricing anomalies.[6]

Table 2 on the next page gives the annual averages of the different characteristics of the fund portfolios. The Small Cap and Sweden funds have, on average, similar momentum, book-to-market, and dividend yield characteristics. However, firm size naturally differs between the two types of funds. The average traded volume per day of stocks in Small Cap funds is only SEK 18 million, whereas the corresponding figure for Sweden funds is SEK 251 million.

[6]The correlations of past one year return and the other variables are similar to the correlations of past three months return, the correlations of average traded volume and the other variables are similar to the correlations of market capitalization, and the correlations dividend yield and other variables are similar to the correlations of and book-to-market ratio.

A similar difference between Small Cap and Sweden funds is observed for the average market capitalization of the stocks: SEK 6 billion and SEK 87 billion, respectively. Both average traded volume and average size have increased significantly during the sample period.

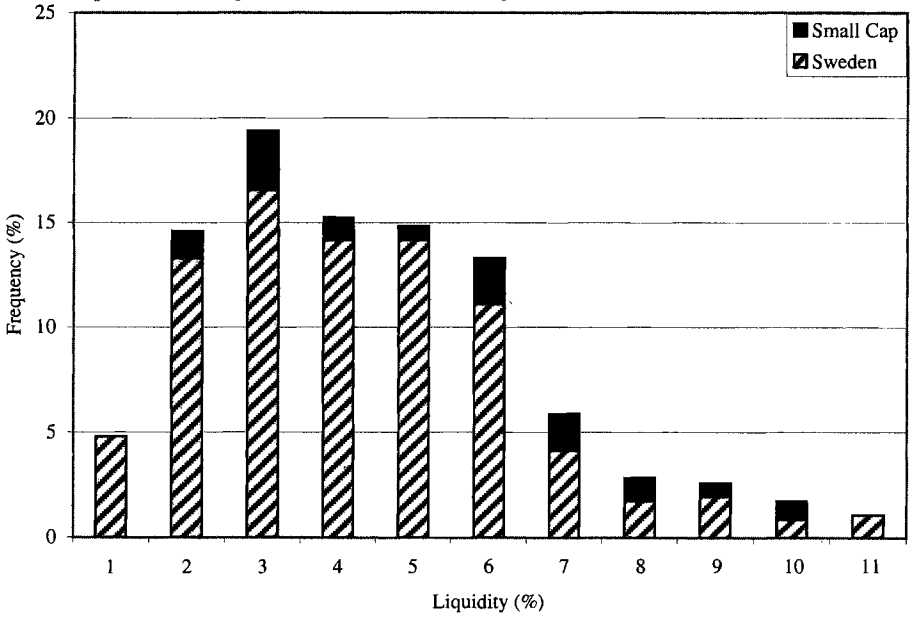
Table 2: Annual and Average Characteristics of Investment Strategies

	1996	1997	1998	1999	2000	Average
			Panel A. All Funds			
Other investments	7.3	4.9	3.8	5.0	9.2	6.0
Diversification ratio	27.8	30.7	31.3	31.5	32.4	30.7
Cash	4.6	4.0	4.0	3.0	3.7	3.9
Return 3 months	-1.7	15.2	-3.1	17.1	46.4	14.8
Market capitalization	33	47	55	69	175	76
Book-to-Market	52	41	31	28	20	34
			Panel B. Small Cap Funds			
Other investments	6.9	5.9	6.2	4.2	10.3	6.7
Diversification ratio	31.2	39.6	35.9	40.6	42.1	37.9
Cash	7.9	7.6	4.3	4.2	3.6	5.5
Return 3 months	-1.0	22.9	0.5	12.1	54.0	17.7
Market capitalization	7.5	6.6	6.3	6.9	3.7	6.2
Book-to-Market	54	42	33	33	23	37
			Panel C. Sweden Funds			
Other investments	7.4	4.7	3.4	5.1	9.1	5.9
Diversification ratio	27.3	29.5	30.5	29.8	30.9	29.6
Cash	4.2	3.5	3.9	2.8	3.7	3.6
Return 3 months	-1.8	14.1	-3.8	18.2	45.2	14.4
Market capitalization	36	52	63	80	202	87
Book-to-Market	52	41	31	28	19	34

This table shows annual and average characteristics of the funds' investment strategies. The investment strategies are based on other investments, cash, diversification ratio, return past 3 months, market capitalization, and book-to-market ratio. All the characteristics are expressed in percentage except market capitalization, which is in SEK billion.

Figure 1 on the following page shows that Small Cap funds have, on average, a larger share of their assets in cash: on average, 5.5% compared with 3.6% for Sweden funds. This difference might be due to the fact that Small Cap funds have less total assets, and that the funds need to keep a certain amount of cash to handle the flows.

Figure 1: Distribution of the Funds' Liquidity
The figure shows the distribution of 459 annual observations of liquidity or cash holdings in the fund portfolios. 17 portfolios have cash holdings above 12% of total assets.



The fund managers of Small Cap funds and Sweden funds make similar diversification decisions. Figure 2 on the next page shows that the diversification ratio varies mainly between 20% and 50% for both categories of funds, though the mean and median is slightly lower for Sweden funds. Interestingly, Table 2 shows that the diversification ratio has increased during the sample period. The results are similar when diversification is measured as the number of stocks. On average, both Small Cap and Sweden funds hold about 40 stocks, but the dispersion is wide. The number of stocks in the funds' portfolio is generally between 20 and 70 at the end of each year during the sample period.

In Figure 3 on page 64, we notice that both Small Cap funds and Sweden funds invest to a similar extent in assets that are not traded on the Stockholm Stock Exchange (SSE). Typically, these are firms that will be traded on the SSE in the near future. The median Small Cap and median Sweden fund invest 4% of their assets in this type of firm.

Figure 2: Distribution of the Funds' Diversification Ratio
The figure shows the distribution of the diversification ratio; 398 annual observations refer to Sweden funds and 62 refer to Small Cap funds.

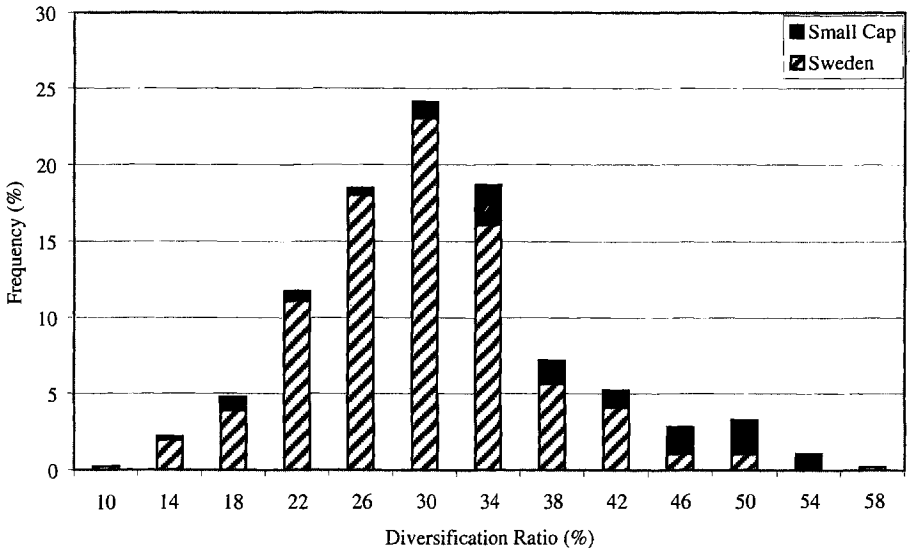
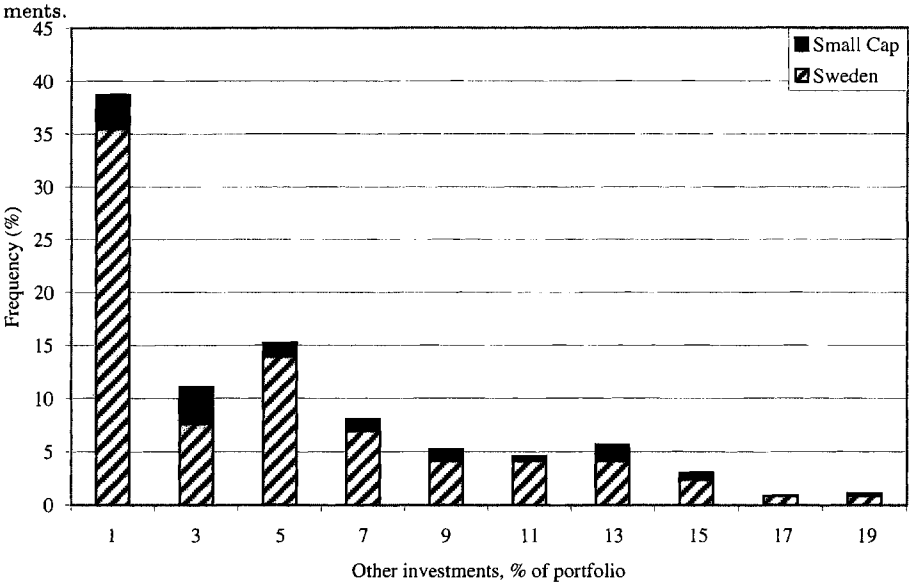


Figure 3: Distribution of the Funds' Other Investments
The figure shows the distribution of 460 annual observations of portfolio holdings of other investments. Thirty portfolios have more than 20% of the portfolio invested in other investments.



3 Performance Evaluation

In this paper, fund performance is measured using both the traditional unconditional alpha model, as in Jensen (1968), and the conditional alpha, following Ferson and Schadt (1996). The Ferson and Schadt (1996) measure is obtained by the following time-series regression

$$R_{it} - R_{ft} = \alpha_i + \beta_{i0}(R_{bt} - R_{ft}) + \beta_{i1}^{'} q_{t-1}(R_{bt} - R_{ft}) + \varepsilon_{it}, \qquad (3.1)$$

where R_{it}, R_{bt}, and R_{ft} are the return on fund i, the benchmark, and the risk-free asset, respectively. The predetermined information variables are denoted q_{t-1}. Each information variable has zero mean. The ε_{it} is a fund-specific error term. The intercept, α_i, is Jensen's alpha measure or the systematic pricing error. This deviation from the benchmark model, if it is positive (negative),

can be interpreted as superior (inferior) performance. The time-varying beta coefficient ($\beta_{i0} + \beta_{i1}^{'} q_{t-1}$) measures the exposure to the benchmark and is a measure of the fund's systematic risk. Moreover, I employ the methods developed in Treynor and Mazuy (1966) and Henriksson and Merton (1981) to check whether the results are biased due to market timing.

The alpha is estimated on weekly fund returns and two benchmark portfolios are used: the General Market index and Small Firms index. The return on risk-free asset is approximated by the 7-day STIBOR. I use the de-meaned lagged market return and the level of the yield curve as information variables.

Engström (2001) decomposes overall alpha into components attributeable to strategic and tactical decisions; the same method is applied here. The performance of the fund managers' strategic decisions is the risk-adjusted return of a buy-and-hold or replicating portfolio of each fund. This replicating portfolio is constructed based on obseved portfolio holdings and is rebalanced annually. Further, it meets the same regulations as the true fund. Tactical performance is the risk-adjusted return on the fund in excess of its replicating portfolio.

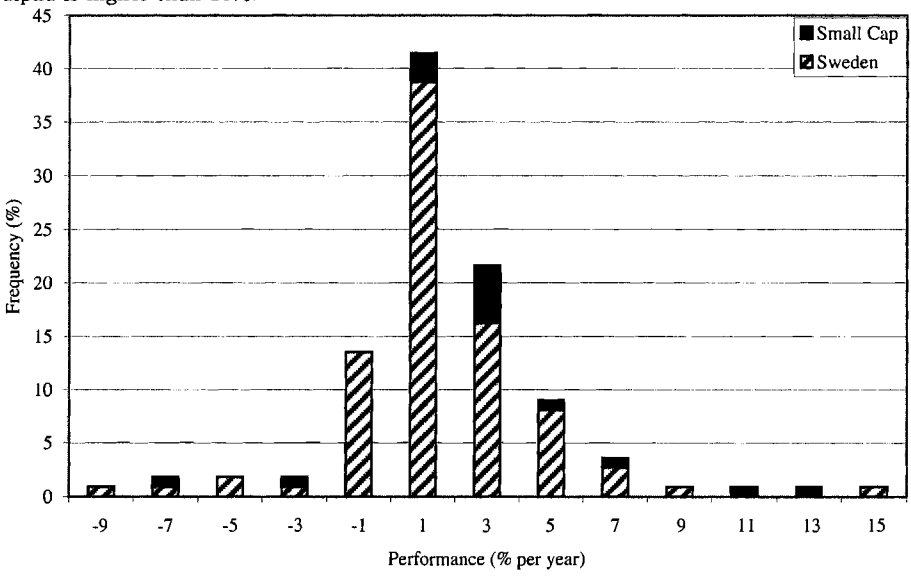
3.1 Empirical Results

Figure 4 on the next page shows the distribution of the funds' overall performance. The average performance (α) of Small Cap funds is 3.2%, and the corresponding average performance for Sweden funds is 1.7%, when the conditional model is employed. Similar results are obtained when the unconditional model is used. However, statistically only a few funds' performance is significantly higher than zero. Interestingly, Figure 4 shows that the performance of most funds is very similar since 77% of them deliver a performance of between -2% and 4% on an annual basis. Moreover, the performance measures are robust since the evaluation suggests that the fund managers possess neither a positive nor a negative timing ability.

The performance evaluation also shows that the average beta for Small Cap funds is close to one (towards the Small Firms index) and the average beta for Sweden funds is close to one (towards the General Market). Moreover, the beta is also close to one for most funds. Finally, the regression results show that 90% of the funds' returns are explained by the benchmarks.

The average performance of the funds is high compared with funds in the

Figure 4: Distribution of Overall Performance
The figure shows 112 estimated conditional alphas for the sample of funds from 1996 to 2000. The alphas are separated based on the investment objectives, Small Cap and Sweden. One alpha is higher than 16%.



U.S. and other European countries. The evidence in international studies suggests that once fees are deducted, the average mutual fund does not outperform a relevant index. In a previous study, Dahlquist, Engström, and Söderlind (2000) show that Swedish equity funds perform well compared in an international perspective. They show that the average performance between 1993 and 1997 was close to zero, once fees were deducted.

Moreover, the high overall performance observed is as Engström (2001) shows, mainly due to successful tactical decisions. The average performance of tactical decisions is 5.4% and 0.9% per year for Small Cap and Sweden funds, respectively. In contrast, the average performance of strategic decisions is -2.0% per year for Small Cap and 0.8% for Sweden funds.

4 Performance and Investment Strategies

In order to analyze how the funds create performance, we study fund performance along with several different investment strategies. This is done by measuring fund performance on a year-by-year basis, using the method described in Section 3, and then relating this to annual data of portfolio characteristics. Annual portfolio holdings are observed at the end of each year from 1995 to 1999. I let these observed portfolio holdings serve as proxy for the fund managers' investment strategy the coming year. That is, the end of year portfolio holdings in 1995 serves as proxy for the investment strategy during 1996, and so on.

We can express the panel data regression model as

$$\hat{\alpha}_{i\tau} - \overline{\hat{\alpha}}_{\tau} = \gamma_0 + \gamma_1 \left(z_{i\tau} - \overline{z}_{\tau} \right) + \xi_{i\tau}, \tag{3.2}$$

where $\hat{\alpha}_{i\tau}$ is the estimated alpha for fund i in year τ, and $z_{i\tau}$ is the characteristic of the portfolio at the beginning of year τ, which is a proxy for the investment strategy. I allow for fixed (year) effects by subtracting the mean of the alpha and the attribute during a year, denoted by $\overline{\hat{\alpha}}_{\tau}$ and $\overline{z}_{\tau}$, respectively. The relation between alpha and the investment strategy is evaluated by a weighted least squares (WLS) approach where each observation is weighted by the reciprocal of its residual standard deviation from the performance regression 3.1. I use the WLS approach because the alphas are generated variables that contain measurement errors. This will introduce heteroskedasticity since the different alphas are measured with varying degrees of precision. The implication of this is that ordinary least squares (OLS) are inefficient and that the traditional estimates of the standard errors are misleading.

I also measure the performance of trading strategies based on fund characteristics. This offers further evidence on the cross-sectional differences and helps to quantify them economically. The funds are first ranked according to the attribute and then divided into two equally-weighted portfolios; low attribute funds make up one, and higher attribute funds the other. The cut-off points for Small Cap funds are below the 33rd percentile and above the 67th percentile; for Sweden funds the cut-off points are below the 25th percentile and above the 75th percentile. Moreover, I also use the latter as cut-off points

when evaluating all the funds. This choice of cut-off points strikes a good balance between getting a large number of funds in each of the two portfolios and making the two portfolios distinctly different.[7] Based on the cut-off points, I construct a fictitious zero-cost portfolio by buying the "high" portfolio and short-selling of the "low" portfolio. This zero-cost portfolio is held for one year, after which, the sorting procedure is repeated, new portfolios are created and held for the subsequent year, and so on. Note that all the funds (even those that exit the sample during the period) are used in these strategies.

4.1 Asset Pricing Anomalies

In this section, I discuss the results in Tables 3 - 5 and examine how fund performance is affected by investment strategies that are related to the well-known momentum effect in equity prices, the firm size effect, and the value premium. The tables show the results for joint evaluation of all the funds. However, I comment on the corresponding results for Small Cap and Sweden funds separately.

4.1.1 Momentum in Equity Prices

In this section, we explore how the momentum effect might affect the performance of mutual funds in the Swedish market. Table 3 on the facing page presents results on the relation between past return characteristics and fund performance. Two different horizons of past return are examined: one three-month and one twelve-month (based on the portfolio holdings at the beginning of each year). Further, the table divides the results into overall, strategic, and tactical performance.

The momentum effect is one of the most explored asset pricing anomalies. Jegadeesh and Titman (1993) show that momentum is profitable, that is buying past winners creates abnormal returns. However, the momentum effect is short-lived and abnormal returns can be created at the three- to twelve-month horizon. In contrast, Conrad and Kaul (1998) and DeBondt and Thaler (1985) show that contrarian strategies are usually profitable at longer horizons. Based

[7] I use different cut-off points for Small Cap funds and Sweden funds since the number of funds within each investment objective differs significantly.

on this evidence, we could expect that professional portfolio managers use this information and choose a portfolio that is biased towards momentum stocks. The empirical evidence supports this hypothesis; Grinblatt, Titman, and Wermers (1995), and Falkenstein (1996) show that U.S. mutual funds actually have portfolios that are biased towards momentum stocks. Interestingly, Grinblatt, Titman, and Wermers (1995) show that funds investing in momentum stocks realized better returns.

Table 3: Performance and Momentum in Stock Returns

	Overall Perf.		Strategic Perf.		Tactical Perf.	
	Ret. 1 Y	**Ret. 3 M**	**Ret. 1 Y**	**Ret. 3 M**	**Ret. 1 Y**	**Ret. 3 M**
Single Panel Regressions†						
Coefficient	*-14.38*	*-20.02*	-0.39	10.92	*-8.17*	*-14.07*
Standard error	(2.75)	(6.96)	(2.58)	(6.94)	(2.19)	(6.75)
Performance of Trading Strategies‡						
Alpha	-1.41	0.64	-0.47	0.99	-0.95	-0.35
Standard error	(2.01)	(2.73)	(2.15)	(2.80)	(1.27)	(1.75)

This table relates estimated annual overall alphas, strategic alphas, and tactical alphas to annual investment strategy of the fund, which is based on past stock returns.

†The single panel regression is a regression of the alpha on a constant and each attribute individually allowing for fixed year effects. The equation (3.2) is estimated with weighted least squares, where each observation is weighted by the inverse of the standard deviation of the estimated alpha. The slope coefficient is reported and *emphasized* if it is statistically significant at the 10% level. The corresponding heteroskedasticity-consistent standard error is shown in parentheses below the coefficient. The number of observations in the regressions are 451.

‡The trading strategy is to buy (with equal weights) funds above the 75th percentile of the attribute, and sell (with equal weights) funds below the 25th percentile. The performance of the trading strategy is estimated in the same way as the performance of the funds, and the conditional alpha is reported. The corresponding heteroskedasticity-consistent standard error is shown in parentheses below the alpha.

I obtain statistically significant results in the cross-sectional regression of *overall performance* and past stock returns, but this result cannot be established when the trading strategy is employed. This difference between the

cross-sectional regression and the trading strategy is due to outliers. The average performance of funds with low past stock returns is similar to the average performance of funds with high past stock returns. In contrast, the median performance of funds with low past stock returns is higher than the median performance of funds with high past stock returns. Hence, this result suggests a weak negative relation between past returns and overall performance. Similar results are obtained when only Sweden funds are evaluated, whereas no relation between past returns and overall performance is found for Small Cap funds.

Table 3 shows that the results for *tactical performance* are similar to the overall performance measure. However, a weak positive relation is found between tactical performance and past returns when Small Cap funds are examined.

The results are somewhat different when *strategic performance* is examined. Table 3 shows no statistically significant relation between past returns and strategic performance. This evidence is similar to Rouwenhorst (1998), who explores momentum in an international setting and concludes that momentum is not present in Sweden. However, I find a negative relation between past returns and strategic performance when I examine Small Cap funds separately. This result is statistically significant both in the cross-sectional regressions and when the trading strategies are employed. In contrast, there is only a weak negative relation between past returns and strategic performance for Sweden funds.

4.1.2 Firm Size

In this section, we study how performance might be affected by investment strategies that are based on firm size (market capitalization) or liquidity risk (average traded volume). Table 4 on the next page presents results on how these investment strategies explain differences in fund performance in Sweden. Two different measures are used: value-weighted market capitalization and value-weighted average traded volume. Further, the table presents the results for overall, strategic, and tactical performance.

Another often cited asset pricing anomaly is the size or small-firm effect. The pioneer work was done by Banz (1981), who studied small firms in the U.S. Banz finds that investing in small firms creates abnormal returns. Interestingly,

Heston, Rouwenhorst, and Wessels (1995) show that the small-firm effect holds in an international setting. Moreover, Brennan, Chordia, and Subrahmanyam (1997) support these results by discovering a negative relation between firm size and risk-adjusted returns on individual securities. However, they show that the negative size effect disappears when the dollar volume of trading is included in the regression. This suggests that the size effect is actually a trading volume effect that could be interpreted as a proxy for liquidity risk. In contrast to the momentum effect, this anomaly does not appear to be taken advantage of by professional investors. Falkenstein (1996) finds that U.S. fund managers have a significant preference for stocks with high visibility, as measured by the amount of coverage in newspaper articles. These firms normally have a large market capitalization and low liquidity risk.

The results suggest that there is a weak negative relation between firm size or traded volume and *overall performance* for funds in Sweden. However, I find no relation between firm size and performance when I examine Small Cap and Sweden funds separately.

Table 4: Performance and Firm Size

	Overall Perf.		Strategic Perf.		Tactical Perf.	
	Mcap	**Mean vol**	**Mcap**	**Mean vol**	**Mcap**	**Mean vol**
Single Panel Regressions†						
Coefficient	*-0.58*	-0.51	0.12	0.18	*-0.75*	*-0.69*
Standard error	(0.33)	(0.33)	(0.38)	(0.35)	(0.23)	(0.21)
Performance of Trading Strategies‡						
Alpha	-1.50	-1.42	1.99	2.24	*-3.43*	*-3.58*
Standard error	(2.01)	(1.97)	(2.49)	(2.44)	(1.75)	(1.64)

This table relates estimated annual overall alphas, strategic alphas, and tactical alphas to the annual investment strategy of the fund, which is based on firm size. For details, see Table 3.

Moreover, firm size cannot explain differences in *strategic performance*. Almost all the measures were found to be insignificant. The only measure that

is statistically significant is when the strategic performance of Sweden funds is examined in a cross-sectional setting versus firm size.

In contrast, I find a very strong negative relation between firm size and *tactical performance*. Table 4 shows that all measures, both strategies based on market capitalization and average traded volume, are statistically significant in the cross-sectional setting and when the trading strategies are employed. However, I do not find a relation between tactical performance and firm size when I examine Small Cap funds and Sweden funds separately.[8] This suggests that the negative relation between firm size and tactical performance is mainly caused by the fact that Small Cap funds' tactical performance is much higher than that of Sweden funds.[9] Interestingly, this negative effect can explain part of the negative size-of-fund effect that was found by Dahlquist, Engström, and Söderlind (2000), since smaller funds invest in smaller stocks.

4.1.3 Valuation of Firms

In this section, I explore how the performance is affected by investment strategies that are based on the valuation of the firms. I use book-to-market values and dividend yields as proxies for the valuation of the firms.

The existing literature has identified an asset pricing anomaly which is related to the valuation of the firm. Based on the valuation, firms can be classified as value or growth firms. Value firms have high ratios of book-to-market equity and high dividend yield. Many studies of the U.S. stock market have found that value stocks outperform growth stocks (see e.g., Fama and French (1992), Fama and French (1996), and Lakonishok, Shleifer, and Vishny (1994)). This anomaly is often referred to as the book-to-market effect or the value premium. Interestingly, Fama and French (1998) conclude that this asset pricing anomaly holds in an international setting.

Table 5 on the facing page presents results on the relation between the valuation of the stocks in the managed portfolio and the performance of funds in Sweden. The value-weighted book-to-market ratio and the value-weighted dividend yield of the stocks in the portfolio at the beginning of the year are

[8]The coefficient and standard error from the panel regression are -0.73 and 0.51 for Small Cap funds. The corresponding figures for Sweden funds are 0.22 and 2.28.

[9]See Engström (2001) for details on the tactical performance.

used as proxies for the fund's investment strategy. As before, the table presents the results for overall, strategic, and tactical performance.

Table 5: Performance and Valuation of Firms

	Overall Perf.		Strategic Perf.		Tactical. Perf.	
	B t M	Div Yield	B t M	Div Yield	B t M	Div Yield
Single Panel Regressions†						
Coefficient	*18.19*	*3.81*	4.11	1.00	5.61	*1.89*
Standard error	(3.51)	(0.82)	(4.26)	(1.01)	(3.85)	(0.86)
Performance of Trading Strategies‡						
Alpha	1.38	0.45	-0.70	0.87	*2.10*	-0.41
Standard error	(1.61)	(2.01)	(1.60)	(2.13)	(1.24)	(1.66)

This table relates estimated annual overall alphas, strategic alphas, and tactical alphas to the annual investment strategy of the fund, which is based on the valuation of stocks. For further details, see Table 3.

The cross-sectional examination of book-to-market ratios and dividend yield versus *overall performance* suggests that there is a value premium in Sweden (see Table 5). However, the relation is weak, since we do not obtain significant results when the trading strategies are employed. Similar results are obtained when only Sweden funds are examined. In contrast, no relation between the valuation of firms and overall fund performance is found when only Small Cap funds are examined.

Table 5 shows that no relation exists between *strategic performance* and the valuation of firms when all the funds are jointly examined. A similar result is obtained for Small Cap funds. In contrast, I find a weak positive relation between strategic performance and dividend yield for Sweden funds.

The results suggest that funds with more value stocks in their portfolios have higher *tactical performance*. However, the only statistically significant findings that support this are obtained when all the funds are jointly examined. This suggests that the result is due to the higher book-to-market ratios and higher tactical performance of Small Cap funds.

4.2 Other Investment Strategies

This section explores the relation between the performance of the funds and other characteristics of the managed portfolio. Three characteristics are examined: the degree of diversification, investments outside the funds' primary investment universe, and the funds' cash holdings. The results are mainly related to overall and tactical performance, since there are no significant results for strategic performance. Table 6 shows the results for joint evaluation of all the funds. However, I comment on the corresponding results for Small Cap and Sweden funds separately.

Table 6: Performance and other Investment Strategies

	Overall Performance			Tactical Performance		
	Cash	**Other invest.**	**Div ratio**	**Cash**	**Other invest.**	**Div ratio**
Single Panel Regressions†						
Coefficient	*10.33*	*-6.59*	*7.83*	*19.05*	-3.05	*5.38*
Standard error	(5.82)	(3.13)	(2.85)	(6.11)	(3.20)	(3.13)
Performance of Trading Strategies‡						
Alpha	1.41	-0.23	*2.67*	1.13	-0.25	*2.58*
Standard error	(1.40)	(1.38)	(1.18)	(0.90)	(1.36)	(1.14)

This table relates estimated annual overall alphas and tactical alphas to the annual investment strategy of the fund (diversification ratio, other investments, and cash holdings). For further details, see Table 3.

4.2.1 Diversification Ratio

In this section, I want to study how fund managers' diversification strategy affects performance in the performance evaluation. Holding a less diversified portfolio implies a higher probability/risk of experiencing both a higher and lower return. In Sweden, some recently launched funds have an investment objective restricting their investment to about 20 stocks. Table 6 presents the results of the relation between fund performance and diversification ratio, computed as described in Section 2.

The results show a positive relation between the funds' degree of diversification and *overall performance*. This result is found to be statistically significant both in the cross-sectional analysis and the trading strategy. Moreover, I find similar but weaker results when the Small Cap and Sweden funds are examined separately.

Table 6 also presents a strong positive relation between the funds degree of diversification and *tactical performance*. This result is statistically significant both in the cross-sectional analysis and in the trading strategy. The same strong positive relation between tactical performance and the funds' degree of diversification is also revealed when Small Cap funds are examined separately. However, I do not find any relation between tactical performance and degree of diversification for Sweden funds. Finally, I find no relation between *strategic performance* (the replicating portfolio) and the degree of diversification.

4.2.2 Other Investments

In this section, I examine how investments outside the funds primary investment universe affect the performance of funds' in Sweden. Table 6 presents the result on the relation between the funds' 'other investments' and performance; the share of the portfolio that is invested outside the funds' primary investment universe is referred to as 'other investments' and mainly consists of non-listed firms, but also includes foreign stocks.

A weak negative relation is found between the funds' *overall performance* and other investments. This result is partly caused by outliers and is not statistically significant when the trading strategy is employed. A similar result is obtained when Sweden funds are examined separately. The table also shows that no statistically significant results appear when *tactical performance* is examined.

The relation between fund performance and other investments is also interesting since substantial investments outside the funds' primary investment universe can raise a benchmark problem. For instance, Elton, Gruber, Das, and Hlavka (1993) show that the high performance in Ippolito (1989) is due to a benchmark model that does not correspond to the evaluated funds' investment universe. Further, Elton, Gruber, Das, and Hlavka (1993) show that the performance in Ippolito (1989) is lower when an appropriate model is used. Contrary

to Elton, Gruber, Das, and Hlavka (1993), the results in this evaluation of Sweden and Small Cap funds do not suggest that investment outside the funds primary investment universe affect the performance. Hence, the benchmark problem in Ippolito (1989) is not present here.

4.2.3 Cash Holdings

In this section, we examine the relation between the funds' cash holdings and performance. Mutual funds need to keep some cash holdings in order to handle net outflows. However, as we saw in Figure 1, the dispersion and magnitude of cash holdings cannot be motivated by flows. Other factors, such as a pessimistic fund manager, could affect the decision to hold cash. This is, of course, a risky decision since the manager will be punished if the raw returns are lower than the returns of the benchmark.

Table 6 shows that the cross-sectional analysis of *overall performance* to the funds' cash holdings suggests a positive relation. However, the statistical significance disappears when the trading strategy is employed. Further, I find no statistically significant results when the funds are examined separately based on investment objective. This suggests that the weak positive relation is due to the larger cash holdings and higher overall performance of Small Cap funds.

Table 6 also suggests that a weak positive relation exists between *tactical performance* and the funds cash holdings. That is, funds' that have large cash holdings at the beginning of the year make more successful tactical decisions. This result can once again be explained by the differences in the characteristics of Small Cap and Sweden funds, but it also proves to be statistically significant in the cross-sectional regressions for Sweden funds.

4.3 Robustness Checks

This section summarizes the robustness checks of the relation between performance and investment strategies that are based on the characteristics of the fund portfolio.

I start by examining whether the WLS estimates are robust, and specifically study how the regression results are affected by the inclusion or non-inclusion

of outliers.[10] This evaluation shows that outliers have a marginal effect on the significant WLS results. Further, in Table 1 we observed high correlations between some of the investment strategies; this could have an important effect on the results. I therefore examine the relation between alpha and investment strategy in a multiple setting. Two setups are considered: one multiple regression for asset pricing anomalies (e.g., market capitalization, three months' past return, and book-to-market ratio), and one for other characteristics of the portfolio (e.g., diversification ratio, other investments, and cash). These multiple regressions show that the significant results in the single regressions hold when the multiple regression is employed. Finally, these robustness checks provide support of the results in Section 4.

5 Conclusions

This paper has attempted to shed some light on how fund managers' investment strategies affect the performance of Swedish mutual funds. The first part explored strategies that are related to the evidence on asset pricing anomalies, such as the momentum effect, the firm size effect, and book-to-market effect. The study shows that a weak negative relation exists between performance and past stock returns in the portfolio. Further, there is some evidence that the highest performing Sweden funds invest to higher extent in smaller companies. This evidence can partly explain why we observe a negative fund-size effect in Dahlquist, Engström, and Söderlind (2000). Moreover, investing in value stocks can help to improve overall performance.

The examination of the relation between the performance of the passive (strategic) portfolio and momentum, firm size, and valuation characteristics gives even weaker results compared with overall performance. This suggests that asset pricing anomalies related to momentum, firm size, and the valuation of stocks do not exist in Sweden.

[10] I have reestimated the WLS regressions on every possible subsample of size $N-2$ drawn from the entire sample of N observations. This gives $N(N-1)/2$ different estimates, and I examine the distribution of these. Other approaches are estimations using the method of least absolute deviations (LAD) and the method of least trimmed squares (LTS), which put less weight on outliers. See, for instance, Rousseeuw and Leroy (1987) or Amemiya (1985) chapter 2 for further details on the estimators.

The second part of the paper explores strategies that are related to the structure of the managed portfolio. One important investment strategy concerns the extent to which the portfolio manager should diversify. This paper shows that mutual funds with a more diversified portfolio perform somewhat better than funds with a less diversified portfolio. However, diversification can be achieved by extending the funds' investment universe and investing in non-listed stocks. Elton, Gruber, Das, and Hlavka (1993) show that funds investing in these types of assets might achieve superior performance simply because these assets are not captured within the benchmark model. This paper, however, finds no evidence to indicate that investment outside the fund's primary investment universe will enhance performance. Moreover, the effects of cash holdings on performance are explored, and some weak evidence suggests that large cash holdings imply better tactical decisions.

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Chapter 4

Costly Information, Diversification, and International Mutual Fund Performance

1 Introduction

Is it profitable to invest in the search for information? This is an important question for asset managers and for mutual fund companies that in the face of increasing competition might want to develop their supply of mutual funds.

In this paper, I provide new evidence on actively managed mutual funds by studying hypotheses related to the costly search for information. We know that an efficient market will provide informed investors with superior returns in a Grossman and Stiglitz (1980) world. However, these returns will only just cover the cost of becoming informed. Investors investing in actively managed funds can be said to be buying an attempt to obtain information that will generate superior performance. If it is not possible to obtain superior performance from information, then there is no need to invest in a costly search for this information. Hence, passive management, or index tracking, would instead be

[0]I would like to thank Magnus Dahlquist, Peter Englund, Anders Löflund and Paul Söderlind for their helpful comments and suggestions.

an efficient way to manage the fund's assets.

Today, the literature on evaluations of actively managed mutual funds is rich. However, it mainly consists of evaluations of domestic U.S. funds and only a few studies that explore questions related to the cost of information. One such study is Ippolito (1989), who examines the costly search for information by comparing mutual fund costs and performance. He concludes that the mutual funds earn returns large enough to offset their costs of becoming informed. Elton, Gruber, Das, and Hlavka (1993) show, however, that this result is due to an incorrectly specified model and that it reverses when an additional benchmark is used.

Evaluating international mutual funds is interesting for several reasons. For instance, the costs associated with the search for information are more significant for funds with a larger investment universe. Hence, the evidence on information aspects is particularly relevant for international funds. Further, it is important to extend the evidence on the performance of international equity mutual funds since only a few studies have been conducted on the performance of these funds (see, e.g., Cumby and Glen (1990)). In this paper, I will also shed some light on how the mutual funds have allocated their assets.

This paper evaluates 299 international equity mutual funds that invest in Asia and Europe, and extends the existing literature on the costly search for information by considering three new perspectives. First, I evaluate the screening of funds conducted by unit-link companies. Do unit-link companies find the best performing funds? Second, I examine whether there are economies of scale in information-gathering by comparing large international mutual fund companies with small Swedish competitors. Third, I analyze the costs associated with the size of investment universe by comparing funds that have large and small investment universes.

The overall results show that the average fund has underperformed. This result is therefore similar to that of Cumby and Glen's evaluation of a small sample of international funds and evaluations of domestic U.S. equity funds. The results for Asia and Europe, however, differ somewhat. The Asia funds, like the Japanese mutual funds studied by Cai, Chan, and Yamada (1997) show a negative performance, which cannot be explained by the fees. In contrast, the negative performance by the Europe funds can be explained by fees. In terms of

diversification benefits, investments in Asia funds performed even more poorly. Unlike the Asia funds, the Europe funds have provided such benefits, as was also found by Cumby and Glen (1990). Further, this paper has found a severe underperformance by non-surviving Asia funds and a significant survivorship bias among funds that diversify their investments across Asia.

Neither among the Asia funds nor among the Europe funds does the evidence suggest the existence of returns to scale in the information gathering process. Furthermore, the Asia fund managers with a smaller investment universe seem to perform better than the fund managers with a larger investment universe. In contrast to the Asia funds, the Europe funds performance does not seem to be affected by the size of their investment universe. Interestingly, the results show that unit-link companies do not seem to be successful in their screening of funds.

The rest of the paper is organized as follows. A description of the sample of funds and the benchmarks used are presented in Section 2. In Section 3, a performance evaluation is conducted by using both an unconditional and a conditional benchmark model as well as a single- and five-index model. Section 4 explores hypotheses related to the costly search for information. Finally, Section 5 presents the conclusions.

2 Data

2.1 Sample of Funds

In the early 1990s only a few international equity mutual funds existed in Sweden. Consequently, the sample period has been chosen to range from 1993 to 1998. At the beginning of the sample period, the two most popular international mutual equity funds for Swedish households were funds that invested in Asia and in Europe. The sample consists of virtually all the equity funds in the Swedish mutual fund industry that have existed during the sample period and that have an investment objective in Asia or Europe. The Swedish mutual fund industry is defined as mutual funds that are advertised and sold in Sweden.[1] Hence, the sample consists of both domestic and foreign owned

[1]Defined by *Findata* and available in their database.

mutual fund companies. The Europe funds category I, however, excludes funds focusing on the Nordic countries; most of these were evaluated in Dahlquist, Engström, and Söderlind (2000). Furthermore, this study does not cover funds focusing on eastern Europe since they behave more like funds investing in other emerging markets than like western Europe funds.

The total number of funds examined in this study is 299. Of these, 147 funds focus on the Asian markets and 152 focus on the European markets. Net asset values are obtained from the *Trust* database of *Findata*. Returns are calculated on a monthly basis for a Swedish investor (in SEK) and include dividends.

2.1.1 Fund Characteristics

The sample of funds explored in this paper consists of both 'normal' equity mutual funds and unit-link mutual funds. Funds offered in the unit-link program are funds that have been carefully examined and chosen by the companies providing this program. The selection criteria include both historical performance and more qualitative variables in the business process, such as evaluation of the fund management team. One important difference between these two mutual fund types is their tax treatment. The only tax that is considered in this paper is a tax of about 0.75% per year, deducted from the net asset value of unit-link funds.[2] Certain unit-link funds, namely life funds, are excluded due to the significant tax difference between these funds and 'normal' equity funds.[3]

Regulations concerning investment policies have been harmonized across the European Union,[4] and are followed by virtually all of the mutual funds in the Swedish industry. The UCITS terms in Europe are very similar to the U.S. 1940 Act defining diversification,[5] whose terms most U.S. mutual funds meet.

[2]The unit-link funds pay this tax annually. Instead, investors in these funds face a lower tax on capital gains.

[3]The annual tax paid by the life funds varies, but can amount to several percent of the NAV.

[4]The UCITS terms were introduced in 1985 (Undertakings for Collective Investments in Transferable Securities). These terms state that the funds are not allowed to hold a single stock worth more than 10% of their total assets. Moreover, they are only allowed to hold stocks worth more than 5% of their total assets to a maximum of 40% of total assets.

[5]The terms state that as to 75% of the assets of the fund, the fund cannot acquire more than 10% of the voting securities of any issuer *and* cannot invest more than 5% of total fund assets in any one issuer. Hence, the minimum number of stocks a diversified U.S. mutual

Other sample characteristics are as follows:

- all funds are open-end funds;
- the investment objective is homogeneous in that the main focus is on a single country or on a single region (Asia or Europe);
- the average fee is about 1.5% per year, which is similar to the fees of U.S. equity funds. Some funds also have exit and loading fees;
- most funds have low requirements on the initial investment, typically SEK 100 (During the sample period, the price of one USD was about SEK 8). This has made it possible for many Swedes to invest in mutual funds, and today most Swedes own a share of a mutual fund.

2.1.2 Entry and Mortality

The picture of the Swedish mutual fund industry has changed significantly during the sample period. In particular, the part of the fund industry investing in Asia has evolved differently from the part investing in Europe.

During the sample period, funds that have invested in Asia have decreased their market share measured as asset managed. At the beginning of the sample period, the Asia and Europe funds were the most popular funds. Today, the Asia funds have a market share that is less than both Global and Nordic equity mutual funds. Table 1 shows that the mortality rate of these funds, however, has been low with only 13% of the original funds not surviving. There are almost three times as many funds at the end of the sample period as there are at the beginning.

In contrast, the assets managed by European equity mutual funds have increased by more than 500% during the sample period and represent today Swedish households' most popular type of international equity mutual funds. This growth is primarily due to the growth in average assets managed by funds as the number of funds has increased by less than 50%. The mortality rate among Europe mutual funds has been higher than for Asia mutual funds; more than 40% of the funds that existed at the beginning of the sample period have not survived.

fund and a European (UCITS) mutual fund must own is 16.

Table 1: Exits and Entries of Funds

	1992	1993	1994	1995	1996	1997	1998
				Panel A: Asia Funds			
Entry	—	14	31	23	18	12	6
Exit	—	0	1	1	3	20	12
Year End	43	57	87	109	124	116	110
Attrition Rate	—	0.00	1.15	0.92	2.42	17.24	10.91
Survived	38	48	71	82	96	104	110
Mortality Rate	11.63	15.79	18.39	24.77	22.58	10.34	0.00
				Panel B: Europe Funds			
Entry	—	12	17	14	16	7	4
Exit	—	1	8	12	9	16	8
Year End	78	89	98	100	107	98	94
Attrition Rate	—	1.12	8.16	12.00	8.41	16.33	8.51
Survived	43	50	65	76	89	90	94
Mortality Rate	44.87	43.82	33.67	24.00	16.80	8.16	0.00

The table shows the number of funds at December each year for the period 1992 to 1998. It also reports on the number of funds that enter and exist 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 existence in December 1998. The mortality rate is computed as one minus the number of survived funds divided by the number of funds at the end of the year.

2.2 Benchmarks and Equity Markets

Statistics on the benchmarks used and the different equity markets in Asia and Europe are presented in Table 2. During the sample period, the average investment in Asian equity has significantly underperformed the average investment in world equity. The total return (including dividends) from January 1993 to December 1998 on the *MSCI Asia/Pacific index* is 24%, which can be compared with the 185% return on the MSCI World index.[6] However, the differences across equity markets in the Asian region are substantial. No sin-

[6] All return figures in this section are calculated from a Swedish investors' point of view, in SEK. Since several major currencies have appreciated against the Swedish Krona, the return in their currency of denomination is lower. The U.S. dollar has appreciated by 14.5%, the GBP by 26.5%, the JPY by 23.7% and the Euro by 10.9%.

gle equity market has outperformed the world index, yet a few have showed a significant positive return of about 114% during the sample period. These markets are Australia, Hong Kong and New Zealand. On the other hand, China, Indonesia, Malaysia, Pakistan and Thailand each show a total return of about −50%. The return on the largest equity market in Asia, namely the Japanese, has not been impressive. During the six-year sample period, the total return, including dividends, was 20%. Naturally, this is very close to the return on the Asia/Pacific index, since the Japanese equity weight was almost 70% on average.

In contrast to investments in the Asian market, the average investment in Europe has significantly outperformed the average investment in world equity between 1993 and 1998. The total return (including dividends) on the *MSCI Europe index* was 259%. All equity markets in Europe experienced a positive total return, and only one market, namely the Austrian, experienced a total return lower than 100%. Greece, Ireland, the Netherlands, Spain, Sweden and Switzerland experienced a total return of between 350 and 400%. The Finnish equity market is Europe's extreme outlier with a total return of 1086% during the sample period. This is primarily due to one single company, namely Nokia.

In the performance evaluation of Asia and Europe mutual funds, I use both regional indices and some major country indices. The regional indices are *MSCI World, MSCI Asia/Pacific and MSCI Europe.*[7] The country indices are the *MSCI Australia, MSCI Hong Kong, MSCI Japan, MSCI Korea and MSCI Taiwan, MSCI France, MSCI Germany, MSCI Spain, MSCI Sweden, MSCI Switzerland* and *MSCI U. K.*[8] I have used so-called '*Free*' indices for the countries for which *MSCI* provides this kind of index. The '*Free*' indices reflect actual buyable opportunities for global investors by taking into account local market restrictions on share ownership by foreigners. Moreover, all indices are value weighted and dividends are reinvested. The return on the risk free asset is approximated by the return on the Swedish 30 day T-bill. In the conditional models, the world dividend yield, which is also obtained from the MSCI, is used as an information variable.

[7] The World index includes 47 countries, the Asia Pacific includes 15 countries and the European index includes 21 countries.

[8] The country indices in Asia and Europe sum to an average weight of 89% and 75% of the Asia/Pacific and Europe index, respectively (excluding Sweden).

Table 2: Benchmark Returns and Fund Style

Indices	Return 1993-98	Mean E.R.	S.D. E.R.	Market Weight	Mean Style
World	184.9	12.02	15.2		
Asia/Pacific	23.9	-0.92	21.00		
Australia	113.7	8.12	20.60	5.7	7.8
Hong Kong	114.3	11.94	34.68	6.5	18.5
India	0.4	-2.22	30.28	1.3	7.5
Indonesia	-56.8	-4.36	57.53	0.9	2.6
Japan	20.2	-1.06	22.86	69.2	30.3
Korea	-10.6	2.82	50.95	2.9	4.0
Malaysia	-44.2	-7.30	42.94	3.4	7.3
Pakistan	-49.0	-8.28	44.02	0.8	5.6
Philippines	3.7	2.65	42.66	0.1	3.4
Singapore	35.8	3.81	33.15	2.1	6.6
Taiwan	88.3	11.08	39.79	4.6	4.4
Thailand	-61.6	-9.82	50.64	1.6	1.8
Europe	259.4	15.93	15.04		
Austria	42.4	1.24	20.21	0.8	6.9
Belgium	335.5	19.22	15.37	2.3	7.4
Finland	1086.0	39.18	28.48	1.1	0.8
France	196.2	13.51	20.22	12.6	4.6
Germany	255.9	16.38	18.73	14.0	14.8
Greece	366.1	23.80	31.34	0.4	2.0
Italy	300.5	20.21	27.23	5.1	9.1
Netherlands	350.2	20.00	16.56	7.8	5.0
Spain	408.1	23.34	23.22	3.9	6.8
Sweden	350.2	20.76	20.69	3.6	8.0
Switzerland	369.1	20.89	17.64	10.4	11.3
United Kingdom	212.9	13.50	14.59	34.0	23.3

The table shows statistics of benchmark returns, market weight, and fund style. The statistics show total return between 1993 and 1998 in percent, mean excess return, and standard deviation of excess return. Means and standard deviations are expressed in % per year for the sample period. Market weight refers to the average weight for the sample period of the regional index. Fund style shows average style of the funds. Market weight and fund style are expressed in %.

2.3 Style Analysis

Fund performance is attributed to the allocation of its assets. It is interesting to learn how the funds allocate their assets to different markets. For instance, do they favor absolute performance and invest in bull markets or do they try to create good relative performance in bear markets? To investigate how the funds have allocated their assets, I undertake a style analysis, as in Sharpe (1992). This style analysis captures the funds' weight to each benchmark in the regression. The regression equation 4.1 is used, but the number of benchmarks is extended, and there are restrictions on the coefficients. The betas must sum to one and they must be non-negative. In this style analysis, I use twelve country indices as benchmarks. For the funds investing in the Asian region, I use Australia, Hong Kong, India, Indonesia, Japan, Korea, Malaysia, Pakistan, Philippines, Singapore, Taiwan, and Thailand. Similarly, I use Austria, Belgium, Finland, France, Germany, Greece, Italy, Netherlands, Spain, Sweden, Switzerland, and the U. K. as benchmarks for funds investing in the European region. Table 2 shows the average fund style.

The average fund that invested in Asia seems to have deviated its investments significantly from the Asia/Pacific index. For instance, the average weight in Japanese stocks has been 30% compared with a 70% weight in the index. Instead, the funds have invested significantly more in Hong Kong and India compared with their weights in the index. In contrast to the average Asia fund, the style of the average Europe fund is much more closely linked to the European index. The main differences are that the funds seemed to invest significantly less in French equities, and more in Austrian, Belgian and Swedish equities. The results in Table 2 suggest that both Asia and Europe fund managers have been quite successful in chasing well-performing equity markets.

3 Performance Evaluation

The most commonly used measure when evaluating mutual fund performance is Jensen's alpha measure. However, this measure is known to suffer from a statistical bias when fund managers successfully time the market. The impli-

cation is that successful timers can obtain a negative performance. In response to the statistical bias problem, Grinblatt and Titman (1989) propose a new measure, the Positive Period Weighting measure, which does not suffer from this bias. Another development has been proposed by Lehmann and Modest (1987), who were the first to adapt the APT to performance evaluation and show how the evaluation is affected by the choice of benchmark model. The importance of choosing the correct factor in the Jensen single factor model has also been demonstrated in Elton, Gruber, Das, and Hlavka (1993). They extend the single factor model used in Ippolito (1989) into a multi-factor model and show that the result reverses.

The Jensen measure has traditionally been unconditional in the sense that historical average returns are used to estimate expected performance. Hence, it does not account for time-varying expected returns and risk. Ferson and Schadt (1996) develop the traditional measure of performance further by using predetermined information variables. This conditional measure of performance allows for time-varying expected returns and risk. Moreover, they provide some evidence suggesting that this conditional model yields a somewhat higher measure of mutual fund performance than the unconditional measure.[9]

Another development, presented by Chen and Knez (1996), is the use of stochastic discount factors when evaluating mutual fund performance. Dahlquist and Söderlind (1999) apply this method to a small sample of Swedish equity mutual funds.

3.1 Evaluation of the Sample of Funds

The performance of the sample of funds is explored by calculating several measures. Following Ferson and Schadt (1996), I have calculated a conditional alpha measure that allows for time-varying expected returns and risk. To explore the importance of choosing the correct benchmarks, as demonstrated by Elton, Gruber, Das, and Hlavka (1993), I calculate the conditional measure using both a single index and a five-index model. In the single index model, I use a regional index as the benchmark. They are *MSCI Asia/Pacific (all countries)* and *MSCI Europe (all countries)* for the Asia and Europe mutual

[9]Dahlquist, Engström and Söderlind (2000) obtain similar result.

funds, respectively. The five-index model is based on five major country indices, which are described in Section 2.2. Moreover, in a similar setting to Cumby and Glen (1990), I calculate a measure of the international diversification benefits obtained from investing in Asia and Europe mutual funds. The diversification benefits are calculated in a single index setting using World index and the Sweden index as benchmarks. I also calculate and compare the results in the conditional setting with the results in the unconditional setting.

The traditional unconditional Jensen alpha measure is estimated by the following regression equation

$$R_{it} - R_{ft} = \alpha_i + \beta_i \left(R_{bt} - R_{ft}\right) + \varepsilon_{it}, \tag{4.1}$$

where R_{it} and R_{bt} denote the gross return on fund i and the gross return on the benchmark during the period t. The return on risk-free asset is the 30-day T-bill, and is denoted by R_{ft}. The intercept α_i is the Jensen alpha measure, or the systematic pricing error. A positive (negative) alpha can be interpreted as a superior (inferior) performance. All results are annualized (i.e., an alpha of 1% means that the fund has outperformed the benchmark portfolio by 1% per year). The beta coefficient measures the exposure versus the benchmark and is a measure of the fund's systematic risk. The ε_{it} is a fund-specific error term.

The unconditional model can easily be extended to capture potential time-variation in risk and expected returns. We obtain the conditional model by including a vector q_{t-1} of predetermined information variables. Assuming that the beta for each fund varies over time, and that this variation can be captured by a linear relation to the information variables, we have that

$$\beta_{it-1} = b_{i0} + b_i' q_{t-1}. \tag{4.2}$$

The information variable has zero mean, which implies that the expected value of beta is b_{i0}. In the regressions, I use the world dividend yield as an information variable, which can be viewed as a proxy for the valuation of stocks.[10] The mutual funds with 15 observations or more are evaluated, and the alphas

[10]World dividend yield has some predictive ability for international stock returns. See, e.g., Ferson and Harvey (1993).

and betas are estimated with least squares in all models. However, the standard errors are designed to allow for autocorrelation and heteroskedastisity.[11]

This model is based on only one benchmark, but it can easily be extended to a multi-index setting. In a multi-index model, both the β_i and R_{bt} are vectors where each element in β_i represents the fund's sensitivity to each benchmark.

3.1.1 Fund Performance

In this subsection, I present the evidence obtained on the performance of the sample's 299 mutual funds, whose investment objective is in the Asian or the European equity market. This sample does not suffer from survivorship bias since it contains all the funds that existed during the sample period. The results of the performance evaluation are presented in Table 3.

In the Asian region, the mutual funds seem to underperform severely. The average mutual fund underperforms by 8.9% per year when the funds are evaluated using the five-index model. This result is consistent with the results of both Brown, Goetzmann, Hiraki, Otsuki, and Shiraishi (1998) and Cai, Chan, and Yamada (1997). Their study of Japanese mutual funds shows that the average fund underperforms by about 8%. However, this underperformance disappears when the Asia mutual funds are evaluated in the single-index model. In this setting, the average performance becomes only -0.6% per year. The *Asia/Pacific index* does not seem efficient in explaining the performance of diversified Asia funds, but this is natural given that it mainly consists of Japanese equity (about 70%), and therefore mainly explains the performance of mutual funds focusing on Japanese equity.

The analysis of the European region produces different results. The average performance is -1.6% per year when the five-index model is used. This performance corresponds to the average management fee. The distribution of the Europe funds' alpha is much tighter than for Asia funds'. Almost all the alphas of the Europe funds are between -10% and 10%. When the performance is measured using the *MSCI Europe index* as the benchmark, the result changes very little. The average performance increases somewhat to -1.3% per year. This makes the broad European index appear more efficient in capturing mutual fund returns than the broad Asian index.

[11] Following the approach as in Newey and West (1987).

Table 3: Performance Measures

Asia				Europe			
α	α^+ α^-	R^2	Wald	α	α^+ α^-	R^2	Wald
			Benchmark: Single index				
-0.63	0.01	0.48	0.35	-1.32	0.03	0.67	0.29
(-1.50)	0.03	(0.47)		(-1.34)	0.11	(0.68)	
			Benchmark: Five index				
-8.87	0.00	0.81	0.60	-1.57	0.04	0.81	0.64
(-7.66)	0.50	(0.84)		(1.53)	0.17	(0.85)	
			Benchmark: World index				
-17.94	0.00	0.42	0.09	3.94	0.11	0.54	0.29
(-17.35)	0.58	0.45		(3.64)	0.07	(0.55)	
			Benchmark: Sweden index				
-15.78	0.00	0.18	0.17	3.33	0.05	0.40	0.54
(-15.54)	0.32	(0.18)		(3.21)	0.02	(0.41)	

The table shows the results from conditional performance evaluations of funds for the period 1993 to 1998. Results from four different benchmark models are presented: a single-index, five-index, World index, and Sweden index model. The conditional model allows for time-variation in betas via an information variable (world dividend yield). Details about the performance measures are given in the text. The alpha, α, refers to the average and median (in parentheses) of the cross-sectional alphas for each category. The α^+ and the α^- refer to the test of zero alpha at the 10% level of significance. α^+ and the α^- are the percentage of significant positive and negative alphas, respectively. R^2 is the average and median (in parentheses) adjusted coefficient of determination across funds in the categories. The Wald statistic refers to a test of no time-variation in the betas, where the percentage of rejected null hypothesis at the 10% significance level is reported.

The conditional performance of the Asia and Europe funds is similar to the unconditional performance. Also, the average performance is similar when the number of observations used in the estimation weights the performance.

3.1.2 Diversification Benefits

International investments and diversification have received increased attention from individual and institutional investors. In Bailey and Lim (1992), the diversification benefits of investing in closed-end country funds are explored. Their findings indicate that country funds offer some diversification benefits but are poor substitutes for direct holdings of foreign equities. This is partly due to the fact that closed-end funds are not traded at the funds' NAV and are priced more like domestic U.S. equities than like the foreign stocks they are invested in. Similar to Bailey and Lim (1992), Harvey (1995) finds significantly enhanced portfolio opportunities through the addition of emerging markets. A critical drawback of this study, however, is its use of market indices and the ignorance of the high transaction costs. In contrast, Bekaert and Urias (1996) find that U.K. closed-end emerging market funds provide significant diversification benefits, while comparable U.S. funds do not. Hence, it is essential to explore the diversification benefits from true investment vehicles.

In this paper, I obtain a measure of international diversification benefits from investments in a large sample of open-end mutual funds investing in Asia and Europe. This measure is computed in a setting similar to that of Cumby and Glen (1990) and Eun, Kolodny, and Resnick (1991), who have calculated these benefits for U.S.-based international funds in terms of Jensen's alpha, using a domestic index as the benchmark. That is, the performance is measured as the systematic pricing error in a regression where the systematic risk is measured relative the the domestic index. Their findings suggest that these mutual funds outperform a U.S. index,[12] providing its investors with diversification benefits, but fail to outperform the World Index. In this paper, this analysis is conducted by calculating Jensen's alpha using the *MSCI World index (all countries)* and *MSCI Sweden* as benchmarks.

The results suggest that the Asia mutual funds do not provide diversifi-

[12]Cumby and Glen (1990) use the Morgan Stanley index for the United States while Eun, Kolodny and Resnik (1991) use the Standard&Poor 500 index.

cation benefits to Swedish investors. The performance of the funds becomes pervasively negative both when the World index and the Swedish index are used as benchmarks - on average, −17.9% and −15.8% per year, respectively. Further, 58% of the alphas are significantly negative and no significant positive alpha is observed when the World index is used as benchmark.

In contrast to the Asia funds, but in line with the findings of Cumby and Glen (1990) and Eun, Kolodny, and Resnick (1991), the Europe mutual funds seem to provide diversification benefits. The average performance is 3.9% and 3.3% compared to the World index and the Swedish index, respectively. This result is interesting, since the Europe funds have provided their investors with a lower return than mutual funds that invest in Sweden. Moreover, Dahlquist, Engström, and Söderlind (2000) show that mutual funds that invest in Swedish equity fail to outperform a Swedish benchmark.

3.2 Excess Return and Survivorship Bias

Since the sample consists of virtually all the funds that have existed during the sample period, it does not suffer from survivorship bias. This allows us to calculate the survivorship bias for the Asia and Europe funds. Two measures of survivorship bias are calculated, both in terms of excess return and in terms of Jensen's alpha.[13] The excess return is calculated by first forming an equally weighted portfolio of all funds, only surviving funds and non-surviving funds and then measuring the return on these portfolios in excess of the return on the risk free asset. The survivorship bias is obtained by computing the difference between the portfolios of all the funds and the surviving funds. These results are presented in Table 4.

Due to low returns on the equity markets in the Asian region the excess return for mutual funds investing in this region are expected to be low. However, the results show that the excess return is in fact negative. On average, the excess return for all mutual funds with an investment objective in the Asian region shows an underperformance of 1.0% per year relative to the risk-free asset. The surviving funds show a 0.4% higher return per year. In Table 1 we observe low mortality rates for the Asian region. However, this examination

[13] Jensen's alpha is calculated using a conditional five-index model, described in Section 3.1.

shows that funds that did not survive the sample period have underperformed severely. On average, the return for these funds was 8.5% less than the risk free asset. When the alpha measure is employed the performance of non-survivors is −9.9%. Further, the difference between surviving funds and non-surviving funds is statistically tested by employing a trading strategy. This trading strategy, or zero cost portfolio, consists of a long position in an equally weighted portfolio of surviving funds and a short position in an equally weighted portfolio of non-surviving funds. The performance of this zero cost portfolio is 5.3% per year and statistically significant at the 5% level. This result suggests that poor performance might explain why Asia funds leave the market.

Table 4: Estimates of Survivorship Biases

	1993	1994	1995	1996	1997	1998	1993 to 1998		
	Averages of Excess Returns						Mean	α	S.E.
Asia funds									
All	61.40	-24.79	-19.39	0.18	-23.93	0.34	-1.03	-5.41	2.76
Surviving	61.24	-24.07	-18.65	-0.27	-23.48	1.54	-0.62	-5.08	2.69
Non-Surv.	60.81	-28.74	-21.63	1.56	-28.45	-37.06	-8.52	-9.86	4.01
Surv.–All	-0.16	0.72	0.74	-0.45	0.45	1.20	0.41	0.34	0.25
Europe funds									
All	34.89	-18.08	-5.05	16.30	29.97	22.45	13.41	-1.42	1.84
Surviving	36.66	-17.96	-4.72	16.41	30.15	22.73	13.88	-1.23	1.85
Non-Surv.	32.76	-18.14	-5.98	15.88	29.28	26.07	13.13	-1.50	2.41
Surv.–All	1.77	0.12	0.33	0.11	0.18	0.28	0.46	0.20	0.19

The table shows the average excess returns in % per year for equally weighted portfolios of surviving funds, non-surviving and both surviving and non-surviving (All) funds. The estimates of the survivorship biases for the each year of the sample period are measured by the difference between the average portfolio returns for surviving, and all funds (All). For the full period, 1993 to 1998, the mean return, a conditional alpha measure, and the standard error of the alpha are reported.

The results among the mutual funds with an investment objective in the European region are different from those obtained among funds in the Asian region. The average excess return is significantly positive. For all mutual funds, the average excess return is 13.4% per year, only 0.3% higher than for the non-surviving funds. The surviving funds show an excess return of 13.9%

per year, which implies a survivorship bias of 0.5%. This positive absolute performance turns out to be negative when the alpha measure is employed. The survivorship bias, however, is somewhat smaller using the alpha measure. This result indicates that other factors besides poor performance cause the Europe funds to leave the market.

Two interesting results emerge when the survivorship bias is examined in more detail. First, there is a statistically significant survivorship bias for regional funds in Asia. The bias for these funds is 1.1% per year and robust to the choice of benchmark model. This might be due to more intensive competition among regional funds because the number of funds with similar investment objectives is much larger than for focusing funds. However, no such pattern is observed among the Europe funds. Second, it is natural to believe that the foreign funds that did not perform well would leave the Swedish mutual fund industry due to competitive disadvantages in Sweden. However, there is no statistically significant evidence of a such difference in the survivorship bias between Swedish and foreign-owned funds.

3.3 Selectivity and Market Timing

A skilled fund manager can create performance by altering the risk level in the fund to different market situations. Preferably, the risk level (the exposure to the market) is high in bull markets and low in bear markets. This skill, however, is known to cause a statistical bias in Jensen's evaluation technique. Successful market timers can obtain negative performance due to this bias.[14] Another way to create performance is through selectivity, that is, continuously selecting high performing equity. Two commonly used measures of selectivity and market timing are obtained from the models developed in Treynor and Mazuy (1966) and Henriksson and Merton (1981). The first model is based on a quadratic regression, where the excess return on the benchmark is squared.

$$R_{it} - R_{ft} = \alpha_i + \beta_{it-1}\left(R_{bt} - R_{ft}\right) + \gamma_i\left(R_{bt} - R_{ft}\right)^2 + \varepsilon_{it}. \qquad (4.3)$$

The second model, the dummy regression of Henriksson and Merton, where D_t is a dummy variable for a positive excess return, can be written as

[14] See e.g., Grinblatt and Titman (1994).

$$R_{it} - R_{ft} = \alpha_i + \beta_{it-1}(R_{bt} - R_{ft}) + \gamma_i D_t (R_{bt} - R_{ft}) + \varepsilon_{it}. \quad (4.4)$$

In both models the fund manager does not possess a timing ability if the γ_i is equal to zero. The fund manager's selectivity ability is measured by the α_i. A positive alpha implies that the manager possesses a stock-picking ability. These models can easily be extended to allow for conditioning information. Ferson and Schadt (1996) show that the negative timing performance can be removed when the approaches of Treynor-Mazuy and Henriksson-Merton are modified by conditioning on public information. In this paper the reported measures of timing ability are calculated in a setting similar to that in Ferson and Schadt (1996).

Table 5: Market Timing Measures

Treynor-Mazuy				Henriksson-Merton			
α	γ	Wald$^-$	Wald$^+$	α	γ	Wald$^-$	Wald$^+$
Panel A: Asia Funds							
-8.71 (-7.51)	-0.02 (0.00)	0.06	0.14	-7.69 (-6.59)	-0.03 (-0.03)	0.08	0.09
Panel B: Europe Funds							
-2.48 (-2.43)	0.30 (0.15)	0.04	0.11	-2.62 (-3.39)	0.07 (0.05)	0.05	0.12

The table shows the results of the market timing regression in the conditional model. Treynor-Mazuy and Henriksson-Merton refer to the specifications discussed in Treynor and Mazuy (1966) and Henriksson and Merton (1981), respectively. The alpha, α, refers to the average and median (in parentheses) of the cross-sectional alphas for each category. The gamma, γ, refers to the average and median (in parentheses) estimated timing coefficients. The Wald$^-$ and Wald$^+$ statistics report the percentage of rejected null hypotheses of no market timing (negative and positive, respectively) at the 10% significance level.

The findings in this paper are more mixed than the scarce literature on the timing and selectivity ability of international mutual fund managers (see Table

5). However, the overall result in this evaluation suggests that the performance measures are robust to the error that might occur due to market timing. Moreover, both Asia and Europe fund managers possess a poor selectivity ability.

The result concerning fund managers' timing ability depends to a certain extent on the choice of timing measure. About 10% of the Asia fund managers possess a positive timing ability, but almost as many possess a negative timing ability. The results are similar for Europe fund managers. About 10% of the fund managers possess a positive timing ability, but somewhat fewer possess a negative timing ability. In contrast, Cumby and Glen (1990) find evidence suggesting that international fund managers possess a negative market timing ability. Their result is pervasive; the 15 funds examined show a negative timing ability, which is significant. However, this is a small sample and partly due to the events of October 1987.

4 Costly Information and Performance

In a Grossman and Stiglitz (1980) world, informed investors will earn superior returns in an efficient market, but only enough to cover the cost of becoming informed. This section examines hypotheses related to this costly search for information by a closer look at fund performance. The analysis is undertaken by measuring the performance of funds with certain characteristics to find out if a certain type of fund performs better than another. Moreover, trading strategies based on these fund characteristics are evaluated. These strategies provide a measure of the statistical significance of the difference in performance. The evaluated fund characteristics are related to screening, size of mutual fund complex and the size of the fund's investment universe. The results are presented in Table 6 and the performance has been estimated using the five-index conditional model.

4.1 Screening

Previous research has shown that it is difficult for professional mutual fund evaluators to find future winners, see Blake and Morey (2000). This section extends this evidence by comparing the performance of unit-link funds with

Table 6: Performance and Fund Characteristics

	Asia			Europe		
Fund Characteristics	$\overline{\alpha}$	N	α_{port}	$\overline{\alpha}$	N	α_{port}
Equity fund	-8.62	110	2.32	-1.35	103	1.12
Unit Link	-9.82	29	(1.17)	-2.19	37	(0.75)
Swedish	-7.17	50	-2.55	-1.66	71	-2.08
Foreign	-9.82	89	(1.73)	-1.48	69	(1.64)
Regional	-12.13	72	-7.54	-1.45	84	0.34
Focus	-5.36	67	(3.04)	-1.74	56	(1.18)

The table shows the performance for various types of funds. The performance measures are obtained using the five-index conditional model. Reported fund types are normal equity funds or Unit Link funds, owners of fund companies (Swedish or foreign) and the investment objective of the fund (regional, i.e., several countries or focus, i.e., single country). $\overline{\alpha}$ is the average fund performance for each fund type and N refers to the number of funds within each fund type. α_{port} is the alpha of a zero cost portfolio and its standard error (within parenthesis). The first zero cost portfolio is constructed by buying an equally weighted portfolio of equity funds and selling an equally weighted portfolio of unit-link funds. The second zero cost portfolio is constructed by buying an equally weighted portfolio of funds owned by Swedes and selling an equally weighted portfolio of funds owned by foreigners. The third zero cost portfolio is constructed by buying an equally weighted portfolio of regional funds and selling an equally weighted portfolio of focusing funds.

that of other funds. Mutual funds offered in the unit-link program are funds that have been carefully examined and chosen by the companies providing this program. They are selected based on historical performance as well as more qualitative variables in the business process, such as an evaluation of the fund management team. The evaluation and search for funds that will perform above average in the future is associated with a cost that is about 0.6% of the fund assets per year and paid by the fund's investors (by selling shares). The questions that I want to answer are: Is this screening among funds beneficial for investors? Is the unit link funds' performance superior to the performance of the average ordinary fund?

Table 6 shows that screening of funds does not appear to benefit investors.

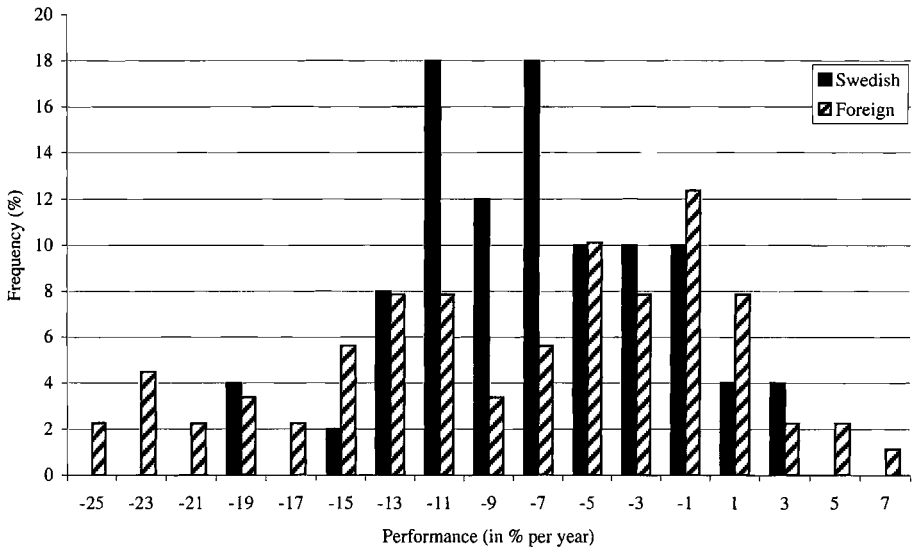
In the Asian region, the unit-link funds do not seem to perform as well as ordinary funds, using both the Asia/Pacific index and the five-index model. To test the statistical significance between the ordinary and unit-link funds, I employ a trading strategy that consists of a long position of an equally weighted portfolio of ordinary equity funds and a short position of an equally weighted portfolio of unit-link funds. This zero cost portfolio yields a performance of 2.3% per year, which is statistically significant. However, in terms of diversification benefits, the performance of unit-link funds does not differ from the performance of ordinary funds.

The average performance of Europe unit-link funds, like that of Asia funds, is somewhat lower than for ordinary funds. This difference does not turn out to be statistically significant when the above trading strategy is employed. Moreover, in contrast to the Asia funds, this also holds in terms of diversification benefits. It is important to remember, however, that a tax of about 0.75% has been deducted from the unit-link funds' NAV, which explains most of the differences in performance.

4.2 Size of Mutual Fund Complex

The rapid growth of the global mutual fund industry has increased both the number of funds as well as the assets managed per fund. Dahlquist, Engström, and Söderlind (2000) have found evidence of a negative fund-size effect, namely that larger funds (assets under management) perform worse than smaller funds. This effect is probably explained by the fact that the large funds in their sample are large in relation to the market in which they invest. The size effect related to the assets managed by the single fund should be distinguished with the effect caused by the size of the mutual fund complex (i.e. total asset managed by the fund company). From an information point of view, one would assume that economies of scale exist in the search for information. In this section, I can explore the effect caused by the size of the mutual fund complex since I use a sample of international funds that is small in relation to the market in which they invest. The sample is divided into two parts: funds owned by a Swedish fund company and funds owned by a foreign fund company that in terms of assets under management is about $10-40$ times larger than the largest Swedish fund company. Due to the significant difference in size between foreign- and

Figure 1: Performance and Owners for Asia Funds
The figure shows the distribution of conditional alphas for 50 funds investing in a single country (Focus) and 89 funds diversifying across Asia (Regional). Each bin covers an alpha of 2%. The alphas are estimated using a 5-index model. Eight foreign owned funds show an alpha which is lower than 26% and two foreign-owned funds show an alpha that is higher than 8%.



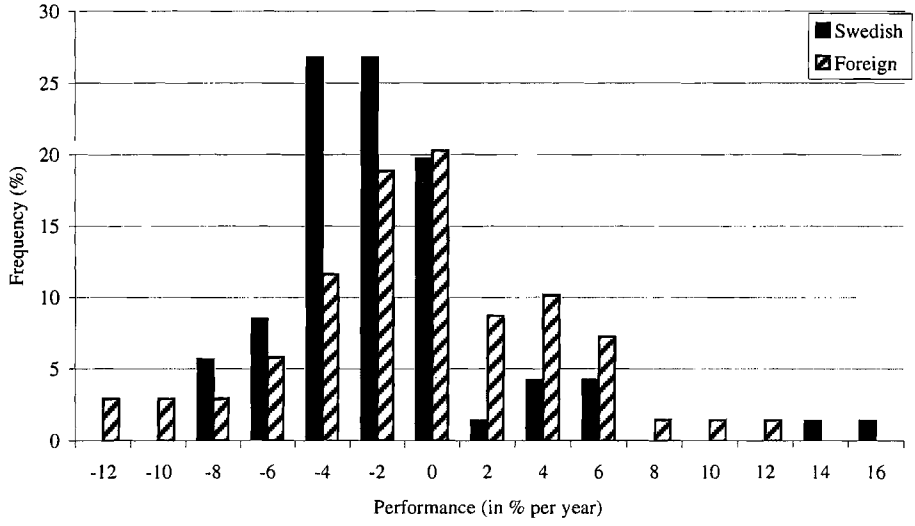
Swedish-owned fund companies, foreign fund companies are expected to have greater research-gathering resources.

Table 6 shows that the results in the Asian region are somewhat mixed. When the average fund performance is compared, we observe that the average performance of Swedish-owned funds is somewhat higher than for foreign owned funds. Figure 1 shows that this difference is caused by some outliers among the foreign owned funds. Moreover, when employing a trading strategy that consists of a long position in an equally weighted portfolio of Swedish-owned funds and a short position in an equally weighted portfolio of foreign-owned funds, the result reverses. This trading strategy yields a performance of -2.6% per year.

The results of the Europe funds differ somewhat from the results of the Asia funds. Similar performance is observed for Swedish- and foreign-owned funds

when the five-index model is used (see Figure 2). When the regional index is used as the benchmark as well as in terms of diversification benefits, the average performance of Swedish owned funds is somewhat poorer than that of foreign-owned funds. These results also hold in both the conditional and unconditional setting.

Figure 2: Performance and Owners for Europe Funds
The figure shows the distribution of conditional alphas for 71 funds investing in a single country (Focus) and 69 funds diversifying across Europe (Regional). Each bin covers an alpha of 2%. The alphas are estimated using a 5-index model. Three foreign-owned funds show an alpha that is lower than 13%.



4.3 Investment Objective

The final fund characteristic analyzed relates to the fund's investment objective. Fund managers who select their investments from a small investment universe can spend more time analyzing each company. On the other hand, fund managers who diversify across a region can derive diversification benefits and face fewer problems associated with a large size. It is interesting to see whether these benefits received by funds with a large investment universe, are offset by the higher cost associated with larger research-gathering resources. In this paper, I distinguish between funds with a small investment universe (funds that

invest in a single country) and funds with a large investment universe (funds that diversify across a region).

Figure 3: Performance and Investment Objectives for Asia Funds
The figure shows the distribution of conditional alphas for 67 funds investing in a single country (Focus) and 72 funds diversifying across Asia (Regional). Each bin covers an alpha of 2%. The alphas are estimated using a 5-index model. Eight funds (six Regional and two Focus) show an alpha that is lower than 26% and two funds (Focus) show an alpha that is higher than 8%.

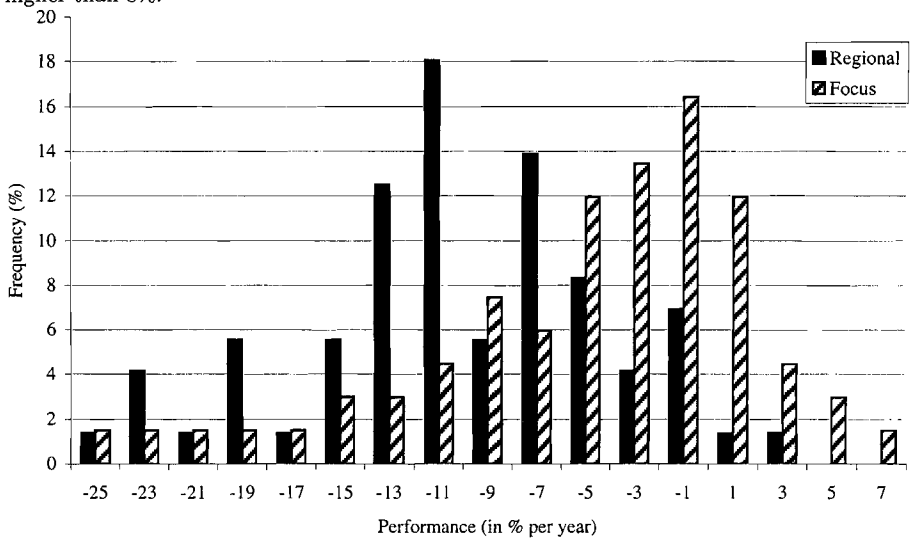
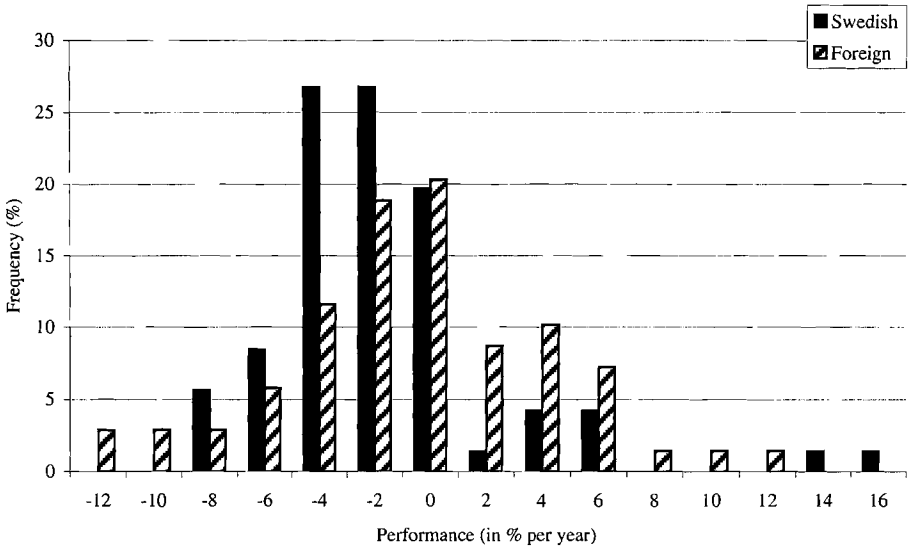


Table 6 shows that the average performance of funds with a small investment universe (focus) is 7% higher than the average performance for funds that diversify across Asia. This result does not seem to be driven by outliers; in effect Figure 3 shows that the funds seem to be drawn from two different distributions. Moreover, this superior performance is obtained with the five-index model as well as in terms of diversification benefits, and holds both in the unconditional as well as in the conditional setting. To measure the statistical significance in this difference, I form a zero-cost portfolio that consists of a long position of an equally weighted portfolio of regional funds and a short position of an equally weighted portfolio of focusing funds. This trading strategy yields a performance of -7.5% per year, which is statistically significant. Hence, the benefits of diversification seem to be offset by the higher cost, associated with

larger research-gathering resources.

Contrary, for the European region, we observe similar average performance for the regional fund as for the average focusing fund. Moreover, Figure 4 shows that the distributions of regional and focusing funds are similar. When the trading strategy is employed, as described above, the result shows that no statistical evidence exists to suggest that the benefits of diversification should be offset by higher costs associated with larger research-gathering resources. However, when the European index is used as benchmark, and in terms of diversification benefits to an international investor, focusing funds seem to perform somewhat better.

Figure 4: Performance and Investment Objectives for Europe Funds
The figure shows the distribution of conditional alphas for 56 funds investing in a single country (Focus) and 84 funds diversifying across Europe (Regional). Each bin covers an alpha of 2%. The alphas are estimated using a 5-index model. Three funds (two Regional and one Focus) show an alpha that is lower than 13%.



5 Conclusions

This paper extends the evidence on the performance of international equity funds by examining a large sample of funds that invest in Asia and Europe. The results obtained are robust in the sense that the sample of funds is not contaminated with survivorship bias. Moreover, the results do not change significantly when employing models for market timing. In contrast to Cumby and Glen (1990), this study finds no evidence that suggests that fund managers possess a negative timing ability.

The findings in this paper suggest that international funds underperform. The deducted management fee can explain the underperformance of the Europe funds but not the underperformance of the Asia funds. However, from an international investor's point of view, investments in Europe funds have been beneficial. These funds have provided their investors with diversification benefits and positive performance. In contrast, the Asia funds' performance is pervasively negative in terms of diversification benefits. Further, the results show a severe underperformance among non-surviving Asia funds, which suggests that poor performance is a reason for their termination.

In the second part of the paper, I study hypotheses related to the mutual funds' costly search for information. Grossman and Stiglitz (1980) argue that investing in a costly search for information should create opportunities for superior performance, which will compensate for the search costs. In this paper mixed evidence has emerged.

Among the Asia funds, the evidence suggests that investments in search for information *do not* create superior performance that is enough to compensate for the search costs. First, the costly screening of funds conducted by unit-link companies is not compensated by higher performance. Second, funds investing in the search for information in a large investment universe are not compensated for the search costs to the same extent as funds that invest in search for information in a small investment universe. However, there is mixed evidence on how the size of mutual fund complex affects performance. Since no statistically significant evidence exists, we cannot reject the null hypothesis of no economies of scale in the costly search for information.

Contrary to the findings regarding the Asia funds, the evidence related

to the Europe funds suggests that investments in the search for information *do* create superior performance that is sufficient to compensate for the search cost. First, I cannot reject the hypothesis that investment in costly screening is compensated by a higher performance, which is enough to offset the cost. Second, I cannot reject the hypothesis that smaller mutual fund complexes that face higher search costs are compensated by higher performance. No statistically significant difference exists in the performance of funds that belong to small and large mutual fund complexes and hence no economies of scale are found in the costly search for information. Third, I cannot reject the hypothesis that funds investing in the search for information in a large investment universe are compensated for the search costs. In fact, funds with large investment universe seem to perform somewhat better than funds with a small investment universe.

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